



STOCK WATCH

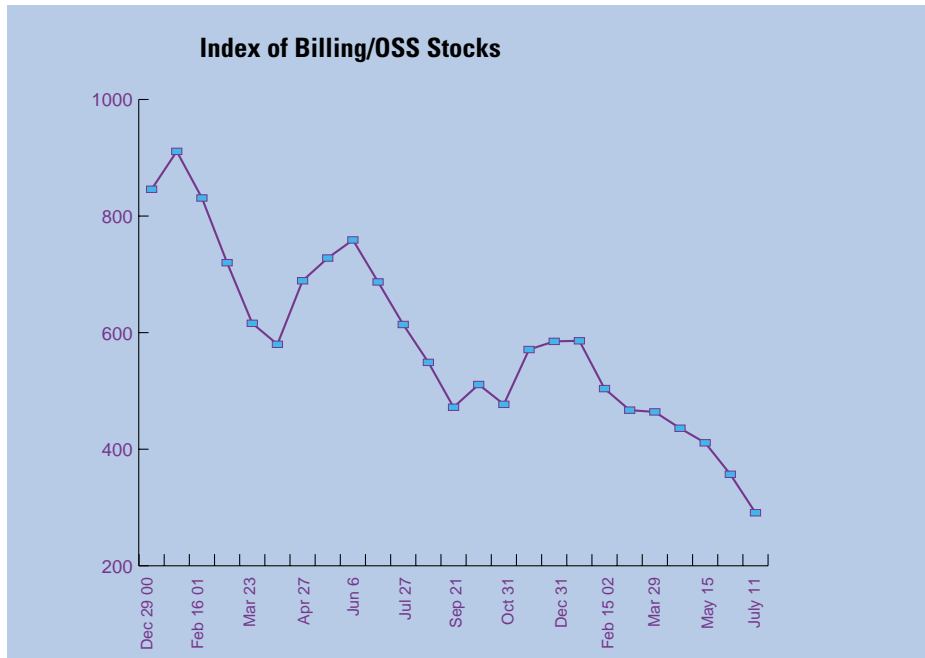
THE 24 HOUR BROADBAND CONSUMER

Contrary to recent fears that the introduction of Wi-Fi (W-LAN) may wipe out the expected revenue debt-laden operators hope to receive from 3G, Pete Sokoloff, MD, Peter A. Sokoloff & Co, argues that the technology's introduction could actually be good news for both carriers and vendors.

The Steven Spielberg, Tom Cruise summer thriller 'Minority Report' features many high-technology possibilities. Aside from the darker sides of the plot, the artist's vision portrays a host of creative uses for up and coming nanotechnology, interactive telecommunications and 24-hour broadband networks.

Nanotechnology, the emerging science of constructing molecular level electronics and machines, promises to revolutionise functionality and lower costs to the point where common household items become intelligent. Imagine a near-empty disposable milk container that could wirelessly communicate to a household computer, prompting the automatic addition of a quart of milk to the shopping list. Or your kids reading the back of the cereal box and watching video animation?

Unlike the film, in the future our eyes will probably not be assailed by laser scans from every passing advertising sign, exposing our identity and calling out our names. But identification will exude from mobile phones, PDAs and other devices we come into contact with. Consumers will have the ability to control what, when and where they choose to share information with some interactive medium. We will constantly wirelessly interact with our homes, offices and



external environment. A huge and imaginative trove of content will be created, directed and streamed into our lives, 24 hours a day.

Most of the content will likely be beyond the control of telecom carriers. Who will make the money by connecting the consumer to their office, their home and the world in a 24-hour 'always-on' mode? 3G, cable and wireline networks will ultimately provide the network backbone, but the fate of the last mile is uncertain given the emergence of publicly

available wireless Ethernet technology. Using Wi-Fi standards, any entrepreneur can become an inexpensive broadband service provider, serving a wireless radius of up to 300 feet. Within the next twelve months, it is anticipated that more than ten million computers and laptops will have 802.11b (Wi-Fi) hardware installed. Within five years many offices and homes will be wireless.

Untapped market

Someday, probably sooner than we might

expect, we will live in a true 24 hour interactive broadband environment. Until that ubiquitous time arrives, the next step in the evolution is broadband mobile wireless. Very shortly, the majority of laptops will inexpensively come with Wi-Fi. Users will need to subscribe to some kind of connection service. Considering that there are about 27 million laptops in the U.S. alone, this is a huge untapped market.

Right now, in San Francisco you could have coffee and broadband at your local Starbucks (some fifty stores have been wired for Wi-Fi). Or you could subscribe to a service roaming aggregator like Boingo and access thousands of Wi-Fi access points. Boingo, led by Earthlink founder Sky Dayton, collects subscriber fees and shares them with the many small network operators who host Wi-Fi systems. Besides coffee houses, Wi-Fi networks serve airports, hotels, office buildings, college campuses, key sections of congested freeways and anywhere else that someone wants to spend a few thousand dollars and open their network to the outside world.

