C D Wootton.

DDM/D2/0

OPERATORS HANDBOOK

SYSTEM DDM

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MEMORY LIGHTING CONTROL SYSTEM DDM

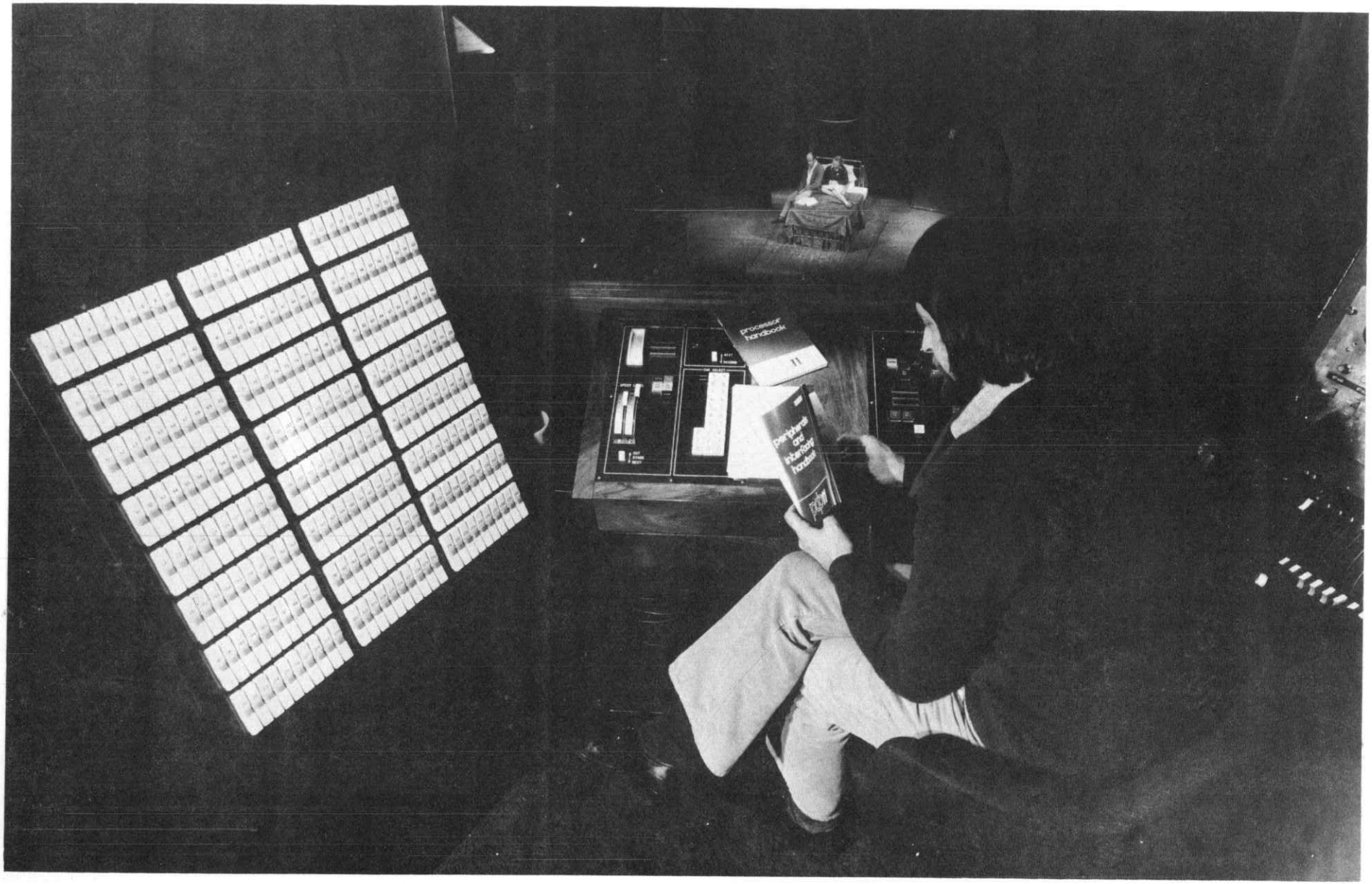
SUMMARY OF CONTENTS

ASSOCIATED HANDBOOKS:

DDM/T1/0	Magnetic Tape system, Operators Handbook.
DDM/S1/0	Stalls Control, Operators Handbook.
DDM/D2/T	Technical Handbook

This is issue 3 of the complete operators handbook. All the sections are issue 2 with the exception of 4.9.3. which is issue 3.

DETAILED LIST OF CONTENTS



DDM SYSTEM INSTALLED AT THE ROYAL SHAKESPEARE THEATRE, STRATFORD-UPON-AVON

1. INTRODUCTION

1.1. THE D.D.M. SYSTEM

The D.D.M. lighting control system which is described in this handbook is an advanced intensity memory system which offers many unique facilities.

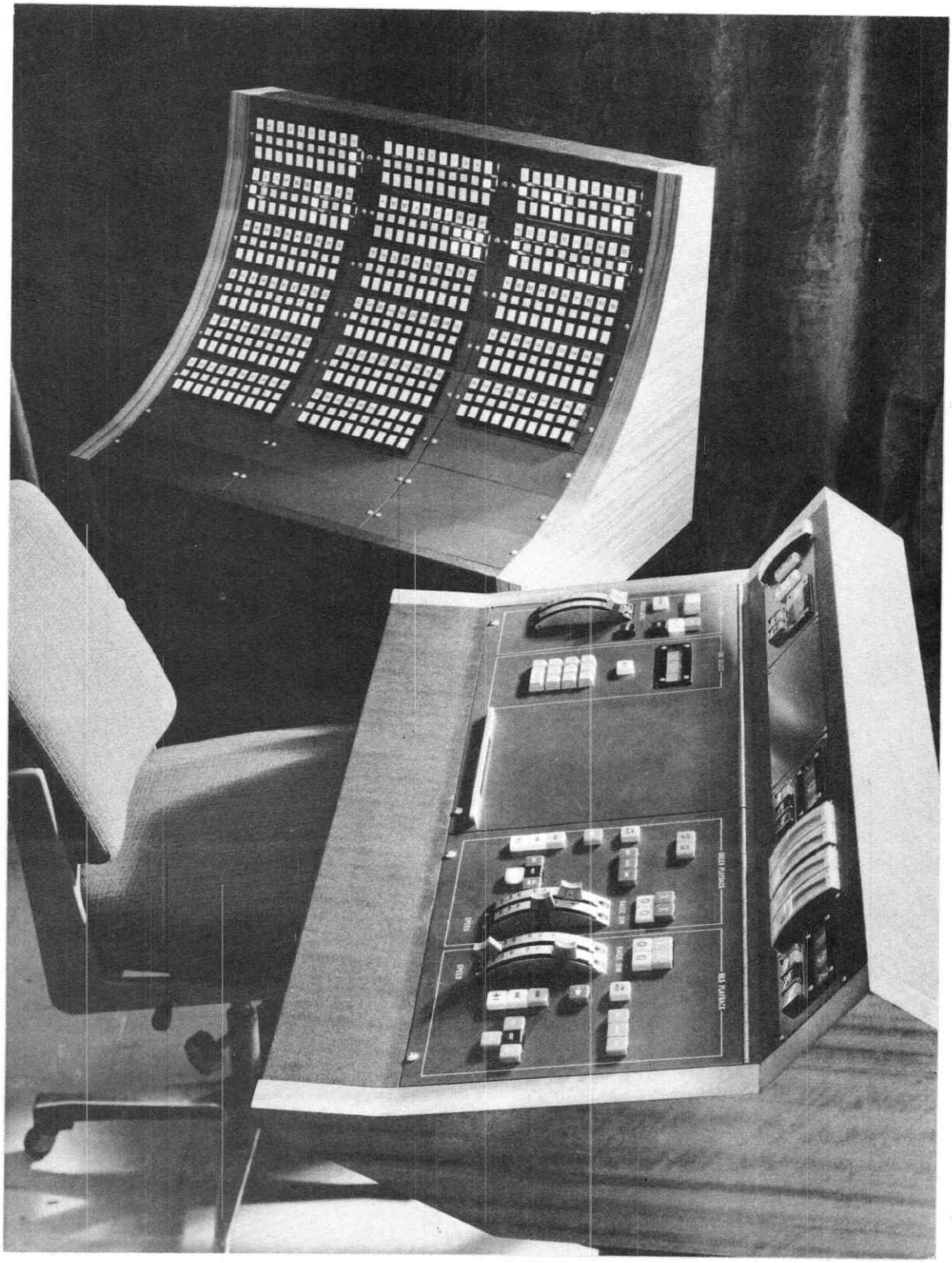
The system uses a sophisticated mini computer (Digital Equipment Corporation PDP-11) which has a softwave program to determine the operational facilities. This gives the system unprecedented flexibility and has enabled a design to be produced without the normal limitations imposed by a conventional system. The use of a proprietary general purpose computer which is produced in large quantities offers the user better reliability and value for money.

It may be useful to a prospective operator to review the main features of the system. These are summarised below and considered in more detail in Sections 3 and 4 of this handbook.

(a) CHANNEL CONTROL

An individual ROCKER control is provided for each channel. The Rockers provide a comprehensive mimic display with three lamps per channel. This enables an operator to identify a channel and modify it instantly with reference to only one point in the system. The rockers can always be used for modification regardless of the state of the control and any number may be operated simultaneously.

When channels have been modified they can be automatically returned, singly or collectively, to their unmodified levels. Individual circuits can be rapidly identified by means of a 'Flash' to full or zero facility.



180 WAY DDM/D2 SYSTEM
MASTER DESK AND ROCKER WING

(b) RECORD

Overall Recording and Selective recording of channels is provided. There are interlocks to prevent over-recording a previously used memory number. 'Blind' recording of channel levels is possible without bringing the channels up on stage.

(c) PLAYBACK

Two independent playbacks each with separate control of the 'raise' and 'dim' speeds are provided. These controls enable cues to be added or subtracted or cross-faded; the functions can be stopped or varied at any time during the operation.

In addition to the facility to operate two simultaneous cross-fades or two fades up plus two fades down, together at varying speeds, there is also a cut facility enabling switch cues to be carried out without affecting the levels of common channels, which are also being faded.

Transfer facilities between the red and green playbacks enable cues to be combined or split at any time - even during the middle of a fade.

A reverse control enables the operator to go back on a cue instantly at any time. This facility is invaluable during a lighting rehearsal when it is often necessary to run cues a number of times to achieve correct timing. The facility is also useful when balancing groups.

