About this manual

This manual is intended as a guide for television camera operators with some knowledge of robotic equipment and systems used in broadcasting.

The LCS software will already be installed on the computer supplied with your system. The guide contains information about using the LCS software and the associated Mini Joystick Panel (MJP) that remotely control cameras and pan/tilt heads.

The LCS system can be supplied with various options and is configured by the installation engineers to suit highly specific customer requirements.

This guide applies to Software Version LCS v1.

Note. Some of the features described in this guide may not be applicable to your installation.

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Safety Guidelines

This product is designed and manufactured to meet strict quality and safety standards. However, it is important that you are aware of the following installation and operation precautions. Many of these instructions are commonsense precautions, but for your own safety and to ensure that you do not damage the equipment, we recommend that you read them.

Obey warnings and instructions
You should read all of the safety instructions before operating the equipment. Retain this operators guide for future reference and adhere to all warnings in the guide or on the equipment. Do not attempt to operate this equipment if you do not understand how to operate it.

Usage Statement
Do not use this product for any other purpose other than that specified in this usage statement. The LCS System is designed for use within television studios to remotely control camera and pan/tilt heads. Only trained television camera operators should use this product. This product is not suitable for use outdoors in an exposed environment.

Water, moisture and dust
Protect the product from water, moisture and dust. The presence of electricity near water can be dangerous. Do not use the product near water and take care that liquids are not spilled onto the equipment.

Climate
The equipment should not be used outside the operating limits. Refer to the Operating Manuals supplied with the products for the operating range of the equipment.

Servicing
You should not attempt to service the equipment. Contact Vinten or your local distributor to arrange servicing.

Cleaning
We encourage regular cleaning of the product.
- Do not use oil or grease on any exposed part of the equipment. This is unnecessary and traps dirt which acts as an abrasive.
- Do not use solvent or oil-based cleaners, abrasives or wire brushes to remove accumulations of dirt as these damage the protective surfaces. To clean mechanical surfaces, use only detergent based cleaners.
- External electrical connection ports should only be cleaned with a semi-stiff brush or using a vacuum cleaner.

Notes about Robotic equipment
Display prominent warning signs in studios, alerting personnel that robotic equipment is present and may move without warning. Ensure personnel remain a minimum of 1m (40 inches) clear of robotic equipment in use. Operators must familiarise themselves with the resulting working envelope of robotic products including all ancillary equipment (lens, zoom and focus controls, viewfinder, prompter etc.), to prevent inadvertent collisions. Only operate robotic products remotely when you can see them to avoid harm to personnel and collisions with obstacles and other hazards.

Power sources
Only connect the equipment to a power supply of the type as marked on the equipment.

Cables
Always ensure that all power and auxiliary communications cables are routed so that they do not present any danger to personnel. Take care when routing cables in areas where robotic equipment is in use.
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Overview

The Legislative Control System (LCS) is designed to control cameras and other video equipment that are typically used in a parliament situation for the recording and televising of parliamentary sessions; either of the main parliament auditorium or committee rooms or both.

The LCS does not handle video camera or audio signals directly, it controls the devices that do. The LCS architecture provides multi-user, multi-facility control of cameras, camera control units (CCU, microphone systems and robotic devices. It can also interface with other components such as character generators, video routers and vision mixers, enabling rapid development and substitution of components within the system.

Controlled by a Windows XP based GUI and displayed on a high definition touch screen, the LCS provides up-to-date information on the available functions and status of the system.

LCS works by directing cameras to predetermined target locations in response to events happening inside the venue. Each target (or seat) is represented on a software seating plan and associated with multiple cameras, each with multiple shot capabilities. The operator assigns and prioritises a series of shot types against each target which can be recalled through touch screen control. The LCS calculates the best quality shot available and cameras associated to these shots automatically move into position.

A keyboard and mouse may also be used.

Based on standard Ethernet architecture, the LCS is able to control multiple locations and show multiple live images, which is ideal for monitoring and rapidly selecting shots for multi-camera coverage applications.

The core of the system combines the LCS software with a high performance, rack-mounted computer linked by Ethernet networking. A touch screen monitor, Mini Joystick Panel (MJP), keyboard and mouse complete the user controls.

