

INTERDEPARTMENTAL

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from the office of

To: E. Fredkin
From: J. H. Saltzer
Date: December 21, 1972
Subject: Large LSI Memory for Multics at I.P.C.

From the current contract, I have attempted to estimate how much LSI memory could be attached to the 6180 within the budget available. Here is the line of reasoning:

| | Rental |
|---|-------------------------|
| Planned rental for memory: | |
| Bulk store and controller (2M words) | \$ 29.2k/mo. |
| Primary memory (384k words) | <u>36.0k/mo. (est.)</u> |
| Total budgeted memory cost/mo. | \$ 65.2k/mo. |
| | <u> x12 months</u> |
| Total budgeted memory cost/yr. | \$782.4k/yr. |
| Yearly maintenance budget | <u>78.0k/yr.</u> |
| Total I.P.C. outlay budgeted for memory | \$860.4k/yr. |

| | |
|--|-----------------|
| Proposed rental or purchase of LSI memory: | |
| I.P.C. budget | \$ 860k/yr. |
| Unanticipated income from Project MAC | <u>300k/yr.</u> |
| Total available for LSI memory | \$1160k/yr. |

Amount purchasable or rentable: (Rental assumes 10% maintenance charge, purchase assumes 1% maintenance charge)

| | Purchase | Rental |
|------------|----------------|----------------------------------|
| @ 3¢/bit | 1.0 Mwords/yr. | 3.4 Mwords |
| @ 2¢/bit | 1.6 Mwords/yr. | 5.4 Mwords |
| @ 1.5¢/bit | 2.1 Mwords/yr. | 7.1 Mwords |
| @ 1.0¢/bit | 3.2 Mwords/yr. | 10.8 Mwords |
| @ 0.5¢/bit | 6.4 Mwords/yr. | 16.0 Mwords (maximum attachable) |

The memory sizes in the "rental" column can be achieved in either of two ways: rental from a cooperative outside vendor who is prepared to risk purchasing that much memory, or by I.P.C. assuming the risk. If I.P.C. assumes the risk, they may prefer to assume a smaller risk, and purchase an amount intermediate between the two columns.

Here is a possible purchase plan, using some specific assumptions about LSI cost:

| Year | Assumed cost/bit | Purchase this much | Total memory | Outlay | Income |
|--------|------------------|--------------------|--------------|---------|---------|
| 1973 | 2 ¢ | 2 Mwords | 2 Mwords | \$1.45M | \$1.16M |
| 1974 | 1.5¢ | 3 Mwords | 5 Mwords | 1.45M | 1.16M |
| 1975 | 1.0¢ | 4 Mwords | 9 Mwords | 1.45M | 1.16M |
| 1976 | 0.5¢ | 7 Mwords | 16 Mwords | 1.35M | 1.16M |
| 1977 | 0.3¢ | 0 | 16 Mwords | 0 | 1.16M |
| 1978 | 0.2¢ | 0 | 16 Mwords | 0 | 1.16M |
| Totals | | | | \$5.70M | \$6.96M |

(residual value of 16M word memory at end of 1978 ~ \$1.3M)

This plan does not take into account increased income from other new users (which would probably go into additional processor and disk storage rental) or discount of present outlay against future income. On the other hand, it would appear that a conservative plan of this general kind can be easily constructed.

xc: R. Scott
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