(d) PREVIEW

Cues can be previewed and, if necessary, modified before use. A number of memories can also be added together or have memorised groups of channels subtracted from them before being used.

(e) AUTO MODIFICATION

An Auto Mod store is provided to enable a temporarily modified channel level to be automatically substituted for the memorised level.

(f) TEST PROGRAM

The use of a computer means that a system check-out and fault diagnostic program can be used to simplify fault finding. This is described in the Technical Handbook.

(g) MODULAR DESIGN AND RELIABILITY

The system has been designed in a modular form so that all principal items plug-in. The number of different power supplies and electronic cards have been reduced to simplify spares stocking and maintenance.

Wire wrapped and crimped connections are used extensively throughout the equipment in the interests of reliability.

1.2. SCOPE OF THE HANDBOOKS

This handbook provides a general introduction to the equipment and describes in detail the operational functions for the basic system. There are separate handbooks for the Magnetic Tape Cassette System and the Stalls Control.

The associated Technical Handbook describes routine maintenance procedures and gives instructions for running the diagnostic program and using the associated fault location flow charts.

2. EQUIPMENT

2.1. CONTROL ROOM

2.1.1. MASTER DESK

All controls for normal operation with the exception of channel and some ancillary controls are mounted on the master desk. The master panel layout is shown in Figure 1. The panel is divided into sections for each main function :

Channel control

Cue select

Record

Green playback

Red playback

There are no electronic cards within the master desk.

2.1.2. ROCKER WING

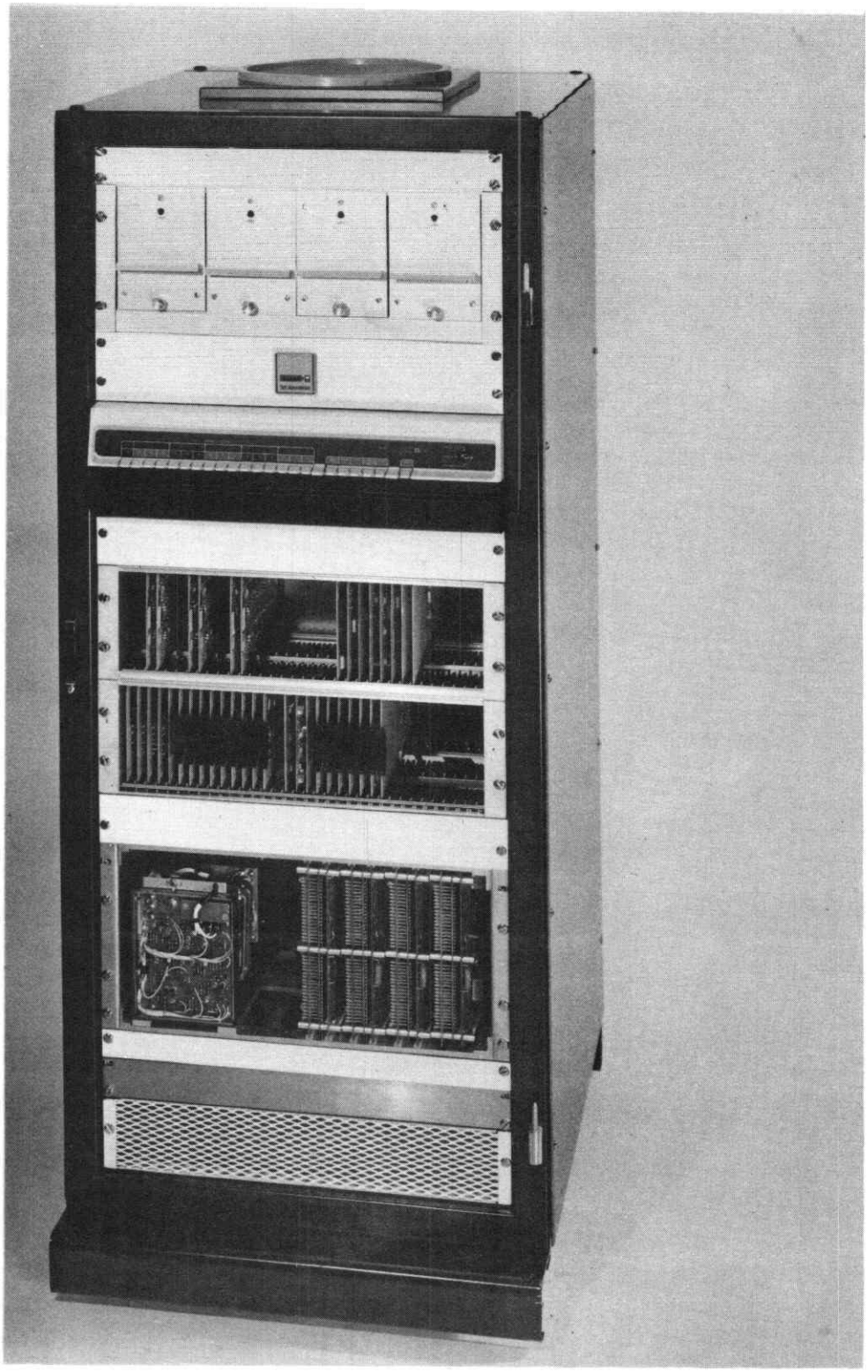
This wing, situated on the left of the master desk mounts the Rocker channel controls and the associated electronic cards for the master desk and rockers. The size of wing supplied depends on the number of control channels.

2.1.3. AUXILIARY DESK

This desk, which is normally situated on the right hand side of the master desk, provides independent control of all channels by means of 10 group masters selected by a matrix patch. The desk includes a panel containing a number of subsidiary and interlock controls. Where the Magnetic Tape Cassette System is fitted the controls are included in a panel on the Auxiliary Desk.

The base units under the desk accommodate power supplies for the control room equipment and the electronics associated with the Tape System (when fitted).

DDM/D2/0



DDM EQUIPMENT RACK

2.2. EQUIPMENT RACK

The single electronic equipment rack associated with the system is normally enclosed in a separate room. The rack contains :

D.E.C. Computer type PDP-11

Ferrite Memory for bulk (cue) storage

Interface electronic cards

Power supplies

Provided that the power to the system is remotely switched, access to this rack is not required for normal operation.

2.3. OPTIONAL EQUIPMENT

2.3.1. MAGNETIC TAPE CASSETTE SYSTEM

The control panel for the tape system is normally mounted at the end of the auxiliary desk furthest from the operator. The necessary electronics and the cassette recorder are enclosed in a base unit accommodated under the auxiliary desk.

2.3.2. STALLS CONTROL

A portable Stalls control for use in the stalls or at the side of the stage is available. A single cable connection to the equipment rack is all that is required and alternative outlets can be provided.

3. BASIC OPERATING PROCEDURE

This section of the handbook describes the recommended procedure for carrying out certain basic operations with the system. No attempt has been made to describe the use of the system in detail as the experienced user will soon discover methods of use beyond the scope of a handbook of this nature. The detailed functions of the controls are fully described in Section 4 of this handbook.

Numbers in brackets in the following sections refer to the corresponding numbers on Figure 1.

3.1. SYSTEM SWITCH ON & OFF

Insert a TOK 3 Key in the ON switch situated on the Auxiliary desk. Turn this key to the right against the spring stop and then release. The system should now be ON and the adjacent red neon light will illuminate.

To turn the system OFF the key is used in the OFF switch.

3.1.1. CHECK PROCEDURE IF SYSTEM FAILS TO SWITCH ON

1. Check that the mains supply to the equipment rack is ON.
2. Check that the RACK and DESK circuit breakers on the equipment rack distribution panel are ON (operating levers up).
3. Check that contactor on the distribution panel has switched. The neon adjacent to the push switches should be on.
4. If the contactor has failed, the system may be turned on in an emergency by means of the CONTACTOR OVERRIDE switch in the equipment rack (switch this UP).

If the system still fails to function, refer to the TECHNICAL HANDBOOK.

3.2. BASIC SETTING AND RECORDING

The system when first turned on will revert to the state it was in when turned off. The control should be cleared by pressing RED and GREEN CANCEL pushes and ensuring that both RED and GREEN MODES are selected.

3.2.1. SETTING CHANNEL LEVELS

(for detailed description of channel controls and illustration of ROCKER unit see Section 4.2.)

(a) Use LEVEL FADER (2) at 10, SPEED (1) at 3 to 5 seconds and press TOP rocker to raise channel or BOTTOM rocker to lower channel as appropriate.

OR

(b) Use SPEED (1) at INST. Press TOP rocker and use LEVEL FADER (2) to set the channel level. BOTTOM ROCKER will cancel the level set.

Channels may be adjusted simultaneously if required. A channel will only be under control while the appropriate ROCKER is operated.

3.2.2. MONITOR CHANNEL LEVEL

Press the AMBER rocker centre push to show the channel level on the METER (10).

The meter will also show the channel level whenever TOP or BOTTOM rocker is pressed. Any channel above zero will have a RED or GREEN mimic in the Channel rocker. Thus the rockers give a continuous display of the channels in use.

3.2.3. LOCATING A CHANNEL

Hold FLASH (3) and press TOP or BOTTOM ROCKER to flash the channel ON and OFF.

3.2.4. RECORDING

1. Select the cue (memory) number on the CUE SELECT pushes (20).
2. Place this number in the RECORD CUE DISPLAY (15) by pushing the RECORD CUE push (13).
3. Record the lighting state by pressing the RECORD push (16). Recording will be indicated by a RED background in the RECORD CUE DISPLAY. If the AUDIBLE WARNING sounds, the cue number has already been used and recording will not take place unless the RECORD push is operated again.

   If a number of cues are to be recorded in sequence the subsequent cue numbers can be incremented by pressing +1 (14) without selecting the number on CUE SELECT.

3.2.5. SELECTIVE RECORDING

There are individual record pushes on RED and GREEN playbacks. They enable selective recordings to be made of the GREEN or RED contributions only.

1. Ensure that the required cue number is in the GREEN or RED CUE DISPLAY (38).
2. Press GREEN (or RED) RECORD (35).
3. If Audible Warning sounds press the RECORD push again to override the 'previously recorded' interlock.

3.3. PLAYBACK

For normal operation the GREEN and RED playbacks can be treated as identical and cues may be carried out on either playback. Two playbacks are particularly useful if two up and down fades at different speeds are required.

3.3.1. CROSSFADE

The CROSSFADE is the basic cue function with the incoming cue replacing the previous lighting state.

