

UNIVERSITY OF CAMBRIDGE

**FACULTY OF MUSIC
WEST ROAD CONCERT HALL**

**GUIDE TO
CONCERT HALL LIGHTING**

West Road Concert Hall Lighting Guide

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1 Overview

This guide provides an introduction to, and overview of, the lighting control system installed in the concert hall. The three systems of house lights, working (rehearsal) lights and stage lighting are covered from the operator's perspective.

1.1 Intended Audience

Because a large proportion of the concert hall's users has no prior knowledge of entertainment lighting systems, this guide assumes no such knowledge. Given the information in this guide, a concert organiser should be able to use the standard systems to provide basic lighting for a concert in the normal format to a professional standard. For this group, it will generally be sufficient to read only sections 6 and 7, and the parts of the other subsections that are referenced therein.

Users who have experience of stage or concert lighting may find this guide useful as a brief introduction to the facilities available in the hall. Sections 2, 3 and 4 provide a general description of the lighting systems for this audience.

Users who are familiar with the concert hall, but want more information on how to operate the lighting control console should consult the ETC Element User Manual on the manufacturer's website:

<http://www.etcconnect.com/WorkArea/DownloadAsset.aspx?id=10737461200>.

1.2 Standard Equipment Provision

The provision of lighting equipment reflects the majority use of the hall, *i.e.* classical music concerts. The stage lighting rig is designed to provide an even, white lighting cover over the stage area for this application.

On occasion, the hall is used for events that require a more elaborate lighting installation, *e.g.* staged opera or television productions. In such cases, it will usually be necessary to augment the standard installation with a further temporary installation. Such additional installations are the responsibility of the incoming company, and must always be carried out by suitably qualified, competent personnel.

The installed stage lighting rig should be considered a fixed rig, *i.e.* it must not normally be moved or adjusted from its standard layout and focus. With prior agreement of the hall management, incoming users who do not wish to use the standard lighting rig may be permitted to move or refocus the lighting units for their production. In all cases, any incoming company who move or refocus any components of the standard rig must restore the standard layout and focus on leaving, so that the next user finds the standard rig configuration as described here.

2 Stage Layout

The concert hall stage layout has three component areas:

- The main, fixed, rectangular, stage area. This occupies the full 17.6m width of the concert hall, and extends downstage from the back wall 6.8m to the orchestra pit. On either side of the orchestra pit, the stage floor continues to form the front part of the auditorium floor.

- The orchestra pit, which is usually covered by its lid, forming an extended apron stage area. This extends a further 1.9m downstage in the centre.
- The extended stage area, which is not normally present. When these stage sections are fitted, they cover the well seating area that would normally accommodate audience rows A–C.

The entire stage floor area is at ground level, as is the front of the auditorium. The three stage areas are shown schematically in Figure 1. The most common stage configuration is to have the orchestra pit covers fitted, providing the apron stage, but the extended stage area absent, and rows A–C in use.