Wayport, started in 1996, is one of the earliest Wi-Fi operators, with access points installed in some 450 hotels and 9 airports. T-Mobile Broadband (formerly Mobilestar) provides Wi-Fi to Starbucks and approximately 600 locations in 19 states.

Wi-Fi is still very much an early-adopter medium and the companies mentioned here have yet to gain a significant foothold in the broadband market. Earlier attempts such as Metricom's Ricochet service failed to attract mobile customers for a narrowband offering. As usual, consumer habits lag behind technology. Mobile broadband does seem destined to become a way of life, but the right combination of content, connection and network is thus far elusive and the message is fragmented.

Good news

Wi-Fi may seem like a threat to traditional carriers. While Wi-Fi will certainly create more competition for end-user customers, it will create a boom in broadband usage and wholesale carrier sales. This is because every one of these little local networks has to link into a big pipe owned by a carrier. As usage increases, carriers will finally have a compelling reason for switching to usage-based billing.

Just as the Internet caught many unaware, Wi-Fi seems destined to creep into the very fabric of our lives. The big broadband pipes were not built in vain, just built too early. Wi-Fi has the potential to fill those pipes faster than many would believe.



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Index of Public Billing & OSS Companies

Company	Ticker		11 July 2002	31 Dec 2001	YTD % Change	52 Week High	Mkt Cap (000s)
Ace Comm	ACEC	ACEC	1.09	1.14	-4.4%	1.75	10,156
Affiliated Comp Services	ACS	ACS	44.16	106.13	-58.4%	57.05	5,821,966
ADC Telecom	ADCT	ADCT	2.33	4.6	-49.3%	7	1,855,670
American Mgmt. Sys.	AMSY	AMSY	14.68	18.08	-18.8%	25.04	614,505
Alltel Corp.	AT	AT	45.45	61.73	-26.4%	65.15	14,132,178
Astea International	ATEA	ATEA	0.93	0.73	27.4%	1.28	13,580
Boston Comm.	BCGI	BCGI	7.09	11.35	-37.5%	18.1	122,203
Comverse Technology Inc	CMVT	CMVT	9.55	22.37	-57.3%	30.98	1,786,137
CSG Systems	CSGS	CSGS	16.61	40.45	-58.9%	57.56	875,214
Cellular Tech Serv	CTSC	CTSC	1.07	2.29	-53.3%	3.76	2,452
Convergys Corp.	CVG	CVG	15.94	37.49	-57.5%	38.5	2,756,074
Daleen Technologies	DALN	DALN	0.15	0.35	-57.1%	1.08	3,530
AMDOCS Corp.	DOX	DOX	8.57	33.97	-74.8%	48.75	1,907,922
DSET Corporation	DSET	DSET	0.25	1.15	-78.3%	2.96	1,271
DST Systems	DST	DST	39.95	49.85	-19.9%	59.8	4,782,375
Evolving Systems Inc	EVOL	EVOL	0.23	0.79	-70.9%	4.85	3,057
HNC Software, Inc.	HNCS	HNCS	15.37	20.6	-25.4%	29.8	548,217
Lightbridge	LTBG	LTBG	8.49	12.15	-30.1%	15.54	239,885
MDSI Mobile Data Solutions Inc	MDSI	MDSI	3.3	3.51	-6.0%	5.08	29,245
Mind CTI	MNDO	MNDO	1.24	1.67	-25.7%	3	25,502
MetaSolv Software	MSLV	MSLV	3.7	7.85	-52.9%	9.1	138,868
Micromuse	MUSE	MUSE	4.21	15	-71.9%	23.1	314,495
Peregrine Software	PRGN	PRGN	0.7	14.83	-95.3%	29.14	134,610
Portal Software Inc.	PRSF	PRSF	0.54	2.08	-74.0%	3.62	95,327
Siebel Systems	SEBL	SEBL	12.16	27.98	-56.5%	47.75	5,758,648
TCSI	TCSI	TCSI	0.531	0.76	-30.1%	1.26	11,035
Management Network	TMNG	TMNG	1.9	6.9	-72.5%	7.66	63,205
T-Netix Inc.	TNTX	TNTX	3.6	3.33	8.1%	4	54,115
TTI Team Telecom	TTIL	TTIL	15.06	25.02	-39.8%	35.09	150,480
Ultimec	ULCM	ULCM	6.14	10.06	-39.0%	24.23	254,171
Veramark Tech	VERA	VERA	0.7	0.7	0.0%	1.5	5,827
VeriSign	VRSN	VRSN	5.94	38.04	-84.4%	57.93	1,404,151
Vertel Corp.	VRTL	VRTL	0.12	0.67	-82.1%	1.32	4,058
Total Index			291.75	583.62	-50.0%		

Highlighted stocks are up from year-end 2001.

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