1. Select required cue number on the CUE SELECT (20).
2. Press GREEN (or RED) playback CUE (22). The cue will now transfer to the GREEN CUE DISPLAY (38).
3. Set RAISE and DIM speeds (43, 44) as required.
4. Check that ADD, MOVE or DIM are not selected.
5. Press FADE (25).

If the cue required is the next in sequence on GREEN playback then the +1 push should be used without selecting a number in CUE SELECT.

The fade may be interrupted at any time, provided the next cue has not been selected, by a further operation of the FADE push.

3.3.2. MOVE

The MOVE function provides a crossfade, ignoring channels at zero in the incoming cue.

The sequence of operation is identical to that described for CROSSFADE except that the MOVE push (31) is operated before pressing FADE.

3.3.3. ADD

The ADD function enables a cue to be added to the existing lighting. The operation is identical to CROSSFADE except that the ADD push (30) is operated before pressing FADE. It is not necessary to set the DIM SPEED as no down-fades occur.

3.3.4. SUBTRACT

The DIM is a subtract function and dims to zero those channels in the next cue.

The operation is similar to CROSSFADE except that only the DIM SPEED needs to be set and the DIM push (32) is operated before pressing FADE.

3.3.5. ALL DIM

1. Set DIM SPEED (44)
2. Press ALL DIM (28)

3.3.6. REVERSE

Operating REVERSE (26) will reverse an action either during the change or after it has been completed. The REVERSE is subject to the RAISE and DIM speeds.

3.3.7. SNAP CUES

Press INSTantaneous (27) together with the FADE, ALL DIM or REVERSE.

INST can be used during any fade to complete it instantaneously. ALL DIM and INST will give a Blackout. Alternatively CANCEL (36) may be used.

3.3.8. SPEED OVERRIDE

The RAISE and DIM SPEED faders can be used at any time to change the speed of a fade.

3.3.9. CUE OVERRIDE

Any cue can be stopped by pressing the FADE push if the next cue number has not been selected. Alternatively, the RAISE or DIM parts of the fade can be stopped by operating the latching STOP pushes (42).

At any time a new cue can be carried out without completing a cue already in progress. It is only necessary to select the new cue number using CUE or +1 and to press FADE.

The cue function (CROSSFADE, ADD, MOVE, DIM) can be changed at any time during a fade by selecting or deselecting the appropriate ADD, MOVE or DIM push.

For example a MOVE can be changed to a CROSSFADE in the middle of a fade by deselecting the MOVE function. This can be particularly useful when it is required to have the incoming lighting established before the existing lighting fades out.

3.3.10 PROCESSIONAL CUES

NOTE Some systems have a SUM NEXT push in place of +NEXT and -NEXT. Section 4.9.3. will give details in the handbooks for these systems.

A number of overlapping or processional fades up or down can be carried out as shown in the following example. (Use the NEXT display push (5) to watch what is happening in NEXT store).

1. Select first cue number (e.g. Cue 10) using Cue or +1.
2. Set RAISE and DIM speeds to a fairly low speed.
3. Press FADE (assuming a CROSSFADE is required and ADD, MOVE, DIM are not selected).
4. Select +NEXT.
5. Press +1.
   The next cue number (cue 11) will then add to the first cue which is already in NEXT store.
6. Press FADE (before the first fade has completed).
   Cue 11 will now have been added to the original fade of cue 10.
7. Press +1 (cue 12).
8. Press FADE.
   Cue 12 will now be included in the fade with cue 10 and 11.

9. Select - NEXT

10. Press +1 (for cue 13)

The channels present in cue 13 will have been subtracted from cues 10, 11 and 12 in NEXT store.

11. Press FADE

Cues 10, 11, 12, will continue to fade but the channels present in cue 13 will begin to fade out at the speed set by the DIM fader.

There are numerous variations of the processional cue which can be derived by using ADD, MOVE or DIM for the entire processional fade or selecting them during the fade.

3.3.11. SEQUENTIAL CUES

Press SEQ (23)

The cue number will automatically sequence at the end of each cue. It will then be unnecessary for the operator to increment the cue number for each cue.

The SEQ function will remain selected until it is tripped by re-operating the SEQ push.

3.3.12. COMBINING RED AND GREEN PLAYBACKS

Press TRANSFER R TO G (24)

The contents of RED PLAYBACK will be copied on to GREEN, and RED PLAYBACK will be cleared.

3.4. MODIFICATION AND PREVIEW OF CHANNEL LEVELS

3.4.1. CHANNEL MODIFICATION

A channel can be modified at any time by means of the channel rockers.

1. Set SPEED to a suitable slow speed and LEVEL FADER at 10.
2. Touch TOP Rocker to raise channel level. Touch BOTTOM Rocker to lower channel level.

The modification will take place on whichever playback the channel is present. It may be limited to RED or GREEN only by means of the RED and GREEN MODE switches (see Section 4.2.6. and 4.9.) The AMBER ROCKER mimic will show for all modified channels.

3.4.2. RETURN TO PLAYBACK LEVEL

1. Set SPEED to desired speed of return
2. Press and hold RETURN
3. Press AMBER ROCKER push for the channel concerned.
4. Release RETURN.

   The channel will fade to its original playback level.

3.4.3. PREVIEW OF NEXT CUE

1. Press the NEXT display push (5).

   The rockers will now display the channels present in the GREEN and RED NEXT stores.

2. Press AMBER ROCKER push to monitor channel levels.

3.4.4. MODIFICATION OF NEXT CUE

1. Press the NEXT display push
2. Use the ROCKERS and SPEED and LEVEL to adjust the channel levels.

3.5. OTHER USEFUL FACILITIES

There are a number of other facilities which are described in detail in Section 4 of this handbook.

1. Selective transfer from GREEN to RED playback enabling cues to be split during a fade. See section 4.8.2.
2. Compiling cues in NEXT store.
   See Section 4.9.3.
3. AUTO MODIFICATION facility for applying temporary modifications to selected channels on playback.
   See section 4.10.
4. BLIND facility on GREEN and RED PLAYBACKS for 'Blind' plotting and recording.
   See section 4.11.
5. Record and playback of MODIFICATIONS only.
   See Section 4.4.6. and 4.9.5.
6. CUT CUES independent of fades on either Playback.
   See section 4.6.

4. DETAILED OPERATIONAL DESCRIPTION

This section of the handbook describes in detail the operational facilities provided by the control system. Basic operating procedures are described in Section 3.

4.1. GENERAL

The system provides two separate PLAYBACKS which enable entirely separate groups of lighting to be set up or recalled from memory. A number of other advantages of having two playbacks will become apparent. These playbacks are identified by the colours GREEN and RED.

4.2. CHANNEL CONTROLS

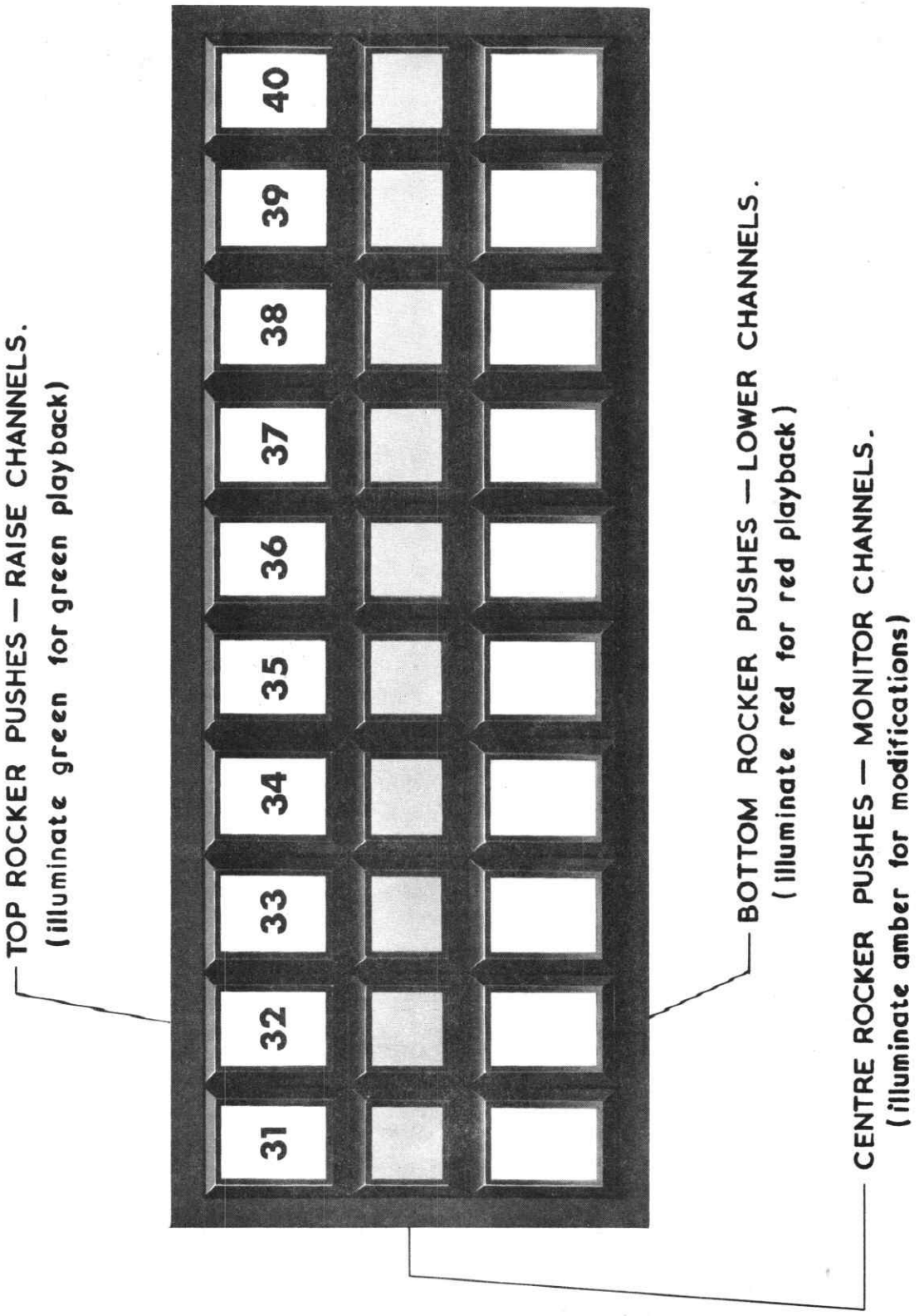
4.2.1. ROCKER (see illustration on following page)

Rocker controls are provided for each channel and these are mounted in the rocker wing. The rocker is basically three illuminated push switches arranged in a convenient form for ease of operation.

