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The Worst of *Times*

The $100-trillion balance sheet of the United States dominates all other economic data. The stock market *is* the real economy.

This was a month of politics and media. That is the definition of a bad hair month, gazing at the catered coifs of pols and TV pundits and inhaling the halitosis that passes for their ideas. A Foxy blonde with a network show tells me that the Fed caused a stock market bubble by excessively loose monetary policy, at a time when the dollar was appreciating by 40 percent against almost anything you could name, from gold bars to coffee beans. The curly-coifed Clinton and Enron counsel Robert Rubin solemnly informs the world that government spending stimulates an economy and low tax rates bring it down. From both sides of the aisle politicians describe George Bush's ten year tax shuffle and shift, rebate and switch, as a $1.6 trillion tax cut. "For the rich." I know the mantra, but real tax rate reductions always increase revenues, especially from the rich. Rebates, though, are government expenditures, not tax cuts, and after the $7 trillion stock market meltdown most of the remaining rich will turn out to be class action lawyers conducting a litigated buyout of surviving parts of the U.S. economy. The Sarbanes-Oxley accounting reform law signed by the President awards these entrepreneurial paladins twice as much time (five years) to wait for the corporate pockets to refill before filing a suit after a company's stock tanks.

Summing up the prevailing view in an article in the Sunday *New York Times* of August 25, Gretchen Morgenson depicts the telecosm as a "pyramid scheme," in which telecom CEOs—hold your breath—invested in the stocks of companies related to telecom! Amid the fun house mirrors of insider trading rules, we now live in a world where the only investors free of suspicion are people who channel their money to companies they know nothing about. Approved by politicians everywhere, the best investment by this measure is a state-run lottery. If people are not allowed to put their money in companies they understand, capitalism loses its advantage over socialism, since what makes capitalism succeed is the assignment of capital to the insiders who earned it—and thus learned how to invest it profitably.

Excelsior. Morgenson has still deeper insights to impart. She uncovers a curious transaction in which John Sidgmore, now Worldcom CEO, bought 713 shares of an estimable web switching company called Alteon Websystems. A little over a year later he suspiciously sold them for $42,295 *after the company was purchased by Nortel*. What

Inside:

could he have had in mind? Why didn't he invest his money in municipal bonds or Coca Cola and the *Washington Post* like Warren Buffett? She also recounts a series of transactions involving telecom execs such as Matt Bross of Williams Communications who were granted shares in telecom equipment companies such as Corvis and Chromatis for advisory and other services. Three days later, in the *Times,* she tells of the receipt by Bernie Ebbers of the right to purchase "friends and family" shares in a series of telco IPOs. The IPO carnival is long over, and Bernie is broke, but in all these cases Morgenson detects an incriminating design: "*While it is unclear when or if investors sold the shares, they clearly intended to profit from investing*." Can't have that.

For much of the article, Morgenson's guide is *Barron's* favorite telecom analyst Susan Kalla. Viewing the amazing proliferation of new optical technology, which increased a millionfold the potential capacity of fiber optic lines—and accommodated a three thousand fold rise in Internet traffic in five years—some observers saw an industrial miracle. But Kalla shrewdly sees through all that. She concludes sagely: "In the end, all the technology turned out to be identical and commodity-like," resembling TV hair.

After my time in Washington and Waco, I returned to the Berkshires for a board meeting of Wave Systems, which I can only discuss in general terms, since current law bars the disclosure of any information that cannot be revealed to everyone at once on a so-called level playing field. Because the only information pertinent for investors is information yet to be embodied in the price, this level playing field rule stultifies the markets by eliminating most germane facts from them. Relevant intelligence and market value migrates chiefly to authorized inside traders such as venture capitalists (who appraise hundreds of business plans under non-disclosure and sit on the boards of the companies they finance) and to conglomerate executives who have intimate knowledge of all the companies under the company aegis and move resources among them in response to inside knowledge. GE and Berkshire Hathaway represent the epitome of this trend; Tyco and Enron are its debacle. But it is "level playing field" rules that create the incentive to move transactions into conglomerates and their proliferating subsidiaries, where all trades and purchases are based on inside knowledge. The public is left to ponder quarterly earnings reports, economic statistics, "technical" market analysis, and other astrological data. This is what I call the "outsider trading scandal."

Microsoft now concludes software is too hackable: hardware security is the answer.

In any case, quarterly earnings remain irrelevant for Wave, which in ten years has never produced any earnings, or even any revenues that you would notice. For ten years, however, Wave has been advocating, designing and building a programmable hardware security chip while Microsoft and most other companies have upheld the adequacy of software security. During this time, most PC functions were not transactional, and security could be safely embodied in software on the servers at such sites as Dell, Amazon or Ebay or on firewalls and other devices on the network.

