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645 SYSTEM CLOCKS

1. Three general needs for measurement of time exist in a shared access system. Process identification requires time of day as an element. The execution of a process requires some measure of elapsed time to establish the end of the time slice allocated. Finally, time of day is again required to awaken some suspended processes.

2. The processor interval timer approach (e.g. 635) is not adequate for these tasks. It is almost impossible to synchronize timers in several processors. Further, clock "ticks" are lost by resetting these timers whenever a new process is begun. Elapsed process time is not a good basis for some accounting procedures since this is not invarient with system load.

3. For the 645 system, the following scheme seems suitable and lessens the problem of processing time accounting.

   a. The processor interval time should be incremented by processor memory cycles rather than xtal oscillator.

   b. The lockup timer should remain unchanged except that its resolution period be reduced from 16 msec. to 1 msec.

   c. A time of day clock be provided as a terminal on a GIOC channel. This clock should have the following properties:

      1. Time is recorded as a 72 bit binary count incremented every microsecond.

      2. The contents of this counter are to be transferred to a predetermined core location whenever a selected bit in the counter changes state. This selection should be manual and changeable. An interrupt need not be generated by this event.

      3. The suspended process "wake up" problem can be handed in a similar fashion. To accomplish this a second manually selected bit position should generate an interrupt to the system whenever a change of state occurs.

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4. A third manually selectable counter output should be provided to signal the system alarm clock. The alarm clock could well be part of the TOD clock.

5. Initial value of clock should be set manually. Whether this is input in binary or conventional representation is a matter of customer requirement.

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