The top (green) lamp in the rocker illuminates to show that the channel is up on GREEN PLAYBACK. The top part of the rocker is engraved with the appropriate channel number.

A similar but red lamp in the bottom of the rocker indicates channels on RED PLAYBACK.

The amber centre push illumination shows modified channels and also channels in AUTO MOD (Para 4.10.)



MODULE OF 10 ROCKER PUSHES

The various push functions are described in detail in the following paragraphs where the operation of associated master desk controls is given. However, in general, the following actions occur :

Touch top rocker	Channel fades up
Touch bottom rocker	Channel fades down
Touch amber push	Channel level is monitored on channel meter.

4.2.2. LEVEL FADER (2)

The LEVEL fader is used in conjunction with TOP ROCKER to set or vary a level. The channel will move to the level set on this fader whenever a channel TOP ROCKER is pressed. If the TOP ROCKER is pressed continuously then the fader may be used in a conventional manner to control the level of that channel. The fader will cease to control the channel whenever the TOP ROCKER is released. The channel level set will, however, be held.

If the BOTTOM ROCKER is pressed the channel will be cleared to 0 regardless of the setting of the LEVEL fader.

The rate at which the channel responds is determined by the SPEED fader.

The method of control described above will generally be used for setting initial channel levels during early tehearsals.

4.2.3. SPEED FADER (1)

The SPEED fader has a range from 30 seconds to instantaneous. This is the time the channel will take to fade over the full range 0 to 10. When the LEVEL and TOP ROCKER are used the SPEED will normally be set to instantaneous so that all changes to the level fader have an immediate effect.

If the SPEED control is used, the LEVEL fader will normally be set to 10 so that the full range of control is possible. Touching the TOP ROCKER will then enable the channel to be faded up to the desired level. Fading down is achieved by touching BOTTOM ROCKER.

Any number of rockers can be operated simultaneously.

This method of control will generally be used to modify previously set levels.

4.2.4. CHANNEL METER (10)

The CHANNEL METER indicates the channel level whenever a TOP or BOTTOM ROCKER is pressed. If it is desired to monitor channel level without changing the level the AMBER centre push on the rocker should be pressed. If more than one push is operated together, then the meter will respond to the first one pressed.

If the channel is present on both playbacks the meter will read the higher of the two levels (but see para 4.2.6.)

Channel levels in NEXT and CUT stores can also be checked (see para 4.2.7.)

4.2.5. FLASH (3)

This push overrides the normal action of TOP and BOTTOM rocker. If TOP ROCKER is pressed while FLASH is held the channel will flash to full as long as the rocker is pressed, and will then return to its previous level. Pressing BOTTOM ROCKER will flash the channel to zero with return to previous level on release.

The FLASH function is invaluable for locating circuits rapidly.

4.2.6. GREEN & RED MODES (8,9)

These pushes, which can be used to limit the display and operation of the channel controls, are normally both selected and illuminated.

Under this condition, operation of the Channel rocker will cause the channel to be raised on GREEN playback unless it is already present on RED Playback. This is because the system is programmed to treat the GREEN playback as the preferred playback. However, with both modes selected the channel controls will always modify the lighting on stage.

If either MODE is deselected by pressing the appropriate push, operation can be entirely restricted to one playback. Thus if GREEN MODE is deselected then operation of the rockers will set and modify RED playback only. If an Amber rocker push is operated the CHANNEL METER will indicate the RED playback level only.

The normal mode of operation can be restored by re-pressing the GREEN MODE push.

The MODE functions interact with the BLIND (37) pushes on the playbacks (see para 4.11).

It is most important for normal operation that both GREEN and RED MODES are selected. This ensures that it is always possible to override Red or Green playback with the channel controls.

4.2.7. CUT/STAGE/NEXT DISPLAY PUSHES (7,6,5,)

These interlocked pushes enable the rockers to control and display either STAGE, NEXT or CUT stores. Rocker control and display is normally limited to STAGE and the STAGE push is illuminated. However, the rockers can be made to display and control channels in NEXT and CUT stores by holding down the NEXT or CUT push as appropriate. As soon as the push is released control will revert to STAGE.

The CHANNEL METER (10) will indicate the appropriate channel level in the store selected by these pushes.

4.2.8. RETURN (4)

The RETURN facility enables a modified channel to be automatically returned to its previous playback level. When the RETURN push is

pressed, together with a channel amber rocker push, that channel will fade back to its playback level at a speed set by the SPEED fader. Once the return has been started it will continue automatically and any number of channels can be returned together.

4.3. CUE SELECT

The Cue Select system consists of a keyboard (20) and numerical display window (18) and operates in a very similar manner to the keyboard on a desk calculator. The cue number required is selected on the keyboard in a conventional manner i.e. hundreds, tens and units.

The Cue Select can be cleared by pressing the CLEAR push on the keyboard. This should always be done before selecting a new cue number.

The cue number can be incremented by using the +1 push (19).

Hundreds digits above 3 will not select. For example 563 will select as 63. Cue numbers outside the capacity of the system will select but the use of the '+1' or a 'CUE' push will cause the audible warning system to sound.

Once a number has been selected it may be used for recording or playback by pressing the appropriate CUE push on the record and playback panels.

The maximum cue capacity in the ferrite core store will depend on the number of channels and the number of modules of core store fitted. It will be stated on the system details sheet at the front of this handbook.

Cue 000 is a valid cue number although some users prefer to retain it as an "all zeros" cue. If for example the system has a capacity of 128 cues then cues 000 to 127 will be valid.

4.4 RECORD

An overall record facility together with selective recording of Green playback, Red playback or modifications only is provided.

4.4.1. RECORD KEYSWITCH

All record functions are subject to this switch which is located on the Auxiliary Desk and has a TOK 4 key. When the switch is OFF it is impossible to select a RECORD CUE number or operate any of the RECORD CONTROLS.

4.4.2. RECORD CUE DISPLAY (15)

The Record cue number appears in the RECORD CUE display (15): a red background to the number indicates that the number has just been recorded.

4.4.3. CUE (13)

This push transfers the number in CUE SELECT to the RECORD CUE DISPLAY.

4.4.4. +1 (14)

This push increments the number in the RECORD CUE DISPLAY. It is useful when recording cues in sequence.

4.4.5. RECORD (16)

With a cue number in the RECORD CUE display the lighting state may be recorded by depressing the RECORD push. Recording will be indicated by a RED ground behind the RECORD CUE number.

If the cue number has already been used, recording will be inhibited and an audible warning will sound. If the operator wishes to rerecord this cue number he can override the interlock by depressing the RECORD push a second time. Recording will then take place and the RED ground will appear in the RECORD CUE display.

4.4.6. RECORD MODS (17)

This control operates in a similar manner to the RECORD push but only those circuits which have been modified (appropriate amber channel mimics showing) will be recorded. This facility can be invaluable during rehearsal when it may be desirable to record modifications for subsequent application to other cues.

4.4.7. RECORD GREEN (35)

The RECORD GREEN push will record the GREEN PLAY-BACK contribution only, on the cue number showing in the GREEN CUE display. A previously used cue number will not record and the audible warning will sound. This may be overriden by pressing the push a second time. The push will illuminate to indicate that recording has taken place.

The facility is useful if it is required to record only part of the lighting on stage.

4.4.8. RECORD RED

The function of the RECORD RED is similar to RECORD GREEN except that only the RED PLAYBACK contribution will be rerecorded on the RED CUE number.

4.5. GREEN PLAYBACK

Each playback has a STAGE store which effectively holds the information for those channels actually in use on stage.

There is also a NEXT (or preview) store in which the incoming cue state is held. This store is accessible for preview or modification.

On GREEN PLAYBACK only there is also a CUT store for holding cut-in cues.

4.5.1. GREEN CUE DISPLAY (38)

The cue number for the playback is displayed in the GREEN CUE display against a coloured ground. The colours used have the following meanings :-

BLACK	:	Cue number displayed is in NEXT store waiting to be used.
GREEN	:	Cue number displayed is the lighting on stage.
RED	:	Cue number displayed is the lighting on stage but modified, or other cues are present.

A coloured background will normally appear as soon as a cue is initiated.

4.5.2. CUE (22)

The CUE push is used for transferring a number from CUE SELECT to the NEXT STORE when it will be displayed in the GREEN CUE display with a black ground.

If CUE is pressed when there is no number in CUE SELECT then the audible warning will sound.

When the cue is actually used on stage, the background in GREEN CUE display will change to GREEN (or RED if other cues are present).

The CUE push may be operated at any time without affecting lighting on stage. It is necessary to press an ACTION push to indicate a cue.

4.5.3. +1 (21)

The +1 push is used to increment the cue number in the NEXT store. This push will normally be used to increment the cue number for the 'next' cue once a sequence has been established using the CUE push.

4.5.4. SEQUENCE (23)

The SEQ push is used to select the SEQUENCE mode for the playback. When this is selected the cue number in the NEXT store automatically increments when the previous cue is completed. The push is illuminated when the mode is selected. It can be deselected at any time by operating the push again.

4.5.5. SPEED CONTROLS

The speed at which playback actions occur is determined by separate controls for RAISE and DIM (43, 44).

The RAISE speed fader lever sets the speed for all circuits increasing in level during an action.

The DIM speed fader lever sets the speed for all circuits decreasing in level during an action.

The basic speed set by the faders may be modified by the X RAISE and X DIM pushes (41) on both playbacks which decrease the speed set by the appropriate fader lever by a factor of 10.

The speed ranges available are :-

1 sec to 60 secs	Normal
10 sec to 600 secs (10 mins.)	Appropriate RAISE, or DIM, X push selected and illuminated to give a X10 factor.

The RAISE and DIM speeds are entirely separate and may be 'ridden' during a fade if required.

"O" pushes (42) may be used to stop the progress of either the RAISE or the DIM. When selected, these pushes illuminate.

INSTANTANEOUS actions are possible by using the INST push (27) see para 4.5.7.4.

4.5.6. FADE PROGRESS METERS (39, 40)

The progress of all fades is shown on the FADE PROGRESS meters. The scales are calibrated 0-10 and indicate the fade progress and not channel level, except for a fading over the full range. The left hand RAISE meter travels from 0 to 10 and shows the progress of channels increasing in level.

The right hand DIM meter moves from 10 to 0 and shows the progress of channels decreasing in level.

4.5.7. CUE ACTION PUSHES

The four ACTION pushes (25 to 28) are used to initiate and control cues on the playback.

