

---

---

**UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION**

Washington, D.C. 20549

---

**FORM 10-K**

---

(Mark One)

**ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the Fiscal Year Ended December 31, 2001

**TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

Commission File No. 0-25826

**HARMONIC INC.**

(Exact name of Registrant as specified in its charter)

Delaware  
(State of incorporation)

77-0201147  
(I.R.S. Employer Identification No.)

549 Baltic Way

Sunnyvale, CA 94089  
(408) 542-2500

(Address, including zip code, and telephone number,  
including area code, of Registrant's principal executive offices)

Securities registered pursuant to section 12(b) of the Act: None

Securities registered pursuant to section 12(g) of the Act:

Common Stock, par value \$.001 per share

Indicate by check mark whether the Registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for shorter period that the Registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes  No

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of the Registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K.  \_\_\_\_\_

Based on the closing sale price of the Common Stock on the NASDAQ National Market System on March 1, 2002, the aggregate market value of the voting stock held by non-affiliates of the Registrant was \$681,114,456. Shares of Common Stock held by each officer and director and by each person who owns 5% or more of the outstanding Common Stock have been excluded in that such persons may be deemed to be affiliates. This determination of affiliate status is not necessarily a conclusive determination for other purposes.

The number of shares outstanding of the Registrant's Common Stock, \$.001 par value, was 59,470,455 at March 1, 2002.

**DOCUMENTS INCORPORATED BY REFERENCE**

Portions of the Proxy Statement for the Registrant's 2002 Annual Meeting of Stockholders (which will be filed with the Securities and Exchange Commission within 120 days of the end of the fiscal year ended December 31, 2001) relating to Items 10 (as to Directors), 11 and 12 of Part III are incorporated by reference in Part III of this Form 10-K.

---

---

## **TABLE OF CONTENTS**

### **PART I**

- [Item 1. Business](#)
- [Item 2. Properties](#)
- [Item 3. Legal Proceedings](#)
- [Item 4. Submission of Matters to a Vote of Security Holders](#)

### **PART II**

- [Item 5. Market for the Registrant's Common Stock and Related Security Holder Matters](#)
- [Item 6. Selected Financial Data](#)
- [Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations](#)
- [Item 7A. Quantitative and Qualitative Disclosures About Market Risk](#)
- [Item 8. Financial Statements and Supplementary Data](#)
- [REPORT OF INDEPENDENT ACCOUNTANTS](#)
- [CONSOLIDATED BALANCE SHEETS](#)
- [CONSOLIDATED STATEMENT OF OPERATIONS](#)
- [CONSOLIDATED STATEMENT OF STOCKHOLDERS' EQUITY](#)
- [HARMONIC INC. CONSOLIDATED STATEMENT OF CASH FLOWS](#)
- [NOTES TO CONSOLIDATED FINANCIAL STATEMENTS](#)

### **PART III**

- [Item 10. Directors and Executive Officers of the Registrant](#)
- [Item 11. Executive Compensation](#)
- [Item 12. Security Ownership of Certain Beneficial Owners and Management](#)
- [Item 13. Certain Relationships and Transactions](#)

### **PART IV**

- [Item 14. Exhibits, Financial Statement Schedules and Reports on Form 8-K](#)

[SIGNATURES](#)

[EXHIBIT INDEX](#)

[EXHIBIT 3.1](#)

[EXHIBIT 3.2](#)

[EXHIBIT 10.31](#)

[EXHIBIT 10.32](#)

[EXHIBIT 10.33](#)

[EXHIBIT 10.34](#)

[EXHIBIT 21.1](#)

[EXHIBIT 23.1](#)

---

## PART I

### Item 1. *Business*

Some of the statements contained in this Annual Report on Form 10-K are forward-looking statements that involve risks and uncertainties. The statements contained in this Annual Report on Form 10-K that are not purely historical are forward-looking statements within the meaning of Section 27A of the Securities Act and Section 21E of the Exchange Act, including, without limitation, statements regarding our expectations, beliefs, intentions or strategies regarding the future. All forward-looking statements included in this Report on Form 10-K are based on information available to us on the date hereof, and we assume no obligation to update any such forward-looking statements. These statements involve known and unknown risks, uncertainties and other factors, which may cause our actual results to differ materially from those implied by the forward-looking statements. In some cases, you can identify forward-looking statements by terminology such as “may,” “will,” “should,” “expects,” “plans,” “anticipates,” “believes,” “intends,” “estimates,” “predicts,” “potential,” or “continue” or the negative of these terms or other comparable terminology. Although we believe that the expectations reflected in the forward-looking statements are reasonable, we cannot offer any assurance of future results, levels of activity, performance or achievements. Moreover, neither any other person nor we assume responsibility for the accuracy and completeness of such statements. Important factors that may cause actual results to differ from expectations include those discussed in “Factors That May Affect Future Results of Operations” beginning on page 26 in this document. The terms “Harmonic,” “the Company,” “we,” “us,” “its” and “our” as used in this Annual Report on Form 10-K refer to Harmonic Inc. and its subsidiaries and its predecessors as a combined entity, except where the context requires otherwise.

#### Overview

Harmonic designs, manufactures and sells a variety of broadband solutions that allow communications service providers around the world to deliver video, voice and data to their subscribers. Harmonic’s technically advanced fiber optic, digital video and data delivery systems enable network operators to provide a range of interactive and advanced digital services that include digital video, high-speed Internet access, telephony, HDTV, video and audio streaming, and video-on-demand.

Historically, almost all of our sales were derived directly or indirectly from sales of fiber optic transmission systems to cable television operators. With the introduction of digital headend products beginning in 1997, we broadened our product offering to enable delivery of digital video, voice and data over satellite and wireless networks and cable systems.

