mp4-specs.dat

```
******Start fetch cycle******
st=0 rt='[pc]-> mar' imar rac=1 rn=3
st=1 rt='[[mar]]->mdr' read
st=2 rt='[mdr]->ir' omdr iir
st=3 rt='[pc]+1->q' rac=1 rn=3 ib p1 oadder
st=4 rt='[q]->pc' oq wac=1 wn=3
cond='ir1512' value=0 nst=5
nst=20
st=5
cond='ir118' value=0 nst=10
***Checking for single operand instructions***
cond='ir118' value=1 nst= 111
cond='ir118' value=2 nst= 111
cond='ir118' value=3 nst= 111
cond='ir118' value=4 nst= 111
cond='ir118' value=5 nst= 111
cond='ir118' value=6 nst= 111
cond='ir118' value=7 nst= 111
cond='ir118' value=8 nst= 111
cond='ir118' value=10 nst= 111
st=10
cond='ir75' value=1 nst= 790
cond='ir75' value=4 nst= 11
cond='ir75' value=0 nst=15
cond='ibrch' value=0 nst=600
cond='ibrch' value=1 nst=605
st=11
cond='ir4' value=0 nst=805
cond='ibrch' value=0 nst=600
cond='ibrch' value=1 nst=605

**halt***
st=15 halt

st=16
cond='c' value=1 nst=17
cond='c' value=0 nst=18
nst=0
st=17 CLRC
nst=0
st=18 SETC
nst=0


**********************************************
st=20
****************************** source-register
cond='ir118' value=0 nst=30
```

```
****************************** source- register indirect
cond='ir118' value=1 nst=40
****************************** source- register autoincrement
cond='ir118' value=2 nst=50
****************************** source- register autodecrement
cond='ir118' value=3 nst=60
****************************** source- register index
cond='ir118' value=4 nst=70
****************************** source- register absolute
cond='ir118' value=5 nst=80
****************************** source- register immediate
cond='ir118' value=6 nst=90
******************************
cond='ir1512' value=0 nst=10



******** source- register add. mode*********
st=30 rt='[r(ir3:ir2)] ->t2' rac=2 it2
nst=110
******* source - register indirect add.mode****
st=40 rt='[r(ir3:ir2)] ->mar' rac=2 imar
st=41 rt='[[mar]] ->mdr' read
st=42 rt='[mdr]->t2' omdr it2
nst=110
******* source- Autoincrement add.mode *****
st=50 rt='[r(ir3:ir2)] ->mar' rac=2 imar
st=51 rt='[[mar]] ->mdr' read
st=52 rt='[mdr]->t2' omdr it2
st=53 rt='[r(ir3:ir2)] ->t1' rac=2 it1
st=54 rt='[t1] + 1 ->q' oa p1 oadder
st=55 rt='[q] ->t3' oq it3
st=56 rt='t3 ->[r(ir3:ir2)]' wac=2 oq
nst=110
******* source -Autodecrement add.mode*****
st=60 rt='[r(ir3:ir2)] ->t1' rac=2 it1
st=61 rt='[t1] -1 ->q' oa comp oadder
st=62 rt='[q] ->t3' oq it3
st=63 rt='[t3] ->mar' ot3 imar
st=64 rt='[[mar]] ->mdr' read
st=65 rt='[mdr] ->t2' omdr it2
st=66 rt='t3 ->[r(ir3:ir2)]' ot3 wac=2
nst=110
***** source- index mode ********
st=70 rt='[pc]-> mar' imar rac=1 rn=3
st=71 rt='[[mar]]->mdr' read
st=72 rt='[pc]+1->q' rac=1 rn=3 ib p1 oadder
st=73 rt='[q]->pc' oq wac=1 wn=3
st=74 rt='[mdr] -> t3' omdr it3
st=75 rt='[r(ir3:ir2)]->t1' rac=2 it1
st=76 rt='[t1]+[t3] ->q' oa ot3 ib oadder
```

```
st=77 rt='[q] ->mar' oq imar
st=78 rt='[[mar]]->mdr' read
st=79 rt='[mdr] ->t2' omdr it2
nst=110

***** source- absolute ********
st=80 rt='[pc]-> mar' imar rac=1 rn=3
st=81 rt='[[mar]]->mdr' read
st=82 rt='[pc]+1->q' rac=1 rn=3 ib p1 oadder
st=83 rt='[q]->pc' oq wac=1 wn=3
st=84 rt='[mdr] -> mar' omdr imar
st=85 rt='[[mar]] ->mdr' read
st=86 rt='[mdr]->t2' omdr it2
nst=110

****source-immediate *******
st=90 rt='[pc]-> mar' imar rac=1 rn=3
st=91 rt='[[mar]]->mdr' read
st=92 rt='[pc]+1->q' rac=1 rn=3 ib p1 oadder
st=93 rt='[q]->pc' oq wac=1 wn=3
st=94 rt='[mdr] -> t2' omdr it2
nst=110




*************** destination addressing modes******
st=110
cond='ir1512' value=0 nst=10
cond='ir75' value=0 nst=120
cond='ir75' value=1 nst=160
cond='ir75' value=2 nst=190
nst=15
st=111
