

# Appendix J - Full Memory Map

The fixed low regions of the Intuition Engine 64-bit physical bus, in address order, with their size and purpose. IE64 can address beyond this low window when RAM is present. IE32, M68K, and x86 see the low 4 GB window directly; the 6502 and Z80 see windowed views into it (Chapters 27 and 28).

## J.1 Low RAM and stacks

Range	Size	Purpose
\$000000-\$0003FF	1 KB	M68K vector table; x86 IVT; trap vector base for IE64.
\$000400-\$040FFF	~256 KB	BASIC ROM image, system call shim, monitor stub.
\$041000-\$041FFF	4 KB	General low workspace; not the BASIC line/input buffer.
\$042000-\$042FFF	4 KB	IE64 BASIC shared state page.
\$043000-\$06FFFF	180 KB	IE64 BASIC standalone runtime blob area and legacy program-text fallback.
\$600000-\$6EFFFF	960 KB	IE64 BASIC reserved low32 string export window.
\$700000-\$77FFFF	512 KB	IE64 BASIC public MEMALLOC range 2.
\$780000-\$791FFF	72 KB	IE64 BASIC AOT-owned low32 scratch gap, excluded from MEMALLOC.
\$792000-\$7FFFFF	440 KB	IE64 BASIC public MEMALLOC range 1.
\$820000-\$FFFFFF	8064 KB	IE64 BASIC public MEMALLOC range 0.
\$1000000-\$10003FF	1 KB	IE64 BASIC-owned line/input scratch in the normal low32 fallback layout.
\$1000400 upward	dynamic	IE64 BASIC internal arena for programme text, variables, strings, file bridge, and pinned owner records in the low32 fallback layout.
top of the low32 BASIC resident window	dynamic	IE64 BASIC hardware stack, guard page, and dynamic control-flow stack. The reservation is capped below \$10000000 even when active RAM is larger.

## J.2 PC-compatible VRAM apertures

Range	Size	Purpose
\$0A0000-\$0AFFFF	64 KB	VGA graphics window (mode 13h, mode 12h linear).
\$0B0000-\$0B7FFF	32 KB	Reserved (PC-compatible monochrome text window; not implemented).
\$0B8000-\$0BFFFF	32 KB	VGA text buffer (\$B8000).

## J.3 General RAM gap

Range	Size	Purpose
\$0C0000-\$0CFFFF	64 KB	Free RAM (general user).
\$0D0000-\$0DFFFF	64 KB	Voodoo texture RAM aperture. IE64 BASIC no longer uses this as its fixed stack.
\$0E0000-\$0EFFFF	64 KB	Free RAM (general user).

## J.4 The MMIO region (\$F0000-\$FFFFFF)

Range	Size	Device
\$F0000-\$F049B	1180 B	Video chip + palette + extended blitter.
\$F0700-\$F07FF	256 B	Terminal / serial / input.
\$F0800-\$F0B7F	896 B	SoundChip channel registers.
\$F0B80-\$F0B91	18 B	AHX player.
\$F0BA0-\$F0BBF	32 B	MIDI/MUS player.
\$F0BC0-\$F0BD7	24 B	MOD player.
\$F0BD8-\$F0BF3	28 B	WAV player.
\$F0BF4-\$F0BF6	3 B	Live MIDI byte stream port.
\$F0C00-\$F0C20	33 B	PSG / AY.
\$F0C30-\$F0C3F	16 B	SN76489.
\$F0C40-\$F0CFF	192 B	SoundChip flex channels 4-6.
\$F0D00-\$F0D20	33 B	POKEY.
\$F0D40-\$F0DFF	192 B	SoundChip flex channels 7-9.
\$F0E00-\$F0E1C	29 B	SID primary registers.
\$F0E20-\$F0E2D	14 B	SID player block.
\$F0E30-\$F0E4C	29 B	SID2 registers.
\$F0E50-\$F0E6C	29 B	SID3 registers.
\$F0E80-\$F0EFF	128 B	SFX trigger legacy aliases, channels 0-3.
\$F0F00-\$F0F6B	108 B	TED audio + video.
\$F1000-\$F13FF	1 KB	VGA registers.
\$F1400-\$F140F	16 B	HOST appliance block.
\$F2000-\$F2017	24 B	ULA registers.
\$F2100-\$F213F	64 B	ANTIC.
\$F2140-\$F21FB	188 B	GTIA.
\$F2200-\$F221F	32 B	File I/O.
\$F2260-\$F22AF	80 B	Amiga Paula DMA.

