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*   HC12 i/o register locations (9s12dp256)
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porta:      equ 0    ;port a = address lines a8 - a15
portb:      equ 1    ;port b = address lines a0 - a7
ddra:       equ 2    ;port a direction register
ddrb:       equ 3    ;port a direction register

porte:      equ 8    ;port e = mode,irqandcontrolsignals
ddre:       equ 9    ;port e direction register
pear:       equ $a   ;port e assignments
mode:       equ $b   ;mode register
puar:       equ $c   ;port pull-up control register
rdriv:      equ $d   ;port reduced drive control register
ebictl:     equ $e   ;e stretch control

initrm:     equ $10  ;ram location register
initrg:     equ $11  ;register location register
initee:     equ $12  ;eeprom location register
misc:       equ $13  ;miscellaneous mapping control
mtst0:      equ $14  ; reserved
itcr:       equ $15  ;interrupt test control register
itest:      equ $16  ;interrupt test register
mtst1:      equ $17  ; reserved

partidh:    equ $1a  ;part id high
partidl:    equ $1b  ;part id low
memsiz0:    equ $1c  ;memory size
memsiz1:    equ $1d  ;memory size
intcr:      equ $1e  ;interrupt control register
hprio:      equ $1f  ;high priority reg

bkipct0:    equ $28  ;break control register
bkipct1:    equ $29  ;break control register
bkip0x:     equ $2a  ; break 0 index register
bkip0h:     equ $2b  ; break 0 pointer high
brp0l:      equ $2c  ; break 0 pointer low
bkplx:      equ $2d  ; break 1 index register
bkplh:      equ $2e  ; break 1 pointer high
brp1l:      equ $2f  ; break 1 pointer low
ppage:      equ $30  ;program page register

portk:      equ $32  ;port k data
ddrk:       equ $33  ;port k direction
synr:       equ $34  ; synthesizer / multiplier register
refdv:      equ $35  ; reference divider register
ctflg:      equ $36  ; reserved
crgflg:     equ $37  ; pll flags register
crgint:     equ $38  ; pll interrupt register
clkssel:    equ $39  ; clock select register
pllctl:     equ $3a  ; pll control register
rtictl:     equ $3b  ;real time interrupt control

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copctl:      equ $3c ;watchdog control
forbyp:      equ $3d ;
ctctl:      equ $3e ;
armcop:      equ $3f ;cop reset register

tios:        equ $40 ;timer input/output select
cforc:       equ $41 ;timer compare force
oc7m:        equ $42 ;timer output compare 7 mask
oc7d:        equ $43 ;timer output compare 7 data
tcnt:        equ $44 ;timer counter register hi
*tcnt:       equ $45 ;timer counter register lo
tscr:        equ $46 ;timer system control register
ttov:        equ $47 ;reserved
tctl1:       equ $48 ;timer control register 1
tctl2:       equ $49 ;timer control register 2
tctl3:       equ $4a ;timer control register 3
tctl4:       equ $4b ;timer control register 4
tmsk1:       equ $4c ;timer interrupt mask 1
tmsk2:       equ $4d ;timer interrupt mask 2
tflg1:       equ $4e ;timer flags 1
tflg2:       equ $4f ;timer flags 2
tc0:         equ $50 ;timer capture/compare register 0
tc1:         equ $52 ;timer capture/compare register 1
tc2:         equ $54 ;timer capture/compare register 2
tc3:         equ $56 ;timer capture/compare register 3
tc4:         equ $58 ;timer capture/compare register 4
tc5:         equ $5a ;timer capture/compare register 5
tc6:         equ $5c ;timer capture/compare register 6
tc7:         equ $5e ;timer capture/compare register 7
pactl:       equ $60 ;pulse accumulator controls
paflg:       equ $61 ;pulse accumulator flags
pacn3:       equ $62 ;pulse accumulator counter 3
pacn2:       equ $63 ;pulse accumulator counter 2
pacn1:       equ $64 ;pulse accumulator counter 1
pacn0:       equ $65 ;pulse accumulator counter 0
mcctl:       equ $66 ;modulus down counter control
mcflg:       equ $67 ;down counter flags
icpar:       equ $68 ;input pulse accumulator control
dlyct:       equ $69 ;delay count to down counter
icovw:       equ $6a ;input control overwrite register
icsys:       equ $6b ;input control system control

timtst:      equ $6d ;timer test register

pbctl:       equ $70 ; pulse accumulator b control
pbflg:       equ $71 ; pulse accumulator b flags
pa3h:        equ $72 ; pulse accumulator holding register 3
pa2h:        equ $73 ; pulse accumulator holding register 2
palh:        equ $74 ; pulse accumulator holding register 1
pa0h:        equ $75 ; pulse accumulator holding register 0
mccnt:       equ $76 ; modulus down counter register
*mccnt1:     equ $77 ; low byte
tcoh:        equ $78 ; capture 0 holding register
tclh:        equ $7a ; capture 1 holding register