The LCS is able to provide multiple methods of targeting and delegate selection. The system can be configured to suit your operational requirements for multiple operators, studios, venues and cameras. In critical applications, the LCS can be installed with full redundancy, guaranteeing a system with maximum availability.
### Technical Specification

<table>
<thead>
<tr>
<th><strong>Hardware</strong></th>
<th>PC Ethernet controlled 22&quot; touchscreen</th>
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<td>Windows XP operating system</td>
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<td><strong>Microphone</strong></td>
<td>VCG</td>
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<tr>
<td><strong>Vision switcher</strong></td>
<td>Serial/Ethernet Tally (preview &amp; Tally)</td>
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<tr>
<td><strong>Back up</strong></td>
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<tr>
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<td>Target selection</td>
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### Key Features and Benefits

- Multi-user, multi-facility control of cameras, CCU controls and robotic devices
- Modular, adaptable design for continuous upgrading of existing systems from small joystick panels through to 22" touchscreen
- Flexible and intuitive user interface
- Simple and flexible touchscreen operation with custom configuration
- Manual or automated shot selection
- External trigger control
- Flexible system control interfaces
- Shot grading for intelligent shot selection
- Multiple venues, multiple seat plans
- Highly configurable, with flexible monitoring facilities
- Full and true redundancy/backup
- Multiple control stations can have simultaneous access to the system if required
- Modular design which can be easily upgraded to add additional features

A diagram of a typical LCS system configuration is shown on the next page, followed by a brief introduction to the key components of the LCS system.
LCS structure

A studio can be controlled by multiple control stations, but each control station can only control one studio/venue at any one time.

Control Stations

A single control station may actually have two user interfaces, two joysticks, and two operators. In this arrangement, the two parts of the control station mirror one another exactly – a camera selected on one joystick control will be selected on the other. Alternatively, they could be arranged as two separate control stations, each controlling the same set of devices. In this second case, a selection on one joystick control is not selected on any other.
The LCS controls

Every operator has their own way of working so we’ve made it easy to personalise your screen layout. To use screen space efficiently, you can activate only the controls that you need.

Multiple copies of any control can be placed on the touchscreen(s) – they will work in sync. Controls may be resized independently, laid out as you prefer and locked in position, ready for use every time you log in.

Each operator has a unique login that enables the LCS to recall their preferred control layout as required.

You can lay out your interface over multiple monitors, perhaps having the seat plan on one screen and your controls on another.

The controls are introduced on the following pages...
The Toolkit control is accessed from the top menu or by pressing Ctrl-T on your keyboard. It is used to select and make available the other controls by pressing the relevant control button.

The show layout controls checkbox (when checked) allows you to close, resize and reposition the controls as required. This is a global action that works on all displayed controls. You can reposition the panel by dragging in most areas of the control; dragging on the lower blue box resizes the control.

Select the yellow box and a pop-up window appears with a list of commands. Select Style to..., Delete to close the panel, Full/Screen to..., Save to store settings to disc and Save as to save the settings using a file name and location of your choice.

When you have arranged the controls on your screen(s), you should uncheck the show layout controls box, to ‘lock’ the controls and avoid accidentally moving or resizing them during broadcast. Ctrl-L has the same function.

Multiple copies of a control can be active and remain synchronised at all times. You may find that more than one copy of a control is useful in multi-screen set-ups.

In an installation where there is more than one venue (an upper and lower legislature, or a chamber and televised committee room, say), the Venue control allows you to switch between them.

Each venue, has its associated cameras, seat plans targets and shots.

The list of venues is established during configuration. The currently selected ‘Venue’ button is highlighted in pale green.

The Keypad control is useful whenever you need to input a number.

It allows you to select a specific seat or target by number. Cancel operates on the whole numeric entry; the backspace arrow button deletes the right-most character, one character at a time.
Chroma Seat Plan

The Chroma Seat Plan control allows you to select a target by clicking on its graphical representation (as an alternative to keying in the target number using the Keypad control).

Seat plans can be produced using any graphics bit-map program, but they must be saved as 24-bit .BMP files so that the seat number can be encoded in the colour of the seat. (See ‘Appendix: Encoding seat number by colour’.)

The graphic does not have to be a representation of an auditorium – it could, for example, be a map showing constituencies, with targets selected by the location of their constituencies.

