GILDER TECHNOLOGY REPORT

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On the Road Again

EZchip is no longer a venture investment; it is a rip roaring winner, my best pick since Qualcomm.

Inside:

Is there life after death? Following three years of gazing through my all-optical prism into ground zero of the Telecosm, my eyes begin to play tricks on me. But amid the glassy debris at the bottom of the pit, I seem to descry distinct signs of life. Ivan Seidenberg of **Verizon** (VZ) and Ed Whitacre of **SBC Communications** (SBC) are coming to Telecosm 2004 (October 19 – 20, in Lake Tahoe) to tell us that fiber to the home is full speed ahead. Prospering in the rollout, says "Uniphase" on our subscriber message board at *www.gildertech.com*, will be our old friends **Avanex** (AVNX), through **Alcatel's** (ALA) contract with SBC, and **Ciena** (CIEN) through its Catena subsidiary. **Advanced Fibre Communications** (AFCI) and **Tellabs** (TLAB), he reports, are losing ground.

And there deep in the shadows, do I see the glimmer of a **Broadwing** (BWNG) phoenix? Or merely a comatose Corvis (now Broadwing)? Who cares? By any name it's a buy I say. It's all-optical. It's two generations ahead. It's a ten-bagger sure. For a more fair and balanced rendition of the news and numbers, see Charlie Burger's account that follows (Page 4).

But from the inside sanctums of the industry, a Telecosmic friend, who goes by the pseudonymous "Core Router," warns that three months ago all orders for optics went back on hold. **AT&T** (T), **MCI Inc.** (MCIP), everyone but Verizon and SBC, zeroed out all purchases and is pruning costs and preening to be purchased. Girding for battle with **Comcast Corp.** (CMCSA) and other cable TV players, only the Bells remain to buy last mile optics.

"Still," I say, "the worse it is for AT&T and MCI, the better for Broadwing." Survival of the fittest fiber. Only Broadwing can follow the prices down into the pit and still make a profit. With the best network, Broadwing will be the survivor and champion. Core Router agrees with my analysis. But it may be a perilous path to profitability. In typical form, the government may step in and save the bad networks and kill the best. Darwin on the Potomac ordains survival not of the fittest but of the fattest.

Still BWNG is at $7.28 and it's a raving buy. It's not going to die and if it survives it prevails. Go for it folks. That has been my message for the last two years.

The problem is that fewer people seem to relish the privilege of paying for such advice. People pay one tenth as much for bandwidth as five years ago and one tenth as much to attend the the Gilder/Forbes Telecosm Conference. It begins next week at the Inn in Squaw Creek, Lake Tahoe. Come, it's better than ever and it's 90 percent off! And though the Inn has sold out, other Tahoe hotels still have space.

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Meanwhile, hovering near my phone and computer awaiting any bids for speeches at my usual plush fees, I instead incur a septic **Seagate** (STX) of computer viruses, tapeworms of telemarketing calls on my voicemail, and email offers of eternal life and tumescence. In the eternal life department, I defer to my eschatological pal Ray Kurzweil, who was reported on the net to be planning to spend his next hundred years in a disk drive, awaiting developments in biotech. His new book, however, *Fantastic Voyage: Live Long Enough to Live Forever,* "the science behind radical life extension," is full of fascinating information on advances in biotech, brain, and health science.

Only Broadwing can follow the prices down into the pit and still make a profit

It's bold and inspiring in its confidence in the new genomic and nutritional revelations. This guy *really* believes in information technology. Eternal tumescence, on the other hand, I leave to you younger fellows and Bob Dole, who always told me, when running for vice president, that he sought "indoor work with no heavy lifting."

In the end, I give up my wait by the phone and say "to Sheol with the EZ shekels." I go for the honor and glory of American platinum miles. (Perhaps the IRS will make a deal for them!) So I launch a nationwide search for glints of hope amid the shattered silica of my favored industry. Beneath the 737, though, were clouds.

Ascending from Utopia to Qualcomm

They parted as I landed at Dulles on September 15 on my way to address a group of earnest Virginians attempting to bring broadband socialism to Loudoun County. Located next to Washington's Netplex, Loudoun is the nation's fastest booming bailiwick and still served by the usual American dribbleware, MegaHype, **Netflix** (NFLX), and UPS. Representatives of many broadband pretenders were available in the gallery of the Lansdowne resort, the luxurious new site of the conference. This event offered a panoply of impressive teleconferencing and teleworking gear and a pastiche of wireless "broadband" in the high kilobits, and no multimegabit links. But the Lansdowne network administrator told me, "Actually, the LAN was up; it was the WAN that was down."

Portentously regaling the Virginians at Lansdowne was Congressman Frank Wolf (R-Va.) and Paul Morris of the Utopia project. Utopia is bringing broadband to 14 Utah towns in the Wasach Valley thanks to government guaranteed bonds, $80 million of which have already been raised out of a planned total of some $350 million. Morris is no piker: households in Utopia will be connected to the net by fiber optic lines working at 100 megabits per second each way on fast Ethernet, presumably delivering Mormon genealogical data from the Temple databases in Salt Lake City all over Utah in milliseconds, with hosts of bearded ancestors and angel investors arriving at your dining room table in holographic 3D, with delphic visions of President Romney and timely tips for nanotech plays.