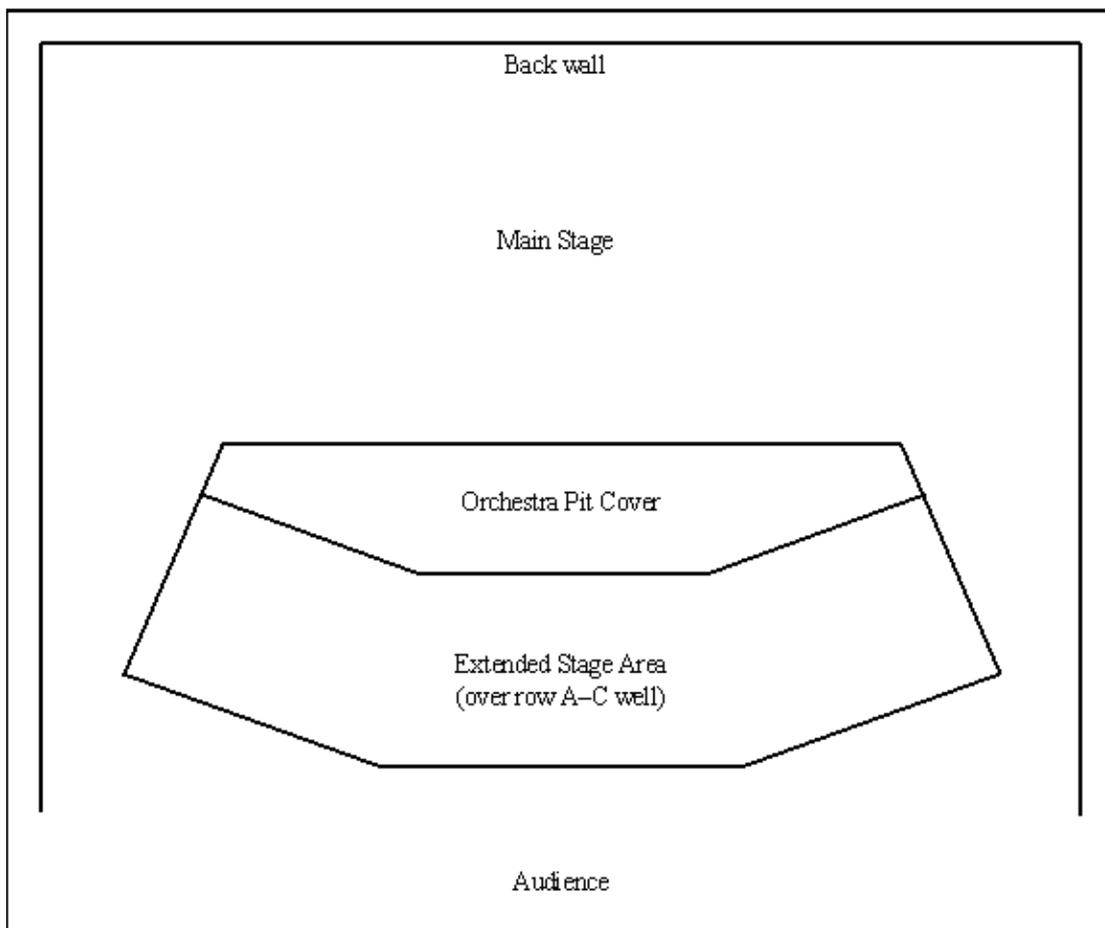


Figure 1: Stage Layout

A pair of teal velour curtains is permanently mounted on a motorised track running around the perimeter of the main rectangular stage area. This allows the curtains to be:

- Open, stowed in the upstage corners hiding the access ladders and galleries in the upstage corners, or
- Closed across the back wall, which provides useful acoustic damping of reflections from the wall while still hiding the access ladders and galleries.

A note on direction terms: The terms “upstage”, “downstage”, “prompt side” and “opposite prompt” are used throughout this guide to refer to directions on the stage. In case these are unfamiliar terms, they are defined here.

- *Downstage (DS)* means the direction on the stage towards the audience, away from the back wall.
- *Upstage (US)* is the opposite of downstage, i.e. away from the audience, towards the back wall.
- *Prompt side (PS)* is *Stage Left*, i.e. the left side of a performer standing on stage facing the audience. Traditionally this is the side of the stage where the prompt desk is found.
- *Opposite prompt (OP)* is *Stage Right*, the opposite side to prompt side.

Upstage prompt side is therefore the top right hand corner of Figure 1.

3 Lighting System

There are four lighting systems installed in the hall:

- The performance stage lighting,
- Working lights,
- House lights, and
- Emergency lighting

The emergency lighting is not covered here, since it is permanently connected and does not require any action to control it during the normal day to day use of the hall.

3.1 House Lights

The house lights are the lights that light the auditorium area, *i.e.* those normally on before and after concerts, and during the interval, but not during the performance itself.

3.1.1 House Light Circuits

The three independently controlled house light circuits are:

- **Walkway Downlights.** These are a series of PAR38 LED spotlight fittings hanging in the roof structure that point downwards, lighting the main staircases through the auditorium seating areas.
- **Tungsten Roof Lights.** These are a set of 500W tungsten flood lights mounted above the overhead wooden “eggbox” structure that provide a diffused general light over the main part of the auditorium.
- **Fluorescents.** These are mounted around the outside of the auditorium, along the boxes at the sides and around the corridor at the back of the seating area.

