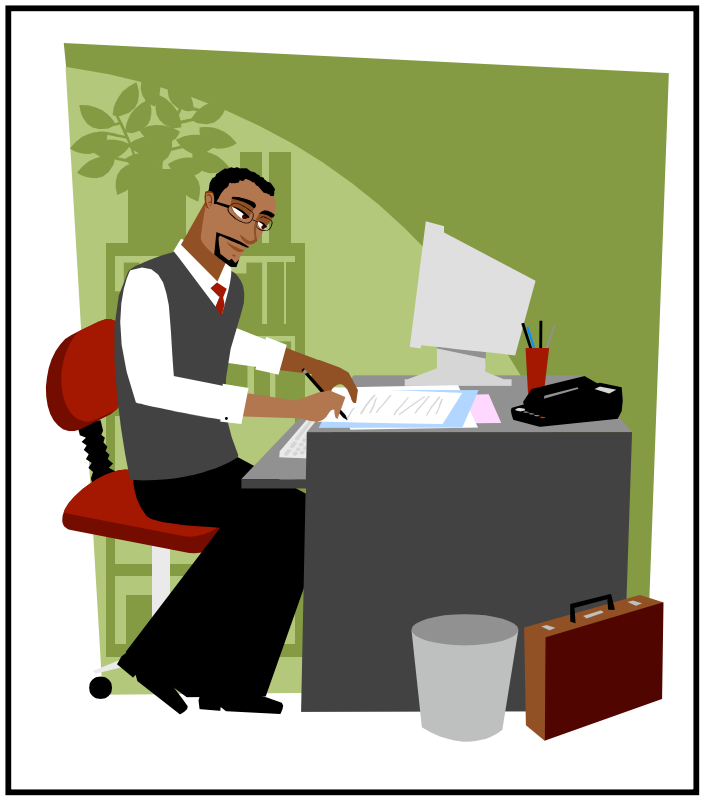
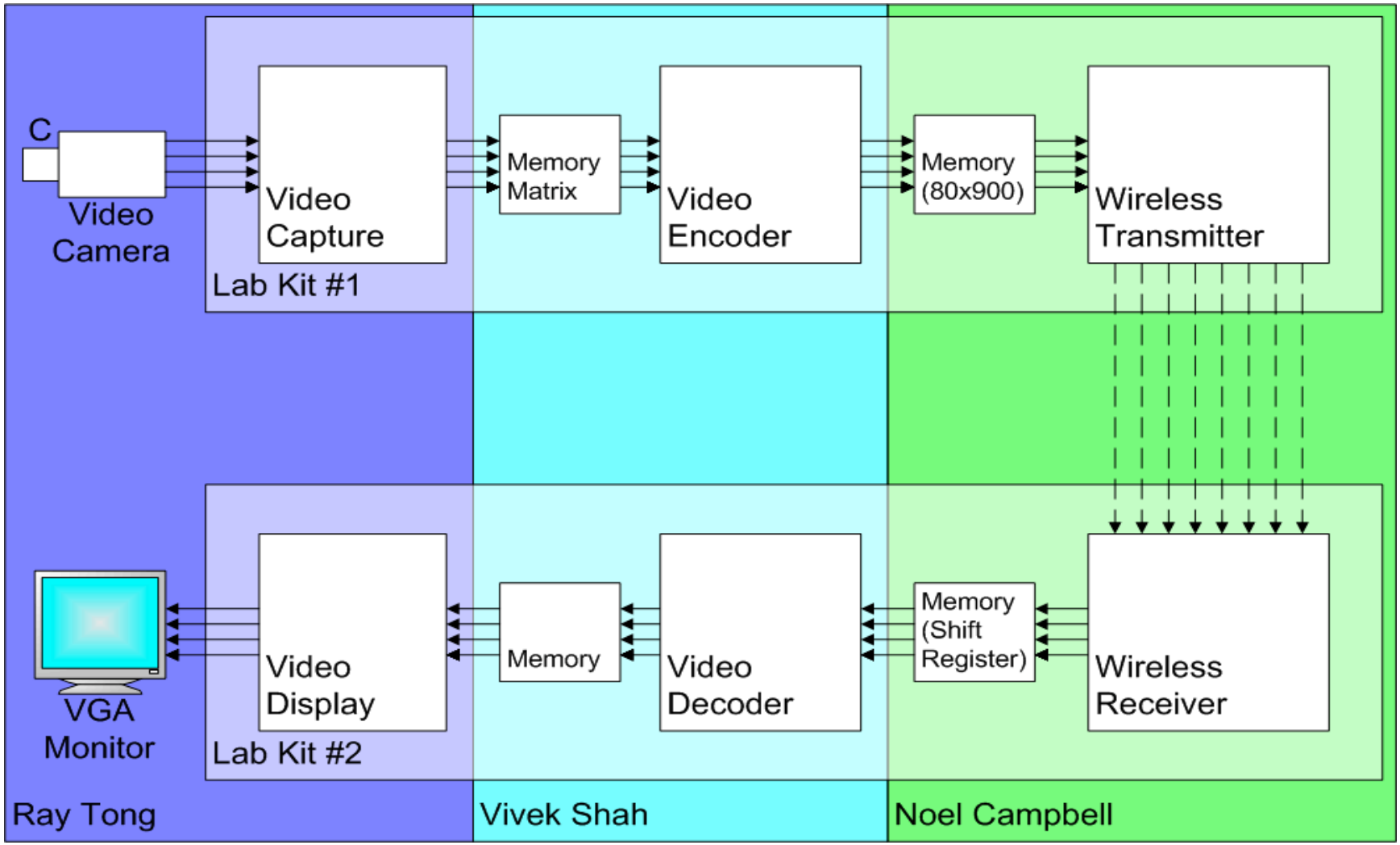
Wireless Security System



