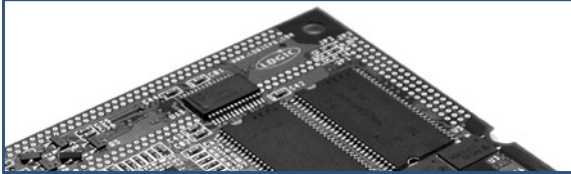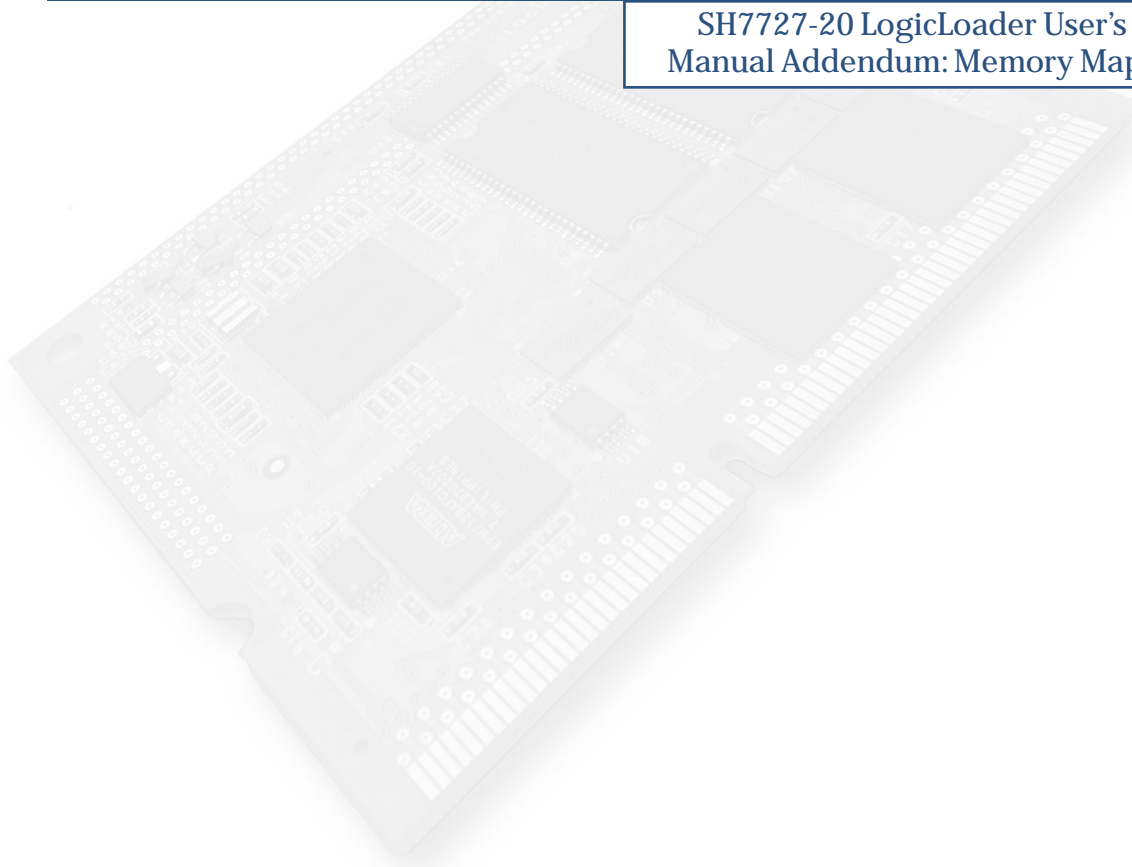LOGIC PRODUCT DEVELOPMENT   WWW.LOGICPD.COM

Zoom™

Card Engine

SH7727-20 LogicLoader User's
Manual Addendum: Memory Maps

REVISION HISTORY

REV	EDITOR	DESCRIPTION	LoLo Ver.	APPROVAL	DATE
A	Bruce Rovner	Release	--	HAR	08/15/04
B	James Wicks	Figure 1.1 Added	--	BR	10/20/04
C	James Wicks	Update to accommodate LoLo v1.4, Removed Rev B section 1.1	1.4	JAW	7/14/04
D	Aaron Stewart	Added Supported Option in LogicLoader	1.4.3	ME	12/3/04

1   SH7727-20 LogicLoader Addendum: Memory Map Diagrams

1.1   SH7727-20 Hardware Memory Map

The SH7727 processor has the ability to address the memory map as cached or uncached, depending on the value of the top nibble of the address. The Renesas SH7727 Manual should be consulted for full documentation of this feature. LogicLoader will configure the memory map as shown in Figure 1.1 below.

