

## INDEX TO LECTURE NOTES

(ver5.0)

Active array	III-79	Chaff	IV-107
Airborne MTI	II-47	Chirp	III-22
Adaptive antenna	IV-143	Chirp complications	III-31
Albershiem's formula	I-91	Circulators	II-4, III-116
Altitude return	II-55	Clutter	I-41
Ambiguity function	III-10	Clutter area	II-48
Amplifier	III-125	Clutter attenuation	II-68
AN/APS-31	IV-18	Clutter improvement factor	II-68
AN/APS-200	II-64	Clutter (surface) reflection	II-52
Angel echoes	IV-95, IV-98	Clutter return	II-48
Angular accuracy	III-21	Clutter spectrum	II-55
AN/PPS-6	IV-16	Coherent pulse train	I-76, II-80, II-97
AN/SPS-40	IV-20	Coherent sidelobe canceler (CSLC)	IV-139
AN/SPS-64	IV-12	Collapsing loss	II-6
AN/TPQ-37	IV-2	Complex signals	III-9
AN/SPS-67	IV-14	Conical scan antenna	II-104, IV-137
Antenna arrays	III-53	Coordinate systems	I-35
Antenna as radar target	I-108	Corner reflector	I-125
Antenna far field	III-39	Cosecant-squared pattern	III-68
Antenna gain	I-15, III-41	Cross eye jamming	IV-135
Antenna imperfections	III-107	Cross range	IV-31
Antenna pattern control	III-65	Continuous wave (CW) radar	II-23, II-27
Antenna polarization	I-16, III-44	dBZ	IV-94
Antenna radomes	III-104	Decibel (dB)	I-47
Antennas	III-35	dBsm	I-102
Antenna RCS	I-108	Delay Line canceler	II-39
Antenna scanning modulation	II-93, II-106	Diffuse scattering	II-53
Antenna temperature	II-8, III-74	Digital pulse compression	III-32
Aperture antenna	III-39, III-45	Digital beamforming	III-98
Aperture efficiency	III-67	Directive gain	III-41
Apparent Range	II-43	Discrete Fourier transform	II-86
Array factor	III-54	Doppler filtering using DFT	II-87
Attenuation constant	I-7	Doppler frequency shift	II-19
Average power (time-averaged)	I-100	Down range	IV-31
B-2	I-133	Duplexer (antenna switch)	I-33, III-115
Barker sequences	III-33	Dwell time	I-97
Bandlimited signal	I-82	Eclipsing	II-40
Beam solid angle	III-41	Effective temperature	II-7, I-53
Beamshape loss	II-5	Electromagnetic waves	I-1
Beam coupling loss	III-78	Electromagnetic spectrum	I-18
Beamwidth limited	II-50	Element factor	III-54
Beat frequency	II-30	Equivalent earth radius	II-125
Bistatic radar	I-23, IV-112	F-117	I-132
Blind speeds	II-67	False alarm	I-49
Boltzman's constant	I-48	Filters	I-51, III-118
Bragg scatter	IV-98	Fluctuating targets	I-112, I-117
Butler matrix	III-57, III-75	FMCW	II-30
Burnthrough range	I-58	FMCW complications	II-34
Carrier modulation	I-73	FMCW range determination	II-32