With the emergence of all-optical-networks, however, the core will be photonic and largely exempt from undetected tapping or tampering, while the edge will be the locale of an increasing proliferation of web services and business transactions needing digital rights management and authentication of identity. Although most computer functions do not have to be secure, trust on the edge will increasingly become a crucial business enabler.

According to a long, authoritative article by Steven Levy in the *Newsweek* of July 1, Microsoft has now come to recognize this trend. Reversing its previous belief in software sufficiency, Microsoft concludes that software is too hackable to be safe for a world of expanded business-to-business and business-to-consumer transactions and interactions. Urging that security be incorporated in hardware on the edge of the network rather than in software in the core, on clients rather than chiefly on servers, the Redmond colossus has proposed a new security platform called Palladium. Palladium provides a secure "vault" in which encryption, metering, authentication, and other functions can be executed on the distributed client rather than out on a server on the Net. It supplies your computer with a silicon wallet that you can use safely across the Net for a variety of applications much as you use your existing wallet as a repository of credit cards, smart cards, cash, keys and other instruments that you employ for specific transactions. As an analogy for the movement of trust from the center to the edge of the network, Wave CEO Steven Sprague cites the movement of banking transactions from a marmorial building with protected vaults, accessible only in person with picture ID s and relevant documents, to nearly ubiquitous ATM machines accessible with a variety of credit cards and passwords.

Palladium's specs can be incorporated in a hardwired ASIC (Application Specific Integrated Circuit) that can perform a set of desired operations or transactions, such as offering persistent protection of music and video. But this system implies a separate ASIC for each application and a hardware upgrade for each protocol change or improvement. Most of the experts quoted in the *Newsweek* article have been working with Wave to perfect its programmable technology, called Embassy. Embassy not only can perform all the specs of Palladium but also can be programmed in firmware for each upgrade and patch on the system. Since security protocols are diverse and must be changed in response to successful attacks, Wave believes that only a programmable device is appropriate.

Only Wave possesses such a fully programmable security cell. Incorporating an ARM processor kernel, a secure clock, nonvolatile memory, and a set of security APIs (application interfaces), the device fits as a cell in a single-chip-system or on motherboards, network interface cards,

disk controllers or other locations where secure transactions are needed. Thoroughly tested and demonstrated in the European financial system for home banking under FINREAD, Embassy is adaptable for cable set top boxes, smart card readers, secure keyboards, disk drives, and any other computer or special purpose transactional components that need to be rendered either permanently or temporarily secure. Although as a board member I cannot recommend the stock, I suggest that readers contemplate the material available on the Wave.com website and attend the Telecosm session that will debate Palladium.

After the Wave meeting, I returned to the world of policy and under the auspices of the Discovery Institute of Seattle, Bret Swanson and I penned a memo to the President. In edited form, it follows.

MEMORANDUM
TO: President George W. Bush
FROM: George Gilder and Bret Swanson
RE: Leading on the Economy…Purging Darman's Ghost

Let's get one thing straight right off the bat. The stock market is the real economy.

Between 1965 and 1982, the output of the United States as measured by GDP grew 3 percent per year. Not bad. But the Dow Jones Industrial Average, a simple proxy for asset values, was literally stagnant. No growth in almost two decades.

More than Vietnam, Watergate, or Iran, it is this simple fact that explains the failed presidencies of Johnson, Nixon, Ford, and Carter.

Similarly, GDP was growing more than a year before the 1992 election, but the stock market was not.

Real estate has held up so far because investors fled the financial securities that endow our technology-based economy in favor of more traditional assets. But only a new wave of technology can fuel a new wave of productivity and growth.

As economist John Rutledge sums up, "We all have to learn that the incredible Reagan Run of the last twenty years is over. From now on we are going to have to actually earn the money." This means policies—from tax cuts to monetary stability to deregulation—as far-reaching and sustained as Reagan's own.

Dominating all other economic forces are moves within the $100-trillion balance sheet of the United States. A $7-trillion loss in asset values dwarfs $30-billion "real" income increases or $20-billion up-ticks in consumer spending. Multi-trillion changes in stock market values overwhelm even $100-billion surges in budgetary deficits or $80 billion bulges in the trade gap. As investors attempt to shift money among different vehicles of long term value around the globe—from stocks to bonds and real estate—asset markets determine the movement of interest rates far more than does the Federal Reserve Board alone. Unlike industrial purchasing projections, consumer confidence phantoms, or domestic monetary indices in a global sea of dollars, asset movements give an accurate real time picture of the economy.

To win the upcoming elections, the White House must develop a coherent, positive, and bold plan for the economy based on the reality of a technology and stock market depression.

