



# OMAP35x Torpedo SOM Addendum to LogicLoader™ User Manual

## LogicLoader Documentation

Logic // Products  
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### Abstract

This document contains information that addresses how LogicLoader runs specifically on the OMAP35x Torpedo SOM. As such, this document acts as a supplement to the *LogicLoader User's Manual*.

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## Revision History

REV	EDITOR	REVISION DESCRIPTION	LogicLoader Version	APPROVAL	DATE
A	DVE, JCA	Initial release	2.4.9 & later	EN	02/10/10

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# 1 OMAP35x Torpedo SOM Memory Map Diagrams

## 1.1 SDRAM Configuration

The OMAP35x Torpedo SOM is designed to accommodate SDRAM/DDRAM of different sizes. Under LogicLoader's default configuration, all memory installed is accessible. Please refer to TI's *OMAP35xx Applications Processor Technical Reference Manual* for more information on the SDRAM controller.

## 1.2 MMU Remap: Physical Memory to Logical Memory

LogicLoader sets up the MMU to remap physical memory to logical memory. Type `info cpu` at the `losh>` prompt to see how LogicLoader remaps physical memory to logical memory.

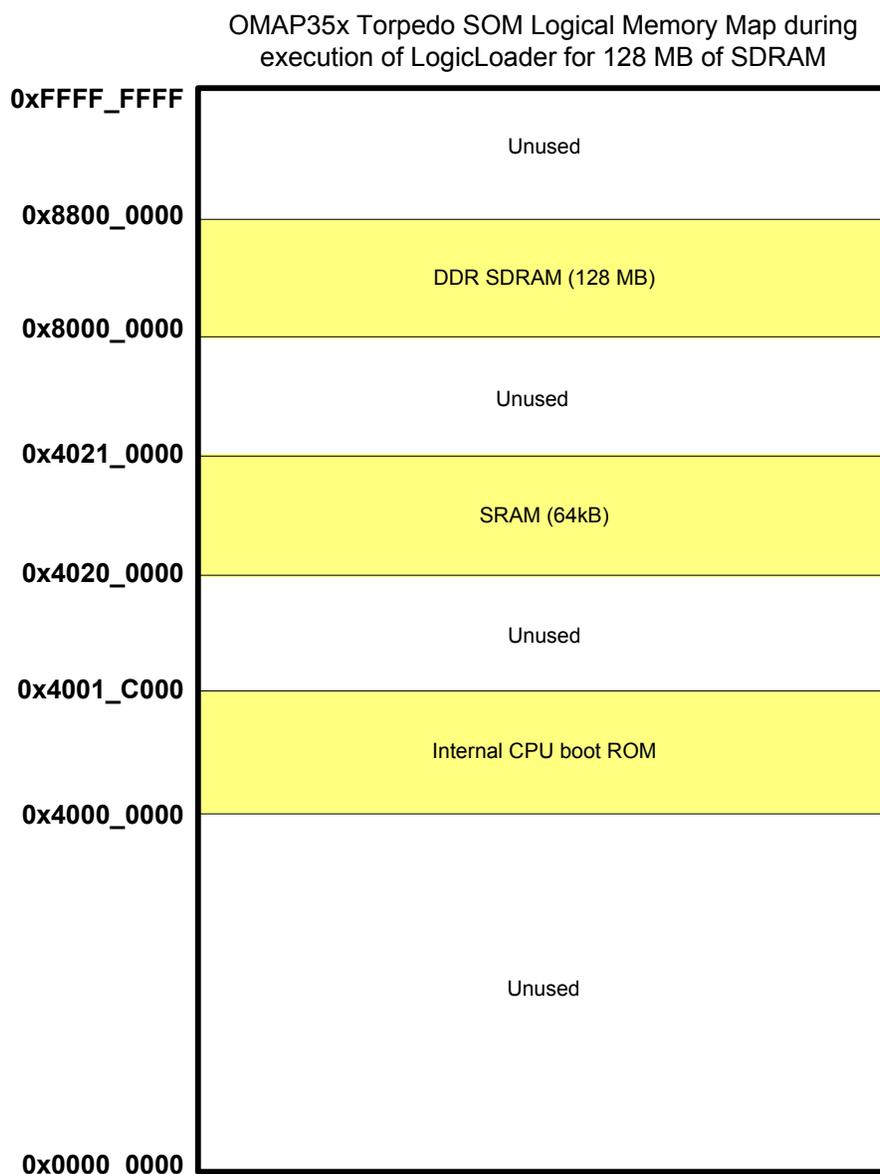
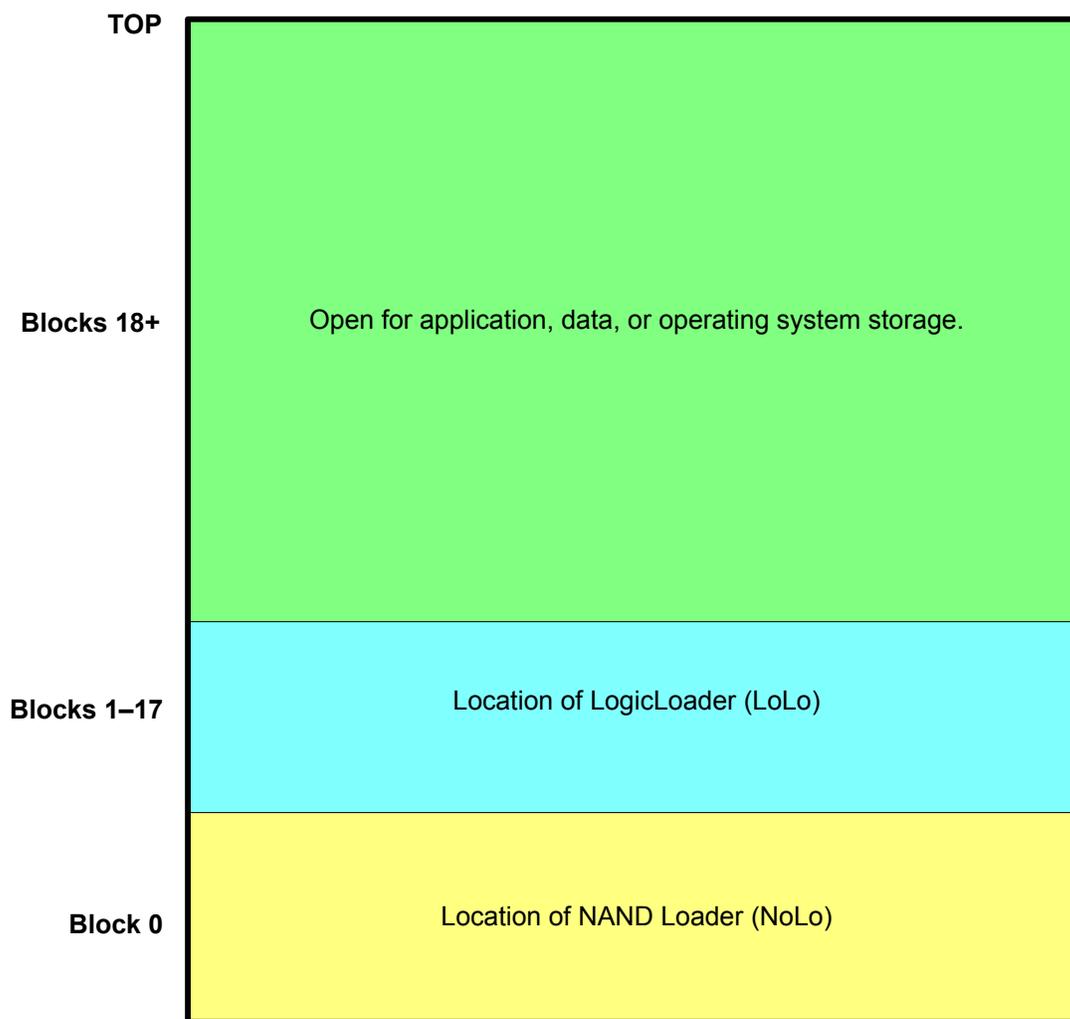