cond='ir75' value=0 nst=112
cond='ir75' value=1 nst=161
cond='ir75' value=2 nst=191

st=112
cond='ir4' value=0 nst=130
cond='ir4' value=1 nst=150
***** register and indirect*******
st=120
cond='ir1512' value=0 nst=10
cond='ir4' value=0 nst=130
cond='ir4' value=1 nst=150
nst=15

********* destination - register
st=130 rt='[r(ir1:ir0)] -> t4' rac=3 it4
****Single op****
```

```
cond='ir1512' value=0 nst=132
****ADD*****
cond='ir1512' value=1 nst=230
****SUB*****
cond='ir1512' value=2 nst=290
****OR****
cond='ir1512' value=5 nst=351
****AND****
cond='ir1512' value=6 nst=410
****MOVE****
cond='ir1512' value=3 nst=470
*****EXG****
cond='ir1512' value=4 nst=530

nst=15


st=132
cond='ir118' value=1 nst=752
cond='ir118' value=2 nst= 650
cond='ir118' value=3 nst= 675
cond='ir118' value=4 nst= 701
cond='ir118' value=5 nst= 725
cond='ir118' value=6 nst= 770
cond='ir118' value=7 nst= 776
cond='ir118' value=8 nst= 744
cond='ir118' value=10 nst= 820
********* destination -indirect
st=150 rt='[r(ir1:ir0)] ->mar' rac=3 imar
st=151 rt='[[mar]] ->mdr' read
st=152 rt='[mdr]->t4' omdr it4
****Single op****
cond='ir1512' value=0 nst=153

****ADD****
cond='ir1512' value=1 nst=240
****SUB****
cond='ir1512' value=2 nst=300
****OR****
cond='ir1512' value=5 nst=361
****AND*****
cond='ir1512' value=6 nst=420
****MOVE****
cond='ir1512' value=3 nst=480
*****EXG****
cond='ir1512' value=4 nst=540
nst=15

st=153
cond='ir118' value=1 nst= 754
cond='ir118' value=2 nst= 654
```

```
cond='ir118' value=3 nst= 678
cond='ir118' value=4 nst= 704
cond='ir118' value=5 nst= 727
cond='ir118' value=6 nst= 770
cond='ir118' value=7 nst= 776
cond='ir118' value=8 nst= 744
cond='ir118' value=10 nst= 820
********** dest- increment and decrement
st=160
cond='ir1512' value=0 nst=10
cond='ir4' value=0 nst=170
cond='ir4' value=1 nst=180
nst=15

st=161
cond='ir4' value=0 nst=170
cond='ir4' value=1 nst=180
********** dest-increment
st=170 rt='[r(ir1:ir0)] ->mar' rac=3 imar
st=171 rt='[[mar]] ->mdr' read
st=172 rt='[mdr]->t4' omdr it4
****Single op****
cond='ir1512' value=0 nst=173
****ADD****
cond='ir1512' value=1 nst=250
****SUB****
cond='ir1512' value=2 nst=310
****OR*****
cond='ir1512' value=5 nst=371
****AND****
cond='ir1512' value=6 nst=429
****MOVE****
cond='ir1512' value=3 nst=490
*****EXG****
cond='ir1512' value=4 nst=550
nst=15
st=173

cond='ir118' value=1 nst= 756
cond='ir118' value=2 nst= 657
cond='ir118' value=3 nst= 682
cond='ir118' value=4 nst= 706
cond='ir118' value=5 nst= 729
cond='ir118' value=6 nst= 770
cond='ir118' value=7 nst= 776
cond='ir118' value=8 nst= 744
cond='ir118' value=10 nst= 820

********** dest-decrement****
st=180 rt='[r(ir1:ir0)]->t1' rac=3 it1
st=181 rt='[t1]+1 ->q' oa comp oadder
```

```
st=182 rt='[q] ->t5' oq it5 newz newn
st=183 rt='t5 ->[r(ir1:ir0)]' wac=3 oq
****Single op****
cond='ir1512' value=0 nst=184
****ADD****
cond='ir1512' value=1 nst=260
****SUB****
cond='ir1512' value=2 nst=320
****OR***
cond='ir1512' value=5 nst=380
****AND****
cond='ir1512' value=6 nst=440
****MOVE*****
cond='ir1512' value=3 nst=500
*****EXG*****
cond='ir1512' value=4 nst=560
nst=15

st=184
cond='ir118' value=1 nst= 758
cond='ir118' value=2 nst= 660
cond='ir118' value=3 nst= 685
cond='ir118' value=4 nst= 710
cond='ir118' value=5 nst= 731
cond='ir118' value=6 nst= 770
cond='ir118' value=7 nst= 773
cond='ir118' value=8 nst= 767
cond='ir118' value=10 nst= 815
******* dest- index and absolute*****
st=190
cond='ir1512' value=0 nst=10
cond='ir4' value=0 nst=200
cond='ir4' value=1 nst=210
nst=15
st=191
cond='ir4' value=0 nst=200
cond='ir4' value=1 nst=210
nst=15
