;   slip<

[Diagnostic program t 21   test of mode 1 and 4   oct.68   PEH

     The program tests all possible combinations of the conditions in
mode 1 and 4. If an error is detected output is given on typewriter
according to the following table

        output   type of non-successful function

     g0, g1, g2   basic operation fullword, LH, RH halfword
     a0, a1, a2   adress part of   – –   –   –   –   –
     n0, n1, n2   n-mark (S-mark)   – –   –   –   –   –
     i0, i1, i2   indirect adressing –   –   –   –   –
     r0, r1, r2   relative-mark   – –   –   –   –   –
     s0, s1, s2   subroutinemark   – –   –   –   –   –
     p0, p1, p2   p-index   – –   –   –   –   –
        B   indicator condition
        D   D-mark
        f   floating-point mark
        H   halfword mark added
        h   –   –   –   deleted
        IK   IKC operation
        K   K-part of indicator (bit pos.37)
        T   T-part of indicator (bit pos.35)
        Z   Z-part of indicator (bit pos.36)
        L   LA or LB operation (bit pos.33, 34, 38, 39)
        X   X-modification
        V   V-modification
        q   incremental operation
        qs   incremental operation is erroneously
                         treated as static or vice-versa

     The letters may be combined, thus the message
                              isB
means that a mode 1 or 4 error is detected during execution of an instruction
which is indirect adressed, s-marked and furnished with some indicator
condition.

     If KA is set during run the error message will be followed by a
three-digit number which gives the adress of the cell from which the alarm
was called.
     Pressing of KB causes the machine to stop.
     If no errors are detected an ok message is typed every 20 seconds.

     Input of program.
     The program may be read in like any other B or C test. However, if
this does not work the program may be read in using as simple instructions
as possible in this way:
     1. RESET GIER.
     2. place the tape in the reader starting in the middle of the 100 spaces
        found a few inches after the starting point used for old track 0.
     3. clear the entire core store using hardware test 1.
     4. clear R, M and by.
     5. insert in cell 41 – 43 the following instructions:

     41.   ly 43   bit pos. 4, 6,8, 9, 20, 21, 22, 24, 25
     42   cl 76   –   –   3, 6, 7, 21, 23
     43.   gm   –   –   21, 22, 24

     6. start GIER in cell 41

     When the program has been read in the primitive input program in
cell 34 – 39 is re-established.   ]