Target Summary

The Target Summary control is your main broadcast control.

Each row corresponds to a ‘Control Bus’ in conventional broadcasting terms. This is where the ‘On Air’ shot and the cameras and shots that are queued for the next targets are displayed. You can select and trim shots before switching them to air.

The Target Summary displays selected target information and provides a quick and easy way of choosing which target to take to air or to cue for the next broadcast.

The padlock icons allow cameras to be locked against particular shots. Locking a camera here also locks it on the camera control.

The seat or target number is displayed between the Release button and the On Air/Take indicators.

Cameras

The Cameras control lets you select any of the cameras configured for the system. When a camera is being manoeuvred to set up a shot, two blue lamps flash below the selected camera. Depending on a camera’s tally status, single coloured lamps illuminate below, with Red = On Air, and Green = Next On Air (Cued).

The padlock icon under each camera indicates the state of the manual lock. Selecting the icon when it is unlocked, locks the camera to its current shot and changes the icon to a yellow locked padlock. Selecting the padlock icon again releases the camera for use elsewhere.
Target Store

The Target Store control is where you set up your matrix of favoured shots for each target in your venue. It displays a grid of your systems cameras and shot types: Close, Medium, Wide and Other.

Every possible shot for your target should be assigned a score value of 0 to 50 depending on its quality. These scores determine which shot will be used by the LCS during broadcast. The default shot value is 25.

Snoop

The Snoop control is used by engineers during installation, configuration or troubleshooting to interrogate the system and is not generally seen by the operator.

The display uses a hierarchical tree structure to display the way the system has been set up, and its status in real time.

The settings of ‘Snoop’ and ‘Show’ determine what is displayed in the tree structure. To maximise system performance, leave Snoop and Show inactive.

Control Container

The Control Container is useful for letting you group together commonly used controls in one place. They can then be moved around the screen as a single group.

Screen layouts, including Control Container setups, can be saved and reloaded under your own login settings.
The CCU panel enables you to adjust camera settings and fine-tune your picture quality. Use it to adjust Gain, Pedestal, Iris and Shutter settings to suit the shooting conditions.

If supported, Auto White, CAM/BAR and Iris mode can be enabled by selecting the appropriate button.

The controls (and the scales) made available in the CCU panel depend on the make and model of camera installed in your system. For example, Iris Level settings could range from 0 to 100 for one camera type, and 0 to 1028 for another camera type.

The Microphones control is only configured in systems which have a separate data stream of active microphones available. This is typically in legislatures where a Speaker controls who is permitted to speak by activating a microphone.

The control populates with targets as microphones become active and ready for broadcast, allowing you to quickly cue a sequence of shots.

If available, the Microphones control provides an alternative to the Keypad control for quickly selecting a target.

The Active Seat Plan provides an instant visual indication of broadcast status, such as Mic Live, and whether a Target (i.e. seat) is occupied.

It also lets you to select a target by clicking on its graphical representation (as an alternative to keying in the target number using the Keypad control).

Targets can be represented as simple graphical icons as shown here or with your own customised symbols.

The position of cameras can also be shown, if requested at engineering configuration time.
Logging in as a user

Double click the LCS icon on your desktop or choose LCS from the program menu.

The LCS login splash screen appears. The login control is in the lower left corner and the software version number is shown on the lower right corner.

The Licence Management and About buttons are described overleaf; you do not need to use these features during a routine login.

The user ID field is populated when the system has fully started. Select your user ID from the drop-down list, enter the corresponding password and press Login.

Note: the Login control screen disappears after you press the Login button and your login details have been accepted.
Create a user name and password
User accounts must be created before running the LSC software to allow users to login.
To create a user account, proceed as follows:
1. Select the USER MANAGER short-cut icon on the touch screen desktop.
2. Select ADD USER.
3. Type in the user name and password.
4. If an Administrator account is required, tick the Administrator box.
5. Select OK.

License Management
The License Management button displays the License Management control which allows different licences to be applied.

The screen above is displayed when a valid licence has successfully loaded.
To safely exit this process, it is recommended that you press Finish, then Close, then exit the LCS application and launch it again from the desktop icon (or choose LCS from the program menu).

