

EDUCATION

Big hands small head

The bad use of a
wide angle lens

by Graham Reed

A long time ago, in a place that no longer exists, BBC Television Centre, we had large cameras E.M.I. 2001. They were often referred to as the cameraman's camera, as at the time they gave what was considered excellent pictures in 625 lines (SD), but of course they suffered from many problems. They needed constant lining up and also needed a lot of light. They had 4x1 inch tubes, red, green, blue and luminance, so the light was split four ways. Because of the large format size and the usually low aperture of f3.5 the depth of field was of course quite small so constant focusing was the name of the game. We only had two types of lenses, a K and J; one was standard and one was a wide angle. But as the optical block was in the centre of the camera any panning did not have a crabbing effect.

We only ever talked in lens angles and never focal lengths, this of course makes perfect sense when a director and designer are drawing up plans for a production and they need to know what angle of view the cameras can get. So the actual focal lengths of lenses have no importance. It has been a long time since a director has talked to me about angle of views. I think many new young directors have no idea about this. Before any production the camera crew would line-up the camera's shot box using a camera angle line-up chart. This meant that during a scene the cameras could all have the same lens angle thus producing the same perspective.

It is this issue of perspective that it seems many young, and not so young, cameramen and directors do not understand.

This lack of understanding of the basic fundamentals which seems not



to have been taught to the people entering the TV industry is one reason the Institute of Training in Television Production, ITTP, was formed. One of the aims of the ITTP is to have agreed basic skills that people entering the industry will have. These skills will be set by industry professional organisations.

If for an example you were standing in the park this is how you would see the trees it is what we call standard perspective.



But if you look at the scene with a wide angle lens you would see this perspective. The trees now look a lot further apart.



But if you had a narrow angle lens the trees will now look close together.



In all these pictures it is the same tree on the right of the frame. So how would the viewer understand really how far apart the trees are if you used a wide or narrow angle lens, and what feeling to the scene would this give?

We should also consider the viewing distance that the average TV viewer sits whilst watching their programmes, because this viewing distance would also have an effect on the perspective the viewer sees. Most 16:9 TV cameras have a CCD of 12.26mm wide by 6.6mm high and to produce 'normal' perspective we need to use a 35mm lens. So in order to view the images with correct perspective on a display with a height of 330mm we would have to enlarge the image 50 times (330 divided by 6.6) so we would sit $50 \times 35 = 1,750\text{mm}$ or 1.75 meters from the screen to view the correct perspective.

Since the days of EMI 2001 cameras lens manufacturing and design has come a very long way. New materials, designs and new mechanics have all vastly improved the optical performance of lenses.

Now with all the excitement about 4k should we be asking how good some of the lenses are that people are using with these cameras? It wasn't very long ago that I worked with people who were still using SD lenses on HD cameras and asking 'Does it matter?' Yes!!

Another issue with 4k working is that the lenses will have to have an even smaller 'permissible circle of confusion' which will result in even smaller depth of field. When we first started to use 'lightweight' cameras the shortest focal length lens we had was 8 mm. It was exciting days throwing a handheld camera with a wide angle lens, (8mm) around the Top of the Pops studio. One cameraman who became