Perhaps this will be a wakeup call to the Bells. So far, **Qwest** (Q) has sent lawyers, who had the positive effect of keeping Utopia out of the retail telecom business and out of any layers above the physical fiber and the IP. For equipment, they are contracting out to **Cisco** (CSCO) and World Wide Packets and a digital settop box maker from London called Amino. It was similar with the new government "Lambda Rail." Somehow, even when they are creating fiber links at $2,000 a household (hey, I'm not knocking it, but given eminent domain and all the rights of way, Verizon can do it for $1,000), these government guys always end up with Cisco. Survival of the fattest again.

From Loudoun, I returned home to pay more real taxes on phantom income from the glory years, which turned my mind toward the matter of money. How could I find better help and heuristics than by giving free speeches to the Money Show. I delivered several from September 22 – 24 at the San Francisco Marriott. On the way out I read two books on nanotech so I would be ready for a confrontation with Josh Wolfe of the estimable *Forbes/Wolfe Nanotech Report* (full of interesting stuff). Josh had tantalized me with a "personal letter" the previous week about new massively parallel Millipede nanostorage and I was avidly waiting to learn the identity of the exciting new company that had developed it. It turns out to be **IBM** (IBM). Oh, well. Wolfe also told people to plunge into **Veeco** (VECO), a semiconductor capital equipment company in Long Island that also makes scanning probe nanoscopes. (It promptly went down 30 percent despite sharply increasing sales of the scopes.) It might be a buy today. Wolfe is on the case.

Meanwhile, I told the gathered multitude to buy **EZchip** (LNOP), **Essex** (KEYW), **Broadwing** (BWNG), **Agilent** (A), **Cepheid** (CPHD), **Synaptics** (SYNA), and **Qualcomm** (QCOM). (Within the next three weeks, they went up some 8 percent). They are mostly based on complex semiconductor technology that resolves geometries measured in nanometers. My stalwart assistant Sandy Fleishmann tells me, though, that Wolfe got a thousand or so new subscriptions and I got about 13. Show me the money. I resolve to read more books on nano.

View from the summit

Then, two weeks later, on October 6, I scale Nob Hill and brave raucous 24-hour picket lines at San Francisco's Fairmont Hotel to regale the World Technology Summit with my views of the future of technology. There I got to savor the wisdom of premier venture capitalists Vinod Khosla of Kleiner Perkins Caulfield & Byers (who recommended soul saving investments in Bangladesh and in nan-

otech) and Steve Jurvetson of Draper Jurvetson who touted nanotech galore. It would produce self-replicating money machines in 2025, too late to pay my taxes. Oh, well.

Both Jurvetson and Khosla celebrated the achievement of Zettacore, a nanotech memory system that replaces the space and power hungry capacitors on ordinary DRAM cells with molecular domains. Competing with **NVE Corp**. (NVEC), **Energy Conversion Devices** (ENER), FRAM, Millipede, Axiom, and a host of others, Zettacore has recently delivered a prototype with a megabit of working memory cells. In an age of four gigabit Flash memories, a megabit seems tame. But the two venture titans pointed out that a gigabit memory consists of one thousand megabit frames. Zettacore had offered proof of concept for a gigabit nonvolatile low power memory chip.

Jurvetson also gave an account of a recent meeting he had with FCC Chairman Michael Powell in which the chairman enthused about Skype, the amazing free voice over IP system launched by the founders of Kazaa, the peer-to-peer music service. Making a call that morning, Jurvetson reported that there were 650 thousand people on line using Skype at that moment. To date, there have been 28 million downloads of the enabling code. Originating in Europe, operating entirely in free software on the edges of the Internet, now offering Skype-out service to ordinary phones, and soon to move to video and video teleconferencing services, the emergence of Skype suggested to Powell that he and the FCC could no longer regulate telephony. It had moved beyond their reach. Operating entirely in software on the edge, Skype also signals the eventual end of the kinds of ever-smarter network cores that Cisco and the long-distance carriers hope to provide us. To Skype, IQ in the network is just a thicket of problems to circumvent.

Skype signals the eventual end of the kinds of ever-smarter network cores that Cisco hopes to provide us

Powell and the FCC also recently adopted new rules to facilitate broadband over power line technology. Since power lines reach virtually every home and office, they were presented as offering valuable new "competition" to companies providing broadband services. Someday the folks in Washington will figure out that it is not competition we need in the world's most competitive industry but freedom from regulations that prevent anyone from winning or making any money from broadband deployment.

All in all, the Technology Summit provided fascinating speeches and panels ranging over technologies from energy to space flight, healthcare to nanotech. The energy technologies all took for granted that "global warming" mandated a concerted move to "sustainable energy sources," such as power from the moon or from manure, though in fact there remains no evidence that current temperatures are above the average over the last two thousand years and much evidence that temperatures were far warmer in previous millennia. (Remember when Greenland was green and Iceland was populous?) Taken seriously at the summit, nonetheless, were hydrogen cars, offal energy, ethanol, and windmills.