     b a50, b15, c10

```
          i=27

[   27]       pm i+5      ;
[   28]       gm -2   M   ;
[   29]       pm i+4      ;
[   30]       gm 0    M   ;
[   31]       hv 40       ;
[   32]       ar a1       ;
[   33]       tk 42       ;
[   34]       pmn64XDIZA; primitive input
[   35]       tl -7,lyr1;
[   36]       pi LZAt508;
[   37]       xr X IZB    ;
[   38]       hv 35 LZB   ;
[   39]       gr41MRCt-1;
[   40]       tk 42       ;
[   41]       qq          ;
[   42]       vy 16       ;
[   43]       sy 29       ; red ribbon
[   44]       sy 58       ; LC
[   45]       sy 64       ;
[   46]       hv a0       ; goto start


;      alarm print

[   47]b0:    qq          ; work
[   48]       qq          ; constant
[   49]       sy 55       ; g
[   50]       qq          ;
[   51]       sy 49       ; a
[   52]       hv b1       ;
[   53]       sy 37       ; n
[   54]       hv b1       ;
[   55]       sy 57       ; i
[   56]       hv b1       ;
[   57]       sy 41       ; r
[   58]       hv b1       ;
[   59]       sy 18       ; s
[   60]       hv b1       ;
[   61]       sy 39       ; p
[   62]b1:    sy 16       ; [full-word]
[   63]       hv a2       ; goto s-print
[   64]       sy 55       ; g
[   65]       hv b2       ;
[   66]       sy 49       ; a
[   67]       hv b2       ;
[   68]       sy 37       ; n
[   69]       hv b2       ;
[   70]       sy 57       ; i
[   71]       hv b2       ;
[   72]       sy 41       ; r
[   73]       hv b2       ;
[   74]       sy 18       ; s
[   75]       hv b2       ;
[   76]       sy 39       ; p
[   77]b2:    sy 1        ; 1 [LH half-word]
[   78]       hv a2       ; goto s-print
[   79]       sy 55       ; g
[   80]       hv b3       ;
[   81]       sy 49       ; a
[   82]       hv b3       ;
[   83]       sy 37       ; n
[   84]       hv b3       ;
[   85]       sy 57       ; i
[   86]       hv b3       ;
```

```
[  87]      sy 41      ; r
[  88]      hv b3      ;
[  89]      sy 18      ; s
[  90]      hv b3      ;
[  91]      sy 39      ; p
[  92]b3:   sy 2       ; 2 [RH half-word]
[  93]      hv a2      ; goto s-print
[  94]      sy 60      ; B [indicator condition]
[  95]      sy 50      ;
[  96]      hv a2      ;
[  97]      sy 60      ; D
[  98]      sy 52      ;
[  99]      hv a2      ;
[ 100]      sy 54      ; f [floating-point mark]
[ 101]      hv a2      ;
[ 102]b4:   sy 60      ; H
[ 103]      sy 56      ; h
[ 104]      hv a2      ;
[ 105]      sy 60      ; IK [IKC operation]
[ 106]      sy 57      ;
[ 107]      sy 60      ; K
[ 108]      sy 34      ;
[ 109]      hv a2      ;
[ 110]      sy 60      ; L
[ 111]      sy 35      ;
[ 112]      hv a2      ;
[ 113]b5:   sy 40      ; q
[ 114]      hv a2      ;
[ 115]      sy 40      ; qs
[ 116]      sy 18      ; [static op treated as incremental
[ 117]      hv a2      ; or vice-versa]
[ 118]      sy 60      ; T
[ 119]      sy 19      ;
[ 120]      hv a2      ;
