

## Active Errata List

- Flash/EEPROM – First Read after Write Disturbed
- Timer 2 – Baud Rate Generator – No IT When TF2 is Set by Software
- Timer 2 – Baud Rate Generator – Long Start Time
- UART – RB8 Lost with JBC on SCON Register
- ADC – Interrupt During Idle Conversion
- CAN – CANCONCH Harmless Corruption
- Flash/EEPROM – First Read after Load Disturbed
- CAN – Sporadic Errors
- C51 Core – Bad Exit of Power-down in X2 Mode
- Timer0/1 – Extra Interrupt
- EEPROM - Lock-up During ISP write

## Errata History

Lot Number	Errata List
A00151	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16
A00369	1, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16
A00367, A00368, A00396 to A00529	1, 3, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16
A00510, all lots from A00588	1, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16

## Errata Description

### 1. Flash/EEPROM – First Read after Write Disturbed

After a write of more than 32 bytes in the EEPROM and 16 bytes in the user Flash memory, the read of the first byte may be disturbed if it occurs just after the write.

#### Workaround

Do not load/write more than 32 bytes at a time for EEPROM memory.

Do not load/write more than 16 bytes at a time for user Flash memory.

Or perform a 'dummy' read before reading the first byte.

Or wait 10 ms before reading the first byte.

### 2. Buffer Noise

Large bounces and high noise are generated when buffers are switching (both rising and falling edges).

#### Workaround

None.

### 3. Double IT on External Falling Edge on INT1 or INT0 in X2 Mode

When the CPU is in X2 mode and Timer 1 or Timer 0 in X1 mode (CKCON = 0x7F), IEx flag is not cleared by hardware after servicing interrupt. In this case, the CPU executes the ISR a second time.

#### Workaround

The workaround is to clear IEx bit in Interrupt subroutine.

```
INT1_ISR : ; Interrupt sub routine
CLR IE1
....
```



## CAN Microcontrollers

T89C51CC01  
T89C51CC01UA  
T89C51CC01CA

## Errata Sheet



#### 4. **Movc Instruction on Boot Memory from Boot Memory Does Not Work**

No movc instruction is performed when a program running on the boot memory tries to read its own code using a movc instruction.

##### **Workaround**

None.

#### 5. **Power OFF Flag**

Power OFF Flag does not work.

##### **Workaround**

None.

#### 6. **CAN – Lost CAN Error Interrupt**

When a stuff error occurs during a CAN frame transmission on DPRAM write access, the controller does not generate the error interrupt and any received frame can generate a Receive interrupt.

##### **Workaround**

None.

#### 7. **Timer 2 – Baud Rate Generator – No IT When TF2 is Set by Software**

When Timer 2 is used in baud rate generator mode, setting TF2 by software does not generate an interrupt.

##### **Workaround**

Use Timer 1 instead of Timer 2 to generate baud rate and interrupt.

#### 8. **Timer 2 – Baud Rate Generator – Long Start Time**

When Timer 2 is used as a baud rate generator, TH2 is not loaded with RCAP2H at the beginning, then UART is not operational before 10000 machine cycles.

##### **Workaround**

Add the initialization of TH2 and TL2 in the initialization of Timer 2.

#### 9. **UART – RB8 Lost with JBC on SCON Register**

May lose RB8 value, if RB8 changes from 1 to 0 during JBC instruction on SCON register.

##### **Workaround**

Clear RB8 at the beginning of the code and after each time it goes to 1.

#### 10. **ADC – Interrupt Controller/ADC Idle Mode/Loops In High Priority Interrupt**

The problem occurs during an A/D conversion in idle mode, if a hardware interrupt occurs followed by a second interrupt with higher priority before the end of the A/D conversion. If the above configuration occurs, the highest priority interrupt is served immediately after the A/D conversion. At the end of the highest priority interrupt service, the processor will not serve the hardware reset interrupt pending. It will also not serve any new interrupt requests with a priority lower than the high level priority last served.

##### **Workaround**

Disable all interrupts (Interrupt Global Enable Bit) before starting an A/D conversion in idle mode, then re-enable all interrupts immediately after.

## 11. CAN – CANCONCH Harmless Corruption

When the stuff error occurs (same condition than the errata 6), the CONCH1, CONCH0 bits in CANCONCH are corrupted. This corruption has no effect on the behavior of the Transmit channel.