About
The About button displays the About control which provides the version number and running status of each system component, as in the sample screen below:

Press Close to exit the About control.
Top level screen menus

The top level menu choices (shown in the menu bar at the top of the screen) are System, View, Tools and Help.

Under System...
- Logout – to end an LCS session or change user
- Exit – to leave the LCS application

Under View...
- General properties
- Layout – you can also access this by pressing <Ctrl>L.

Under Tools...
- License – opens the License Management control
- Toolkit – opens Toolkit control. You can also access this by pressing <Ctrl>T.
- User Management
- System management and system settings.

Under Help...
- About – to display the version number and running status of each system component.

User Management

The User Management control (available from Tools, in the Top level screen menu) allows operator privileges to be set.

Access levels are determined by the licence file, and may include:

<table>
<thead>
<tr>
<th>Access Level</th>
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<tbody>
<tr>
<td>Administrator</td>
<td>Unrestricted</td>
</tr>
<tr>
<td>User</td>
<td>Restricted operation</td>
</tr>
<tr>
<td>Test</td>
<td>Restricted operation</td>
</tr>
<tr>
<td>Service</td>
<td>Unrestricted</td>
</tr>
<tr>
<td>Guest</td>
<td>Restricted operation</td>
</tr>
<tr>
<td>Install</td>
<td>Unrestricted</td>
</tr>
</tbody>
</table>

Press Save to save the settings you have established, or Cancel to leave the previous settings unchanged.
Adjusting your camera settings

The CCU panel interfaces with every camera on your system, collecting its technical data so that you can adjust settings such as colour gain, shutter mode, iris and white levels.

Use the CCU to calibrate your system each day before you start shooting, or if lighting conditions change significantly.

Select a camera using the Cameras control. Its number shows in the top left corner of the CCU control.

The calibration and adjustment settings should be familiar from using the on-camera adjustment settings.
Loading your venue’s target plans

Now that your cameras are calibrated and ready for use you need to load your venue’s seating plan into LCS so that all the correct target information is available.

Currently, there are two ways of doing this: either by loading a static graphical representation as a Chroma-encoded bitmap image file, or by using an Active Seat Plan.

This section tells you how to configure LCS so that it has the right information loaded.

Both the Chroma Seat Plan and the Active Seat Plan provide touchscreen target selection, enabling rapid selection and setting up of shots for broadcast.

The Active Seat Plan also provides instant visual feedback of a target’s broadcast status in the form of coloured highlights: a blue header might be chosen to represent Mic Live, etc.

During installation, your LCS is usually configured with your venue’s target plan. However, there may be occasions when you need to load a different plan or create a new one.
Select an Active Seat Plan

Your LCS will have an active seat plan of your venue(s) already installed.

Press Schematic A to load it and use your mouse and wheel to scale and position it within the ‘active’ area of the control panel. When you are happy with its size and position press Lock to secure it, keeping your configuration ready for next time you log in.

If more than one plan is stored, it will be available by pressing Schematic B, etc.

Every target in the active seat plan provides an instant visual indication of its broadcast status, for example: Default, Tallied, Live and Empty.

The example below shows Seat 1 as Mic Live.

Every seat (or target) represented is linked to a database of stored camera shots, so selecting a target will prompt the LCS to load those shots to the Target Summary control ready for possible use.

The Chroma Seat Plan and Active Seat Plan controls are independent from user login so that you can access more than one venue’s target information at any time.

The next section describes how to create a database of shots.

Select a Chroma Seat Plan

To load a new Chroma Seat Plan, either drag the corresponding file from your image folder (or any other file location you have chosen) and drop it over the lower section of the chroma seat plan control (where the selection buttons appear). Alternatively, you can type the corresponding image file name into the Display Name text entry point and press enter on your keyboard. The target plan appears in the ‘active’ area of the control with an illuminated button below showing that it is selected and active.

You can rename the image by typing into the display name text entry point. Any changes appear in the plan selection button, as shown in the ‘Senate Seat Plan’ example shown above.

You can have multiple target plans loaded simultaneously, but only one is active at a time. To change their order, key in a number in the Index entry point.

Press Save to keep the current control configuration, ready for use next time you log in.

To remove a target plan, select it by pressing its button and then press Remove this image.