[ 121]      sy 60      ; X
[ 122]      sy 23      ;
[ 123]      hv a2      ;
[ 124]b6:   sy 60      ; XV
[ 125]      sy 23      ;
[ 126]      sy 60      ; V
[ 127]      sy 21      ;
[ 128]      hv a2      ;
[ 129]      sy 60      ; Z
[ 130]      sy 25      ;


;      s-print

[ 131]a2:   sy 58      ;
[ 132]      hv a3 NKA  ;
[ 133]      sy  0      ;
[ 134]      tk 42      ;
[ 135]      ar c2      ;
[ 136]      gr c3      ;
[ 137]      tl 80      ; R:=M:=0
[ 138]      gs i+1     ;
[ 139]      qq [s]     ;
[ 140]      ar i-1     ;
[ 141]      cl 10      ;
[ 142]      ml c       ;
[ 143]c4:   ck -10     ;
[ 144]      ca  0      ;
[ 145]      hv i+2     ;
[ 146]      hv i+3     ;
[ 147]      arn i+1    ;
[ 148]      qq 16      ;
[ 149]      ga i+1     ;
```

```
[ 150]      sy          ;
[ 151]      tk 42       ;
[ 152]      ar c3       ;
[ 153]      ar a1       ;
[ 154]      gr c3       ;
[ 155]      ca  0       ;
[ 156]      hv i+3      ;
[ 157]      ac c6       ;
[ 158]      hv a3       ;
[ 159]      ml c1       ;
[ 160]      hv c4       ;
[ 161]c0:   m 10-2      ;
[ 162]c1:   qq 10.39    ;
[ 163]c2:   qq 2.39     ;
[ 164]c3:   qq          ; work


;     message counter

[ 165]a3:   sy  0       ;
[ 166]      tk 42       ;
[ 167]      ar c6       ;
[ 168]      ar a1       ;
[ 169]      gr c6       ;
[ 170]      ca  0       ;
[ 171]      hv a0       ;
[ 172]      sy 64       ;
[ 173]      ar c5       ;
[ 174]      gr c6       ;
[ 175]      hv a0       ;
[ 176]c5:   qq 20.39    ;
[ 177]c6:   qq 19.39    ;


;      reset and start

[ 178]a0:   tk 42       ;
[ 179]      ar c7       ;
[ 180]      gr c8       ; reset ok-counter
[ 181]      pp  0       ;
[ 182]      ps  0       ;
[ 183]      hv i+2      ;
[ 184]a1:   qq -1.39    ; constant
[ 185]      tk 42       ;
[ 186]      hv i+2 NKB  ;
[ 187]      zq  LKB     ;
[ 188]      ud -2       ; test of adress, fullword
[ 189]      sr a1       ;
[ 190]      ca  0       ;
[ 191]      hv i+2      ;
[ 192]      hs 2b       ; print(ga0)
[ 193]      qqtb4XVD    ; [qq  ,hv b4], test of +half-word mark, print(H)
[ 194]      qq          ; dummy
[ 195]a4:   ar a1       ; test of LA, LB
[ 196]      hs 8b4 LA   ; print(L)
[ 197]      hs 8b4 LB   ; print(L)
[ 198]      pi -1       ; test of T, Z, K
[ 199]      hs 5b5NTC   ; print(T)
[ 200]      hs 5b6 LZ   ; print(Z)
[ 201]      tk 42       ;
[ 202]      hs 5b6 NZ   ; print(Z)
[ 203]      hs 5b4 LO   ; print(K)
[ 204]      tk 42       ; R:=0
[ 205]a5:   pm a1       ; test of X, M:=-1.39
[ 206]      cl 40  X    ;
[ 207]      hv i+2 LZ   ;
[ 208]      hs 8b5 NZ   ; print(X)
```

```
[ 209]     pm a1  X  ; R:=-1.39, M:=0
[ 210]     sr a1     ; R:=0
[ 211]     hv i+2 LZ ;
[ 212]     hs 8b5 NZ ; print(X)
[ 213]     tk 42  X  ; M:=0
[ 214]     xr        ; R:=0
[ 215]a6: hv i+2 LZ ;
[ 216]     hs 8b5 NZ ; print(X)
[ 217]     ar a1  X  ; M:=-1.39
[ 218]     xr        ; R:=-1.39
[ 219]     sr a1     ; R:=o