4.5.7.1. FADE (25)

This push is the basic 'go' and 'stop' control for cues on the playback. When pressed, it initiates a fade at the speed set by the SPEED FADERS and illuminates whilst the cue is in progress. Movement from one set of levels to another is linear and simultaneous, beginning and ending together.

Operating the push whilst a fade is happening will stop the fade. A further operation will restart the fade.

So that new cues can be initiated before the current cue has completed the FADE push will start the new cue rather than stopping the present cue if a new cue number has been

selected in NEXT store (black background to the CUE DISPLAY).
The normal function of the push is to initiate a simple crossfade; however, this can be modified by means of the CUE FUNCTION pushes (see Para 4.5.8.)

In the simple performance situation with SEQ mode selected for automatic sequencing of cues the FADE push and the SPEED faders are the normal operational controls.

The FADE action will deselect REVERSE or ALL DIM when these are selected.

4.5.7.2. ALL DIM (28)

The ALL DIM action push simply initiates a fade of all channels on the playback to zero at the speed set by the DIM SPEED fader. The dim can be stopped and restarted by successive operations of the push. Channels which have been added to the playback (either by manual modification or transfer from the other playback) after the ALL DIM was initiated will not be included.

4.5.7.3. REVERSE (26)

The REV push when operated reverses the last cue action to the point where that particular action is commenced. The speeds of the channels changing remain as set on the speed controls; e.g. the channels which were dimming on the original cue and are now raising will be subject to the DIM speed control.

The REVERSE action may be stopped and restarted by re-pressing the push.

The control is particularly useful in rehearsal when mixing groups of lighting as it enables a group of channels to be faded up and down to obtain a correct balance. It is also useful when rehearsing cue timings as it enables the cue to be rapidly reversed by using REV in conjunction with INST (see Para 4.5.7.4.)

When carrying out a reverse the fade progress meters move in reverse.

4.5.7.4. INSTANTANEOUS (27)

This control can be used in conjunction with any of the ACTION pushes to effect a snap action. The INST push should be held whilst the appropriate ACTION push is operated.

If it is pushed while a cue is in progress the action will complete instantaneously.

4.5.8. CUE FUNCTION PUSHES (30 to 32)

These pushes (ADD, MOVE, DIM) are used to select the manner in which a new cue combines with the existing cues, if any, on the playback. The most common cue situation is a simple substitution of the present lighting state by the new one. This will be called a CROSSFADE which is taken to include an instantaneous crossfade or crosscut. It is this function which is carried out by the FADE action push when none of the CUE FUNCTIONS are selected.

The ADD, MOVE and DIM pushes illuminate to show which function is selected and are interlocked to prevent more than one being selected. A second push operation deselects the function.

The functions can be changed during the progress of a cue. For example, a CROSSFADE may be changed to an ADD by selecting the ADD function during the cue.

4.5.8.1. ADD (30)

The ADD function when used with FADE adds the

incoming cue to the lighting state already on stage. Any common channel levels will add on a "highest takes precedence" basis.

The DIM speed fader and meter are inoperative during an ADD fade.

4.5.8.2. MOVE (31)

The MOVE function is similar to a CROSSFADE except that zero levels in the new cue are ignored. This makes it possible, for example, to fade a group of channels to new levels (higher or lower) without having to record the levels of all the channels in use.

The control gives an add function similar to ADD except that common channel levels add on a "latest takes precedence" basis.

4.5.8.3. DIM (32)

The DIM has a subtract function which dims to zero those channels on stage which are above zero in the cue number in NEXT store. The channel levels in this case are ignored as it is only necessary to identify the channels that have to dim.

The RAISE speed fader and meter are inoperative during a DIM.

4.5.9. CANCEL (36)

The CANCEL Push clears the playback completely and restores the playback to a 'normal' condition. It should always be used before starting a rehearsal or performance and when the system has first been turned on in order to clear any controls which may have been set previously.

The cue number in the NEXT store is not cleared by CANCEL so that a sequence can be maintained if required.

4.6. CUT STORE

GREEN playback only, has a CUT STORE which enables cues to to be cut-in independently of the main playback functions.

4.6.1. CUT-IN(33)

If a cue number is set up on CUE SELECT and CUT IN is pressed, that cue will be transferred to CUT STORE and will add, on a highest takes precedence basis, to the lighting on GREEN PLAYBACK.

The background in the CUE SELECT window will change to RED to indicate that the cue has been used for a CUT.

The CUT IN push will illuminate so long as there is any cue in CUT STORE.

Any cue in progress on GREEN PLAYBACK will be unaffected by the cut operation. If there are common channels in the playback and cut stores they will add on a highest takes precedence basis. However, the playback levels will remain independent and can continue fading 'under' the cut cue so that if the cut is cleared the correct playback level will remain.

Any number of cues can be CUT IN to CUT STORE where they will add together, with common channels adding on a highest takes precedence basis. For each cue the number will need to be selected on CUE SELECT. The CUE SELECT +1 push can of course be used to select cut cues in sequence.

A new cue action on GREEN Playback will normally absorb the CUT STORE, and its contents will fade to the levels determined by the NEXT cue. If it is necessary to retain the CUT cue this can be achieved by holding down the CUT IN push while the ACTION push for the new cue is operated. The CUT cue will then remain in CUT STORE.

The CUT IN push is also used to recall MODS ONLY cues recorded by the RECORD MODS CONTROL. The use of

this facility is fully described in Para 4.9.5.

4.6.2. CUT OUT (34)

Cues may be subtracted from CUT STORE by selecting the number on CUE SELECT and pressing the CUT OUT Push. Common channels between a number of cut cues will be cut out in the first cue in which they appear.

If there is no cue set on CUE SELECT then pressing CUT OUT will cancel all the cues in CUT STORE.

4.7. RED PLAYBACK

The facilities provided on RED PLAYBACK are similar to those on GREEN PLAYBACK except that there is no CUT STORE: the TRANSFER facility, which will be described later, is also different.

All Rocker mimics for RED playback show RED in the bottom of the Rocker. As described previously, the system is programmed with a preference for GREEN playback so that lighting will not normally be set on RED playback unless some deliberate action is taken - See para 4.2.6.

The main uses of RED playback are :

(a) Carrying out a second cross fade or other action when GREEN playback is already being used for a fade at a different speed.

(b) Setting up cues using the BLIND facility whilst using the GREEN playback to carry out cues on stage.

(c) In conjunction with the TRANSFER facilities to enable cues to be combined or split during fades.

4.8. TRANSFER

Normally the RED and GREEN playbacks are entirely separate but facilities are provided for transferring and copying cues between the playbacks.

4.8.1. GREEN TRANSFER (24)

(TRANSFER RED TO GREEN)

This push when operated copies all channels on RED playback onto GREEN playback and clears RED playback. As the channels add to GREEN playback on a highest takes precedence basis, no change in stage lighting will occur.

The channels transferred will not be absorbed in any cue already in progress on Green playback; e.g. an ALL DIM in progress will not dim out transferred channels.

The control is invaluable for collecting a complex combination of cues on both playbacks onto GREEN playback so that a simple cue can be performed; e.g. a crossfade to a new cue state.

4.8.2. RED TRANSFER (45)

(TRANSFER GREEN TO RED)

This facility is a selective transfer from GREEN playback to RED playback and clears the transferred channels from GREEN Playback.

The channels to be transferred are determined by the channels present in RED NEXT STORE. The levels in the NEXT store are not relevant to the transfer. It should be noted that the channels in RED NEXT can be from a cue number and/or set up manually in the store by means of the ROCKERS and NEXT DISPLAY push (see Para 4.2.7.)

The TRANSFER facility may be used during a fade and, although the transferred channels will be frozen, all other channels will continue their fades. Immediately the transfer has occurred it is possible to start a cue on

RED playback involving the transferred channels. The RED NEXT cue number which is used to identify the transfer channels can normally be recorded with the correct channel levels for the new cue.

This control enables a cue fading on GREEN playback to be split and the channels transferred to RED playback faded up or down at a different speed.

4.9. PLAYBACK MODIFICATION & PREVIEW

4.9.1. MODIFICATION

Any playback channel whether on RED or GREEN playback can be modified provided that both RED and GREEN modes are selected (para 4.2.6.) . If only one mode is selected then only that playback will be modified.

Modification is achieved by touching TOP ROCKER to raise level and BOTTOM ROCKER to lower level. The channel LEVEL fader should normally be set at 10 and the SPEED FADER set at a suitable speed (paras 4.2.2. and 4.2.3.). Immediately the channel is changed from its playback level then the AMBER centre push illuminates to show that a modified state exists.

If the particular channel is present on both playbacks then the ROCKER will modify only the higher playback levels. If the Channel is faded down the playback levels will combine at the lower playback level. If it is desired to change only one of the playbacks then the other playback mode push should be deselected.

If a channel is modified during a fade then that channel will be extracted from the fade and be under manual control. When a new ACTION is started any modifications will be absorbed in the new cue and the AMBER mimic will extinguish. E.g. if the action is a CROSSFADE and the modified channel is not present in the new cue then it will fade out.

If it is desired to return the cue to its original unmodified state the cue may be recalled on the playback. If it is a single cue number and already in NEXT store it is only necessary to re-operate the FADE push.

If it is necessary to return individual channels to their playback levels then the RETURN push should be pushed

while the appropriate AMBER rocker push is momentarily pressed.

This procedure is described in para 4.2.8.

4.9.2. PREVIEW & MODIFICATION OF NEXT

When the NEXT DISPLAY PUSH (para 4.2.7.) is held in, the ROCKER contacts and mimics as well as the channel controls act on, and display the contents of, the RED and GREEN NEXT stores. Thus a cue in NEXT store can be observed on the ROCKER mimics and individual channel levels can be checked by pressing the AMBER centre push. The MODE pushes (8,9,) may be used to separate common channels in both RED and GREEN NEXT stores.

If it is necessary to modify channel levels in the NEXT store this can be done in the normal way by using the ROCKER. The AMBER modification mimic does not show for NEXT STORE and if the original level is required, the cue will have to be recalled from memory.

If a clear memory is called up and put into NEXT STORE, then channels may be set up from scratch to be faded in as a new cue. Similarly a group of channels could be set up in NEXT store and the DIM action used to fade out those channels on stage.

4.9.3. COMPILING CUES IN NEXT STORE + NEXT, - NEXT (29)

These two pushes, which illuminate and have push-on push-off action, are used for compiling cues in NEXT store. With + NEXT selected, cues put into NEXT store using CUE, +1 or SEQ will add together on a "highest takes precedence" basis.

With - NEXT selected, cues put into NEXT store will subtract from those already in NEXT store. In this case any channel above zero in the new cue will be deleted from the NEXT store.