3.1.2 House Light Control

The house lights are controlled from two pushbutton control stations, one on the wall in the upstage prompt-side (stage left) corner of the stage, near the access ladder, and one on the panel at the rear of the hall, to the right of the stage lighting control console. The station at the back of the hall is the main one and can control all three house light circuits; the one at the corner of the stage can only control the walkway

downlights. The idea behind this is that when opening up the hall, starting with no lights being on, one can enter from the stage and turn on the walkway downlights to light the staircases, then go to the rear of the hall to turn on the other house light circuits. Similarly, when locking up and leaving the hall, one turns off the tungsten roof lights and fluorescent house lights from the panel at the rear of the hall, leaving on only the walkway downlights, then walks down the staircase to the stage to turn off the walkway downlights on the way out.

The pushbutton control stations have pushbuttons arranged in vertical columns of four buttons, each button with an associated red LED indicator. The station on the stage has a single column of buttons, for the walkway downlights only; the station at the rear of the hall has three columns, one for each house light circuit. The four buttons within a column allow the lights to be set to four pre-set levels: the bottom button sets the circuit to off, the top one to full on, and the other two to two intermediate brightness settings. When one of the buttons is pressed, the LED indicator next to the selected button illuminates, and the brightness of the lighting circuit fades gradually to the selected level.

The main pushbutton control station, at the back of the hall, is laid out as shown in Figure 2. Note that the conventional light switch, labelled “House Lights” and positioned slightly above this panel, no longer does anything (it was part of an older installation).

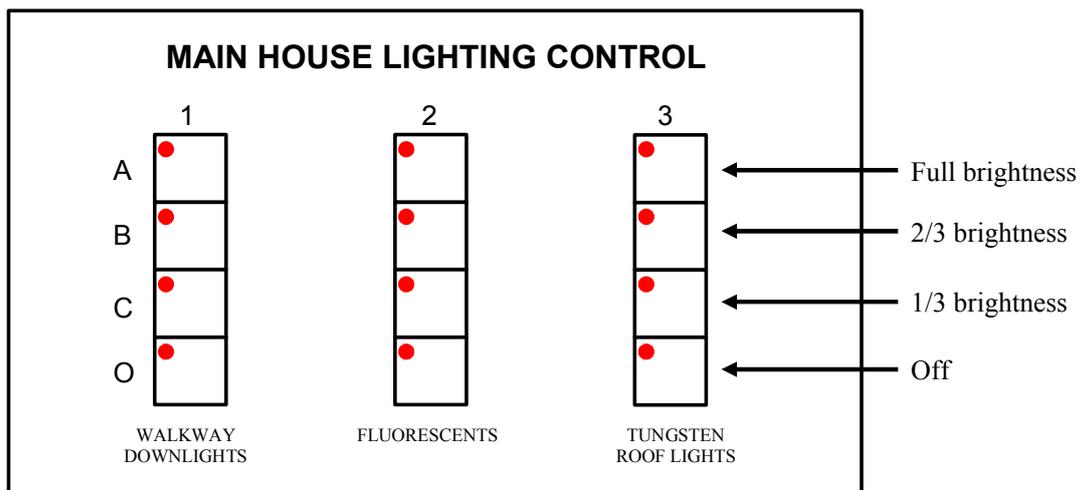


Figure 2: Main House Light Control Station

While it is most common for the house lights to be controlled from the push button control stations, it is also possible to control them from the lighting console. The two control sources combine on the basis of *highest takes precedence*, i.e. the circuit is on if either system commands it on, at the highest level requested by either. For a circuit to be off, both controls (pushbutton system and console) must have it set to off. This means that it is always possible for the pushbutton controls to set the house lights on, irrespective of the state of the console.

The house lights are controlled from console channels 124 and 125:

- 124 controls both the tungsten roof lights and the walkway downlighters, and
- 125 controls the fluorescents.

In the standard submasters set-up on the console, submaster 50 controls all three house light circuits together.

3.2 Working Lights

Working lights is the name given to lights that are used for staff to see what they are doing during normal day-to-day routine in the hall. They are different from the performance lighting and house lighting systems in that they are simpler, lower power systems that are relatively cheap to run and easy to maintain. Most of the time, for activities such as setting up or rehearsing a concert, the working lights should be used, not the performance or main house lights. Using the main house lights or performance lighting for such activities is unnecessarily expensive, directly in electricity, but also indirectly because the lamp life of the performance lighting units is only a few hundred hours (compared to several thousand for the working lights). As a guide:

- Working lights alone should be used at all times when the public are not present in the hall.
- The house lights may be used if necessary, *e.g.* if people are using or cleaning the seating areas of the auditorium.
- The performance lighting should be used only for performances or rehearsals where the lighting is important (*e.g.* Dress or Technical for staged productions).

