About Digital Projection Sizes

Introduction

Digital projection size means the pixel dimensions of image files (width and height) and not the size of the resulting image on a screen.

Perhaps the most commonly asked question about digital projection size is 'What is the Standard?'. The answer is simple. There is no standard projection size; there never has been; and there won't ever be a standard projection size.

'Projected Digital Images – Standards For Events' was published by the PAGB in 2007 and updated in 2020. In there, Standard B.02 is for the organiser or host of an event to say what projection size will be used, based on the organiser's equipment.

For simplicity here, the organiser or host of an event is a Club. But, exactly the same applies for a Federation, for the PAGB, for an Exhibition or for any other organisation. The Club may then be dealing with projection of images delivered by its own members, or it may be dealing with images delivered by other Clubs for an inter-Club event.

What Projection Sizes Are Available

Sizes may be described by an abbreviation or by pixel numbers – always width first and followed by height. Table 1 shows the common abbreviations and their pixel sizes, all of which use a 4:3 aspect ratio.

Abbreviation	Width	Height	Comment
VGA	640	480	Good web image option
SVGA	800	600	Adequate for teaching / PowerPoint
XGA	1024	768	Suggested minimum for Clubs
SXGA+	1400	1050	
UXGA	1600	1200	

Widescreen aspect ratios, either 16:9 or 16:10 tend not to be used for Club still images, but are found on most laptops and many projectors, and may be used for AV presentations. Table 2 shows some examples.

Abbreviation	Width	Height	Comment
WXGA	1280 - 1366	720 to 800	No single value
WUXGA	1920	1200	16:10
Full-HD	1920	1080	16:9
Ultra-HD	3840	2400	16:9; 4 x Full-HD

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Full-HD and Ultra-HD are television standards. Anything 720 pixels high is 'HD-Ready'. The other abbreviations all come from developments in computer graphics systems. WXGA is not uniquely defined but all versions would be HD-Ready.

The commonest requirement for Clubs is to project still images at a 4:3 aspect ratio. That requirement can be mapped onto available equipment sizes as shown in Table 3.

Pixel size	Use
XGA: 1024 x 768	XGA projector
SXGA+: 1400 x 1050	SXGA+ projector OR Part area of Full-HD projector
UXGA: 1600 x 1200	Part area of WUXGA projector

What Projection Sizes Are In Use

When digital projection started in Clubs, there were two sizes in use – XGA and SXGA+. XGA was easily available in the market. SXGA+ was more restricted, with Canon XEED projectors mostly used for this size. This is not a discussion about which technology is better, but Canon XEED projectors were many times the price of commodity XGA projectors, and that price differential remains today even with different sizes.

Ten years later and XGA remains perfectly suitable for Club use, but the number of Clubs using XGA has dwindled. Any Club replacing its equipment can now get very good value from a larger size, especially Full-HD. Because Full-HD is used in home theatre, projector manufacturers have the volume of production to bring prices down, and prices have come down dramatically.

Full-HD allows a Club to use SXGA+, and is a good replacement as SXGA+ projectors are no longer available. At Club level, SXGA+ is as suitable as XGA, but now the size is closer to the developments which have happened for larger organisations, such as the PAGB and many Federations, which have moved to UXGA.

Larger organisations are running events with larger audiences. The availability of UXGA is worthwhile for them despite the cost. For a Club with smaller audiences, a move from SXGA+ to UXGA is cost with little or no benefit. That is especially the case as laptop computers with screen sizes higher than Full-HD are another cost increment.

The estimated current usage of projection sizes is in Table 4.

Size	By Clubs	By PAGB / Federations
XGA	? < 15%	
SXGA+	Most	
UXGA	? <10%	Effectively all

At What Size Should Images be Submitted

Within a declared projection size, photographers can submit images which use any amount of that space. It is recommended, but not required that the submitted image uses the maximum in one (if not both) dimensions. An image which is less than the projection size in both directions is 'undersized', and should not be expanded by the display system to fill the projection space.

An image which is more than the projection size in either direction is 'oversized', and the display system may reduce the image to the projection size, maintaining the aspect ratio.

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Allowing the display system to reduce image size is not recommended because it changes the image quality outside the control of the photographer. But, there are more ways in common use whereby the display system degrades the photographer's image, including digital keystone adjustments and use of long analog signal cables to the projector. In practice, it is hard to see the effects of any of these actions without careful side-by-side comparison.

What to do about oversize images becomes a policy decision by the event organiser. Within a Club, allowing oversize images from members may enable more participation. For an international salon, oversize images might be disqualified. Declaring the event policy is PAGB Standard B.09.

A Club receives images from its members for internal events. The Club may also forward images on behalf of its members to external events. As external events move to the UXGA size, while most Clubs remain at the SXGA+ size, Clubs have to consider how they will manage in a mixed environment.

It cannot be emphasised too strongly that Clubs do not have to re-equip to UXGA merely because larger organisations have done so.

When most Clubs used XGA, while many larger organisations used SXGA+, it was always possible for a Club to expect XGA images from its members and submit those XGA images to an SXGA+ event. An XGA image is 73% linear or 53% area of the SXGA+ image space. Many images do not use the full projection dimensions in both directions, but when XGA became less prevalent, the presentation of a series of XGA images at an SXGA+ event became rather obvious and detrimental. XGA Clubs had options (1) to submit at XGA, (2) to ask members with images selected for an event to resubmit at SXGA+, or (3) to upsize available images before submission. CACC published advice on upsizing procedures which retained quality indistinguishable from the original.

Moving to the present, most Clubs use SXGA+, while most larger organisations use UXGA. An SXGA+ image is 87% linear or 77% area of the UXGA image space. The appearance of an SXGA+ image at an UXGA event is unremarkable, especially when many images do not use the full area available.

SXGA+ Clubs now have the same three options as XGA Clubs had before, but now they have a fourth and simpler option. Asking members to submit always at UXGA means that images are reduced for internal events (which is hardly noticeable), but images are already compliant for external events.

Conclusion

Given a Club's current equipment, Clubs may use the discussion here to review the logistics of their events, and of the stock or library which they hold of members' images for selection, and of how they will make submissions to external events. Each Club will then decide what image size they will ask their members to use for submission.

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