```
;-------------------------------------------------------------------------------
;  This file is part of the C51 Compiler package
;  Copyright (c) 1995-1997 Keil Software, Inc.
;-------------------------------------------------------------------------------
; Modified by G. Dempsey 7/11/00 for interrupts
; changed startup.a51 to absolute code starting at 8000h
; also required to locate at 8000h in linker options
;
; Modified by Aaron Mahaffey 09/10/02 - removed interrupt vector table
;
;  STARTUP.A51:  This code is executed after processor reset.
;
;  To translate this file use A51 with the following invocation:
;
;     A51 STARTUP.A51
;
;  To link the modified STARTUP.OBJ file to your application use the following
;  BL51 invocation:
;
;     BL51 <your object file list>, STARTUP.OBJ <controls>
;
;-------------------------------------------------------------------------------
$NOMOD51           ; omit assembler micro definitions
$Include(reg515.inc)    ; define 515 micro
;
;  User-defined Power-On Initialization of Memory
;
;  With the following EQU statements the initialization of memory
;  at processor reset can be defined:
;
; the absolute start-address of IDATA memory is always 0
IDATALEN    EQU   080H  ; the length of IDATA memory in bytes.
;
XDATASTART  EQU   0H    ; the absolute start-address of XDATA memory
XDATALEN    EQU   0H    ; the length of XDATA memory in bytes.
;
PDATASTART  EQU   0H    ; the absolute start-address of PDATA memory
PDATALEN    EQU   0H    ; the length of PDATA memory in bytes.
;
;  Notes:  The IDATA space overlaps physically the DATA and BIT areas of the
;          8051 CPU. At minimum the memory space occupied from the C51
;          run-time routines must be set to zero.
;-------------------------------------------------------------------------------
;
;  Reentrant Stack Initilization
;
;  The following EQU statements define the stack pointer for reentrant
;  functions and initialized it:
;
;  Stack Space for reentrant functions in the SMALL model.
IBPSTACK    EQU   1      ; set to 1 if small reentrant is used.
IBPSTACKTOP EQU   0FFH+1     ; set top of stack to highest location+1.
;
;  Stack Space for reentrant functions in the LARGE model.
XBPSTACK    EQU   0      ; set to 1 if large reentrant is used.
XBPSTACKTOP EQU   0FFFFH+1; set top of stack to highest location+1.
;
```

```
;   Stack Space for reentrant functions in the COMPACT model.
PBPSTACK    EQU   0     ; set to 1 if compact reentrant is used.
PBPSTACKTOP EQU   0FFFFH+1; set top of stack to highest location+1.
;
;-----------------------------------------------------------------------------
;
;   Page Definition for Using the Compact Model with 64 KByte xdata RAM
;
;   The following EQU statements define the xdata page used for pdata
;   variables. The EQU PPAGE must conform with the PPAGE control used
;   in the linker invocation.
;
PPAGEENABLE EQU   0     ; set to 1 if pdata object are used.
PPAGE       EQU   0     ; define PPAGE number.
;
;-----------------------------------------------------------------------------

            NAME   ?C_STARTUP

?STACK             SEGMENT   IDATA

            RSEG  ?STACK
            DS    1

            EXTRN CODE (?C_START)
            PUBLIC      ?C_STARTUP


; Define starting location for program

stard       EQU     8000H           ; start address for program

            CSEG  AT    stard

?C_STARTUP: LJMP  STARTUP1

            CSEG  AT stard+0BH      ; 0BH=addr for Timer 0

            CSEG  AT stard+13h      ; External interrupt 1.

            CSEG  AT stard+1BH      ; Timer 1 interrupt.

            CSEG  AT stard+23H      ; Serial interrupt

            CSEG  AT stard+2BH      ; Timer 2

            CSEG  AT stard+43H      ; IADC interrupt.

            CSEG        AT stard+4BH      ; IEX2 interrupt.

            CSEG  AT stard+53H      ; IEX3 interrupt.

            CSEG  AT stard+5BH      ; IEX4 interrupt

            CSEG  AT stard+63H      ; IEX5 interrupt.

            CSEG  AT stard+6BH      ; IEX6 interrupt.
```

```
STARTUP1:

; Initilization Specific To The EMAC MicroPac 535 SBC

                setb  P5.5        ; reset SC26C92 DUART
                clr   P5.5        ; bring DUART out of reset
                setb  P5.0        ; make A16 of 128K Ram, hi
                clr    P5.1            ; enable memory mapped IO
                clr   P5.2        ; disable EEPROM
; End Of MicroPac 535 Initilization

IF IDATALEN <> 0
                MOV   R0,#IDATALEN - 1
                CLR   A
IDATALOOP:      MOV   @R0,A
                DJNZ  R0,IDATALOOP
ENDIF


IF XDATALEN <> 0
                MOV   DPTR,#XDATASTART
                MOV   R7,#LOW (XDATALEN)
  IF (LOW (XDATALEN)) <> 0
                MOV   R6,#(HIGH XDATALEN) +1
  ELSE
                MOV   R6,#HIGH (XDATALEN)
  ENDIF
                CLR   A
XDATALOOP:      MOVX  @DPTR,A
                INC   DPTR
                DJNZ  R7,XDATALOOP
                DJNZ  R6,XDATALOOP
ENDIF

IF PPAGEENABLE <> 0
                MOV   P2,#PPAGE
ENDIF

IF PDATALEN <> 0
                MOV   R0,#PDATASTART
                MOV   R7,#LOW (PDATALEN)
                CLR   A
PDATALOOP:      MOVX  @R0,A
                INC   R0
                DJNZ  R7,PDATALOOP
ENDIF

IF IBPSTACK <> 0
EXTRN DATA (?C_IBP)

                MOV   ?C_IBP,#LOW IBPSTACKTOP
ENDIF

IF XBPSTACK <> 0
EXTRN DATA (?C_XBP)

                MOV   ?C_XBP,#HIGH XBPSTACKTOP
```

```
                MOV    ?C_XBP+1,#LOW XBPSTACKTOP
ENDIF

IF PBPSTACK <> 0
EXTRN DATA (?C_PBP)
                MOV    ?C_PBP,#LOW PBPSTACKTOP
ENDIF

                MOV    SP,#?STACK-1
                SETB   EAL            ; enable all interrupts
                LJMP   ?C_START

                END
```