

# CSCI E-92: Application Note 12

## Stack Contents for New Process

Stack Contents Pushed by “ldr r0, [%shcsr]; mov r1, %[active]; orr r1, r1, %[pended]; and r0, r0, r1; push {r0}”  
 This is Top Of Stack (TOS) at lowest address; SP points to this word  
 (see AN6: QuantumInterruptInfo.txt)

Word with SVCALLACT & SVCALLPENDEDED bits

Stack Contents Pushed by “push {r4,r5,r6,r7,r8,r9,r10,r11}”  
 (see StackManipulationInAssembler/main.c; If R4 is saved by your SysTick function entry code, it does not need to be in the “push” register list above and the corresponding “pop” register list)

|  |
|--|
| R4 (This value of R4 is replaced by the value of R4 saved below)                               |
| R5   |
| R6   |
| <b>R7 (Note: the SysTick function exit code generated by GCC relies on the contents of R7)</b> |
| R8   |
| R9   |
| R10  |
| R11  |

Stack Contents Pushed by Entry Code to SysTick Handler  
 (see StackManipulationInAssembler/main.c, AN7: SysTickTimer.txt, and AN8: PendSVInterrupt.txt)

|  |
|--|
|  |
| copyOfSP   |
|  |
| R4 (This is the value of R4 for the new process)                           |
| R7 (This is the value of R7 for the new process)                           |
| LR (R14) (This is the LR popped into PC by the SysTick function exit code) |

Stack Frame Pushed by Processor when Acknowledging Interrupt  
 If No FP Extension (see svc.c and AN10: CauseOfDefaultISR.txt)

|   |
|---|
| R0  |
| R1  |
| R2  |
| R3  |
| R12   |
| LR (R14) (This is the LR established when the new process starts to run)                |
| Return Address (This is the address of the first instruction to run in the new process) |
| xPSR (bit 9 indicates the presence of a reserved alignment word at offset +32)          |
| Possible Reserved Word for Alignment on 8 Byte Boundary                                 |