******dest- index*****
st=200 rt='[pc]-> mar' imar rac=1 rn=3 newz newn
st=201 rt='[[mar]]->mdr' read
st=202 rt='[pc]+1->q' rac=1 rn=3 ib p1 oadder
st=203 rt='[q]->pc' oq wac=1 wn=3
st=204 rt='[mdr] -> t3' omdr it3
st=205 rt='[r(ir1:ir0)]->t1' rac=3 it1
st=206 rt='[t1]+[t3] ->q' oa ot3 ib oadder
st=207 rt='[q] ->mar' oq imar
st=208 rt='[[mar]]->mdr' read
st=209 rt='[mdr]->t4' omdr it4
****Single op****
cond='ir1512' value=0 nst=218
```

```
****ADD****
cond='ir1512' value=1 nst=270
****SUB****
cond='ir1512' value=2 nst=330
****OR****
cond='ir1512' value=5 nst=391
****AND****
cond='ir1512' value=6 nst=452
****MOVE****
cond='ir1512' value=3 nst=510
*****EXG****
cond='ir1512' value=4 nst=570
nst=15



*******dest-absolute****
st=210 rt='[pc]-> mar' imar rac=1 rn=3
st=211 rt='[[mar]]->mdr' read
st=212 rt='[pc]+1->q' rac=1 rn=3 ib p1 oadder
st=213 rt='[q]->pc' oq wac=1 wn=3
st=214 rt='[mdr] -> mar' omdr imar
st=215 rt='[mdr] ->t5' omdr it5
st=216 rt='[[mar]] ->mdr' read
st=217 rt='[mdr]->t4' omdr it4

****Single op****
cond='ir1512' value=0 nst=219

****ADD****
cond='ir1512' value=1 nst=280
****SUB****
cond='ir1512' value=2 nst=340
****OR****
cond='ir1512' value=5 nst=401
****AND****
cond='ir1512' value=6 nst=460
****MOVE****
cond='ir1512' value=3 nst=520
*****EXG****
cond='ir1512' value=4 nst=580
nst=15

st=218
cond='ir118' value=1 nst= 763
cond='ir118' value=2 nst= 667
cond='ir118' value=3 nst= 692
cond='ir118' value=4 nst= 718
cond='ir118' value=5 nst= 736
cond='ir118' value=6 nst= 770
```

```
cond='ir118' value=7 nst= 776
cond='ir118' value=8 nst= 744
cond='ir118' value=10 nst= 820
st=219
cond='ir118' value=1 nst= 765
cond='ir118' value=2 nst= 670
cond='ir118' value=3 nst= 695
cond='ir118' value=4 nst= 721
cond='ir118' value=5 nst= 738
cond='ir118' value=6 nst= 770
cond='ir118' value=7 nst= 776
cond='ir118' value=8 nst= 744
cond='ir118' value=10 nst= 820
******************ADD INSTRUCTION******************

******* add -dst register*********************************
st=230 rt='[t2] ->t1' ot2 it1
st=231 rt='[t1]+[t4] ->q' ot4 ib oa oadder newc newv
st=232 rt='[q] -> [r(ir1:ir0)]' oq wac=3 newz newn
nst=0
*********add -dst indirect***********
st=240 rt='[t2] ->t1' ot2 it1
st=241 rt='[t1]+[t4] ->q' ot4 ib oa oadder newc newv
st=242 rt='[q]->mdr' oq imdr newz newn
st=243 rt='[r(ir1:ir0)] -> mar' rac=3 imar
st=244 rt='[mdr] ->[mar]' write
nst=0
*********** add -dst increment
st=250 rt='[t2] ->t1' ot2 it1
st=251 rt='[t1]+[t4] ->q' ot4 ib oa oadder newc newv
st=252 rt='[q]->mdr' oq imdr newz newn
st=253 rt='[r(ir1:ir0) ->mar' rac=3 imar
st=254 rt='[mdr] ->[mar]' write
st=255 rt='[r(ir1:ir0) ->t1' rac=3 it1
st=256 rt='[t1]+1 ->q' oa p1 oadder
st=257 rt='[q] -> [r(ir1:ir0)]' oq wac=3 newz newn
nst=0
*********** add- dst decrement
st=260 rt='[t5] ->mar' ot5 imar
st=261 rt='[[mar]] ->mdr' read
st=262 rt='[mdr] -> t4' omdr it4
st=263 rt='[t2] ->t1' ot2 it1
st=264 rt='[t1]+[t4] ->q' ot4 ib oa oadder newc newv
st=265 rt='[q]->mdr' oq imdr newz newn
st=266 rt='[t5] ->mar' ot5 imar
st=267 rt='[mdr] ->[mar]' write
nst=0
*************add - dst index
st=270 rt='[t2] ->t1' ot2 it1
st=271 rt='[t1]+[t4] ->q' ot4 ib oa oadder newc newv
st=272 rt='[q] ->mdr' oq imdr newz newn
```

```
st=273 rt='[mdr] ->[mar]' write
nst=0

******** add-dst absolute
st=280 rt='[t2] ->t1' ot2 it1
st=281 rt='[t1]+[t4] ->q' ot4 ib oa oadder newc newv
st=282 rt='[t5]->mar' ot5 imar
st=283 rt='[q] ->mdr' oq imdr newz newn
st=284 rt='[mdr] ->[mar]' write
nst=0



********************SUB INSTRUCTION************************************

************sub-dst register
st=290 rt='[t4] ->t1' ot4 it1
