```
SSSSSSSSSSSS      000000000     RRRRRRRRRRR    TTTTTTTTTTTTTTTT    333333333        222222222
SSSSSSSSSSSS      000000000     RRRRRRRRRRR    TTTTTTTTTTTTTTTT    333333333        222222222
SSSSSSSSSSSS      000000000     RRRRRRRRRRR    TTTTTTTTTTTTTTTT    333333333        222222222
SSS             000     000     RRR     RRR         TTT          333       333    222       222
SSS             000     000     RRR     RRR         TTT          333       333    222       222
SSS             000     000     RRR     RRR         TTT          333       333    222       222
SSS             000     000     RRR     RRR         TTT                    333              222
SSS             000     000     RRR     RRR         TTT                    333              222
SSSSSSSSS       000     000     RRRRRRRRRRR         TTT                  333                222
SSSSSSSSS       000     000     RRRRRRRRRRR         TTT                333                  222
SSSSSSSSS       000     000     RRRRRRRRRRR         TTT              333                  222
       SSS      000     000     RRR  RRR            TTT            333                   222
       SSS      000     000     RRR  RRR            TTT          333                   222
       SSS      000     000     RRR  RRR            TTT        333                    222
       SSS      000     000     RRR     RRR         TTT       333       333         222
       SSS      000     000     RRR     RRR         TTT      333        333        222
SSSSSSSSSSSS     000000000      RRR     RRR         TTT       333333333          222222222222
SSSSSSSSSSSS     000000000      RRR     RRR         TTT       333333333          222222222222
SSSSSSSSSSSS     000000000      RRR     RRR         TTT       333333333          222222222222
```

```
   000000   PPPPPPPP   CCCCCCC    000000   DDDDDDDD  EEEEEEEEEE  SSSSSSSS
   000000   PPPPPPPP   CCCCCCC    000000   DDDDDDDD  EEEEEEEEEE  SSSSSSSS
  00    00  PP    PP  CC        00    00   DD    DD  EE              SS
  00    00  PP    PP  CC        00    00   DD    DD  EE              SS
  00    00  PP    PP  CC        00    00   DD    DD  EE              SS
  00    00  PP    PP  CC        00    00   DD    DD  EE              SS
  00    00  PPPPPPPP  CC        00    00   DD    DD  EEEEEEE     SSSSSS
  00    00  PPPPPPPP  CC        00    00   DD    DD  EEEEEEE     SSSSSS
  00    00  PP        CC        00    00   DD    DD  EE
  00    00  PP        CC        00    00   DD    DD  EE              SS
  00    00  PP        CC        00    00   DD    DD  EE              SS
  00    00  PP        CC        00    00   DD    DD  EE              SS
   000000   PP         CCCCCCC    000000   DDDDDDDD  EEEEEEEEEE  SSSSSSSS    ....
   000000   PP         CCCCCCC    000000   DDDDDDDD  EEEEEEEEEE  SSSSSSSS    ....


  RRRRRRRR  EEEEEEEEEE   QQQQQQ
  RRRRRRRR  EEEEEEEEEE   QQQQQQ
  RR    RR  EE         QQ      QQ
  RR    RR  EE         QQ      QQ
  RR    RR  EE         QQ      QQ
  RR    RR  EE         QQ      QQ
  RRRRRRRR  EEEEEEE    QQ      QQ
  RRRRRRRR  EEEEEEE    QQ      QQ
  RR  RR    EE         QQ   QQ QQ
  RR  RR    EE         QQ   QQ QQ
  RR    RR  EE         QQ      QQ
  RR    RR  EE         QQ      QQ
  RR      RR  EEEEEEEEEE    QQQQ  QQ
  RR      RR  EEEEEEEEEE    QQQQ  QQ
```

```
! File: OPCODES.REQ IDENT = 'V04-000'    ! File: OPCODES.REQ Edit: PDG1001

!**********************************************************************