I try not to be flippant about the technologies that are touted in the U.S. while the government continues to tax and suppress practical advances such as fiber-optic broadband, 3G wireless, DDT, PCBs, nuclear energy, and Alaskan drilling. I like Skype as much as the next guy and I have devoted more than two decades to studying nanotech in its various forms (mostly semiconductor capital gear). But subsidies for nanotech and provisions for powerline broadband and celebration of the rakish engineers at Skype and obsessive bashing of Bells offer no remedies at all for the catastrophic ground zero destruction of U.S. telecom by politicians—federal, state, and local—who want to tax, regulate, and litigate the Internet in fifty different states.

Ultimately, Skype must ride on broadband pipes around the world that it does nothing to fund or enhance. Ultimately, it is phone companies of various kinds, from Broadwing to the Bells, that will build out most of the new fiber and wireless infrastructures on which the Telecosm will subsist.

So I returned from the Technology Summit with the belief that American technologists are in a fugue state, diverting themselves with fantasies of windmills and hydrogen cars while our existing technologies, from the Internet to the power grid, fall ever farther behind our rivals in Asia. The field described as nanotech is fascinating, but many of the most valuable nanotech investments are already covered by the *GTR*.

My experience with the taxman, though, spurred a post to the subscriber message board (*www.gildertech.com*) on October 3 in which I attested, despite the dour tidings from Core Router, that it was "So Far So Good" in 2004. I include an updated version of the post below:

Prospering in the paradigm

I gather among some in our circle a disgruntled sense that in a time of war—with oil prices spiking and an ascendant presidential candidate espousing protectionism, tax hikes, and technophobia, and with the semiconductor stock index down 35 percent—the *GTR* has failed to generate high returns. At the same time many of the complainants rebel at the high risk of GTR stocks. Thus they refuse to buy the ones that go up, such as Essex, EZchip, Qualcomm, Synaptics, **National Semiconductor** (NSM), and even Broadwing/Corvis. And they chastise me for pointing to companies such as **Centillium** (CNTL), **ESS Technology** (ESST), and **Avistar** (AVSR) that have nipped

TELECOSM TECHNOLOGIES

Advanced Micro Devices	(AMD)
Agilent	(A)
Altera	(ALTR)
Analog Devices	(ADI)
Broadcom	(BRCM)
Broadwing	(BWNG)
Cepheid	(CPHD)
Chartered Semiconductor	(CHRT)
Equinix	(EQIX)
Essex	(KEYW)
EZchip	(LNOP)
Flextronics	(FLEX)
Intel	(INTC)
JDS Uniphase	(JDSU)
Legend Group Limited	(LGHLY.PK)
McDATA	(MCDTA)
Microvision	(MVIS)
National Semiconductor	(NSM)
Power-One	(PWER)
Qualcomm	(QCOM)
Samsung	(SSNLF/SSNHY)
Semiconductor Manufacturing International	(SMI)
Sprint	(FON)
Synaptics	(SYNA)
Taiwan Semiconductor	(TSM)
Terayon	(TERN)
Texas Instruments	(TXN)
VIA Technologies	(2388.TW)
Wind River Systems	(WIND)
Xilinx	(XLNX)
Zoran	(ZRAN)

Note: The Telecosm Technologies list featured in the Gilder Technology Report is not a model portfolio. It is a list of technologies that lead in their respective application. Companies appear on this list based on technical leadership, without consideration of current share price or investment timing. The presence of a company on the list is not a recommendation to buy shares at the current price. George Gilder and Gilder Technology Report staff may hold positions in some or all of the stocks listed.

Broadwing (BWNG)

PARADIGM PLAY: THE PARAMOUNT ALL-OPTICAL COMPANY

OCTOBER 14: 7.28, 52-WEEK RANGE: 7.20 – 30.70, MARKET CAP: 355.26M

Now that Corvis has acquired Focal, has shed itself of its old stigmatic name and now trades as Broadwing (BWNG) on the Nasdaq, and has completed a 1 for 10 reverse stock split, what's the company worth? Nothing … if it doesn't survive. Broadwing must turn cash flow positive soon to convince investors and potential customers that the network will be around for awhile. At issue is Broadwing's S-4 filing with the SEC this summer. In that document, based on data through March 2004, Broadwing calculated an EBITDA (a proxy for cash flow) annual *loss* of $53.6m on a combined pro forma basis with Focal.

In the future according to Broadwing—confirmed by John Spirtos, SVP of M&A, at a Jeffries conference last month—Focal synergies are expected to save $20m to $30m per year. Say $25m. The access forward initiative is expected to save an additional $3m - $6m per month on network access (local connection) costs. Say $4.5m, or $54m/year. As of June, so Broadwing has informed us directly, access forward was one-third complete, leaving $36m in savings to come based on our $54m estimate. Add the $36m of access forward savings to the $25m of Focal savings and EBITDA turns positive by $8.6m.

