4 Running The System
The Network

The interconnection of the various units in any Broadway system is performed using Harman Communications Architecture (HCA) - a protocol developed by the Harman Pro Group specifically for the Broadway console, which has now been made available to other manufacturers.

HCA has two strengths which make it particularly suited to Broadway:

- object discovery - the ability to detect and integrate any new network devices when they are switched on. Network devices will “announce themselves” as part of the booting process, and will broadcast information about their capabilities.

- generic, object-based protocol - HCA breaks down every network device into control and audio objects. A list of all available objects is then kept in what HCA calls the “registry”, and the “system builder” then links controllers to audio objects.

For a full explanation of HCA, please see Appendix A.

The important point to grasp about HCA is that, thanks to object discovery, any HCA-compatible devices (including non-Broadway units in the future) may be added to the network, and will be auto-detected and integrated by the rest of the system.

The network uses advanced object discovery techniques which allow the user to switch any unit on the network on or off at any time, and the system will recognise that unit and integrate it into the Network. Note: the output rack is an exception to this because it contains the Registry and the System-Builder/Controller software.
Booting The System

Each unit has a finite boot-up time. This is the period immediately after the unit has been switched on, during which the device works out what it contains, what it is expected to do, and what it has to offer the network. Once this is complete, it will begin negotiation with the network, “talking” to any other booted devices. As far as the user is concerned, the booting process is a boring but essential part of any Broadway component, but, barring disasters, the boot sequence need only be performed once a day.

It is not possible to pass audio or data before the boot process is complete - indeed, it is important that no data is sent during the boot process, so the user should avoid touching surface controls during the primary boot sequence.

All Broadway units may be powered up at the same time, and after a brief self-check, will begin communication over the network system.

The touchscreen will inform the user of booting progress. This is shown in the form of a "progress bar", which gradually fills from left to right.

It is VITAL to the successful booting of Broadway that all of the input which the console expects to be available are visible on the network. Any missing inputs (usually a whole rack which has not powered up, etc.) will be reported to the user, and the problem must be identified and resolved before boot will continue.

The console will also expect a certain number of Input Surfaces. If the number of surfaces found differs from the number expected by the console, one of two things will happen:

- if the console finds MORE Input Surfaces than it had expected, then these will simply be attached to the system, and made available to the user.

- if the number found is FEWER than the number it had expected, then the user will be prompted for a course of action. A message such as: "Input Surface 2 not found" will be presented on the touchscreen, and at that point there are 3 options available via the switches BELOW the touchscreen:

  LAST - Remove completely
  This option will remove the Input surface in question from the list of expected components, so the console will not only boot without it on this occasion, but furthermore will not ask for it during any future boot procedures.
  The Surface may still be reattached in the future, however, simply by booting the console completely first, then powering up the Input Surface, which will reattach itself automatically.

  CANCEL - Ignore
  The console will temporarily ignore the missing surface and complete the boot regardless, but will still look for it during all future boots.

  EXECUTE - Retry
  The console will look again for the missing item. This is useful if the user simply forgot to turn the unit on, or the unit wasn't physically attached to the network for some reason. Any number of retries are allowed, but the warning message ("...not found", etc.) will be shown within a few seconds of retrying if the unit is still not found.

  Once the console has established communication with all the elements of the network, the console is ready for use. This is marked by the appearance of the Cue List on the Master Surface Touchscreen.
Fader Tray

Selecting Channels

The Input surfaces will now show twenty channels on the twenty faders. These are labelled via the 4-character displays with the name of the inputs (which, by default, are the input number, e.g. 1:34 for rack 1, input 34).

Above each input fader there is an associated [SEL] switch. This selects the associated channel, bringing it up onto the Assignable Channel Strip for parameter viewing and editing.

Each input fader also has a meter (16 segment plus peak LED), which reads the pre-fade signal.

Banks

There are 8 “Banks”, or layers, of the 20 Faders on each Broadway Input Surface. This means that a single 600mm-wide Input surface can access up to 160 channels.

Pressing any of the 8 BANK buttons in the centre of the fader tray will bring up the appropriate bank of twenty faders.