Figure 1.1: OMAP35x Torpedo SOM Hardware Memory Map

### 1.3 LogicLoader and the Configuration Block in Flash Memory

The OMAP35x Torpedo SOM comes with LogicLoader programmed into the SOM's resident NAND boot flash array (see Figure 1.2 below). The NAND Loader (NoLo) resides in block 0 and LogicLoader resides in blocks 1 to 17 of NAND flash. NAND memory (128 MB) can be used for application, data, or operating system storage. However, the NAND device is only accessible through the NAND controller.



**Figure 1.2: NAND Boot Flash Memory Layout**

### 1.4 LogicLoader's Location in RAM

Logic's LogicLoader bootloader executes out of SDRAM. The diagram below (see Figure 1.3) depicts the run-time location of LogicLoader. Refer to the *Zoom OMAP35x Torpedo Development Kit QuickStart Guide* for steps required to start LogicLoader.

Run-time location of LogicLoader:

At reset, LogicLoader relocates itself from flash memory to system SDRAM. LogicLoader then spends the remainder of its run-time executing out of system SDRAM.

Note: The size of LogicLoader's code and variable sections are estimates. This size depends on the exact features built into the LogicLoader image and may change with new releases. The location of LogicLoader's stack is dynamically determined at run-time based on the size of the code and variable section. Therefore, the location of the stack is provided as an estimate in this diagram.

