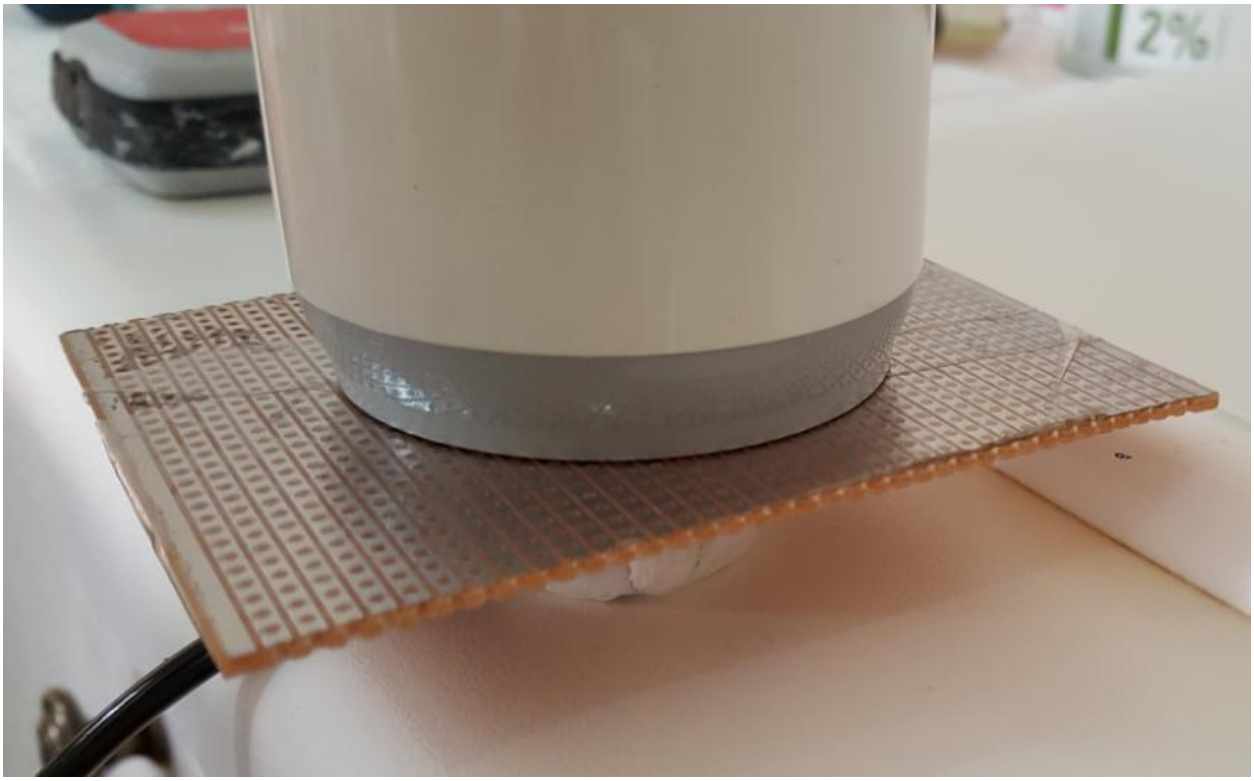
Step Wedge Phantom Procedure

1. Using a piece of Prestik, press the sensor into the Prestik. Using something flat like the memory stick supplied in the kit. Place over the sensor and taking the x-ray press firmly onto the flat surface. The objective is to get the x-ray beam to enter the sensor at 90 degrees.



2. Slide the flat object out and place the step wedge supplied in the kit squarely onto the sensor. The top of the wedge should be in line with the end of the x-ray cone. See figure 1. You will need to pull the cone away a bit to position the step wedge.
3. Select an appropriate setting on the X-ray and expose. The object of the exercise is to obtain the best possible to image by decreasing or increasing the exposure time. A good image is one that should look like this.

4. The ideal setting would be when you can see all 5 steps and the contrast holes in the center of each set.
5. Record this setting for future reference.
6. The objective is to repeat the above steps as accurately as possible the next time you are required to do the test.

The above test is to monitor image quality over time however the same parameters and procedure must be followed in order to get consistent images.

The original image is always compared to the latest image taken. The distance of the end of the cone from the step wedge will influence image quality therefore it is important to make sure the distance is the same each time.

See image examples.

For critical assessment carefully compare lighter and darker patches on the image to the original image taken. A change of 20% in gray scale steps is the maximum allowable. The equates to 1 step difference in change. Check the low contrast holes to make sure they are visible.