!*                                                                    *
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!**********************************************************************


!++
!
! FACILITY:     VAX-11 SORT / MERGE
!
! ABSTRACT:
!
!       This module defines numeric values of opcodes and operand specifiers.
!
! ENVIRONMENT:  VAX/VMS user mode
!
! AUTHOR: P. Gilbert, CREATION DATE: 07-Dec-1981
!
! MODIFIED BY:
!
!       V01-000         Original
!       V01-001 Change values of two-byte opcodes to conform with definitions
!               in STARLET.  PDG 4-Apr-1983
!--
```

```
MACRO OPCODES =
'HALT'    ,  0,  '00',    ,    ,    ,    ,    ,    ,    ,
'NOP'     ,  0,  '01',    ,    ,    ,    ,    ,    ,    ,
'REI'     ,  0,  '02',    ,    ,    ,    ,    ,    ,    ,
'BPT'     ,  0,  '03',    ,    ,    ,    ,    ,    ,    ,
'RET'     ,  0,  '04',    ,    ,    ,    ,    ,    ,    ,
'RSB'     ,  0,  '05',    ,    ,    ,    ,    ,    ,    ,
'LDPCTX'  ,  0,  '06',    ,    ,    ,    ,    ,    ,    ,
'SVPCTX'  ,  0,  '07',    ,    ,    ,    ,    ,    ,    ,
'CVTPS'   ,  4,  '08',    rw,ab,rw,ab,    ,    ,
'CVTSP'   ,  4,  '09',    rw,ab,rw,ab,    ,    ,
'INDEX'   ,  6,  '0A',    rl,rl,rl,rl,rl,wl,
'CRC'     ,  4,  '0B',    ab,rl,rw,ab,    ,    ,
'PROBER'  ,  3,  '0C',    rb,rw,ab,    ,    ,    ,
'PROBEW'  ,  3,  '0D',    rb,rw,ab,    ,    ,    ,
'INSQUE'  ,  2,  '0E',    ab,ab,    ,    ,    ,    ,
'REMQUE'  ,  2,  '0F',    ab,wl,    ,    ,    ,    ,
'BSBB'    ,  1,  '10',    bb,    ,    ,    ,    ,    ,
'BRB'     ,  1,  '11',    bb,    ,    ,    ,    ,    ,
'BNEQ'    ,  1,  '12',    bb,    ,    ,    ,    ,    ,
'BEQL'    ,  1,  '13',    bb,    ,    ,    ,    ,    ,
'BGTR'    ,  1,  '14',    bb,    ,    ,    ,    ,    ,
'BLEQ'    ,  1,  '15',    bb,    ,    ,    ,    ,    ,
'JSB'     ,  1,  '16',    ab,    ,    ,    ,    ,    ,
'JMP'     ,  1,  '17',    ab,    ,    ,    ,    ,    ,
'BGEQ'    ,  1,  '18',    bb,    ,    ,    ,    ,    ,
'BLSS'    ,  1,  '19',    bb,    ,    ,    ,    ,    ,
'BGTRU'   ,  1,  '1A',    bb,    ,    ,    ,    ,    ,
'BLEQU'   ,  1,  '1B',    bb,    ,    ,    ,    ,    ,
'BVC'     ,  1,  '1C',    bb,    ,    ,    ,    ,    ,
'BVS'     ,  1,  '1D',    bb,    ,    ,    ,    ,    ,
'BGEQU'   ,  1,  '1E',    bb,    ,    ,    ,    ,    ,
'BLSSU'   ,  1,  '1F',    bb,    ,    ,    ,    ,    ,
'ADDP4'   ,  4,  '20',    rw,ab,rw,ab,    ,    ,
'ADDP6'   ,  6,  '21',    rw,ab,rw,ab,rw,ab,
'SUBP4'   ,  4,  '22',    rw,ab,rw,ab,    ,    ,
'SUBP6'   ,  6,  '23',    rw,ab,rw,ab,rw,ab,
'CVTPT'   ,  5,  '24',    rw,ab,ab,rw,ab,    ,
'MULP'    ,  6,  '25',    rw,ab,rw,ab,rw,ab,
'CVTTP'   ,  5,  '26',    rw,ab,ab,rw,ab,    ,
'DIVP'    ,  6,  '27',    rw,ab,rw,ab,rw,ab,
'MOVC3'   ,  3,  '28',    rw,ab,ab,    ,    ,    ,
'CMPC3'   ,  3,  '29',    rw,ab,ab,    ,    ,    ,
'SCANC'   ,  4,  '2A',    rw,ab,ab,rb,    ,    ,
'SPANC'   ,  4,  '2B',    rw,ab,ab,rb,    ,    ,
'MOVC5'   ,  5,  '2C',    rw,ab,rb,rw,ab,    ,
'CMPC5'   ,  5,  '2D',    rw,ab,rb,rw,ab,    ,
'MOVTC'   ,  6,  '2E',    rw,ab,rb,ab,rw,ab,
'MOVTUC'  ,  6,  '2F',    rw,ab,rb,ab,rw,ab,
'BSBW'    ,  1,  '30',    bw,    ,    ,    ,    ,    ,
'BRW'     ,  1,  '31',    bw,    ,    ,    ,    ,    ,
'CVTWL'   ,  2,  '32',    rw,wl,    ,    ,    ,    ,
'CVTWB'   ,  2,  '33',    rw,wb,    ,    ,    ,    ,
'MOVP'    ,  3,  '34',    rw,ab,ab,    ,    ,    ,
'CMPP3'   ,  3,  '35',    rw,ab,ab,    ,    ,    ,
'CVTPL'   ,  3,  '36',    rw,ab,wl,    ,    ,    ,
```