What to Do

With 70 bankruptcies so far—and 23 more in view—the telecom meltdown is history's most spectacular disintegration of a single industry. The Clinton FCC's heavy-handed re-regulation of the industry halted progress in last mile broadband connections that could bring video teleconferencing, education, and personal TV programming to homes and businesses.

By *unilaterally* deregulating the telecom/Internet sector, this Administration can unleash the capital investment that (1) feeds the entire semiconductor, computer, and fiber optics food chain and (2) will finally bring us a real broadband Internet, fulfilling the original hopes of a new global marketplace of products, services, ideas, and entertainment. For a sustainable economic expansion, unleash broadband.

Unbundling

The snarl of regulation and litigation that surrounds the government-mandated "unbundling" of local phone networks is probably the single biggest reason why local phone companies don't want to invest in local phone plant. The FCC requires the local phone companies to "unbundle" their networks into smaller "network elements" and offer them at heavily discounted prices to competitors. This not only deters investment by the local phone companies themselves; it also stifles investment by competitors aiming to build networks rather than to hitchhike on someone else's facilities. All the real investors end up competing against FCC prices set far below actual cost.

When the competitors fail, they bring treble damage antitrust suits against the incumbents—with the Department of Justice sometimes cheering them on. Consumer class actions have followed—with DOJ again supporting the antitrust plaintiffs' bar.

The President should:

1. Direct the Department of Justice to intervene in all legal proceedings that attempt to transform interconnection and unbundling disputes into treble-damage antitrust suits. The regulators have made a hash of these issues already. Swamping the industry in antitrust litigation will deepen the slump and extend it for years.
2. Publicly call upon the FCC to expedite the process of reclassifying all broadband services as "information services," thus deregulating them completely.
3. Call upon the FCC to comply with the recent order of the D.C. Circuit Court of Appeals for an expeditious review of its unlawfully expansive network unbundling rules.
4. Call upon the FTC to abandon its counterproductive order that AOL Time Warner grant open access to rivals over its own coaxial cable assets.

TELECOSM TECHNOLOGIES

JDS Uniphase (JDSU)

ACTIVE AND PASSIVE OPTICAL COMPONENTS

JULY `02 MONTH END: 2.53 52-WEEK RANGE 2.06-12.44 MARKET CAP: 3.5B

ANCHORED—Revenues for the June quarter were $222 million, off 15% sequentially and 63% from last year, and the company projected a further decline this quarter. But cash of $1.4 billion is more than a quarter of market cap and will steady the company through the difficult days still to come.

Avanex (AVNX)

ADAPTIVE PHOTONIC PROCESSORS

JULY `02 MONTH END: 2.33 52-WEEK RANGE 1.57-9.40 MARKET CAP: 162M

MISSING LINK—Oplink shareholders nixed the planned merger with Avanex. Although U.S.-based institutions and shareholders voted overwhelmingly in the affirmative, Oplink's Taiwanese contingent, with over 40% of the shares, blocked the deal. Avanex says it will continue to design its products in the U.S. and pursue outsourced foreign manufacturing, but Oplink's Chinese ties were a key part of that strategy. With no consolidation, no Simon Cao, and no new telecom investment, Avanex will struggle with sales well into next year. Revenue for the June quarter was just $8 million, but $177 million in cash and the industry's best optical technology (still) mean Avanex can hang on for another two years.

Ciena (CIEN)

METRO WDM PLATFORMS

JULY `02 MONTH END: 4.03 52-WEEK RANGE 3.38-22.0 MARKET CAP: 1.7B

ONE-TENTH—Revenue in Ciena's second calendar quarter was just one-tenth that of 2Q01. Even in the face of such disastrous numbers, the company retains a $1.9-billion market cap and has somewhat avoided the catastrophic fate of the rest of the optical realm. Consolidation with ONI (who added 14 new customers), $1.3 billion in cash, and good relationships with current big customers like AT&T have cushioned the blow.

Corvis (CORV)

WDM SYSTEMS, RAMAN AMPLIFICATION, EDGE SWITCHES

JULY `02 MONTH END: 0.56 52-WEEK RANGE 0.51-3.90 MARKET CAP: 230M

TRICKLING IN—Corvis reported just $3 million in sales for the June quarter and laid off another 70 U.S. employees. Such bad news, however, can lead companies to make positive moves. Case in point: Corvis announced it would outsource much of its manufacturing to Celestica, retaining only final assembly, testing, R&D, and the manufacture of a few specialized components. The value of Corvis was never in its substantial manufacturing abilities in Columbia, Maryland, but rather in the technical prowess and innovative network design ideas contained in the heads of CEO David Huber and top engineer David Smith. With more than $500 million in cash and a new product that will go head to head with Ciena's popular CoreDirector optoelectronic switch, Corvis is preparing itself for another year of paltry telecom capital spending—and for the eventual resumption of the Telecosm.

