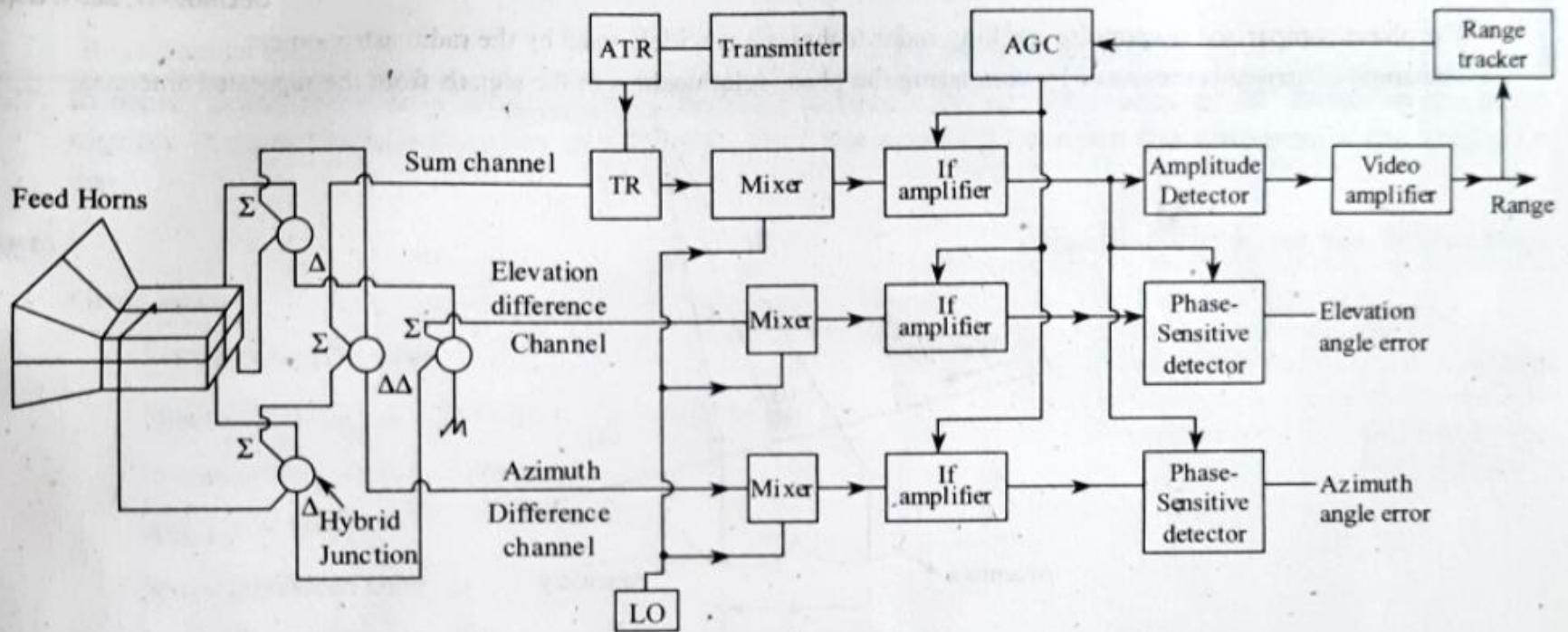**Ans:**

Figure (1) illustrates the block representation of amplitude comparison monopulse tracking radar.

Figure (1): Block Diagram of Two-Coordinate (Azimuth and Elevation) Amplitude-comparison Monopulse Tracking Radar

The cluster of four feeds is used, which generates four partially overlapping antenna beams. These feeds are used with a parabolic reflector, casse-grain antenna or a lens. These feeds are used to generate the sum pattern. The sum of two adjustment feeds are taken to form the difference pattern by subtracting it from the sum of other two adjacent feeds.

Three mixers are used as shown in figure (1). These three mixers are operated from a signal local oscillator to maintain the phase relationships between the three channels.

Two phase sensitive detectors are used to extract the angle error information, one for Azimuth and the other for elevation.

The signal amplification takes place at the IF amplifier stage. After amplification, the compensating delays are introduced, which in turn brings the sum signal and two difference signals in time coincidence. The signals after passing through AGC are provided to phase detector, of which, Elevation angle error and Azimuth angle error are extracted.

The ideal feed-illuminations for a mono pulse radar is as shown in figure (2). It is a five-horn feed illumination, one is for generating sum pattern and other four for difference pattern.
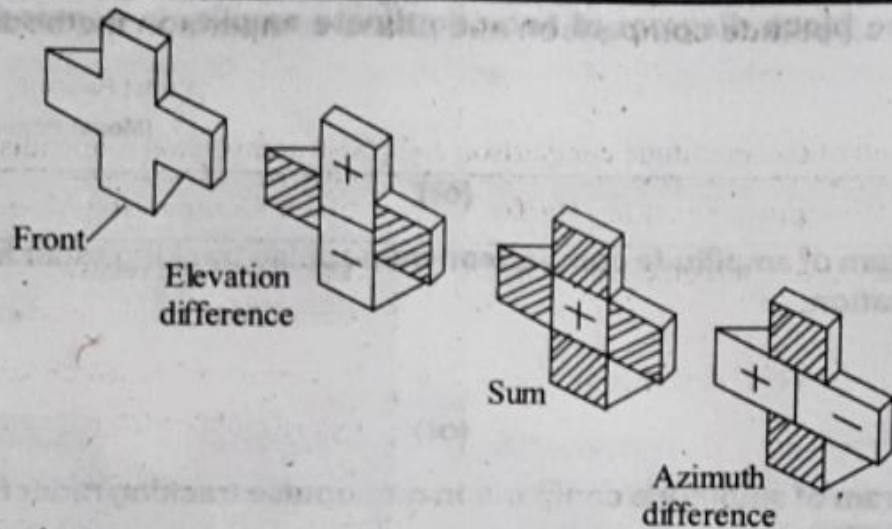
Figure (2): Approximately "Ideal" Feed-Aperture Illumination for Monopulse Sum and Difference Channels

Q25. Explain the principle of operation of phase comparison monopulse tracking radar.