Chapter 9 Television

Color video - RGB

Format – NTSC (PAL, SECAM), high definition TV (analog and digital)
Broadcasting – Local station, CATV, Satellite
Related Product – Computer monitors

Signaling –
525 lines vs. 625 lines
Aspect ratio of 4:3 vs. 16:9
Interlaced frames
Vertical scan rate: 30 Hz vs. 25 Hz refresh rate
Horizontal scan rate: 525 lines/frame x 30 frames/sec = 15.75 kHz
Resolution: 0.7-0.75 utilization factor

Information –
Composite video
Luminance (brightness); ~340 lines
Chrominance (color); 50-100 lines
Y=0.3R+0.5G+0.11B
I=0.6R-0.28G-0.32B
Q=0.21R-0.52G+0.31B
Blanking
H Sync
V Sync
Color burst

Bandwidth Allocation –
Luminance: AM vestigial side band; -0.75 MHz to 4.5 MHz from the carrier
Chrominance: QUAM VSBSC with sub-carrier at 3.58 MHz
Sound: FM with sub-carrier at 4.5 MHz

Receiver Design –
RF, IF, Video Detector, Audio IF, Audio Detector
Sync Separator
H Sync
V Sync
CRT: Control, acceleration, focusing, deflection, shadow mask, purity, convergence
RGB to Composite Video and vice versa

Modern TV Circuitry
Picture-in-picture (PIP)
Comb filter

CATV Signal Distribution
High-Definition TV
Analog MUSE system; 1125 lines, 8 MHz
Digital system; compression, 1920x1080, 6 MHz; 19.3 Mb/sec
Computer Monitors, LCD, Plasma, and Other Display Technologies