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tc2h:          equ $7c ; capture 2 holding register
tc3h:          equ $7e ; capture 3 holding register

atd0ctl0:      equ $80 ;adc control 0 (reserved)
atd0ctl1:      equ $81 ;adc control 1 (reserved)
atd0ctl2:      equ $82 ;adc control 2
atd0ctl3:      equ $83 ;adc control 3
atd0ctl4:      equ $84 ;adc control 4
atd0ctl5:      equ $85 ;adc control 5
atd0stat:      equ $86 ;adc status register hi
*atd0stat      equ $87 ;adc status register lo
atd0test:      equ $88 ;adc test (reserved)
*atd0test      equ $89 ;

atd0dien:      equ $8d ;

portad:        equ $8f ;port adc = input only
adr00h:        equ $90 ;adc result 0 register
adr01h:        equ $92 ;adc result 1 register
adr02h:        equ $94 ;adc result 2 register
adr03h:        equ $96 ;adc result 3 register
adr04h:        equ $98 ;adc result 4 register
adr05h:        equ $9a ;adc result 5 register
adr06h:        equ $9c ;adc result 6 register
adr07h:        equ $9e ;adc result 7 register

pwme:          equ $a0 ;pwm enable
pwmpol:        equ $a1 ;pwm polarity
pwmclk:        equ $a2 ;pwm clock select register
pwmprclk:      equ $a3 ;pwm prescale clock select register
pwmcae:        equ $a4 ;pwm center align select register
pwmctl:        equ $a5 ;pwm control register
pwmtst:        equ $a6 ;reserved
pwmprsc:       equ $a7 ;reserved
pwmscla:       equ $a8 ;pwm scale a
pwmsclb:       equ $a9 ;pwm scale b
pwmscnta:      equ $aa ;reserved
pwmscntb:      equ $ab ;reserved
pwmcnt0:       equ $ac ;pwm channel 0 counter
pwmcnt1:       equ $ad ;pwm channel 1 counter
pwmcnt2:       equ $ae ;pwm channel 2 counter
pwmcnt3:       equ $af ;pwm channel 3 counter
pwmcnt4:       equ $b0 ;pwm channel 4 counter
pwmcnt5:       equ $b1 ;pwm channel 5 counter
pwmcnt6:       equ $b2 ;pwm channel 6 counter
pwmcnt7:       equ $b3 ;pwm channel 7 counter
pwmper0:       equ $b4 ;pwm channel 0 period
pwmper1:       equ $b5 ;pwm channel 1 period
pwmper2:       equ $b6 ;pwm channel 2 period
pwmper3:       equ $b7 ;pwm channel 3 period
pwmper4:       equ $b8 ;pwm channel 4 period
pwmper5:       equ $b9 ;pwm channel 5 period
pwmper6:       equ $ba ;pwm channel 6 period
pwmper7:       equ $bb ;pwm channel 7 period

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pwmnty0:      equ $bc ;pwm channel 0 duty cycle
pwmnty1:      equ $bd ;pwm channel 1 duty cycle
pwmnty2:      equ $be ;pwm channel 2 duty cycle
pwmnty3:      equ $bf ;pwm channel 3 duty cycle
pwmnty4:      equ $c0 ;pwm channel 0 duty cycle
pwmnty5:      equ $c1 ;pwm channel 1 duty cycle
pwmnty6:      equ $c2 ;pwm channel 2 duty cycle
pwmnty7:      equ $c3 ;pwm channel 3 duty cycle
pwmsdn:       equ $c4 ;pwm shutdown register

