Hardware

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Contents

Chapter 1

Hardware

1.1   Amiga® Hardware Reference Manual: D System Memory Maps

A true software memory map, showing system utilization of the various
sections of RAM and free space is not provided, nor possible with the
Amiga.

All memory is dynamically allocated by the memory manager at boot time,
and the actual locations of system structures may change from
release-to-release, machine-to-machine, or boot-to-boot (see the
AllocMem() function in the exec.library for more details).

Likewise, Amiga applications are compiled in such a way that they can be
dynamically relocated at run time by the system loader.

To find the location of system structures, application software should use
the function interface provided in the operating system. If this is not
possible then the address of a data structure should be obtained by
searching the lists of system structures maintained by Exec. The first
step is to fetch the address of the exec.library from location 4; this is
the only absolute memory location in the system. All other system data
structures are indirectly linked to this base address.

Though a detailed system memory map is not possible, this section does
present the general layout of memory areas within the current generation
of Amiga computers. To ensure maximum compatibility, avoid relying on the
address ranges given here. Instead use the system provided interfaces to
ask for the system reources you need.

```
 A1000, A500 and A2000 Memory Map
 A3000 Memory Map
```

1.2   D System Memory Maps / A1000, A500 and A2000 Memory Map
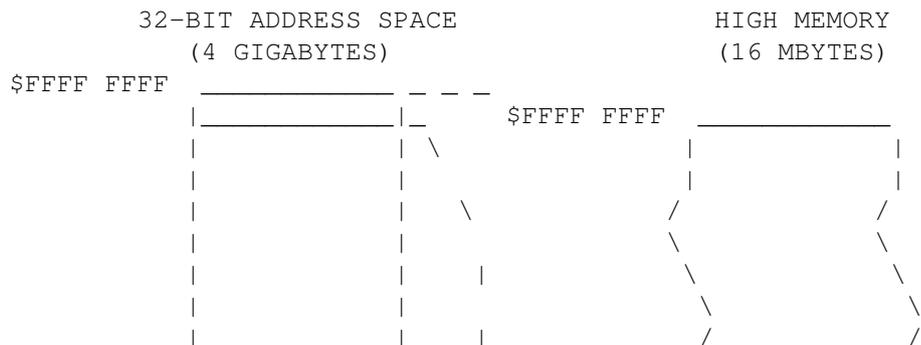
```
Address Range            Description
-----------------        ------------------------------------------------
00 0000 - 03 FFFF        256K Chip RAM (A1000 Chip RAM,
                             1st 256K for A500/A2000)
```

```
04 0000 - 07 FFFF        256K bytes of Chip RAM (2nd 256K for A500/A2000)

08 0000 - 0F FFFF        512K  Extended chip RAM  (to 1 MB for A2000).

10 0000 - 1F FFFF        Reserved. Do not use.

20 0000 - 9F FFFF        Primary  8 MB Auto-config space .

A0 0000 - BE FFFF        Reserved. Do not use.

BF D000 - BF DF00         8520-B  (access at even-byte addresses only)
        -       -
BF E001 - BF EF01         8520-A  (access at odd-byte addresses only)
        -       -
                         The underlined digit chooses which of the
                          16 internal registers  of the 8520 is to be
                         accessed.  See Appendix F.

C0 0000 - DF EFFF        Reserved.  Do not use.
   |
   | C0 0000 - D7 FFFF  Internal expansion (slow) memory (on some systems).
   |
   | D8 0000 - DB FFFF  Reserved.  Do not use.
   |
   | DC 0000 - DC FFFF  Real time clock (not accessable on all systems).
   |
   | DF F000 - DF FFFF  Chip registers.  See  Appendix A  and  Appendix B .
   +--

E0 0000 - E7 FFFF        Reserved.  Do not use.

E8 0000 - E8 FFFF         Auto-config space .  Boards appear here before
                         the system relocates them to their final address.

E9 0000 - EF FFFF        Secondary  auto-config space  (usually 64K I/O
                         boards).

F0 0000 - FB FFFF        Reserved. Do not use.

FC 0000 - FF FFFF        256K System ROM.
```

