

March 4, 1969

TO: Multics Performance Log
FROM: J. H. Saltzer
SUBJECT: Change in Page Fault Distribution upon adding Ring zero
Typewriter Device Interface Module.

About 25% of the performance improvement provided by the Ring zero typewriter DIM seems to have come about from a shift in the page fault distribution. The mean of this distribution has dropped about 10%; some categories of page fault lengths have increased despite an overall reduction in page fault number.

One possible explanation for the unexpected behavior is that the reduced pressure on core memory (from a smaller working set required to do I/O) results in shorter average search time for page removal candidates. Unfortunately, there is currently no meter available on that search length to verify this hypothesis.

If the hypothesis is correct, runs with 384k of core memory should show a significantly shorter average page fault time as well as fewer page faults.

This effect acts as an accelerator to push the system into deep overload when a slight overload begins; it would appear that average page removal candidate search time might be a good candidate as a sensitive measure of system overload.

A chart of the page fault distribution of systems 2.2 and 2.2A is attached, to exhibit the observed changes.

Multics Page fault time distribution

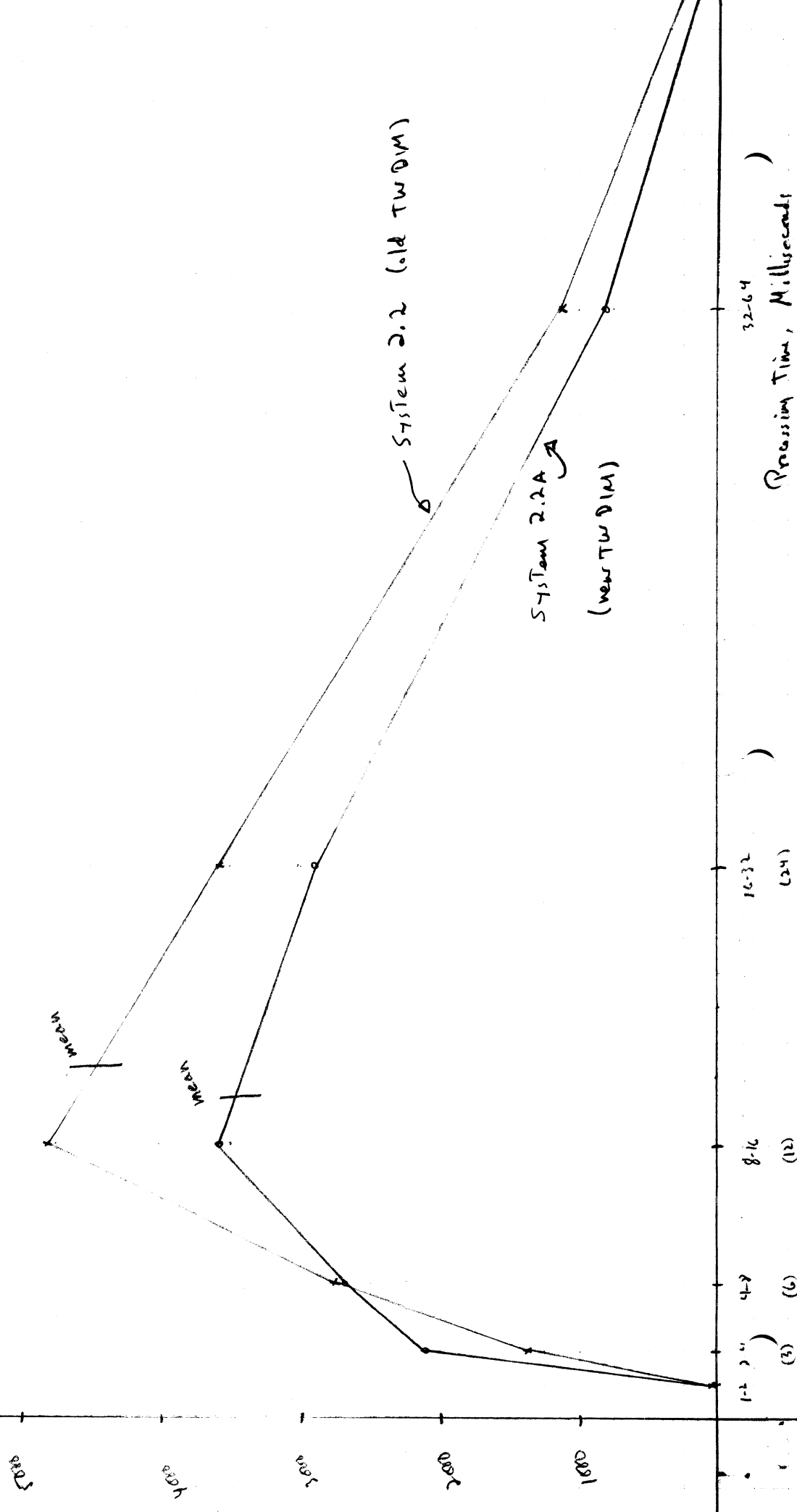
3/3/69 SAS

Change on adding Ring 0 Typewriter DIM ; Using "Typical User" Certification Script
 Command processing only (Program execution excluded)

Area under curve is proportional to
 Total time in page fault handling

Mean dropped about 10%

 Total
 Count



Processing Time, Milliseconds