There are three groups of working lights installed in the hall, each described below:

3.2.1 Rear Entrance Working Lights

These are two circuits of round wall or ceiling mounted units, controlled by switches mounted near the rear door to the auditorium. One circuit has light fittings along the wall of the East balcony boxes from the rear of the auditorium to the production office. The other has similar fittings mounted on the ceiling of the corridor at the rear of the auditorium from the door to the lighting and sound control position. They are intended to allow people entering through the rear door to get to the production office or to the control position, where the walkway downlights can be turned on to illuminate the staircases to the stage.

3.2.2 Stage Working (Rehearsal) Lights

There are three circuits of stage working lights, controlled from three switches in the upstage prompt side (stage left) corner of the stage, near the access ladder. The three circuits are protected by the three circuit breakers above and to the left of the switches. The switches are labelled “platform lights”. These control three sets of discharge flood lights, illuminating the stage area. Normally, all three circuits are used together to light the whole stage area.

Note that, because these lights are discharge types, they take a short while to reach their full operating brightness after being switched on, typically a minute or so. Immediately after switch on, they are quite dim. It is best to be aware of this, and reassure performers that they will soon be brighter—just wait a moment. It is common for performers arriving for a rehearsal to turn on these lights, notice their relatively low intensity, and react, “These are nowhere near bright enough for us to see, we must use the performance lighting.” Not so: if one waits a couple of minutes, the working lights will provide plenty of output for rehearsal use. If you switch the working lights

off and immediately back on, do be aware that they will again take a short while to respond.

3.2.3 “Loft” Gallery Working Lights

Also controlled from a switch in the upstage prompt-side corner of the stage, these are a number of small fluorescent fittings arranged along the overhead galleries above the stage. They are only needed when working on these galleries, and otherwise should be left off. The switch is labelled “Loft Working Lights”.

3.3 Performance Lighting

The performance lighting system is controlled from a ETC Element console located at the rear of the hall, under a wooden roller cover to the left of controls for the sound system and air conditioning system. This controls all of the performance lighting units via 72 ways of dimmer in the dimmer room (accessed through the ceiling trap door in the corridor near the console). The performance lighting system is described in the following sections.

4 Performance Lighting

4.1 Configuration

The performance lighting rig is composed of 25 Source Four Pars, 750W and 12 Cantata PC 1200W units fitted with barn doors and rigged on the overhead bars, providing a combination of downlight and steep front light cover for the stage area. In addition, 8 Strand SL 15/32 600W zoom profile units are rigged on auditorium side bars, 4 each side, to provide fill-in front light.

There are three over-stage lighting bars, each of which has an access gallery running immediately downstage of it. These bars are all at the same (fixed) height of 8.6m above the stage floor, and symmetric about the stage centre line:

- **Electrics Bar Zero (LX0)** is over the extended stage / row A–C area, above a fixed wooden baffle, and 9.0m long. The baffle limits the stage area that can be lit from this bar in the downstage direction to approximately half of the apron area. 10 dimmer circuits are available from 12 15A outlets on this gallery: two circuits appear at two outlets each, the others at one outlet each. 8 Source Four Par units are rigged along this bar.
- **Electrics Bar One (LX1)** is slightly upstage of the downstage edge of the fixed main stage, behind the most downstage of the two movable over stage baffles. This bar is 12.4m long, though it should be noted that approximately 2m at the prompt side end runs above the operating cables for the motorised curtains, making it difficult to rig units at this end of the bar without them fouling the cables. 10 dimmer circuits are available from 12 15A outlets on this gallery: two circuits appear at two outlets each, the others at one outlet each. 11 Source Four Par units are rigged along this bar.
- **Electrics Bar Two (LX2)** is slightly upstage of the mid-stage point, at 2.6m from the back wall, behind the midstage one of the two movable over stage baffles, and 12.4m long. 8 dimmer circuits are available from 10 15A outlets on this gallery:

two circuits appear at two outlets each, the others at one outlet each. 6 Source Four Par units are rigged along this bar.