[ 220]     hv i+2 LZ ;
[ 221]     hs 8b5 NZ ; print(X)
[ 222]     qq     V  ; test of V
[ 223]     hs 2b6    ; print(V)
[ 224]     pm a1  XV ; test of XV
[ 225]a7: hs b6     ; print(XV)
[ 226]     sr a1     ;
[ 227]     hv i+2 LZ ;
[ 228]     hs b6  NZ ; print(XV)
[ 229]     arf a1  X ; test of floating-point mark
[ 230]     hv i+2 NZ ;
[ 231]     hs 8b3    ; print(f)
[ 232]     tk 42     ;
[ 233]     ar a1  D  ; test of D
[ 234]     ca a1     ;
[ 235]     hv i+2    ;
[ 236]     hs 5b3    ; print(D)
[ 237]     tk 42     ;
[ 238]     ar a1     ; test of n, full-word
[ 239]a8: qqn       ;
[ 240]     hv i+2 LZ ;
[ 241]     hs 6b  NZ ; print(n0)
[ 242]     ca (1b)   ; test of i, full-word
[ 243]     hv i+2    ;
[ 244]     hs 8b     ; print(i0)
[ 245]     tk 42     ;
[ 246]     ar ra1    ; test of r, full-word
[ 247]     sr a1     ;
[ 248]     hv i+2 LZ ;
[ 249]a9: hs 10b NZ ; print(r0)
[ 250]     ps a1     ; test of s, full-word
[ 251]     ar s      ;
[ 252]     sr a1     ;
[ 253]     ps  0     ;
[ 254]     hv i+2 LZ ;
[ 255]     hs 12b NZ ; print(s0)
[ 256]     pp a1     ; test of p, full-word
[ 257]     ar  p     ;
[ 258]     sr a1     ;
[ 259]a10: pp  0     ;
[ 260]     hv i+2 LZ ;
[ 261]     hs 14b NZ ; print(p0)
[ 262]     ar a1     ; test of LH hailf-word
[ 263]     ps 42     ;
[ 264]     ud   ,    ; LH, basic op
[ 265]     ps  0     ;
[ 266]     hv i+2 LZ ;
[ 267]     hs 2b1 NZ ; print(g1)
[ 268]     ps -1     ; test of LH adress
[ 269]a11: ud -2,    ;
[ 270]     ps 0      ;
[ 271]     sr a1     ;
[ 272]     hv i+2 LZ ;
[ 273]     hs 4b1 NZ ; print(a1)
[ 274]     ar a1     ; n, LH
[ 275]     qqn  ,    ;
```

```
[ 276]      hv i+2 LZ ;
[ 277]      hs 6b1 NZ ; print(n1)
[ 278]      pi i-4     ;
[ 279]      gi i+1     ;
[ 280]      ar (i-6),  ; i, LH
[ 281]a12: sr a1      ;
[ 282]      hv i+2 LZ ;
[ 283]      hs 8b1 NZ ; print(i1)
[ 284]      pi a1-i-2 ;
[ 285]      gi i+1     ;
[ 286]      ar ra1,    ; r, LH
[ 287]      sr a1      ;
[ 288]      hv i+2 LZ ;
[ 289]      hs 10b1NZ ; print(r1)
[ 290]      ps a1      ;
[ 291]      ar  s,     ;
[ 292]      sr a1      ;
[ 293]a13: ps  0      ;
[ 294]      hv i+2 LZ ;
[ 295]      hs 12b1NZ ; print(s1)
[ 296]      pp a1      ;
[ 297]      ar  p,     ;
[ 298]      sr a1      ;
[ 299]      pp  0      ;
[ 300]      hv i+2 LZ ;
[ 301]      hs 14b1NZ ; print(p1)
[ 302]      ,tl [VM]  ; test of -half-word
[ 303]a14: hv i+2     ;
[ 304]      hs 1b4     ; print(h)
[ 305]      tk 42      ;
[ 306]      ar a1      ; test of RH half-word
[ 307]      ps 42      ;
[ 308]      ,ud        ; basic op
[ 309]      qq         ; dummy
[ 310]      ps  0      ;
[ 311]      hv i+2 LZ ;
[ 312]      hs 2b2 NZ ; print(g2)
[ 313]a15: ps -1      ; RH adress
[ 314]      ,ud -2     ;
[ 315]      sr a1      ;
[ 316]      ps  0      ;
[ 317]      hv i+2 LZ ;
[ 318]      hs 4b2 NZ ; print(a2)
[ 319]      ar a1      ; n, RH
[ 320]      ,qqn       ;
[ 321]      hv i+2 LZ ;