Essex (ESEX.OB)

OPTICAL PROCESSORS

JULY `02 MONTH END: 3.55 52-WEEK RANGE 2.15-8.25 MARKET CAP: 19M

SPOOKY STUFF—The Department of Defense awarded Essex a $2.4 million contract to develop electronic warfare and signal intelligence applications using its Hyperfine WDM technology.

Telecosmic Terry: Essex CTO Terry Turpin's products and prototypes appear across the entire spectrum of the Telecosm, from fiber optics to satellite imaging to CDMA wireless. Turpin joins us once again at Telecosm VI, September 30-October 2, in Lake Tahoe. His topic: "Computing with Light: Analog Optics Beyond the Fibersphere."

StorageNetworks (STOR)

DATA STORAGE MANAGEMENT, SOFTWARE

JULY `02 MONTH END: 1.53 52-WEEK RANGE 1.18-8.10 MARKET CAP: 151M

EDS OPPORTUNITY?—Legg Mason upgraded shares of STOR on the belief that Storage Networks will either enter into a very large software licensing deal with EDS, or sell EDS the entire company. Either scenario would drive the stock significantly higher. Even without an EDS deal, downside risk in STOR is limited. Shares currently trade at roughly $30 million below cash, while the company is burning approximately $6 million per quarter and increasing business with its best customers…CEO Peter Bell joins us at Telecosm VI.

Scale Eight

MASSIVELY PARALLEL GLOBAL STORAGE

PRIVATE

Scale Eight's timid CTO Josh Coates joins us at Telecosm VI.

Mirror Image Internet

GLOBAL CACHING AND STOREWIDTH PLATFORM

PRIVATE

YAWN—Copernic, a provider of information management solutions for businesses, has renewed its instaContent contract, stating proven content delivery performance, reduced infrastructure costs and an increase in online software sales. Copernic's contract renewal coincides with a new product release that will create an additional increase in Web traffic and demand for software downloads.

Equinix (EQIX)

SECURE INTERNET BUSINESS EXCHANGES

JULY `02 MONTH END: 0.48 52-WEEK RANGE 0.31-3.53 MARKET CAP: 47M

IBM EXPANSION—Equinix reported 2Q revenues of $18 million, adding 37 new customers including Earthlink, DoubleClick and Infonet, and bringing their total customer count to 248. Equinix also

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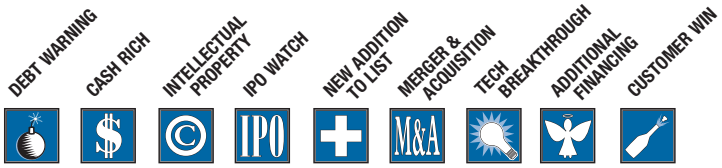

MEAD'S ANALOG REVOLUTION

National Semiconductor (NSM)
Synaptics (SYNA)
Sonic Innovations (SNCI)
Foveon
Impinj
Audience Inc.
DigitalPersona

COMPANIES TO WATCH

Analog Devices (ADI)
Barcelona Design
Cablevision (CVC)
Comcast (CMCSK)
Cox (COX)
Endwave (ENWV)
Powerwave (PWAV)
Samsung
Xilinx (XLNX)

recognized additional orders in the quarter from 63 existing customers. They have remained focused on de-leveraging the company, retiring nearly $28 million in debt during the quarter, and continue to expect positive cash flow in the fourth quarter of 2002. On August 13, IBM signed a multi-year agreement extending its Global Services operations beyond the four Equinix IBX centers in which it currently operates.

Debt Equals Delisting?: Share price dilution as a result of debt for equity swaps coupled with the telecom nuclear winter has led to Equinix being slapped with a Nasdaq delisting notice. Equinix has appealed, and may do a reverse stock split to achieve compliance.

Sprint PCS (PCS)

NATIONWIDE CDMA WIRELESS NETWORK

JULY `02 MONTH END: 4.10 52-WEEK RANGE 2.36-29.05 MARKET CAP: 4.1B

NOW WE WILL SEE—Launched August 11, no solid numbers are yet available for the PCS Vision data service, but its superior line of handsets has created a significant buzz. Specifically, the Samsung A500 and Handspring Treo PDA, both with hi-res color screens, are already on back-order.