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'CMPP4'  .  4,  '37'  .  rw,ab,rw,ab,   .   .
'EDITPC' .  4,  '38'  .  rw,ab,ab,ab,   .   .
'MATCHC' .  4,  '39'  .  rw,ab,rw,ab,   .   .
'LOCC'   .  3,  '3A'  .  rb,rw,ab.   .   .   .
'SKPC'   .  3,  '3B'  .  rb,rw,ab.   .   .   .
'MOVZWL' .  2,  '3C'  .  rw,wl.   .   .   .   .
'ACBW'   .  4,  '3D'  .  rw,rw,mw,bw,   .   .
'MOVAW'  .  2,  '3E'  .  aw,wl.   .   .   .   .
'PUSHAW' .  1,  '3F'  .  aw.   .   .   .   .   .
'ADDF2'  .  2,  '40'  .  rf,mf.   .   .   .   .
'ADDF3'  .  3,  '41'  .  rf,rf,wf.   .   .   .
'SUBF2'  .  2,  '42'  .  rf,mf.   .   .   .   .
'SUBF3'  .  3,  '43'  .  rf,rf,wf.   .   .   .
'MULF2'  .  2,  '44'  .  rf,mf.   .   .   .   .
'MULF3'  .  3,  '45'  .  rf,rf,wf.   .   .   .
'DIVF2'  .  2,  '46'  .  rf,mf.   .   .   .   .
'DIVF3'  .  3,  '47'  .  rf,rf,wf.   .   .   .
'CVTFB'  .  2,  '48'  .  rf,wb.   .   .   .   .
'CVTFW'  .  2,  '49'  .  rf,ww.   .   .   .   .
'CVTFL'  .  2,  '4A'  .  rf,wl.   .   .   .   .
'CVTRFL' .  2,  '4B'  .  rf,wl.   .   .   .   .
'CVTBF'  .  2,  '4C'  .  rb,wf.   .   .   .   .
'CVTWF'  .  2,  '4D'  .  rw,wf.   .   .   .   .
'CVTLF'  .  2,  '4E'  .  rl,wf.   .   .   .   .
'ACBF'   .  4,  '4F'  .  rf,rf,mf,bw,   .   .
'MOVF'   .  2,  '50'  .  rf,wf.   .   .   .   .
'CMPF'   .  2,  '51'  .  rf,rf.   .   .   .   .
'MNEGF'  .  2,  '52'  .  rf,wf.   .   .   .   .
'TSTF'   .  1,  '53'  .  rf.   .   .   .   .   .
'EMODF'  .  5,  '54'  .  rf,rb,rf,wl,wf,   .
'POLYF'  .  3,  '55'  .  rf,rw,ab.   .   .   .
'CVTFD'  .  2,  '56'  .  rf,wd.   .   .   .   .
'X57'    .  0,  '57'  .     .   .   .   .   .   .
'ADAWI'  .  2,  '58'  .  rw,mw.   .   .   .   .
'X59'    .  0,  '59'  .     .   .   .   .   .   .
'X5A'    .  0,  '5A'  .     .   .   .   .   .   .
'X5B'    .  0,  '5B'  .     .   .   .   .   .   .
'INSQHI' .  2,  '5C'  .  ab,aq.   .   .   .   .
'INSQTI' .  2,  '5D'  .  ab,aq.   .   .   .   .
'REMQHI' .  2,  '5E'  .  aq,wl.   .   .   .   .
'REMQTI' .  2,  '5F'  .  aq,wl.   .   .   .   .
'ADDD2'  .  2,  '60'  .  rd,md.   .   .   .   .
'ADDD3'  .  3,  '61'  .  rd,rd,wd.   .   .   .
'SUBD2'  .  2,  '62'  .  rd,md.   .   .   .   .
'SUBD3'  .  3,  '63'  .  rd,rd,wd.   .   .   .
'MULD2'  .  2,  '64'  .  rd,md.   .   .   .   .
'MULD3'  .  3,  '65'  .  rd,rd,wd.   .   .   .
'DIVD2'  .  2,  '66'  .  rd,md.   .   .   .   .
'DIVD3'  .  3,  '67'  .  rd,rd,wd.   .   .   .
'CVTDB'  .  2,  '68'  .  rd,wb.   .   .   .   .
'CVTDW'  .  2,  '69'  .  rd,ww.   .   .   .   .
'CVTDL'  .  2,  '6A'  .  rd,wl.   .   .   .   .
'CVTRDL' .  2,  '6B'  .  rd,wl.   .   .   .   .
'CVTBD'  .  2,  '6C'  .  rb,wd.   .   .   .   .
'CVTWD'  .  2,  '6D'  .  rw,wd.   .   .   .   .
'CVTLD'  .  2,  '6E'  .  rl,wd.   .   .   .   .
```

