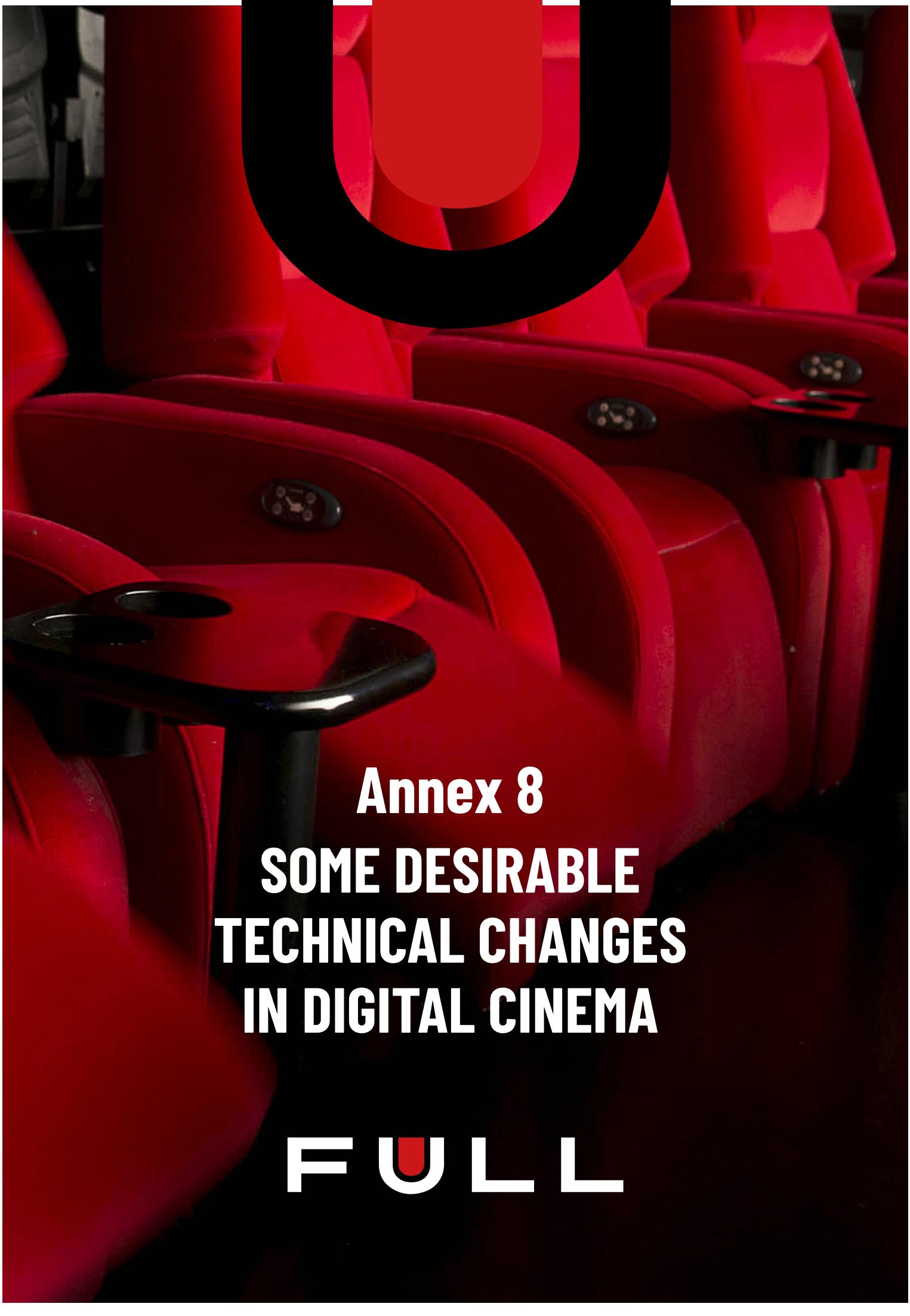

Annex 8

SOME DESIRABLE TECHNICAL CHANGES IN DIGITAL CINEMA

FULL

SOME DESIRABLE TECHNICAL CHANGES IN DIGITAL CINEMA

As we constantly reiterate, we believe that the future of cinema is in immersion. Therefore, the changes that we consider necessary are designed to enhance the immersive experience, in terms of both image and sound. Let's look at these changes:

1. Modifying the subtitles for original language movies, adapting them to be projected onto immersive screens.

In many countries around the world, movies are only shown in the original language with subtitles. This is a serious problem for immersive cinema in general and for PLF movie theatres in particular. In an immersive room, the distance ratio between the movie-goer and the screen is different from a standard room, because the screens are proportionally far bigger. With such big screens, it is hard to follow the action in the movie and, at the same time, read the subtitles. To enjoy a subtitled movie in such a room, we have to sit very far back, in the last few rows. However, sitting far back means sacrificing a large degree of the immersion. If we really believe that immersion is the future of cinema, this problem needs to be resolved without delay.

One solution would be for all movies to be dubbed, but many movie-goers prefer watching in the original language with subtitles. They have good reason for this preference, as the dialogue is an integral part of the artistic work (I should probably add that I prefer subtitled movies). Another more desirable solution would involve a simple technical modification that enabled subtitled movies to be viewed properly on immersive screens. To achieve this, there should be an option to change the size and location of the subtitles at will. This would make it easy to ensure that everybody in the room could read them comfortably. Let's specify the changes required: On an immersive screen, the subtitles must be somewhat higher, bringing them closer to the centre of the frame, and the size of the projected subtitles must be comparatively smaller than the usual size in a standard subtitled projection. This solution might not appeal to the creators of the movie, as the new proposed subtitle position is far more invasive, but it would ensure that movie-goers enjoy their movie more and better. At the end of the day, this must be the common goal of the entire industry.

This would be the ideal solution, to be able to correct the size and location of the subtitles as we see fit. However, if the Distributors consider it too big a risk to delegate this power to Exhibitors, a

simple option would be to include two subtitle versions in the DCP, one for projecting onto a standard projection screen, and the other onto an immersive screen (in standard terminology, a PLF screen). The Distributors should bear in mind that any of these alternatives would facilitate the introduction of immersive screens in countries where they only show movies in the original language with subtitles.

2. Improving the projection quality by enabling projectors to change the frame rate of a movie during projection

We do not want to get into a discussion about the frame rate, nor would we presume to pontificate about an ideal frame rate. We do not know whether the optimal speed would be 48, 60 or 120 frames per second, or any other speed for that matter. But we do know that the speed of a standard digital projector is currently 144 images per second, far superior to the standard 24 images. We also know that a projector could switch from one speed to another in a way that is completely imperceptible to the human eye. Lastly, there is no doubt that the quality of the projection would benefit from a higher frame rate, especially in scenes with very fast action and in panning shots. The more immersive the projection, the greater the benefit of this higher frame rate will be, because, on a bigger screen, it is much easier to spot the shortcomings associated with the current standard frame rate.

The main problems that we commonly associate with higher frame rates include the size of the enormous files required by the DCPs and the high financial costs related to the postproduction of the movies, particularly when they involve a lot of special effects. However, in view of the fact that it would be desirable for some parts of the movies to be shown at higher frame rates, there is an option that would combine the benefits of a faster frame rate, while avoiding most of the drawbacks. This would consist of enabling future generations of digital projectors to project certain parts of the movies faster, as deemed appropriate by the creators. Moreover, the DCPs would have to incorporate a time code that indicated the starts and end of these speed changes. As a result, the DCPs could include an “extended” version of each movie, so that the projectors equipped to do so could project the parts shot at a higher frame rate (having previously completed the additional input of the “extended” fragments of course). Therefore, a single DCP could simultaneously meet the requirements of both current projectors and projectors equipped to project at variable speeds. With this simple solution, movie-goers could enjoy the advantages associated with a higher frame rate, without the need for excessively large file sizes. The parts of a movie that would significantly benefit from a higher frame rate normally only make up a minimal proportion of the footage as a whole.