The + and - NEXT facility can therefore be used for compiling groups of cues before fading them up on the playback.

With the + NEXT push selected processional cues can be carried out by putting each cue into NEXT and re-starting a crossfade before the previous fade has completed. Similarly a cue can be subtracted from a fade by using - NEXT and re-operating the FADE push.

4.9.4. MODIFICATION OF CUT STORE

In the same manner as NEXT STORE the contents of CUT STORE may be displayed and the ROCKERS used to set-up CUT STORE if the CUT PUSH (para 4.2.7.) is held in.

Any channels added to, or changed in, CUT STORE will of course affect stage lighting.

4.9.5. PLAYBACK OF "MODS ONLY" CUES

Modifications to a playback cue may be individually recorded by using the RECORD MODS control described in para 4.4.6. These modification cues can be played back as cues in the normal way. However, the modification cue may be recalled as actual modifications, complete with AMBER channel mimics and overriding existing playback levels, if the cue number is set up on CUE SELECT and the CUT IN push is operated. Under these circumstances the CUT IN push does not operate in the normal manner and CUT STORE is unaffected. A "MODS ONLY" cue is identified in the memory by a special flag which ensures that the CUT IN push operates in this way.

This facility is particularly useful during rehearsal when it may be required to apply similar modifications to a number of cues.

4.10 AUTO MOD

An AUTO MODification store is provided to enable a temporarily modified channel level to be automatically substituted for the memorised level. This is useful for example when a lantern is knocked out of adjustment during a performance.

4.10.1. SET A-M (I2)

To set a channel on the AUTO MOD store it is first adjusted to the level required by means of the appropriate ROCKER: this will normally mean modifying the channel and the AMBER mimic will light. The SET A-M push is then held down and the channel AMBER rocker push is pressed. This will light to show that the channel is now on AUTO MOD store. To avoid confusion the normal AMBER modification mimics are inhibited whilst the SET A-M push is operated.

The AMBER rocker mimic will show continuously for a channel set in AUTO MOD stores. It will not be cleared by the playback CANCEL pushes. A channel may be removed from the AUTO MOD store by holding down the SET A-M push and re-pressing the AMBER rocker push. A channel can be modified to any level including zero provided it is above zero on the memory. Any number of channels can be recorded on AUTO MOD store, at different levels if required.

4.10.2. ADD A-M (II)

The AUTO MOD level will only override the normal level recalled from memory when the ADD A-M push has been operated. This push will illuminate and the function may be deselected by re-pressing the push.

Setting a channel on AUTO MOD and selecting the ADD A-M function will have no effect until a cue is recalled from memory into NEXT store, when the AUTO MOD level will be substituted. When the channel is removed from AUTO MOD store, or ADD A-M is deselected, the modified level will remain on the playback until a new cue is called up from the memory.

The ADD A-M can be deselected whilst a particular cue is recalled from memory if it is necessary to retain the original level for that cue but to continue to modify subsequent cues.

4.11. BLIND (37)

Either playback may be "blacked out" by means of the appropriate BLIND push. The facility is particularly useful for setting up cues without affecting lights on stage. Use of the playback RECORD push enables such a blind cue to be recorded without recording any lighting on stage.

The BLIND push is interlocked with other functions as follows :-

(i) When first operated, the push illuminates and carries out a playback cancel to ensure that unwanted information is not included in a "blind" setting.

(ii) While selected, BLIND forces the RED and GREEN modes (para 4.2.6.) to limit Rocker Control to the blacked out playback (i.e. only one MODE push illuminated). If ROCKER control is required on the other playback then the appropriate MODE push will have to be held down as long as control is required. Immediately it is released, control reverts to the BLIND playback.

(iii) When BLIND is deselected the playback is again automatically cancelled to avoid bringing up the blind setting on stage and the RED and GREEN modes are automatically reselected.

Both playback BLIND pushes may be selected to completely inhibit system output to the dimmers.

4.12 SUBSIDIARY CONTROLS

A number of additional controls are mounted on the AUXILIARY DESK.

4.12.1. AUDIBLE WARNING

A volume control is provided for the desk AUDIBLE WARNING. The warning sounds under the following conditions:

(i) Attempt to +1 a cue number beyond the maximum capacity.

(ii) Attempt to use CUE with no number or a non-valid cue in CUE SELECT.

(iii) Attempt to record on a previously recorded cue.

(iv) MAGNETIC TAPE SYSTEM in operation.

(v) Computer failure

(vi) Program corruption

(vii) Overheat alarm (see 4.12.5.)

Only in cases (iv) (v) and (vii) is the warning continuous. Computer failure will immediately cause the system to 'lock-up'. However, lighting on stage will freeze for a few minutes giving time to set up standby lighting on the AUXILIARY CONTROL. When changeover to the AUXILIARY is required the main control should be switched off.

Program Corruption will cause the audible warning to sound but will not necessarily render the system inoperable. The system should be used with discretion as operating problems could occur.

4.12.2. MIMIC INTENSITY CONTROL

Control of the level of the ROCKER and DESK mimics is provided.

4.12.3 STALLS CONTROL LOCKOUT

A keyswitch with a TOK 4 key is provided to lock out the STALLS CONTROL when this is included. The operation of this switch is fully described in the STALLS CONTROL handbook.

4.12.4. CONTROL SYSTEM ON/OFF

Momentary action keyswitches with TOK 3 keys are normally provided for turning ON and OFF the entire DDM control system. These switches may be duplicated elsewhere in the system.

4.12.5. OVERHEAT ALARMS

Overheat alarm mimics are provided to give a warning of overheat in the following items of equipment :-

(i) Rocker Wing

(ii) Auxiliary Desk/Power Unit

(iii) Equipment Rack

The alarms will normally operate at an ambient (room) temperature of 30 to 35°C. However, if there is a fault condition or fan failure, they may also show.

If the alarms do show, immediate steps must be taken to rectify the fault condition otherwise further damage or equipment failure may occur.

5. AUXILIARY CONTROL

The auxiliary control system is included in a desk normally situated on the righthand side of the master desk. The system is entirely independent of the main DDM control system and has an independent mains supply.

5.1. AUXILIARY CONTROL FACILITIES

The system can be used to control any or all of the channels on the main control system. It has two main functions :-

(i) To control circuits such as tab dressing, orchestra lights, follow spots, etc. which would be inconveniently controlled by the main system.

(ii) To provide an independent back-up system on which basic lighting is possible should the main system fail. The system adds to the levels set on the DDM system on a "highest takes precedence" basis.

5.1.1. MASTERS

The system is provided with 10 independent master faders identified by letters A to L (I and J are omitted) Each master is subject to an alternative action ON/OFF push which illuminates when ON.

Each master is capable of driving from 1 to 360 channels.

5.1.2. PIN MATRIX PATCH

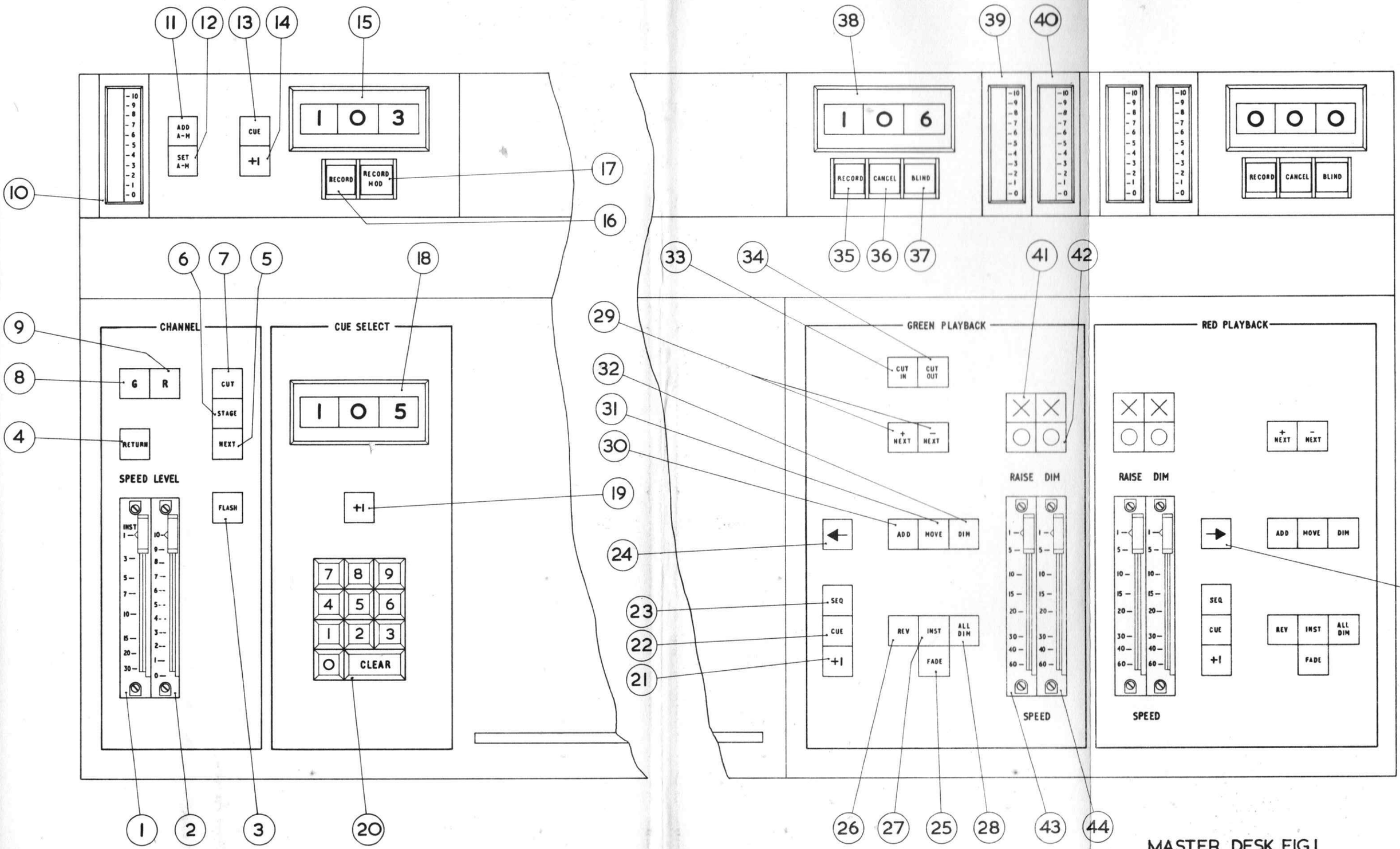
Selection of channels to each master is by means of a matrix patch panel. The panel is engraved with the channel number in rows, and the masters (A-L) in columns. A number of diode pins of assorted colours are supplied for the matrix. A channel is selected on a master by putting a pin in the hole which lines up vertically with the channel number and horizontally with the master letter. The channel may be selected to any number of masters, in which case the highest level master takes precedence.

