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Memorandum

To: Jim Allchin, Jonathan Roberts, Mosne Dunie, Steve Madigan, Frank Artale

From: Megan Bliss, Rob Bennett

Cc: Eugene Ho, Adam Taylor, David Cole, Carl Stork, Margaret Johnson, Laurie Litwack

Re: Analysis of whether Win95i/NTWi and Memphis makes business sense

Moshe asked product marketing to answer some key questions related to upcoming product releases:

- Do we need a compelling 8 MB consumer client in 1998?
- Do we need a compelling 8 MB business client in 1998 (Cairo DS client, etc.)?
- Should Nashville be an add-on product, OEM-only release or full retail and OEM release? Eg. What is our OEM and retail release strategy?

Net conclusions/recommendations:

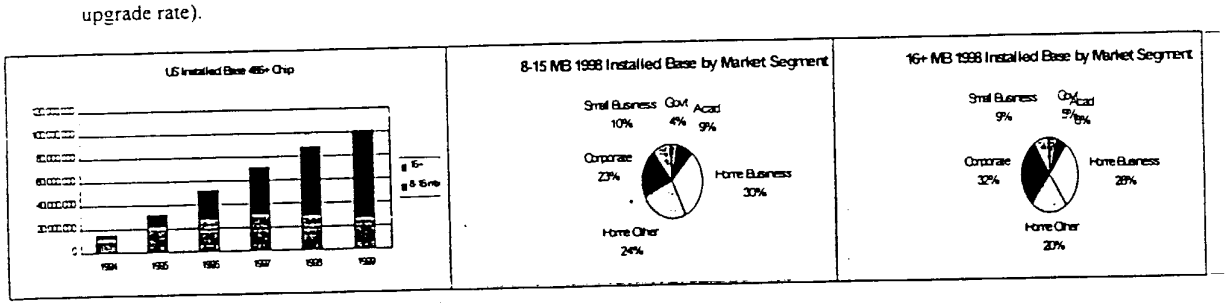
8 MB Consumer Client

Our recommendation is to *not* do a full blown Memphis release in 1997/1998. Instead, we recommend we:

1. Deploy resources to making Cairo more appealing to the consumer market (simpler security, better installation, Win95 upgrade, better app/device compatibility, better multimedia support, SIPC, consumer device support, etc.)
2. Do MS Plus Pack v. 3.0 for the 8-15MB consumer market.

Key rationale for these recommendations:

1. 2/3 the market in 1998 will be NT-capable systems—it makes sense to invest in NT for this market, given we will have to eventually do the work for NT anyway.
2. The 8-15MB market is primarily in the consumer segment, so we have an opportunity to milk this segment for more money. A Plus Pack will achieve a much higher attach rate than a full blown OS release, and ultimately a larger revenue stream (the retirement rate of the 8-15MB systems is much faster than the anticipated Memphis upgrade rate).



8MB Business Client

Our recommendation is to *not* do the Cairo client work for the 8-15MB space, if it impacts other key development initiatives (eg. making Cairo appealing to the consumer segment). Clearly, if we had infinite development resources, we would do this work—it would be easier to convince current Win95 customers to upgrade their redir than their OS.

The key factors driving our recommendation are:

1. The business opportunity for the Cairo client is relatively small: 9M units in medium, large and government accounts compared to 21M consumer units (8-15 MB systems); 34% of 16 MB + systems
2. ½ the 9M units are Pentium/Pentium Pro and could be upgraded to 16MB, NT-capable systems
3. In terms of dev/test tradeoff, we'll get more ROI investing in making 1) Cairo appealing to consumer space and 2) a consumer add-on for the 8-15MB space. Any distraction from these primary goals will cost us $$.

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HENGAD-Bayonne, N.J.

OEM and Retail Release Strategy?

From a market perspective, we can not have significant functional disparity between the OEM and FG channel. Our current plan of record (btw, 1st time we've done this as a company) is to have significant disparity—perhaps a full release off—between the OEM and retail channels by Q1 CY 97. Below amplifies the disparity and current delivery timeline for products. Note that much of the functionality included in the OPKs and SPs are core product components (API carrying devices).