```
'ACBD'    ,  4,  '6F',  rd,rd,md,bw,  ,  ,
'MOVD'    ,  2,  '70',  rd,wd,  ,  ,  ,
'CMPD'    ,  2,  '71',  rd,rd,  ,  ,  ,
'MNEGD'   ,  2,  '72',  rd,wd,  ,  ,  ,
'TSTD'    ,  1,  '73',  rd,  ,  ,  ,
'EMODD'   ,  5,  '74',  rd,rb,rd,wl,wd,
'POLYD'   ,  3,  '75',  rd,rw,ab,  ,
'CVTDF'   ,  2,  '76',  rd,wf,  ,  ,  ,
'X77'     ,  0,  '77',  ,  ,  ,  ,
'ASHL'    ,  3,  '78',  rb,rl,wl,  ,  ,
'ASHQ'    ,  3,  '79',  rb,rq,wq,  ,  ,
'EMUL'    ,  4,  '7A',  rl,rl,rl,wq,  ,
'EDIV'    ,  4,  '7B',  rl,rq,wl,wl,  ,
'CLRQ'    ,  1,  '7C',  wq,  ,  ,  ,
'MOVQ'    ,  2,  '7D',  rq,wq,  ,  ,  ,
'MOVAQ'   ,  2,  '7E',  aq,wl,  ,  ,  ,
'PUSHAQ'  ,  1,  '7F',  aq,  ,  ,  ,
'ADDB2'   ,  2,  '80',  rb,mb,  ,  ,  ,
'ADDB3'   ,  3,  '81',  rb,rb,wb,  ,  ,
'SUBB2'   ,  2,  '82',  rb,mb,  ,  ,  ,
'SUBB3'   ,  3,  '83',  rb,rb,wb,  ,  ,
'MULB2'   ,  2,  '84',  rb,mb,  ,  ,  ,
'MULB3'   ,  3,  '85',  rb,rb,wb,  ,  ,
'DIVB2'   ,  2,  '86',  rb,mb,  ,  ,  ,
'DIVB3'   ,  3,  '87',  rb,rb,wb,  ,  ,
'BISB2'   ,  2,  '88',  rb,mb,  ,  ,  ,
'BISB3'   ,  3,  '89',  rb,rb,wb,  ,  ,
'BICB2'   ,  2,  '8A',  rb,mb,  ,  ,  ,
'BICB3'   ,  3,  '8B',  rb,rb,wb,  ,  ,
'XORB2'   ,  2,  '8C',  rb,mb,  ,  ,  ,
'XORB3'   ,  3,  '8D',  rb,rb,wb,  ,  ,
'MNEGB'   ,  2,  '8E',  rb,wb,  ,  ,  ,
'CASEB'   ,  3,  '8F',  rb,rb,rb,  ,
'MOVB'    ,  2,  '90',  rb,wb,  ,  ,  ,
'CMPB'    ,  2,  '91',  rb,rb,  ,  ,  ,
'MCOMB'   ,  2,  '92',  rb,wb,  ,  ,  ,
'BITB'    ,  2,  '93',  rb,rb,  ,  ,  ,
'CLRB'    ,  1,  '94',  wb,  ,  ,  ,
'TSTB'    ,  1,  '95',  rb,  ,  ,  ,
'INCB'    ,  1,  '96',  mb,  ,  ,  ,
'DECB'    ,  1,  '97',  mb,  ,  ,  ,
'CVTBL'   ,  2,  '98',  rb,wl,  ,  ,  ,
'CVTBW'   ,  2,  '99',  rb,ww,  ,  ,  ,
'MOVZBL'  ,  2,  '9A',  rb,wl,  ,  ,  ,
'MOVZBW'  ,  2,  '9B',  rb,ww,  ,  ,  ,
'ROTL'    ,  3,  '9C',  rb,rl,wl,  ,  ,
'ACBB'    ,  4,  '9D',  rb,rb,mb,bw,  ,
'MOVAB'   ,  2,  '9E',  ab,wl,  ,  ,  ,
'PUSHAB'  ,  1,  '9F',  ab,  ,  ,  ,