sc0bdh:       equ $c8 ;sci 0 baud reg hi byte
sc0bdl:       equ $c9 ;sci 0 baud reg lo byte
sc0cr1:       equ $ca ;sci 0 controll reg
sc0cr2:       equ $cb ;sci 0 control2 reg
sc0sr1:       equ $cc ;sci 0 status reg 1
sc0sr2:       equ $cd ;sci 0 status reg 2
sc0drh:       equ $ce ;sci 0 data reg hi
sc0dlr:       equ $cf ;sci 0 data reg lo
sclbdh:       equ $d0 ;sci 1 baud reg hi byte
sclbdl:       equ $d1 ;sci 1 baud reg lo byte
sclcr1:       equ $d2 ;sci 1 controll reg
sclcr2:       equ $d3 ;sci 1 control2 reg
sclsr1:       equ $d4 ;sci 1 status reg 1
sclsr2:       equ $d5 ;sci 1 status reg 2
scldrh:       equ $d6 ;sci 1 data reg hi
scldlr:       equ $d7 ;sci 1 data reg lo
spi0cr1:      equ $d8 ;spi 0 controll reg
spi0cr2:      equ $d9 ;spi 0 control2 reg
spi0br:       equ $da ;spi 0 baud reg
spi0sr:       equ $db ;spi 0 status reg hi

sp0dr:        equ $dd ;spi 0 data reg

ibad:         equ $e0 ;i2c bus address register
ibfd:         equ $e1 ;i2c bus frequency divider
ibcr:         equ $e2 ;i2c bus control register
ibsr:         equ $e3 ;i2c bus status register
ibdr:         equ $e4 ;i2c bus message data register

dlcblr1:      equ $e8 ;bdlc control regsiter 1
dlcbsvr:      equ $e9 ;bdlc state vector register
dlcblr2:      equ $ea ;bdlc control register 2
dlcblr:       equ $eb ;bdlc data register
dlcblrdr:     equ $ec ;bdlc analog delay register
dlcbrsr:      equ $ed ;bdlc rate select register
dlcscr:       equ $ee ;bdlc control register
dlcblstat:    equ $ef ;bdlc status register
spilcr1:      equ $f0 ;spi 1 controll reg
spilcr2:      equ $f1 ;spi 1 control2 reg
spilbr:       equ $f2 ;spi 1 baud reg
spilsr:       equ $f3 ;spi 1 status reg hi

spldr:        equ $f5 ;spi 1 data reg

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spi2cr1:      equ $f8 ;spi 2 controll reg
spi2cr2:      equ $f9 ;spi 2 control2 reg
spi2br:       equ $fa ;spi 2 baud reg
spi2sr:       equ $fb ;spi 2 status reg hi

sp2dr:        equ $fd ;spi 2 data reg

fclkdiv:      equ $100 ;flash clock divider
fsec:         equ $101 ;flash security register

fcnfg:        equ $103 ;flash configuration register
fprot:        equ $104 ;flash protection register
fstat:        equ $105 ;flash status register
fcmd:         equ $106 ;flash command register

eclkdiv:      equ $110 ;eeprom clock divider

ecnfg:        equ $113 ;eeprom configuration register
eprot:        equ $114 ;eeprom protection register
estat:        equ $115 ;eeprom status register
ecmd:         equ $116 ;eeprom command register

atd1ctl0:     equ $120 ;adc1 control 0 (reserved)
atd1ctl1:     equ $121 ;adc1 control 1 (reserved)
atd1ctl2:     equ $122 ;adc1 control 2
atd1ctl3:     equ $123 ;adc1 control 3
atd1ctl4:     equ $124 ;adc1 control 4
atd1ctl5:     equ $125 ;adc1 control 5
atd1stat:     equ $126 ;adc1 status register hi
*atd1stat     equ $127 ;adc1 status register lo
atd1test:     equ $128 ;adc1 test (reserved)
*atd1test     equ $129 ;

atddien:      equ $12d ;adc1 input enable register

portad1:      equ $12f ;port adcl = input only
adr10h:       equ $130 ;adc1 result 0 register
adr11h:       equ $132 ;adc1 result 1 register
adr12h:       equ $134 ;adc1 result 2 register
adr13h:       equ $136 ;adc1 result 3 register
adr14h:       equ $138 ;adc1 result 4 register
adr15h:       equ $13a ;adc1 result 5 register
adr16h:       equ $13c ;adc1 result 6 register
adr17h:       equ $13e ;adc1 result 7 register
can0ctl0:     equ $140 ;can0 control register 0
can0ctl1:     equ $141 ;can0 control register 1
can0btr0:     equ $142 ;can0 bus timing register 0
can0btr1:     equ $143 ;can0 bus timing register 1
can0rflg:     equ $144 ;can0 receiver flags
can0rier:     equ $145 ;can0 receiver interrupt enables
can0tflg:     equ $146 ;can0 transmit flags
can0tier:     equ $147 ;can0 transmit interrupt enables
can0tarq:     equ $148 ;can0 transmit message abort control
can0taak:     equ $149 ;can0 transmit message abort status