### Workaround

No workaround is required, re-writing CANCONCH to start a new message resolves this corruption.

## 12. Flash/EEPROM – First Read after Load Disturbed

In the 'In-Application Programming' mode from the Flash, if the User software application loads the Column Latch Area prior to calling the programming sequence in the CAN Bootloader.

The 'Read after load' issue leads to a wrong Opcode Fetch during the column latch load sequence.

### Workaround

Update of the Flash API Library. A NOP instruction has to be inserted after the load instruction.

```
MOVX @DPTR,A ;Load Column latches
NOP ; ADDED INSTRUCTION
```

## 13. CAN – Sporadic Errors

When BRP = 0 or when BRP > 0 and SMP = 0, the CAN controller may desynchronize and send one error frame to ask for the retransmission of the incoming frame, even though it had no error.

This is likely to occur with BRP = 0 or after long inter frame periods without synchronization (low bus load). The CAN macro can still properly synchronize on frames following the error.

### Workaround

Setting BRP greater than 0 in CANBT1 and SMP equals 1 in CANBT3 allows re-synchronization with the majority vote, and thus fixes the issue.

The sampling point might have to be slightly advanced for the majority vote to take place within the bit. Therefore, at maximum speed of 1Mbit/s, the sampling point should be at less than 80% (e.g. 75%) for XTAL = 16 MHz or less than 85% (e.g. 80%) for XTAL = 20 MHz.

## 14. C51 Core – Bad Exit of Power-down in X2 Mode

When exiting power-down mode by interrupt while CPU is in X2 mode, it leads to bad execution of the first instruction run when CPU restarts.

### Workaround

Set the CPU in X1 mode directly before entering power-down mode.

## 15. Timer0/1 – Extra interrupt.

When the Timer0 is in X1 mode and Timer1 in X2 mode and vice versa, extra interrupt may randomly occurred for Timer0 or Timer1.

### Workaround

Use the same mode for the two timers..

## 16. EEPROM – Lock-up during ISP write.

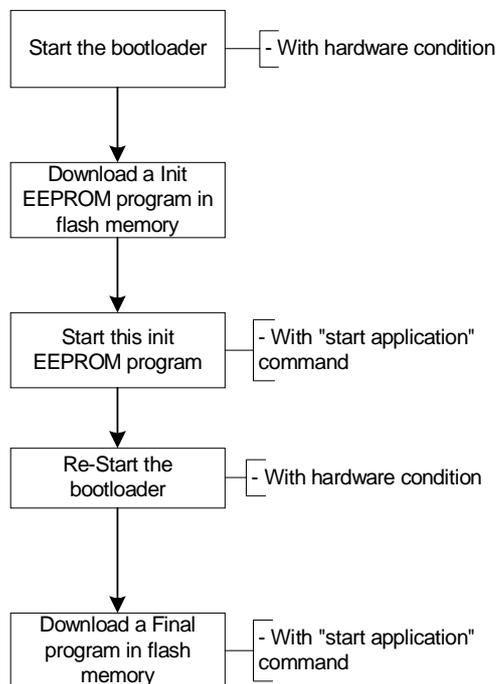
Program lock-up can be experienced when using Atmel FLIP software or a custom In system Pogramming tools to write in the internal EEPROM. This problem occurs with clock frequency > 12MHz in X2 mode or 24MHz in X1 mode. Neither the code Flash nor the EEPROM are corrupted by the lock-up. Although the EEPROM cannot be written by the bootloader.

This problem does not affect the capability to erase, read and write into the code Flash and the additional bytes with In-System Programming as Atmel FLIP.

This problem is bootloader related and doesn't affect the capability for the user to read and write into the EEPROM. This problem is technology dependant. The likelihood of experiencing the problem is low at Clock frequency > 24 MHz in X1 mode and nulle below. A reset can be applied to recover from the lock-up.

### Workaround

The following process can be done to work around the problem.