Allocation of inputs to Banks is totally free, and the assignment of an input to a particular Bank does not preclude the assignment of that same input to any other Bank. It might be desirable, for example, to assign a selection of three or four important lead microphones to the first few faders on every Bank, whilst reassigning the remaining faders to various inputs. This way, when the various Banks are selected, the first few faders appear unaffected, and the primary microphones are therefore always visible and usable.
TheAssignable Channel Strip

The Assignable channel strip is the removable unit which forms the top third of the Input Surface.

When a channel is [SEL]ected, it will appear on the ACS. This emulates the channel strip of a conventional console, running logically through the expected functions from left (A/B selection) to right (final Main outputs).

Modes

The assignable channel strip (ACS) carries all the controls for one channel, it is assigned to a channel with the [SEL] button. Just as the Input surface changes function with mode switches, so the ACS will change its functionality dependent upon the INPUT, GRAUX, MATRIX or VCA mode of its parent ACS. When operating remotely the ACS allows the user to select this mode via the LCD screen controls.

ACS Modes and Channel Hold

The ACS operates in Input GrAUX and Matrix Modes, and the Input Surface operates in these three plus VCA mode.

In normal operation, the ACS mode and current selection are linked to those of the parent Input Surface. Therefore if a change of mode or selection is made on the ACS, then that change will be reflected on the Parent and vice versa.

The general rule is that only one channel may be selected on any surface at any time on Broadway. When the mode is changed, the last selected channel remains selected until the next channel is selected. It is therefore possible to change modes on the surface without reassigning the ACS.

Chan Hold

When CHANNEL HOLD is selected on the ACS, the parent surface and ACS are effectively detached.

In this mode, it is no longer possible to SELect channels on the parent surface, with the “SEL” on the last selected channel remaining illuminated, and the parent denying SELection of further channels. The mode switches on the parent DO remain functional, but the changes of mode are not written to the ACS.

Channel selection on the ACS continues to function as before, including mode changes, but the parent will no longer follow these selections.

When the CHAN HOLD is deselected, the ACS will return to the mode and channel selection of the parent surface.
ACS Controls

[48V] Phantom power on/off
Phantom power is only available on the XLR component of the combination input connectors on Broadway (or via the 3-pin header associated with this for multiway cabling). Phantom power may be set up independently for A and B inputs.

[Mic/Line] Toggles between mic and line Input
Combination jacks on the rear allow XLR OR balanced TRS jack connection, but, as explained earlier, each input channel on Broadway has just two inputs - A and B. Both A and B may use EITHER the XLR OR the TRS jack. Once one of these has been connected, MIC / LINE only changes the Gain, and does NOT toggle between XLR and TRS connectors.
[B] Selects the second Input connector. Gain can be assigned independently for this Input.

[6] Phase reverse
For stereo channels, only the left channel will be reversed.

Signal Peak LEDs
These 3 LEDs show SIGNAL PRESENT (green) and PEAK (red) at various points in the channel path. Signal is considered to be -30, Peak is at +18dB.

Gain
Rotary control for Input gain, switched between mic or line scaling. The encoder uses a continuous bar display format. Note that a separate gain value is stored for the A and the B sources. The outer scale shows LINE level gains, the inner scale shows MIC level gains.

High Pass Filter
Smooth rotary control, covers 31.1Hz - 400Hz (12 positions). The IN button switches the filter in circuit.

Low Pass Filter
Smooth rotary control, covers 1kHz - 20kHz (12 positions). The IN button switches the filter in circuit.

EQ
The EQ is 4 band fully parametric. The HF and LF bands can be switched between PEAK and SHELF using the [SHELF] button. All controls are non-detented: frequency is displayed as a single segment, Gain as a bar centred on the centre segment and Q is shown as a width bar display. EQ range is:
Band 1: 20Hz - 400Hz   Band 2: 63Hz - 1kHz
Band 3: 400Hz - 10kHz   Band 4: 1kHz - 20kHz
(Q for all bands is 0.7 - 3.6)
The EQ soft button on the LCD to the left of the EQ section enables the display to show the EQ Values (it is also possible to see the Gain-Frequency curve for the current setting by pressing "show curve" on "EQ" page the LCD).

**EQ IN**
This switches the EQ in circuit.

**Insert**
The [INS IN] button switches the insert point into the signal path. The [INS PRE EQ] puts the insert immediately before the EQ. With this switch off, the insert point is post EQ and before any Aux pick-off point.

**Fader**
The rotary control fader has identical functionality to the main fader tray fader. Moving this encoder will move the fader and vice versa. The encoder is smooth and uses a bar type display.