'ADDW2'   ,  2,  'A0',  rw,mw,  ,  ,  ,
'ADDW3'   ,  3,  'A1',  rw,rw,ww,  ,  ,
'SUBW2'   ,  2,  'A2',  rw,mw,  ,  ,  ,
'SUBW3'   ,  3,  'A3',  rw,rw,ww,  ,  ,
'MULW2'   ,  2,  'A4',  rw,mw,  ,  ,  ,
'MULW3'   ,  3,  'A5',  rw,rw,ww,  ,  ,
'DIVW2'   ,  2,  'A6',  rw,mw,  ,  ,  ,
```

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'DIVW3' , 3, 'A7', rw,rw,ww, , , ,
'BISW2' , 2, 'A8', rw,mw, , , ,
'BISW3' , 3, 'A9', rw,rw,ww, , , ,
'BICW2' , 2, 'AA', rw,mw, , , ,
'BICW3' , 3, 'AB', rw,rw,ww, , , ,
'XORW2' , 2, 'AC', rw,mw, , , ,
'XORW3' , 3, 'AD', rw,rw,ww, , , ,
'MNEGW' , 2, 'AE', rw,ww, , , ,
'CASEW' , 3, 'AF', rw,rw,rw, , , ,
'MOVW' , 2, 'B0', rw,ww, , , ,
'CMPW' , 2, 'B1', rw,rw, , , ,
'MCOMW' , 2, 'B2', rw,ww, , , ,
'BITW' , 2, 'B3', rw,rw, , , ,
'CLRW' , 1, 'B4', ww, , , ,
'TSTW' , 1, 'B5', rw, , , ,
'INCW' , 1, 'B6', mw, , , ,
'DECW' , 1, 'B7', mw, , , ,
'BISPSW' , 1, 'B8', rw, , , ,
'BICPSW' , 1, 'B9', rw, , , ,
'POPR' , 1, 'BA', rw, , , ,
'PUSHR' , 1, 'BB', rw, , , ,
'CHMK' , 1, 'BC', rw, , , ,
'CHME' , 1, 'BD', rw, , , ,
'CHMS' , 1, 'BE', rw, , , ,
'CHMU' , 1, 'BF', rw, , , ,
'ADDL2' , 2, 'C0', rl,ml, , , ,
'ADDL3' , 3, 'C1', rl,rl,wl, , , ,
'SUBL2' , 2, 'C2', rl,ml, , , ,
'SUBL3' , 3, 'C3', rl,rl,wl, , , ,
'MULL2' , 2, 'C4', rl,ml, , , ,
'MULL3' , 3, 'C5', rl,rl,wl, , , ,
'DIVL2' , 2, 'C6', rl,ml, , , ,
'DIVL3' , 3, 'C7', rl,rl,wl, , , ,
'BISL2' , 2, 'C8', rl,ml, , , ,
'BISL3' , 3, 'C9', rl,rl,wl, , , ,
'BICL2' , 2, 'CA', rl,ml, , , ,
'BICL3' , 3, 'CB', rl,rl,wl, , , ,
'XORL2' , 2, 'CC', rl,ml, , , ,
'XORL3' , 3, 'CD', rl,rl,wl, , , ,
'MNEGL' , 2, 'CE', rl,wl, , , ,
'CASEL' , 3, 'CF', rl,rl,rl, , , ,
'MOVL' , 2, 'D0', rl,wl, , , ,
'CMPL' , 2, 'D1', rl,rl, , , ,
'MCOML' , 2, 'D2', rl,wl, , , ,
'BITL' , 2, 'D3', rl,rl, , , ,
'CLRL' , 1, 'D4', wl, , , ,
'TSTL' , 1, 'D5', rl, , , ,
'INCL' , 1, 'D6', ml, , , ,
'DECL' , 1, 'D7', ml, , , ,
'ADWC' , 2, 'D8', rl,ml, , , ,
'SBWC' , 2, 'D9', rl,ml, , , ,