Any or all channels may be selected to one master.

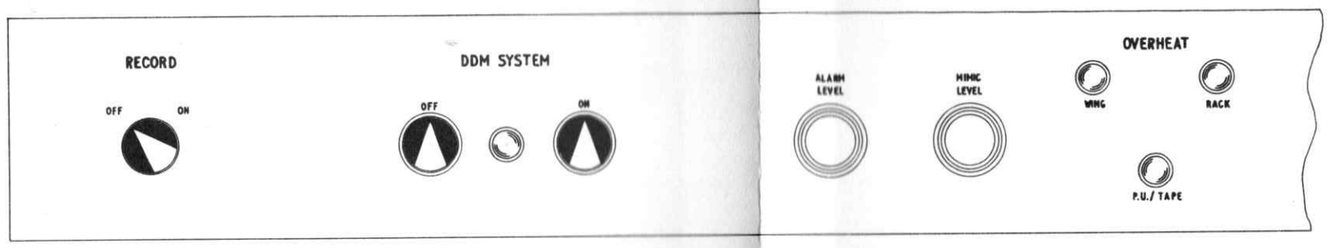
5.1.3. MAINS SUPPLY

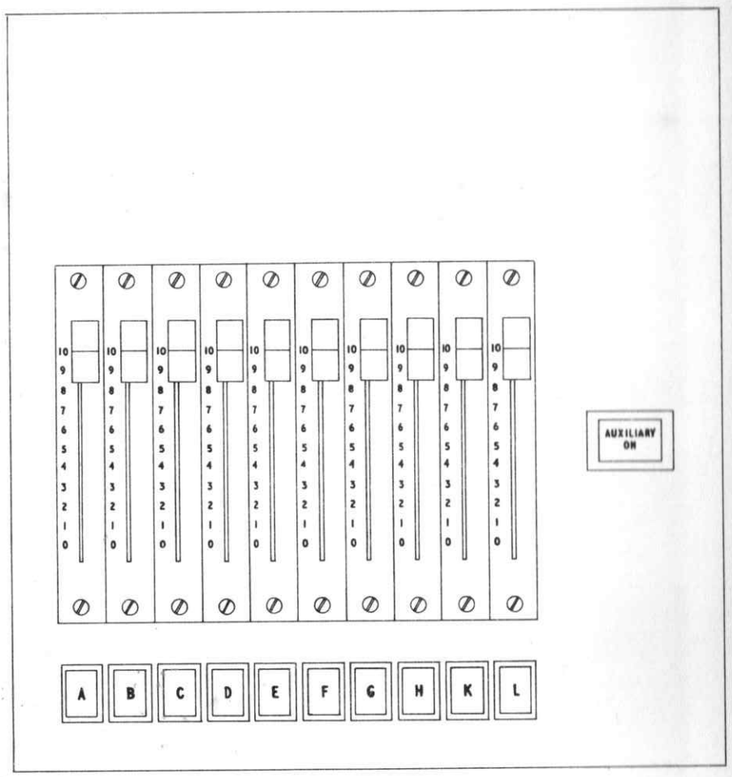
The mains supply is independent of the main DDM system

supply. It is switched on by an alternative action illuminated push switch which is engraved AUX ON.



MASTER DESK FIG I





AUXILIARY CONTROLS F

Fig 2

OPERATORS HANDBOOK

SYSTEM DDM

MAGNETIC TAPE CASSETTE SYSTEM

RANK STRAND ELECTRIC

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A DIVISION OF RANK AUDIO VISUAL LIMITED

CONTENTS

1. INTRODUCTION

The tape system is accommodated in the AUXILIARY DESK and consists of a Control Panel and a Tri-Data CARTRIFILE 20 Cassette Recorder. The system may be used to transfer cues from the DDM magnetic core memory to magnetic tape cassettes.

This facility can be used when a number of productions are running in repertoire, or it is desired to retain the cues of a particular production for future use. Thus the cue capacity of the system is expanded to allow an unlimited library of productions to be built up.

It is possible to transfer cues either singly or in groups as required to any location on the TAPE or MEMORY. This makes it possible to transfer selected cues and to edit the sequence of cues if necessary.

The TAPE SYSTEM may also be used to input the DDM program as well as the special HARDWARE TEST program. Full details of this procedure are given in the TECHNICAL HANDBOOK.

2. BASIC OPERATING PROCEDURE

(for detailed functions see Section 3)

2.1. TRANSFER FROM MEMORY TO TAPE

1. Select a cassette which does not contain plots which are still required!
2. Slide the tape protective cover fully back.
3. Insert the cassette in the CARTRIFILE unit in either the UPPER or LOWER tape position.
4. Switch the FILE PROTECT SWITCH on the tape to the record enabled position (ENABLE in the window on the front).
5. Using a TOK 4 key, switch the TAPE WRITE keyswitch ON.
6. Press MEMORY TO TAPE.
7. Select the first cue location to be recorded on the tape (normally 000) in the TAPE START thumbwheel selector.
8. Select the first and last cues to be transferred from the memory in the MEMORY START and STOP thumbwheel selectors. (To transfer one cue only select the same number in the MEMORY START and STOP thumbwheel selectors).
9. Press the UPPER or LOWER TAPE push as appropriate.*
10. Press START.

The tape should now start and the START push will illuminate until the transfer is complete.

N.B. After use turn off the CARTRIFILE by switching off the TAPE WRITE keyswitch.

2.2. EDITING CUES FROM MEMORY TO TAPE

1. Proceed as detailed in Section 2.1. for the transfer of the first cue or group of cues.
2. To transfer the next cue it is not necessary to select a TAPE START number, provided the SEQUENCE push is operated. Cues will then transfer into the next available cue location on the tape.
3. Select as before the MEMORY START and STOP cue numbers.

*On some systems the UPPER and LOWER TAPE pushes are omitted and the selection is automatic.

4. Press START.

N.B. After use turn off the CARTRIFILE by switching off the TAPE WRITE keyswitch.

2.3 TRANSFER FROM TAPE TO MEMORY

1. Slide back the protective cover over the tape on the cassette.
2. Insert the cassette in the CARTRIFILE unit in either the UPPER or LOWER tape position.
3. Using a TOK 4 key switch the MEMORY WRITE keyswitch ON.
4. Press TAPE TO MEMORY.
5. Select the first and last cues to be transferred from tape in the TAPE START and STOP thumbwheel selectors.
6. Select the first cue location to be recorded on MEMORY in the MEMORY START thumbwheel selector.
7. Press the UPPER or LOWER TAPE push as appropriate.*
8. Press START.

The transfer should now commence and the START push will remain illuminated until the transfer is complete.
After use turn off the CARTRIFILE by switching off the MEMORY WRITE keyswitch.

2.4 CHECK

Immediately after transferring a cue or group of cues press CHECK. The system will then carry out a check for accuracy of transfer of that group of cues. On completion the CHECK O.K. mimic should illuminate. If it does not, the tape mechanism should be cleaned as detailed in the TECHNICAL HANDBOOK and the transfer and check repeated.

2.5. MEMORY CLEAR

1. Make quite certain that you do not require the information recorded on MEMORY or that it is properly recorded on tape!
2. Using a TOK 4 key switch the MEMORY WRITE keyswitch on.
3. Press MEMORY CLEAR
4. Select the first and last cues to be cleared from memory on the

* On some systems the UPPER and LOWER TAPE pushes are omitted and selection is automatic.

MEMORY START and STOP thumbwheel selectors.

5. Press START

The process is almost instantaneous. After use turn off the MEMORY WRITE keyswitch.

3. DETAILED OPERATIONAL DESCRIPTION

3.1. CARTRIFILE RECORDER SYSTEM

3.1.1. TAPE CASSETTE

The Tape Cassette contains an endless 50ft tape loop with a cue capacity equal to that of the bulk memory in the DDM system.

Each tape has a FILE PROTECT switch on the front of the cassette to prevent accidental recording. The file protected position of the switch is indicated by PROTECT showing in the small window. The record enabled position of the switch is indicated by ENABLE showing in the window. A small frame of white plastic has to be removed from the window before the switch can be moved. It should always be replaced to prevent accidental operation of the switch.

A slide cover is provided to cover the tape when the cassette is not in use. This cover must be fully retracted before the cassette is used in the recorder and should always be replaced immediately the cassette is removed from the recorder.

The front of each cassette has a surface suitable for writing. Cue and show information may be written here if required.

IT IS MOST IMPORTANT FOR THE TAPES TO BE PERFECTLY CLEAN AND FREE FROM DUST. THEY SHOULD BE STORED AND USED IN A DUST-FREE AREA.

The information on the tapes can be destroyed by magnetic fields.

THE CASSETTES MUST NOT BE PLACED NEAR MAGNETS OR EQUIPMENT SUCH AS ELECTRIC MOTORS, CONTACTORS, ETC.

3.1.2. CARTRIFILE CONTROLS

The two alternative tape positions are provided in the Cartrifile unit. These are UPPER and LOWER. On some systems it is necessary to select the tape position on the CONTROL PANEL.

The cassette slots straight into the CARTRIFILE after the tape cover on the cassette has been fully retracted. The cassette should be inserted squarely and firmly into the slot.

The cassette may be removed by simply pulling it out.

IT MUST NOT BE REMOVED WHEN THE WHITE "TAPE BUSY" PILOT BESIDE THE CASSETTE IS ILLUMINATED.

3.2. TAPE CONTROL PANEL

The layout of the TAPE CONTROL panel is shown in Figure 1

3.2.1. WRITE KEY SWITCHES (1,2)

All functions on the panel are subject to the TAPE and MEMORY WRITE Key switches. Turning on the appropriate switch will allow information to be destroyed on either TAPE or MEMORY (magnetic core memory) respectively. Only one of these switches should be turned on at a time (the key is trapped in the ON position to ensure this.) Operating either of these switches also turns on the CARTRIFILE recorder.

THESE SWITCHES MUST NOT BE OPERATED WHILE THE TAPE IS IN MOTION.

3.2.2 FUNCTION PUSHES

The four tape-system function pushes are interlocked so that only one may be selected at a time. Each illuminates when the respective function is selected. The appropriate WRITE key switch must be on before a function can be selected.