**[Mute]**
Identical function to the [Mute] on the channel strip.

**[Solo]**
Identical function to the [Solo] on the channel strip.

**PAN IN**
When this switch is on, the channel is routed through the Pan pot. Switching [PAN] out of the signal path will send the signal directly to the currently-selected main outputs at unity.

**PAN**
See 4.6 for details of the pan laws.[OP1] etc. These switches route the signal to the appropriate output. If the Pan is switched out of circuit, the switches allow discrete routing to one channel of the stereo or LCR routings.

**[CHAN HOLD]**
This button holds the current assignment on the ACS so that the [SEL] button no longer changes the assignment.

**[ISO]**
This operates like the channel strip ISO button. When on, the channel will not respond to snapshots called from the scene-set automation system.
**GrAux Controls**

The 16 rotary controls are switched globally with the SWAP key between two groups of 16 GrAuxes to allow access to all 32 GrAuxes. Of course, although only 16 GrAuxes are visible at any time, all 32 remain active regardless of whether 1-16 or 17-32 are visible.

The GrAux send levels are shown as “bar” type LED rings, and the right-hand extreme of the LED ring denotes a maximum send level (0dB, a unity send to the appropriate GrAux buss).

There is a four-character LED dot matrix display to show the name associated with each GrAux channel. These names are entered into the system via the touchscreen, in the FADER ASSIGN page.

If a GrAux is globally configured as stereo, then the odd numbered GrAux automatically controls the level for both legs and the even-numbered control becomes the pan control. The latter control will be named as PAN. This is also indicated by the format of the display: level is shown as a bar display and Pan is displayed as a single point display.

The [ON] switch is analogous to a routing switch on a conventional console, since it switches the signal to the bus. The [PRE] switch selects whether the pick off is pre or post fader. When [PRE] is illuminated, the pick-off is pre-fader.

GrAuxes are Pre Input Cut switch when used Pre-fader.

**ACS LCD Screen**

(See diagrams opposite for screen hierarchy)

**0 Base Screen**

The “top” level screen, this is where channel selection is performed

Encoder 1 will scroll through the available channels by name

Encoder 2 will select the current rack number

Encoder 3 will select channels by input number

Encoder 4

Switch 1 accesses the EQ screen (5)

Switch 2 accesses the PAN mode screen (4)

Switch 3 accesses the Function screen (1)

Switch 4 accesses the Surface Mode selection screen (2)

**1 Function**

Allows access to the 3 “function” pages of the LCD. The encoders are not active.

Switch 1 accesses the COPY screen (15)

Switch 2

Switch 3 accesses the Direct Out screen (13)

Switch 4 returns to the Base screen (0)

**2 Surface Mode**

This screen allows the user to change the associated input surface to Input / Graux or Matrix mode.

Switch 1 Selects Input Mode

Switch 2 Selects GrAux Mode

Switch 3 Selects Matrix Mode

Switch 4 Returns to the Base screen (0)
4 L+R
Encoder 1
Encoder 2 Selects the surround (4/5 signal) to follow the PAN or be fed DIRECT
Encoder 3
Encoder 4
Switch 1 Selects L+R Mode (4)
Switch 2 Selects LCR Mode (8)
Switch 3 Selects LCRS Mode (10)
Switch 4 Returns to the base screen (0)

5 EQ Values
This screen is accessed via Switch 1 from the Base Screen. This screen cannot be used to EDIT the parameters, only to VIEW exact values.
Switch 1 accesses the “EQ Curve” screen (7)
Switch 2
Switch 3
Switch 4 Returns to the base screen (0)

7 EQ Curve
This displays an EQ curve for the channel, based upon the current EQ settings. The curve will be updated whenever a change is made to the EQ parameters.
Switch 1
Switch 2
Switch 3 returns to the base screen (0)
Switch 4 returns to the EQ Values screen (5)

8 LCR
Encoder 1
Encoder 2 Selects DIRECT / PAN
Encoder 3
Encoder 4
Switch 1 Selects L+R Mode (4)
Switch 2 Selects LCR Depth Mode (9)
Switch 3 Selects LCRS Mode (10)
Switch 4 Returns to the Base screen (0)