'MTPR' , 2, 'DA', rl,rl, , , ,
'MFPR' , 2, 'DB', rl,wl, , , ,
'MOVPSL' , 1, 'DC', wl, , , ,
'PUSHL' , 1, 'DD', rl, , , ,
'MOVAL' , 2, 'DE', al,wl, , , ,
```

```
'PUSHAL' ,  1,  'DF' ,  al, , , ,
'BBS'    ,  3,  'E0' ,  rl,vb,bb, , , ,
'BBC'    ,  3,  'E1' ,  rl,vb,bb, , , ,
'BBSS'   ,  3,  'E2' ,  rl,ub,bb, , , ,
'BBCS'   ,  3,  'E3' ,  rl,ub,bb, , , ,
'BBSC'   ,  3,  'E4' ,  rl,ub,bb, , , ,
'BBCC'   ,  3,  'E5' ,  rl,ub,bb, , , ,
'BBSSI'  ,  3,  'E6' ,  rl,vb,bb, , , ,
'BBCCI'  ,  3,  'E7' ,  rl,vb,bb, , , ,
'BLBS'   ,  2,  'E8' ,  rl,bb, , , ,
'BLBC'   ,  2,  'E9' ,  rl,bb, , , ,
'FFS'    ,  4,  'EA' ,  rl,rb,vb,wl, , ,
'FFC'    ,  4,  'EB' ,  rl,rb,vb,wl, , ,
'CMPV'   ,  4,  'EC' ,  rl,rb,vb,rl, , ,
'CMPZV'  ,  4,  'ED' ,  rl,rb,vb,rl, , ,
'EXTV'   ,  4,  'EE' ,  rl,rb,vb,wl, , ,
'EXTZV'  ,  4,  'EF' ,  rl,rb,vb,wl, , ,
'INSV'   ,  4,  'F0' ,  rl,rl,rb,ub, , ,
'ACBL'   ,  4,  'F1' ,  rl,rl,ml,bw, , ,
'AOBLSS' ,  3,  'F2' ,  rl,ml,bb, , , ,
'AOBLEQ' ,  3,  'F3' ,  rl,ml,bb, , , ,
'SOBGEQ' ,  2,  'F4' ,  ml,bb, , , ,
'SOBGTR' ,  2,  'F5' ,  ml,bb, , , ,
'CVTLB'  ,  2,  'F6' ,  rl,wb, , , ,
'CVTLW'  ,  2,  'F7' ,  rl,ww, , , ,
'ASHP'   ,  6,  'F8' ,  rb,rw,ab,rb,rw,ab,
'CVTLP'  ,  3,  'F9' ,  rl,rw,ab, , ,
'CALLG'  ,  2,  'FA' ,  ab,ab, , , ,
'CALLS'  ,  2,  'FB' ,  rl,ab, , , ,
'XFC'    ,  0,  'FC' ,  , , , , , ,
'ESCD'   ,  0,  'FD' ,  , , , , , ,
'ESCE'   ,  0,  'FE' ,  , , , , , ,
'ESCF'   ,  0,  'FF' ,  , , , , , %;
```

```
MACRO FDCODES =
'CVTDH'   .  2.  '32FD'.  rd,wh,    .    .    .
'CVTGF'   .  2.  '33FD'.  rg,wf,    .    .    .
'ADDG2'   .  2.  '40FD'.  rg,mg,    .    .    .
'ADDG3'   .  3.  '41FD'.  rg,rg,wg,     .    .
'SUBG2'   .  2.  '42FD'.  rg,mg,    .    .    .
'SUBG3'   .  3.  '43FD'.  rg,rg,wg,     .    .
'MULG2'   .  2.  '44FD'.  rg,mg,    .    .    .
'MULG3'   .  3.  '45FD'.  rg,rg,wg,     .    .
'DIVG2'   .  2.  '46FD'.  rg,mg,    .    .    .
'DIVG3'   .  3.  '47FD'.  rg,rg,wg,     .    .
