

*Shortened version
for Brentford to work on*

DDM/RSC Summary of Control Requirements 22/9/70

(Based on full ergonomic description given to RSC)

THE CONTROLS

There are three distinct types of control function in the dimmer memory system DDM (a) The Channel Controls to create the stage lighting pictures using the dimmers in the first place and subsequently to modify them at any time. (b) The Numerical Selection controls to enable each picture to be recorded (filed) under a reference (cue) number and subsequently selected for playback. (c) The Master Controls which determine what is to be done with the picture selected for playback. Shall it be added to that already on the stage or substituted and at what rate of speed?

CHANNEL CONTROLS

They take the form of a centre stable Rocker tablet which in effect integrates three push buttons and three pilot lamps as one unit mounting at $\frac{3}{4}$ inch horizontal centres and 3 inch vertical.

Touching the top of the rocker raises the channel dimmer and the bottom lowers it. In both cases removal of the finger stops the process instantly. The action is monitored by a green pilot lamp inside the top. This comes on at half light for all intermediate dimmer levels and at full when the channel is full on - no further gain being possible. The completion of the reverse process to out is indicated by extinction of the lamp. Precise information is given on the CHANNEL DIAL. Whenever a channel rocker is touched the dial monitors that particular dimmer position. If several are held under the fingers to travel simultaneously, perhaps in conflicting directions, then the one actually touched first takes precedence on the dial. The position of particular channel dimmers can be ascertained without movement by using the push button in the centre of the rocker.

Associated with the channel rockers are certain MODE controls. These qualify or alter the function of the rockers. Most obvious is the SPEED control. This consists of twin linear potentiometers. That on the left regulates the time dimmers will take when operated manually from the rockers to "travel" from zero to full or vice versa. The range of speed is from instantaneous (top) to 30 secs (bottom).

A sign indicator with the word "Instant" is brought in at the top position. A second potentiometer TOP SET by its position determines the position to which the dimmer will travel if the top of the rocker is held. (This may be lower than its present position). The bottom of the rocker always then takes it to zero. The word "Top Set" appears in a sign indicator at all positions except the top.

There is an amber warning lamp in the centre push of each rocker which lights whenever a rocker is used to modify a memory in playback. Return of the channel to the level prior to modification or re-recording removes this warning. The lamp and push are also used as part of AUTO MOD (q.v.).

There is a group of four mode push buttons. Two reversible luminous enable the rockers to control dimmers in association with the RED PLAYBACK system (q.v.) instead of with the GREEN system as is normal. The red lamps are in the bottom section of the rockers and the green in the top enabling both to be displayed simultaneously without confusion when necessary. The third push, a momentary contact, is for FLASH and the fourth a luminous reversible for AUTO-MOD. These are described later.

A third mode control known as the DISPLAY MODE, more frequently used, takes the form of a three position sprung-centre switch. In its normal "centre" position the rockers display and operate the lighting ON STAGE. Held in the bottom position the display and operation is of the lighting in the "NEW" store and in the top position in the CUT store. These functions will become clearer in the Playback section below.

NUMERICAL SELECTION "CUE SELECT"

A set of luminous push buttons is provided to enable the requisite range of numbers to be selected for filing in, or obtaining for playback from, the memory. These are arranged in columns for units, tens and where applicable hundreds. In addition there is a black non-luminous CANCEL push.

To provide the computer with a message all columns must be occupied. Thus "one" displays as "001". Use of the digits column automatically sets zeros in the other columns. Any push when used substitutes its number for any other which may be already selected in its own column.

Associated with numerical selections are three luminous indicator windows, for RECORD, GREEN PLAYBACK and RED PLAYBACK respectively. The numbers can be shown in these against black, green, red or amber backgrounds as described later. Each time a number is used it is automatically cancelled, the lights being extinguished at the pushes. Selection of numbers in this way is only necessary to start a sequence or when breaking it to go back or to jump well ahead. Except when using the special CUT pushes the NEXT number is usually obtained by inching-on with the NEXT control which forms part of each playback.