9 LCR Depth
This page shows that the channel is in LCR Depth mode. The Surround type can be set to DIRECT or PAN, and the Front/Back pan can be set as a “forward percentage”, where 100% is panned totally forward, and 0% is totally panned to the rear component.
Encoder 1
Encoder 2 Selects DIRECT / PAN
Encoder 3 Sets the forward panning percentage (default 100%)
Encoder 4
Switch 1 Selects L+R Mode (4)
Switch 2 Selects LCR Mode (8)
Switch 3 Selects LCRS Mode (10)
Switch 4 Returns to the Base screen (0)
10 LCRS Panning
Encoder 1
Encoder 2
Encoder 3
Encoder 4
Switch 1 Selects L+R Mode (4)
Switch 2 Selects LCR Depth Mode (9)
Switch 3 Selects LCR Mode (10)
Switch 4 Returns to the Base screen (0)

11 Graux Select Screen
This screen allows selection of Grauxes, in the same way as (0) allows selection of Inputs. It also allows access to the pan mode and input surface mode pages (3) and (2). The pan page in this case will set up panning of Grauxes into Main outputs

12 Matrix Select Screen
This screen allows selection of Matrices, in the same way as (0) allows selection of Inputs. It also allows access to the input surface mode pages (3) and (2)

13 Direct Output
This screen shows only the pre/post fade status of the Direct Output for that input.
Encoder 1
Encoder 2
Encoder 3 selects the Direct Out to be Pre/Post fader
Encoder 4
Switch 1
Switch 2
Switch 3
Switch 4 will return to the Base Screen (0).

15 Copy Single
This screen allows copying of channel parameters from a source channel to single destination channels.
Switch 1
Switch 2 selects the Copy Multiple 1 page (16)
Switch 3 will return to the Base Screen (0)
Switch 4 will return to the Func Screen (1)

16 Copy Multiple 1
This screen allows copying of channel parameters from a source channel to multiple adjacent (on the SURFACE) destination channels. The syntax for this page is that the user selects the source channel (from which the data is to be copied); this selection moves the LCD to Copy Multiple 2. The second screen then asks the user to input the first of the destination channels. When this is selected, the LCD will move to Copy Multiple 3, which asks the user to input the last of the destination channels. The console will then copy the source channel parameters to the first and last selected channel, and all channels WHICH APPEAR ON THE SURFACE between these two fader assignments. See CHANNEL COPY for more information on this function.
Switch 1 returns to the Copy Single page (15)
Switch 2
Switch 3
Switch 4 will return to the Func Screen (1)

17 Copy Multiple 2
This screen allows copying of channel parameters from a source channel to a
number of destination channels. See Copy Multiple 1 (16) for an explanation of the
syntax here.

Switch 1
Switch 2 Resets the channel to factory defaults
Switch 3
Switch 4 will return to the Func Screen (1)

18 Copy Multiple 3
This screen allows copying of channel parameters from a source channel to a
number of destination channels. See Copy Multiple 1 (16) for an explanation of the
syntax here.

Switch 1
Switch 2
Switch 3
Switch 4 will return to the FUNC screen (1)

19 Copy Single 2
When this page is present, pressing SEL on any channel will copy the audio
parameters of the source channel to the SEL(ect)ed destination.

Switch 1
Switch 2 Resets the channel to factory defaults
Switch 3
Switch 4 Returns to the Copy Single header page

20 Oscillator
Encoder 1 Adjusts Frequency of the SINE OSCillator wave
Encoder 2 Adjusts level of the Oscillator (See Note 1 below)
Encoder 3 Selects Mode of Oscillator [OFF / PINK / SINE]
Encoder 4

Switch 1
Switch 2 Resets the channel to factory defaults
Switch 3
Switch 4 Returns to the Copy Single header page

Note 1: The level of the SINE wave is adjustable through a range of +20dB to -50dB, BUT is calibrated such that the 0.0dB point on the ACS LCD is actually fed onto the buss at -10.0dB.

In PINK noise mode, the Level control switches to be simply an "UP/DOWN" level control, rather than calibrated values.
In SINE mode, the available frequencies are:
4k, 3k15, 2k5, 2k, 1k6, 1k26, 1k, 800, 630, 400, 315, 250, 200, 160, 126, 100, 80, 63, 40, 31.5, 25, and 20Hz.
Encoder Tray

The six rows of encoders in the encoder tray are designed for visibility and editing of six chosen rotary functions at any time across the 20 input surface channels. The function of each row of encoders is set by using the ↑ and ↓, then pressing the appropriate “LOCK” button.