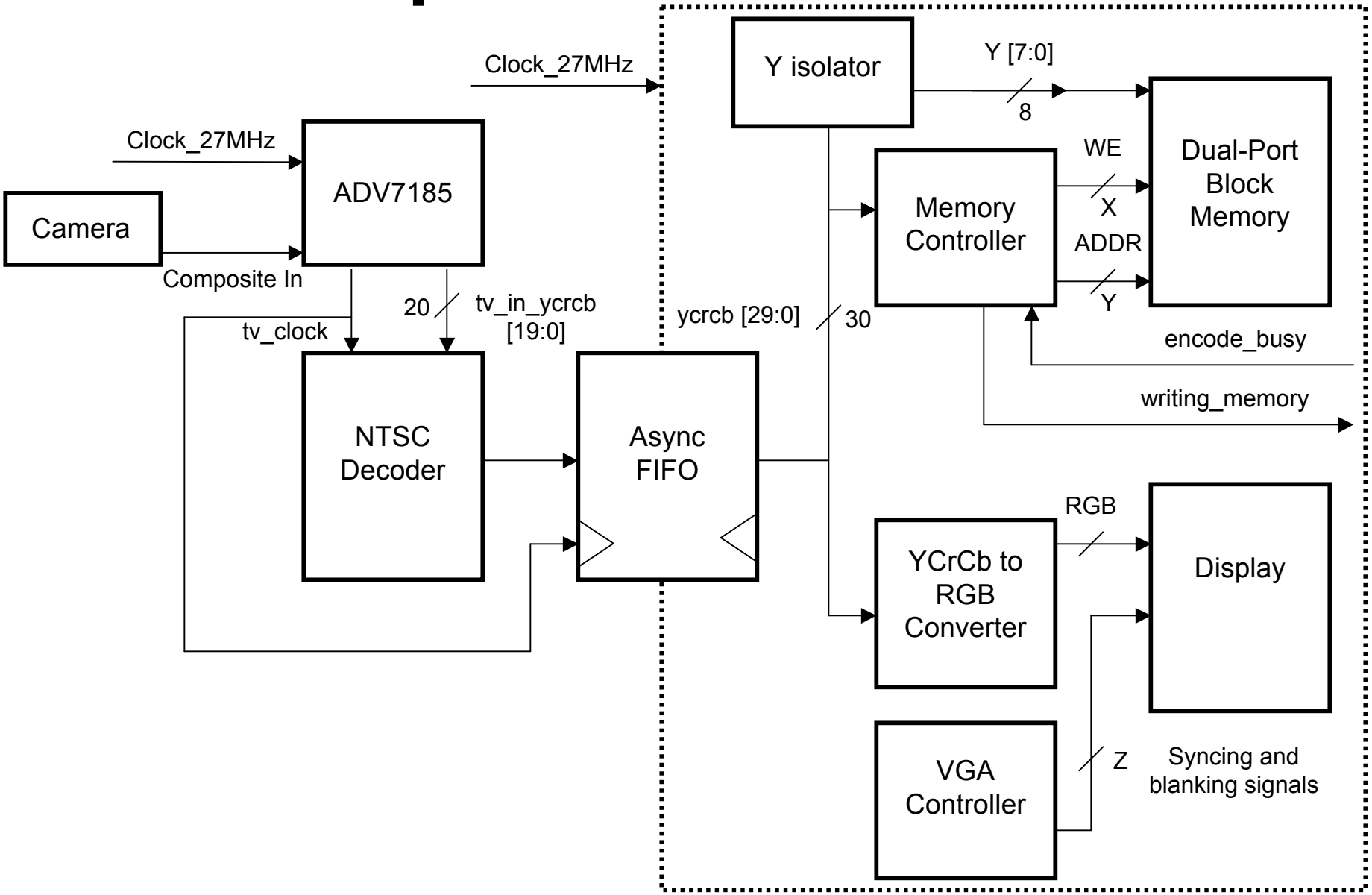
Noel Campbell
Vivek Shah
Raymond Tong

TA: Javier Castro

Video Surveillance Block Diagram



Video Capture Overview



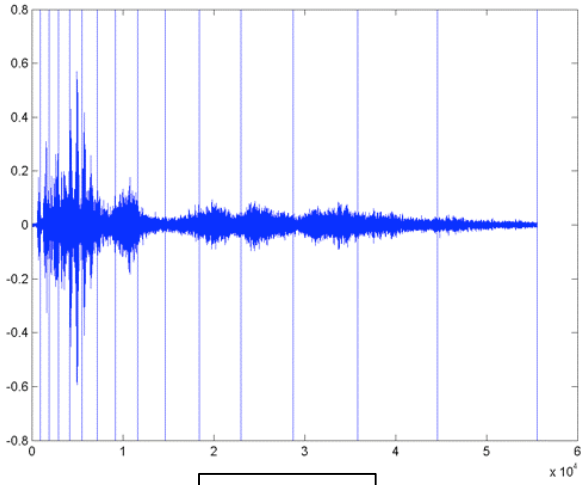
Technical Considerations

- Synchronization of data
  - ADV7185 clock vs lab kit 27 MHz clock
- Displaying data in VGA
  - Acquire 240 X 240 real time video
    - Write data to block memory then continuously read from it
- Memory Controller
  - Write a frame worth of data into block memory for encoding and transmission