Figure 1.1: SH7727-20 Hardware Memory Map

SH7727-20 Memory Map during execution of BoLo and LoLo

Address	Region	UNCACHED	CACHED
0xFFFFFFFF			
	BUS CONTROL REGISTERS	NA	NA
0xFFFFFF00			
	RESERVED		
0x1C000000			
	PCMCIA	X	
0x18000000			
	EXTERNAL I/O (SLOW)	X	
0x14000000			
	EXTERNAL I/O (FAST)	X	
0x10000000			
	SDRAM		X
0x0C000000			
	NOT USED		
0x08000000			
	INTERNAL I/O REGISTERS	X	
0x04000000			
	FLASH MEMORY	WRITE	READ
0x00000000			

Note: For cached addresses, add 0x80000000.
          For uncached addresses, add 0xA0000000.

1.2   Location of BoLo and LoLo in Flash Memory on the SH7727-20

The Zoom Starter Development Kits come with both BoLo and LoLo programmed into the Card Engine's resident flash array. See Figure 1.2 below.

Figure 1.2: Flash Memory Layout

TOP

Open for application, data, or operating system storage.

0x00080000

LoLo is resident in flash memory starting at address 0x00040000. This is also the address which BoLo automatically jumps to, if not interrupted by the user.

0x00040000

BoLo is resident in the lowest block of flash.

0x00000000

1.3   Run-time RAM location of BoLo and LoLo on the SH7727-20

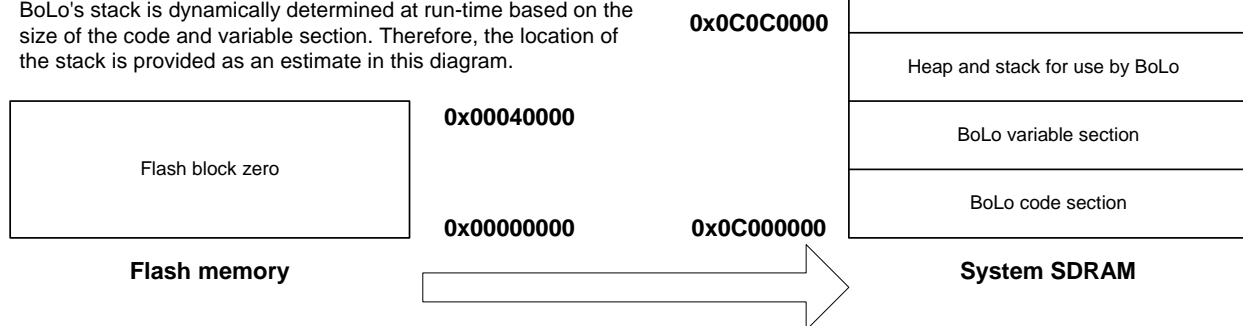Both BoLo and LoLo execute out of RAM. The diagrams shown on the following page, Figure 1:3: SH7727-20 RAM Execution Environment for BoLo and LoLo, depict the memory used by these two programs.

Figure 1.3: SH7727-20 RAM Execution Environment for BoLo and LoLo

Run-time location of BoLo and LoLo:

At reset, BoLo relocates itself from flash memory to system SDRAM. BoLo then spends the remainder of its run-time executing out of system SDRAM.
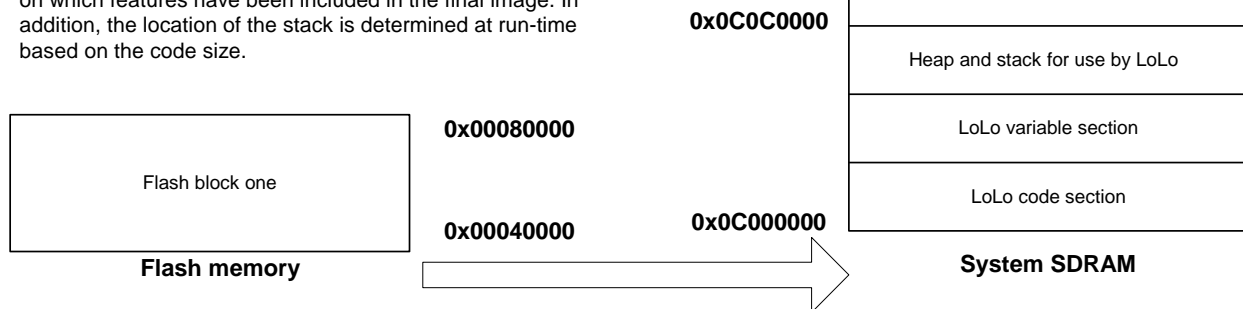
Note: the size of BoLo's code and variable sections are estimates. This size depends on the exact features built into the BoLo image and may change with new releases. The location of BoLo's stack is dynamically determined at run-time based on the size of the code and variable section. Therefore, the location of the stack is provided as an estimate in this diagram.

	Free RAM
0x0C0C0000	Heap and stack for use by BoLo
	BoLo variable section
	BoLo code section

0x00040000

Flash block zero

0x00000000   **0x0C000000**

Flash memory   **System SDRAM**

If not interrupted by the user or the presence of the RAM cookie, BoLo jumps to the address 0x00040000. BoLo expects to find LoLo there, however, users may choose to overwrite LoLo with their own program code.

LoLo exhibits the same behavior as BoLo. LoLo relocates itself from flash memory to system SDRAM and then spends the remainder of its run-time executing in SDRAM. Note that LoLo completely overwrites BoLo while relocating itself.

Keep in mind that the size of LoLo's code and variable sections are estimates in this diagram. The true size changes depending on which features have been included in the final image. In addition, the location of the stack is determined at run-time based on the code size.

	Free RAM
0x0C0C0000	Heap and stack for use by LoLo
	LoLo variable section
	LoLo code section

0x00080000

Flash block one

0x00040000   **0x0C000000**

Flash memory   **System SDRAM**

2   SH7727-20 Supported Options for Standard Configuration

The table below provides data on the peripheral support options built-in to LogicLoader for this card engine. Additional functionality is possible by implementing custom code or commands on the system.

Feature	LoLo Command	Supported Options Description
Audio	play-wav	At 8 and 16 bit mono .wav files can be played and recorded at: 8.000, 11.025, 22.050, 32.000, 44.100, 48.000 kHz At 16 bit stereo (mono not supported) .wav files can be played and recorded at: 8.000, 11.025, 22.050, 32.000, 44.100, 48.000 kHz
CompactFlash	mount	Memory Cards only SanDisk, PNY, HP cards have been verified 16 -> 256MB are verified
Ethernet	ifconfig	LogicLoader supports file downloads through TFTP
IRDA	None	LogicLoader does not support IRDA
PCMCIA/ CompactFlash	None	LogicLoader does not support PCMCIA/CompactFlash
Power Management	None	LogicLoader does not support power management
Serial	None	LogicLoader uses UARTA (UART2) on the SH7727-20 card engine for serial communication.
Touch	touch-cal	LogicLoader supports touch calibration
Update	update	LogicLoader supports the update command, this command can be used to run a .upd file as an executable, update the CPLD and update and re-burn bolo/lolo to flash.

USB Device	None	LogicLoader does not support USB
Video	video-open	LogicLoader supports the following video displays for the SH7727-20 card engine at 8 and 16 bits per pixel only on the following display kits. **Logic Display Kits:** LQ121S1DG31 TFT SVGA 12.1" LQ64D343 TFT VGA 6.4" LQ10D368 TFT VGA 10.4" LQ035Q7DB02-20 TFT QVGA 3.5"

3   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 Options list was created to describe the supported features for fully populated standard card engine builds. If the card engine 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 Product Development sales at: product.sales@logicpd.com.