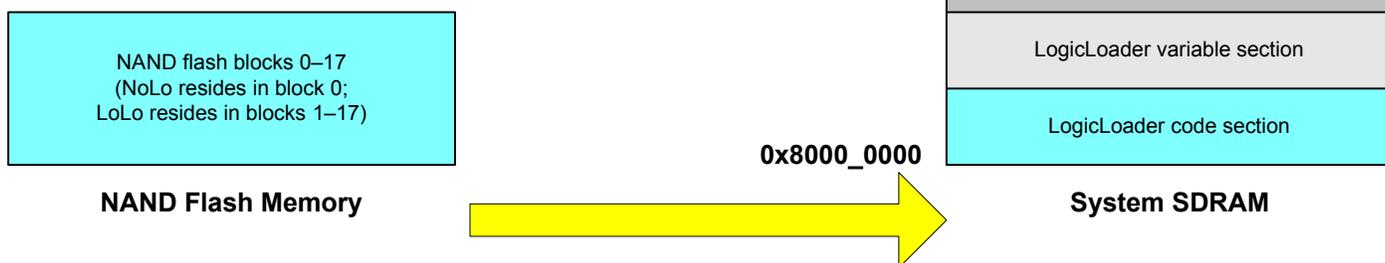


Figure 1.3: LogicLoader RAM Execution Environment

## 1.5 NAND Flash Support

The OMAP35x Torpedo SOM uses NAND flash memory, which is a block device commonly used for bulk storage. Since NAND flash is a block device, a program typically cannot be executed directly out of NAND. Also, reading and writing to the device is more complicated than to a NOR flash device since the NAND memory is only accessible via the NAND controller.

On a standard configuration OMAP35x Torpedo SOM, the 128 MB of NAND flash contains 1,024 blocks, where each block is 128kB.

## 2 Booting LogicLoader from SD Card

The OMAP35x Torpedo SOM supports booting from SD cards. If you would like to create a bootable SD card, make sure the card is formatted for the FAT file system. Download the latest version of LogicLoader from the Logic website. From that download, copy over the following files to your SD card:

- MLO — This file is a raw binary image of NoLo
- lboot.elf — This file is LogicLoader in .elf format
- lboot.cfg — This file is the Configuration Block, which is optional to add

Once these files are on the SD card, insert the card into the SD slot on the baseboard and power on the development kit. The LogicLoader `l_osh>` prompt will appear in Tera Term just the same as if it was booted from the SOM.

### 3 OMAP35x Torpedo SOM LogicLoader Functionality

#### 3.1 Supported Hardware Peripherals

The table below lists OMAP35x Torpedo SOM-specific peripherals supported by LogicLoader.

Hardware Peripheral	Support (Y/N)	Details
Audio	N	--
Display:	Y	LogicLoader supports 16 bits per pixel; custom displays can be supported by using the configuration block
LCD-3.6-QVGA-10R	Y	Display kit with LCD part number LQ036Q1DA01
LCD-4.3-WQVGA-10R	Y	Display included with Zoom OMAP35x Torpedo Development Kit
LCD-6.4-VGA-10R	Y	Display kit with LCD part number LQ64D343
Ethernet	N	--
NOR Flash Memory	N	--
NAND Flash Memory	Y	128 MB standard
IrDA	N	--
Memory Card Expansion:		
IO Mode PCMCIA/ CF	N	--
Memory Mode CF	N	--
SD/MMC	Y	Read/Write (FAT16); Read only (FAT32)
Smart Card	N	--
Processor:		
Cache	Y	16kB Instruction & Data cache
Clock	Y	600 MHz CPU (LogicLoader runs at 500 MHz) / 166 MHz External Bus
Power Management	N	--
MMU	Y	--
PS/2	N	--
RTC	N	--
SDRAM	Y	128 MB mDDR mode (automatically detected by LogicLoader)
SSP	N	--
Serial Port:		
UARTA	Y	115200 baud standard, RTS flow only; 2400 to 460800 baud can be supported by using the configuration block
UARTB	N	--
UARTC	N	--
CAN	N	--
Touch Screen	N	--
USB Host	N	--
USB OTG	N	--
Misc:		
GPIO	Y	Use 'w' and 'x' commands to access data direction and data registers to control GPIO lines per register description in Hardware Specification document.
Status	Y	Toggles to show system "heartbeat"

*\*Note: If a peripheral is not mentioned on this list, it should be assumed there is no native support for it in LogicLoader besides the ability to read and write from registers.*

## 4 Disclaimer

Logic strives to provide the most up to date information. However, the list of supported features in this document is partial and subject to change.

The “Supported Hardware Peripherals” list was created to describe the supported features for fully populated standard SOM builds. If the SOM in use is a custom build or has some hardware feature omitted, the commands related to those hardware features may not function.

If you need software support on demand, please contact Logic sales at:  
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