Video Compression

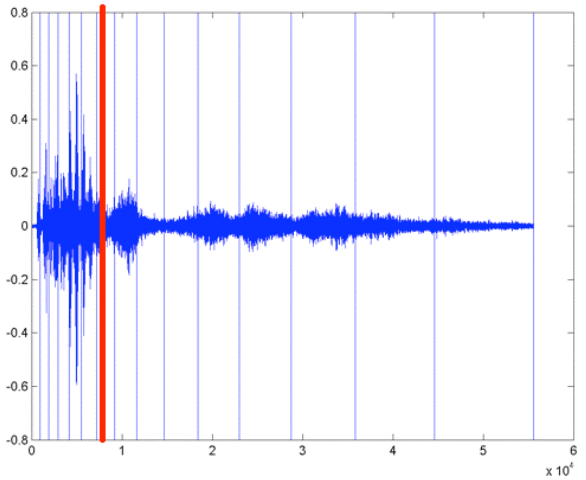
512 bits/block

Discrete Cosine Transform

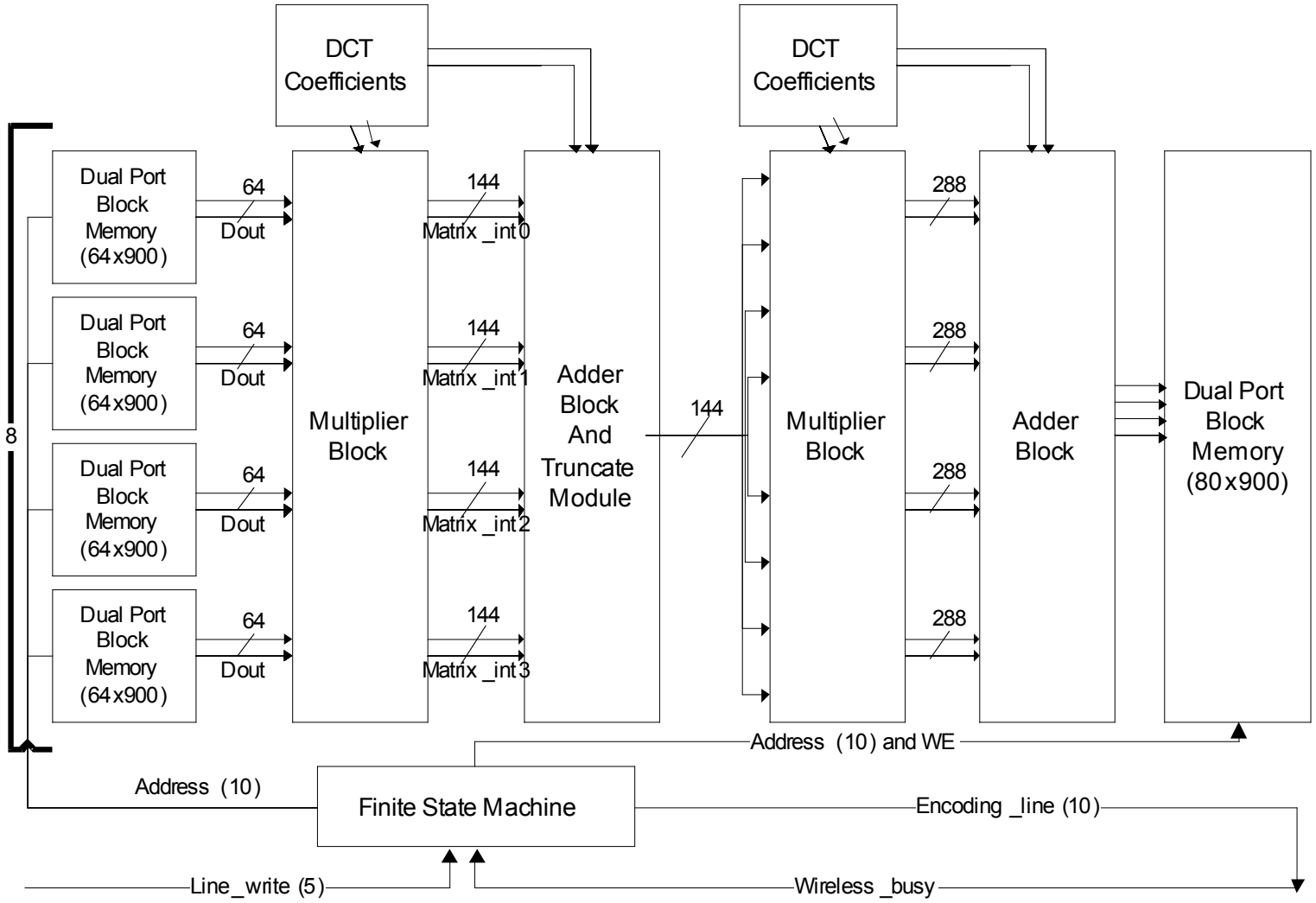