OEM	Service Pack	Retail
OPK #2 • IE 3.0 • Fat32 & tools • CDFS enhancements • Multimedia enhancements (Active Movie, DirectX, RL, Direct 3D, etc.) • Comm enhancements (Unimodem/V, PS Phone, etc.) • Better driver support (infrared, 120MB floptical, APM 1.2, etc.) • Ratings API work • MSN 1.3 *OPK #3* • WDM support (USB, P1394, etc.)	*SP #1* • NetWare client • Updated network install tools (corporate) • DLC client • Updated drivers (incl. Infrared) • NTS admin tools	Retail box includes none of the items to the left, nor is there a current plan to update the retail box. If we don't do Memphis, this is the box we'll have to live with for 3 years –

Timeline Date	OEM	Finished Goods
June/July	OPK 2	IE 3.0 (at least in beta) in NTW 4.0
Sept.	Core componets of Nashville (IE 3.0, Shellview, Active client platform, Personal Web Server) avail. to OEMs	MS Plus 2.0 add-on (Nashville) Potential step-up for retail channel for core components ($10) Potential rework of channel units to include Internet disk and new box snipe Downloadable everywhere: like water!
Jan/Feb	OPK #3	Potential retail update to Win95 & NTW to include core Internet components and to synch OEM & retail channels

The question of what to do to win the browser battle, and thus what to do about Nashville core components is a much tougher issue, because it involves a very substantial set of tradeoffs. In an ideal world (of infinite resources), the right things to do to win the browser battle would be to:

1. Ship OPK#2 as planned (with questionable inclusion of FAT32). IE 3.0 is critical component (with auto-download of shellview, when complete)
2. **DISCUSSION ITEM:** Ship Nashville as MS Plus v. 2.0, with subset of critical OS functionality shipped in a "step-up" at low cost eg. $10 (and on-line) to existing customers: IE 3.0, Shellview, Active client platform, Personal Web Server.
3. Include IE 3.0, Shellview, Personal Web Server, Active Client Platform in OPK#3. (Offer these components to OEMs when Nashville ships, then incl. in next OPK). We want to insure the "core" components ship out on every box.
4. **DISCUSSION ITEM:** The version control problem outlined above will create huge headaches for customers eg. Joe Customer has already installed Win95 on 2K systems, then purchases 2K OEM boxes. The 2K new boxes have DirectX and other multimedia support, Internet access & and other features not accessible to the 2K original users. An expensive solution (in terms of dev/test resources) to the problem is to rev. retail channel concurrent with OPK#3.

Key factors to keep in mind:

1. We need at least 30% penetration of our browser & associated APIs on the desktop to get developers to write to it.
2. Leveraging our strong share on the desktop will make switching costs high (if they get our technology by default on every desk then they'll be less inclined to purchase a competitive solution).
3. We are ultimately responsible for QFE/test of the desktop—this can not be avoided. Also, we are facing a huge competitive threat on the desktop from Netscape—we need to be able to respond much more quickly, which may mean revving product more often than we have it the past. We need to set up the appropriate infrastructure to match this challenge.

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Product Opportunities

OPK#2	Plus v. 2.0 (aka Nashville): OEM, Retail	DISCUSSION ITEM: Internet Starter Kit v. 2.0 (or Step-up): Retail only
Product components: • As per current plan	• IE 3.0, Shellview, ActiveX, Pers. Web Svr • Oprah, Athena • Direct MPEG, Direct 3D, Active VRML, Direct X, other multimedia • Wang viewer • Ratings • Read/write HTML Wordpad • MSN 2.0, etc.	Product components: • IE 3.0 • Shellview • ActiveX • Personal Web Server
	Note: Brade/Joachim plan to offer this to OEMs as per current Plus agreements (less than 4% attach rate). We will offer core components to OEMs to include with Win95 OS.	Non goals: • Ship all Nashville components (only ship components core to OS) • Full retail upgrade (service paks, driver updates, etc.)
Open issue: • FAT32 needs decision (separate review being scheduled)	Open issues: • A large % of items planned for Nashville do not run on NT • Testing for NT—meet our quality expectations? • Synch ship for NT/95 required: not planned	Open issues: • Step-up or starter kit • Install/test/dev resources
Date: June 96	Date: Q3 CY 96	Date: Q3 CY 96

