

June 1970

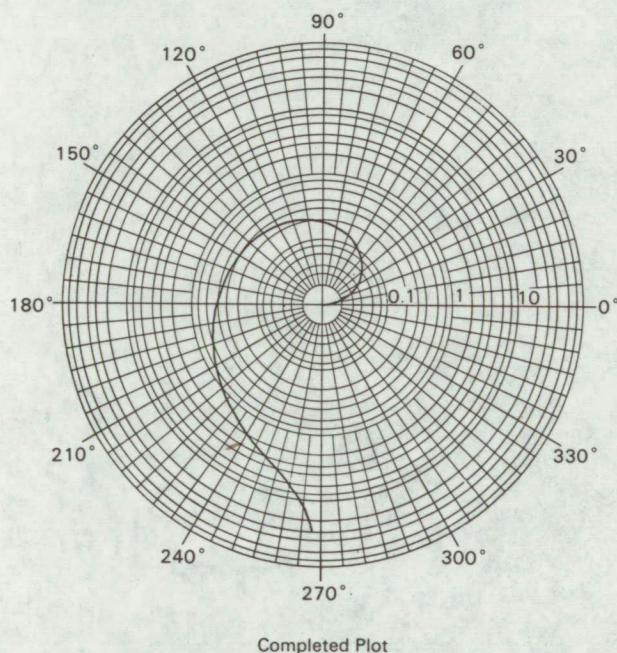
Brief 70-10311

# NASA TECH BRIEF



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## Computerized Polar Plots by a Cathode Ray Tube/Grid Overlay Method



### The problem:

To develop a technique for producing fast, accurate Nyquist (frequency-response phase/amplitude) plots.

### The solution:

Use a CRT plotter with a transparent grid overlay. The overlay is aligned with four calibration dots and therefore is not affected by CRT drift or changes in vertical or horizontal gain.

### How it's done:

The plot tapes are programmed to plot the data trace, the four calibration dots, and the labeling. The plots are traced on special paper producing a perma-

nent, hard copy. A grid overlay is chosen that aligns with the calibration dots on the hard copy plot (see Figure) and the two are taped together.

Rapid and accurate hard copy printouts and duplicates of polar grid plots or tracings can be obtained using this method. Advantages are: (1) plot is not affected by cathode ray tube; (2) changes in vertical and horizontal gain do not affect the reading; (3) data trace is traced four times (producing heavier line weight); and (4) previous methods produced about 6 plots per hour; this method produces over 50.

The grid overlays are made by drawing the grid pattern, 16 inches in diameter, on a polyester resin and then reducing to a standard 6 inch size.

### Notes:

1. This innovation may be of interest to personnel engaged in industrial research, educational research, and industrial temperature/pressure monitoring. The technique can be used wherever polar plots established from a computer are utilized.
2. No additional documentation is available. Specific questions, however, may be directed to:

Technology Utilization Officer  
Marshall Space Flight Center  
Huntsville, Alabama 35812  
Reference: B70-10311

### Patent status:

No patent action is contemplated by NASA.

Source: Edward L. Shoup and James M. Freeman of  
The Boeing Company  
under contract to  
Marshall Space Flight Center  
(MFS-14464)

Category 03