The cues affected by the functions are determined by the CUE NUMBER selectors (8). No function will actually happen until the START push is operated.

3.2.2.1 MEMORY TO TAPE (3)

This push selects a transfer of cue data from system MEMORY to TAPE i.e. recording a show on magnetic tape.

3.2.2.2. TAPE TO MEMORY (5)

This selects a transfer of cue data from TAPE to system MEMORY, e.g. reading a show back onto the DDM system memory for a subsequent performance.

3.2.2.3 TAPE ERASE (4)

This control enables a tape to be erased should this be required. It is not, however, necessary to erase a tape before recording new cue information, although if cues of a new show are to be transferred onto an old tape it will save possible confusion if the tape is first erased.

3.2.2.4. MEMORY CLEAR (6)

This function enables a selective clearance of the MEMORY to be carried out. It is subject to the MEMORY START and STOP numbers on the CUE NUMBER SELECTORS. All channels are recorded at level zero and the "recorded flag" is removed from the cue number so that the AUDIBLE WARNING does not sound if an attempt is made to record on the cue.

3.2.3 CUE NUMBER SELECTORS (8)

These numerical thumbwheel selectors determine the START and STOP CUE NUMBER on TAPE and MEMORY that are involved in a function or transfer. When a function is selected only those selectors which need to be set will illuminate. E.g. for MEMORY TO TAPE only TAPE START, MEMORY START, and MEMORY STOP will illuminate.

3.2.4 UPPER/LOWER TAPE SELECTION (9)

As well as putting the tape in the correct position in the CARTRIFILE, on some systems it is necessary to select the correct UPPER TAPE or LOWER TAPE push. When the UPPER and LOWER TAPE pushes are not fitted selection will be automatic. As the tape drive mechanisms in the two positions are independent

either position may be used. This gives a useful back-up in case of a recorder mechanical fault.

3.2.5 START (13)

All actions with the exception of CHECK are subject to this push. It illuminates as long as the action is in progress. Note that while the tape is moving the white TAPE BUSY pilot beside the cassette on the CARTRIFILE will be lit. The time taken will vary depending on the starting position of the tape and the number of cues involved.

3.2.6 SEQUENCE (7)

As it is possible to determine exactly which cues are transferred, and to where they are transferred, it is possible to edit the sequence of cues. If cues were being transferred, for example, from MEMORY to TAPE the procedure could be :-

	MEMORY		TAPE
(a) Cues	1 - 9	transfer to	1 - 9
(b) Cues	64 - 68	transfer to	10 - 14
(c) Cues	10 - 19	transfer to	15 - 24

After the first group of cues it would be necessary to change the TAPE START selector and some arithmetic would be necessary to determine the next cue number. However, if the SEQUENCE mode is selected, cues will transfer into the next cue location on the tape and it will not be necessary to set the TAPE selectors after the initial transfer.

The SEQUENCE mode may be deselected by re-pressing the push.

3.2.7 CHECK (14)

The accuracy of any of the functions or transfers can be verified by operating the CHECK push. If the CHECK is used with either MEMORY TO TAPE or TAPE TO MEMORY selected, the system will take the contents of the TAPE and MEMORY for the cues on the CUE NUMBER SELECTORS and compare them for accuracy.

If the cues selected are identical then the CHECK O.K. mimic (15) will illuminate. If the CHECK O.K. fails to illuminate then the original transfer of cue information should be repeated and a further attempt made to check the information. If the check still fails then the TECHNICAL HANDBOOK should be consulted.

A check of TAPE ERASE or MEMORY CLEAR will ensure that only zero level information is recorded.

3.2.8. WARNING LAMPS

3.2.8.1. INSUFFICIENT STORAGE (10)

This warning will show if an attempt is made to put more cues on either tape or memory than the capacity of the system. In such a case no transfer will occur.

3.2.8.2. CORRUPT TAPE (11)

If the information taken off the tape is in any way mutilated the CORRUPT TAPE mimic will light and the tape will stop. The information on tape can be corrupted by the following actions :-

(i) Mains failure whilst the Tape is in motion

(ii) Turning the system or WRITE KEY SWITCHES off whilst the tape is in motion.

(iii) Removing the cassette whilst the tape is in motion.

(iv) Dirt or dust on the CARTRIFILE heads or tape. Refer to TECHNICAL HANDBOOK for cleaning instructions.

(v) Storing the cassette near a magnet or magnetic field (e.g. an electric motor)

The tape will normally stop at the first cue which is corrupted. The remainder of the cues and normally most of the corrupt cue can usually be retrieved. Full details of the procedure are given in the TECHNICAL HANDBOOK.

3.2.8.3. CHECK (OPERATOR ERROR) (12)

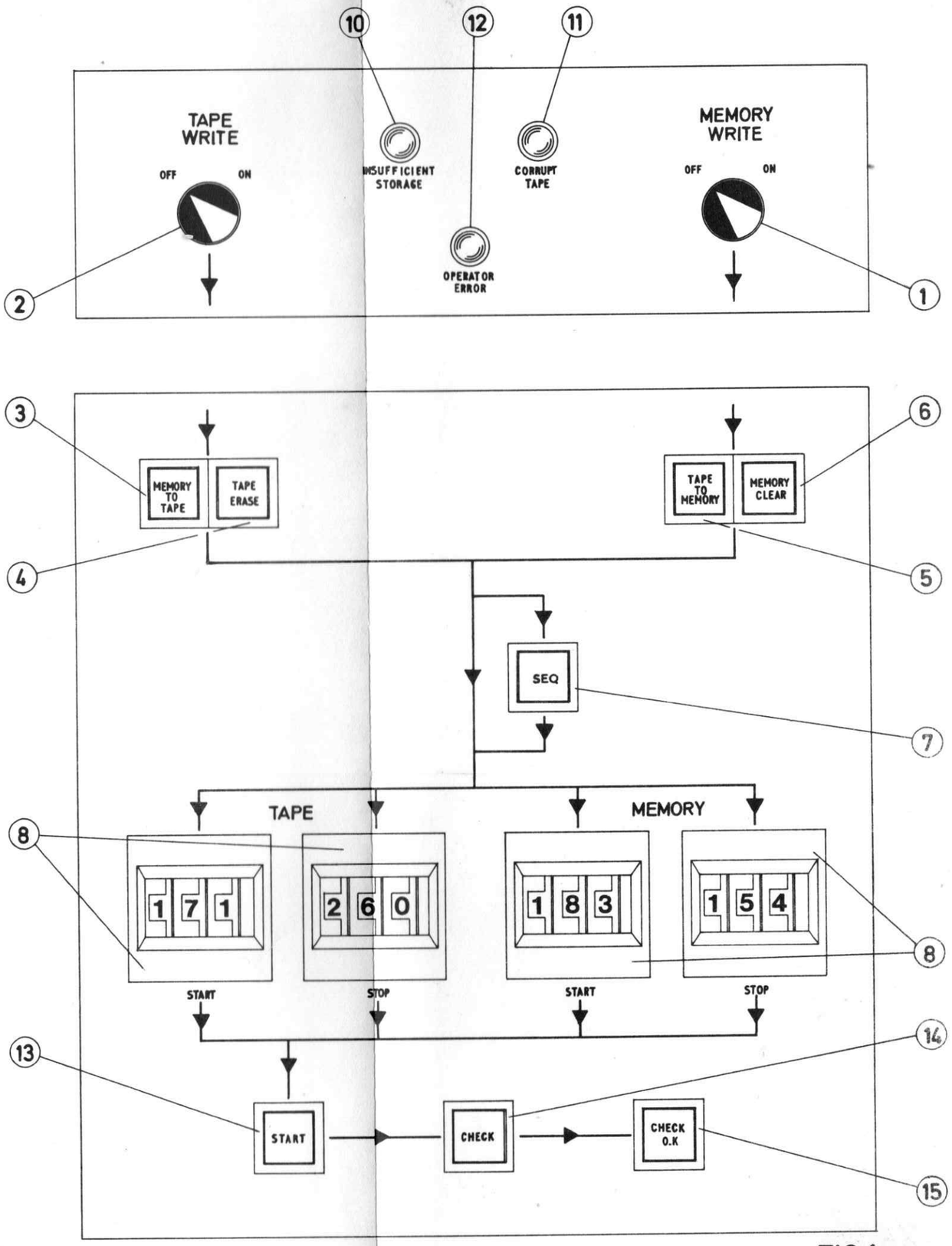
The function of this mimic is self-explanatory. It will normally show if an incorrect function or non-valid cue is selected. Likely errors are :-

(i) CARTRIFILE not switched on.

(ii) Cassette inserted for LOWER TAPE when UPPER TAPE push (if fitted) is selected.

(iii) Attempt to record on tape without setting the FILE PROTECT switch to the record enabled position (para 5.1.1.)

(iv) Cassette not properly inserted in the CARTRIFILE.



TAPE PANEL

FIG.1

RANK STRAND

GENERAL INFORMATION

REGIONAL OFFICES & ASSOCIATE COMPANIES

HEAD OFFICE & SOUTHERN REGION

RANK STRAND ELECTRIC LTD.,
P.O. Box 70, Great West Road,
Brentford, Middx., TW8 9HR.
Tel: 01-568 9222 Telex: 24408 Cables: Rankaudio Brentford

MAINTENANCE DEPT:
52a Goldhawk Road,
Shepherds Bush, London, W12 8DH
Tel: 01-743 6840

NORTHERN REGION:
Church Lane, Lowton,
Nr. Warrington, Lancs., WA3 2PN
Tel: Ashton-in-Makerfield (0942-) 73811

SCOTLAND:
104 Hydepark Street, Glasgow, G3 8DN
Tel: 041-248 5735

ASSOCIATE COMPANIES:

Asia:
Rank Strand Asia Ltd.,
1618 Star House, 3 Salisbury Road,
Tsim Sha Tsui, Kowloon, Hong Kong.
Tel: K-677589
Telex: HX 4953 Ranksa Cables: Spotlite Hong Kong

Australia:
Strand Electric (Australia) Pty. Ltd.,
19 Trent Street, Burwood, Victoria 3125.
Tel: 29-3724 Cables: Spotlite Melbourne

Canada:
Strand Century Ltd.,
6334 Viscount Road, Malton, Ontario.
Tel: (416) 677-7130
Telex: 06 22204 Cables: Spotlite Toronto.

Germany:
Rank Strand Electric,
3301 Salzdahlum, Salzbergstrasse 2, W. Germany.
Tel: 05331-7951
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5432 West 102nd Street, Los Angeles,
California 90045

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