```
print ct.list

                ct.list   09/26/73  1023.3 edt Wed


1014    COMPILATION LISTING OF SEGMENT ct
        Compiled by: Multics PL/I Compiler, Version II of 30 August 1973.
        Compiled on: 09/26/73  1017.3 edt Wed
            Options: profile map

   1 clock_test:          procedure;
   2
   3          declare     cv_dec_ external entry(char(*)) returns(fixed bin(35)),
   4                      cu_$arg_ptr external entry(fixed bin,ptr,fixed bin,fixed bin(35)),
   5                      clock_ external entry returns(fixed bin(71)),
   6                      ioa_ external entry options(variable),
   7                      (time1,time2) fixed bin(71),
   8                      (dt,index,limit,code) fixed bin(35),
   9                      arglen fixed bin,
  10                      argptr ptr,
  11                      arg char(arglen) based;
  12
  13          declare     microsecond(1000) fixed bin(35);
  14
  15 do index = 1 to 1000;
  16 microsecond(index) = 0;
  17 end;
  18
  19          call cu_$arg_ptr(1,argptr,arglen,code);
  20          if code ^= 0 then return;
  21          limit = cv_dec_(argptr->arg);
  22
  23          do index = 1 to limit;
  24          time1 = clock_();
  25          time2 = clock_();
  26          dt = time2 - time1;
  27          if dt > 1000 then dt = 1000;
  28          microsecond(dt) = microsecond(dt) + 1;
  29          end;
  30
  31          do index = 1 to 1000;
  32          if microsecond(index) > 0 then call ioa_("^4d  ^4d",index,microsecond(index));
  33          end;
  34
  35          return;
  36
  37 end;
```

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```
clock_test 10##2000
   70      53
   71     921
   72     736
   73     186
   74      37
   75       8
   76       8
   77       4
   78       2
   82       1
   83       3
   84       2
   86       2
   87       1
  105       1
  106       2
  109       2
  125       1
  126       1
  127       1
  128       1
  203       2
  204       2
  206       2
  207       2
  209       1
  211       1
  212       3
  213       2
  215       1
  217       3
  218       1
  219       2
  221       2
  251       1
 1000       2
r 1613   .956   .200   19
```

with 2 cpu's

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```
ct$clock_test 2000
  73   1000
  74    999
  75     11
 123      1
 125      1
 126      1
1000      1
r 1131   .823   4.034   70
```

