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High Speed Memory Cycle Time

Preliminary investigations of the characteristics of the high speed memory have been made by the advanced memory development group at IBM. Lack of pertinent data from the feasibility model now under test have made it necessary to make certain ideal assumptions. Based upon these assumption the investigation reveals the following:

MEMORY CYCLE TIME

1. Without features

   a. With "tuning" (i.e. with driver gate adjustments) 0.655 usec*

   b. Without "tuning" (i.e. without driver gate adjustments) 0.940 usec*

2. With count in memory feature (no check bit up dating) add 0.188 usec to (a) and (b). This additional time includes the 70 millimicroseconds for the regenerate loop. The latter limits the number of possibilities for decreasing this portion of the memory cycle.

*Note: time must be alloted in every memory cycle for a logical question - do we want to count/clear memory? To do this it may be necessary to add an additional 20 millimicroseconds to the stated times just to provide the time to make this decision in each cycle.

All of these times represent the best data to date. How much the cycle time (without features) will have to be backed off from .655 towards .940 usec will only be known after more test data becomes available from the model test which test is scheduled to be completed by 1 March 1959. The .940 usec time, then, represents the extent of backing off that may be necessary as more becomes known of line lengths, effects of freon on delay, availibility of the type 088 transistors, etc. The degree of reliability and maintainibility is also a very important factor in determing what the final cycle time will be:

As an example of the use of the above figures supposing one wanted to know what the cycle time would be if no "tuning" or descrewing circuits were to be used (this one would be the easiest to maintain of course - all other factors being equal), and if one were to select the best available components. This time would be .940 usec .188 or 1.128 useconds.

Test specifications have been revised recently to provide core driver transistor type 088 to do this job. The stated yields were below 5%. They are not yet in production but are expected to be by April 1959.

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