'CVTGB'   .  2.  '48FD'.  rg,wb,    .    .    .
'CVTGW'   .  2.  '49FD'.  rg,ww,    .    .    .
'CVTGL'   .  2.  '4AFD'.  rg,wl,    .    .    .
'CVTRGL'  .  2.  '4BFD'.  rg,wl,    .    .    .
'CVTBG'   .  2.  '4CFD'.  rb,wg,    .    .    .
'CVTWG'   .  2.  '4DFD'.  rw,wg,    .    .    .
'CVTLG'   .  2.  '4EFD'.  rl,wg,    .    .    .
'ACBG'    .  4.  '4FFD'.  rg,rg,mg,bw,  .    .
'MOVG'    .  2.  '50FD'.  rg,wg,    .    .    .
'CMPG'    .  2.  '51FD'.  rg,rg,    .    .    .
'MNEGG'   .  2.  '52FD'.  rg,wg,    .    .    .
'TSTG'    .  1.  '53FD'.  rg,       .    .    .
'EMODG'   .  5.  '54FD'.  rg,rw,rg,wl,wg,   .
'POLYG'   .  3.  '55FD'.  rg,rw,ab,     .    .
'CVTGH'   .  2.  '56FD'.  rg,wh,    .    .    .
'ADDH2'   .  2.  '60FD'.  rh,mh,    .    .    .
'ADDH3'   .  3.  '61FD'.  rh,rh,wh,     .    .
'SUBH2'   .  2.  '62FD'.  rh,mh,    .    .    .
'SUBH3'   .  3.  '63FD'.  rh,rh,wh,     .    .
'MULH2'   .  2.  '64FD'.  rh,mh,    .    .    .
'MULH3'   .  3.  '65FD'.  rh,rh,wh,     .    .
'DIVH2'   .  2.  '66FD'.  rh,mh,    .    .    .
'DIVH3'   .  3.  '67FD'.  rh,rh,wh,     .    .
'CVTHB'   .  2.  '68FD'.  rh,rh,    .    .    .
'CVTHW'   .  2.  '69FD'.  rh,rh,    .    .    .
'CVTHL'   .  2.  '6AFD'.  rh,rh,    .    .    .
'CVTRHL'  .  2.  '6BFD'.  rh,rh,    .    .    .
'CVTBH'   .  2.  '6CFD'.  rb,wh,    .    .    .
'CVTWH'   .  2.  '6DFD'.  rw,wh,    .    .    .
'CVTLH'   .  2.  '6EFD'.  rl,wh,    .    .    .
'ACBH'    .  4.  '6FFD'.  rh,rh,mh,bw,  .    .
'MOVH'    .  2.  '70FD'.  rh,wh,    .    .    .
'CMPH'    .  2.  '71FD'.  rh,rh,    .    .    .
'MNEGH'   .  2.  '72FD'.  rh,wh,    .    .    .
'TSTH'    .  1.  '73FD'.  rh,       .    .    .
'EMODH'   .  5.  '74FD'.  rh,rw,rh,wl,wh,   .
'POLYH'   .  3.  '75FD'.  rh,rw,ab,     .    .
'CVTHG'   .  2.  '76FD'.  rh,wg,    .    .    .
'CLRO'    .  1.  '7CFD'.  wo,       .    .    .
'MOVO'    .  2.  '7DFD'.  ro,wo,    .    .    .