with 1 cpu

```
>1dd>cxl>e>print_profile ct

   LINE      STH         COUNT          COST                PROGRAM

                                                            ct
     15        1             1             5
     16        1          1000          2000
     17        1          1000          5000
     19        1             1            14 + 1 (call_ext_out)
     20        1             1             2
     21        1             1            19 + 1 (call_ext_out_desc)
     23        1             1             7
     24        1          2000         12000 + 2000 (call_ext_out)
     25        1          2000         12000 + 2000 (call_ext_out)
     26        1          2000          6000
     27        1          2000          8000
     28        1          2000         10000
     29        1          2000         10000
     31        1             1             5
     32        1          1000         20000 + 1000 (call_ext_out_desc)
     33        1          1000          5000
     35        1             1             0 + 1 (return)

TOTAL                                  90053 + 5003
r 1133   .847   3.726   77
```

```
clock_test:     procedure;

        declare   cv_dec_ external entry(char(*)) returns(fixed bin(35)),
                  cu_$arg_ptr external entry(fixed bin,ptr,fixed bin,fixed bin(
                  clock_ external entry returns(fixed bin(71)),
                  ioa_ external entry options(variable),
                  (time1,time2) fixed bin(71),
                  (dt,index,limit,code) fixed bin(35),
                  arglen fixed bin,
                  argptr ptr,
                  arg char(arglen) based;

        declare   microsecond(2000) fixed bin(35);

        declare   1 process_usage,
                    2 number_wanted fixed bin,
                    2 number_returned fixed bin,
                    2 cpu_time_used fixed bin(71),
                    2 memory_usage fixed bin(71),
                    2 number_of_page_faults fixed bin(35),
                    2 num_bulk_store_pf fixed bin(35),
                    2 process_virtual_time fixed bin(71),
                    2 x_paging_measure fixed bin (71),

                  hcs_$get_process_usage external entry(ptr, fixed bin(35)),
                  puptr pointer,
                  pvt(10) fixed bin(71),
                  position fixed bin,
                  addr builtin;


        do index = 1 to 2000;
        microsecond(index) = 0;
        end;

        puptr = addr(process_usage);
        process_usage.number_wanted = 0;

        call cu_$arg_ptr(1,argptr,arglen,code);
        if code ^= 0 then return;
        limit = cv_dec_(argptr->arg);

        do index = 1 to limit;
        position = 1;
        call hcs_$get_process_usage(puptr,code);
        pvt(position) = process_usage.process_virtual_time;
        position = position + 1;
        call hcs_$get_process_usage(puptr,code);
        pvt(position) = process_usage.process_virtual_time;
        dt = pvt(2) - pvt(1);
        if dt > 2000 then dt = 2000;
        microsecond(dt) = microsecond(dt) + 1;
        end;


        do index = 1 to 2000;
        if microsecond(index) > 0 then call ioa_("^4d  ^4d",index,microsecond(ind
        end;
```

```
clock_test_time.pl1                    [illegible]

k_test:          procedure;

     declare     cv_dec_ external entry(char(*)) returns(fixed bin(35)),
                 cu_$arg_ptr external entry(fixed bin,ptr,fixed bin,fixed bin(35)),
                 clock_ external entry returns(fixed bin(71)),
                 ioa_ external entry options(variable),
                 (time1,time2) fixed bin(71),
                 (dt,index,limit,code) fixed bin(35),
                 arglen fixed bin,
                 argptr ptr,
                 arg char(arglen) based;

     declare     microsecond(1000) fixed bin(35);

     declare     1 process_usage,
                   2 number_wanted fixed bin,
                   2 number_returned fixed bin,
                   2 cpu_time_used fixed bin(71),
                   2 memory_usage fixed bin(71),
                   2 number_of_page_faults fixed bin(35),
                   2 num_bulk_store_pf fixed bin(35),
                   2 process_virtual_time fixed bin(71),
                   2 x_paging_measure fixed bin(71),

                 hcs_$get_process_usage external entry(ptr, fixed bin(35)),
                 puptr pointer,
                 pvt(10) fixed bin(71),
                 position fixed bin,
                 addr builtin;


     do index = 1 to 1000;
     microsecond(index) = 0;
     end;

     puptr = addr(process_usage);
     position = 1;
     process_usage.number_wanted = 0;
     call hcs_$get_process_usage(puptr,code);
     pvt(position) = process_usage.process_virtual_time;
     position = position + 1;

     call cu_$arg_ptr(1,argptr,arglen,code);
     if code ^= 0 then return;
     limit = cv_dec_(argptr->arg);

     call hcs_$get_process_usage(puptr,code);
     pvt(position) = process_usage.process_virtual_time;
     position = position + 1;

     do index = 1 to limit;
     time1 = clock_();
     time2 = clock_();
     dt = time2 - time1;
     if dt > 1000 then dt = 1000;
     microsecond(dt) = microsecond(dt) + 1;
     end;

     call hcs_$get_process_usage(puptr,code);
```

```
      pvt(position) = process_usage.process_virtual_time;
      position = position + 1;

      do index = 1 to 1000;
      if microsecond(index) > 0 then call ioa_("%d  %d",index,microsecond(index
      end;

      call hcs_$get_process_usage(puptr,code);
      pvt(position) = process_usage.process_virtual_time;

      do index = 2 to position;
        dt = pvt(index) - pvt(index-1);
        call ioa_("to position %d. %d microsec.",index,dt);
      end;

      return;

;

121   .923   .750   43
```

