

# TECHNICAL PROJECTION AND EQUIPMENT: SCREENING YOUR FILMS



## Overview

The main objective of any screening is to present the film to your audience as close as possible to the way the director intended it to be seen in a social setting. Care and attention are paramount, but a love for what you are doing is even more important. Remember, you're not just showing a film – you're *presenting a show!*

## 1. Choosing your venue

Choosing the right venue is one of the most important factors in running a successful Community Cinema (CC). Your venue will determine how you will screen your films. CCs that operate from village, town, school and church halls, social and youth clubs, community centres, theatres, hotels, cafes, pubs, etc., are likely to project films on DVD, VHS or Blu-ray. Those that operate from college and university lecture theatres, arts centres or fully equipped cinemas are likely to screen on 35mm film, DVD, Blu-ray and, in a few cases, on High Definition digital projectors. Most CCs will find they can choose from many potential venues, so assess your options and choose the venue that is right for your organisation. In the end, anywhere you can imagine a screening can probably be turned into an auditorium.

Some general points to consider when selecting a venue:

### How easy is it to get to?

Local is better, but make sure it's easy to get to. Car parking space is a plus.

### Is it accessible for all?

All public venues are required to provide access to disabled people under the Disability Discrimination Act (1995) and it's important to familiarise yourself with the access options of your venue, e.g., wheelchair access, disabled parking, loop system for hard of hearing, etc., so you can keep your audience informed.

### Can you provide other services?

Many CCs provide opportunities for their members and audience to socialise before or after a film.

- Is there space in your venue to do this, e.g., another room?
- Is there place to serve teas, coffees or something more substantial? This can provide a good source of revenue as well as a focal point for conversation.
- Check that the toilets are kept to a good standard.

Make sure you are clear on the legal regulations for serving alcohol: see *Legal Aspects*

### What will it cost and how do you book it?

- Can you book the venue for your whole season (or year) of programming? Is it always available on your CC evening? Is there any other event on the same night that may be noisy and interfere with your screening?
- Does the quoted cost include VAT? (Note that rental alone does not incur VAT.) Is a deposit required?
- Are there any extra charges – for use of catering facilities, etc.? Does the venue have a notice board where you can put a poster?

For information and advice on hiring or managing your own venue, refer to *Legal Aspects*

Once you have chosen the right venue for your film showings you will need to start thinking about technical projection. While cinéphiles may maintain that real cinema means reel projection, recent improvements in digital technology are such that you can now present your audience with a genuine cinema experience. If a venue already has projection equipment installed, it will make your life much easier. You may also be able to share venues successfully with other groups, e.g., in a theatre, community arts centre or school – these places often have some equipment that you could use. However, if your preferred venue has not previously been used for film screenings, then you will need to explore how it can be adapted to offer an environment that is both comfortable and suitable for film screenings. Key questions when adapting the venue for your community screenings are:

### **Is it suitable for screening films?**

Obvious, but often overlooked!

- Can you fit in a decent-sized screen without causing an obstruction – one that will give a ‘cinema’-type viewing experience? Will draughts cause the surface to deform?
- Is there room to set up your projector? Will the projector noise be unacceptable for your audience?
- With the seating in position is there an unobstructed path across the audience to the screen?
- Is the blackout complete throughout the year? Evening sun can be a problem in September.
- Are there suitable power sockets close to the equipment to reduce cabling hazards?
- Are the emergency exits clear at all times and are all fire regulations observed? Fire doors must be kept closed.
- Are there clear access paths? You will need to ensure that the path the audience takes to their seats isn’t going to cause them to trip over equipment and cables. Attach power and speaker cables to the floor, or use cable covers.
- Are the hall’s acoustics a problem? Reverberation (‘echo’) can be checked by clapping and listening to what ‘comes back’. A graphic equaliser can ease frequency colouration problems – but you need to remember that the presence of an audience can have a significant effect on the acoustics and you may have to experiment during a screening.

If you are providing your own projection equipment for film screenings, can you leave it in a secure place at the venue? This will reduce the time to set up before a screening. An installed roll-down screen, for example, is a very good investment.