Qualcomm (QCOM)

CDMA INTEGRATED CIRCUITS, IP, SOFTWARE

JULY `02 MONTH END: 27.48 52-WEEK RANGE 23.21-65.47 MARKET CAP: 21.2B

CHINESE BREW—China Unicom announced plans to deploy Qualcomm's BREW starting in the fourth quarter of 2002. Using color handsets from the likes of Samsung and LG BREW applications complement the doubling of voice capacity and increased data rates enabled by Unicom's network migration to CDMA2000 1x. In trials in eight cities now, 1x will propel Unicom and hence Qualcomm in this crucial market.

Siemens Succumbs: The announcement that Siemens has signed a CDMA license agreement completes the basket of major hardware and handset makers paying Qualcomm royalties for all 3G flavors.

Altera (ALTR)

PROGRAMMABLE LOGIC DEVICES

JULY `02 MONTH END: 11.83 52-WEEK RANGE 10.19-31.05 MARKET CAP: 4.5B

TURNING POINT?—Sales of $179 million for the June quarter were in line with expectations. Net income was $21 million, or $.06 per diluted share, and the company ended the quarter with $894 million in cash. In other words, the company is not in bad shape considering the still-weak tech sector. CEO John Daane is especially excited about the roll-out of a brand new high-end programmable chip: "The Stratix family is on track for a record setting revenue ramp and is already changing the nature of competition in the PLD industry."

Broadcom (BRCM)

BROADBAND INTEGRATED CIRCUITS

JULY `02 MONTH END: 18.76 52-WEEK RANGE 14.69-53.35 MARKET CAP: 5.1B

UPTICK—Net revenue of $258.2 in the second calendar quarter was 8.1% better than the first quarter and 22.4% better than the June 2001 quarter. Noticeable upticks were observed in cable modems, Gigabit Ethernet products, and the company's new 802.11b wireless LAN chipset.

Terayon (TERN)

BROADBAND CABLE MODEMS, HEAD-ENDS

JULY `02 MONTH END: 1.30 52-WEEK RANGE 0.86-14.75 MARKET CAP: 95M

TIGHTROPE—Terayon announced major cost-cutting moves designed to get it through the cap-ex trough and further focus on its lead in DOCSIS 2.0 broadband cable chips and head-ends. To get operating expenses below $20 million a quarter (excluding its Imedia chip division), the company will lay off 165 employees, a 25% cut.

Two Big Wins: In better news, Comcast, soon to be America's largest cable operator via its acquisition of the AT&T division, and Cox Communications, the 5th largest operator, each said they had certified Terayon's DOCSIS 2.0-based modem and planned initial deployments. The stock has tripled from its lows.

EZchip (LNOP)

10 GIGABIT NETWORK PROCESSORS

JULY `02 MONTH END: 6.69 52-WEEK RANGE 2.70-16.45 MARKET CAP: 49M

BIG WIN—China's largest telecom equipment maker, ZTE, announced it will build a new metro optical switching platform around EZchip's NP-1 network processor. Wu Jie, ZTE's Metro Ethernet team leader, gave a ringing endorsement: "EZchip is providing us with the most integrated 10-Gigabit network processor available today, which enables simpler design and faster time to market with tremendous system cost savings. We look forward to a long and fruitful relationship with them." For more on the rapidly changing Chinese technology economy, see Nick Tredennick's August issue of Dynamic Silicon entitled "The China Phenomenon." It is a wake-up call to all American technologists and policy makers.

Numbers on Your Side: With more than a billion people, China's increasing use of net-connected computers and mobile IP phones yields an explosion of new IP addresses. One of the many reasons ZTE went with EZchip may have been EZ's ability to handle IPv6 (Internet Protocol version 6). Where most net processors require numerous extra memory chips to handle version 6's millions of new IP addresses, IPv6 is merely a set of software instructions for EZchip.

National Semiconductor (NSM)

SINGLE-CHIP SYSTEMS, ANALOG EXPERTISE, FOVEON IMAGERS

JULY `02 MONTH END: 18.11 52-WEEK RANGE 15.44-37.30 MARKET CAP: 3.3B

ON SALE NOW—Still under $18, National remains a bargain. Wyse Technology, a leading maker of thin-client computers, just selected National's low-power Geode processor for its latest $399 "PC alternative." The new Wyse Winterm, which runs Microsoft's CE .NET platform and boasts security, smart card, and Wi-Fi wireless LAN features, targets the health care, government, and education markets, among others—anywhere a customer needs a large number of low-cost terminals.

Camera-cosm: Camera shops are now reporting initial shipments of the first Foveon-powered device, the Sigma SD-9 single-lens reflex (SLR). Foveon's chief inventors, Dick Merrill and Carver Mead, will join us at the sixth annual Telecosm conference in late September. National CEO Brian Halla also headlines Telecosm 2002, giving a talk on "The New Analog Opportunity: Cameras and Beyond." A number of Sigma-Foveon cameras will be on hand for delegates to try.