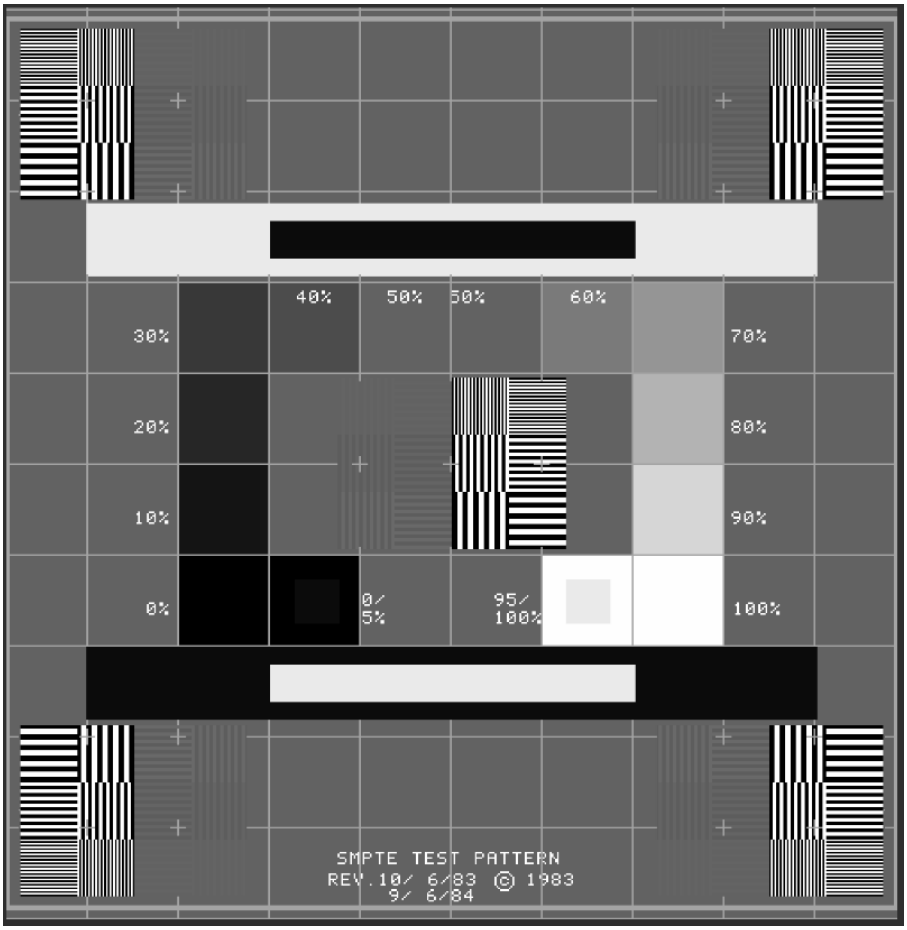
It may not always be possible to see the low contrast holes on each step. This will differ from unit to unit.

Diagnostic Monitor Test

On the memory stick supplied will be an image labelled SMPTE open the image. Please note maximise the image. It is also acceptable to enlarge the image.

1. There are 4 squares with slightly lighter squares inside them. A set at the dark end and a set at the light end. These are marked 0% on 5% and 95% on 100%. These squares should be visible. If they are not then adjust the lightness or darkness om your monitor until you can see them.
2. There are 16 distinct grey squares. These should all be visible and particular attention should be paid to the first 3 shades at the lighter end and the 3 at the darker end. Each should be different from the other.
3. In each corner of the image the thin lines should be clearly visible. If without enlargement the lines appear to merge together in places but are clearly discernable when enlarged, then this is an indication that x-rays should be enlarged when viewing them.
4. All parts of the pattern should be in proportion, squares look like squares and circles look like circles.

To view images reflective glare from Windows should be avoided. Low lighting conditions should be used whenever possible.



you should see a square within the square. If you cannot see this on the pattern then adjust the screen dark and light tools until they are visible.

