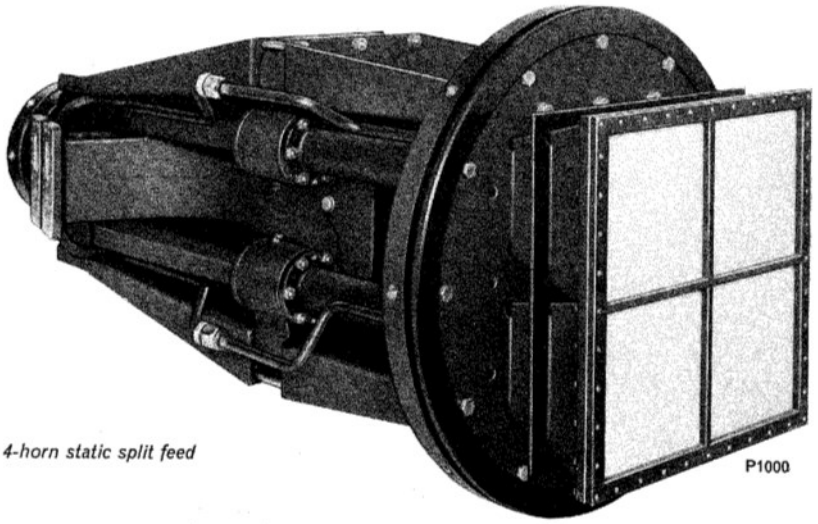
Aerial Feeds for Satellite Communications

The Marconi Company has amassed a wealth of experience over many years in the design of microwave aerials for radar, radio communications and weapon systems and is now able to offer feed systems for satellite communication purposes covering all likely requirements in both the civil and military fields. Designs have been built for a four-horn static split system in the military band, and conical scanning systems in the civil band. Designs also exist for conical scanning in the military and static-split in the civil bands. In all cases, in association with the appropriate reflector systems, the Gain/Noise Temperature (G/T) ratios required for presently-envisaged satellite systems can be met with some performance margin. It is recommended that for most applications, a dual reflector system using a quasi-paraboloid/hyperboloid configuration should be used. This combination results in an improvement in gain of up to 1 dB over conventional systems. Computer programmes are available for defining optimum profiles.



4-horn static split feed

P1000

4-Horn Static Split Feed Application

For use with 40 ft diameter Cassegrain reflector system.

DATA SUMMARY

Frequency band:
Receive 7250–7750 MHz.
Transmit 7900–8400 MHz.
Polarization: Circular.
Gain: 58·3 dB (65% efficiency at horn aperture), 8000 MHz.

Single Horn Feed Application

For use with 42 ft diameter Cassegrain reflector system, with rotating off-set sub-reflector for conical scanning.

DATA SUMMARY

Frequency band:
Receive 4045–4195 MHz.
Transmit 6275–6425 MHz.
Polarization: Linear, steerable by remote control with tell-back.
Gain:
At 4120 MHz 53·4 dB (71·9% efficiency at horn aperture).
At 6350 MHz 56·7 dB (64·5% efficiency at horn aperture).

Single Horn Feed Application (incorporating Mode Conversion Scanning)

For use with 90 ft diameter Cassegrain reflector system.

Rotating feed with beam off-set on beacon frequency only.

DATA SUMMARY

Frequency band:
Receive 3700–4200 MHz.
Transmit 5925–6425 MHz.
Polarization: Circular or Linear, steerable by remote control, with tell-back.
Gain:
5925 MHz 62·9 dB (67% efficiency at horn aperture).
4000 MHz 60·2 dB (80% efficiency at horn aperture).

A mode conversion section section at the throat of the horn provides beam off-set at beacon frequencies only. Horn rotation at up to 1000 r.p.m results in a conical scan at these frequencies.

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