56 bits/block

Inverse Discrete Cosine Transform

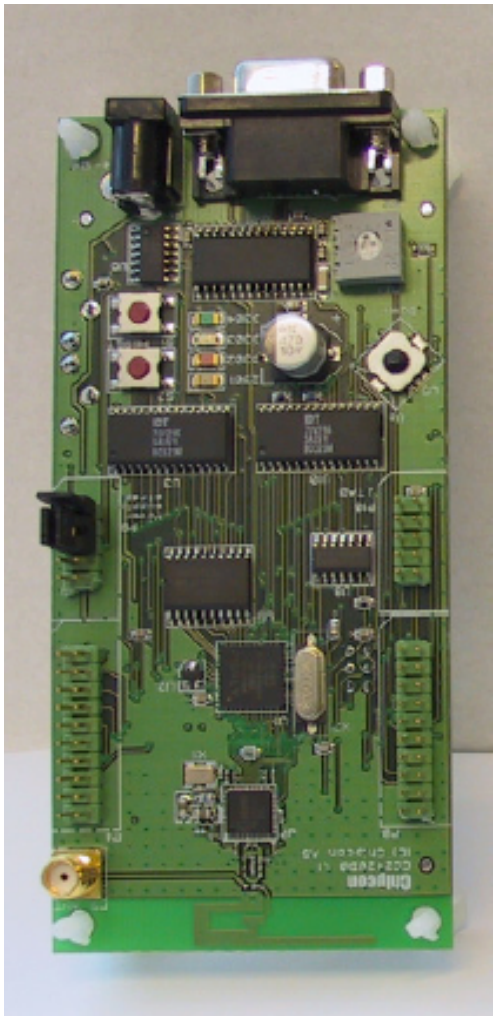


Video Encoder

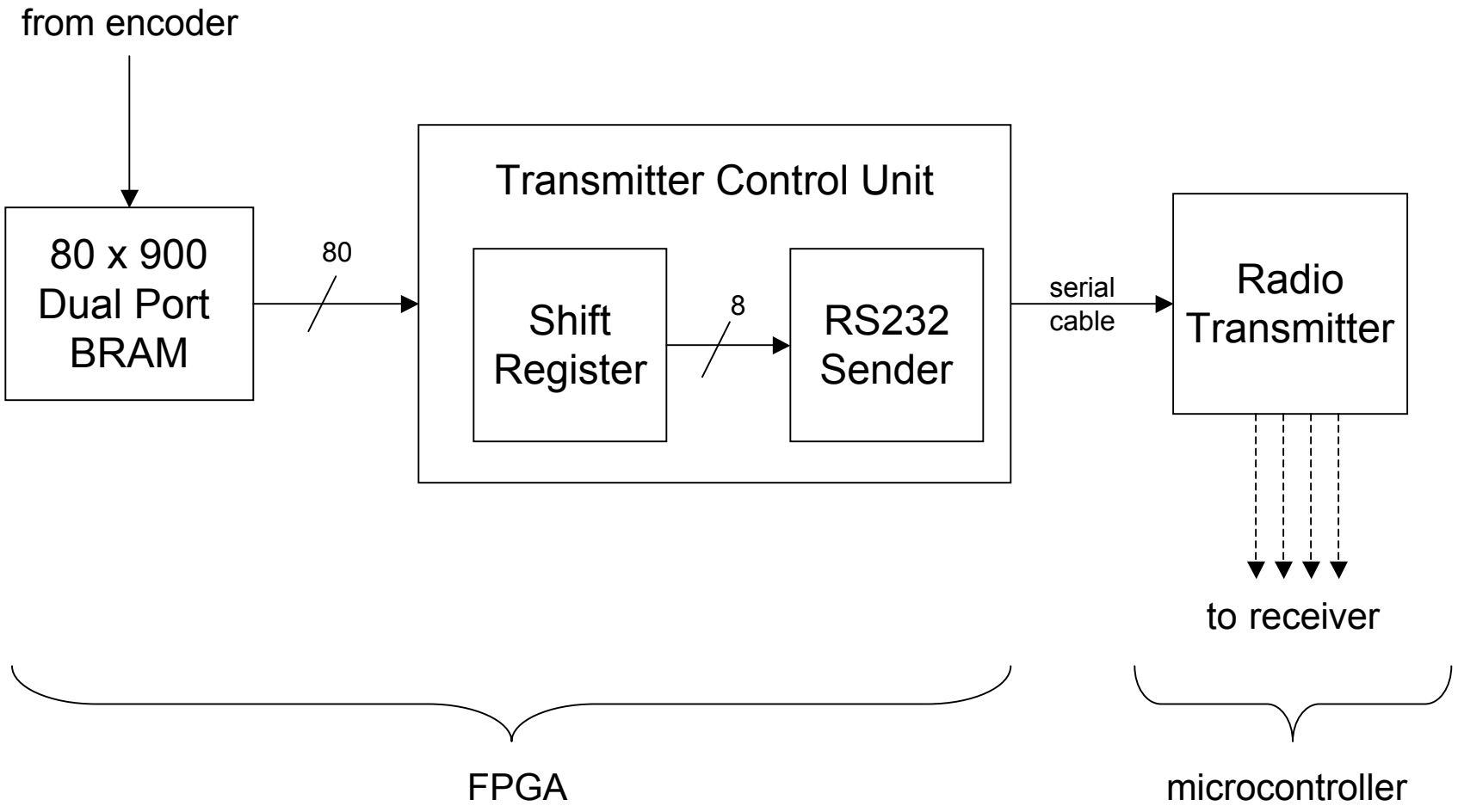