In order to further expand our digital systems capability, Harmonic entered into a merger agreement with C-Cube Microsystems Inc., or C-Cube, on October 27, 1999, pursuant to which C-Cube merged into Harmonic. Under the terms of the merger agreement, C-Cube spun off its semiconductor business as a separate publicly traded company prior to the May 3, 2000 closing. C-Cube then merged into Harmonic and Harmonic therefore acquired C-Cube’s DiviCom business, which provides MPEG-2 encoding products and systems for digital television.

The merged Company has been organized into two product divisions, Broadband Access Networks, or BAN, for fiber optic systems and Convergent Systems, or CS, for digital headend systems. While the two divisions have been organized generally around the pre-merger Harmonic fiber optics systems and the DiviCom digital headend systems, respectively, these divisions do not correspond to the pre-merger companies in significant ways. For example, certain Harmonic product lines are now part of the CS division.

Harmonic was initially incorporated in California in June 1988 and reincorporated into Delaware in May 1995. Our principal executive offices are located at 549 Baltic Way, Sunnyvale, California 94089. Our telephone number is (408) 542-2500.

## Industry Background

### *Demand for Broadband Services*

The demand for broadband services has increased significantly in recent years due in large part to the dramatic growth of the Internet, which has facilitated commercial applications such as telecommuting and electronic commerce as well as its widespread use for communicating and accessing information. Rapid growth in the number of Internet users and the demand for more bandwidth-intensive video, voice and data content has strained existing communications networks and created bottlenecks, especially in the "last mile" of the communications infrastructure where homes connect to the local network. Increasingly, individuals who experience the value of high-speed Internet access from their work locations are demanding similar levels of speed from their home or laptop connection. Access to the Internet over the last mile using standard telephone dial-up connections, however, has been limited generally to speeds of up to 56 Kbps.

### *Competition and Deregulation*

Increased demand for residential broadband services, combined with recent and proposed regulatory reform, has spurred competition among communication service providers worldwide to offer combinations of video, voice and data services. Historically, U.S. long distance carriers and regional Bell operating companies, or RBOCs, provided only telephony services in the residential market. Cable television multiple system operators, or MSOs, provided video programming. Direct broadcast satellite, or DBS, service operators also provided only video programming and were further restricted by regulation from making local television channels available in local markets. As a result, none of these operators had networks conducive to providing high-speed data services to residential subscribers, or any other services that they had not been previously allowed to provide. The Telecommunications Act of 1996, however, generally permitted service operators to enter each other's markets and to provide a variety of voice, video and data services. As a result, most cable companies have begun to offer broadband services, including digital video, internet access and telephony, over their cable systems in the last few years. Similarly, telcos are deploying various digital subscriber line, or DSL, technologies for high-speed data services over their existing copper networks. A small number of telcos also have deployed alternative delivery systems such as hybrid fiber coax, or HFC, fiber to the curb and broadband wireless for data and video transmission, and a few have also deployed video services over their DSL networks. DBS operators have now introduced local channels in a substantial number of markets and have also commenced limited deployment of Internet services to the home and small businesses. In many major metropolitan areas, new carriers have entered the market, although many have scaled back or halted construction because of funding limitations caused by recent market conditions. For example, companies such as RCN are building state-of-the-art networks to compete with incumbent RBOCs and cable operators.

Similar deregulation of telecommunications and broadcasting abroad has fostered substantial growth and competition in foreign communications markets. Many countries have liberalized the provision of broadcast television and abolished or exposed to competition incumbent broadcast and telecom monopolies. Several have encouraged digital broadcasting in order to provide more channel capacity, higher quality video, and the provision of other digital services, such as data and voice. These developments have led to the establishment of new cable television networks, the launch of new DBS services and the introduction of broadband wireless services, the latter two particularly in countries with little wired infrastructure, or large remote areas where wired networks are uneconomic.

### *Response of the Cable Operators*

To address increasing competition and demand for high-speed broadband services, cable operators are introducing voice and data services in addition to video. By offering bundled packages of broadband services, cable operators are seeking to obtain a competitive advantage over telephone companies and DBS providers and to create additional revenue streams.

## [Table of Contents](#)

In order to provide high-speed Internet service, cable operators are deploying cable modems in an increasing number of their systems. At the end of 2001, there were approximately 8 million cable modem subscribers in the United States.

Similarly, cable operators are upgrading and rebuilding their networks to offer digital video, which enables cable operators to provide more channels and better picture quality than analog video, allowing them to better compete against the increasing penetration of DBS services. Cable operators have begun to roll out new interactive services such as video-on-demand, or VOD, on their digital platforms. VOD allows subscribers to order, start, pause and stop selected movies and other content at their own discretion.

Many cable operators are also upgrading and building out their networks to provide telephony services. These operators have rolled out telephone services in a number of major markets and have also targeted certain business markets for the delivery of high-bandwidth services.

The ability of cable operators to deliver digital video, voice and high-speed data services on a broad scale, however, is constrained by the design of their legacy networks. These networks, which reach more than 90% of U.S. homes, were built initially for one-way broadcast analog television and require substantial upgrades to make them capable of reliably supporting two-way digital services, such as high-speed Internet access and telephony. In addition to upgrading and extending network infrastructure with fiber optics, it is necessary for cable operators to invest in new digital headend equipment that can receive and process content from a variety of sources in increasingly complex headends. For example, VOD services require video storage equipment and servers, complemented by devices capable of routing, multiplexing and modulation for delivering signals to subscribers over an HFC network.

### *Response of the Satellite Operators*

Satellite operators around the world have established digital television services serving millions of subscribers. These services, which are capable of providing up to several hundred channels of high quality video, have become popular with consumers who want a wider choice of programming than is typically available from cable or broadcast television. The increasing availability of digital set top boxes and small low cost receiving dishes for subscribers' homes has facilitated the rollout of DBS services.