Once an appropriate set of 6 controls has been set up on one or more Input surfaces, this can be stored in one of the Control Presets switches on the left hand side of the Master Surface by holding the touchscreen SETUP button, and pressing the desired Control Preset switch. The 8 Control Presets are global for a Project, and are therefore not recallable per cue.

It is also possible to use the Input Surface faders to control the output buses of the console: see the “Outputs” section.

The ↑ and ↓ switches will scroll through all rotary ACS parameters.

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Channel copy / reset channel

With the Channel Copy function in Broadway, it is possible to take the channel parameters from one channel and apply them to a number of different channels. There are two ways of achieving this:

1) Single channel copy

2) Multiple channel copy

1) Single channel copy:

Pressing COPY in the FUNC page of the ACS LCD will bring up the COPY SINGLE 1 page. The user is then required to tell the console the “source channel” - that is, the channel from which the data is to be copied.

The source channel is selected with a press of its associated SEL switch. This action will present the COPY SINGLE 2 screen, which asks the user to select the destination channels to which the source channel data should be copied. Pressing SEL on any channel at this point will cause the source channel data to be copied to that channel. Once all copying has been completed, pressing EXIT (F4 on the ACS LCD) will return the user to the BASE PAGE on the LCD.
2) Multiple channel copy

The **COPY MULTIPLE** LCD screen allows copying of channel parameters from a source channel to multiple adjacent (on the SURFACE) destination channels. The syntax for this page is:

The user **SELects** the source channel (from which the data is to be copied); this selection moves the LCD to Copy Multiple 2.

The second screen then asks the user to input the first of the destination channels. When this is **SELected**, the LCD will move to Copy Multiple 3.

The user is then required to input the last of the destination channels. The console will then copy the source channel parameters to the first and last **SELected** channel, and all channels WHICH APPEAR ON THE SURFACE between these two fader assignments. That is, if the first selection is fader 1 on BANK 1, and the second selection is fader 3 on BANK 4, then the source channel data will be copied over ALL channels appearing ON THE SURFACE FADERS between those two locations (i.e. all faders in BANK 1, all faders in BANK 2 and the first 3 faders in BANK 3).

As an additional aid to programming, when the SOURCE channel has been selected (in **COPY MULTIPLE 1**), it is possible to reset the SOURCE to the default factory parameters for inputs. This is useful for resetting or "flattening" large sections of the desk with just a few button presses.

As with all Broadway functionality, there is no **UNDO** for the copy function. Remember, though, that the new channel information is not stored in a cue until a **[CREATE IT]** or **[UPDATE CUE]** is performed in the touchscreen. Should a copy be made in error, simply recall the original cue to return to the old desk setup.
The Master Surface has three primary functions:

- To offer VCA control of channels
- To control and meter the output levels of all the busses
- To run the touchscreen front end for the automation system

**VCA's**

The VCA masters are assigned via the touchscreen software - see “Assigning VCA's” in “Touchscreen Functions” below.

**Outputs**

Broadway is a 40-buss console. Those 40 are arranged thus:

32 Group/Aux (GrAux) Sends

5 Main Outputs (Left, Centre, Right and Stereo surround)

3 Solo busses
The console will also support up to 40 matrix outputs.

The GrAux output levels are adjusted via two banks of controls - 16 faders and 16 encoders. By default, the 16 faders control the first 16 GrAux sends, and the 16 encoders above control the second 16 GrAuxes. This setup is ideally suited to the situation where the first 16 busses are used as conventional groups, and the second 16 as auxiliary sends.

If required, the encoder and fader assignments may be swapped by pressing the SWAP switch. This means that, should the user wish to use GrAuxes 17-32 as conventional groups rather than auxiliary sends, they can be brought onto conventional faders for easier setup and mixing.

The 5 Main Outputs may be adjusted using the 4 faders on the left of the centre section in the Master Surface. The 4 faders control the Left, Centre, Right and Stereo Surround outputs of the console respectively.

The Matrix outputs are controlled by the same faders and encoders as the GrAuxes. On the left of each row of controls lies a GRX and MTX switch, which defines whether that row of controls is affecting the GrAux or Matrix outputs.