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can0tbel:      equ $14a ;can0 transmit buffer select
can0idac:      equ $14b ;can0 identifier acceptance control

can0rerr:      equ $14e ;can0 receive error counter
can0terr:      equ $14f ;can0 transmit error counter
can0ida0:      equ $150 ;can0 identifier acceptance register 0
can0ida1:      equ $151 ;can0 identifier acceptance register 1
can0ida2:      equ $152 ;can0 identifier acceptance register 2
can0ida3:      equ $153 ;can0 identifier acceptance register 3
can0idm0:      equ $154 ;can0 identifier mask register 0
can0idm1:      equ $155 ;can0 identifier mask register 1
can0idm2:      equ $156 ;can0 identifier mask register 2
can0idm3:      equ $157 ;can0 identifier mask register 3
can0ida4:      equ $158 ;can0 identifier acceptance register 4
can0ida5:      equ $159 ;can0 identifier acceptance register 5
can0ida6:      equ $15a ;can0 identifier acceptance register 6
can0ida7:      equ $15b ;can0 identifier acceptance register 7
can0idm4:      equ $15c ;can0 identifier mask register 4
can0idm5:      equ $15d ;can0 identifier mask register 5
can0idm6:      equ $15e ;can0 identifier mask register 6
can0idm7:      equ $15f ;can0 identifier mask register 7
can0rxfg:      equ $160 ;can0 rx foreground buffer thru +$16f
can0txfg:      equ $170 ;can0 tx foreground buffer thru +$17f

can1ctl0:      equ $180 ;can1 control register 0
can1ctl1:      equ $181 ;can1 control register 1
can1btr0:      equ $182 ;can1 bus timing register 0
can1btr1:      equ $183 ;can1 bus timing register 1
can1rflg:      equ $184 ;can1 receiver flags
can1rier:      equ $185 ;can1 receiver interrupt enables
can1tflg:      equ $186 ;can1 transmit flags
can1tier:      equ $187 ;can1 transmit interrupt enables
can1tarq:      equ $188 ;can1 transmit message abort control
can1taak:      equ $189 ;can1 transmit message abort status
can1tbel:      equ $18a ;can1 transmit buffer select
can1idac:      equ $18b ;can1 identifier acceptance control

can1rerr:      equ $18e ;can1 receive error counter
can1terr:      equ $18f ;can1 transmit error counter
can1ida0:      equ $190 ;can1 identifier acceptance register 0
can1ida1:      equ $191 ;can1 identifier acceptance register 1
can1ida2:      equ $192 ;can1 identifier acceptance register 2
can1ida3:      equ $193 ;can1 identifier acceptance register 3
can1idm0:      equ $194 ;can1 identifier mask register 0
can1idm1:      equ $195 ;can1 identifier mask register 1
can1idm2:      equ $196 ;can1 identifier mask register 2
can1idm3:      equ $197 ;can1 identifier mask register 3
can1ida4:      equ $198 ;can1 identifier acceptance register 4
can1ida5:      equ $199 ;can1 identifier acceptance register 5
can1ida6:      equ $19a ;can1 identifier acceptance register 6
can1ida7:      equ $19b ;can1 identifier acceptance register 7
can1idm4:      equ $19c ;can1 identifier mask register 4
can1idm5:      equ $19d ;can1 identifier mask register 5
can1idm6:      equ $19e ;can1 identifier mask register 6