Wireless Transmission

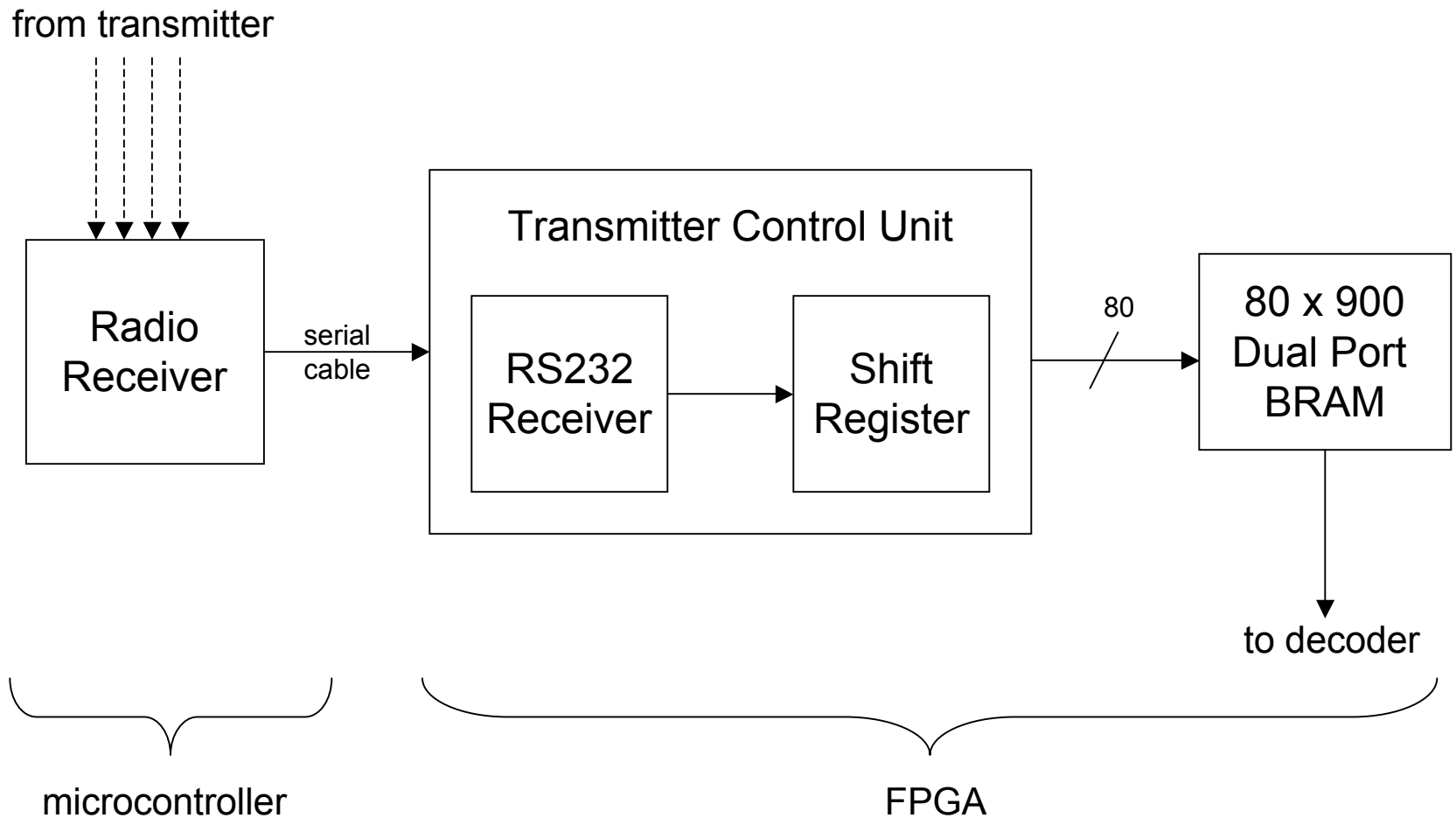
- Data is sent serially from the labkit to the wireless kit
- Data is assembled into packets and sent from camera-end to fixed-end via CC2420 radio
- Data is then sent serially from receiver wireless kit to the receiver labkit