Press less... to shrink the control so that just the target plan and lower selection buttons are visible. Press more... to expand the control and display the load, remove and save functions.
Creating a database of shots

Before you can use the LCS for day-to-day broadcasting, you’ll need to set up a matrix of the best available shots of each seat or ‘target’.

First, establish your ‘venue’ (the legislature, chamber or studio that you are recording) so you have the right set of cameras and seating plan available.

This section tells you how to make a record of the best shots so you can access them quickly during programme making.

When you login, the LCS presents you with the settings and control configurations from your last session. It is advisable to check all the cameras on your system for correct levels before shooting and that you have the correct seating plan loaded.

To create your database of shots you will need to have the Keypad, Camera and Target Store controls active on your touchscreen. You will also need a preview monitor and the Mini Joystick Panel (MJP).
The Target Store control is used to save information on a collection of camera shots for each of the targets. This information is presented in the form of a matrix with reference to camera number and shot type. All the installed cameras are identified by number across the top of the matrix area.

The LCS system is supplied with a default list of four shot types: Close, Medium, Wide and Other. You can name any number of shot types, but the default set is usually sufficient for most applications.

The shot types are displayed in descending priority down the left side of the matrix. The default order is Close, Medium, Wide and Other, but this can be changed. New shot types can also be added during set-up, via the configuration file.

The button at each intersection of camera and shot type represents a particular shot. When the LCS is first installed, the Target Store for any particular target is empty of shots. Empty shot buttons in the matrix are blank with no text.

It is recommended that the Target Store is fully populated with all available cameras, shot types and quality scores. This improves the smooth functioning of the system, which is then able to optimise shot selection when new targets are selected.

To set up a target and save a shot, enter the target number in the Keypad control or on the MJP and press Target. You can also select your target using one of the seat plans and your touchscreen. Either way, the system is alerted to which target you are about to assign your shots to and displays that targets’ information in the Target Store.

Next, select a camera from the Camera control and, using the MJP and a preview monitor, adjust the camera’s view, zoom and focus settings. You’ll notice two blue indicator lamps flashing under the selected camera, telling you that it is in use.

When you are happy with the shot, press the appropriate button location to place the shot information in to the matrix. Where possible, you should do this for each shot type – Close, Medium, Wide and Other, and for each camera so that the LCS has a useful selection of shots to choose from when a target is selected.

The ‘active’ shot button is surrounded by a yellow frame and displays a default shot quality score of 25. You’ll also notice that Save and Cancel buttons appear, enabling you to save or cancel your shot’s information.

The Shot Score value can be adjusted, usually within the range of 0 to 50. With your finger over the number in the button, you can use the touch screen to drag vertically up (to increase the score) or drag vertically down (to decrease the score). Alternatively, you can click on the value and scroll up or down using the mouse wheel.

This quality score is important, as it enables the LCS to interrogate its database of stored shots when a particular target is selected for broadcast. Depending on the available cameras, it automatically selects the shots that have the highest priority and quality scores and presents them to the output bus. There is more information about this in the next section – ‘Broadcasting your programme’.

At this point you should consider how you are going to appraise your shots for quality and try to be consistent when building the shot matrix. Usually, shots from cameras that view the target from the front are scored higher than those that view the target from the side. Other factors that should influence the quality appraisal include lighting, background or foreground distractions and possible obstructions that limit the view.

**Quality Score of Zero – a special case**

If a particular shot is no longer required and is not to be used by the system, the shot quality score should be set to a value of zero. All shots with this quality score are ignored by the system and effectively ‘deleted’ from the database. The shot matrix still indicates that a shot has been stored, but it is easily overwritten as required.
When you are satisfied that the camera shot is set up correctly and that the quality score for that shot is appropriate, you can save the shot information permanently to the LCS database by pressing the Save button. Once saved, the yellow frame disappears from the shot button.

Pressing Cancel discards any changes and returns the shot button to its previous state.

To reduce the number of times Save needs to be pressed, it is possible to assign a number of shots to the matrix for your target and then save them all with a single press of the Save button.

**Warning:** Pressing the Cancel button will lose all the shots that have been placed in the matrix but not yet saved!

The Target Store tracks the most recent target selections and presents you with the relevant matrix of saved shots. The actual camera shots that have been selected for use by the LCS are indicated by a light blue triangle in the top left corner of the matrix shot button.

