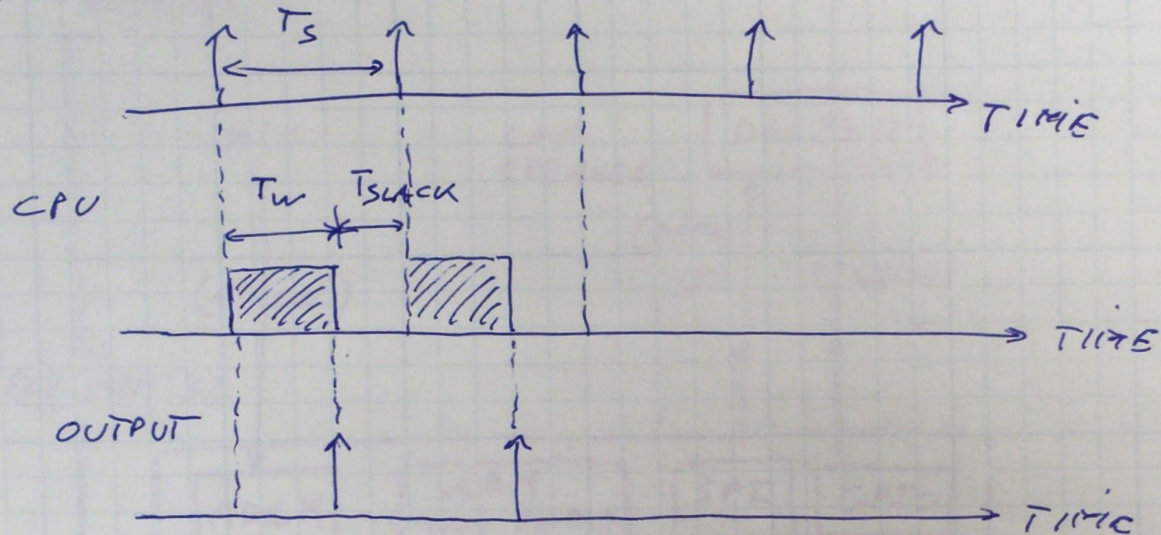


# REAL TIME OPERATION

INPUT



## HARDWARE SHARING FACTOR

$$HSF = \frac{F_{CLK, CPU}}{F_s}$$

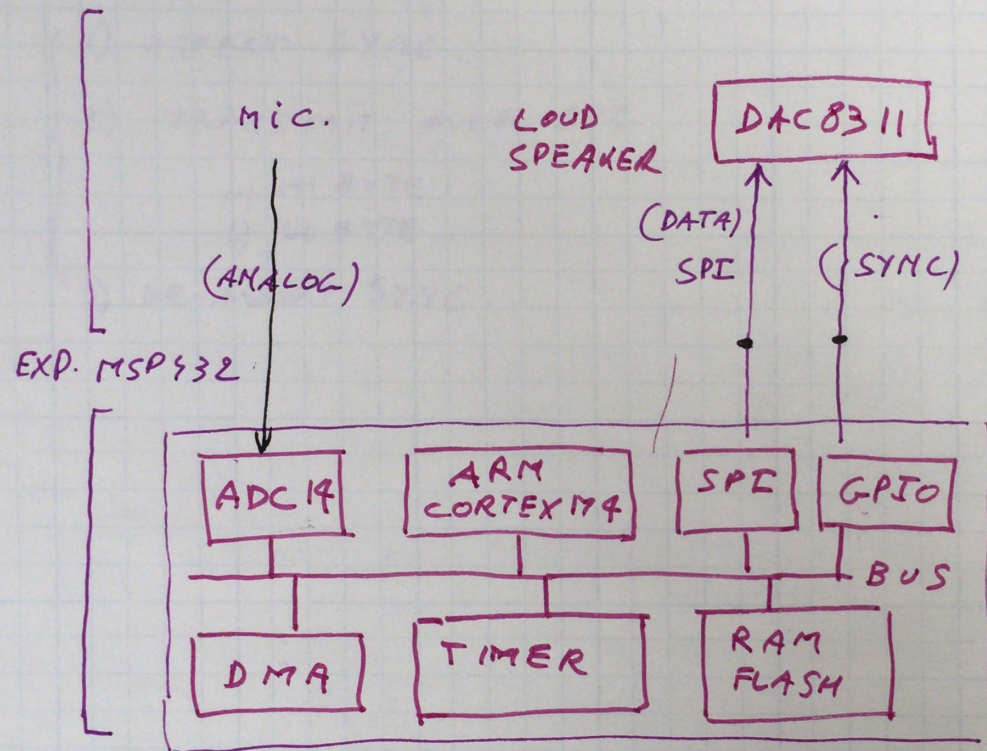
SOFTWARE DSP : HSF : 100... 1000

HARDWARE DSP : HSF : 1



# ARCHITECTURE OF MSP432 + BOOSTXL

BOOSTXL



## BASIC A/D OPERATION

- 1) SAMPLE INPUT VOLTAGE = "SAMPLE TRIGGER"
- 2) CONVERSION
- 3) END OF CONVERSION



# BASIC D/A OPERATION

- 1) ASSERT SYNC.
- 2) TRANSMIT OVER SPI
  - a) HI BYTE
  - b) LO BYTE
- 3) DE-ASSERT SYNC.