DBS services, however, operate mostly in a one-way environment. Signals are transmitted from an uplink center to a satellite and then beamed to dishes located at subscribers' homes. This method is suited to the delivery of broadcast television, but does not lend itself easily to two-way services, such as Internet access.

As cable operators expand the number of channels offered and introduce services such as video-on-demand, DBS providers seek to protect and expand their subscriber base in a number of ways. DBS operators now have the right to provide local channels to local markets in the United States and are progressively introducing local channels in various markets. In the United States, "must-carry" regulations generally require DBS operators to transmit all local channels in any markets they serve, thereby adding constraints on channel capacity. Advances in digital compression technology allow DBS operators to cost-effectively add these new channels and further expand their video entertainment offerings.

### *Response of the Telcos*

Telephone companies or, telcos, are also facing increasing competition and demand for high-speed residential broadband services. To date, their offerings in residential markets have been aimed mostly at providing Internet access in addition to traditional voice services. This is being accomplished principally by the deployment of DSL technology.

Like the cable networks, the telcos' legacy networks are not well equipped to offer new services. The substantial bandwidth limitations of the copper-based "last mile" have limited DSL deployment and present an even greater barrier to providing video services. Although cable companies and certain new broadband

## [Table of Contents](#)

service providers have networks equipped to deliver video and are moving to capture data and voice customers, few telcos have to date offered video services as a competitive response.

These telcos have introduced video services delivered to subscribers in a number of ways. These methods include the construction of new networks, either emulating the cable HFC architecture or adding a “video overlay” to existing fiber/copper networks, but these networks have proven to be expensive to construct. Some telcos have introduced broadband wireless services, which are generally less expensive to construct, but which have bandwidth constraints and other technical limitations of their own. Video delivered over DSL lines has major bandwidth limitations, but the use of video compression technology at very low bit rates has allowed certain operators to introduce video services.

### *The Market Opportunity*

The construction of new networks or the upgrade and extension of existing networks to facilitate high-speed broadband video, voice and data services requires substantial expenditure and often the replacement of significant portions of the existing infrastructure. The economic success of incumbent and new operators will depend to a large extent on their ability to offer a choice of attractively priced packages of voice, video and data services to consumers, and to do so with high reliability and easy access to their network. As PC penetration continues to increase, we believe that interchanges of video and data via the Internet will increase. The availability of high bandwidth to the home in order to deliver maximum choice and flexibility will become increasingly important. Compression of video and data to maximize the available bandwidth and the construction of robust “fat pipes” for delivery of content to and from the home are both essential elements in building and supporting these networks.

### **The Harmonic Solution**

Harmonic designs, manufactures and sells a variety of broadband solutions that allow communications service providers around the world to deliver video, voice and data to their subscribers. Harmonic’s technically advanced fiber optic, digital video and data delivery systems enable network operators to provide a range of interactive and advanced digital services that include digital video, high-speed Internet access, telephony, HDTV, video and audio streaming, and video-on-demand.

### **Products**

Harmonic’s products fall into two principal groups, Broadband Access Networks Products and Convergent Systems Products. In addition, Harmonic provides Professional Services and Systems Support to its customers worldwide.

*Broadband Access Networks Products.* Our optical transmission products, node platforms and return path products, and element management hardware and software allow cable operators to deliver traditional broadcast video services while supporting the roll-out of emerging interactive services and managing the fiber network. Various types of optical transmitters enable cable operators to design network architectures which address the service and technical requirements of their systems. Our optical nodes are designed to incorporate a variety of modules which provide the operator with network flexibility and scalability to support increases in subscribers and new services.

*Convergent Systems Products.* Our digital headend products provide broadband operators with the ability to accept a variety of signals from different sources, in different protocols, and to organize and manage this content to maximize use of the available bandwidth. Our encoders, multiplexers and modulators allow our customers to convert analog video to digital and to process this output into a stream which can be delivered over a fiber or wireless network to subscribers. Our Narrowcast Services Gateway, or NSG, enables cable operators to deliver video-on-demand services to their subscribers.

## **Broadband Access Networks Products**

The Broadband Access Networks Division applies its strengths in optics and electronics, including expertise with lasers, modulators, and radio frequency technology, to develop products which provide enhanced network reliability and allow broadband service providers to deliver advanced services, including two-way interactive services. We have provided the operator with end-to-end capability in the fiber portion of the network.

### *Optical Transmission Systems*

We offer MAXLink transmitters and optical amplifiers, PWRLink transmitters and DWDM systems for a wide range of optical transmission requirements.

*MAXLink Transmitters and Optical Amplifiers.* The MAXLink transmitters and optical amplifiers operate at a wavelength of 1550 nm and serve long-haul applications and fiber dense architectures that are beyond the capability of shorter range 1310 nm transmitters. This system is suited to evolving cable networks employing such features as redundant rings, hub interconnects and broadcast layer transmission.

*PWRLink Transmitters.* The PWRLink series of optical transmitters provides optical transmission primarily for use at a headend or hub for local distribution to optical nodes and for narrowcasting, which is the transmission of programming to a select set of subscribers.

*METROLink System.* Our METROLink DWDM system allows operators to expand the capacity of a single strand of fiber and also to provide narrowcast services directly from the headend to nodes. This ability can significantly reduce the size of hubs and the associated building and equipment maintenance costs. By increasing the downstream and upstream capacity of existing optical fiber, METROLink can also eliminate the often significant expense of laying additional fiber.

*GIGALight.* Our GIGALight is a DWDM system for transporting multiple Gigabit Ethernet traffic. It allows high-bandwidth services, such as video-on-demand, to be carried on a single fiber and targeted by wavelength.