OPK#3	DISCUSSION ITEM: Win95 Retail Rev	DISCUSSION ITEM: NTW Retail Rev
Product components: • OPK#3 contents (WDM critical component) • – IE 3.0/4.0, Shellview, Active client platform, Personal Web Server	Product components: • All extensions to OS (esp. API components) incl. IE 3.0/IE 4.0, ISDN, Shellview, Personal Web Server, Ratings?, Direct X & other multimedia components, Active X, drivers critical to running apps (eg. Direct MPEG), Service Pack updates	Product components: • IE 3.0/IE 4.0, Shellview, Personal Web Server, Service Pack updates, Driver updates
	Non goals: • Inclusion of new device support applicable only to new OEM systems	
Open issues: • Do we do OPK update for NT w/subset of features? • All of Nashville or just core components? (eg. do we let Joachim "sell" Nashville as add-on to existing OEM contracts?)	Open issues: • How do we build this box? • Could have *substantial impact* on Cairo (and new work in consumer space needed for Cairo)!	Open issue: • Do we synch with other Win95 components (eg. Oprah, ratings, OPK 2,3) that don't run on NT today
Date: End of year 96	Date: Q1 97	Date: Q1 97

Cairo: OEM, Retail	Cairo Consumer (deltas from Cairo): OEM, Retail
Product components: • As per current plan + • Win32 app compatibility fixed • Increase driver support (esp. multimedia, consumer devices) • Win95 upgrade • WDM (USB, P1394, etc.) • Synch with Win9x, Nashville features not currently available • SIPC • Installation improvements	Product components (assume as little deviation from core Cairo as possible): • Security model change to be appropriate for home/small office (eg. wizards, multi-user; no domains) • Strip out non-essential features for consumer space (eg. IPX, Cairo client and other enterprise network components, admin tools, etc.) • Easier login process • Other "Memphis" features approp. to consumer
Open issue: • Win95 upgrade—what does a clean upgrade entail? (eg. what apps do we need to upgrade, what settings, etc.)	Open issues: • Do we relax security/robustness requirements to get better app, device compatibility • Do we need to support DOS, Win16 apps we don't support today? Eg. do we allow Win 3.1 or Win 9x upgrade users to "switch" to a "compatibility" mode? • Do we need to support "older" Win32 apps in upgrade scenarios (eg. Office95) • *NOTE: Research planned to understand these issues better*
Date: H2 CY 97 (assuming we don't do Win95/NTW retail revs at beginning of year which would impact Cairo schedule substantially)	Date: H2 CY 97

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Remaining action items from product marketing

1. Understand what the application market and installed base looks like in 1998. How predominant are MS-DOS applications? 16-bit Windows VxDs (apps we don't run today)? Older Win32 apps (eg. Office 95)? Understanding the landscape here will help us determine a) the type and extent of Win95 upgrade we'll need, and b) what kind of application support we need (eg. do we need to consider "breaking" security/robustness to supporting legacy applications in the consumer space?).
2. Determine the price differential between an 8MB and 16MB new system in 1998. This will help us determine our "risk" in investing in an NT-only solution. If there is [illegible] cost difference between 8MB and 16MB in this timeframe, then we'll be less exposed to competitors and non-PC (eg. Internet terminals) in the low-end space.
3. How separate is consumer NT from core-NT? Clearly, we'll be at less schedule and dev risk if as much code as possible is shared. We will do further research into what is needed in the consumer space that is vastly different from the business space (eg. security, we know needs to be changed, but what else?).
4. Additional research to determine Cairo upgrade rates—for instance, we want to quantify our potential impact of not doing Cairo client work for Win95. Do customers prefer just adding a new redir (& other needed functionality)? Probably, but would they *not* upgrade to Cairo to get this functionality.