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Synaptics (SYNA)

TOUCH-SENSORS, FOVEON IMAGERS

JULY `02 MONTH END: 6.05 52-WEEK RANGE 3.52-20.75 MARKET CAP: 140M

100 MILLION MARK—Revenues for the June quarter were $25.8 million, bringing the FY02 total to an impressive $100.2 million, but the company warned of a probable one-time sequential decline in the September quarter. The company was also added to the Russell 2000 index. The stock is up to 6 from all-time lows around 4, but still trades at less than half its January IPO price.

Most Undervalued: Check out stockgarden.com where SYNA has been ranking one or two.

Texas Instruments (TXN)

DIGITAL, ANALOG, MIXED-SIGNAL PROCESSORS

JULY `02 MONTH END: 23.15 52-WEEK RANGE 18.16-37.00 MARKET CAP: 39B

NEW AGE RADIO—TI announced availability of a DSP base-band chip that is a key component of iBiquity's new digital radio platform. You've no doubt read about XM and Sirius, two young companies broadcasting digital radio via *satellites*. Coming soon, however, is digital radio from your conventional *terrestrial* station. Like satellite, it offers CD-quality sound and extra information on an LCD display, like song title and artist, news, and weather. The iBiquity "in band" technology combines new digital signals with existing analog channels, meaning no new spectrum is required and old radios can still receive low-fidelity analog tunes. iBiquity is well funded by the radio and auto industries, among others, and has a patent-lock on the hybrid digital-analog technology. Digital radio receivers will be on the market in 2003, and will begin arriving in new cars in 2004. With U.S. auto sales numbering more than 15 million a year, TI can bump its annual DSP volume projections by more than a few million and its DSP dollar revenues by several hundred million. Separately, a Toshiba cable modem based on a TI chip was the first device to receive the Euro-DOCSIS 1.1 certification.

Analog Boosts Financials: Revenues for the June quarter were $2.2 billion, up 18% sequentially. CEO Tom Engibous credited high performance analog components, which grew 25%, as a key driver.

Narad Networks

GIGABIT ETHERNET COAXIAL CABLE NETWORKS

PRIVATE

TELECOSMIC—Narad CEO Dev Gupta, designer of the both the first vDSL chip and Narad's new broadband cable technology, will be a key speaker at Telecosm. Also joining us are the chief technology officers at Cox Communications and Time Warner to tell us what's next in cable.

Soma Networks

BROADBAND WIRELESS ACCESS, NETWORK SOFTWARE

PRIVATE

DITTO—Soma CEO Yatish Pathak will talk about the future of wireless—fixed, mobile, Wi-Fi—at Telecosm VI, September 40-October 2, in Lake Tahoe, California.

The Telecosm Technologies list is not a model portfolio. It is a list of technologies in the Gilder Paradigm and of companies that lead in their application. Companies appear on this list only for their technology leadership, without consideration of their current share price or the appropriate timing of an investment decision. The presence of a company on the list is not a recommendation to buy shares at the current price. Mr. Gilder and other GTR staff may hold positions in some or all of the stocks listed.

Pricing and Depreciation

The FCC's TELRIC pricing regulation requires local phone companies to lease out portions of their network at rates far below the historical cost of building them.

The President should:

1. Call upon the FCC to grant complete pricing flexibility for services of any kind offered over all new facilities deployed after January 1, 2002.
2. Call upon the FCC to grant broad pricing flexibility for all wholesale services that are offered only because they are mandated by regulators
3. Direct the IRS to permit accelerated depreciation of all capital assets in the telecom sector, in accord with the market realities of an industry in the midst of an unprecedented technological revolution.

Industry Restructuring

In pursuit of preposterous "structural separation" between local, long-distance, wireless, and information-service providers, the Clinton-Gore administration kept the industry in feckless fragments. First requiring Worldcom to sell off the MCI Internet backbone to Cable&Wireless, Justice then blocked a proposed WorldCom merger with Sprint, all on the ludicrous theory that this Clinton, Mississippi upstart might monopolize the entire Internet (which itself was then under 10 percent of the communications market). Today, WorldCom controls 13 percent of the Internet "backbone" and is bankrupt. Some monopoly! Qwest would be bankrupt today, too, had it not merged with U.S. West.

With telecom revenues rising 50 percent between 1996 and 2001, demand was not the problem. The problem was a million new pages of telecom regulation privatizing risks and socializing returns. The problem was a 165 percent explosion of debt, swelled by a 40 percent rise in the dollar. The problem was an FCC regime of forced "competition" in which no one could win or make any money.

Before investors regain confidence in the future profitability of the industry, it will have to undergo fundamental restructuring.

