- GPIO (General Purpose Input/Output)
- SWITCHES
- LEDS

Readings

Notepack: P1 → P11 & INTRO
P12 → P15 & GPIO w/ Switch/LED Port
P16 → 44 & Assembly (some use)

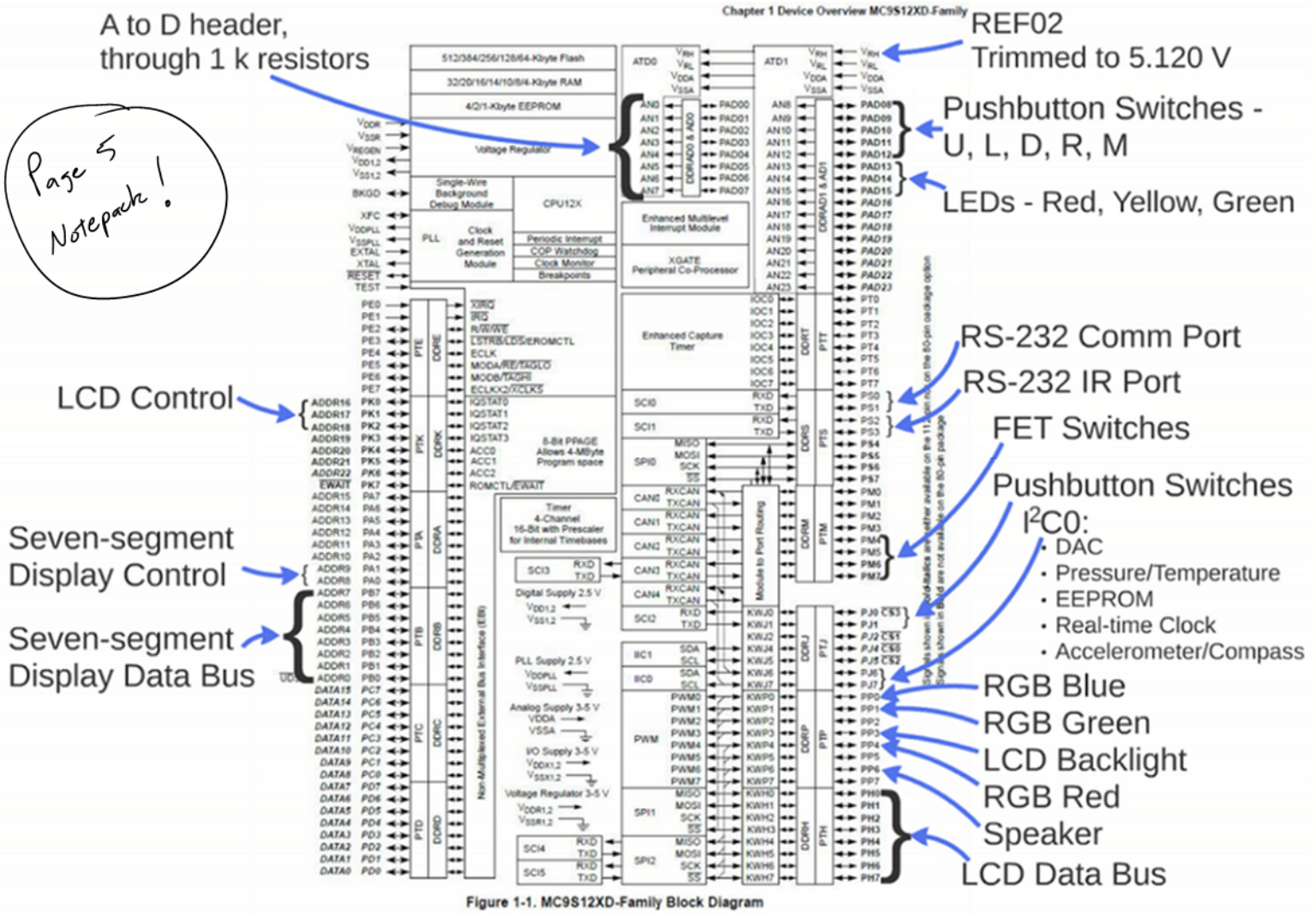