The transfer of a number from CUE SELECT to any window is by use of a NEXT or ADD NEXT control. Exceptions are the CUT-IN and CUT-OUT pushes. These take the number directly. A number can be cleared without using it by the black cancel push alongside.

MEMORY ACTION

The memory controls consist of an indicator window displaying numbers against either a black or amber ground. Under this is a sprung centre switch. Pushed down this takes the number off the numerical selectors (if alight), records the stage picture against it and puts it in the window against an amber ground indicating that it has been so used.

If however that memory number is already occupied with a recorded picture the number appears against a black ground and an audible warning is sounded to give the operator a chance to have second thoughts. Pushing the switch down a second time removes the inhibition, recording takes place and the amber background appears. Pushing the switch up inches the number in the window up one at a time but always with a black ground (a process known as Next-ing). When pulled down at any time it records subject only to the inhibitory action as before. Use of the switch to record without selecting any new number and in consequence the amber background is already present will both remove this to leave that number against a black ground and sound the warning.

The RECORD switch puts into the instant memory system the complete lighting picture as present on the stage at the time. If there is no light then it will be remembered as no light i.e. the memory set to zeros. A memory with zeros throughout is of course considered "free" and sounds no warning.

The GREEN and the RED PLAYBACK systems have a record push under their windows, which is referred to as RE-RECORD because this is its commoner use. When pressed it records the contribution of that master system only to the stage. Any attenuation because the NEW master has not been brought to full will be recorded as attenuated. Whether the BLACKOUT control is on or off is however ignored both by RECORD and RE-RECORD thus making it possible to set up memories without disturbing the stage.

The number in the playback window will be used when re-recording whether it has a coloured background or not. If however a number is displayed on CUE SELECT this can be taken over for recording instead if NEXT is used to put that number in the playback window. However the background will remain black showing that the particular number has not necessarily been recalled as lighting in fact. Indication that recording has taken place when using these individual playback re-record facilities is given by an amber light appearing in the push itself. As soon as the number in the window is changed from that actually used to record or re-record the amber light is extinguished. All recording is subject to a key switch.

PLAYBACK CONTROLS

Either the Green or the Red playback system can be used in exactly the same way, the only difference being in the colour of the display at the channel rockers and elsewhere.

Each playback system has a numerical display window and a set of controls. Associated with each is a store referred to as the NEW. There is in fact another store in which the state of lighting at the time of initiating a new cue is automatically parked as a holding action.

The Playback controls provide sustained functions or "actions" so that the operator then only rides the SPEED regulators to get the timing right.

The action push buttons to each playback system are:-

NEXT Memory Number (ADDITIONAL)
NEXT " " (Substitute)
CROSSFADE (subject to both Raise and Dim speeds)
MOVE (" " " " " " " ")
DIM (subject to Dim speed)
REVERSE (return to "as you were" for all above)
INSTANTANEOUS (temporarily cuts out both raise and
dim speeds)

CROSSFADE will take channels to all levels on the memory selected. MOVE has the same action except that zeros are treated as neutral. Movement from one set of levels to another is linear and simultaneous, beginning and ending together no matter how disparate the distance to be travelled. DIM uses the memory to identify the channels, it will if not interrupted run them proportionately to zero.

CROSSFADE, MOVE and DIM read the memory of the number in the window onto the "New" store no matter whether it has a coloured background or not. ADD NEXT also reads the memory but trips any "action" pushes. NEXT does not read the memory nor does it trip any action.

OPERATION OF CUES

The process of operating lighting cues as distinct from composing them, begins by selecting a number. This has to be put in the playback window by using the NEXT push buttons. Either CUE SELECT is used and the NEXT push takes that number or the push is used on its own to inch up numbers one at a time until the number required appears. In either case the number will have a black ground and the selection of it will not interrupt the progress of the previous cue on that master.

