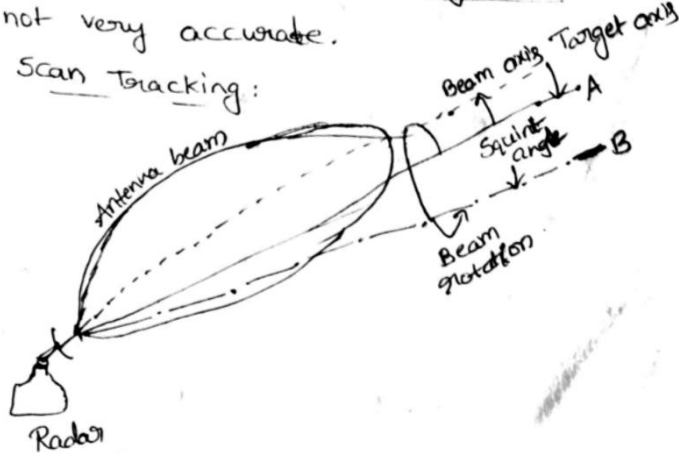


It is not very accurate.

Conical Scan Tracking:



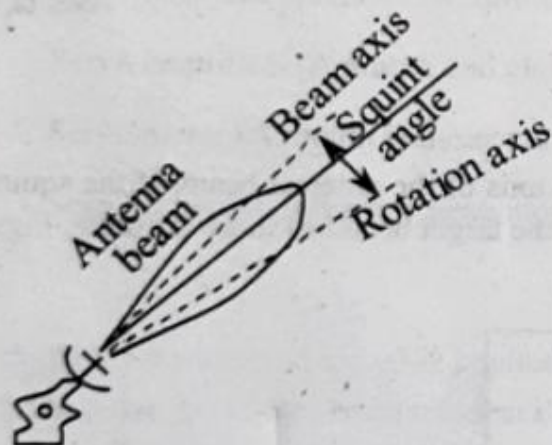
Pic. Conical Scan tracking

- A logical extension of the simultaneous lobing is to rotate continuously on offset antenna beam rather discontinuously step the beam between fixed positions. This is known as Conical Scanning.
- The angle between the axis of rotations and the axis of antenna beam is called the Squint angle.
- Consider a target at position A. The echo signal will be modulated at a frequency equal to the rotations frequency of the beam.
- The amplitude of the echo signal modulation will depend upon the shape of the antenna pattern, the Squint angle and the angle between the target line of sight and the rotation axis.
- The phase of the modulation depends on the angle between the target and the rotation axis.
- The Conical Scan modulation is extracted from echo signal and applied to a Servo-Control System which continuously positions the antenna on the target.
- Note that two ~~servos~~ are required because the tracking problem is two dimensional. Both the rectangular and polar tracking Co-ordinates may be used.
- When the antenna is on-target as in B fig (1) the line of sight to the target and the rotation axis coincide and the Conical Scan modulation is zero.

Comparison between conical scan and sequential lobing is given below.

Conical Scan

1. The transmitting antenna continuously rotates on its axis in the proximity of target.
2. The position of the target is found from the conical scan modulation (Modulation is applied on the echo signal).
3. The angle between the axis of rotation and the axis of antenna beam is known as squint angle.

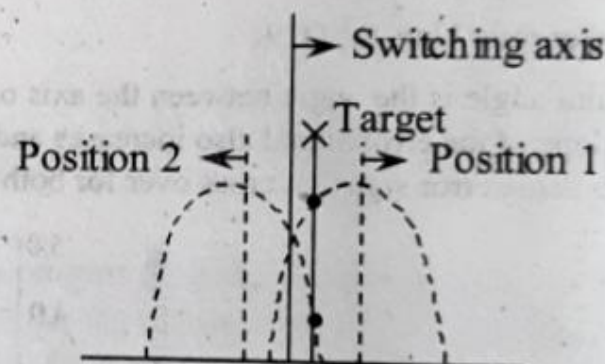


Figure

4. The echo signal obtained is modulated at a frequency equal to the rotational frequency of the beam generated by antenna. The amplitude of this echo signal modulation is based on the angle between the target and the rotational axes. This conical scan modulation is extracted from the echo signal and applied to servo control systems that can change the position of antenna towards the target.
5. The target is finally found when the line of sight of the target and the rotation axis coincide and the conical axis modulation is zero.

Sequential Lobing

1. The transmitting antenna is switched between positions with respect to reference direction in the proximity of target. The reference direction is generally the axis of rotation.
2. The position of target is found from the measure of equality of the signals from the switching positions.
3. The angular difference between the target position and reference direction (Usually the axis of antenna) is angular error.



Figure

4. This technique neither employs modulation of echo signal nor uses servo-control systems. Here, the angular displacement of the target is given by the difference of the signal voltage amplitudes obtained from the switching positions and the sign of this difference gives the angular direction of the target.
5. The target is found when the angular error is equal to zero or the signal voltages obtained from switched positions are equal.