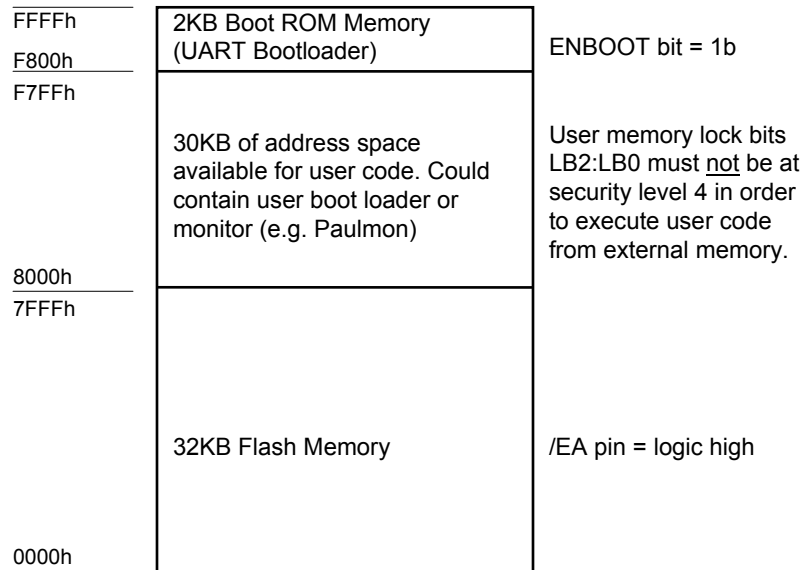


# ECEN 5613 Code Space Memory Map

External accesses use /PSEN pin (code fetch or MOVC)



1

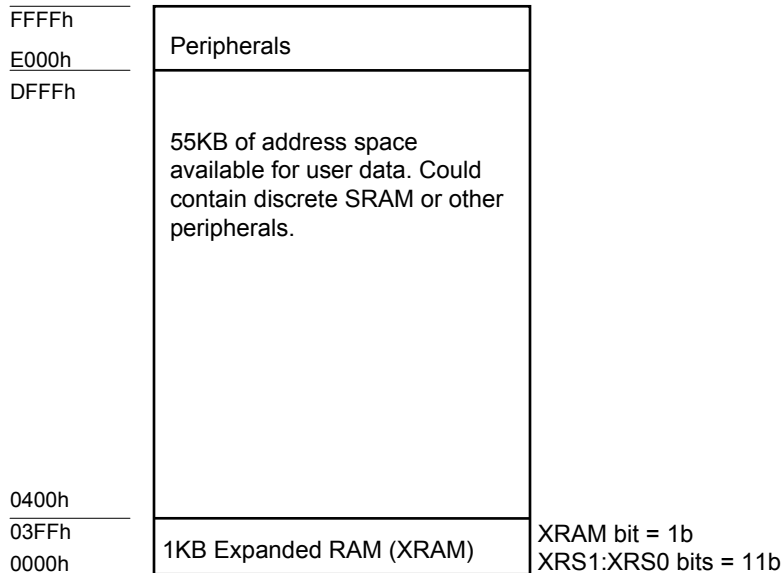
## Code Space Memory Map Notes

- 2KB Boot ROM only occupies F800h-FFFFh if the ENBOOT bit of the AUXR1 register is set. See datasheet page 21. Otherwise, the Boot ROM is not accessible and F800h-FFFFh is available for other uses.
- 32KB Flash is only accessible if the /EA pin is high.
- If /EA is high, code fetches from addresses 0000h-7FFFh will be directed to internal flash and code fetches from 8000h-FFFFh will be directed to external memory (using the /PSEN signal). However, if the Boot ROM is enabled, then accesses to F800-FFFFh will be directed to internal Boot ROM.
- If /EA is low, then all code fetches from 0000h-FFFFh will be directed to external memory. However, if the Boot ROM is enabled, then accesses to F800-FFFFh will be directed to internal Boot ROM.
- In order to run code from an EPROM that is mapped at address 0000h, the /EA pin must be low.
- User memory lock bits LB2:LB0 in the HSB must not be at security level 4 in order to allow user code execution from external memory.

2

# ECEN 5613 Data Space Memory Map

External accesses use /RD and /WR pins with MOVX instruction



3

## Data Space Memory Map Notes

- AT89C51RC2 contains 1KB of internal Expanded RAM (XRAM). This is in addition to the standard 256 bytes of scratchpad RAM (IRAM) and the 128 bytes of SFR space.
- XRAM is accessed using the MOVX instruction. Accesses to XRAM will not have any affect on ports P2/P0, or the /WR or /RD pins. Accesses to data memory above 3FFh will utilize ports P2, P0, and the /WR or /RD pins.
- In order to make 1KB XRAM accessible (via MOVX instruction), three conditions must be met:
  - XRAM bit in HSB must be unprogrammed (1b value)
  - EXTRAM bit in AUXR must be cleared (0b value). Note: the value of the XRAM bit is copied to the EXTRAM bit at reset.
  - XRAM size bit field (XRS1:XRS0) in AUXR must be set to 11b. The default value of this field is 00b, which enables only 256 bytes of XRAM.

4