Two NEXT pushes are provided, the left hand one is used when a memory number is to be substituted i.e. is to be taken solo and operated exactly as described. The right hand is used when the memory number is to be added to others. In this case the contents of a number of memories can be added together (highest levels in any common channels taking precedence) before a cue is initiated. Where this is done the ADD NEXT

push lights up internally and remains illuminated until the NEXT push is pressed to obtain a memory solo; the window will show the last number added. ADD NEXT trips the CROSSFADE, MOVE, DIM and REVERSE controls also their sign indicator, whereas NEXT does not. To obtain a preview of the contents of memories, whether solo or added, and then modify them the 3-way Display mode switch is used.

The memory number or numbers once selected the required action push is pressed; this lights internally and in addition lights the indicator sign to show CROSSFADE, MOVE and DIM as appropriate. It also puts a green background behind the memory number. (N.B. the green background will already be there if ADD NEXT had been used to add memories). Completion of the action extinguishes the light in the push but leaves the Indicator sign and also the green background to the memory number. A new number removes the latter and use of another action push changes the sign. The rate of change is shown on a dial just above the speed control. For MOVE and CROSSFADE the dial reads from 0 to 10 but for DIM the needle runs from 10 to 0.

Since there are separate speeds for the increasing and decreasing levels the DIAL takes it time from the slower of the two speeds. REVERSE in each of the above three actions initiates a return to the condition before the particular push was pressed. It follows therefore that pressing the REVERSE push before an action push has been used can do nothing whatever. Because this is so the push will neither light up when touched nor will it put a green background in the window. Once the green background has been put there by any one of the three action pushes, whether the action itself is complete or not (or still in progress or not) the REVERSE push will extinguish the action push and light up itself until the reverse is completed.

The effect of REVERSE in the case of CROSSFADE, RAISE and DIM is to return the stage lighting to exactly the state before the particular push was pressed.

So long as a green background appears in the memory number window the REVERSE push will be able to take effect. This will often be in respect of a just completed action and in consequence no action push is alight but the sign indicator with the name of the last action will be, as a reminder to the

operator as to what is was. Completion of the reversal extinguishes the light in the REVERSE push but only initiation of a different action will alter the sign indicator. A reverse action like any other can be interrupted or stopped.

When REVERSE is used the speeds of the original action are retained i.e. channels which were increasing their level will while reversed, dim at the same speed as they were increasing at and vice versa.

All actions except Cuts are influenced by the SPEED control (q.v.) but as an operational precaution the speed when in full top position is one sec. not instantaneous. Thus obviating the risk of the operator running inadvertently from a dimming cue into a switching one. Use of the INSTANT push will provide an instantaneous switching when required see Switching and Cut. As to what channels switch in to an increased and what to a decreased level or to out will be entirely governed by the lighting effect recorded on the memory used.

SPEED REGULATION

As a basis for discussion it is suggested that the eleven full divisions of a standard Rank Strand quadrant lever should each represent roughly half as much again as its predecessor. Thus at the top we get 1 sec and the bottom 60 secs. The SLOW push when engaged would multiply the duration by a factor of ten. Thus the top is 10 secs and the bottom 10 minutes.

A single control will be sited in a secondary area so that the factor can be altered when necessary. Since the control is dealing with speed of, not travel position of, the master a series of decisive notches on the regulator may have advantages over a continuously variable regulator. There would be then 21 contacts i.e. nineteen intermediate steps between 1 sec and 60 secs. DIM only the left hand.

SWITCHING AND CUT

The three pushes CROSSFADE, RAISE and DIM can be made to operate as switching functions by pressing the INSTANT push alongside at the same time. This overrides the speed which then immediately reverts to normal when released.

In addition there is an auxiliary cut store which can be used to pile switching cues on the Green playback without interrupting long duration changes.

For the Cut store there are two pushes CUT-IN and CUT-OUT and they obtain their memory number direct from the CUE SELECTOR. The CUT-IN lights up itself, switches on the channels to the level of the memory and puts the number against a red ground in the Green window. The green function already going on is not interrupted and both that number and the display of its content (for individual rocker modification if necessary) will appear while the Display mode switch is held down.

