

# NASA TECH BRIEF



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## A Thirty-Six Element Array Antenna System

### The problem:

To design an antenna system which does not require the movement of the antenna or the presence of an operator.

### The solution:

Use a thirty-six element square array, with mutual coupling between crossed slots for array elements as an electronically scanned tracking antenna.

### How it's done:

A mathematical model was built using actual values to determine operating characteristics of array elements in different beam scanning directions. This computer design technique was used to produce information pertaining to the number and configuration of antenna elements required for optimum scanning performance in multielement antenna arrays. The information gained through this study indicates that the crossed slot arrangement produces a nearly hemispherical pattern and the resultant beam may be scanned through the entire hemisphere by means of

thirty-five digital phase shifters. These are capable of shifting phase in  $22.5^\circ$  increments from  $0^\circ$  to  $360^\circ$ .

### Notes:

1. This innovation may be of interest to designers and manufacturers of microwave antenna systems.
2. Documentation is available from:

Clearinghouse for Federal Scientific  
and Technical Information  
Springfield, Virginia 22151  
Price \$3.00

Reference: TSP69-10390

### Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

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Category 01