Appendix: Detailed Analysis of PC Market and Opportunities in 1998

1998 Situation[1]

- In 1998 2/3 of installed base will be NT-capable (16 MB+)
- Even Win95 today is not upgrading a large percentage of the 8 MB market (>50% ship on 16MB systems)
- More than ½ of the 8-15MB installed base will be in the home. Another 20% will be in small business and education. Only 25% of this installed base will be in medium-large accounts and govern.....
- Approximately. 13M systems (of 30M total 8-15MB systems) will be "upgradable" to 16 MB, good performing NT systems (Pentium, PPro)
- Note, only 36% of the installed base of 16MB+ systems will be in medium, large and government accounts. The remaining 64% will be in home (rec/biz), small business, and academic segments.
- There will be 50M+ NT-capable Win95 machines in the installed base in 1998 (base case)

Issues/Risks

- The obvious: Memphis (or equivalent) is not resourced. Fixing Cairo to be appropriate for the consumer base is not resourced.
- Our biggest risk of not doing Memphis is not the 8 MB market, but the home rec/small biz/home biz market with 16 MB PCs (NOTE: 64% of the 16 MB+ market). If we do not fix Cairo to be appealing to this segment, we are at substantial risk. Cairo, as per plan, is *not* the release that is appealing to this large, and growing market.
- The biggest risk of doing home/consumer focused Memphis release is 8-15MB medium, large and government accounts (9M units). THOUGH, over ½ of these PCs are Pentium/Pentium Pros and will be upgradable to 16MB.
- Adding corp-only features (eg. Cairo client work vs. targeting home/consumer features) to Memphis l ...ited upside (9M potential in medium, large and government accounts)
- Other big risk of doing a full blown OS release is that we predict that Memphis OS upgrade rates will be very low on an annual basis into the installed base (4-5%); customers may very well retire their <16 MB systems before we recoup our investment
- Other risks are that Memphis doesn't hold 8MB footprint or isn't compelling enough to drive high adoption rates; OR that Cairo doesn't hold 16 MB footprint or doesn't deliver on the consumer features in NT (we try, but fail)
- There is considerable risk to Cairo schedule (opportunity for 2/3 of the market if we do the right release) if we divert resources to Memphis or an add-on product. Not only will this hurt the desktop business, but the server business as well!
- Lack of a smooth Win95 upgrade will kill our Cairo upgrade rate potential and revenues
- Installed base of NT-capable Win95 systems do not want to upgrade: they'd rather install an add-on (eg. Cairo directory service redir) than do a full OS upgrade (and we don't do the work to let them do this).
- INTERNATIONAL/LOCALIZATION: Win95 currently has much broader coverage, in terms of language support, than NTW. Their current localization team is being disbanded. There were significant "concessions" Win95 had to make to support many of the languages that could cause problems for NT.

[1] Note that all data based on U.S.-only IPR data that we used for the base case (eg. conservative case) in the 3 year plan (we do not have good worldwide data for PC shipment forecasts). In the 3 year plan we assumed that to get the WorldWide #, you need to multiply U.S. number by a factor of 2.3. The 8-15MB #s will likely be under-represented as a % of plan worldwide (and thus, 16 MB+ #s overstated).

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Recommendations/opportunity

- The biggest opportunity for Memphis (or an add-on product) is in the home (16M+ units in 8-15MB installed base); small business adds another. Thus, any work to target this segment should be focused on appealing consumer features.
- Invest in making Cairo appealing to a broader segment (since we will have to do this work eventually anyway), rather than doing a full blown Memphis release. Again, since 2/3 of the market will be NT-capable, it makes sense to invest in this market.
- If we make Cairo the right product, then we should not do a Memphis. We should consider doing MS Plus (3.0?), a life extender, for home rec/home biz/small biz market, focused on consumer features. We'll get a higher attach rate for a Plus pack than a new release—customers are much more willing to shell out $50 for an add-on than doing a full blown OS upgrade. (see revenue analysis below)
- Do not do Cairo client work for 8-15MB clients if this involves a tradeoff in work for Cairo or consumer features. Again, the opportunity here is small (9M) in comparison to providing value-add for the consumer market; AND, ½ of these machines could be upgraded to NT-capable systems.
- Invest in smooth upgrade for Win95 systems (50M units!); otherwise we can assume *very* slow Cairo upgrade rates, and less than optimal revenues. Incent Win95 users to upgrade with better pricing than current FPP.
- Work with Joachim's group to insure that OEMs are not shipping 8MB PCs in CY 98

Revenue implications

Revenue Analysis of Different Options (U.S.)

