Computer System Application

A Combination of Many Topics

- Serial Communication Devices and Standards for long Distance
- Parallel Communication Devices and Standards for Short Distance
- Memory Devices
- Central Processing Unit
- Study of Timing Requirement
- Transducers and Analog to Digital and Digital to Analog Converters
- Basic Real World Electronics: Signal Conditioning, Processing
- Fast Devices Requiring DMA and other Techniques
- Slow Devices Requiring Interrupts
## Memory Map

### For IBM PC

<table>
<thead>
<tr>
<th>HEX ADDRESS</th>
<th>FUNCTION</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>2FFFFFFFFFF</td>
<td>Extended Memory Area (Up to 4GB)</td>
<td>Depends on the memory installed</td>
</tr>
<tr>
<td>10FF00</td>
<td>High Memory (About 64K)</td>
<td>Requires Himem.Sys Requires A20 Gate Handler</td>
</tr>
<tr>
<td>10FEFF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>100000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FFFFFF</td>
<td>ROM 256K (see next page)</td>
<td></td>
</tr>
<tr>
<td>C8000</td>
<td>Video Display RAM (VDR) 128K</td>
<td>C0000 – C8000 Video BIOS ROM B0000 – C0000 TEXT AREA (64K) A0000 – B0000 Graphics Area (64K)</td>
</tr>
<tr>
<td>C7FFF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A0000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9FFFFF</td>
<td>RAM 640K Transient Program Area</td>
<td>See Figure 3</td>
</tr>
<tr>
<td>00000</td>
<td></td>
<td></td>
</tr>
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Building Blocks of an Embedded System

- CPU
  - General Purpose CPU
  - Digital Signal Processor (DSP)
  - Microcontroller
- ROM
- RAM
- Timers
- Timing and Clock Generator
- Real Time Clock
- Special I/O Devices (ADC and DAC)
- Interrupt Controllers
Main Building Blocks of General Purpose Computer

- A General Purpose CPU
- RAM
- ROM
- EEPROM
- Cache
- Interrupt Controller
- Timing and Clock Generator
- Real Time Clock
- Timers
- Extension Slots
- Plug-in Cards
- Power Supply
- FDD
- HDD
- Mouse
- CD-ROM
- Modem
- Monitor
- Keyboard
- Serial and Parallel Communication Systems
- Etc
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