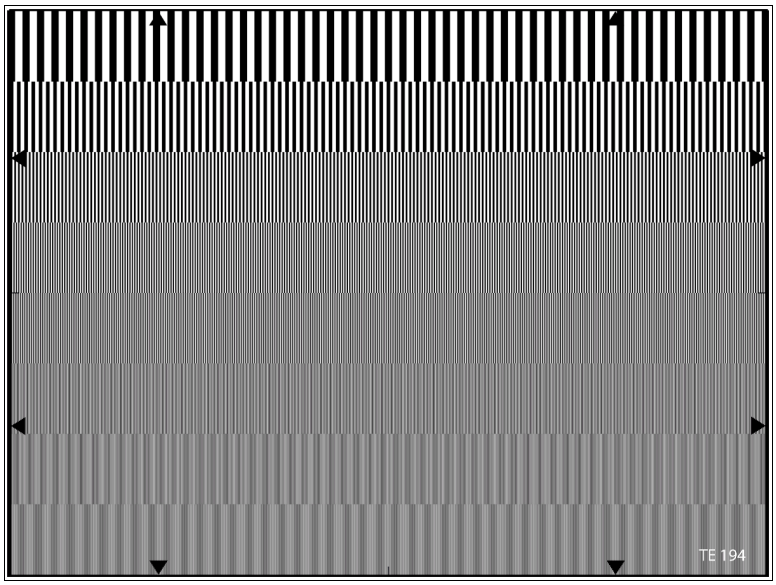
ALIASING TEST CHART

REFLECTANCE



Aliasing effects are moiré distortions caused by interferences of two rasters. Independent of the type of camera aliasing effects can arise by interferences of motive rasters and the TV line structure e.g. the well known venetian blind effect or textile stripe patterns.

CCD cameras have a special immanent aliasing problem caused by the spatial image sampling. The spectrum of the signal obtained at the camera output is compromised of a basic spectrum repeated around multiples of the CCD sampling frequency. The CCD sampling frequency depends on the CCD size and the number of the pixels per CCD width. For some high spatial frequencies of the image, the condition dictated by sampling theorem is not met, so that the basic spectrum and duplicated spectrum can be superimposed and give rise to inter-frequency beats. The result is moiré in the pictures.

Moiré visibility depends on the type of analyser, on the camera's low pass optical filtering and on the spatial frequency of the test pattern analysed.

The TE194 consists of 8 rows of rectangular bars the spatial frequencies of 1, 2, 4, 6, 8, 10, 12 and 14MHz. To adjust the odd frequency values 3 to 13 the picture has to be zoomed in a way that it is limited by the respective markings (arrows) on the upper and bottom edge of the test chart. The frequency then refers to the row with the next lower even frequency each.

Measurement procedures can be made with a spectrum analyser or a wide-band video oscilloscope.

Measurement conditions

Gamma correction: OFF
Contour correction: OFF
Color correction: ON

Spectrum analysers measurements

The measurement principle consists in locating, on the spectral analyses of the luminance signal Y or coded Y, and successively R, G, B; the interference lines resulting from sampling. The camera is aligned on the test chart at a given spatial frequency. The camera output is connected with the input of a spectrum analyser. The iris is adjusted so, that the white level corresponds to a vision signal of 700mV / 75 Ohms. The pedestral is set at 0 mV. In case of the analyses of a signal including mixed sync pulses, it is recommended that these pulses, which render interpretation of the spectrum analyser curves more difficult, be suppressed.

A measurement example is given in figure 2 below.

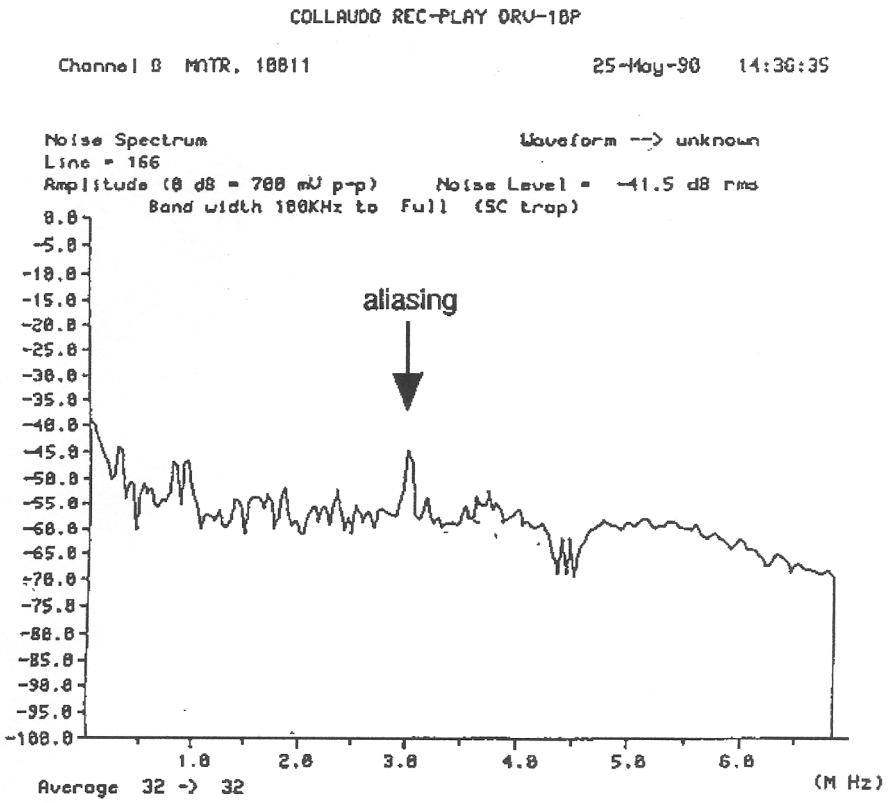


Fig. 2

If the number of horizontal CCD pixels is known, it is possible to calculate the sampling frequency, which is easily located on the analysers screen:

Sampling F (MHz) = No. of horizontal pixels / 52

The frequency of the interference line is given by the difference between the sampling frequency and the test pattern frequency:

Interference F = Sampling F – test pattern F

The measurement involves determine the difference in level between the useful signal (s) at test pattern frequency and the signal at interference frequency. The measurements have to be repeated for each of the spatial frequencies and made several times (approx. 10 times) to determine an average result.