1.3 D System Memory Maps / A3000 Memory Map

```
Address Range          Description
----------------------  ------------------------------
$0000 0000 - $001F FFFF   Amiga  Chip Memory

$0020 0000 - $009F 0000    Zorro II Memory Expansion Space

$00A0 0000 - $00B7 FFFF    Zorro II I/O Expansion Space
```

```
$00B8 0000 - $00BE FFFF   Reserved

$00BF 0000 - $00BF FFFF    CIA Ports & Timers


$00C0 0000 - $00C7 FFFF   Expansion Memory

$00C8 0000 - $00D7 FFFF   Reserved


$00D8 0000 - $00DB FFFF   Reserved

$00DC 0000 - $00DD FFFF   Memory Mapped Clock

$00DD 0000 - $00DE FFFF   SCSI Control

$00DE 0000 - $00DE FFFF   Motherboard Resources

$00DF 0000 - $00DF FFFF   Amiga  Chip Registers


$00E0 0000 - $00E7 FFFF   Reserved

$00E8 0000 - $0EFF FFFF    Zorro II I/O & Configuration

$00F0 0000 - $00F7 FFFF   Diagnostic ROM (Reserved)

$00F8 0000 - $00FF FFFF   High ROM (512K)


$0100 0000 - $03FF FFFF   Reserved

$0400 0000 - $07FF FFFF        Motherboard Fast RAM

$0800 0000 - $0FFF FFFF   Coprocessor Slot Expansion

$1000 0000 - $7FFF FFFF   Zorro III Expansion


$8000 0000 - $FEFF FFFF   Reserved

$FF00 0000 - $FF00 FFFF    Zorro III Configuration Unit

$FF01 0000 - $FFFF FFFF   Reserved
```

```
        32-BIT ADDRESS SPACE              HIGH MEMORY
          (4 GIGABYTES)                   (16 MBYTES)
 $FFFF FFFF  _____ _ _ _
            |_____|_     $FFFF FFFF  _____
            |            | \             |            |
            |            |               |            |
            |            |  \           /            /
            |            |           \            \
            |            |    |         \            \
            |            |               \            \
            |            |    |           /            /
```

```
                  |            |         |            |            |
                  | Reserved   |         |            | Reserved   |
                  |            |         |            |            |
                  |            |         | $FF01 0000 |------------|
                  |            |         |            | Zorro III  |
                  |            |         |            |Config. Unit|
                  |            |           $FF00 0000 |_____|
                  |            |         |_ _ _
                  |            |
                  |            |
                  |            |          _ _ _      LOW MEMORY
                  |            |         |           (256 MBYTES)
   $8000 0000 |------------|         $0FFF FFFF  _____
                  |            |    |       |            |
                  |            |    |       |            |
                  |            |    |       | Coprocessor|
                  |            |    |       |    Slot     |
                  | Zorro III  |    |       |  Expansion  |
                  | Expansion  |    | $0800 0000 |------------|
                  |            |    |       | Motherboard|
                  |            |  / |       |  Fast RAM  |
                  |            |    $0700 0000 |------------|
                  |            | /  |       |            |
   $1000 0000 |------------|-   |       |  Reserved  |
                  |            |    |       |            |
                  |            |    $0100 0000 |------------|- -    - -
                  | Low Memory |    |       |   24-bit   |  \   /
                  |(256 MBytes)|    |       |  Address   |   \/ (continued
                  |            |    |       |   Space    |   /\   below)
   $0000 0000 |_____|_ _ _ $0000 0000 |_____|_ _/  \_
                                                                       |

                _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _|
             |

             |
                         _ _ _      HIGH I/O REGISTERS
             |          |
                              $DF FFFF  _____
          \ | /          |       |            |
                         |       | Amiga Chips|
     (continued from above) |  $DF 0000 |------------|
                         |       | Motherboard|
     24-BIT ADDRESS SPACE  |       | Resources  |
          (16 MBYTES)      $DE 0000 |------------|
   $00FF FFFF _____  |       |SCSI Control|
          |            |    $DD 0000 |------------|
          | High ROM   |    |       |  Memory-   |
   $00F8 0000 |------------|    |       |  mapped   |
          | Diagnostic |    |       |  clock    |
          |   ROM      |    $DC 0000 |------------|
   $00F0 0000 |------------|    |       |  Reserved  |
          |Zorro II I/O|    $DD 0000 |------------|
          | and config.|  /  |  Reserved  |
   $00E8 0000 |------------|    $DA 0000 |------------|
          | Reserved   | /  |  Reserved  |
```

```
$00E0 0000 |------------|-          $D9 0000 |------------|
           |  High I/O  |                    |  Reserved  |
           |  registers |           $D8 0000 |_____|
$00D8 0000 |------------|- - - -
           |            |
           |  Reserved  |
           |            |
$00C8 0000 |------------|
           | Ranger RAM |
$00C0 0000 |------------|- - - -
           |   Low I/O  |           $BF FFFF  _____
           |  registers |                    |            |
$00B8 0000 |------------|-                    | CIA Ports  |
           |            |  \                  | and Timers |
           |Zorro II I/O|           $BF 0000 |------------|
           | Expansion  |   \                 |  Reserved  |
           |            |           $BE 0000 |------------|
$00A0 0000 |------------|     |               |  Reserved  |
           |            |     |     $BD 0000 |------------|
           | Zorro II   |     |               |  Reserved  |
           | Memory     |     |     $BC 0000 |------------|
           | Expansion  |     |               |  Reserved  |
           |            |     |     $BB 0000 |------------|
$0020 0000 |------------|     |               |  Reserved  |
           | Standard   |     $BA 0000 |------------|
           | Chip RAM   |     |               |  Reserved  |
           |  (Up to    |     $B9 0000 |------------|
           | 2 MBytes)  |     |               |  Reserved  |
$0000 0000 |_____|           $B8 0000 |_____|
                             |_ _ _
```

Figure D-1: Amiga 3000 Memory Map