st=291 rt='[t1]-[t2]->q' ot2 ib comp oa p1 oadder newc newv
st=292 rt='[q] -> [r(ir1:ir0)]' oq wac=3 newz newn
nst=16
***********sub -dst indirect
st=300 rt='[t4] ->t1' ot4 it1
st=301 rt='[t1]+[t2] ->q' ot2 ib comp p1 oa oadder newc newv
st=302 rt='[q]->mdr' oq imdr newz newn
st=303 rt='[r(ir1:ir0)] -> mar' rac=3 imar
st=304 rt='[mdr] ->[mar]' write
nst=16
**********sub- dst increment0091
st=310 rt='[t4] ->t1' ot4 it1
st=311 rt='[t1]+[t2] ->q' ot2 ib comp p1 oa oadder newc newv
st=312 rt='[q]->mdr' oq imdr newz newn
st=313 rt='[r(ir1:ir0) ->mar' rac=3 imar
st=314 rt='[mdr] ->[mar]' write
st=315 rt='[r(ir1:ir0) ->t1' rac=3 it1
st=316 rt='[t1]+1 ->q' oa p1 oadder
st=317 rt='[q] -> [r(ir1:ir0)]' oq wac=3 newz newn newz newn
nst=16
*********sub- dst decrement
st=320 rt='[t5] ->mar' ot5 imar
st=321 rt='[[mar]] ->mdr' read
st=322 rt='[mdr] -> t4' omdr it4
st=323 rt='[t4] ->t1' ot4 it1
st=324 rt='[t1]+[t2] ->q' ot2 ib comp p1 oa oadder newc newv
st=325 rt='[q]->mdr' oq imdr newz newn
st=326 rt='[t5] ->mar' ot5 imar
st=327 rt='[mdr] ->[mar]' write
nst=16

********sub -dst index
st=330 rt='[t4] ->t1' ot4 it1
st=331 rt='[t1]+[t2] ->q' ot2 ib comp p1 oa oadder newc newv
```

```
st=332 rt='[q] ->mdr' oq imdr newz newn
st=333 rt='[mdr] ->[mar]' write
nst=16
*******sub-absolute

st=340 rt='[t4] ->t1' ot4 it1
st=341 rt='[t1]+[t2] ->q' ot2 ib oa oadder newc newv
st=342 rt='[t5]->mar' ot5 imar
st=343 rt='[q] ->mdr' oq imdr newz newn
st=344 rt='[mdr] ->[mar]' write
nst=16


************OR INSTRUCTIONS************

******or- dst register************
st=351 rt='[t2] OR [t4] ->q' ot2 ot4 ib oadder clrc clrv
st=352 rt='[q] -> [r(ir1:ir0)]' oq wac=3 newz newn
nst=0
******or -dst indirect************

st=361 rt='[t2] or [t4] ->q' ot2 ot4 ib oadder clrc clrv
st=362 rt='[q]->mdr' oq imdr newz newn
st=363 rt='[r(ir1:ir0)] -> mar' rac=3 imar
st=364 rt='[mdr] ->[mar]' write
nst=0
*********** or -dst increment************

st=371 rt='[t2] or [t4] ->q' ot2 ot4 ib oadder clrc clrv
st=372 rt='[q]->mdr' oq imdr newz newn
st=373 rt='[r(ir1:ir0) ->mar' rac=3 imar
st=374 rt='[mdr] ->[mar]' write
st=375 rt='[r(ir1:ir0) ->t1' rac=3 it1
st=376 rt='[t1]+1 ->q' oa p1 oadder
st=377 rt='[q] -> [r(ir1:ir0)]' oq wac=3 newz newn
nst=0
********* or -dst decrement************
st=380 rt='[t5] ->mar' ot5 imar
st=381 rt='[[mar]] ->mdr' read
st=382 rt='[mdr] -> t4' omdr it4
st=383 rt='[t2] or [t4] ->q' ot2 ot4 ib oadder clrc clrv
st=384 rt='[q]->mdr' oq imdr newz newn
st=385 rt='[t5] ->mar' ot5 imar
st=386 rt='[mdr] ->[mar]' write
nst=0
******* or -dst index************

st=391 rt='[t2] or [t4] ->q' ot2 ot4 ib oadder clrc clrv
st=392 rt='[q] ->mdr' oq imdr newz newn
st=393 rt='[mdr] ->[mar]' write
nst=0
```

```
******** or- dst absolute************
st=401 rt='[t2] or [t4] ->q' ot2 ot4 ib oadder clrc clrv
st=402 rt='[t5]->mar' ot5 imar
st=403 rt='[q] ->mdr' oq imdr newz newn
st=404 rt='[mdr] ->[mar]' write
nst=0




******************AND INSTRUCTIONS************


******and- dst register************
st=410 rt='[t2] ->q' ot2 ib comp oadder
st=411 rt='[q] ->t2' oq it2
st=412 rt='[t4] ->q' ot4 ib comp oadder
st=413 rt='[q] ->t4' oq it4
st=414 rt='[t2] or [t4] ->q' ot2 ot4 ib oadder clrc clrv
st=415 rt='[q] -> q' oq ib comp oadder
st=416 rt='[q] ->[R(IR1:IR0)]' oq wac=3 newz newn

nst=0
******and -dst indirect************
st=420 rt='[t2] ->q' ot2 ib comp oadder
st=421 rt='[q] ->t2' oq it2
st=422 rt='[t4] ->q' ot4 ib comp oadder
st=423 rt='[q] ->t4' oq it4
st=424 rt='[t2] or [t4] ->q' ot2 ot4 ib oadder clrc clrv
st=425 rt='[q] -> q' oq ib comp oadder
st=426 rt='[q]->mdr' oq imdr newz newn