By following such an approach, we would obtain a notable improvement in the quality of the projection in both immersive and standard rooms, without incurring excessive technical or distribution costs. Moreover, filmmakers could experiment and test out the virtues of different frame rates. Ultimately, the speed, or combination of speeds, that ends up being imposed as the standard is irrelevant. What really matters is improving the experience, and any standard above 24 images per second would be desirable. It is worth noting that the current standard of 24 images per second became the norm in the 1920s, after the appearance of sound. It was not chosen to improve the quality of the image, but rather to prevent the sound distortion that occurred when projecting with too low a frame rate. The time has come to change the frame rate, improve the visual experience of movie-goers and equip cinemas with an additional resource that facilitates their battle against the television format.

3. Improving the projection by allowing projectors to manipulate the shape of the projected image, particularly in the case of the most immersive rooms (including PLFs).

All Exhibitors know that, in any cinema that projects from a point higher than the axis of the screen, the resulting projection is in the shape of a trapezium. We currently, “resolve” this problem using digital masking to conceal the side portions of the projected image affected by this trapezium. Of course, the projected image is still distorted and the pixels of the eliminated portions are lost. This occurs in almost all movie theatres all over the world, and the problem is far more pronounced in rooms with stadium seating. Although stadium seating improves the movie-goers’ view, it creates a bigger vertical deviation of the projection beam with respect to the screen axis, because we are projecting from a greater height. The lens’ “Shift” function enables us to correct this deviation slightly, but not completely.

Furthermore, when the focal length is really short, the capacity of the Shift function to correct the image disappears or drops to a maximum of two or three degrees, which is usually insufficient. In the case of highly immersive rooms, as the screens are very big and the room is almost square, the distance between the movie-goers and the screen is very small, so the focal lengths are also very short. Therefore, the problem of the trapezoidal distortion of the projected image tends to be far worse in immersive rooms than in standard rooms. If, moreover, the screen is curved, the problem is compounded, as there is the distortion caused by the curvature of the screen on top of the trapezoidal distortion.

To solve this problem, top-class projectors will need to incorporate a small piece of software that enables the geometric manipulation of the image,

along the lines of warping, or at least a small program like Keystone (see note 1). In the case of curved screens, the required programming is somewhat more sophisticated, although perfectly feasible. Nowadays, the leading projector manufacturers already have this software and supply it to the creators of big audiovisual events, in which the use of warping is widespread. In contrast, movie projectors cannot use this tool, because, unlike events, movies are subject to the limitations associated with cinema security standards.

Although the security requirements of movies prevent us from accessing or manipulating the encrypted image, the sector must be able to find a solution that allows us to avoid this distortion of the projected image. For instance, the KDM digital key that "opens" a movie for projection in a certain room for specific days and times, could also open other authorizations at the same time. Let's imagine it could open some warping software with specific parameters for each particular screen in a multiplex. These programs and parameters should receive the prior approval of the Distributors. The Majors could delegate to some technical managers the power to define, test, and accept the parameters set for each specific screen, and monitor them over time. The security of the movie would not be compromised, because the Exhibitor would not have the power to open the warping software. Only the specific KDM of each movie could open this software and allow warping for that particular screen and time, subject to previously agreed and approved parameters.

Of course, we do not have the technical knowledge required to assert that this proposal is viable. There are probably many other approaches that are perhaps simpler. We only know that the potential application of the proposed tool would solve a serious problem that exists and improve the quality of the projection in all the movie theatres around the world, particularly in the most immersive ones. Using our now freed patents, it is possible to build a multiplex that resolves this significant problem through the architecture of a room, without needing to incorporate any warping software, but our solution only applies to newly built multiplexes. Ideally, it is necessary to find a standard solution suitable for all cinemas worldwide.

DOWNLOAD THE FULL DOSSIER AT:
www.thebestcinemas.com

1 Keystone is usually available in most domestic projectors. Mechanically or digitally, it enables the image to be manipulated and corrected, so the user can modulate an inverse trapezium and correct the final image projected.