# THREE SCHEMES FOR REAL TIME I/O.

- 1) POLLED I/O
- 2) INTERRUPT DRIVEN I/O
- 3) DMA DRIVEN I/O

## POLLED I/O.

WHILE (1) {

// A/D CONVERSION

TRIGGER-AD();

WHILE (AD-NOT-READY());

INSAMPLE = ADCVAL();

CONSTANT =  $T_{AD}$

OUTSAMPLE = FUNC DSP(INSAMPLE);

$T_{DSP}$ .

// D/A CONVERSION

ASSERT-DAC-SYNC();

SEND-SPI (HI BYTE(OUTSAMPLE));

SEND-SPI (LO BYTE(OUTSAMPLE));

DEASSERT-DAC-SYNC();

CONSTANT. =  $T_{DA}$

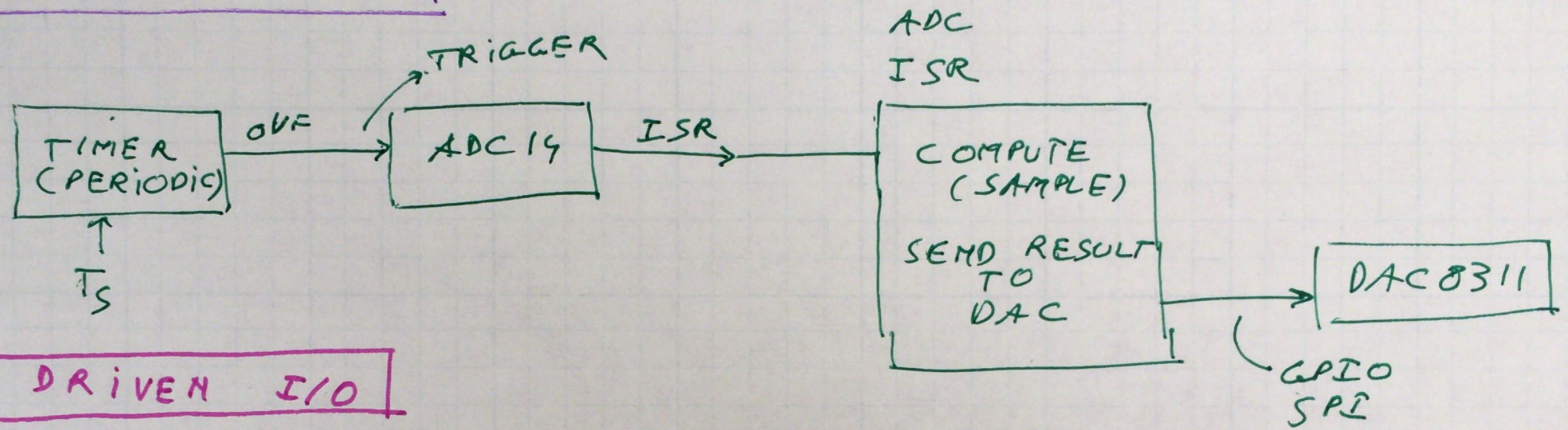
$T_{ITERATE}$

$T_s = T_{ITERATE}$

}



INTERRUPT DRIVEN I/O



DMA DRIVEN I/O