st=427 rt='[r(ir1:ir0)] -> mar' rac=3 imar
st=428 rt='[mdr] ->[mar]' write
nst=0
*********** and -dst increment************
st=429 rt='[t2] ->q' ot2 ib comp oadder
st=430 rt='[q] ->t2' oq it2
st=431 rt='[t4] ->q' ot4 ib comp oadder
st=432 rt='[q] ->t4' oq it4
st=433 rt='[t2] or [t4] ->q' ot2 ot4 ib oadder clrc clrv
st=434 rt='[q] -> q' oq ib comp oadder
st=435 rt='[q]->mdr' oq imdr newz newn
st=436 rt='[mdr] ->[mar]' write
st=437 rt='[r(ir1:ir0) ->t1' rac=3 it1
st=438 rt='[t1]+1 ->q' oa p1 oadder
st=439 rt='[q] -> [r(ir1:ir0)]' oq wac=3 newz newn
nst=0
********* and -dst decrement************
st=440 rt='[t5] ->mar' ot5 imar
st=441 rt='[[mar]] ->mdr' read
st=442 rt='[mdr] -> t4' omdr it4
```

```
st=443 rt='[t2] ->q' ot2 ib comp oadder
st=444 rt='[q] ->t2' oq it2
st=445 rt='[t4] ->q' ot4 ib comp oadder
st=446 rt='[q] ->t4' oq it4
st=447 rt='[t2] or [t4] ->q' ot2 ot4 ib oadder clrc clrv
st=448 rt='[q] -> q' oq ib comp oadder
st=449 rt='[q]->mdr' oq imdr newz newn
st=450 rt='[t5] ->mar' ot5 imar
st=451 rt='[mdr] ->[mar]' write
nst=0
******* and -dst index************
st=452 rt='[t2] ->q' ot2 ib comp oadder
st=453 rt='[q] ->t2' oq it2
st=454 rt='[t4] ->q' ot4 ib comp oadder
st=455 rt='[q] ->t4' oq it4
st=456 rt='[t2] or [t4] ->q' ot2 ot4 ib oadder clrc clrv
st=457 rt='[q] -> q' oq ib comp oadder
st=458 rt='[q] ->mdr' oq imdr newz newn
st=459 rt='[mdr] ->[mar]' write
nst=0
******** and- dst absolute************
st=460 rt='[t2] ->q' ot2 ib comp oadder
st=461 rt='[q] ->t2' oq it2
st=462 rt='[t4] ->q' ot4 ib comp oadder
st=463 rt='[q] ->t4' oq it4
st=464 rt='[t2] or [t4] ->q' ot2 ot4 ib oadder clrc clrv
st=465 rt='[q] -> q' oq ib comp oadder
st=466 rt='[t5]->mar' ot5 imar
st=467 rt='[q] ->mdr' oq imdr newz newn
st=468 rt='[mdr] ->[mar]' write
nst=0


*************MOVE INSTRUCTIONS************

******* MOVE -dst register*********************************
st=470 rt='[t2] ->[t1]' ot2 it1
st=471 rt='[t1] ->q' oa oadder clrc clrv
st=472 rt='q ->[r(ir1:ir0)]' oq wac=3 newz newn
nst=0

*********MOVE -dst indirect***********
st=480 rt='[t2] ->[t1]' ot2 it1
st=481 rt='[t1] ->q' oa oadder clrc clrv
st=482 rt='[q]-> mdr' oq imdr newz newn
st=483 rt='[mdr] ->[mar]' write
nst=0

********** MOVE -dst increment************
st=490 rt='[t2] ->[t1]' ot2 it1
st=491 rt='[t1] ->q' oa oadder clrc clrv
```

```
st=492 rt='[q]-> mdr' oq imdr newz newn
st=493 rt='[mdr] ->[mar]' write
st=494 rt='[r(ir1:ir0)] ->t1' rac=3 it1
st=495 rt='[t1]+1 ->q' oa p1 oadder
st=496 rt='[q] -> [r(ir1:ir0)]' oq wac=3
nst=0

********** MOVE - dst decrement***********
st=500 rt='[r(ir1:ir0)] ->mar' rac =3 imar
nst=480

*************MOVE - dst index************
st=510 rt='[t2] ->[t1]' ot2 it1
st=511 rt='[t1] ->q' oa oadder clrc clrv
st=512 rt='[q]-> mdr' oq imdr newz newn
st=513 rt='[mdr] ->[mar]' write
nst=0

******** MOVE-absolute************
st=520 rt='[t2] ->[t1]' ot2 it1
st=521 rt='[t1] ->q' oa oadder clrc clrv
st=522 rt='[q]-> mdr' oq imdr newz newn
st=523 rt='[mdr] ->[mar]' write
nst=0

******* EXCHANGE************
******* EXCHANGE -dst register*********************************
st=530 rt='[t4] -> mdr' ot4 imdr
st=531 rt='[t2] -> [r(ir1:ir0)]' ot2 wac=3

****************************** source-register
cond='ir118' value=0 nst=620
****************************** source- register indirect
cond='ir118' value=1 nst=625
****************************** source- register autoincrement
cond='ir118' value=2 nst=625
****************************** source- register autodecrement
cond='ir118' value=3 nst=625
****************************** source- register index
cond='ir118' value=4 nst=625