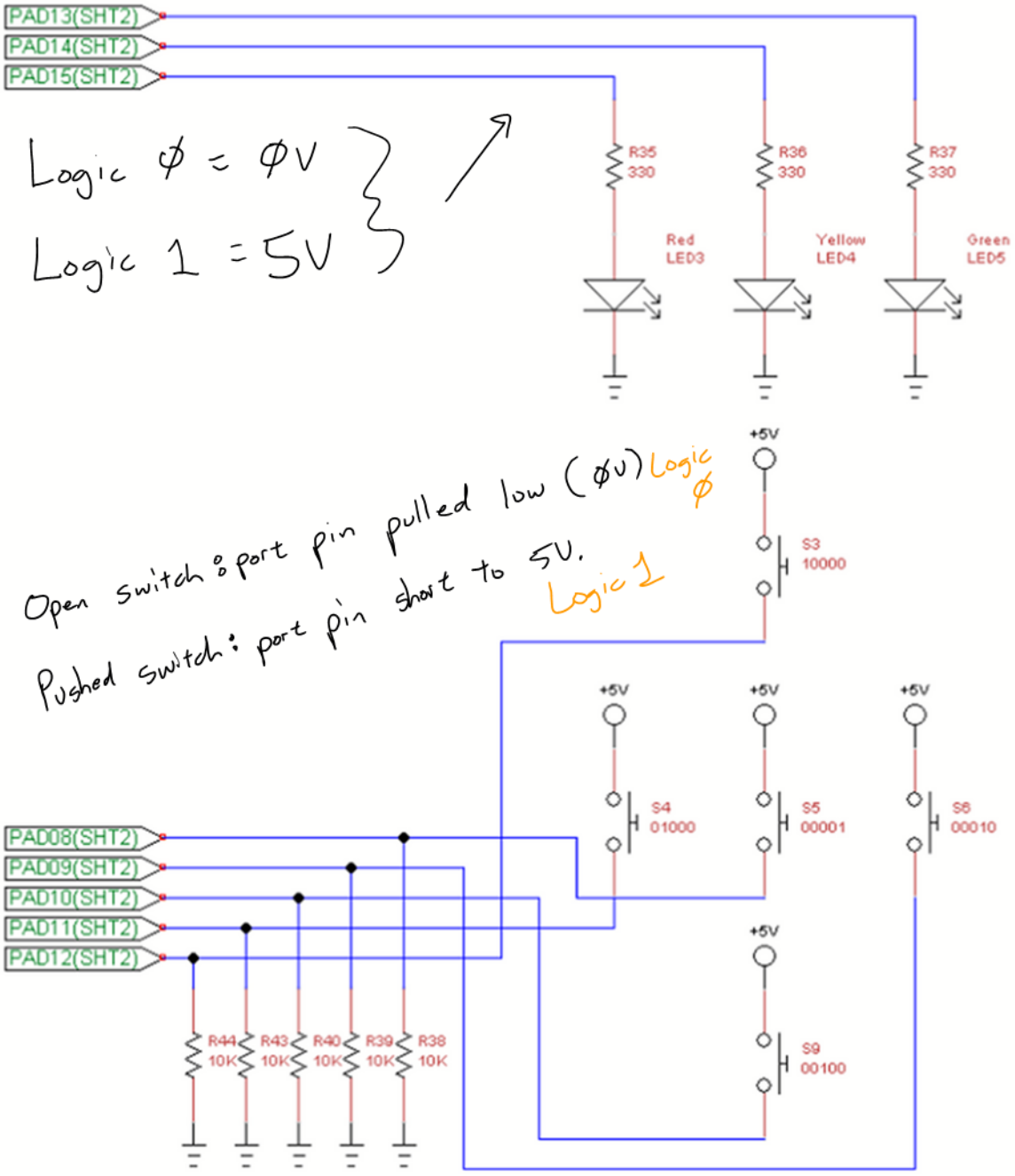
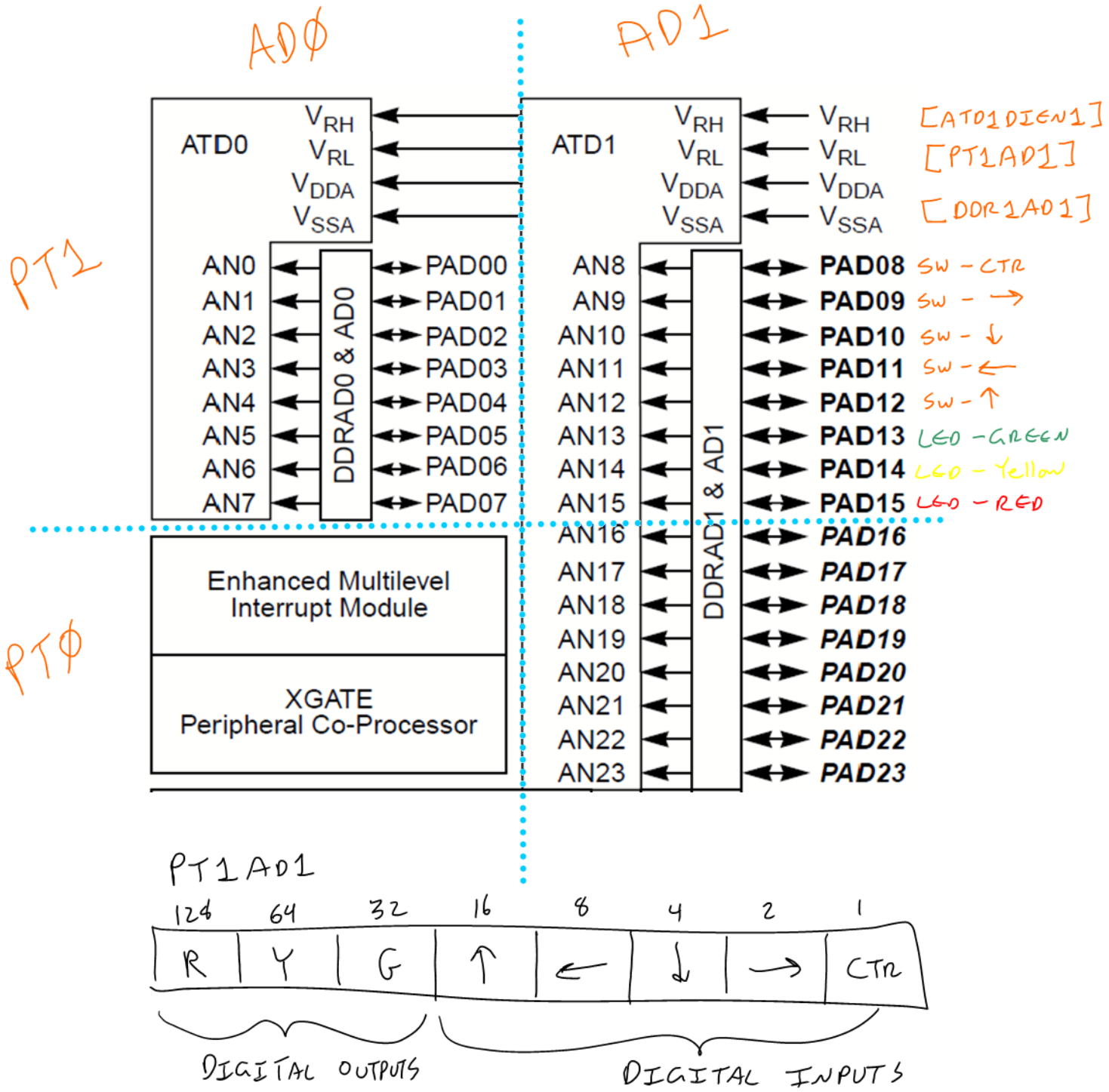