Should you wish to manually override the shot that the LCS has selected automatically, you can press the corresponding shot button in the matrix. The LCS will use the new shot and move the light blue triangle accordingly.

Several shots can be trimmed and saved with single Save if desired, but remember that pressing Cancel loses all unsaved trimmed shots.

The Target Store Panel has a Summary section that contains a button for each of the control buses that are active in your Target Summary control. Pressing any of them displays the stored shot information assigned to that target so that you can make adjustments if necessary.

When you have completed and saved a shot matrix for every target in your venue, you can start to use the LCS for broadcasting. The next section explains how the LCS is used on a daily basis.

At any time, shot information in the Target Store can be edited. To edit a shot, select it by pressing the appropriate shot button in the matrix. Adjust the camera view, zoom, focus and black point using the MJP, and assess the shot value.

The shot button is given a yellow surround to indicate that the shot has been trimmed (changed). When you are happy with your changes, press Save (or Cancel to discard any changes).
Broadcasting your programme

Now that you have a complete shot matrix for your venue you can start broadcasting.

This section tells you how to manage your target shots, cue takes, apply tally and manually lock and unlock cameras.

Typical user set up

Seat Plan, Keypad, Target Store, Target Summary and Camera are the most common controls to have available on your touchscreen. In a two-screen set up, it would be usual to have the Seat Plan on one screen, with other controls distributed on the other screen.

To broadcast effectively you will need your preferred selection of LCS controls displayed, a video preview monitor and the Mini Joystick Panel (MJP).
Select your target from the seat plan or enter it via the keypad control or MJP, followed by the target type (target microphone, delegate).

The LCS immediately searches its database of stored shots and presents that information to the control bus on the Target Summary control. It also displays the matrix relating to your target in the Target Store control (if you have chosen to have it active on your screen).

The target information you requested is displayed along a horizontal row in the Target Summary control – this is your target control bus.

The Target Summary control displays the targets that have cameras currently assigned to them, their shot type, tally and manual camera lock status.

Example showing a six camera system

In the example above:

Seat 1 has Camera 1 with a Close shot type and Camera 2 has a Wide shot type allocated to it. Seat 1 is currently On-Air with video from Camera 1, as shown by the red button. (Notice too, the red triangle displayed in the matrix button of the Target Store and the red indicator showing under Camera 1 on the Camera control).

Tally commands are made using third-party video switching devices. The red On-Air button is an indicator only; it is not active by touchscreen.

Pressing the Release button releases Camera 1 from Tally and removes target information from the control bus, leaving blank empty buttons ready to be filled with a new target. Pressing Summary loads all of that target’s stored shot information into the Target Store so you can make edits if you need to.

Seat 25 has Camera 3 with a Medium shot type and Camera 5 has a Close shot type allocated to it. The target is cued for the next shot, as shown by the green Take button and the yellow padlock. (Notice too, the yellow triangle displayed in the Target Store and the yellow padlock under Camera 2 in the Camera control). Again, the green button is for indication only, it is not active from the touchscreen.

Pressing the Release button removes the target information from the control bus, leaving blank empty buttons ready to be filled with a new target’s information. The Summary button is not available as Camera 2 has the manual Lock set, as shown by the yellow triangle in the button and the yellow padlock.

Neither Seat 19 nor Seat 15 have any cameras assigned to them, probably because there were no cameras available to provide an acceptable shot. Pressing Release removes them from the control bus.

If all your cameras are allocated to targets but another target is requested, you will have to release one of the cameras from its current target for use on the new one.

When a target is On-Air you can only make minimal adjustments (trims) to the shot. The MJP joystick, focus and zoom controls are all given reduced sensitivity.

If you want to trim your shot prior to broadcasting, press the Summary button in the control bus of your target in the Target Summary control. This prompts the Target Store control to show the matrix of shots saved for that particular target.

In the Target Store, select the shot button from the matrix and make and save your changes using the MJP as described in the previous section.

The Target Summary control allows you to preview your target shot. To preview in your monitor, press a button with a shot type displayed.

Blank buttons have no shot information stored.