If, by the middle of next year, Broadwing passes the survivorship test and turns cash-flow positive, what will happen to its stock price? In answer, we will be conservative and assume the company makes the next four payments of the $225m convertible debt ($120.2m including the 5% interest) in stock. At the recent price $7.50 per share, that adds 16m shares to the current 62m, bringing the total to 78m shares and the market cap to $585m. Based on the S-4 pro forma financials, current enterprise value is $426m or 0.5x estimated annual sales of $850m.

Now, consider Broadwing's struggling competitor, Level 3. With a burdensome balance sheet unknown to Broadwing and cash-flow losses from operations, Jim Crowe's company sports an enterprise value almost 2x sales. Give Broadwing the same valuation and share price triples to $24.60.

Naysayers will argue that we are too positive—savings will be on the low end of, or even lower than, Broadwing's estimate, and revenues will continue to erode. (After all, Spirtos *did* hint that pro forma annual revenue may have settled down to $830m from $850m.) And we omitted the one time integration costs. Work at it hard enough, and you can find a way to bankrupt Broadwing. Optimists, no doubt, will counter with their own figures until we wax fat with the cornucopian crunching of numbers and grow bald with the hair-splitting of numbers. And, for all that, the mystery questions will remain:

What will the market think of integration costs? How many dilutions have investors factored in? Will revenues erode in the short-run? Will MCI hang tough or be sold off? Will AT&T flourish in bankruptcy court? Will a Kerry FCC do something even more stupid, and do it more quickly, than we can imagine? Did Spagnolo leave because he was ready to move on to other temporary projects; did he quit because he was disgusted with Corvis management; or did he get booted because he botched Focal?

Forget it. This is an asset conversion and we we'll learn the story as we read it, adjusting our expectations as we turn the pages. The Broadwing story is one of a superior asset-the only all-optical long-haul network-combined with an acquisition that energizes the asset by connecting it to its source of energy-the network edge. If the conversion succeeds in 2005, Broadwing will thrive thereafter. Value anchors help us to spot emerging problems or good news early on, but they can't make us prescient.

An investment in Broadwing is a long-term commitment; bottom-line profits will not pop up tomorrow The S-4 pro forma yields an annualized net GAAP loss of $176.8m. Subtract $61m-the total of Focal savings ($25m) and access forward savings ($36m), and we are still left with a $115.8m shortfall a year from now, assuming steady revenues. To calculate a value anchor, consider a 50% revenue increase, from $850m to $1,275m. That means a lot more traffic on Broadwing's all-optical network where incremental margins are close to 90%. With Broadwing's goal of gross margins in the mid- to high 30s (assuming no revenue increases) already about reached, a gross margin of 40% assuming a 50% revenue increase is probably conservative. Take 40% of $1,275m and get $510m. Further, assume that R&D remains at the current annualized rate of $16m and that SG&A is reduced to 29% of revenues from the 39% in the pro forma after access forward and Focal synergies are combined with the 50% revenue increase. For all that, we barely crack through breakeven to a penny a share profit. But by now Broadwing is no longer a mystery to Wall Street and sideline investors have missed a good part of the opportunity.

SONIC INNOVATIONS (SNCI)

OFF THE LIST THIS MONTH

OCTOBER 14: 3.83, 52-WEEK RANGE: 3.56 – 12.54, MARKET CAP: 79.89M

The *really* bad news in Sonic Innovations's preannouncement of 30 September wasn't the anticipated revenue shortfall. It was a two sentence bombshell: "When competing products narrow the performance gap or dealer incentives intensify, our sales are subject to weakness. This has been the trend in the third quarter."

MEAD'S ANALOG REVOLUTION

NATIONAL SEMICONDUCTOR (NSM)
SYNAPTICS (SYNA)
SONIC INNOVATIONS (SNCI)
FOVEON
IMPINJ
AUDIENCE INC.
DIGITALPERSONA

COMPANIES TO WATCH

ATHEROS
ATI TECHNOLOGIES (ATYT)
BLUEARC
COX (COX)
ENDWAVE (ENWV)
LINEAR TECHNOLOGY (LLTC)
LUMERA (LMRA)
ISILON
MEMORYLOGIX
NOVELLUS (NVLS)
POWERWAVE (PWAV)
TECHNOLOGY
SEMITOOL (SMTL)
SIRF
SOMA NETWORKS
STRETCH INC.
SYNOPSYS (SNPS)
TENSILICA
XANOPTIX

EZ Does It ...*Again*

TWO GENERATIONS AHEAD IN NETWORK PROCESSORS

OCTOBER 14: 8.60, 52-WEEK RANGE: 4.77 – 12.17, MARKET CAP: 79.56M

In the world of network processors, *EZchip Inside* may soon become as ubiquitous as *Intel Inside* has become in the microprocessor world. Portentous is the news from the East. On September 28, Huawei-3com, a Hong-Kong-based joint venture of the largest communications equipment company in China and the U.S. Ethernet expert, announced it had selected EZ's NP-1c network processing chip for its high-end and mid-range switching products. Ezchip (LNOP) stock jumped 50 percent on the news. After trading between $5.50 and $6.50 for the last five months, and recently bottoming at $5.22 on September 27, it has bounced to $8.30, its highest level since April.