The President should:

1. Direct the Department of Justice to heed the Clayton Act, which allows common carriers to combine with rivals in order to extend connectivity. Justice should affirm that "extending common carrier lines" includes wireless carrier lines.
2. Direct the Department of Justice to review and terminate most of the extant antitrust decrees and other merger-related orders that afflict the cable and telephone companies with very substantial, continuing regulatory burdens.

End the NextWave Overhang

The Clinton FCC conducted a massive auction of spectrum in 1996, and then put more spectrum on the market, devaluing all the original purchases. Purchaser of $4.7 billion

of spectrum, NextWave had to to file for Chapter 11 protection in 1998. The Commission then re-auctioned the licenses in January 2001 at the height of the telecom boom, for about $16 billion, but was prevented by the courts from actually seizing the spectrum from Next Wave. The "winning" bidders in the January 2001 auction thus remain potentially liable for that full amount, if and when the FCC delivers the spectrum. The credit rating agencies, as a result, have put the entire wireless industry on negative outlook, making it difficult for the carriers to finance new construction.

The President should call upon the FCC to concede that it has failed to deliver the spectrum to the solvent, second-round bidders, and should therefore rescind the second-round auction in its entirety, freeing up the funds.

Call Off the DOJ

The Administration should rein in the lawyers—the career anti-trust lawyers of the DOJ/FTC and the career anti-business lawyers of the plaintiff's bar. The President has direct control over the DOJ, where, as columnist Bob Novak pointed out recently, many anti-business Clinton appointees remain in positions of power. Ashcroft should replace them and abolish the anti-trust trap that prohibits (a) prices being too low (predatory) (b) prices being too high (monopoly gouging) or (c) prices being just right (collusion).

The President should use the Bully Pulpit to take on the most corrupt big business in America—Trial Lawyers Inc.—a giant enterprise whose leaders operate more like racketeers than like businessmen. With CEOs and CFOs, you get a few bad apples but lots of new jobs, and new products, and new wealth. But the very job of trial lawyers is to destroy jobs, and products, and wealth. They do so under the cover of the laws they pass and sustain through the Democratic Party. This is the real Big Business corruption story.

Thankfully this administration quietly settled the misguided Microsoft case. But in its place the DOJ and Federal Trade Commission have substituted a new *jihad* on technology companies. With no notion of industry realities, the DOJ antitrust division employs more than 300 lawyers and fifty economists but no technologists at all. The FTC is similarly devoid of industry expertise. But that does not stop them from kibitzing wantonly in areas that they don't begin to comprehend. At the moment federal government beadles are aiming their blunderbuss at monopolistic implications of interfaces in leading edge system-on-a-chip design synthesis tools developed by Synoptics, as if any leading edge product would not be a monopoly at the outset. The DOJ is suing Micron Technologies for DRAM prices that are too high (or is it too low?), and Sun Microsystems is under assault because it discriminates against Americans in favor of foreign engineers (you know how CEO Scott McNealy cringes in the presence of white people).

All of these cases are laughable, *prima facie*, as the Justice lawyers might say. In the grip of a transition to single chip systems and 90 nanometer geometries, design

ANALOG AUTOMATION
BARCELONA DESIGN

The chief scarcity in analog chips is the engineer's time. In the handcrafted world of analog devices—the links to all real world inputs and outputs, including wired or wireless RF signals, temperatures, pressures, and even light—a simple circuit can take more than a year to build. An advanced device, twice as long. But the proportion of chips containing analog circuitry is increasing rapidly. According to IBS, just 20 percent of chips in 1997 had analog components; by 2006, however, that number will reach 70 percent. At the same time, experienced analog designers are a scarcity themselves, numbering in the tens of thousands, compared to hundreds of thousands on the digital design side.

The flock to digital and its libraries of logical layouts has been so pronounced, says Barcelona Design CEO Thomas Heydlar, that "no one understands electricity anymore." Given that it takes more than a decade to train analog engineers, we've reached an impasse—a very narrow analog design bottleneck.

It is also an innovation bottleneck. Converting a simple phase lock loop (PLL) into a more advanced process geometry, for instance, may take nine months to a year. But from the analog designer's point of view it is a waste of time. The circuit has already been designed once. His talents would be much better used tackling new problems and creating brand new designs for higher-end applications.

Barcelona Design of Silicon Valley enables engineers to move up the value chain. Using Barcelona's optimization software, that PLL retrofit now only requires a few hours of work. Developed by Stanford analog engineer Mar Hershenson and Stanford mathematician Stephen Boyd, the Barcelona system takes inputs from the designer—parameters for noise, jitter, linearity, process, etc.—and turns out an optimized circuit layout.

Where Impinj, a Seattle start-up (GTR, May 2002), optimizes the circuits on the back-end by physically tuning them after fabrication, Barcelona optimizes the design on the front end.