The Advance Lighting Bar 10m long, downstage of the extended stage area. This bar is a horizontal ladder beam, with the lower bar at 7.2m above the stage floor. The Advance bar has 12 dimmer circuits available from 12 15A outlets along the top bar of the ladder beam. 12 Cantata PC 1200W units are rigged on this bar. The Advance Bar is also fitted with an electronic hoist system.

The Advance Bar Electronic Hoist System is hoisted down to 1.7 meters to a comfortable working height that allows easier and safer access to the lamps and connections, and also opens up safer rigging possibilities for visiting crew. The weight limit is 300 Kg evenly spread across the bar. The hoist system is operated via a control panel at the Front of House position just left of the lighting board, giving you a good sight line when operating the system. The control panel is secured via a key operated system, and the key can only be obtained from the Custodians. The hoist system must be used by competent people and must only be used when the platform area is clear. The Tallescope can be used for additional focussing and to access the bar once it is at full height.

The Auditorium Side Bars are positioned above the boxes nearest the stage, and each has 6 dimmer outlets. 4 SL15/32 profile units are rigged on each side bar.

4.1.1 Lighting Plan

The standard lighting plan is shown in Figure 3. A larger (full page) version of the same plan is in Appendix A. A second plan, showing the position of all the circuit outlets is in Appendix B.

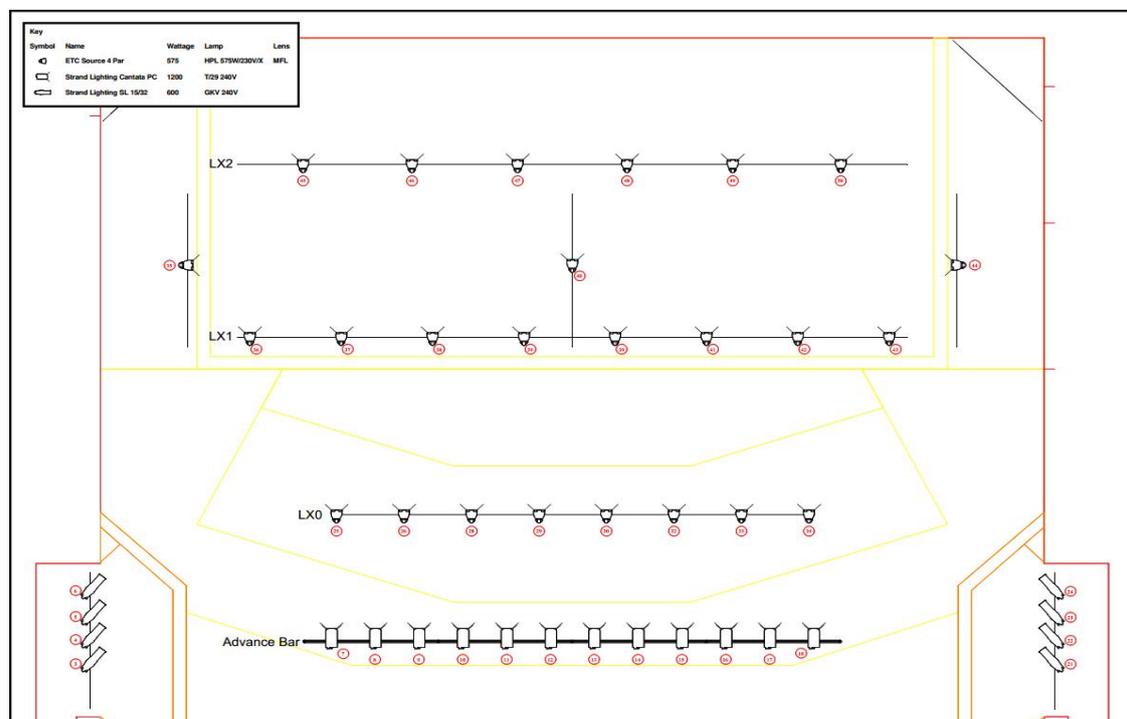


Figure 3: Standard Lighting Plan

4.1.2 Focus Description

The units on the three over-stage bars are all focussed similarly. In each case, the units are set to point slightly upstage of straight down, so that together the units on a particular bar form a continuous “wash” of downlight or steep front light.