### **How big is the venue?**

Too small, and you will not be able to fit in as many viewers, reducing your potential income. Too large, and the venue will ‘rattle’ and screenings will not feel as friendly; your unique selling point as a cinema for the local community will be lost.

As dictated by fire regulations, all public venues have a maximum accommodation number that must not be exceeded.

### **Is it comfortable?**

Two hours is a long time to stay in one position, so:

- Are the seats comfortable?
- With enough legroom?
- Is there a good view of the screen from all seats?
- Is it warm enough that people aren’t wearing scarves but cool enough that people aren’t snoozing through the second act? You may be able to ask previous users of the venue about this.
- Who is responsible for putting the seats out and stowing them again (if applicable)?
- Is heating provided by electric radiant-type heaters? These can omit a light bright enough to spoil a film show.

Use your imagination to overcome potential obstacles. For example, Oxen Park Community Cinema asks its members and audience to bring their own cushions to film showings.

So, how do you start to assemble your own do-it-yourself cinema? Having secured the venue, it's advisable not to commit to any set of equipment until you have tried the full set-up in your own venue. A good audio/visual supplier should be prepared to demonstrate a number of projectors in your venue so that you can gauge the final effect.

## **2. Data projection (DVD, VHS and Blu-ray)**

### **A brief history**

In the 1990s the decline in the availability and quality of 16mm prints of recent releases threatened the future of many CCs. At that point, inexpensive data projection came to the rescue. Film projection of videotapes had been available for a number of years but the machines tended to be large and cumbersome and the picture quality from the three-tube systems disappointing. It was the advent of DVD disks and the improvements in 'data' projectors that resulted in the current boom of new venues making use of this type of projection. The advantages are immediately obvious once you see a good set-up in action: a sharp, bright picture in the right aspect ratio on a large screen, with high-fidelity stereo sound, all emanating from a small stack of high tech boxes at the back of the hall. The films can easily be delivered through the post, and the incorporation of a VHS video player in the stack allows the projection of short films from any number of sources, if not available on DVD.

Unlike a 35mm film projection system, a data projection system is made up of a number of separate elements:

- Data projector
- Player (DVD, VHS or Blu-ray)
- Cueing display for projectionist (useful)
- Sound system (including a receiver or amplifier and loudspeakers)
- Screen

### **The data projector**

The range of data projectors is growing every day. Remember that most projectors are sold for conference room or home cinema use, so the light output and the focal length of the lens (even if zoom is specified) are likely to be unsuitable for a larger auditorium. As almost all projectors are 'data' capable, this can be used to advantage for giving safety and club notices before the presentation, typically from a laptop computer using a Powerpoint slideshow or similar.

Some commonly used terms are:

### **LCD (liquid crystal display)**

LCD projectors have been used by data projectors (and thence home cinema) for some time. Many CCs have these projectors with a suitable long-throw lens and have been happy with the results. The contrast ratio, typically 400:1, gives good picture quality with good colour saturation and image sharpness. Light outputs of at least 2000-2500 lumens (the standard measurement of light intensity) are certainly needed, but this will depend on the size of the screen.

### **DLP (digital light processing)**

DLP-based projectors are becoming the benchmark for data projection mainly because of the much higher contrast ratio, which can triple the best that LCD can offer (e.g., 2000:1), giving better resolution. The image is created by reflecting light from millions of tiny, driven mirrors onto a single silicon 'chip'. Single-chip DLP projectors rely on a spinning colour wheel made up of red, green and blue filters. If the image is bright, this can cause a 'rainbow' effect where the eye can see coloured edges on fast-moving images. This spinning wheel also reduces the light output, which can be quoted as the lumens without the wheel fitted.

Thus, DLP machines generally require a higher lumen output. The rainbow effect can be reduced by ensuring that the picture brightness is not too high and/or using a (more expensive) three-chip DLP projector.