Figure 1-1. MC9S12XD-Family Block Diagram


PAD13(SHT2)
PAD14(SHT2)
PAD15(SHT2)
Logic 0 = 0V
Logic 1 = 5V
R35 330
R36 330
R37 330
Red LED3
Yellow LED4
Green LED5
Open switch: port pin pulled low (0V) Logic 0
Pushed switch: port pin short to 5V. Logic 1
+5V
S3 10000
S4 01000
S5 00001
S6 00010
S9 00100
PAD08(SHT2)
PAD09(SHT2)
PAD10(SHT2)
PAD11(SHT2)
PAD12(SHT2)
R44 10K
R43 10K
R40 10K
R39 10K
R38 10K


AD0
AD1
ATD0
ATD1
VRH
VRL
VDDA
VSSA
PT1
AN0
AN1
AN2
AN3
AN4
AN5
AN6
AN7
DDRAD0 & AD0
PAD00
PAD01
PAD02
PAD03
PAD04
PAD05
PAD06
PAD07
AN8
AN9
AN10
AN11
AN12
AN13
AN14
AN15
AN16
AN17
AN18
AN19
AN20
AN21
AN22
AN23
DDRAD1 & AD1
PAD08
PAD09
PAD10
PAD11
PAD12
PAD13
PAD14
PAD15
PAD16
PAD17
PAD18
PAD19
PAD20
PAD21
PAD22
PAD23
[ATD1DIEN1]
[PT1AD1]
[DDR1AD1]
SW - CTR
SW - →
SW - ↓
SW - ←
SW - ↑
LED - GREEN
LED - Yellow
LED - RED
Enhanced Multilevel Interrupt Module
XGATE Peripheral Co-Processor
PT0
PT1AD1
128
64
32
16
8
4
2
1
R
Y
G
↑
←
↓
→
CTR
DIGITAL OUTPUTS
DIGITAL INPUTS

When we initialize the port, we want it to come up in a known state. This is important for outputs.

We don't want that X-Ray gun starting up when it should not.

The port is buffered, so if we write to it, those values will be expressed when the port pin Δ's to an output.

We want the LEDs to be outputs, and the switches to be inputs: 22.3.2.69 of "Big Pink"

22.3.2.69 Port AD1 Data Direction Register 1 (DDR1AD1)

	7	6	5	4	3	2	1	0
R W	DDR1AD115	DDR1AD114	DDR1AD113	DDR1AD112	DDR1AD111	DDR1AD110	DDR1AD19	DDR1AD18
Reset	0	0	0	0	0	0	0	0

Figure 22-71. Port AD1 Data Direction Register 1 (DDR1AD1)

Field	Description
7–0 DDR1AD1[15:8]	**Data Direction Port AD1 Register 1** 0 Associated pin is configured as input. 1 Associated pin is configured as output. **Note:** Due to internal synchronization circuits, it can take up to 2 bus clock cycles until the correct value is read on PTAD11 register, when changing the DDR1AD1 register. **Note:** To use the digital input function on port AD1 the ATD1 digital input enable register (ATD1DIEN1) has to be set to logic level "1".

3 1's. So... 1s for LEDs, 0s for SWITCHES

OUR STEPS THEN, TO INIT THE SWITCHES AND LEDS:

1. Write 0s to the port (PT1AD1) for the LEDs to make sure they will be off when we activate outputs.
2. Write 0s/1s to DDR1AD1 to make switches inputs/LEDs outputs.
3. Enable digital inputs for the switches (ATD1DIEN1).

When these three steps are complete, we can read the switches and turn on/off the LEDs through PT1AD1.

Let's Try...