All of these bars are located above moveable wooden acoustic baffles, and the unit lower barn doors are set to just keep the light from these units from hitting the baffle, to prevent a sharp shadow line on the stage.

The units from LX0 are normally focussed to provide lighting cover at head height as far downstage as possible (limited by the wooden baffle below LX0) onto the apron stage area, and over the downstage half of the main stage. The top barn doors are set so that the upper edge of the beams lies approximately along the line where the stage floor joins the back wall, or just onto the back wall.

The units from LX1 are normally focussed to provide cover from roughly directly below their bar to the back wall, with the top barn doors set so that the upper edge of the beams is about 2.5m up the back wall.

The units from LX2 are normally focussed to provide extra steep downlight for the most upstage area, from approximately below their bar to the back wall. The top of the beams is allowed to hit the back wall at a height of around 5m, to provide some light on the wall or the curtains (when closed).

The 12 Cantata PC units on the advance bar are divided into two sets of six, both evenly distributed along the bar. One set of six units is normally focussed to provide another layer of steep front light, similar to the over-stage bars, covering the apron area and the downstage part of the main stage that is not well lit by LX0, but with the barn doors set so as not to spill light into the row A–C well seating area. The other set of six units is focussed as downlight onto the extended stage area. From the ends of the bar, the end unit and then the next two alternate units (circuits 7, 9, 11, 14, 16 and 18) light the extended stage area. The centre pair and the alternate two outwards in each direction light the apron area (circuits 8, 10, 12, 13, 15 and 17).

The four SL15/32 profiles on each of the auditorium side bars are normally focussed to provide some front fill light for performers on the main stage and apron areas. The four units are arranged into a “fan” and set to provide soft-edged beams that blend into each other. The central two units in the fan cover the central third to half of the main stage and apron area, with the outer ones covering the outer parts. The units’ internal shutters are used to mask the light beam so that it does not light the audience. These units are not normally focussed to cover the extended stage area. When this area is in use, if front light is needed then the existing units will need to be refocused or extra units rigged at the rear of the side bars to cover the extended stage area.

4.1.3 Additional Resources

The following dimmer channels are available, and are unused by the standard lighting rig. Temporary additional units may be plugged into these channels, if required. All are presented on 15A round-pin sockets.

- 3 × 10A circuits on LX2,
- 1 × 10A circuits on LX1,
- 3 × 10A circuits on LX0,

- 6 × 10A circuits on an old bar above the centre section of the stalls, about two thirds of the way to the rear of the auditorium. This bar has a very limited view of the stage, and so is rarely used.
- 2 × 10A circuits on each auditorium side bar
- 4 × 10A circuits on the stage floor. The same four circuits are available on both sides of the stage, but because of the wiring used to feed them, only a 5A maximum load may be drawn from each socket. Warning labels on the outlets say “1kW max load” as a reminder.

Spare lamps for the installed units, if required, can be provided by the custodians.

Gel frames are installed in all the lighting units in the concert hall, ready for use if required. Colour gels are not used in the standard rig: all the units are open white.

5 Basic Use of the Console

The console, an ETC Element, is a computerised control system whose outputs control all of the performance lighting dimmer channels and can also control the house lights. It offers many ways of controlling the lighting, but for the purpose of most concerts only a few simple operations are required.

The Custodians will be able to provide sufficient instructions to allow a person unfamiliar with the console to perform a few basic tasks:

- Turning the system on and off safely.
- Using pre-programmed combinations of the performance lighting for common concert configurations.
- Making simple adjustments to the pre-programmed states.

Instruction sheets explaining these common functions will also be made available to concert users during their rehearsal and performance.

The manufacturer’s full operation manual for the ETC Element should be consulted if users wish to learn more.

The console is located under a wooden roller cover at the back of the auditorium, near the sound, house light and air conditioning controls. There are two control areas covered by roller covers: the larger one on the left is the lighting console, the smaller one on the right is the sound desk. The console drives two video monitors, mounted on the brick pillar above and to the left of the console itself.

6 Setting Up for a Concert

This section sets out the minimum procedure that an evening’s lighting operator should go through before the concert, before members of the public are admitted to the hall. Operating the lighting for a normal concert is not an onerous, specialist task, so it should be perfectly reasonable for a member of front-of-house staff to do this.