### C Init EEPROM program exmple:

```

#define SIZE_EEPROM 12

unsigned char code
tab_eep[SIZE_EEPROM]={0x11,0x22,0x33,0x44,0x55,0x66,0x77,0x88,0x99,0xAA};

void main (void)
{
  unsigned char xdata * address;
  unsigned char cpt;

  address =0x00;
  for (cpt=0; cpt<SIZE_EEPROM; cpt++)

```

```
{
    EECON = 0x02; // enable eeprom access
    *(address + cpt) = tab_eep[cpt];
    EECON = 0x50;
    EECON = 0xA0;
    while (EECON&0x01);
}
```

## Assembler Init EEPROM program exemple:

```
SIZE_EEPROM EQU 00Ah

CSEG AT 0000H

Mov R1, #SIZE_EEPROM
Mov DPTR, #0h

Load_eeprom:
    MovEECON, #02h    ; set bit EEE for access to the column latches
    MovA, #Tab_eep
    Movc A, @A + DPTR
    Movx @DPTR, A

    Mov EECON, #050h
    Mov EECON, #0A0h

WAIT_FBUSY:
    Mov A, EECON
    AnlA, #001h
    Xrl A, #001h
    JzWAIT_FBUSY
    Inc DPTR
    Djnz R1, Load_eeprom

End_loop:
    jmp End_loop

Tab_eep: DB 012h, 023h, 045h, 067h, 089h, 0ABh, 0CDh, 0EFh
```

## Active UART Bootloader Errata List

- Timer 2 and UART Are Not Stopped
- Watchdog and Flash API Starting the Bootloader Execution
- Autobaud False Start Bit Detection
- Boot Process Compatibility
- Flash API ' \_\_api\_wr\_code\_page' with 0 Data in Length Parameter Field

## UART Bootloader Errata History

Version Number	Errata List
1.2 (1.1.2 displayed by FLIP)	1, 2, 3
1.4	1, 2, 3, 4,5

## UART Bootloader Errata Description

### 1. Timer 2 and UART Are Not Stopped

When the bootloader receives the command 'Start Application' (LJMP 0), the Timer 2 and the UART are not stopped.

#### Workaround

The application must have in its setup function a reset of Timer 2 and UART.

```

mov SCON, #00h
mov T2CON, #00h
mov RCAP2L, #00h
mov RCAP2H, #00h
mov TL2, #00h
mov TH2, #00h

```

### 2. Watchdog and Flash API Starting the Bootloader Execution

When an application call ' \_\_api\_start\_bootloader' or ' \_\_api\_start\_isp' routines while the watchdog is enabled, when the watchdog overflows it will restart the application instead of the bootloader.

#### Workaround

Set BLJB(=1) before calling the \_\_api\_start\_bootloader or \_\_api\_start\_isp if the watchdog is used.

### 3. Autobaud False Start Bit Detection

UART autobaud sequence does not work in some special UARTs.

Some laptops have the UART TX line set to 0 when unused (COM port closed), this results in a false baud rate calculation in the 'U' character.

The autobaud sequence checks for a '0' state (not a falling edge) on the Rx line of the UART microcontroller to detect the 'start' bit of the 'U' synchro character.

As this line is '0' by default when COM port is closed, the autobaud routine starts its baudrate calculation at the opening sequence of the UART.

#### Workaround

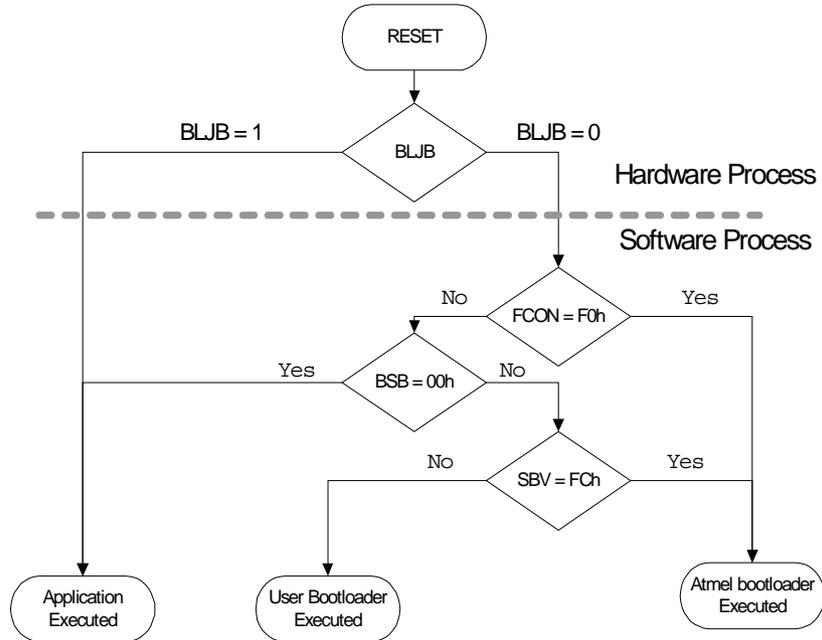
A 'Special Sync' can be used with 'FLIP' software.

