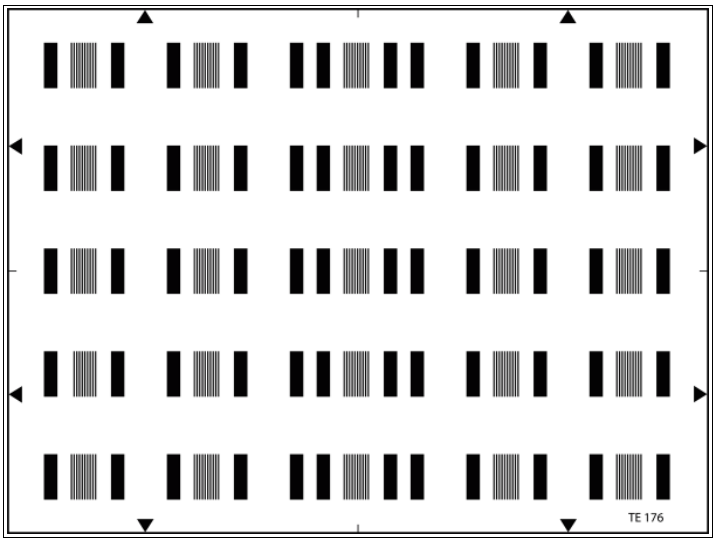
RESOLUTION TEST CHART

REFLECTANCE



The test chart consists of alternating black and white bars with sharp transition (3-5 micrometers). The spatial variation of the density of these bars is a rectangular function of a cyclic ratio equal to 1. Two groups of bars with video frequencies of 0.5 and 5 MHz are distributed over the picture area whereby the 9 outer and middle positions each are essential for the measurements (the vertical, horizontal and diagonal axes, 10% within the extremities).

The equivalences of video and spatial frequencies are:

CCD format	video frequency	cycles / mm	TVL / picture hight
2/3 inch	0.5 Mhz 5.0 MHz	5.9 59	39 390
1/2 inch		8.1 81.2	39 390

Measuring equipment: Video oscilloscope or preferably video oscilloscope with memory

Measuring conditions: The camera settings must be as follows

Shading correction: ON
Aperture correction: OFF
Gamma correction: OFF
Contour correction: OFF
Color correction: OFF

Iris: F/5.6 for 2/3" CCD, F/4 for 1/2" CCD

The test chart is evenly illuminated so that for the low frequency burst at 0.5 MHz the amplitude of the video signal at the output of the correctly positioned and focussed camera is 0% (0V) for the black bars and 100% (700mV / 75 Ohms) for the white bars.

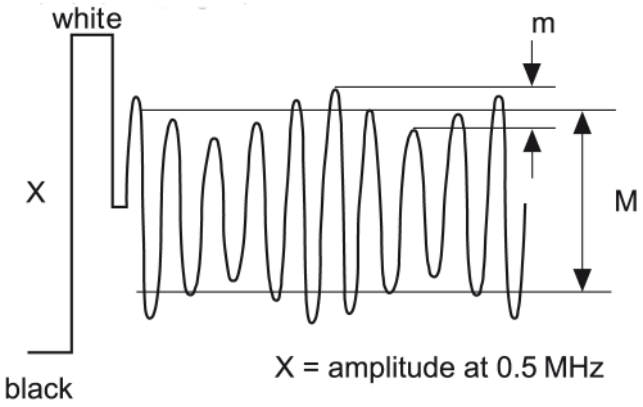
Care must be taken to avoid clipping of the signal to be measured at the black and white level. Measurements can be made on the various camera output signals, but preferably on the Y luminance signal (or coded Y with perfect B and W balance). The measurement is made at the center of the image but also on the edges and at the corners so that account is taken of the lateral chromatic aberrations of the lens. The measurements give the contrast lost of the camera response at the value of 5 MHz. The obtained response is a contrast transfer function (CTF).

The relation to calculate the MTF according to the CTF is:

MTF(N) = π/4[CTF(N) + 1/3CTF(3N) – 1/5CTF(5N) + 1/7CTF(7N) – 1/9CTF(9N) + 1/11CTF(11N)..]

where N is the spatial frequency of the test chart analyzed; N in TVL/H

In the - probable - case of a beat affecting camera response for a given spatial frequency, and under certain conditions only, the measured signal reassembles an amplitude-modulated carrier signal, as shown in the following figure:



The percentage of modulation is then defined by the relation:

% mod = M / X

signal

The interference ripple bat this frequency is given by:

p% = m / M

The results of the measurement may be presented in the form of a table representing the various areas of the image measured.

CTF Values at 5 MHz

xxx %	xxx %	xxx %
xxx %	xxx %	xxx %
xxx %	xxx %	xxx %