This set-up procedure should be done early enough that you have time to correct any minor problems before it is necessary to open the hall to the audience, and at least half an hour before the concert start time. If you are unfamiliar with the hall’s lighting system, you may wish to start earlier to have time to experiment and familiarise yourself with the control systems.

6.1 House Lights

6.1.1 Starting from Darkness

If entering the hall for the first time, with everything in darkness, go via the prompt side wing store to the sliding door at the upstage PS corner of the stage. Press the top button on the pushbutton control station. The LED next to the button will light, and the walkway downlight house lights will fade up. Walk up the stairs to the back of the auditorium, and turn on the other two house light circuits by pressing the top button in each column on the pushbutton control station mounted near the console (section 3.1.2).

6.1.2 If there are already Lights On

If the hall is already open and some lights are on, go to the control position at the back of the auditorium and check that all three house light circuits are on at full brightness. On the push-button control station, the LED indicators next to the top button in each of the three columns should be lit. If not, press the top button to set that house light circuit to full brightness.

6.2 Working Lights

Before members of the public are admitted, all of the working lights should be off. Working lights are designed to provide a basic, functional, cheap light source for day-to-day activities, they do not provide a particularly pleasant quality of light. Therefore, they should not be used during concerts. Check that each of the working light circuits is switched off:

- The stage working lights and loft working lights, controlled by the switches in the upstage prompt side corner of the stage (section 3.2.2 and 3.2.3).
- The rear entrance working lights, controlled from the switches near the door at the back of the auditorium (section 3.2.1). Be sure that **both** sets of these lights are off: the ones along the wall behind the East balcony boxes and the ones along the corridor area at the back of the auditorium. If these are not checked, it will not be obvious until the house lights are turned off at the start of the performance, when it will suddenly become embarrassingly obvious.

6.3 Performance Lighting

If the lighting console is not already on, you should ask the Custodian on duty to start it up for you and load the West Road Concert Hall programme. Any adjustments to the lighting state can then be made using the faders on the desk, or by selecting individual channels using the numeric keypad and setting the brightness manually.

If you wish to save your desired lighting state as a submaster, instructions are provided with the console, but please delete it at the end of your concert.

7 Operating Lighting for a Concert

7.1 Basics

Before the audience is allowed into the hall, go through the setup procedure described in section 6. At the end of this, you should have:

- The house lights on (all three circuits at full).
- The working lights off.
- The performance lighting on and the stage lit as required for your concert.

This section describes the basic actions needed during the concert itself.

7.1.1 At the Start of the Performance

At the start of the concert, just before the performers come out onto the stage, you should dim the house lights. Normally, the house lights are turned completely off during the performance, but an exception is often made during choral works where the audience may wish to follow the text.

To turn the houselights off completely:

- If you are controlling the house lights from the console, move submaster 50 to the bottom of its travel.
- If you are using the pushbutton controls, press the bottom button in each of the three columns.

The house lights will then automatically fade out gradually, and the performance can begin.

Alternatively, if you wish to leave enough light for the audience to follow the text, do not take the house lights completely off but instead dim them:

- If you are controlling the house lights from the console, move submaster 50 downwards to reduce the level of the house lights, for example to the half way point. The level of the house lights is controlled by the position of the fader, so adjust it to get the level you want.
- If you are using the pushbutton controls, press one of the two middle buttons in each of the three columns to set the house light circuits to one third or two thirds level as desired.

7.1.2 At the Interval

At the interval, you need to turn the house lights back on:

- If you are controlling the house lights from the console, move submaster 50 to the top of its travel.
- If you are using the pushbutton controls, press the top button in each of the three columns.