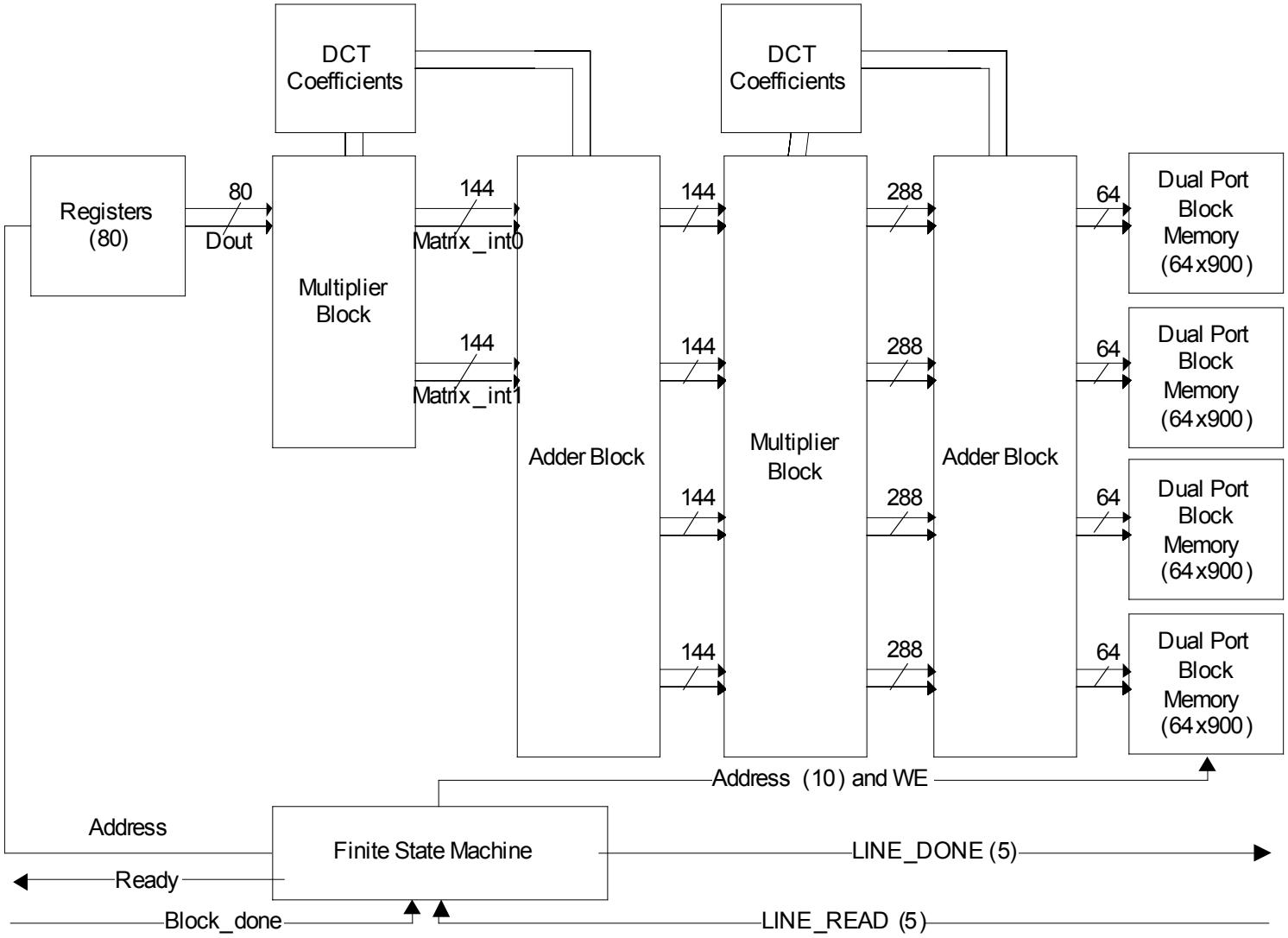
Transmitter



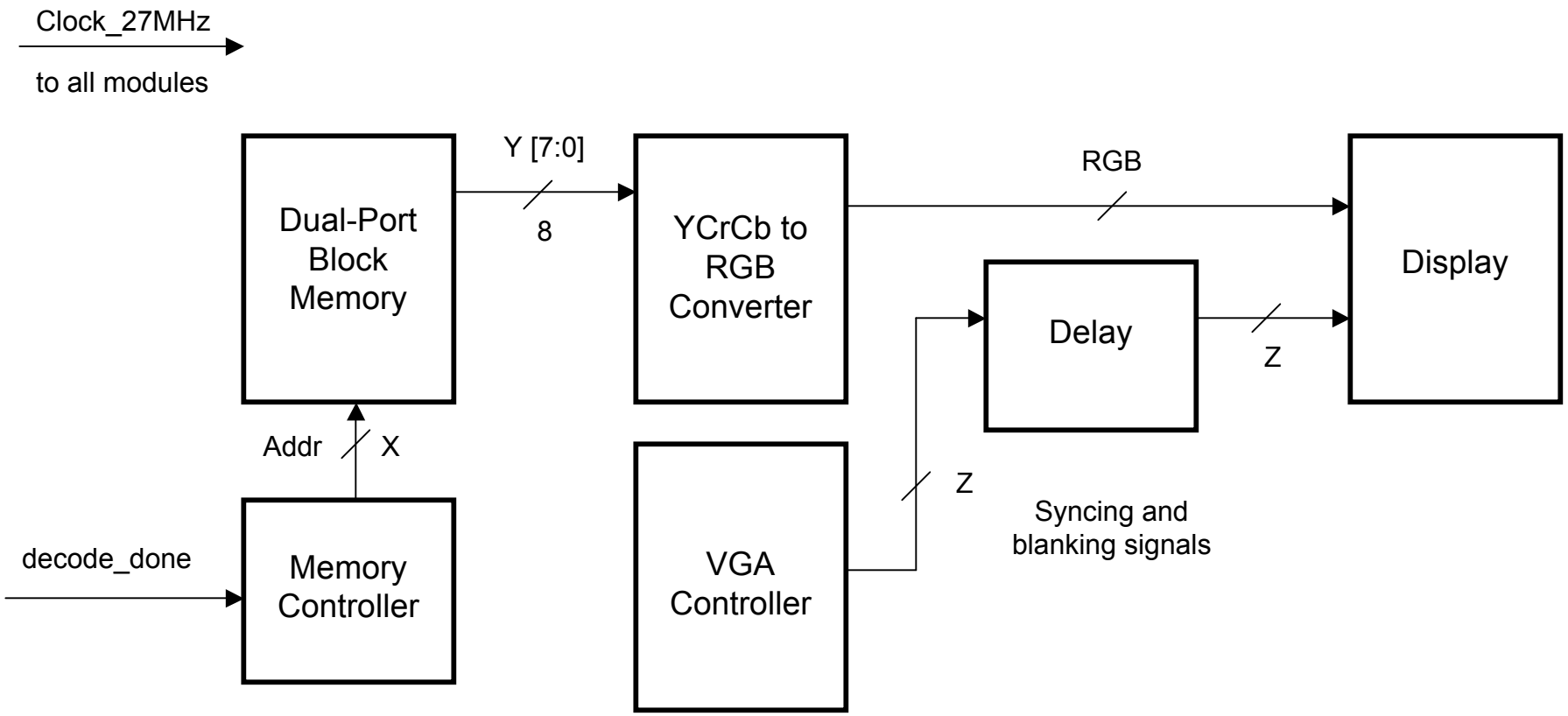
Receiver


from transmitter
Radio Receiver
serial cable
Transmitter Control Unit
RS232 Receiver
Shift Register
80
80 x 900 Dual Port BRAM
to decoder
microcontroller
FPGA

Video Decoder



Video Display Overview



* Only chrominance (Y) is important if displaying grayscale image