	IB	Pen'n	$/unit	subtotal	New shipmt	Pen'n	$/unit	subtotal	Revenue
Memphis (assume no-cons Cairo)	64,356,781	4%	$ 86.00	$ 221,387,325	19,148,532	88%	$50	$ 842,535,386	$ 1,063,922,711
No consumer Cairo	21,438,787	15%	$150	$ 482,372,710	7,497,123	88%	$ 115.00	$ 758,708,852	$ 1,241,081,561
									$ 2,305,004,273
Consumer Cairo	71,888,658	10%	$ 115.00	$ 826,719,565	25,586,363	88%	$ 90.00	$ 2,026,439,947	$ 2,853,159,512
Plus 3.0 (assume consumer Cairo)*	25,306,499	13%	$ 38.00	$ 125,014,105	5,059,288	88%	$ 55.00	$ 244,869,539	$ 369,883,645
									$ 3,223,043,156
Plus 3.0 (assume no-consumer Cairo)	64,356,781	13%	$ 38.00	$ 317,922,496	19,148,532	88%	$ 55.00	$ 926,788,925	$ 1,244,711,421
No consumer Cairo	21,438,787	15%	$150	$ 482,372,710	7,497,123	88%	$ 115.00	[illegible]	$ 1,241,081,561
									$ 2,485,792,982
Consumer Cairo	71,888,658	10%	$ 115.00	$ 826,719,565	25,586,363	88%	$ 90.00	$ 2,026,439,947	$ 2,853,159,512
Memphis (assume consumer Cairo)	25,306,499	4%	$ 86.00	$ 87,054,357	5,059,288	88%	$ 50.00	$ 222,608,653	$ 309,663,010
									$ 3,162,822,522
No consumer Cairo, no Memphis	21,438,787	15%	$ 150.00	$ 482,372,710	7,497,123	88%	$ 115.00	$ 758,708,852	$ 1,241,081,561

Neg affect on Cairo of diverting resources (unknown)

*assumes srvo updated OPK for Win9x + Plus Pak & get $5 extra per unit

Assumptions:

- OEMs still shipping some 8MB PCs (as per IPR data; clearly we'd like to fix this)
- We'll get extra $/unit in OEM channel if we ship Win95 + Plus Pak than Memphis (could easily be a flawed assumption if Memphis is compelling)
- Cairo $/unit = $150 (today we get $180+/unit average but we have less than 10% of units shipping through OEM channel so that will come down); If we do a flavor of Cairo appealing to consumer market we assume that average comes down further, to $115 (blended price of $150 for business mkt; $90 for consumer mkt)
- Penetration rates, as per 3 year plan. Low for Memphis (4%); higher for Cairo (15%). These different penetration assumptions have a substantial implication on overall revenue. Note that the Memphis penetration rate assumes the consumer market—it would be lower if for corporate (1%).

Detailed analysis of market

U.S. PC Market	Year					
Memory	1994	1995	1996	1997	1998	1999
8-16 mb	12,522,269	21,306,857	28,104,795	31,083,232	29,874,044	27,144,903
16+	3,302,295	10,993,298	24,133,205	40,032,112	57,710,591	73,885,781
Grand Total	15,824,563	32,300,155	52,237,999	71,115,344	87,584,636	101,030,684