### *Optical Nodes, Return Path Products and Ethernet Switching Products*

We offer a number of optical nodes, return path transmitters and receivers to provide two-way transmission capability. Optical nodes are designed to allow the customer to add capacity and scale as the number of subscribers grows and new services are provided.

*PWRBlazer Optical Nodes.* Our family of PWRBlazer optical nodes supports network architectures which meet the varying demand for bandwidth delivered to a service area. By the addition of modules providing functions such as return path transmission and DWDM, our configurable nodes are easily segmented to handle increasing two-way traffic over a fiber network without major plant reconstruction.

*Return Path Transmitters and Receivers.* Our return path transmitters support two-way transmission capabilities by sending video, voice and data signals from the optical node back to the headend. These transmitters are available for either analog or digital transport.

*Ethernet Switching Products.* Designed as modules for our PWRBlazer node platform, these switches enable operators to add high-bandwidth services in fiber-to-the-curb or fiber-to-the-home applications. These products are currently under development or in field trials and the first modules are expected to be available for shipment in the second half of 2002.

### *Network Management*

*NETWatch Management System.* Our NETWatch management system consists of transponders and network management software. The transponders operate in broadband networks to capture measurement data and our software enables the broadband service operator to monitor and control the HFC transmission

## [Table of Contents](#)

network from a central office or remote locations. Our NETWatch software is designed to be integrated into larger network management systems through the use of simple network management protocol, or SNMP.

### **Convergent Systems Products**

The Convergent Systems Division develops standards-based solutions that enable operators to increase the capacity of their broadband networks with advanced compression and stream processing technology. Our CS division's advanced digital video solutions enable satellite, cable, telco, broadcast, and wireless operators around the world to offer digital video services and advanced data services to their customers. As video, data and telephony services continue to converge, effectively managing and processing these bandwidth-intensive applications becomes critical to the long-term viability of an operator's network.

#### *Compression Products*

*DiviCom<sup>TM</sup> Encoders.* This is a complete line of high performance and high definition encoders, which provide compression of video, audio and data channels. Using sophisticated signal pre-processing, noise reduction and encoding algorithms, these encoders produce high-quality video and audio at low data rates. Their compliance with widely adopted standards enables interoperability with other products and systems. The MV50 encoder, introduced in early 2001, is our latest encoder with the highest compression efficiency of our encoder family.

#### *Stream Processing Products*

*Media Node.* Media Node is a flexible MPEG-2 networking, switching and multiplexing platform. In a broadcast facility, the video, audio and data streams must be combined or multiplexed into a single stream prior to transmission. Our multiplexing platform combines compressed streams from various sources into a single transport stream. Sources may include Harmonic encoders or third-party devices such as video servers.

*Narrowcast Services Gateway.* Our Narrowcast Services Gateway, or NSG, is a fully integrated server gateway, which interfaces with the output from a video server and integrates routing, multiplexing and modulation into a single package for the delivery of video-on-demand services to subscribers over cable networks.

*Digital Turnaround Systems.* Our digital turnaround system is a flexible, modular platform incorporating various cards for grooming, multiplexing and scrambling digital signals prior to transmission over broadband networks. It is especially well suited to "grooming" applications where a local operator wants to change a line-up of pre-packaged channels or content received from a regional or national feed.

#### *CyberStream Systems*

Our CyberStream system provides an end-to-end hardware and software solution for high-speed data delivery, primarily over satellite and wireless networks to both residential and business users. This system includes a data gateway and a network management system installed at either the satellite uplink or at a headend. The data is transmitted to end-user receivers which may be installed as a card in a PC or in our Enterprise1 receiver/router, which interfaces the CyberStream system with a local area network.

#### *Control and Automation Products*

Modern digital networks are a diverse array of hardware and software components from a variety of vendors, using a number of network protocols and standards. Network management is a key tool that lets service providers monitor and control their networks. Our expertise in digital video, audio and data helps service providers with their network management requirements. Our product line includes a full range of software products that service providers can adapt and configure to meet the needs of their deployments.



## Professional Services and Systems Support

Our technology integration group provides consulting, implementation and maintenance services to our customers worldwide. This group draws upon its expertise in broadcast television, communications networking and compression technology to design, integrate and install complete solutions. We offer a broad range of services including program management, budget analysis, technical design and planning, parts inventory management, building and site preparation, equipment installation and integration, end-to-end system testing, comprehensive training and ongoing maintenance. Harmonic also has extensive experience in integrating our products with numerous third-party products and services.

### Customers

We sell our products to a variety of broadband communications companies. Set forth below is a representative list of our significant end-user customers during 2001.

United States	International
Adelphia	Aliant Telecom
AT&T Broadband	Bell Express Vu
Cablevision	Drake Systems
Charter Communications	Golden Channels
Comcast	Hong Kong Cable Television
Cox	Korea Digital Broadcasting
DirecTV	NTL
EchoStar	Orbit Communications
	Ono
Thomcast	Saskatchewan Telecommunications
Time-Warner Cable	Televest
Winfirst	Telstra-Saturn
	UPC

Historically, a majority of our sales and sales of DiviCom have been to relatively few customers, and due in part to the consolidation of ownership of cable television and direct broadcast satellite systems, we expect this customer concentration to continue in the foreseeable future. Sales to our ten largest customers in 2001, 2000, and 1999 accounted for approximately 49%, 52% and 75% of net sales, respectively. Although we are attempting to broaden our customer base by penetrating new markets such as the telco and broadcast markets, we expect to see continuing industry consolidation and customer concentration due in part to the significant capital costs of constructing broadband networks. For example, Comcast and AT&T Broadband, and EchoStar and DirecTV have announced plans to merge. Both combinations are subject to regulatory and shareholder approvals, amongst other conditions. See "Factors That May Affect Future Results of Operations — Our Customer Base Is Concentrated And The Loss of One or More of Our Key Customers Would Harm Our Business. The Loss of Any Key Customer Would Have a Negative Effect on Our Business." In 2001, sales to DirecTV and Charter Communications accounted for 13% and 11% of net sales, respectively, compared to less than 10% for each of these customers in 2000 and 1999. In 2000, sales to AT&T Broadband accounted for 12% of net sales compared to 41% in 1999. In addition, in 2000 RCN represented 11% of net sales. The loss of DirecTV or Charter Communications, or any other significant customer or any reduction in orders by DirecTV, Charter Communications or any significant customer, or our failure to qualify our products with a significant customer could adversely affect our business, operating results and liquidity.