So far Barcelona has only sampled a PLL, and only in CMOS, but the company says data converters, RF circuits, and op amps are in the works, and that the system also works for silicon germanium (SiGe), gallium arsenide (GaAs), and other exotics.

According to Barcelona's Heydlar, really good analog engineers love the concept. It will free them from the past to concentrate more on the future. Less sophisticated designers, he says, aren't so sure. Automation always draws such reactions, it seems.

Several big analog companies, ST Microelectronics among them, have signed up for the system, where Barcelona will charge for the software package and for each "instance," that is, each circuit produced using its mathematical model.

Barcelona is another signal that analog is ascendant.—*BTS*

tool companies confront exquisitely difficult new challenges. Whether functions should be modular or integrated is not an issue on which Federal Trade Commission lawyers have useful views. A crucial driver of the information economy, Dynamic Random Access Memory (DRAM) is probably the most competitive business on the planet with constantly falling prices and razor-thin margins. In the mid-1980s, everyone assumed Asia would dominate DRAMs forever. But now Micron, founded by a Boise potato farmer, is the world's largest volume DRAM maker, a heroic American success story—and yet the Bush Administration's own Justice Department lawyers are taking aim.

As for anti-American bigotry at Sun, all one must know is that American tech companies are dying for American engineers with leading edge capabilities. They can't find them. Americans scarcely study math or science any more and two thirds drop out of engineering classes in college. At the grade and high school levels, we only pretend to teach math amid the pidgin physics and environmentalist cant. And our tech colleges are filled with Asian immigrants, the only ones willing to do the hard work that sustains and propels the U.S.A. as the globe's high-tech leader. Silicon Valley would collapse without Indian, Chinese, and Israeli talent.

Last week, the CEO of a major U.S. microchip company warned us that the best Chinese engineers are now heading back to China, where they are finding a better economic environment to pursue their ideas. China and India collectively produce a million electrical and electronic engineers annually, some fifteen times more than we do. Forcing companies like Sun to hire from the relatively tiny and litigious platoons of US engineers to build our computers will surely advance the frightening move of engineering creativity and capability overseas. Sending foreign graduates of U.S. tech universities home after they complete their studies is a way to commit economic (and eventually even military) suicide in high technology. They should be given green cards and put on a track to US citizenship.

The President's ability to affect current cases may be limited either by the law or propriety, or both. But the President can choose DOJ and FTC lawyers who exhibit humility in the face of a complex world and appreciate the limited usefulness (indeed, mostly destructive nature) of anti-trust actions in a world where key technologies can improve more than 3000-fold in five years. Career lawyers file silly lawsuits. Presidents (successful ones, anyway) defend the American economy.

Sound Money

Just as capitalism cannot function without trust among its economic actors, capitalism cannot function without a stable unit of account by which to conduct transactions. President Bush inherited a deflationary monetary policy that punished dollar debtors around the globe. With an overly tight Federal Reserve draining a fast growing economy of crucial liquidity between 1997 and 2001, prices and corporate profits plunged, credit crunched, and debtors had to pay back loans in dollars 30 to 40 percent more expensive than the ones they borrowed. Record bankruptcies ensued. Hardest hit were highly leveraged telecom companies building expensive new broadband networks across the globe. But 60 percent of all corporate defaults in 2001 were outside telecom, proving that leverage, not telecom accounting, was the cause. Although many economists claimed that the monetary aggregates were ample, there could not have been "too many dollars" while the value of the dollar rose 40 percent against commodities and other currencies.

Conventional economists find monetary deflation an impossible enigma. In times of deflation as in times of inflation, monetary aggregates bulge, allowing naïve monetarists to assert that liquidity is ample and to warn of impending inflation. Throughout the last ten years of deflation in Japan, monetary aggregates remained proportionately twice as large as those in the U.S. When the value of money is increasing, cash is king and investors move out of long term securities into forms of liquidity measured by the monetary indices. But now we must all realize the disastrous effects of both inflations and deflations—and guard against both. We don't want a weak dollar, or a strong dollar. We want a stable dollar.

The President should announce, "Sound money is a prerequisite of economic growth. Workers, savers, investors, and entrepreneurs the world over need to have confidence that the monetary unit of account will be stable over time. The United States intends to pursue a policy of dollar stability." In other words, replace the current interest rate target with a price-rule, marked by a gold price of $350 per ounce or more. Stable money means no long run inflation and no deflation. Alan Greenspan would probably go for it.

Revaluing technology assets around the globe, these policies would create a broadband future for the American people, with horizons of economic growth and prosperity opening up as wide as the span of light.

—George Gilder and Bret Swanson, August 28, 2002

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