

AMEC27 RADAR ENGINEERING

UNIT-1 AN INTRODUCTION TO RADAR

- 1.1 Basic Radar , The Simple Form of the Radar Equation,
- 1.2 Radar Block Diagram, Radar Frequencies,
- 1.3 Application of Radar, The Origins of Radar

UNIT-2 THE RADAR EQUATION

- 2.4 Detection of Signals in Noise, Receiver Noise and the Signal-to-Noise Ratio,
- 2.5 Probability Density Functions, Probabilities of Detection and False Alarm,
- 2.6 Integration of Radar Pulses, Radar Cross-Section Fluctuations,
- 2.7 Transmitter Power, Pulse Repetition Frequency,
- 2.8 Antenna Parameters, System Losses,
- 2.9 Other Radar Equation Considerations

UNIT-3 MTI AND PULSE DOPPLER RADAR

- 3.1 Doppler and MTI Radar, Delay-Line Cancelers,
- 3.2 Staggered Pulse Repetition Frequencies, Doppler Filter Banks, Digital MTI Processing,
- 3.3 Moving Target Detector, Limitations to MTI Performance,
- 3.4 MTI from a Moving Platform (AMTI), Pulse Doppler Radar, Other Doppler Radar Topics

UNIT-4 TRACKING RADAR

- 4.1 Tracking with Radar, Monopulse Tracking,
- 4.2 Conical Scan and sequential Lobing,
- 4.3 Limitations to Tracking Accuracy, Low-Angle Tracking,
- 4.4 Tracking in Range, Other Tracking Radar Topics,
- 4.5 Comparison of Trackers,
- 4.6 Automatic Tracking with Surveillance Radars (ADT)

UNIT-5 DETECTION OF SIGNALS IN NOISE

- 5.1 Matched-Filter Receiver, Detection Criteria, Detectors,
- 5.2 Automatic Detection, Integrators, Constant-False-Alarm Rate Receivers,
- 5.3 The Radar Operator, Signal Management

UNIT-6 INFORMATION FROM RADAR SIGNALS

- 6.1 Basic Radar Measurements, Theoretical Accuracy of Radar Measurements,
- 6.2 Ambiguity Diagram, Pulse Compression, Target Recognition

Reference Books:

2. Waveform Design and Diversity for Advanced Radar Systems (Electromagnetics and Radar)” by Fulvio Gini and Antonio de Maio
3. Advanced Radar Techniques and Systems” by Gaspare Galati