Sales to customers outside of the United States in 2001, 2000, and 1999 represented 40%, 36% and 30% of net sales, respectively. We expect international sales to continue to account for a substantial portion of our net sales for the foreseeable future. International sales are subject to a number of risks, including changes in foreign government regulations and telecommunications standards, import and export license requirements, tariffs, taxes and other trade barriers, fluctuations in foreign currency exchange rates, difficulty in collecting accounts receivable, difficulty in staffing and managing foreign operations, managing distributor relations and political and economic instability. International markets may not continue to

## [Table of Contents](#)

develop and we may not receive future orders to supply our products in international markets at rates equal to or greater than those experienced in recent periods. See “Factors That May Affect Future Results of Operations — We Depend On Our International Sales And Are Subject To The Risks Associated With International Operations, Which May Negatively Affect Our Operating Results.”

### **Sales and Marketing**

Harmonic has established worldwide sales and professional services and systems support organizations to support both product divisions. In the United States we sell our products through our own direct sales force which is organized geographically and by market to support customer requirements. We sell to international customers through our own direct sales force as well as independent distributors. Principal sales offices outside of the United States are located in the United Kingdom, France, Germany and China. International distributors are generally responsible for importing the products and providing certain installation, technical support and other services to customers in their territory. Our worldwide sales force and distributors are supported by a highly trained technical staff including application engineers who work closely with operators to develop technical proposals and design systems to optimize system performance and economic benefits to operators. Technical support provides a customized set of services, as required, for ongoing maintenance, support-on-demand and training for our customers and distributors both in our facilities and on-site.

Our marketing organization develops strategies for product lines and, in conjunction with our sales force, identifies evolving technical and application needs of customers so that our product development resources can be most effectively and efficiently deployed to meet anticipated product requirements. Our marketing organization is also responsible for setting price levels, demand forecasting and general support of the sales force, particularly at major accounts. We have many programs in place to heighten industry awareness of Harmonic and our products, including participation in technical conferences, publication of articles in industry journals and exhibiting at trade shows.

### **Manufacturing and Suppliers**

We use third party contract manufacturers like Celestica and Paramit to assemble a substantial majority of subassemblies and modules for our products, including such items as printed circuit boards, metal chassis and power supplies. Increasingly we are using such manufacturers to supply full turnkey products and we intend to subcontract an increasing number of tasks to third parties in the future. Our increasing reliance on subcontractors involves several risks, and we may not be able to obtain an adequate supply of components, subassemblies, modules and turnkey systems on a timely basis.

Our manufacturing operations consist primarily of final assembly and test of fiber optic systems for our BAN division. These processes are performed by highly trained personnel employing technologically advanced electronic equipment and proprietary test programs. The manufacturing of our products and subassemblies is a complex process and we cannot assure you that we will not experience production problems or manufacturing delays in the future. Because we utilize our own manufacturing facilities for our fiber optic systems, and to a lesser extent our digital systems, and because such manufacturing capabilities are not readily available from third parties, any interruption in operations could materially and adversely affect our business and operating results.

Many components, subassemblies and modules necessary for the manufacture or integration of our products are obtained from a sole supplier or a limited group of suppliers. Our reliance on sole or limited suppliers, particularly foreign suppliers, and our increased reliance on subcontractors since the merger with C-Cube involves several risks, including a potential inability to obtain an adequate supply of required components, subassemblies or modules and reduced control over pricing, quality and timely delivery of components, subassemblies or modules. In particular, certain optical components have in the past been in short supply and are available only from a small number of suppliers, including sole source suppliers. While we expend considerable efforts to qualify additional optical component sources, consolidation of suppliers in

## [Table of Contents](#)

the industry and the small number of viable alternatives have limited the results of these efforts. We do not generally maintain long-term agreements with any of our suppliers or subcontractors. An inability to obtain adequate deliveries or any other circumstance that would require us to seek alternative sources of supply could affect our ability to ship our products on a timely basis, which could damage relationships with current and prospective customers and harm our business. We attempt to limit this risk by maintaining safety stocks of these components, subassemblies and modules. As a result of this investment in inventories, we have in the past and in the future may be subject to risk of excess and obsolete inventories which could harm our business, operating results, financial position and liquidity. In this regard, our operating results for the last five quarters were adversely affected by provisions for excess and obsolete inventories of approximately \$49 million.

The power shortages that we experienced in California during the first half of 2001 could disrupt our production schedules in the future or those of many of our suppliers. See “Factors That May Affect Future Results in Operations — We Rely On A Continuous Power Supply To Conduct Our Operations, And California’s Current Electrical And Natural Gas Power Crisis Could Disrupt Our Operations And Increase Our Expenses.”

### **Intellectual Property**

We currently hold 39 issued United States patents and 8 issued foreign patents, and have a number of patent applications pending. Although we attempt to protect our intellectual property rights through patents, trademarks, copyrights, licensing arrangements, maintaining certain technology as trade secrets and other measures, we cannot assure you that any patent, trademark, copyright or other intellectual property rights owned by us will not be invalidated, circumvented or challenged, that such intellectual property rights will provide competitive advantages to us or that any of our pending or future patent applications will be issued with the scope of the claims sought by us, if at all. We cannot assure you that others will not develop technologies that are similar or superior to our technology, duplicate our technology or design around the patents that we own. In addition, effective patent, copyright and trade secret protection may be unavailable or limited in certain foreign countries in which we do business or may do business in the future.