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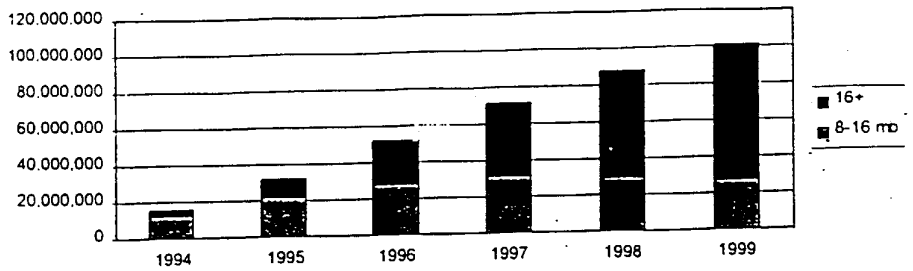
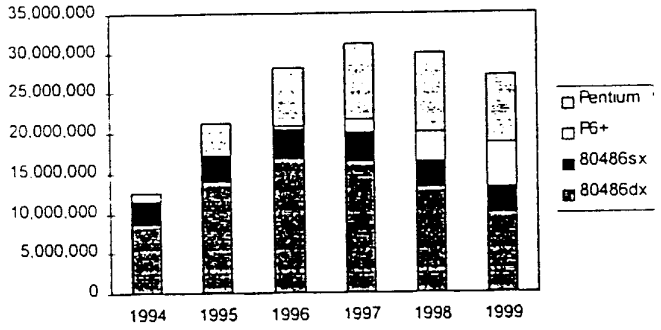
US Installed Base 486+ Chip



U.S PC Market		Year					
Memory	CHIP	1994	1995	1996	1997	1998	1999
8-16 mb	80486dx	8,765,011	13,916,415	16,850,546	16,453,962	13,113,125	10,010,779
	80486sx	2,692,315	3,263,957	3,593,024	3,617,767	3,356,768	3,153,032
	P6+	0	49,448	470,845	1,646,593	3,529,882	5,369,208
	Pentium	1,064,942	4,077,038	7,190,379	9,364,911	9,874,269	8,611,884
16+	80486dx	1,945,628	4,025,078	5,570,881	6,391,855	6,490,247	5,438,978
	80486sx	533,578	697,408	842,619	972,127	1,069,418	1,173,351
	P6+	0	122,609	1,992,673	8,060,016	19,752,435	34,[illegible]155
	Pentium	823,089	6,148,203	15,727,032	24,608,113	30,398,491	31,[illegible]296
Grand Total		15,824,563	32,300,155	52,237,999	71,115,344	87,584,636	101,030,684

8-16MB PC distribution by chip



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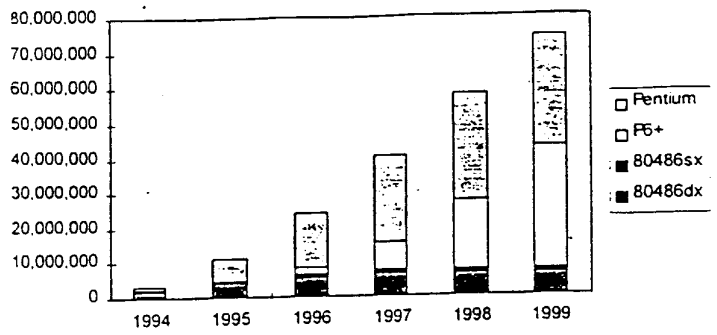
16 MB+ distribution by chip set