[ 322]      hs 6b2 NZ ; print(n2)
[ 323]a16: ,ca (1b)  ; i, RH
[ 324]      hv i+2     ;
[ 325]      hs 8b2     ; print(i2)
[ 326]      ,ar ra1    ; r, RH
[ 327]      sr a1      ;
[ 328]      hv i+2 LZ ;
[ 329]      hs 10b2NZ ; print(r2)
[ 330]      ps a1      ; s, RH
[ 331]      ,ar  s     ;
[ 332]      sr a1      ;
[ 333]a17: ps  0      ;
[ 334]      hv i+2 LZ ;
[ 335]      hs 12b2NZ ; print(s2)
[ 336]      pp a1      ; p, RH
[ 337]      ,ar  p     ;
[ 338]      sr a1      ;
[ 339]      pp  0      ;
[ 340]      hv i+2 LZ ;
[ 341]      hs 14b2NZ ; print(p2)
[ 342]      ,tl  [VM] ; test of -half-word mark
```

```
[ 343]a18: hv i+2      ;
[ 344]      hs 1b4     ; print(h)
[ 345]      pa i+1     ; test of increment
[ 346]      qq   ,qq 1 ;
[ 347]      ar i-1     ;
[ 348]      ca  0      ;
[ 349]      hv i+2     ;
[ 350]      hs b5      ; print(q)
[ 351]      tk 42      ;
[ 352]      pa i+1     ; test of -,B∧q
[ 353]a19: ar ta1 NZ  ;
[ 354]      hv i+3 LZ  ;
[ 355]      ud b5  NZ  ; print(qB)
[ 356]      hs 2b3 NZ  ;
[ 357]      ar a1      ; test of q
[ 358]      pa i+1     ;
[ 359]      sr  ta1    ;
[ 360]      hv i+2 LZ  ;
[ 361]      hs b5  NZ  ; print(q)
[ 362]      qq tb4 XVM; [qq   ,hs b4]
[ 363]a20: qq          ; test of +half-word mark, print(H)
[ 364]      tk 42      ;
[ 365]      ca (1b)    ; test of i, full-word
[ 366]      hv i+2     ;
[ 367]      hs 8b      ; print(i0)
[ 368]      tk 42      ; test of increment
[ 369]      ga i+12    ; decoding of TD‡0
[ 370]      ar a1      ;
[ 371]      qq(i+10)t512
[ 372]      qq(i+9)t256
[ 373]      qq(i+8)t128
[ 374]a21: qq(i+7)t64;
[ 375]      qq(i+6)t32;
[ 376]      qq(i+5)t16;
[ 377]      qq(i+4)t8 ;
[ 378]      qq(i+3)t4 ;
[ 379]      qq(i+2)t2 ;
[ 380]      qq(i+1)t1 ;
[ 381]      ca -1      ;
[ 382]      hv i+2     ;
[ 383]      hs b5      ; print(q)
[ 384]a22: ga i+1     ; decoding of
[ 385]      pi -1 t1   ; static op
[ 386]      tk 42      ;
[ 387]      ar i-2     ;
[ 388]      ca -1      ;
[ 389]      hv i+2     ;
[ 390]      hs 2b5     ; print(qs)
[ 391]      pi -500    ;
[ 392]      gi i+1     ; decoding of non-static op
[ 393]      bt-500t-100
[ 394]a23: hv i+2     ;
[ 395]      hs 2b5     ; print(qs)
[ 396]      tk 42      ;
[ 397]      pa i+1     ; decoding of
[ 398]      nc 0 t-1   ; non-static op
[ 399]      hv i+2     ;
[ 400]      hs 2b5     ; print(qs)
[ 401]      qq tb4 XVM; test of +h
[ 402]      qq          ;
[ 403]      tk 42      ;
[ 404]      pa i+2     ; test of step 12
[ 405]      nt i+1     ; increment∧r
[ 406]a24: ca  r      ;
[ 407]      hv i+3     ;
[ 408]      ud 10b     ; print(rq)
[ 409]      hs b5      ;
```

```
[ 410]      pa i+3     ;
[ 411]      ps i+2     ;
[ 412]      nt i+1     ; increment∧s
[ 413]      ca   s     ;
[ 414]      hv i+4     ;
[ 415]      ps  0      ;
[ 416]      ud 12b     ; print(sq)
[ 417]a25: hs b5      ;
[ 418]      ps  0      ;
[ 419]      pa i+3     ;