We believe that the future success of our business will depend on our ability to translate the technological expertise and innovation of our personnel into new and enhanced products. We generally enter into confidentiality or license agreements with our employees, consultants, vendors and customers as needed, and generally limit access to and distribution of our proprietary information. Nevertheless, we cannot assure you that the steps taken by us will prevent misappropriation of our technology. In addition, we have taken in the past, and may take in the future, legal action to enforce our patents and other intellectual property rights, to protect our trade secrets, to determine the validity and scope of the proprietary rights of others, or to defend against claims of infringement or invalidity. Such litigation could result in substantial costs and diversion of resources and could negatively affect our business, operating results, financial position and liquidity.

In order to successfully develop and market certain of our planned products for digital applications, we may be required to enter into technology development or licensing agreements with third parties. Although many companies are often willing to enter into such technology development or licensing agreements, we cannot assure you that such agreements will be negotiated on terms acceptable to us, or at all. The failure to enter into technology development or licensing agreements, when necessary, could limit our ability to develop and market new products and could cause our business to suffer.

Harmonic’s industry is characterized by the existence of a large number of patents and frequent claims and related litigation regarding patent and other intellectual property rights. In particular, leading companies in the telecommunications industry have extensive patent portfolios. From time to time, third parties, including these leading companies, have asserted and may assert exclusive patent, copyright, trademark and other intellectual property rights against us or our customers. Indeed, a number of third

## [Table of Contents](#)

parties, including leading companies, have asserted patent rights to technologies that are important to us. We expect to increasingly be subject to infringement claims asserted by third parties as the numbers of products and competitors in the telecommunications industry grow. In this regard, since December 2000, we have been in communication with several of Harmonic's customers who have been contacted by one of these leading companies that believes certain of our products require a license under a number of their patents. We currently are reviewing the identified patents to examine whether we consider a license necessary. While it is our understanding that the third party is willing to grant our customers a non-exclusive license under the identified patents, there can be no assurance that the terms of any offered license would be acceptable to our customers or that failure to obtain a license or the costs associated with any license would not cause our business, operating results, financial position and liquidity to be materially adversely affected.

### **Backlog**

We schedule production of our systems based upon our backlog, open contracts, informal commitments from customers and sales projections. Our backlog consists of firm purchase orders by customers for delivery within the next twelve months as well as deferred revenue which is expected to be recognized within the next twelve months. At December 31, 2001, backlog amounted to \$25.3 million, compared to \$49.6 million at December 31, 2000. Anticipated orders from customers may fail to materialize and delivery schedules may be deferred or canceled for a number of reasons, including reductions in capital spending by cable, satellite and other operators or changes in specific customer requirements. In addition, due to weather-related seasonal factors and annual capital spending budget cycles at many major end-users, our backlog at December 31, 2001 or any other date, is not necessarily indicative of actual sales for any succeeding period.

### **Competition**

The markets for cable television fiber optics systems and digital video broadcasting systems are extremely competitive and have been characterized by rapid technological change and declining average selling prices.

Harmonic's competitors in the cable television fiber optics systems business include corporations such as Arris (a company owned in part by Nortel and AT&T), C-Cor.net, Motorola, Philips and Scientific-Atlanta.

In the digital and video broadcasting systems business, we compete broadly with vertically integrated system suppliers including Motorola, Scientific-Atlanta, Tandberg, Thomson Multimedia and Philips, and in certain product lines with Cisco Systems, Terayon and a number of smaller companies.

Most of our competitors are substantially larger and have greater financial, technical, marketing and other resources than Harmonic. Many of these large organizations are in a better position to withstand any significant reduction in capital spending by customers in these markets. They often have broader product lines and market focus and will therefore not be as susceptible to downturns in a particular market. In addition, many of our competitors have been in operation longer than we have and therefore have more long standing and established relationships with domestic and foreign customers. We may not be able to compete successfully in the future and competition may harm our business, operating results, financial position and liquidity.

If any of our competitors' products or technologies were to become the industry standard, our business could be seriously harmed. For example, U.S. cable operators have to date mostly purchased proprietary digital systems from Motorola and Scientific-Atlanta. While certain operators have made limited purchases of the "open" systems provided by Harmonic, we cannot assure you that our digital products will find broad market acceptance with U.S. cable operators. In addition, companies that have historically not had a large presence in the broadband communications equipment market have begun recently to expand their market share through mergers and acquisitions. The continued consolidation of our competitors could have a

## [Table of Contents](#)

significant negative impact on us. Further, our competitors, particularly competitors of our digital and video broadcasting systems' business, may bundle their products or incorporate functionality into existing products in a manner that discourages users from purchasing our products or which may require us to lower our selling prices resulting in lower gross margins.

### **Research and Development**

We have historically devoted a significant amount of our resources to research and development. Research and development expenses in 2001, 2000, and 1999 were \$51.3 million, \$49.3 million, and \$17.3 million, respectively. The significant increase in 2000 was attributable to the inclusion of DiviCom, which historically has spent a higher percentage of sales on research and development than has Harmonic.

Our success in designing, developing, manufacturing and selling new or enhanced products will depend on a variety of factors, including the identification of market demand for new products, product selection, timely implementation of product design and development, product performance, effective manufacturing and assembly processes and sales and marketing. Because of the complexity inherent in such research and development efforts, we cannot assure you that we will successfully develop new products, or that new products developed by us will achieve market acceptance. Our failure to successfully develop and introduce new products could harm our business and operating results.