### **Wide angle lens**

The 'standard' lens fitted to a home cinema projector is intended for use in a small room with a 'throw' of less than 5 metres. For larger venues, these would mean that the projector has to be near the front of the hall affecting sight lines and restricting seating behind the projector. The more favoured set-up is to place the projector, players and amplifier on a high stand at the back of the hall. This means that you must be able to exchange the wide-angle lens for one with a medium to long focal-length lens. If you are going to use the projector in different venues and/or screen films on DVD and video, you may consider getting further lenses to cover the ranges you need (note that all lenses are zoom lenses, but they can only zoom within certain ranges). Note that with some projectors, it is possible to project from the side of the hall using the keystone adjustment (see below).

### **Scaler**

Most projectors are 'data' projectors, able to respond to a wide range of data and 'movie' signal sources. For data use, the computer often adapts to the available resolution of the projector. However, for movie sources, the projector typically needs to map the fixed format signal source from the player to its resolution. The sub-system that does this is a 'scaler', and some are better than others. A poor scaler will cause motion artefacts and blurred images. It is advisable to try and match the player signal format to the projector if at all possible since this asks least of the projector's scaler, which is 'made to a price'! A good test of the player, scaler and projector capability is the rolling credits at the end of a film. These should be legible and motion-smooth.

### **Keystone Adjustment**

This means a facility for keeping the vertical sides of the picture parallel even though you are projecting at an upward angle. This means that you can keep the projector at a manageable height at the back of the auditorium. However, the adjustment is usually done digitally, which causes resolution artefacts, so is to be avoided if at all possible.

### **Aspect Ratio**

Most DVDs of recent titles are formatted to fit the widescreen television format (16:9) but can be adjusted. In contrast, VHS tapes tend to be in the Academy format (4:3) so your lens and screen must be able to cope with both image sizes while getting the best resolution out of your projector. Because almost all projectors as 'data' projectors they are built to use data formats. More recent projectors are following the 'widescreen' computer display trend, which is 16:10 (WXGA). These are clearly a better choice for movie presentation.

### **Audio Output**

In general, projectors are fitted with minimal audio capabilities, so a separate sound system is essential.

### **Video signal input**

Most players will be able to provide video signal formats that have a higher bandwidth than ordinary television. This is necessary since 'composite video' (typically provided on one 'phono' connection) is only good enough for standard analogue television pictures. RGB and S-video were the first improvements over this. However, 'component' (three connectors) is now common, particularly with DVD players. To get the best from HD, the digital video formats should be used (DVI-D or HDMI).

### **DVD, VHS Video and Blu-ray Players**

Whilst the data projector is the most important and most expensive element in a set-up, the film delivery systems are less crucial and much cheaper. With a DVD player, it is best to go for a multi-region player. DVDs are released encoded for specific regions – Region 1 (USA) or Region 2 (Europe) – to allow new titles to be released at different times in different areas. Most DVD players can accept disks from all regions, but

make sure you ask specifically for a multi-regional player. Players combining a multi-region DVD player in combination with a VHS videocassette recorder are now available from many of the major manufacturers (i.e., JVC, Toshiba) and should be considered in preference to a separate VCR.

The choice of DVD player will also be governed by your other equipment. There are 'upscaling' players that can render DVD into a format that is closer to the native format of the projector. Here, it is simply balancing one scaler's capability against another (the projector's). Also, some DVD players have built-in surround sound decoders. This can be useful if it is not intended to use a separate system to generate the channels you need (centre channel particularly).

Blu-ray is now the internationally accepted HD film format. Blu-ray discs hold five times as much data as ordinary DVDs, which gives much improved picture quality when allied to an HD-compatible projector – but check the combination will work before buying. The signal is best transferred to the projector using DVI-D or HDMI signal formats. The projector must be able to receive and interpret the data format correctly through the 'digital content protection' (DCP) system that Blu-ray publishers have enforced. Currently, Blu-ray players are more expensive than standard DVD players, but the price differential is bound to narrow rapidly. New titles are being released regularly in Blu-ray format, not only 'blockbusters' but even some classics. Though licensing their use for community screenings is not straightforward yet, it is easy to see that Blu-ray discs will become dominant in the foreseeable future.