The padlock icon indicates the state of the manual lock. A camera cannot be allocated to another shot while it is locked. The ‘lock’ is a toggle: pressing the icon when it is unlocked locks the camera to its current shot and changes the icon to a locked padlock. Pressing it again releases the camera for use elsewhere when needed.
Mini Joystick Panel

The Mini Joystick Panel (MJP) is a physical controller capable of controlling pan-and-tilt camera heads and lens zoom.

The MJP accepts external switcher inputs in order to provide an ‘On-Air’ indicator for each camera head.

A three-axis proportional joystick controls pan, tilt and zoom. ‘Proportional’ means that the speed of movement is increased as the joystick is deflected. The MJP automatically compensates the response of the joystick according to the zoom angle of the lens.

Separate control knobs adjust Focus, Iris and Black point settings, providing extremely smooth camera movements during On-Air conditions.
Camera selection

This (red section) of the keypad controls camera selection.

Select an available camera by pressing the appropriate camera number key, from 1 to 12.
Shot selection

This (blue) section of the keypad controls the shot selection.

Select a shot by pressing the appropriate Select number keys, then define the target by pressing a target type selection button: from the microphone number, delegate number or shot (‘seat’) number. Thus:

- Select target by microphone number
- Select target by delegate number
  (The valid range is determined in the configuration file, between 1–9999)
- Select target by seat number
  (The valid range is determined in the configuration file, between 1–9999)

For example, to select delegate number 103, press the ‘1’, ‘0’ and ‘3’ select keys, followed by 📺.

In the same way, to select seat number 87, press the ‘8’ and ‘7’ select keys, followed by 📺.

Functions in the red shaded area are not used in the current release version of this software.

Note that the CANCEL key deletes all shot selection commands about to be completed (not just the last entry).
Stop/Cue/Take buttons

The TAKE button on the MJP mimics the TAKE button on the touch screen. Pressing TAKE readies the target to be taken On Air (i.e. the camera cannot be reassigned).

The STOP and CUE buttons are not used with this version of the LCS software.

‘On Air’ indicator

This indicator lights when the selected camera is tallied red, indicating that it is ‘Live’ or ‘On Air’.
Iris control knob

Use the Iris control to set exposure levels. To fine-tune the Iris, rotate the IRIS control knob.

The ability to control a camera's iris opening (‘aperture’) plays an important role in image quality. The iris is used to maintain the optimum light level to the image sensor so that images appear sharp, clear and correctly exposed and with good contrast and resolution.

The iris can also be used to control the depth-of-field. A wide-open iris has a short depth-of-field, which allows distracting objects in the foreground or background to be placed out-of-focus. A closed-down iris is likely to keep both foreground and background in sharp focus. Either state may be desirable, depending on the directorial needs.

Focus control knob

There are several factors that influence on focus, ranging from available light levels to the focal length of the lens and the zoom settings applied. Put very simply, subjects filmed under good lighting conditions appear sharper with less noise; those filmed under poor light appear ‘softer’ with a noisier image.

To fine-tune the focus, rotate the FOCUS control knob.

Black control knob

The BLACK control allows the operator to adjust the video black point to improve the contrast of the capture.
Joystick control

The Camera and Lens functions are controlled by the 3-way Joystick. The speed of movement of the axis increases as the Joystick travels from its central position. The profile for each of the Joystick axes is designed to allow fine control for small displacements and rapid movements for larger displacements.

Zoom

Zoom relates to the angle of view available to the camera and depends on the focal length range of the lens fitted.

To zoom in close to your subject, twist the joystick knob to the right (clockwise). To zoom away from your subject, twist the joystick knob to the left (anti-clockwise).

Pan/Tilt

The Pan and Tilt control is used to rotate the camera’s angle of view from left-to-right (Panning) or up-and-down (Tilting).

In the obvious way, to pan left or right, move the joystick left or right. To tilt up or down, move the joystick up or down.
Appendix: Encoding seat numbers by colour

Each seat number is represented by a particular colour (made up from a mix of the RGB (red, green and blue colour values).

For example: from the table, seat number 1337 is coded as Red=177, Green=165, Blue=138.

The seat number and corresponding colour values are shown in the table, which can be extended if necessary.

Ensure that the seat plan image is saved as a 24 bits-per-pixel RGB Windows bitmap file (extension *.bmp).

A good choice of free image editor is GIMP which can be downloaded from: http://www.gimp.org/downloads/

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