Fourier transform	I-68		
Frame area (for search)	II-101	Matched filter max SNR out	III-5
Free electron laser	III-140	Maximum detection range	I-32
Frequency bands	I-19, I-20	Method of images	III-60
Fresnel (specular) reflection	I-9	Miss	I-49
Gain control	II-107	Mixers	III-119
Gaussian PDF	I-63	MMIC	IV-100
Gaussian beam	II-5, II-51, II-109	Modulation (mixing)	I-73
Gaussian noise (white noise)	I-48	Monopulse antenna	III-101
Glint	II-114	Monopulse tracking	II-110
Grating lobe	III-56	Monopulse tracking errors	II-115
Ground penetrating radar	IV-152	MTI improvement factors	II-94
Ground plane image	III-60	MTI limitations	II-92
Harmonic radar	IV-28	MTI Radar	II-36
Heterodyning/homodyning/mixing	I-73, II-21, III-1	Multiple beam antennas	III-75
HF radars	IV-54	Multipath	II-117
Height gain curve	II-123	Multiplexer	III-113
High PRF	II-46, II-59	Noise bandwidth	I-52
Hitchhiker radar	IV-113	Noise figure	I-59, II-7
I and Q representation	II-25, II-74	Noise power spectral density	III-1
Imaging of moving targets	IV-67	Noncoherent pulse train	II-97
Integration efficiency/improvement	I-98, I-120	Nutating feed	II-105
Intermodulation products	III-123	Nyquist sampling rate	II-82
Inverse SAR (ISAR)	IV-49	OTH radar parameters	IV-54
Isotropic surface	II-53	Parabolic antenna	III-46
Jammer	I-53, II-14, IV-139	Path gain factor	II-118
Klystron	III-133	Patriot radar	IV-7
Lambertian	II-54	PDF	I-60
Laser radar	IV-144	Phase shifter	III-89
Linear system	I-79	Plane wave	I-1, I-6, I-9
Loss due to absorption	II-25, II-74	Photonics	III-97
Loss due to rain	II-3	Police radar	I-54
Loss from mixer conversion	II-11	Power density	I-6, I-29
Low angle tracking	II-117	Power sources	III-129
Low noise amplifier (LNA)	III-79, III-87, III-125	PPI	I-36, IV-22
Low PRF	II-46, II-59	PRF	I-37, II-46
Low/Ultra-low sidelobes	III-64	Probability of detection	I-49, I-89
LPI radar	III-63	Probability of false alarm	I-49, I-86
Magic Tee	III-117	Propagation mechanisms	I-43, I-82, II-80
Magnetron	III-135	Pulse burst mode	II-91
Mainbeam clutter	II-56	Pulse compression	III-22
Mapping	IV-44	Pulse Doppler Radar	II-36
Mainbeam clutter	II-56	Pulse train	I-37, I-76, II-80
Mapping	IV-44	Pulse train spectrum	I-75
Matched filters	III-21	Pulse width limited	II-49

Quantization errors	II-92, III-90	SNR using integration	I-93
Radar block diagram	I-33	Solid angles	III-38, III-41
Radar classifications	I-26	Spherical wave	I-1, I-6, I-9
Radar displays	I-36, IV-22	Spillover efficiency	III-47
Radar functions	I-25	SPY-1 radar	IV-11
Radar horizon	II-126	Staggered PRFs	II-42, II-71
Radar range equation (RRE)	I-28	Standard temperature	I-48
Radar tracking	II-104	Stepped frequency radar	IV-62
Radiation by line source	III-51	Surface clutter	II-48
Radiation intensity	III-41	Surface wave	I-129
Radiometers	IV-23	Swerling types	I-118
Radome	III-104	Switch (duplexer)	III-115
Range accuracy	III-15	Synchronous detection	II-74, II-78
Range ambiguity	I-38, II-41	Synchronous receiver	II-77
Range gate	I-39, II-89	System temperature	I-53
Range resolution	I-40, III-28, IV-31	Tapered aperture distributions	III-66
Rayleigh distribution	I-65	Tapped delay line	III-75
RCS	I-102	Target reflectivity	I-102, II-52, IV-88
RCS of cylinder	I-105	Thermal Noise	I-48
RCS of sphere	I-104	Threshold detection	I-30, I-49, I-86
RCS reduction methods	I-131	Time delay ranging	I-24
Reflection coefficient	I-10	Time on target	I-97, II-102
Refraction	I-11, II-124	Tracking	II-104
Resonance	IV-80, IV-108	Transformation of variables	I-67
Rician distribution	I-85	Transmission lines	II-4, III-110
Rotary joint	III-114	Transmit/receive module (T/R)	III-98
RRE	I-28	Transmitter characteristics	III-131
RRE for fluctuating targets	I-121	True time delay scanning	III-92
RRE for pulse integration	I-101	Traveling wave	I-129
RRE SAR	IV-46	Two-way beamwidth	II-51
Sampling theorem	II-81	Ultra-wideband radar	IV-72
SAR	IV-31	Ultrasonic radar	IV-86
SAR image	IV-45	Unambiguous range	I-38, II-42
SAR image resolution	IV-35, IV-44	Uncertainty relation	III-20
SAR, focused	IV-38	Velocity accuracy	III-19
SAR, motion compensation	IV-43	Velocity ambiguity	II-45
SAR, speckle	IV-47	Waveform parameters	III-142
SAR, unfocused	IV-36	Weather radar	IV-88
Scattering matrix	I-107	Wind shear	IV-93, IV-96
Scattering mechanisms	I-109		
SCR-270 radar	IV-9		
Sea shadow	I-134		
Sea states and clutter	II-62		
Search detection range	II-103		
Search radar equation	II-100		
Search volume	II-101		
Sequential lobing	II-104		
Shaping	I-124		
Sidelobe clutter	II-57		
Signal-to-jam ratio (SJR)	I-68		
Signal-to-clutter ratio (SCR)	II-52		
Signal-to-noise ratio (SNR)	I-53		
Slotted waveguide	III-62		
Smart antenna, smart skins	III-108		