Despite recent reports that Internet user growth in China is slowing, the Middle Kingdom still represents a mammoth opportunity as it builds networks to connect and encircle cities, to feed data to hundreds of millions of mobile phones, and to link every one of the tens of thousands of new office buildings growing like dandelions from Shenzhen to Shanghai to Beijing. Founded in 1988 as a People's Liberation Army offshoot, **Huawei** is the **Nortel** (NT) of China. It makes everything from 3G wireless base-stations to Internet routers to optical transmission equipment. But unlike Nortel, Huawei is growing fast. With 2003 sales of $3.8 billion, Huawei is tops in China (followed by **ZTE**), but it is also quickly gaining respect and customers internationally with more than $1 billion in international sales last year. Huawei now has 12 development centers worldwide and even outsources 700 software engineers to Bangalore, with 1,000 more on the way. You know that high-cost Chinese labor. Nortel CEO William Owens recently told *The Wall Street Journal* that Huawei is now delivering first-class products inexpensively: "This is not just in the Third World, but we are seeing them globally. As a strategic imperative, we must be focused in getting our costs down." Sales for 2004 are expected to reach $5 billion ($2 billion international). **3com** (COMS), meanwhile, offers sales channels into enterprises in the West.

China's number two native company, ZTE, is also an EZchip customer. It had international sales of $610 million last year and expects total sales of close to $3 billion in 2004. Penetration of the top players in

CONTINUED ON PAGE 6

Which, translated, means: "Our hearing aids are no longer that much better than other high-end aids and are now more expensive. Thus, our sales will continue to decline until we *once again* widen the performance gap early next year while battling the old-boy network of audiologist suppliers and high-margin resellers in the hope of regaining sales momentum—before our competitors inevitably narrow the gap—again. In the meantime, we will not even *consider* price incentives to gain market share, but prefer inventory write-downs as our new products ramp."

Imagine Broadwing announcing that its all-optical core network is now almost indistinguishable from AT&T's in both cost and efficiency and that it is getting tougher and tougher for the newbie network to compete with Grandma Bell on costs. That's how Sonic's announcement hit us two weeks ago. The rationale for Sonic had always been that it had leapfrogged its digital rivals in functionality and size based on Carver Mead's electronic models of the cochlea. Now the frog seems to be in a kettle. Maybe Sonic CEO Andy Raguskus doesn't mean what he said, but it's probably best not to hang around to find out.

Raguskus anticipates 3Q revenues of about $22.5m and a loss of around 3 cents per share. From this information we calculate a net GAAP loss of some $685 thousand, but have insufficient information to estimate margins and liquidity which need to wait until the scheduled conference call of 26 October. However, one sales warning often leads to another, and based on the dour tone of the preannouncement we predict that the trend of 7.5% sequential sales decreases, which began in July, will continue through the end of the year, yielding 4Q revenues of $20.8m and sales for all of 2004 of $93.9m.

Using June's balance sheet and the recent share price of $3.78, we tally an enterprise value of $81.8m or 0.87x our sales projection for 2004. How low can we go? During March 2003, enterprise value sank to 0.25x sales. Today, that would mean a share price of $1.22. This is not so much a prediction as food for thought; until some good news, which even Sonic doesn't anticipate until sometime next year, this stock has considerable downward potential.

But, again, the financials don't matter much if the technology isn't much. We called last quarter's shortfall a sneeze because it was not caused by tepid technology (so we were told) but by reductions in Germany's welfare reimbursements. Today, however, we need to ask: Where's the technology? Rather than reopening our search, we will close our position here and listen for better news elsewhere.

ZORAN (ZRAN)

PARADIGM PLAY: AIR KING—DSPs FOR DIGITAL CAMERAS & DVDs

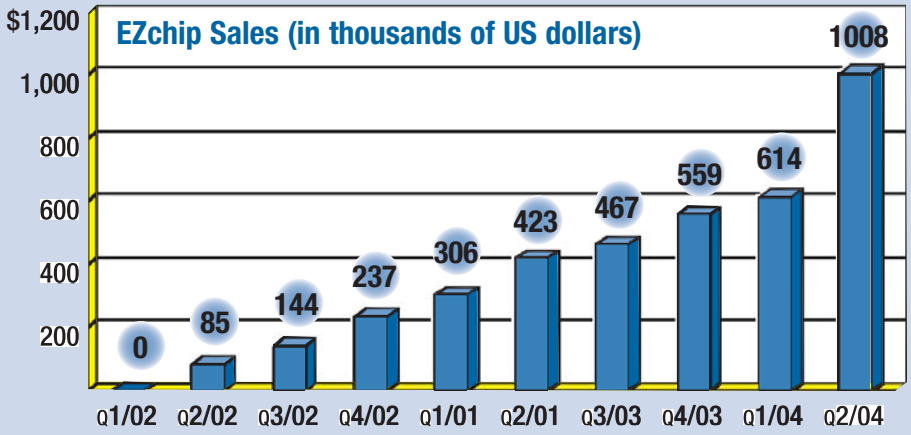
OCTOBER 14: 13.02, 52-WEEK RANGE: 12.98 – 22.48, MARKET CAP: 557.72M

