PAWS for ULX3S

Risc-V RV32IMC CPU
+ DISPLAY & I/O

25MHZ SYSTEM CLOCK

50MHZ COPRO CLOCK

50MHZ MEMORY CLOCK

50MHZ I/O CLOCK

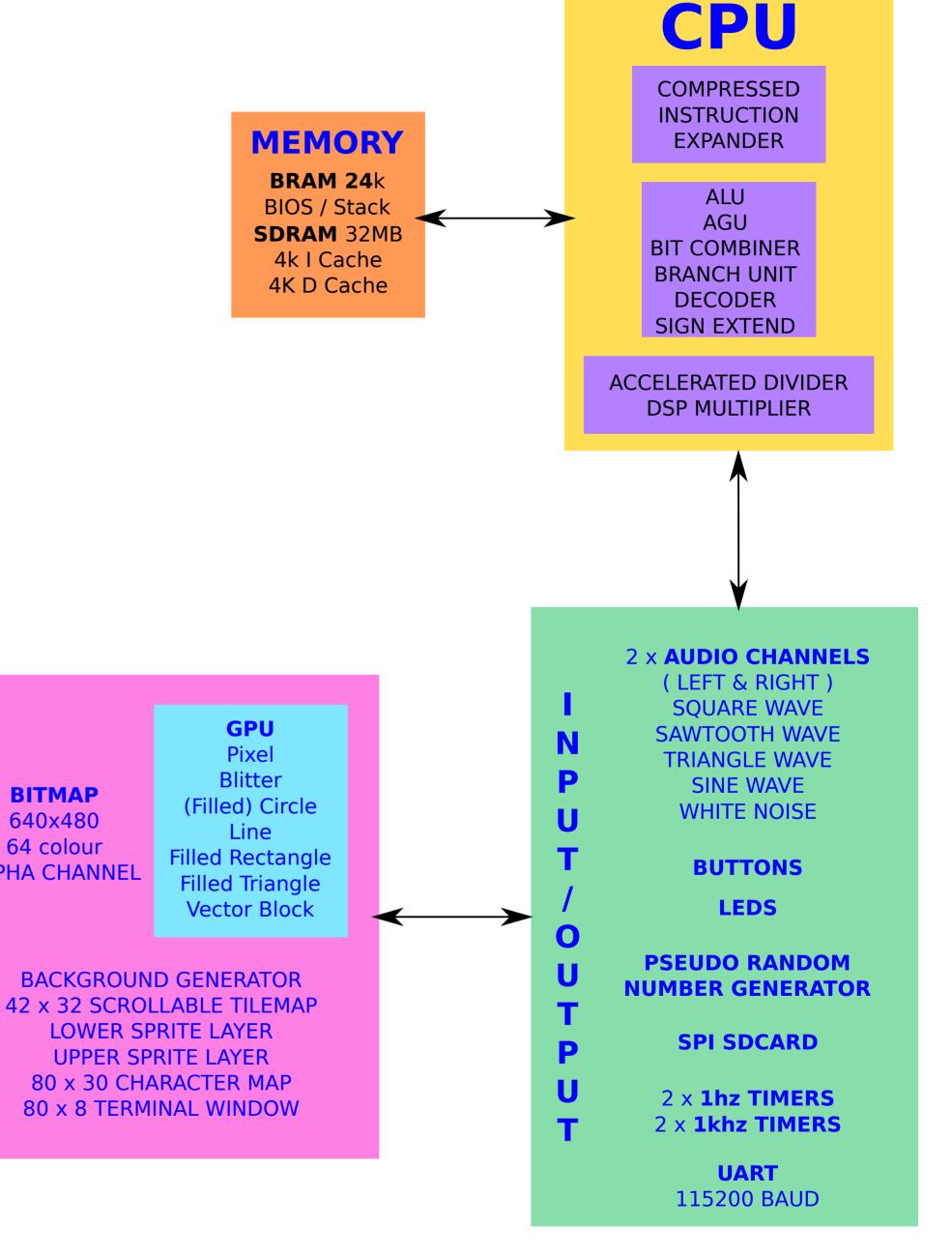**25MHZ VIDEO CLOCK**

25MHZ GPU CLOCK

CPU

COMPRESSED INSTRUCTION EXPANDER

ALU
AGU
BIT COMBINER
BRANCH UNIT
DECODER
SIGN EXTEND

ACCELERATED DIVIDER
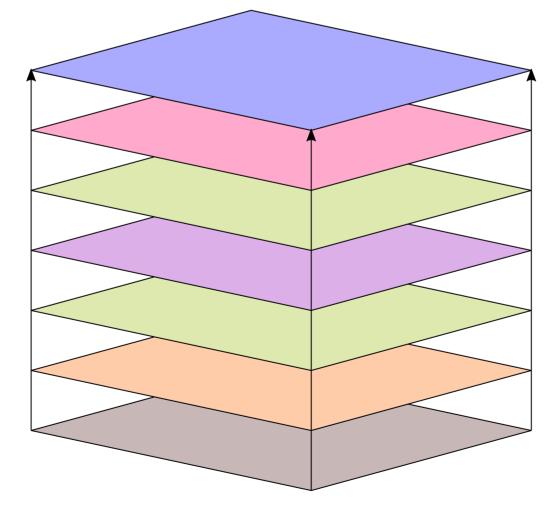DSP MULTIPLIER

MEMORY

BRAM 24k
BIOS / Stack
SDRAM 32MB
4k I Cache
4K D Cache

Terminal Window

Character Map

Upper Sprites

Bitmap

Lower Sprites

Tilemap

Background

H D M I   D I S P L A Y

BITMAP
640x480
64 colour
ALPHA CHANNEL

GPU
Pixel
Blitter
(Filled) Circle
Line
Filled Rectangle
Filled Triangle
Vector Block

BACKGROUND GENERATOR
42 x 32 SCROLLABLE TILEMAP
LOWER SPRITE LAYER
UPPER SPRITE LAYER
80 x 30 CHARACTER MAP
80 x 8 TERMINAL WINDOW

I N P U T / O U T P U T

2 x **AUDIO CHANNELS**
(LEFT & RIGHT)
SQUARE WAVE
SAWTOOTH WAVE
TRIANGLE WAVE
SINE WAVE
WHITE NOISE

BUTTONS

LEDS

PSEUDO RANDOM NUMBER GENERATOR

SPI SDCARD

2 x **1hz TIMERS**
2 x **1khz TIMERS**

UART
115200 BAUD