Inter-Office Memorandum

To	John Weaver	Date	November 3, 1977
From	John Wick	Location	Palo Alto
Subject	More Mesa 3.0 statistics	Organization	SDD/SD

XEROX

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This memo contains the source-to-object expansion ratios for Mesa 3.0 and the previous release. It also attempts to estimate some productivity figures. The old numbers are those reported in W. Shultz's memo of June 6, 1977 (reflecting status as of April, 1977). The new numbers are copied from *Mesa 3.0 Statistics*, October 17, 1977; most of these (except frame sizes) are reproduced below.

Project	Source Code (lines)	Object Code (bytes)	Object per Source Line (bytes)
Compiler (April)	23659	85782	3.63
Compiler (3.0)	26234	96466	3.68
Change	+ 2575	+10684	+0.05
Binder (April)	0	0	n/a *
Binder (3.0)	6218	24886	4.00
Change	+ 6218	+24886	n/a
System (April)	13089	30432	2.33
System (3.0)	17611	51164	2.91
Change	+ 4522	+20732	+0.58
Debugger (April)	6838	26490	3.87
Debugger (3.0)	7798	31354	4.02
Change	+ 960	+ 4864	+0.15
Bootmesa (April)	4564	17958	3.93
Bootmesa (3.0)	2838	9998	3.52
Change	- 1726	- 7960	-0.41
Utilities (April)	1481	5598	3.78
Utilities (3.0)	7173	31108	4.34
Change	+ 5692	+25510	+0.56
Totals (April)	49631	166260	3.35
Totals (3.0)	67872	244976	3.61
Change	+18241	+78716	+0.26

* The old binder is included in the April system figure.

Productivity in this case is hard to measure because we have no figures on the amount of code deleted from the old system, and therefore no figures on the total amount of new code added. The following calculations are based on the net change only (the utilities have *not* been included; they are viewed as overhead):

```
time: 4/1 - 10/15 = 28 weeks
people: 6 - 1 (support) = 5
person weeks: 140
source lines: 18241 - 5692 = 12549
productivity: 89.64 loc/pw = 4660 loc/py
```

This figure includes all activity except support functions, which I have estimated to occupy about one sixth of our time. Note that the staff size includes one full time person from CSL (Ed Satterthwaite somewhat less than full time, with Jim Mitchell making up the difference).

To get some handle on the total amount of new code written, we can try to estimate the amount of code that was removed in one component (say, the system), and then apply this factor to the other projects. An examination on a module basis indicates that about 900 lines were removed from the runtime system.

Old code size	13089
Deletes (estimate)	- 895
Adds (computed)	5417
New code size	17611

This calculation indicates that we should add about 20% to the net change to get the total amount of code written:

```
source lines: 12549 * 120% = 15059
productivity: 107.56 loc/pw = 5590 loc/py
```

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