8-16 MB+ systems

U.S. PC Market		Year					
Market	CHIP	1994	1995	1996	1997	1998	1999
Govt	80486dx	490,713	597,193	609,475	527,785	408,549	290,560
	80486sx	127,631	144,331	151,985	148,483	132,686	116,770
	P6+	0	3,662	23,478	68,843	130,358	186,230
	Pentium	98,292	308,562	461,322	539,358	523,674	440,154
Govt Sum		716,636	1,053,748	1,246,260	1,284,470	1,195,267	1,033,714
Acad	80486dx	592,290	1,055,453	1,462,763	1,559,045	1,262,545	924,497
	80486sx	197,288	248,472	279,732	303,944	291,480	273,138
	P6+	0	5,405	37,900	[illegible]	212,499	516,264
	Pentium	45,237	232,577	508,624	741,107	864,445	783,202
Acad Sum		834,814	1,541,906	2,289,025	2,738,927	2,730,969	2,497,100
Home Business	80486dx	2,028,987	3,409,556	4,326,980	4,692,980	4,289,127	3,681,351
	80486sx	674,081	836,994	959,652	1,030,111	1,061,810	1,090,370
	P6+	0	6,610	99,229	371,028	842,286	1,378,868
	Pentium	191,708	881,209	1,704,913	2,356,890	2,692,437	2,604,278
Home Business Sum		2,894,776	5,134,369	7,090,774	8,451,010	8,885,661	8,754,868
Home Other	80486dx	1,766,363	3,631,799	4,850,355	4,845,658	3,592,030	2,691,753
	80486sx	589,845	761,144	855,762	827,787	748,590	711,459
	P6+	0	5,570	127,481	510,041	1,145,834	1,679,175
	Pentium	72,815	453,627	1,148,099	1,650,033	1,746,793	1,410,543
Home Other Sum		2,429,023	4,852,141	6,981,697	7,833,519	7,233,247	6,492,930
Corporate	80486dx	3,002,026	3,903,060	4,022,732	3,334,219	2,391,463	1,594,681
	80486sx	846,919	965,448	1,001,430	948,171	791,905	662,867
	P6+	0	20,879	131,016	393,399	755,486	1,089,460
	Pentium	523,138	1,694,247	2,520,141	2,969,093	2,863,519	2,334,610
Corporate Sum		4,372,083	6,583,635	7,675,319	7,644,882	6,802,374	5,681,617
Small Business	80486dx	884,633	1,319,354	1,578,241	1,494,274	1,169,410	827,938
	80486sx	256,551	307,567	344,463	359,271	330,298	298,429
	P6+	0	7,322	51,735	168,450	343,417	519,211
	Pentium	133,752	506,815	847,281	1,108,429	1,183,401	1,039,097
Small Business Sum		1,274,936	2,141,058	2,821,720	3,130,425	3,026,527	2,684,674
Grand Total		12,522,269	21,306,857	28,104,795	31,083,232	29,874,044	27,144,903

- Note that more than ½ of the PCs are going into the home; another 20% are going into small biz and education.
- Only 25% of 8-15MB installed base will be in corporate/government accounts

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16 MB+ PCs systems

U.S. PC Market		Year					
Market	**CHIP**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**
Govt	80486dx	127,825	200,791	245,401	260,969	255,639	242,171
	80486sx	30,765	37,478	43,433	48,518	51,657	54,426
	P6+	0	10,778	119,344	411,441	893,915	1,470,011
	Pentium	85,668	513,594	1,107,418	1,582,753	1,833,771	1,850,412
Govt Sum		**244,258**	**762,641**	**1,515,595**	**2,303,681**	**3,034,981**	**3,617,019**
Acad	80486dx	99,872	239,670	380,688	482,056	518,328	521,477
	80486sx	29,203	40,955	52,381	65,500	76,284	88,663
	P6+	0	8,725	107,472	445,888	1,168,629	2,193,620
	Pentium	23,820	244,256	776,362	1,331,096	1,794,734	1,938,976
Acad Sum		**152,895**	**533,607**	**1,316,903**	**2,324,541**	**3,557,977**	**4,743,735**
Home Business	80486dx	475,567	1,059,724	1,519,959	1,885,087	2,116,445	2,291,393
	80486sx	141,143	186,793	230,367	275,949	324,972	382,514
	P6+	0	17,483	472,365	2,047,023	5,310,530	9,950,199
	Pentium	149,037	1,403,082	3,969,984	6,494,792	8,530,875	9,588,684
Home Business Sum		**765,748**	**2,667,082**	**6,192,675**	**10,702,851**	**16,282,822**	**22,218,789**
Home Other	80486dx	322,584	908,328	1,364,731	1,578,025	1,510,953	1,442,007
	80486sx	96,024	135,136	167,501	190,542	205,764	222,988
	P6+	0	10,833	451,796	2,099,551	5,457,537	9,361,845
	Pentium	42,110	553,599	2,140,566	3,637,648	4,500,731	4,341,940
Home Other Sum		**460,718**	**1,607,896**	**4,124,595**	**7,505,265**	**11,674,985**	**15,368,781**
Corporate	80486dx	762,821	1,300,077	1,611,804	1,667,221	1,559,310	1,424,171
	80486sx	194,688	241,710	279,953	308,903	318,296	325,358
	P6+	0	50,626	664,509	2,368,366	5,288,747	8,892,624
	Pentium	446,734	2,852,430	6,296,348	9,249,080	10,791,077	10,676,138
Corporate Sum		**1,404,243**	**4,454,844**	**8,852,613**	**13,593,570**	**17,957,430**	**21,318,291**
Small Business	80486dx	156,959	316,486	448,298	518,496	529,573	511,760
	80486sx	41,754	55,336	68,984	82,716	92,445	101,402
	P6+	0	14,165	177,187	687,747	1,633,077	2,885,856
	Pentium	75,720	581,241	1,436,354	2,312,745	2,947,302	3,120,146
Small Business Sum		**274,433**	**967,228**	**2,130,824**	**3,601,704**	**5,202,396**	**6,619,165**
Grand Total		**3,302,295**	**10,993,298**	**24,133,205**	**40,032,112**	**57,710,591**	**73,885,781**