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canlidm7:      equ $19f ;can1 identifier mask register 7
canlrxfg:      equ $1a0 ;can1 rx foreground buffer thru +$1af
canltxfg:      equ $1b0 ;can1 tx foreground buffer thru +$1bf


can2ctl0:      equ $1c0 ;can2 control register 0
can2ctl1:      equ $1c1 ;can2 control register 1
can2btr0:      equ $1c2 ;can2 bus timing register 0
can2btr1:      equ $1c3 ;can2 bus timing register 1
can2rflg:      equ $1c4 ;can2 receiver flags
can2rier:      equ $1c5 ;can2 receiver interrupt enables
can2tflg:      equ $1c6 ;can2 transmit flags
can2tier:      equ $1c7 ;can2 transmit interrupt enables
can2tarq:      equ $1c8 ;can2 transmit message abort control
can2taak:      equ $1c9 ;can2 transmit message abort status
can2tbel:      equ $1ca ;can2 transmit buffer select
can2idac:      equ $1cb ;can2 identifier acceptance control


can2rerr:      equ $1ce ;can2 receive error counter
can2terr:      equ $1cf ;can2 transmit error counter
can2ida0:      equ $1d0 ;can2 identifier acceptance register 0
can2ida1:      equ $1d1 ;can2 identifier acceptance register 1
can2ida2:      equ $1d2 ;can2 identifier acceptance register 2
can2ida3:      equ $1d3 ;can2 identifier acceptance register 3
can2idm0:      equ $1d4 ;can2 identifier mask register 0
can2idm1:      equ $1d5 ;can2 identifier mask register 1
can2idm2:      equ $1d6 ;can2 identifier mask register 2
can2idm3:      equ $1d7 ;can2 identifier mask register 3
can2ida4:      equ $1d8 ;can2 identifier acceptance register 4
can2ida5:      equ $1d9 ;can2 identifier acceptance register 5
can2ida6:      equ $1da ;can2 identifier acceptance register 6
can2ida7:      equ $1db ;can2 identifier acceptance register 7
can2idm4:      equ $1dc ;can2 identifier mask register 4
can2idm5:      equ $1dd ;can2 identifier mask register 5
can2idm6:      equ $1de ;can2 identifier mask register 6
can2idm7:      equ $1df ;can2 identifier mask register 7
can2rxfg:      equ $1e0 ;can2 rx foreground buffer thru +$1ef
can2txfg:      equ $1f0 ;can2 tx foreground buffer thru +$1ff


can3ctl0:      equ $200 ;can3 control register 0
can3ctl1:      equ $201 ;can3 control register 1
can3btr0:      equ $202 ;can3 bus timing register 0
can3btr1:      equ $203 ;can3 bus timing register 1
can3rflg:      equ $204 ;can3 receiver flags
can3rier:      equ $205 ;can3 receiver interrupt enables
can3tflg:      equ $206 ;can3 transmit flags
can3tier:      equ $207 ;can3 transmit interrupt enables
can3tarq:      equ $208 ;can3 transmit message abort control
can3taak:      equ $209 ;can3 transmit message abort status
can3tbel:      equ $20a ;can3 transmit buffer select
can3idac:      equ $20b ;can3 identifier acceptance control


can3rerr:      equ $20e ;can3 receive error counter
can3terr:      equ $20f ;can3 transmit error counter
can3ida0:      equ $210 ;can3 identifier acceptance register 0

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can3ida1:    equ $211 ;can3 identifier acceptance register 1
can3ida2:    equ $212 ;can3 identifier acceptance register 2
can3ida3:    equ $213 ;can3 identifier acceptance register 3
can3idm0:    equ $214 ;can3 identifier mask register 0
can3idm1:    equ $215 ;can3 identifier mask register 1
can3idm2:    equ $216 ;can3 identifier mask register 2
can3idm3:    equ $217 ;can3 identifier mask register 3
can3ida4:    equ $218 ;can3 identifier acceptance register 4
can3ida5:    equ $219 ;can3 identifier acceptance register 5
can3ida6:    equ $21a ;can3 identifier acceptance register 6
can3ida7:    equ $21b ;can3 identifier acceptance register 7
can3idm4:    equ $21c ;can3 identifier mask register 4
can3idm5:    equ $21d ;can3 identifier mask register 5
can3idm6:    equ $21e ;can3 identifier mask register 6
can3idm7:    equ $21f ;can3 identifier mask register 7
can3rxfg:    equ $220 ;can3 rx foreground buffer thru +$22f
can3txfg:    equ $230 ;can3 tx foreground buffer thru +$23f