### **Cueing display**

A good presentation is one that has a clean start and finish, typically both with a 'blank' (black) screen. There is nothing more uncomfortable for a projectionist than having to share all the DVD cueing with the audience! Most players will have a simple 'composite' video output in tandem with the more complex one being fed to the projector. This can provide a signal to a small (typically 7-inch) LCD monitor that the projectionist can use to cue the programme material while the projector is 'dowsed' (shutter closed). The projector shutter can then be correctly operated in synchronism with the start and finish of the film(s).

### **Amplifiers and speakers**

Your audio/visual supplier will be able to advise you on a compatible amplifier to take the output from the DVD/VCR player. The Dolby 5.1 (7.1) Digital Stereo output from your Blu-ray player can be utilised to give surround sound using the expected six (or eight) speakers, or, perfectly successfully, a central and two elevated wing speakers can be mounted, respectively, in front/below and to either side of the screen. One consideration on location may be the essential need to keep all cabling secure so that the audience cannot trip over it. If you use a standard hi-fi 'stack', you can make use of the built-in CD player to give you background music prior to the show and create the right atmosphere for your screenings (licence permitting – see *Intellectual Property Rights*).

Remember to choose speakers that will take more than the maximum power output from the receiver/amplifier. PA speakers are more robust than those designed for home cinema use and they should be definitely considered if the equipment has to be mobile or stored away after every showing.

### **General advice on sound**

For stereo sound in all formats of projection, the speakers should be placed beside the screen rather than behind it, unless the screen is acoustically perforated. Like the screen, they should be placed to 'fire' over the heads of the audience and, preferably, in line with the screen. Ensure the speakers are pointing towards the audience, and towards the centre of the room. However, if the screen is a reasonable size, a centre speaker is very important for movie sound. Almost all the speech comes from the centre and it should 'appear' to come from the image of the speaking individual. Using stereo speakers alone will cause a 'hole in the middle' of the sound image.

Again, keep wires to the speakers away from main leads and tape them down to avoid a trip hazard or them being pulled from the speakers. If you can plug into a suitable wired-up system, then do so. If using a multi-purpose hall, consider getting your wiring 'fixed' high on the wall so you can easily plug in your

projector at one end and speakers at the other. Ensure that speaker impedances match the output of the amplifiers and that the speaker wattage capacity is greater than the amplifier output to avoid damage to both. Make sure that connections are kept 'in phase' (positive to positive, negative to negative); this can be helped by using polarised speaker connectors (eg 'Speakons').

If there is significant reverberation in the auditorium, try using heavy curtains over bare hard surfaces – the second benefit for blackout curtains! Be prepared to adjust volume, treble and bass to suit both the audience (bodies absorb sound too) and film. A graphics equaliser may be required if your hall's acoustics still present a problem. If there is an AFILS (induction loop system) in the auditorium, ensure that you provide it with a suitable (mono) signal.

### **Screen**

The size of your screen will depend on your venue's dimensions. Portable screens are available with screen areas up to 14 ft (4.3 metres) wide by 10 ft high (3.0 metres) – but you must allow an extra 4 ft (1 m) for the stand, so check your headroom. However, portable screens usually take two people to set up quickly. An alternative (dependent on size of venue) may be a permanent drop-down screen that rolls away into the ceiling or the top of a wall. For a really mobile unit for small halls, the largest tripod screen may be acceptable. You will have to compromise on screen size because you are not going to fill any standard screen with both 4:3 and 16:9 ratio pictures. Whether you have a preference for a widescreen aspect ratio or the Academy 4:3 ratio may depend on whether you intend to show mostly DVDs or VHS videotape. As already explained, you must ensure that you have the correct lens to give you the range of sizes. Of paramount importance is that the screen be perfectly flat.

### **Suppliers**

As emphasised earlier, a local audio/visual supplier is best – one that is prepared to come to your venue and give you a demonstration. The Internet is full of sites trying to sell projectors, DVD players, etc., but these sites are mainly aimed at the home cinema market and the projectors will tend not be suitable for most venues. So make clear your requirements at the outset.

## **3. Projection on 35mm cinema equipment**

If you already have a cinema projector installed at your venue, then using it will immediately add interest to the evening and for the members and audience. Most cinema-goers do not get the chance to see or be a part of the process of film projection – but there's no doubt that it's magical.