### **Employees**

As of December 31, 2001, we employed a total of approximately 715 people, including 235 in sales, service and marketing, 230 in research and development, 145 in manufacturing operations and 105 in a general and administrative capacity. We also employ a number of temporary employees and consultants on a contract basis. During 2001 we reduced our work force by approximately 30% in response to a significant slowing of industry spending and the consequent adverse impact on our operating results. None of our employees is represented by a labor union with respect to his or her employment by Harmonic. We have not experienced any work stoppages and we consider our relations with our employees to be good. Our future success will depend, in part, upon our ability to attract and retain qualified personnel. Competition for qualified personnel in the broadband communications industry and in our immediate geographic area is intense, and we cannot assure you that we will be successful in retaining our key employees or that we will be able to attract skilled personnel in the future.

### **Executive Officers**

The following table sets forth certain information regarding the executive officers of Harmonic and their ages as of March 1, 2002:

<u>Name</u>	<u>Age</u>	<u>Position</u>
Anthony J. Ley	63	Chairman of the Board of Directors, President and Chief Executive Officer
Robin N. Dickson	54	Chief Financial Officer
Patrick Harshman	37	President, Broadband Access Networks
Yaron Simler	43	President, Convergent Systems
Israel Levi	62	Senior Vice President, Systems & Technology

*Anthony J. Ley* has served as Harmonic's President and Chief Executive Officer since November 1988. Mr. Ley was elected Chairman of the Board of Directors in February 1995. From 1963 to 1987, Mr. Ley was employed at Schlumberger, both in Europe and the United States, holding various senior business management and research and development positions, most recently as Vice President, Research and Engineering at Fairchild Semiconductor/ Schlumberger in Palo Alto, California. Mr. Ley holds an M.A. in mechanical sciences from the University of Cambridge and an S.M.E.E. from the Massachusetts Institute of Technology, is named as an inventor on 29 patents and is a Fellow of the I.E.E. (U.K.) and a senior member of the I.E.E.E.

## [Table of Contents](#)

*Robin N. Dickson* joined Harmonic in April 1992 as Chief Financial Officer. From 1989 to March 1992, Mr. Dickson was corporate controller of Vitelic Corporation, a semiconductor manufacturer. From 1976 to 1989, Mr. Dickson held various positions at Raychem Corporation, a materials science company, including regional financial officer of the Asia-Pacific Division of the International Group. Mr. Dickson holds a Bachelor of Laws from the University of Edinburgh and is a member of the Institute of Chartered Accountants of Scotland.

*Patrick Harshman* joined Harmonic in 1993 and has served as President of the Broadband Access Networks division since January 2001. Dr. Harshman has held various positions for Harmonic's digital video and fiber optic transmission product lines. Prior to becoming President of the BAN division, he served as Vice President, Marketing. Dr. Harshman received a Ph.D. in Electrical Engineering from the University of California, Berkeley, where his graduate research focused on nonlinear optical phenomena in optical communication systems.

*Yaron Simler* joined Harmonic in 1991 and has served as President of the Convergent Systems division since February 2001. Dr. Simler has held various positions within the company, most recently, as Vice President, Marketing for the CS division. Dr. Simler received a Ph.D. in Electrical Engineering from the University of California, Berkeley with a focus in optical communications. Dr. Simler is named as an inventor on 1 patent.

*Israel Levi* joined Harmonic in July 1989 and has served as Senior Vice President, Systems & Technology since 2001. Between May 1996 to May 2001, Mr. Levi was Vice President, Research & Development. Mr. Levi held various product management and product development positions at Harmonic between 1989 and 1996. From 1988 to 1989, Mr. Levi served in product development at DSC, a telecommunications systems company, and from 1984 to 1988, Mr. Levi served as Director of CATV Products Division at Catel Communications, a telecommunications equipment manufacturer. Mr. Levi holds an M.S. in Electrical Engineering from Carleton University, Ottawa, Canada and a B.S. in Electrical Engineering from Technion-Israel Institute of Technology.

### **Item 2. Properties**

Our principal operations and corporate headquarters are located in Sunnyvale, California. During the second quarter of 2001 we completed the relocation of the former DiviCom employees from facilities in Milpitas, California to the Sunnyvale campus. We also have a research center in Colorado, several sales offices in the United States, sales and support centers in the United Kingdom, France, Germany and China, and two facilities in Israel. Harmonic has entered into leases worldwide for approximately 500,000 square feet of space which expire at various dates through September 2010. We currently have approximately 220,000 square feet of space which is in excess of our requirements and which we no longer occupy, do not intend to occupy, or will vacate during 2002 and which we plan to sublease. The estimated loss on subleases has been included in the excess facility charges recorded in 2001.

### **Item 3. Legal Proceedings**

#### *Shareholder Litigation*

Between June 28 and August 25, 2000, several actions alleging violations of the federal securities laws by Harmonic and certain of its officers and directors (some of whom are no longer with Harmonic) were filed in or removed to the United States District Court for the Northern District of California. The actions subsequently were consolidated.

A consolidated complaint, filed on December 7, 2000, was brought on behalf of a purported class of persons who purchased Harmonic's publicly traded securities between January 19 and June 26, 2000. The complaint also alleged claims on behalf of a purported subclass of persons who purchased C-Cube securities between January 19 and May 3, 2000. In addition to Harmonic and certain of its officers and directors, the complaint also named C-Cube Microsystems Inc. and several of its officers and directors as defendants. The

## [Table of Contents](#)

complaint alleged that, by making false or misleading statements regarding Harmonic's prospects and customers and its acquisition of C-Cube, certain defendants violated sections 10(b) and 20(a) of the Securities Exchange Act of 1934. The complaint also alleged that certain defendants violated section 14(a) of the Exchange Act and sections 11, 12(a)(2), and 15 of the Securities Act of 1933 by filing a false or misleading registration statement, prospectus, and joint proxy in connection with the C-Cube acquisition.