Range	Size	Device
\$F2300-\$F231F	32 B	Media loader.
\$F2320-\$F233F	32 B	RUN loader block.
\$F2340-\$F238F	80 B	Coprocessor.
\$F2390-\$F23AF	32 B	Clipboard bridge.
\$F23B0-\$F23BF	16 B	Coprocessor extended monitor.
\$F23C0-\$F23DF	32 B	IRQ diagnostics.
\$F23E0-\$F23FF	32 B	Bootstrap loader.
\$F2400-\$F24FF	256 B	SysInfo (RAM-size ABI).
\$F2600-\$F29FF	1 KB	SFX trigger extended window, channels 0-31.
\$F8000-\$F87FF	2 KB	Voodoo 3D registers.
\$FA000-\$FBFFF	6912 B	ULA VRAM aperture.

## J.5 Main video RAM

Range	Size	Purpose
\$100000-\$5FFFFFF	5 MB	Main VRAM aperture for VideoChip framebuffers; large modes may point VIDEO_FB_BASE into ordinary RAM.

## J.6 Low-window RAM and reserved aliases

Range	Size	Purpose
\$00600000-\$FFFFFFF	Dynamic	Extended RAM when backed by the current guest-RAM allocation.
\$FFFF0000-\$FFFFFFFF	64 KB	Sign-extended alias of \$00000000-\$0000FFFF.

Guest RAM can extend beyond these fixed low ranges. Use the SysInfo registers in Chapter 24 to discover total and active visible RAM. IE64 can address backed RAM above \$FFFFFFFF; the compatibility CPUs remain inside the low window or their documented profile caps.

## J.7 The 6502 / Z80 views

The 6502 sees a 16-bit address space \$0000-\$FFFF. Its adapter routes the high page-window region as follows:

6502 range	Maps to low bus address
\$0000-\$00FF	zero page in main RAM.
\$0100-\$01FF	6502 stack page in main RAM.
\$0200-\$CFFF	main RAM.
\$D200-\$D20A	POKEY registers.
\$D400-\$D40F	PSG registers.

6502 range	Maps to low bus address
\$D500-\$D55F	SID registers.
\$D600-\$D605	TED audio registers.
\$D620-\$D632	TED video registers.
\$D700-\$D70D	VGA registers.
\$D800-\$D817	ULA registers, including the paged VRAM data port.
\$E000-\$EFFF	bank-selectable window into main RAM.
\$F000-\$FFF9	MMIO mirror of \$F0000-\$F0FF9, with \$F700-\$F705 and \$F7F0 intercepted as bank registers.
\$FFFA-\$FFFF	NMI / reset / IRQ vectors.

The Z80 sees the same shape with port I/O substituted for the chip-aperture region; the bank-window scheme is identical.

## J.8 Notes

The map above is the compact engineering view of the low and device regions that have fixed meanings inside the 64-bit physical bus. Most user programs use a small sub-set of it - the BASIC variable area, the I/O region, and the main video RAM - and never touch the rest. Programs that compete for memory (a large in-memory dataset, a custom blitter routine, a coprocessor worker that wants its own heap) should carve their storage out of the "Free RAM" gaps in J.1, J.3, and J.6, or from boot-sized extended RAM reported by SysInfo, rather than colliding with the BASIC variable region.