****************************** source- register absolute
cond='ir118' value=5 nst=625
nst=0

*********EXCHANGE -dst indirect***********
st=540 rt='[t2]-> mdr' ot2 imdr
st=541 rt='[t4] ->[r(ir3:ir2)]' ot4 wac = 2
st=542 rt='[mdr] ->[mar]' write
nst=0

********** EXCHANGE -dst increment************
```

```
st=550 rt='[t2]-> mdr' ot2 imdr
st=551 rt='[t4] ->[r(ir3:ir2)]' ot4 wac = 2
st=552 rt='[mdr] ->[mar]' write
st=553 rt='[r(ir1:ir0)] ->t1' rac=3 it1
st=554 rt='[t1]+1 ->q' oa p1 oadder
st=555 rt='[q] -> [r(ir1:ir0)]' oq wac=3
nst=0

********** EXCHANGE - dst decrement***********
st=560 rt='[r(ir1:ir0)] ->mar' rac =3 imar
st=561 rt='[[mar]]->mdr' read
st=562 rt='[mdr]->t4' omdr it4
nst=540

************EXCHANGE - dst index***********
st=570 rt='[t2]-> mdr' ot2 imdr
st=571 rt='[t4] ->[r(ir3:ir2)]' ot4 wac = 2
st=572 rt='[mdr] ->[mar]' write
nst=0


******** EXCHANGE-absolute***********
st=580 rt='[t2]-> mdr' ot2 imdr
st=581 rt='[t4] ->[r(ir3:ir2)]' ot4 wac = 2
st=582 rt='[mdr] ->[mar]' write
nst=0

**********************BRANCH***********
st=600
cond='ir5' value=1 nst=610
st=601 rt='[pc] ->t1' it1 rac=1 rn=3
st=602 rt='[t1]+1->q' oa p1 oadder
st=603 rt='[q] -> pc' oq wac=1 wn=3
nst=0
st=605
cond='ir5' value=0 nst=610
nst=0

st=610 rt='[pc] ->t1' it1 rac=1 rn=3
st=611 rt='[t1]+1->q' oa p1 oadder
st=612 rt='[q] ->t5' oq it5
st=613 rt='[pc]-> mar' imar rac=1 rn=3
st=614 rt='[[mar]]->mdr' read
st=615 rt='[mdr] ->t3' omdr it3
st=616 rt='[t5] ->t1' ot5 it1
st=617 rt='[t1]+[t3]->q' ot3 ib oa oadder
st=618 rt='[q] ->pc' oq wac=1 wn=3
nst=0

**********************************Source exchange register***************
```

```
st=620 rt = 'mdr -> [r(ir3:ir2)]' omdr wac = 2
nst=0

**********************************Source exchange
indirect_register***************
st=625 rt='[mdr] ->[mar]' write
nst=0


***Single Operand***


***INCREMENT - dst register***
******* inc -dst register*********************************
st=650 rt='[t4]->t1' ot4 it1
st=651 rt='[t1]+1 ->q' oa p1 oadder newc newv

nst=232
*********inc -dst indirect***********
st=654 rt='[t4]->t1' ot4 it1
st=655 rt='[t1]+1 ->q' oa p1 oadder newc newv

nst=242
*********** inc -dst increment
st=657 rt='[t4]->t1' ot4 it1
st=658 rt='[t1]+1 ->q' oa p1 oadder newc newv

nst=252
*********** inc- dst decrement
st=660 rt='[t5] ->mar' ot5 imar
st=661 rt='[[mar]] ->mdr' read
st=662 rt='[mdr] -> t4' omdr it4
st=663 rt='[t4]->t1' ot4 it1
st=664 rt='[t1]+1 ->q' oa p1 oadder newc newv

nst=265
*************inc - dst index
st=667 rt='[t4]->t1' ot4 it1
st=668 rt='[t1]+1 ->q' oa p1 oadder newc newv

nst=272

******** inc-dst absolute
st=670 rt='[t4]->t1' ot4 it1
st=671 rt='[t1]+1 ->q' oa p1 oadder newc newv

nst=282

***DECREMENT - dst register***
******* dec -dst register*********************************
st=675 rt='[t4]->t1' ot4 it1
```

```
st=676 rt='[t1]+1 ->q' oa comp oadder newc newv

nst=232
*********dec -dst indirect***********
st=678 rt='[t4]->t1' ot4 it1
st=679 rt='[t1]+1 ->q' oa comp oadder newc newv

nst=242
*********** dec -dst increment
st=682 rt='[t4]->t1' ot4 it1
st=683 rt='[t1]+1 ->q' oa comp oadder newc newv

nst=252
*********** dec- dst decrement
st=685 rt='[t5] ->mar' ot5 imar
st=686 rt='[[mar]] ->mdr' read
st=687 rt='[mdr] -> t4' omdr it4
st=688 rt='[t4]->t1' ot4 it1
st=689 rt='[t1]+1 ->q' oa comp oadder newc newv

nst=265
*************dec - dst index
st=692 rt='[t4]->t1' ot4 it1
st=693 rt='[t1]+1 ->q' oa comp oadder newc newv

nst=272

******** dec-dst absolute
st=695 rt='[t4]->t1' ot4 it1
st=696 rt='[t1]+1 ->q' oa comp oadder newc newv

nst=282

***NEGATE - dst register***
******* Neg -dst register**********************************

st=701 rt='[t4] ->q' ot4 ib comp p1 oadder newc newv