The faders and encoders for the Buss outputs each have an associated MUTE, SOLO and FUNC switch. The operation of the FUNC switch is defined by the mode switches to the left of the fader tray. The four possible modes for the FUNC switch are:

- **ISO** Isolates the output from the automation system
- **T/B ASSN** Selects that output for talkback routing from TALK TO BUSS
- **SEL** Performs no function as yet
- **INS** Toggles the insert for that output IN or OUT

The FUNC switch on each output will toggle the currently selected item on the appropriate channel, except for SELect, which is effectively auto-cancelling, since only once channel can be selected at any time.

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**Talkback**

The talkback mic can be mounted on a gooseneck plugged into the Master section. The T/B Mic gain level can be adjusted via the screw adjustment in the rear panel. Talkback output level can also be adjusted through the screen with independent control for the Main outputs, GrAux outputs and Matrix outputs. The TALK switches are momentary unless pressed quickly, in which case they are software latching, so a quick press will toggle ON/OFF.

The talkback switches are:

- **EXT TALKBACK**
- **MON DESK**
- **TALK TO RACK**
- **TALK TO BUS**
- **CLEARCOM**

The function of each of these switches is described in more detail in "Talkback" below.
**Headphones and Monitoring**

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**Control Room Monitor**

See “Monitors” for detail of the operation and function of these switches.

The Monitor level is adjusted directly from a pot, and is a “real” analogue control, which will prevent the monitoring from being lost in the unlikely event of a network failure. It is not resettable.

[CUT] mutes the monitor outputs.

[DIM] reduces the output level of the monitor outputs.

**Headphones**

See “Headphones” for a description of this function.

The level control on the Master panel is a real pot and directly controls the amplified headphone audio without using the Computer system, and will thus remain operational even if there is a computer fault in the Master section. The level control acts on the amplified output only.

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**Control Assignments**

The eight buttons on the left hand side of the panel are used to assign functions to the assignable rotary controls on the Input modules. All rotary controls are changed desk-wide unless the local [LOCK] switches are on.

The assignment for each of the buttons is saved as part of the global Configuration data for each project.

There are also four Control Preset switches, which are pre-defined sets of assignments for the six rows of encoders:

- **EQ LO**
  - Will display Frequency, Q and Gain of the first two bands of

- **EQ.EQ**
  - HIGH Will display Frequency, Q and Gain of the second two bands of EQ.

- **GRAUX 1-6**
  - Will display the first 6 Graux send levels.

- **GRAUX 7-12**
  - Will display the second 6 Graux send levels.

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**Master Mute**

The latching Master MUTE switch toggles all MUTE switches on the console to the MUTE position. When this switch is toggled back to “off”, the console mutes are returned to their previous settings (i.e. muted if they were previously muted, unmuted if they were not). The MUTE LEDs on the channels will **NOT** illuminate.

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**Solo Clear**

The Solo Clear switch cancels all solo assignments on the console. The switch illuminates as soon as a solo is first pressed, and the illumination ceases as soon as [SOLO CLEAR] is pressed, or all solos are removed.

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**Live**
This switch locks out the Master Mute and talkback, resets the SOLO IN PLACE to be an ordinary PFL, and locks out the editing of cues (i.e. the MAKE switch). It will also disable the oscillator and Interrogate Edit.

LIVE mode has another important function - it enables the offset functionality of the console (see “Offsets” later for more information about Offsets). When LIVE mode is selected, any offsets will immediately be applied to the appropriate channels. When it is pressed again to deselect the mode, the channel parameters will “jump” to their stored values, without the current offsets.

**Peak Detect**

Should the channel path of an input anywhere in the console approach Peak (+18dB or above), the name of that channel will be presented on the Master Surface SOLO meter, and the meter will then switch to monitor that peaking channel.

Pressing SEL below the meter will return it to monitoring the SOLO channel as before, unless another channel on the system has peaked, in which case the meter
will swap to monitor that peaked channel. Once all peaked channels are cleared (SEL having been pressed for each channel), the meter will return to the SOLO buss.

**Outputs**

There are 4 main pan laws for Broadway, two of which have surround options. The “current” law at any time may be selected per channel. The four laws are:

- **L + R** (Conventional Stereo), Surround = pan or direct
- **LCR** (Three-way panning), Surround = pan or direct
- **LCR Depth** (Same as LCR, but can be mixed into 4 and 5 via similar pan and a depth control)
- **LCRS** (Five-way panning)

In any mode, the five output switches may be selected or deselected as required, with the results described below. When an output switch is first selected, the reaction of the other outputs will depend upon the current mode, as defined below. From that point on, however, depending upon mode, the deselection of certain outputs may or may not result in a change of law for that particular channel.