On October 5, Zoran lowered its 3Q revenue estimate by 10% to $117m, which is still a 13% increase over 2Q sales of $103.7m and a 64% increase over last year's same quarter sales. Due to the weakening revenues, we now expect an operating profit of $9.6m, down from our previous estimate of $14.9m but still up from last quarter's $7.3m; operating margin should increase sequentially from 7% to about 8%.

Tightening credit lines in China are encouraging more conservative manufacturing commitments. In response, Chinese DVD-player manufacturers are depleting excess inventory, causing Zoran's shortfall. Zoran is one of the largest suppliers to the DVD market, which accounts for 60% of company sales. China, in turn, accounts for 40% of company-wide sales. Thus, a protracted downturn in the Chinese DVD market could lead to further revenue erosion for the chip maker; Zoran implied that the inventory correction did not begin until late in the quarter, but did not indicate how much further it might go.

Share price fell over 13% in two days on the news, but at the closing price of $14.10 on October 7, it was still above the 52-week low of $13.40 reached on the July 27. Enterprise value of $494m was 1.2x our revised revenue projection for fiscal 2004 ending in December.

Zoran is the "TI Junior" company with digital signal processors, graphics ASICs, and full motion camera chips spread across the consumer electronics landscape. Combine that with the company's recent growth spurt and strong balance sheet, and an inventory correction in DVD players should not materially impact Zoran's long-term prospects. However, considering the current bearish market and the possibility that the inventory correction may continue for at least another quarter, patience might be a virtue here.



the fastest growing market in the fastest growing region has sealed EZ's status as the dominant name in the young but fertile network process arena. EZ already claims a total of 40 customers worldwide , half of them "tier one" networking companies, of which Nokia is the largest we know of. There are also signs that American OEMs have begun buying the EZchip story. But as significant as EZ's coup in Asia is, and as much as we welcome newfound interest in the U.S., the regional developments take a back seat to the real reason EZchip will succeed: EZ's third-generation chip, NP-2.

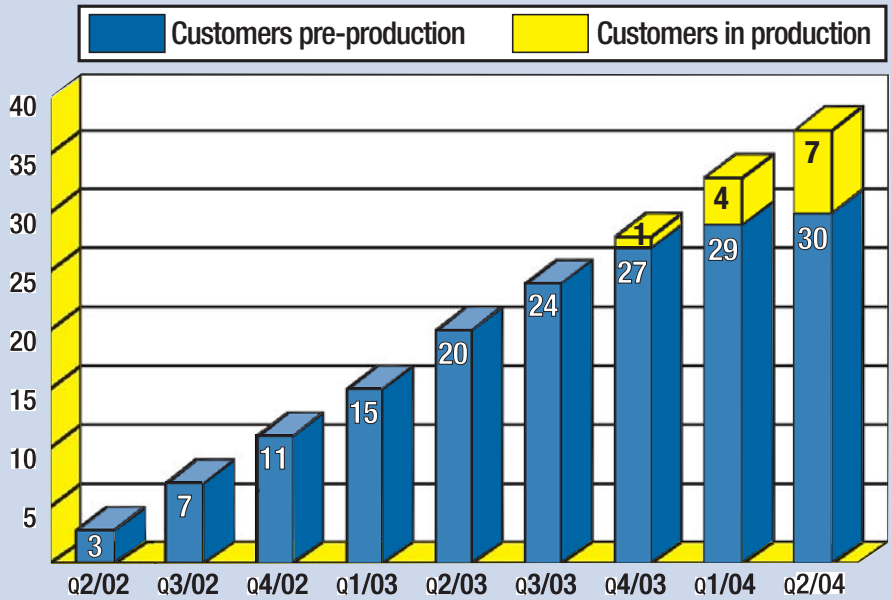
NP-2 changes the game. It demonstrates EZ's commitment to Tredennick's law: *pursue volume and you will achieve performance; target performance and the volumes will never come.* NP-2 expands EZ's addressable market by a factor of ten. NP-2 moves EZ deep into metro, data center, and core enterprise markets. NP-2 moves EZ onto individual line cards in a router or switch, instead of just services cards. There are 10 times as many line cards as services cards. There are 10 times as many metro boxes as core boxes. (Metro equipment directs data traffic moving in and around cities and their neighborhoods. Core routers direct inter-city traffic moving around the country. Line cards, meanwhile, populate a router or switch as more capacity, links, and users are added to the network. A router chassis might take 10 or 12 line cards. But it only needs one services card, which performs specialized tasks, like encryption or Virtual Private Networks, for all the line cards.) Through integration of additional devices and features on a TSMC 0.13 micron chip, and through increased flexibility (there will be some six or seven differently configured NP-2s, all using the same basic design), all at the same or lower price, OEMs can put NP-2 into equipment that costs just one-fourth as much as equipment where NP-1c made sense.