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ptt:         equ $240 ;portt data register
ptit:        equ $241 ;portt input register
ddrt:        equ $242 ;portt direction register
rdrt:        equ $243 ;portt reduced drive register
pert:        equ $244 ;portt pull device enable
ppst:        equ $245 ;portt pull polarity select

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pts:         equ $248 ;ports data register
ptis:        equ $249 ;ports input register
ddrs:        equ $24a ;ports direction register
rdrs:        equ $24b ;ports reduced drive register
pers:        equ $24c ;ports pull device enable
ppss:        equ $24d ;ports pull polarity select
woms:        equ $24e ;ports wired or mode register

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ptm:         equ $250 ;portm data register
ptim:        equ $251 ;portm input register
ddrm:        equ $252 ;portm direction register
rdrm:        equ $253 ;portm reduced drive register
perm:        equ $254 ;portm pull device enable
ppsm:        equ $255 ;portm pull polarity select
womm:        equ $256 ;portm wired or mode register
modrr:       equ $257 ;portm module routing register
ptp:         equ $258 ;portp data register
ptip:        equ $259 ;portp input register
ddrp:        equ $25a ;portp direction register
rdrp:        equ $25b ;portp reduced drive register
perp:        equ $25c ;portp pull device enable
ppsp:        equ $25d ;portp pull polarity select
piep:        equ $25e ;portp interrupt enable register
pifp:        equ $25f ;portp interrupt flag register
pth:         equ $260 ;porth data register
ptih:        equ $261 ;porth input register
ddrh:        equ $262 ;porth direction register
rdrh:        equ $263 ;porth reduced drive register
perh:        equ $264 ;porth pull device enable

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ppsh:      equ $265 ;porth pull polarity select
pieh:      equ $266 ;porth interrupt enable register
pifh:      equ $267 ;porth interrupt flag register
ptj:       equ $268 ;portp data register
ptij:      equ $269 ;portp input register
ddrj:      equ $26a ;portp direction register
rdrj:      equ $26b ;portp reduced drive register
perj:      equ $26c ;portp pull device enable
pps:       equ $26d ;portp pull polarity select
piej:      equ $26e ;portp interrupt enable register
pifj:      equ $26f ;portp interrupt flag register

can4ctl0:  equ $280 ;can4 control register 0
can4ctl1:  equ $281 ;can4 control register 1
can4btr0:  equ $282 ;can4 bus timing register 0
can4btr1:  equ $283 ;can4 bus timing register 1
can4rflg:  equ $284 ;can4 receiver flags
can4rier:  equ $285 ;can4 receiver interrupt enables
can4tflg:  equ $286 ;can4 transmit flags
can4tier:  equ $287 ;can4 transmit interrupt enables
can4tarq:  equ $288 ;can4 transmit message abort control
can4taak:  equ $289 ;can4 transmit message abort status
can4tbel:  equ $28a ;can4 transmit buffer select
can4idac:  equ $28b ;can4 identifier acceptance control

can4rerr:  equ $28e ;can4 receive error counter
can4terr:  equ $28f ;can4 transmit error counter
can4ida0:  equ $290 ;can4 identifier acceptance register 0
can4ida1:  equ $291 ;can4 identifier acceptance register 1
can4ida2:  equ $292 ;can4 identifier acceptance register 2
can4ida3:  equ $293 ;can4 identifier acceptance register 3
can4idm0:  equ $294 ;can4 identifier mask register 0
can4idm1:  equ $295 ;can4 identifier mask register 1
can4idm2:  equ $296 ;can4 identifier mask register 2
can4idm3:  equ $297 ;can4 identifier mask register 3
can4ida4:  equ $298 ;can4 identifier acceptance register 4
can4ida5:  equ $299 ;can4 identifier acceptance register 5
can4ida6:  equ $29a ;can4 identifier acceptance register 6
can4ida7:  equ $29b ;can4 identifier acceptance register 7
can4idm4:  equ $29c ;can4 identifier mask register 4
can4idm5:  equ $29d ;can4 identifier mask register 5
can4idm6:  equ $29e ;can4 identifier mask register 6
can4idm7:  equ $29f ;can4 identifier mask register 7
can4rxfg:  equ $2a0 ;can4 rx foreground buffer thru +$2af
can4txfg:  equ $2b0 ;can4 tx foreground buffer thru +$2bf

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* end registers