- Note, only 36% of the installed base of 16MB+ systems will be in medium, large and government accounts. The remaining 64% will be in home (rec/biz), small business, and academic segments.
- It's easy to see that the risk is substantial if we don't have either a Memphis (or add-on product) or Cairo consumer release.

U.S. PC Market		Year					
Memory	**Operating System**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**
8-16 mo	Windows 95	0	5,450,994	17,601,358	25,114,371	26,202,653	24,712,276
	DOS w/ Win 3.x	10,774,650	13,769,255	8,570,121	4,203,420	2,160,648	1,172,808
	DOS w/o Win 3.x	1,747,618	2,086,608	1,933,316	1,765,441	1,510,743	1,259,819
16+	Windows 95	0	3,689,500	16,863,924	32,700,349	49,837,735	65,519,455
	Windows NT	603,108	1,507,057	2,552,164	3,744,825	4,859,114	5,760,551
	DOS w/ Win 3.x	2,345,929	5,101,657	3,775,477	2,330,522	1,489,591	937,972
	DOS w/o Win 3.x	353,258	695,085	941,640	1,256,415	1,524,151	1,667,803
Grand Total		15,824,563	32,300,155	52,237,999	71,115,344	87,584,636	101,030,684

- The Win95 upgrade to Cairo is *critical*. There will be 50M NT-capable Win95 systems in 1998. If we can not cleanly upgrade them (different than requiring a clean install), we will decrease our upgrade rate and revenues accordingly.

Retirement of 486 from FY 97
PC's 486, 8-15mb

Metric	Year 1996	1997	1998	1999	2000
Year End Installed Base	22,550,025	21,824,437	17,772,584	14,149,850	11,500,922
Shipments.	5,446,919	3,557,592	891,777	197,492	412,662
Retirements	1,941,046	3,800,218	4,341,256	3,203,011	2,471,467
RAM Upgrades to 8-15mb	[illegible] 991	795,446	600,849	483,203	425,329
RAM Upgrades to 16mb	1,142,667	1,278,408	1,203,223	1,100,418	1,015,452
		21,824,437	17,772,584	14,149,850	11,500,922
Retirement Path of 1997 PCs		21,824,437	16,279,958	11,976,529	8,489,610
Actual number in Category		21,824,437	17,772,584	14,149,850	11,500,922

Overall PC Retirement Rate (incl. 16 MB machines)

Metric	Year 1997	1998	1999	2000
Removals	4,663,866	5,513,205	4,321,405	3,598,217
Installed Base	30,091,260	26,169,942	22,551,402	19,837,491
Removal Rate		**18%**	**17%**	**16%**

- The retirement rate of PCs will decline over time, but still be fairly aggressive eg. > 15%. The 486 8-15 MB installed base will ramp down quickly, thus making the overall opportunity to upgrade these systems small over time.

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