Today a customer using the $750 NP-1c might only purchase between 200 and 2,000 chips in the first year of production, depending on the application. Because of NP-2's performance, size, and cost advantages, however, first year orders for each end product are likely to jump by an order of magnitude to a range of 2,000 to 20,000. More than customers or regions, this dramatic shift into higher volume products transforms the company, and after years of negligible revenue begins to yield an enticing and possibly explosive financial picture.

All products through 2005 will use NP-1c. Depending on the number of customers in production (probably between 10 and 15), EZ could generate revenues of between $7 million and $15 million. Requiring about $4 million per quarter to break even, that's not enough to cover costs for the year, though EZ could be slightly profitable in the later half of 2005.

All this will change in 2006 if NP-2 remains on schedule and performs as advertised. NP-2 should sample at the end of this year, go to volume production later in 2005, and roll out into products in early 2006. Assuming ten customers are building and selling products in 2006, EZ sales could reach $50 million to $60 million, with net income of between $17 million and $23 million. Apply a modest P/E of 25, and you get a market value of between $430 million and $570 million, which is three to four times today's value. If EZ could grab 15 customers for NP-2 in its first year, sales could jump to a range of $60 million to $90 million, yielding net income of between $25 million and $41 million, and a market cap of between $630 million and $1 billion. That's between four and seven times current value.

These rough estimates are based on estimated first year volumes. Some products might take off and achieve success year after year. Other products



might tank and never require another chip. The estimates are also based on fragmentary and uncertain knowledge of possible customers and products. But the estimates, which could also prove conservative, do give us our first real financial context for this company, which until now has boasted mostly technology and design wins.

As NP-2 moves EZ down the cost curve and up the volume curve, it leaves its closest competitor, **Intel** (INTL), even further behind. Intel's balky and power-hungry 2800 NPU cannot make the transition from services cards to high-volume line cards. In the low-end arena, EZ is rivaled by **Marvell** (MRVL) and by a small, private company called **Sandburst**. But the beauty of NP-2 is that it can be stripped of certain capabilities to sell for just $445 and still outperform its low-end competitors. Other versions of NP-2, at up to $795, can also outrun the highest-end chip on the market. A Swedish company called **Xelerated** claims its X10q is the most powerful data-path chip in the world. And by certain metrics, like billions of operations per second (it claims 80 BOPS), it just might be. But because it can't execute many instructions per frame (in other words, it can't do anything interesting with packets except pass them through), it is a mostly meaningless measurement not used by customers to evaluate competitors. Moreover, Xelerated needs external TCAMs (tertiary content addressable memories) and even FPGAs (field programmable gate arrays) to help it with classification and co-processing. For the metrics that matter—total chip count, power, and cost—EZchip still wins.

At least four versions of the NP-2 processor will sample in the current quarter (4Q04) or early next (1Q05): a high-end 10-Gigabit Sonet/SDH/Ethernet chip at $795; an Ethernet-only 10-Gigabit chip at $595; a 5-Gigabit chip at $445; and a 10-Gigabit chip stripped of its traffic managers at $445. At least three other chips in the NP-2 family will be introduced in the coming months, including one with TCP-offload and security capabilities (especially important for data storage and data center applications); another that doubles the already industry-leading line speed from 10 to 20 gigabits per second (full-duplex); and a third, low-end chip made for 2.5 gigabit (OC-48) applications.

After the recent bump, LNOP is trading at a market cap of $77 million. Since LNOP owns 53 percent of EZchip Ltd., with 44 percent owned by venture firms and 3 percent owned by IBM, the market value of EZchip Ltd. is around $145 million.

Some investors have worried that because the publicly traded stock, LNOP, owns just 53 percent of EZchip Ltd., shareholders could somehow miss out on future success. But the company founders own 8 percent of the public LNOP shares, or about 4.2 percent of EZchip, and Apax Ventures, one of the early stage investors, actually traded its private equity for 7 percent of the public LNOP shares. Some have speculated that the other EZ private equity owners—Goldman Sachs, Nokia, Tamar, Star, JK&B—might at some point trade for public shares, too. We think LNOP holders are safe.

—Bret Swanson

my noggin for their technologies but that I have not fully investigated and that lack ironclad quarterlies. Yet the reason I post on the board is to give you a sense of my current interests in companies that I may well ultimately reject after closer scrutiny, usually with help from Charlie Burger who combines the technical insights of a physicist with a new mastery of financial analysis. I also benefit from the reactions of the board.

In the course of preparing my tax returns for the October 15 deadline, and figuring out how to pay the bill, I scrutinized my own record of purchases over the last year or so. Although I do not recommend that people follow my own pattern (heavily influenced by the incidence of heavy tax bills from phantom earnings of yore), I think my own results reflect what was possible during this period following the general guidance of the letter (with help during the early period from the *Whitebox Market Observer* as well, then a part of our offering).