nst=232
*********Neg -dst indirect***********
st=704 rt='[t4] ->q' ot4 ib comp p1 oadder newc newv

nst=242
*********** Neg -dst increment
st=706 rt='[t4] ->q' ot4 ib comp p1 oadder newc newv

nst=252
*********** Neg- dst decrement
st=710 rt='[t5] ->mar' ot5 imar
st=711 rt='[[mar]] ->mdr' read
st=712 rt='[mdr] -> t4' omdr it4
```

```
st=713 rt='[t4] ->q' ot4 ib comp p1 oadder newc newv
nst=265
**************Neg - dst index
st=718 rt='[t4] ->q' ot4 ib comp p1 oadder newc newv

nst=272

******** Neg-dst absolute
st=721 rt='[t4] ->q' ot4 ib comp p1 oadder newc newv
nst=282


***COMPLEMENT - dst register***
******* Neg -dst register**********************************

st=725 rt='[t4] ->q' ot4 ib comp oadder clrc clrv

nst=232
********Comp -dst indirect***********
st=727 rt='[t4] ->q' ot4 ib comp oadder clrc clrv

nst=242
*********** Comp -dst increment
st=729 rt='[t4] ->q' ot4 ib comp oadder clrc clrv

nst=252
*********** Comp- dst decrement
st=731 rt='[t5] ->mar' ot5 imar
st=732 rt='[[mar]] ->mdr' read
st=733 rt='[mdr] -> t4' omdr it4
st=734 rt='[t4] ->q' ot4 ib comp oadder clrc clrv
nst=265
**************Comp - dst index
st=736 rt='[t4] ->q' ot4 ib comp oadder clrc clrv

nst=272

******** Comp-dst absolute
st=738 rt='[t4] ->q' ot4 ib comp oadder clrc clrv
nst=282

*******TST*******
st=739 rt='[t5] ->mar' ot5 imar
st=740 rt='[[mar]] ->mdr' read
st=741 rt='[mdr] -> t4' omdr it4
nst=747



st=744 rt='[t1] ->t3' ot1 it3
st=745 rt='[t1]+[t3] ->q' oa ot3 ib comp p1 oadder newc newv
```

```
st=746 rt='[q] ->t3' oq it3
st=747 rt='[t4] ->t1' ot4 it1
st=748 rt='[t1]+[t3] ->q' oa ot3 ib comp p1 oadder clrc clrv
st=749 rt='[q] ->t4' oq it4 newn newz
st=750
cond='ir75' value=1 nst=751
nst=0
st=751
cond='ir4' value=0 nst=910
cond='ir4' value=1 nst=0

***CLR - dst register***
******* Clr -dst register*********************************

st=752 rt='[t1] ->t3' ot1 it3
st=753 rt='[t1]+[t3] ->q' oa ot3 ib comp p1 oadder clrc clrv

nst=232
********Clr -dst indirect***********
st=754 rt='[t1] ->t3' ot1 it3
st=755 rt='[t1]+[t3] ->q' oa ot3 ib comp p1 oadder clrc clrv

nst=242
*********** Clr -dst increment
st=756 rt='[t1] ->t3' ot1 it3
st=757 rt='[t1]+[t3] ->q' oa ot3 ib comp p1 oadder clrc clrv
nst=252
*********** Clr- dst decrement
st=758 rt='[t5] ->mar' ot5 imar
st=759 rt='[[mar]] ->mdr' read
st=760 rt='[mdr] -> t4' omdr it4
st=761 rt='[t1] ->t3' ot1 it3
st=762 rt='[t1]+[t3] ->q' oa ot3 ib comp p1 oadder clrc clrv

nst=265
*************Clr - dst index
st=763 rt='[t1] ->t3' ot1 it3
st=764 rt='[t1]+[t3] ->q' oa ot3 ib comp p1 oadder clrc clrv

nst=272

******** Clr-dst absolute
st=765 rt='[t1] ->t3' ot1 it3
st=766 rt='[t1]+[t3] ->q' oa ot3 ib comp p1 oadder clrc clrv
nst=282
***********JMP***********
st=767 rt='[t5] ->mar' ot5 imar
st=768 rt='[[mar]] ->mdr' read
st=769 rt='[mdr] -> t4' omdr it4
```

```
st=770 rt='t4-> pc' ot4 wac=1 wn= 3
st=771
cond='ir75' value=1 nst=772
nst=0
st=772
cond='ir4' value=0 nst=252
cond='ir4' value=1 nst=0

************JSR*************

st=773 rt='[t5] ->mar' ot5 imar
st=774 rt='[[mar]] ->mdr' read
st=775 rt='[mdr] -> t4' omdr it4



st=776 rt='[SP]-> t1' rac=1 rn=2 it1
st=777 rt='[t1]+1 -> q' oa comp oadder newc newv
st=778 rt='[q]->t1' oq it1
st=779 rt='[t1]->sp' ot1 wac=1 wn=2
st=780 rt='[SP]->mar' rac=1 rn=2 imar
st=781 rt='[PC]->mdr' rac=1 rn=3 imdr
st=782 rt='[mdr] ->[mar]' write
st=783 rt='[t4]-> pc' ot4 wac=1 wn= 3
st=784
cond='ir75' value=1 nst=785
nst=0
st=785
cond='ir4' value=0 nst=252
cond='ir4' value=1 nst=0

nst=0
***********SET/CLEAR **********

st=790