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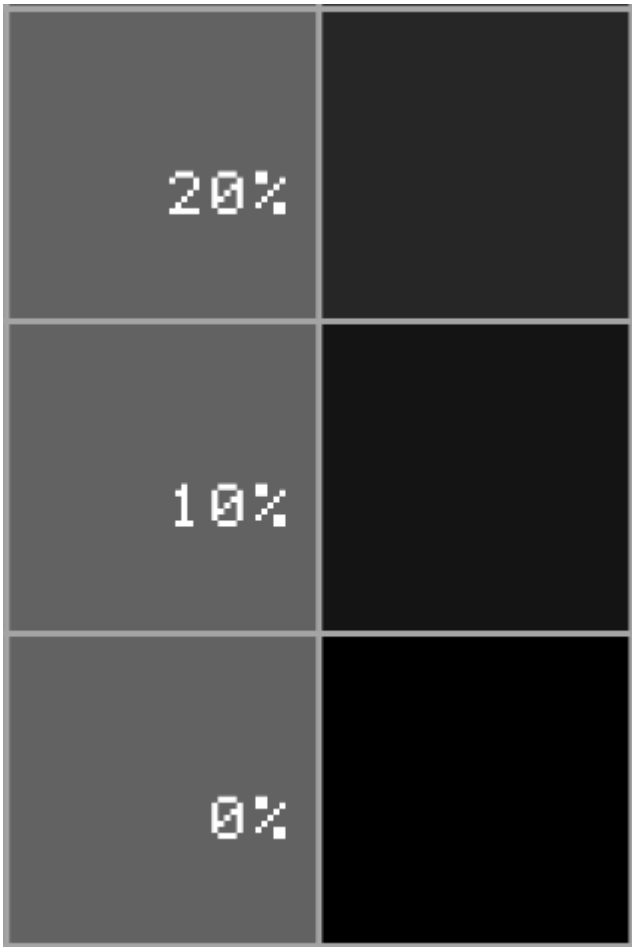
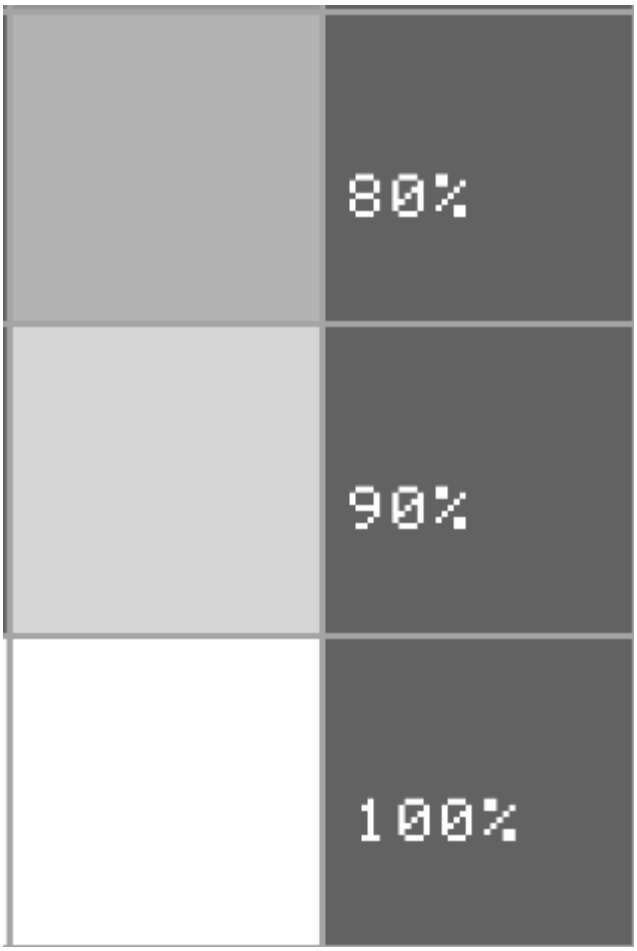
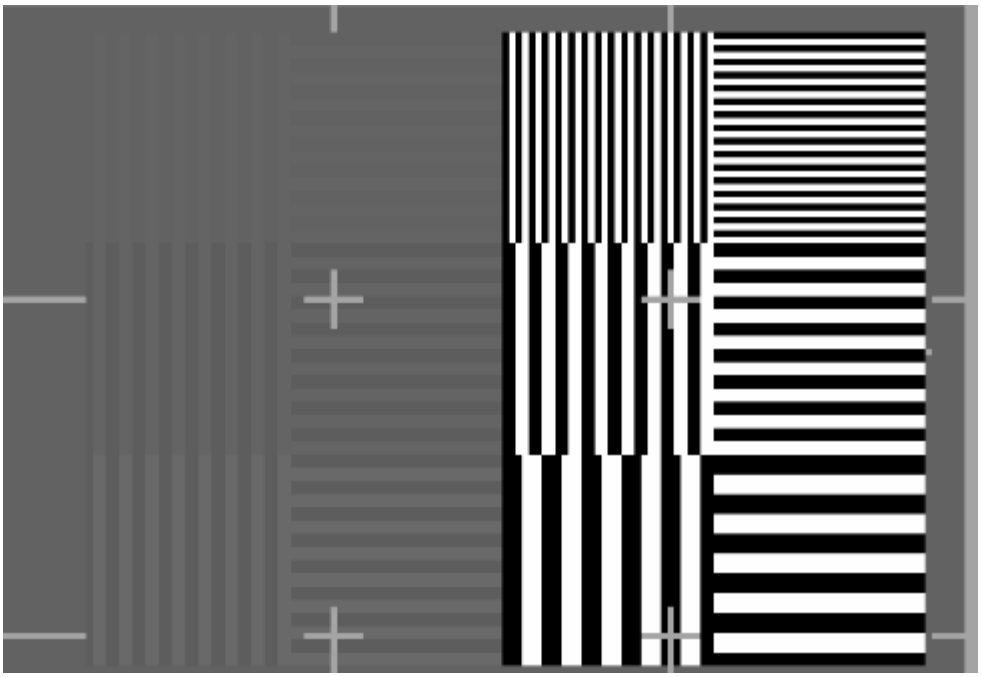


On the darker side of the grey scale pattern the first 3 shades should be clearly different ie 0%,10% and 20%



On the lighter side 100%,90% and 80% should be distinctly different.

You should see all 10 shades of Grey clearly.



In each corner you should see distinct lines this is an indication of how well your monitor displays spatial resolution ie: the ability to see very fine detail essential in dental diagnostics essential for lingual and buccal roots super imposed over each other. The 3 rows of lines on the left should be visible these are low contrast lines.

The transition from black to white should be sharp and not blurred.

Everything on the pattern should be geometrically correct ie a square should look like a square etc. if not then your aspect ratio is incorrect.