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```
clock_test 1000
  70       6
  71     420
  72     408
  73      84
  74      28
  75      12
  76       6
 106       1
 107       2
 108       1
 109       5
 121       1
 122       1
 126       3
 127       1
 196       1
 203       1
 211       1
 214       1
 219       1
 222       1
 223       3
 224       1
 226       1
 232       1
1000       1
r 1020   .787  1.050   33

cl##pvt_test$clock_test 1000
 703     533
 704     330
 705       2
 706       2
 707       2
 708      10
 709      17
 710      10
 711      11
 712      12
 713       7
 714       2
 715       2
 717       1
 719       1
 721       1
 726       1
 727       1
 735       1
 738       1
 740       2
 741       1
 743       2
 744       1
 745       1
 746       1
 747       1
 748       2
 749       1
 750       1
 751       1
 753       2
 754       2
 756       1
 761       1
 762       1
 769       1
 777       1
 785       1
 786       1
 787       1
 798       1
 799       2
 827       1
 860       1
 865       1
 866       1
 867       1
 872       1
 887       1
 892       1
 895       1
 907       1
 909       1
 914       1
 915       1
 926       1
r 1631   2.374   .700   27

clock_test_timed$clock_test 1000
  71     179
  72     737
  73      80
  74       5
  75       1
to position 2. 1700 microsec.
to position 3. 167302 microsec.
to position 4. 193019 microsec.
r 1032   .420   .600   23

pcl cpu

cpu  a  7
cpu  b  6

r 1033   .472  3.100   56
```

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```
clock_test_timed$col##clock_test 1000
  71      2
  72    510
  73    365
  74    112
  75     10
 215      1
to position 2. 41470 microsec.
to position 3. 185244 microsec.
to position 4. 147290 microsec.
r 1022  .574  .998  25

clock_test_timed$clock_test 2000
  71      8
  72    522
  73    786
  74    416
  75    190
  76     37
  77      8
  78      7
  80      1
  81      1
  88      1
 110      1
 123      1
 125      2
 127      1
 129      3
 131      1
 201      1
 203      1
 204      1
 207      1
 212      1
 216      1
 957      1
1000      7
to position 2. 2159 microsec.
to position 3. 348130 microsec.
to position 4. 390886 microsec.
r 1022  .877  .404  27
```

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pvt_test$clock_test1# 1000

706	1
707	9
708	35
709	52
710	59
711	44
712	40
713	22
714	18
715	9
716	9
717	7
718	5
719	2
721	1
722	4
723	4
724	1
725	2
726	1
727	2
728	2
729	4
730	1
731	2
732	2
733	2
734	3
735	4
736	3
737	1
738	6
739	6
740	1
741	2
742	6
743	3
744	10
745	22
746	44
747	64
748	63
749	62
750	46
751	40
752	32
753	23
754	17
755	10
756	3
757	5
758	3
759	2
760	6

2 cpu's —

761	2
762	3
764	2
766	1
767	2
769	2
770	1
772	1
774	3
775	2
776	2
777	1
778	1
781	2
782	2
784	1
787	2
788	1
789	1
791	1
793	1
796	2
797	1
803	1
806	1
809	1
811	1
815	1
819	2
820	2
825	1
826	1
827	2
834	1
860	1
861	1
862	1
863	1
864	1
867	1
870	1
871	1
874	1
876	2
877	1
878	2
879	2
880	2
886	1
887	2
889	1
891	2
892	3
893	1
895	1
897	1
898	1
900	1

902	2
903	1
904	1
905	2
906	1
907	1
908	4
910	1
911	3
912	1
913	3
914	1
915	2
917	2
919	1
920	4
921	3
922	3
923	4
924	1
925	1
927	2
928	3
930	1
932	3
934	1
935	2
936	1
940	1
942	2
944	3
946	2
947	2
948	2
949	1
950	1
953	1
954	1
964	1
968	1
973	1
980	1
1023	1
1094	1
1099	1
1108	1
2000	2

r 1095 4.062 .564 40

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