



# MARYLAND TELECOMMUNICATIONS, INC.

Baltimore, Maryland

## INSTRUCTIONS FOR MTI RESOLUTION CHART

### GENERAL

The MTI Resolution Chart is designed to provide a standard reference for measuring resolution for television cameras and as an aid in determining streaking, interlace, scanning linearity, ringing, aspect ratio and gray scale reproduction of Vidicon and Image Orthicon Television Cameras.

Notice that the Resolution Chart has been arranged to allow resolution measurements in excess of 1,000 lines. Previous charts were limited to 600 or 800 lines of resolution.

### HORIZONTAL AND VERTICAL RESOLUTION

The center horizontal and vertical wedges are composed of four black lines separated by three equal widths of white lines. The numbers printed next to the wedges correspond to the total numbers of lines, black and white, of the indicated thickness which may be placed adjacent to one another in the height of the Chart. Generally, it can be considered that in horizontal resolution of most Camera Chains the limiting factor is the Image Orthicon or Vidicon Tube used. You may read the resolution of the camera tube when scanning has been adjusted to an aspect ratio of 4 to 3 directly from the test pattern.

### GRAY SCALE

The four ten-step gray scales cover a contrast range of approximately 30 to 1. These steps are arranged in a logarithmically decreasing values of reflectance, such that the difference in reflection density between adjacent steps is approximately 0.16.

The gray scale reproduction achieved will depend on the amount of gamma correction employed, the manner in which the camera tube is operated, and the adjustment of the picture monitor. The user will have to standardize these conditions if comparative subjective measurements are to be made.

### SHADING

Shading may be checked by visual inspection of the picture monitor to determine if the background is an even gray (and the same number of gray steps are discernible on all four gray scales.) A waveform monitor may also be used to determine if the average picture signal axis is parallel to the black level line in both line and field frequencies.

### STREAKING

The horizontal black bars at the top and bottom of the large circle are a useful device to indicate low frequency phase shift or poor DC restoration. We have added to this chart the symbol MTI white on a black background and black on a white background to aid in checking the center areas of the picture. The bars and MTI symbols are also useful for adjusting the high peaking circuits generally used in camera chains to compensate for high frequency roll-off of the coupling network between the camera tube and the first video amplifier.

### INTERLACE

The four diagonal black lines inside the square formed by the gray scales may be used to check for interlace. If these lines appear to be jagged partial pairing is occurring of the interlaced lines. This is not a positive test when even and odd fields exactly overlap but the vertical resolution will be reduced to an extent that it will be immediately evident.

### RINGING

The two portions of single line widths are located in the upper right and lower left portions of the circle are used for checking ringing. Since ringing may occur at a multiple of the vertical wedge spacing, these single lines have been included for this purpose.

### OTHER CHECKING FEATURES OF THIS TEST PATTERN

Notice that the corner circles in the 1962 Test Pattern have been modified to allow for resolution checking to 700 lines in the corners. Linearity may be checked in both the horizontal and vertical directions by noting the 200-line pairs of bars on the right and left hand side of the pattern together with the 200-line portion of the wedge, and the vertical 200-line bars at the top and bottom of the test pattern together with the 200-line portion of the horizontal wedge. If the spacing appears to be different in any section of these 200-line bars, linearity is not what it should be. Another feature of this pattern over other patterns is that the edges of the test pattern are indicated by black arrows and are more easily seen than white arrows in most cases.

This test pattern is available in a transparency form or a photographic enlargement dry mounted on stiff cardboard stock. Prices are available upon request.