[ 420]      pp i+2     ; increment∧p
[ 421]      nt i+1     ;
[ 422]      ca   p     ;
[ 423]      hv i+3     ;
[ 424]      ud 14b     ; print(pq)
[ 425]      hs b5      ;
[ 426]      pp  0      ;
[ 427]      tk 42      ;
[ 428]      hv 1a1 NZ  ;
[ 429]a26: ar a1      ;
[ 430]      ncn   LZ   ; test of -,B∧n
[ 431]      hv i+3     ;
[ 432]      ud 6b      ; print(nB)
[ 433]      hs 2b3     ;
[ 434]      tk 42      ;
[ 435]      ar a1      ; test of -,B∧(s)
[ 436]      ga i+1     ;
[ 437]      qq         ;
[ 438]      ps i-1     ;
[ 439]      nc (s) LZ  ;
[ 440]      hv i+5     ;
[ 441]a27: ps  0      ;
[ 442]      ud 8b      ; print(isB)
[ 443]      ud 12b     ;
[ 444]      hs 2b3     ;
[ 445]      ga i+1     ; test of (r) and (s)
[ 446]      qq         ;
[ 447]      ps i-1     ;
[ 448]      ca (s)     ;
[ 449]      hv i+4     ;
[ 450]      ps  0      ;
[ 451]a28: ud 8b      ; print(is0)
[ 452]      hs 12b     ;
[ 453]      ps  0      ;
[ 454]      ca (r-8)   ;
[ 455]      hv i+3     ;
[ 456]      ud 8b      ; print(ir0)
[ 457]      hs 10b     ;
[ 458]a29: pp -1      ; test of IK (mode 4)
[ 459]      pi  0      ;
[ 460]      tk 42      ;
[ 461]      nc  0 IKC  ; p:=0, in:=-1
[ 462]      hs b4      ; if +h then print(H)
[ 463]      gp i+1     ;
[ 464]      ca         ;
[ 465]      hv i+2     ;
[ 466]a30: hs 3b4     ; print(IK)
[ 467]      gi i+1     ;
[ 468]      qq         ;
[ 469]      nc  0 IKC  ; p:=-1, in:=0
[ 470]      hs b4      ; if +h then print(H)
[ 471]      ar i-3     ;
[ 472]      ca -1      ;
[ 473]      hv i+2     ;
[ 474]      hs 3b4     ; print(IK)
[ 475]      gp i+1     ;
[ 476]      ca         ;
```

```
[ 477]a31: hv i+2     ;
[ 478]     hs 3b4     ; print(IK)
[ 479]     gi i+2     ;
[ 480]     tk 42      ;
[ 481]     ca         ;
[ 482]     hv i+2     ;
[ 483]     hs 3b4     ; print(IK)
[ 484]     qq     V   ; test of V
[ 485]     hs 2b6     ; print(V)
[ 486]     pp -1      ; test of VIK
[ 487]     pi  0 VIKC; p:=0, in:=-1
[ 488]     hs i+2     ; print(VIK)
[ 489]a32: hv i+4     ;
[ 490]     ud 2b6     ;
[ 491]     ud 3b6     ;
[ 492]     hv 3b4     ;
[ 493]     tk 42      ;
[ 494]     gp i+1     ;
[ 495]     ca         ;
[ 496]     hv i+2     ;
[ 497]     hs i-7     ; print(VIK)
[ 498]     hv 1a1 NZ ; skip if +h
[ 499]     pm a1  X   ; test of X
[ 500]     hs 8b5 LZ ; print(X)
[ 501]     pm a1 XIKC; test of XIK
[ 502]     gp i+1     ; R:=-1, M:=0, p:=-1, in:=0
[ 503]a33: ca         ;
[ 504]     hv i+4 NZ ;
[ 505]     ud 8b5     ; print (XIK)
[ 506]     ud 9b5     ;
[ 507]     hs 3b4     ;
[ 508]c7:  qq 2000.39; Ok counter
[ 509]c8:  qq         ; work
[ 510]     tk 42      ;
[ 511]     ar i-2     ;
[ 512]     ar a1      ;
[ 513]a34: gr i-4     ;
[ 514]     hv 1a1 NZ ; if 2000 successful runs then
[ 515]     sy 62      ; print(ok)
[ 516]     sy 38      ;
[ 517]     sy 34      ;
[ 518]     sy 29      ;
[ 519]a35: hv a3      ; goto start and reset
```

e27