Despite the growing interest and investment in digital projection, 35mm film projection is used in thousands of cinemas across the world. As the standard new-release format, what multiplex and independent cinemas predominately use, 35mm gives the widest availability of titles and the best quality image and sound, and it means being able to show films that are not yet available on disc formats. This can determine the degree of freedom you have when developing a film programme.

However, unless you have access to a suitably fitted venue and a trained projectionist, it is not recommended that you attempt to adopt this as your standard format for presentation. Investing in 35mm equipment is expensive, and handling 35mm film is complex and time consuming, thus best left to the professionals who do it regularly.

Nevertheless, some CCs do use the 35mm format, more often than not through utilisation of the facilities of a local town or art-house cinema, and the BKSTS (British Kinematograph Sound & Television Society – [www.bksts.com](http://www.bksts.com)) can give guidance and training to people who may be interested in following this route.

## 4. The digital future: looking ahead

The latest projection innovation is digital cinema, or D-cinema. This replaces the workhorse that is the 35mm projector and instead relies on electronics to produce the image. These projectors are specialist 3xDLP projector heads with powerful lamps in a separate lamphouse (Christie is a dominant supplier in the UK). D-cinema has been a continuous growth industry with ever-changing and improving standards. The Hollywood studios set up DCI (Digital Cinema Initiatives) to agree what was needed and to ensure compliance. Although early D-cinema performances used a projector with a width resolution of 1.3k (1280 horizontal pixels x 720 vertical), the current accepted standard is 2k (2048x1080), though there is also provision for 4k (4096x2160) within the standards. There is a lot of interest in D-cinema from the major cinema circuits; some are furnishing complete multiplexes with digital projectors alongside 35mm equipment. One major circuit has equipped a multiplex solely with D-cinema projectors.

Although the quality of the projected image is very good, many cinema owners are unable to justify the cost of a D-cinema installation. The UK Film Council, using Lottery funding, has fitted fully DCI-compliant equipment to approximately 230 screens around the country, including circuit cinemas and smaller independent cinemas, partly to encourage the screenings of films by smaller filmmakers unable to afford producing enough prints. However, cinemas can use the projector for other purposes, such as live opera relays, sports events, interviews, etc. DCI-compliant installations feature content protection methods that require management. The films are typically delivered on special hard drives (similar to that used in PCs) in encrypted form. These need to be copied into a presentation server with the necessary encryption keys programmed to allow projection of the material. It is unlikely that many CCs will ever be able to operate such an installation except by liaising with a commercial venue. The more likely scenario for CCs is being able to project from Blu-ray using semi-pro equipment.

## 5. Presenting a programme

Regardless of the equipment that might be installed where you are setting up a CC, the quality of a performance can be made or spoiled by one thing – the person running the show.

An introduction and welcome by a lead member of the CC will make the film showing more ‘personal’. Make sure the speaker can be heard. If necessary, use the venue’s PA.

Lighting should be dim enough so as not to illuminate the screen, but bright enough to allow the audience to see their way out in an emergency. No other stray light should reach the screen. Sound systems should be installed and checked in advance of the presentation for quality of reproduction.

When the performance is ready to commence, music (if used) should be selected with care to suit the type of film being shown, and should be at a level that allows the audience to talk. Music appropriate to the programme should be chosen. It follows that loud rock music may not be appropriate if the film being shown is a delicate romance, while orchestral music is more suitable as introduction music than vocals.

Consider how you will provide any advertisements or emergency information, e.g., using the projector in ‘data’ mode.

Any performance is enhanced by the lighting being dimmed slowly. If there are stage curtains, these should be lit and dimmed separately, or if not, they should be opened as the house lights are dimmed. If using film, make sure that leaders are not shown. If using disc, use the projector shutter appropriately so that only the programme film material is shown. Focus and sound levels must be re-checked at the beginning of the performance, preferably using a reliable colleague in the auditorium, without causing audience distraction.

Care and attention are paramount but a love for what you are doing is even more important. Anyone can show a film, but a projectionist *presents a show*.

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