

# NASA TECH BRIEF



This NASA Tech Brief is issued by the Technology Utilization Division to acquaint industry with the technical content of an innovation derived from the space program.

## Use of Photographs Speeds Inspection of Printed-Circuit Boards

**The problem:** Visual inspection of printed-circuit boards by reference to engineering drawing is tedious and involves a high error incidence.

**The solution:** Superimpose, on a single screen, the projected images of the printed-circuit board and the original drawing, photographed in complementary colors.

**How it's done:** A monochromatic photographic transparency of the original engineering drawing and a complementary colored photographic transparency of the completed printed-circuit board are projected onto a screen so that they are exactly superimposed. Deviations from the original drawing will be immediately seen. In the case of lines that are too narrow, the color of the transparency of the original will be seen. In the case of a node, or enlarged place, the color of the transparency of the printed circuit board will show. In the case of a line or lines out of place, both colors will be seen. In any such instance, defects will be immediately detected and the original engineering drawing becomes a quick, simple criterion of inspection. In lieu of preparing

transparencies of the finished circuit boards, colored images of the boards could be reflected onto the screen by using an opaque projector with appropriate filters.

### Notes:

1. This innovation may be used for visual comparison of any two-dimensional pattern reproduction against the original.
2. For further information about this innovation inquiries may be directed to:  
Technology Utilization Officer  
Manned Spacecraft Center  
P.O. Box 1537  
Houston, Texas 77001  
Reference: B64-10118

**Patent status:** NASA encourages commercial use of this innovation. No patent action is contemplated.

Source: International Business Machines  
under contract to  
Manned Spacecraft Center (MSC-72)