Over the course of the last 18 months (all in noggin estimates), I sold half my NSM at $42 (pre-split; it had more than doubled from my average price of $18), all my **Applied Materials** (AMAT) at $19, all my Qualcomm at $68 (pre-split), half my **Semitool** (SMTL) at $12, a personal favorite discussed on the message board but not on the list. I bought Corvis at $0.52 ($5.20 BWNG equivalent), LNOP at $6.50 and **I-Flow** (IFLO) from the *Whitebox* list. I also bought Sonic Innovations for $5.80 "with both hands" and lost 40 percent of my money. (I have still not sold, pending a new product in January.) I bought a dollop of my Qualcomm

Essex is developing into a powerhouse producer of unique optics technology for national security and communications

back at $68 or $69 again on a dip about two months ago.

I came out of this period with the vast bulk of my taxes paid and with my personal portfolio up some 40 percent since the earlier tax transactions in April when the largest payments had to be made, all while my favored industries—semiconductors and telecom—crashed. Throughout this period, I posted on the board about these sales and purchases before I made them.

My general rule is to buy on weakness. Thus I did not buy Essex or LNOP or IFLO at $15 or Corvis at $2.00

($20 BWNG equivalent) or Qualcomm at $100. But weakness is your friend. If you don't buy on weakness, you will always be chasing the market.

EZchip I picked in 1999 when it had some 50 serious competitors and no customers. Now it has just two or three competitors (mainly Intel) and close to 50 customers including all the leading router companies in the world's fastest growing market, China, serving perhaps the second fastest growing market, India. Judging from the U.S. pattern, China and India will be buying some 500 thousand routers a year. LNOP is now a major

I picked EZchip in 1999 when it had some 50 serious competitors and no customers

China and India play as well as a network processor champion. Bret Swanson, who has followed the company closely from the beginning, writes about its exciting prospects in this issue. After the Huawei announcement, I posted on the board, "This is no longer a venture investment, it is a rip roaring winner, my best pick since Qualcomm." I didn't mean that it would necessarily have a 26x rise. If it can acquire the right leadership, I think it may well ride a Qualcomm-like wave. But I was referring to my firm pick of this company, like Qualcomm, before it had any customers.

Synaptics I chose when its market was touchpads on 60 percent of the 100 million laptops sold annually, and when Foveon, of which it owns 16 percent, was an unproven concept. Now Synaptics's market is the some one billion cellphones, iPods and imitators. Foveon's X3 chip, though its latest version has been fraught with challenges and delays in the Polaroid 450, is increasingly recognized as the paradigmatic imager for the future.

National Semiconductor has been up and down. Now it is partly down again. It is a major analog player and it owns nearly one third of Foveon. Analog is good. There are perhaps one tenth as many competent analog engineers as digital engineers and every digital device must have analog interfaces to the real world. This fact is at the root of the success of Synaptics as well.

Essex when I chose it was a tiny company with a trove of analog optical inventions and expertise, little revenues, and no profits. Today it is developing into a powerhouse producer of unique optics technology for national security and communications. With the potential of hugely expanding the connectivity of optical networks, its Hyperfine multiplexer-demultiplexer is capable of handling up to 10 thousand wavelengths on a single fiber. The company is reportedly developing analog optical encryption technology that operates at close to five terabits per second, orders of magnitude cheaper and faster than digital technology. It also can process all the calls in a CDMA cell at once in real time. Essex chief scientist Terry Turpin will be presenting at Telecosm. Meanwhile, all Essex's numbers have about quadrupled while its price has doubled in the three years it has been on our list.

I have also bought some safer stocks with paradigmatic promise, such as **Altera** (ALTR). I am seriously contemplating Cepheid, an exciting biotech lab on a chip that can detect anthrax and other infections; **Linear Technology** (LLTC), an always highly valued analog leader that may be coming into reach; **Microvision** (MVIS), the new retinal scan display for teleputers, heads up defense applications, and auto repair; **Novellus** (NVLS), the leader with **Semitool** (SMTL) in copper technology now being adopted by most of the microchip industry; **Centillium** (CNTM), a leader in Voice over IP and Digital Subscriber Line chips that recently gained a design win with AT&T; and **Terayon** (TERN), a beaten-down technology leader in cable modems and headends. My schedule of actual purchases will depend on availability of cash and attractive prices, but I will post on the board before I buy. I am awaiting IPOs from Foveon and Xanoptix. I hope to find more companies. But listening to the technologies that I have been describing in the letter and vetting at Telecosm conferences, I have recovered almost completely from the days when Global Crossing and Globalstar were two of my heaviest holdings, which I never sold, and when my letter nearly bankrupted me. Hang in there folks. See some of you at Telecosm.

– George Gilder, October 14, 2004

Got Questions?

Visit our subscriber-only discussion forum, the Telecosm Lounge, with George Gilder and Nick Tredennick, on www.gildertech.com

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