If Pan is deselected in any mode, the five output switches become five unity mono sends.

All sends to all main outputs are, of course, post the channel fader.

**L+R**

This follows the conventional Soundcraft L/R panning law; that is, signal to the Left channel only when at full left deflection, signal to the Right channel only when at full right deflection, and the usual 4.5dB drop in the centre.

When either L or R is selected, both LED’s (in the L and R switches) are illuminated, to show that the console is in L+R mode. The L and R switches are linked in this mode.

If “C” is pressed, then the signal is sent direct to Output 3, regardless of the panpot.

If SL or SR are pressed in this mode, the setting of “surround” in the ACS output mode selection page will define what happens next:

If “direct” is selected, then the signal will be sent directly (i.e. not via the panpot) to the selected output. The SL and SR switches are not linked in this mode.

If “pan” is selected, then the SL / SR feed will derive its pan information from the panpot, and follow the L + R law defined above (as there is no centre in the surround field). The SL and SR switches are linked in this mode.

**LCR**

This pans through three channels - left, centre and right. At the extremes and the centrepoint (i.e. fully left, fully right, and centre respectively), the signal is delivered exclusively to the associated output. In this sense, LCR may be treated as if it were two separate pans (i.e. between L and C, then between C and R), each with a similar law to the Left / Right law above.

When in LCR mode, all three LED’s (in the L, C and R switches) are illuminated.
when any one is selected. It is possible to deselect the C switch, and return that
particular channel to conventional L / R with the associated law. In this way, a
channel may be “toggled” between conventional stereo and LCR panning simply
by pressing the “C” switch.

If SL or SR are pressed in this mode, the setting of ©surround in the ACS Output
Mode page will define what happens next:

If “direct” is selected, then the signal will be sent directly (i.e. not via the panpot)

to the selected output. The SL and SR switches are not linked in this mode.

If “pan” is selected, then the SL / SR feed should derive its pan information from
the panpot, and follow the L + R law defined above (as there is no centre in the
surround field). The SL and SR switches are linked in this mode.

**LCR Panning**

- Position 1 : signal exclusively to the Left channel
- Position 3 : signal to both L and C, with a 4.5dB drop
- Position 5 : signal exclusively to the Centre channel
- Position 7 : signal to both C and R, with a 4.5dB drop
- Position 9 : signal exclusively to the Right channel

**LCR Depth**

This mode follows the same law as LCR, but the signal may be mixed onto the SL
and SR outputs, at the level defined by the front/rear balance parameter (accessed
via the LCD). Front/rear balance defaults to full front level, and no surround.

The SL / SR feed derives its pan information from the panpot, and follows the L +
R law defined above (as there is no centre in the surround field).
LCRS

This mode should allow panning from SL at the full left deflection, through L, C and R, to SR at the full right deflection.

**LCRS Panning**

- Position 1: signal exclusively to SL channel
- Position 2: signal to both SL and L, with a 4.5dB drop
- Position 3: signal exclusively to the Left channel
- Position 4: signal to both L and C, with a 4.5dB drop
- Position 5: signal exclusively to the Centre channel
- Position 6: signal to both C and R, with a 4.5dB drop
- Position 7: signal exclusively to the Right channel
- Position 8: signal to both R and SR, with a 4.5dB drop
- Position 9: signal exclusively to the Right channel

When in LCR mode, all five LED's (in the L, C, R and SL/R switches) is illuminated when any one is selected. It is possible to deselect the C output, and put the channel into LRS panning (see below), then to remove the SL and SR switches, and return that channel effectively to L + R panning.

**LRS Panning (forced by removal of "C" from LCRS)**

- Position 1: signal exclusively to SL channel
- Position 2: signal to both SL and L, with a 4.5dB drop
- Position 3: signal exclusively to the Left channel
- Position 5: signal to both L and R, with a 4.5dB drop
- Position 7: signal exclusively to the Right channel
- Position 8: signal to both R and SR, with a 4.5dB drop
- Position 9: signal exclusively to the Right channel