NASA TECH BRIEF

Ames Research Center

Improved 135.6-MHz Antenna

A commercially available four-element array can be readily modified to receive 135.6-MHz signals of the kind which are transmitted by the Applications Technology Satellite (ATS). Ordinarily, specially designed antenna arrays must be used for this purpose in order to recover very weak high-speed data pulses in noisy environments; moreover, ordinary antennas are extremely sensitive to ionospheric polarization rotation. For example, a typical commercial high-performance four-element array provides about 16 db of gain compared to a linearity polarized dipole, but the polarization ellipse is about 10 db.

The directibility of each of the four elements of a commercially available antenna is improved by lengthening them, repositioning the feed elements, and changing the total element-to-element spacing to 1.38 λ in both planes; a new quarter-wave section is included for impedance matching and for generating circular polarization with minimum signal loss. Appropriate lengths of phasing and matching elements are made of low-loss foam-filled coaxial cable.

An antenna modified as indicated provides a gain of 19 db with a polarization ellipse of about 1.5 db; beam width in both planes is about 18° with side-lobe levels of about —13 db.

Note:

Requests for further information may be directed to:

Technology Utilization Officer
Ames Research Center
Moffett Field, California 94035
Reference: TSP 73-10500

Patent status:

NASA has decided not to apply for a patent.

Source: Emanuel H. Gross
Ames Research Center
(ARC-10743)

Category 02