In this case, the open port event and the 'U' sent are dissociated. The user must first open the COM port with the 'connect' button, then reset the hardware and finally push the 'sync' button.

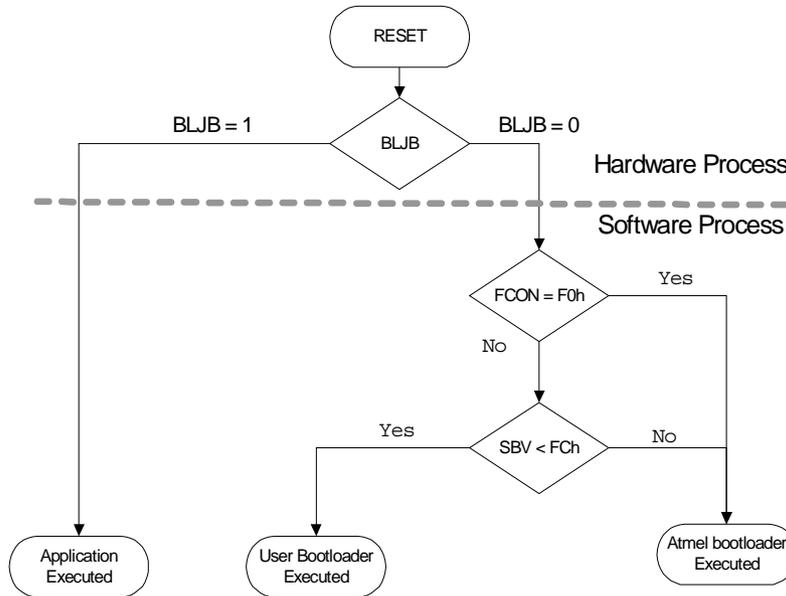
### 4. Boot Process Compatibility

There are some differences between Boot process of bootloader 1.2 and newer versions (see below).

## Version 1.2:



## Version 1.4:



### Workaround

Use the fuse bit BLJB to start the application in both versions.

## 5. Flash API '`__api_wr_code_page`' with 0 Data in Length Parameter Field

When the Flash API '`__api_wr_code_page`' is called with the field '`nb_data`' equal 0 then 255 data are written in Flash.

### Workaround

Include a test on '`nb_data`' before executing `__api_wr_code_page` routine.

## Active CAN Bootloader Errata List

- The CAN is Not Stopped
- Watchdog and Flash API Starting the Bootloader Execution
- Flash API ' \_\_api\_wr\_code\_page' with 0 Data in Length Parameter Field
- Problem to program a hex file less than 16 bytes

## CAN Bootloader Errata History

Version Number	Errata List
1.0.4	1, 2, 3, 4

## CAN Bootloader Errata Description

### 1. The CAN is Not Stopped

When the bootloader receives the command 'Start Application' (LJMP 0), the CAN is not stopped.

#### Workaround

The application must have in its setup function a reset of CAN macro.

```
mov CANGCON, #00h
```

### 2. Watchdog and Flash API Starting the Bootloader Execution

When an application call ' \_\_api\_start\_bootloader' or ' \_\_api\_start\_isp' routines while the watchdog is enabled, when the watchdog overflow it will restart the application instead of the bootloader

#### Workaround

Set BLJB(=1) before calling the ' \_\_api\_start\_bootloader' or ' \_\_api\_start\_isp' if the watchdog is used.

### 3. Flash API ' \_\_api\_wr\_code\_page' with 0 Data in Length Parameter Field

When the Flash API ' \_\_api\_wr\_code\_page' is called with the field 'nb\_data' equals 0 then 255 data are written in Flash.

#### Workaround

Include a test on 'nb\_data' before executing ' \_\_api\_wr\_code\_page' routine.

### 4. Problem to program a hex file less than 16 bytes

When we try to program a hex file with a size size less than 16 bytes, some troubles appear depending of the start address.

#### Workaround

Program with a range address higher than 16 bytes.



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