cond='ir4' value=0 nst=791
cond='ir4' value=1 nst=792
nst=15
st=791
cond='ir0' value=1 nst=793
cond='ir1' value=1 nst=890
cond='ir2' value=1 nst=797
cond='ir3' value=1 nst=798
nst=15
st=792
cond='ir0' value=1 nst=896
cond='ir1' value=1 nst=800
cond='ir2' value=1 nst=803
cond='ir3' value=1 nst=804
nst=15
st=793 rt='[t1] ->t3' ot1 it3
```

```
st=794 rt='[t1]+[t3] ->q' oa ot3 ib comp p1 oadder
st=795 rt='q-> t4' oq it4 newn
nst=0


st=797 CLRV
nst = 0
st=798 CLRC
nst=0

st=800 rt='[t1] ->t3' ot1 it3
st=801 rt='[t1]+[t3] ->q' oa ot3 ib comp p1 oadder
st=802 rt='q-> t4' oq it4 newz
nst=0

st=803 SETV
nst=0
st=804 SETC
nst=0



****RTS******
st=805 rt='[SP] -> mar' rac=1 rn=2 imar
st=806 rt='[[mar]] ->mdr' read
st=807 rt='[mdr] -> mar' write
st=808 rt='[[mar]] -> mdr' read
st=809 rt='[mdr] -> pc' omdr wac=1 wn=3
st=810 rt='[sp]->t1' rac=1 rn=2 it1
st=811 rt='[t1] + 1 ->q' oa p1 oadder
st=812 rt='[q] ->SP' oq wac=1 wn=2
nst=0

******DBRA******

st=815 rt='[t5] ->mar' ot5 imar
st=816 rt='[[mar]] ->mdr' read
st=817 rt='[mdr] -> t4' omdr it4
nst=820

st=820 rt='[t4]-> t1' ot4 it1
st=821 rt='[t1]+1 -> q' oa comp oadder newc newv
st=822 rt='[q]->t4' oq it4

st=823 rt='[t4]->q' ot4 iq
st=824
cond='ir75' value=0 nst=825
cond='ir75' value=1 nst=826
cond='ir75' value=2 nst=827
nst=0
st=825
```

```
cond='ir4' value=0 nst=920
cond='ir4' value=1 nst=921
nst=0
st=826
cond='ir4' value=0 nst=924
cond='ir4' value=1 nst=930
nst=0
st=827
cond='ir4' value=0 nst=933
cond='ir4' value=1 nst=935
nst=0


st=828 rt='[t1]->ir' ot1 iir
st=829
cond='ir0' value=0 nst=830
nst = 850
st=830
cond='ir1' value=0 nst=831
nst = 850
st=831
cond='ir2' value=0 nst=832
nst = 850
st=832
cond='ir3' value=0 nst=833
nst = 850
st=833
cond='ir64' value=0 nst=834
nst = 850
st=834
cond='ir7' value=0 nst=835
nst = 850
st=835
cond='ir108' value=0 nst=836
nst = 850
st=836
cond='ir11' value=0 nst=837
nst = 850
st=837
cond='ir1512' value=0 nst=0
nst = 850



st=850 rt='[pc]-> mar' imar rac=1 rn=3
st=851 rt='[[mar]]->mdr' read
st=852 rt='[pc]+1->q' rac=1 rn=3 ib p1 oadder
st=853 rt='[q]->pc' oq wac=1 wn=3
st=854 rt='[mdr]-> t5' omdr it5
st=855 rt='[PC]-> t1' rac=1 rn=3 it1
st=856 rt='[t1]+[t5]->q'oa ot5 ib oadder
```

```
st=857 rt='[q]-> pc' oq wac=1 wn= 3
nst=0




****clear z***
st=890 rt='[t1] ->t3' ot1 it3
st=891 rt='[t1]+[t3] ->q' oa ot3 ib comp p1 oadder
st=892 rt='[q]-> t4' oq it4
st=893 rt='[t4]-> t1' ot4 it1
st=894 rt='[t1]+1->q' oa comp oadder
st=895 rt='[q]->t4' oq it4 newz
nst=0
***set n***
st=896 rt='[t1] ->t3' ot1 it3
st=897 rt='[t1]+[t3] ->q' oa ot3 ib comp p1 oadder
st=898 rt='[q]-> t4' oq it4
st=899 rt='[t4]-> t1' ot4 it1
st=900 rt='[t1]+1->q' oa comp oadder
st=901 rt='[q]->t4' oq it4 newn
nst=0
****test: no memory update***
st=910 rt='[q]->mdr' oq imdr newz newn
***FOR DBRA***

**REG**
st=920 rt='[q] -> [r(ir1:ir0)]' oq wac=3 newz newn
nst=828
***INDIRECT
st=921 rt='[q]->mdr' oq imdr newz newn
st=922 rt='[r(ir1:ir0)] -> mar' rac=3 imar
st=923 rt='[mdr] ->[mar]' write
nst=828
**INCREMENT****
st=924 rt='[q]->mdr' oq imdr newz newn
st=925 rt='[r(ir1:ir0) ->mar' rac=3 imar
st=926 rt='[mdr] ->[mar]' write
st=927 rt='[r(ir1:ir0) ->t1' rac=3 it1
st=928 rt='[t1]+1 ->q' oa p1 oadder
st=929 rt='[q] -> [r(ir1:ir0)]' oq wac=3 newz newn
nst=828
***DECREMENT****
st=930 rt='[q]->mdr' oq imdr newz newn
st=931 rt='[t5] ->mar' ot5 imar
st=932 rt='[mdr] ->[mar]' write
nst=828
**ABS***
st=933 rt='[q] ->mdr' oq imdr newz newn
st=934 rt='[mdr] ->[mar]' write
nst=828
```

```
***index****
st=935 rt='[t5]->mar' ot5 imar
st=936 rt='[q] ->mdr' oq imdr newz newn
st=937 rt='[mdr] ->[mar]' write
nst=828
```