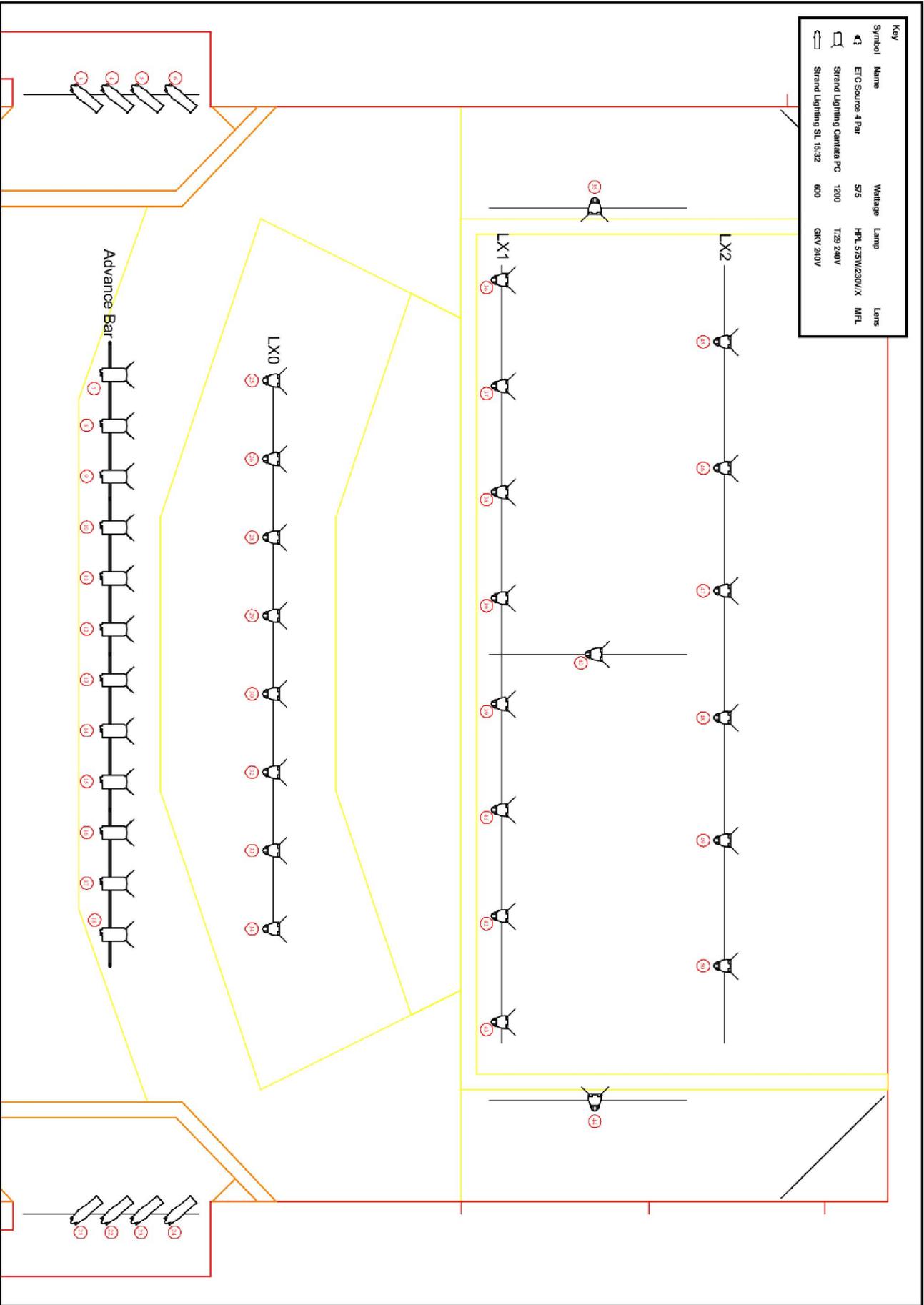
Then, at the end of the interval, just before the performers return to the stage, turn the house lights off (or down) again as you did at the start of the first half.

7.1.3 *At the End of the Performance*

At the end of the performance, after the applause, you will need to turn the house lights on, just as you did at the interval.

Appendix A

A full page version of the standard lighting plan is given on the next page.



Symbol	Name	Wattage	Lamp	Lens
☐	EIC Source 4 Par	575	MR16 575W/230V/X	MFL
☐	Strand Lighting Cantata PC	1200	T729 240V	
☐	Strand Lighting SL 16 32	600	GKV 240V	

LX2 — [Light Symbols]

LX1 — [Light Symbols]

LX0 — [Light Symbols]

Advance Bar — [Light Symbols]

Appendix B

A full page plan showing the positions of the stage lighting and associated circuit outlets is given on the next page.

In the plan, the circuits are shown as follows:

S23	Stage lighting circuit 23
P3	Platform working lights outlet 3
T	15A test socket
Q	Circuit Q outlet. These 15A sockets are switched from the USPS corner.