Further memories can be switched-in by selecting and operating CUT-IN. Memories can be switched-out either by selecting a specific number for the purpose and pressing the CUT-OUT in which case just the content of that particular memory will be tripped or by simply pressing the CUT-OUT without selection whereupon the entire content of the Cut store will be tripped. In the first case the light in the CUE-IN push will not be extinguished until the store is completely clear. However the window will revert to its normal action Green number whenever CUT-OUT is used. Thus to Cut-In and Cut-Out a single memory it is only necessary to select a number for the first purpose and subsequently trip it by pressing CUT-OUT. CUT-OUT puts the channels to zero, thus although two memories may be cut-in one after the other to add highest on common channels. These will be tripped when the first of the two memories is CUT-OUT.

As soon as a new cue number is set in action (Raise, Dim or Crossfade) and a green background appears the content of the Cut store is parked and becomes an integral part of the stage lighting picture which will be affected or not by the cue change or changes as memorised that follow. To prevent this trip action deliberately the CUT-IN push must be held down manually while using other action pushes.

Red Cut-in levels are piled with the levels of the normal Green change in progress highest taking effect.

SECOND PLAYBACK

Rocker action (not display) is restricted to a playback by putting the Mode push for the other one "off". Use of a BLACKOUT to avoid operating the stage lighting from a playback will also trip the Mode push for the other playback.

The Green and Red Playbacks can be used quite independently without any need to use the mode switches. Memories can be called up on either or both and any actions and speeds adopted, whether conflicting or not, without trouble because both playbacks are piling their outputs at the dimmers. In their role of static mimic diagram the rockers also present no difficulty because the Green and Red displays are quite separate at the top and bottom of each rocker. It is the manual functions of the rocker that are shared between the two playbacks together with the push button/amber warning light in the centre which is also associated with such functions.

Two luminous pushes couple the channel rockers to the green manual action and red respectively.

The pushes are reversible and are normally both on. In this condition Green is 'normal' and always has priority. Touching one puts it out and inerts that colour as far as rocker modification and "Dial" reading is concerned. Touch it again for 'as you were'. These pushes are to be linked to the Blackouts also. When a Blackout is "on" the mode for the other playback is extinguished and that rocker action inerted. Should however a stage modification be required in this condition - the dark push is held down to make it take over for just that time, the moment it is released it reverts as before. Putting the blackout off also puts the missing mode switch on once more. The blackout push is not reversible because the operator might inadvertently throw the content he has been using onto the stage. A blackout once put on can therefore only be tripped by the CANCEL push (otherwise known as Wipe).

When both mode switches are "on" the rockers modify the stage picture however derived. Thus if a channel is common to an action on both the green and red playback the channel is taken out of both actions and held in a manual store. At the same time the amber light in the rocker comes on. Progress of an action on either playback resulting in a match of level will

not restore the channel to normal. To do this the level of the channel itself has to be changed to match that of any subsequent action progress. The level taken will be the higher of the two playbacks at the time. Re-recording trips the amber warning also reading or re-reading any memory on either playback, i.e. the automatic parking of the stage lighting state as it is at the time of reading a new memory removes the need for the warning. Only if AUTO MOD is used will it be retained (see below).

If rocker action in respect of one playback has been inerted due to one of them being inerted as described earlier then reference is to any memories or levels of the non-inerted playback. Likewise if the area of action is further limited by the examination of a new store through the holding down of the Mode switch then the matching takes place to that i.e. the memory levels as recorded.

AUTO MOD

When the AUTO MOD mode is "on" (showing amber) any modified channel i.e. ^{also} showing amber will be permanently captured in that modified state and this level will be substituted for any other (except zero) whenever a memory is read subsequently which contains that channel (or channels). This modification can be inerted temporarily by putting the AUTO MOD push off (it is reversible). If the channel rocker is moved to a position which extinguishes its amber light while AUTO MOD is on then it is released therefrom. Any amber rocker lights are always brought on to indicate that it is a substitute level, in the same way as the other indications appear at the rockers when a memory is read.

FLASH

When the push is held on any channel can be put temporarily to full or to out by holding the top or the bottom of its rocker. Any flashing effect depends on the operator's dexterity.

PROGRAMMING OF MEMORY

These fontrols will not be on the main console and are yet to be discussed.

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