'MOVAO'   .  2.  '7EFD'.  ao,wl,    .    .    .
'PUSHAO'  .  1.  '7FFD'.  ao,       .    .    .
'CVTFH'   .  2.  '98FD'.  rf,wh,    .    .    .
'CVTFG'   .  2.  '99FD'.  rf,wg,    .    .    .
'CVTHF'   .  2.  'F6FD'.  rh,wf,    .    .    .
```

```
'CVTWD' . 2. 'F7FD'. rh,wd. . . . . .
'BUGL' . 0. 'FDFD'. il. . . . . .
'BUGW' . 0. 'FEFD'. iw. . . . . %.
```

```
MACRO
    DEF_OPCODES[A,B,C,D,E,F,G,H,I] =
        %NAME('OPC_',A) = %X C %;
LITERAL
    DEF_OPCODES(OPCODES,FDCODES);

UNDECLARE
    %QUOTE OPCODES,
    %QUOTE FDCODES;
```

```
! Define literals for the registers
!
LITERAL
    R_0 =           0,          ! Register 0
    R_1 =           1,
    R_2 =           2,
    R_3 =           3,
    R_4 =           4,
    R_5 =           5,
    R_6 =           6,
    R_7 =           7,
    R_8 =           8,
    R_9 =           9,
    R_10 =          10,
    R_11 =          11,
    R_AP =          12,         ! Argument Pointer
    R_FP =          13,         ! Frame pointer
    R_SP =          14,         ! Stack pointer
    R_PC =          15;         ! Program Counter

! Define literals for addressing modes
!
LITERAL
    M_I =           %X'40', ! Indexed mode
    M_R =           %X'50', ! Register
    M_RD =          %X'60', ! Register deferred
    M_AD =          %X'70', ! Autodecrement
    M_AI =          %X'80', ! Autoincrement
    M_AID =         %X'90', ! Autoincrement deferred
    M_BD =          %X'A0', ! Byte displacement
    M_BDD =         %X'B0', ! Byte displacement deferred
    M_WD =          %X'C0', ! Word displacement
    M_WDD =         %X'D0', ! Word displacement deferred
    M_LD =          %X'E0', ! Longword displacement
    M_LDD =         %X'F0'; ! Longword displacement deferred
```

COM
REQ

SMGUSRTRM
LIS

SORLIB
REQ

SORTSHR
MAP

DEFS0
REQ

DKS
REQ

SORT32

SRTSPC
REQ

CDDTYPE
R32

SORTMERGE
MAP

SMGVECTOR
LIS

CHKPNT
REQ

CDDMAC
R32

SFKEYWRD
REQ

RECSYM
R32

SRTTRN
MAP

QPCODES
REQ