On July 3, 2001, the Court dismissed the consolidated complaint with leave to amend. An amended complaint alleging the same claims against the same defendants was filed on August 13, 2001. Defendants moved to dismiss the amended complaint on September 24, 2001. Pursuant to the Court's July 3, 2001 order, no hearing on the motions will be held unless the Court sets one.

A derivative action purporting to be on behalf of Harmonic was filed against its then-current directors in the Superior Court for the County of Santa Clara on September 5, 2000. Harmonic also was named as a nominal defendant. The complaint is based on allegations similar to those found in the securities class actions and claims that the defendants breached their fiduciary duties by, among other things, causing Harmonic to violate federal securities laws. The derivative action was removed to the United States District Court for the Northern District of California on September 20, 2000. All deadlines in this action have been stayed pending resolution of the motions to dismiss the securities actions. A case management conference is scheduled for April 5, 2002.

Based on its review of the complaints filed in the securities class action, Harmonic believes that it has meritorious defenses and intends to defend itself vigorously. There can be no assurance, however, that Harmonic will prevail. An unfavorable outcome of this litigation could have a material adverse effect on Harmonic's business, operating results, financial position and liquidity.

### *Other Litigation*

In November 2001, we were sued in Tennessee state court by a company alleging breach of contract and breach of a Tennessee statute relating to retailers and suppliers. The suit has a claim for \$2.5 million and other unspecified damages, lost profits and attorneys' fees. The suit has since been removed to Federal Court and a trial date has been set for June 2003. Harmonic believes that it has meritorious defenses and will defend the suit vigorously. However, we cannot assure you that an unfavorable outcome will not adversely impact our business, operating results, financial position and liquidity.

### **Item 4. Submission of Matters to a Vote of Security Holders**

No matters were submitted to a vote of stockholders during the fourth quarter of the year ended December 31, 2001.

**PART II**

**Item 5. Market for the Registrant's Common Stock and Related Security Holder Matters**

- (a) Harmonic's Common Stock has been quoted on the Nasdaq National Market under the symbol HLIT since Harmonic's initial public offering on May 22, 1995. The following table sets forth, for the periods indicated, the high and low sales price per share of the Common Stock as reported on the Nasdaq National Market:

	<u>High</u>	<u>Low</u>
<b>2000</b>		
First quarter	\$157.50	\$72.50
Second quarter	92.69	21.50
Third quarter	35.81	21.75
Fourth quarter	24.50	5.25
<b>2001</b>		
First quarter	12.75	4.30
Second quarter	14.37	2.75
Third quarter	17.30	6.48
Fourth quarter	15.13	6.50

- (b) *Holder of record:* At February 26, 2002, there were 488 stockholders of record of Harmonic's Common Stock.
- (c) *Dividends:* Harmonic has never declared or paid any dividends on its capital stock. Harmonic currently expects to retain future earnings, if any, for the use in the operation and expansion of its business and does not anticipate paying any cash dividends in the foreseeable future. Harmonic's line of credit includes covenants prohibiting the payment of dividends.



**Item 6. Selected Financial Data**

The data set forth below are qualified in their entirety by reference to, and should be read in conjunction with, "Management's Discussion and Analysis of Financial Condition and Results of Operations" and the Consolidated Financial Statements and related notes included elsewhere in this Annual Report on Form 10-K.

	Year Ended December 31,				
	2001	2000	1999	1998	1997
(In thousands, except per share data)					
<b>Consolidated Statement of Operations</b>					
<b>Data:</b>					
Net sales	\$ 203,810	\$ 263,046	\$184,075	\$ 83,857	\$74,442
Gross profit	1,555	75,171	80,605	30,555	34,605
Income (loss) from operations before impairment and amortization of goodwill and other intangibles, and acquired in-process technology	(156,104)	(41,180)	29,321	(7,639)	4,506
Income (loss) from operations <sup>(1)</sup>	(168,787)	(1,683,035)	29,017	(21,943)	4,506
Net income (loss) <sup>(1)</sup>	(166,407)	(1,654,008)	23,680	(21,453)	4,929
Basic net income (loss) per share	(2.84)	(34.06)	0.84	(0.92)	0.24
Diluted net income (loss) per share	(2.84)	(34.06)	0.76	(0.92)	0.21
<b>Consolidated Balance Sheet Data:</b>					
Cash, cash equivalents and short-term investments	\$ 54,277	\$ 99,669	\$ 89,699	\$ 9,178	\$13,670
Working capital	66,608	194,618	129,416	32,318	38,772
Total assets	238,056	425,944	185,693	62,424	58,887
Long term debt, including current portion	2,746	—	—	577	—
Stockholders' equity	135,054	295,702	144,888	43,474	49,931

(1) The 2001 loss from operations and net loss include charges of \$75.6 million, consisting of \$39.2 million for excess and obsolete inventories, \$30.1 million for excess facility costs, \$3.3 million for fixed asset impairment, and \$3.0 million for severance and other costs.

The 2000 loss from operations and net loss include charges of approximately \$1.43 billion, consisting of \$1.38 billion for impairment of goodwill and other intangible assets, \$39.8 million for acquired in-process technology and \$10.0 million for excess and obsolete inventories.

The 1998 loss from operations and net loss include a charge of \$14.0 million for acquired in-process technology.

See Notes 2, 3 and 4 of Notes to Consolidated Financial Statements.

## **Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations**

### **Overview**

Harmonic designs, manufactures and sells a variety of broadband solutions that allow communications service providers around the world to deliver video, voice and data to their subscribers. Harmonic's technically advanced fiber optic, digital video and data delivery systems enable network operators to provide a range of interactive and advanced digital services that include digital video, high-speed Internet access, telephony, HDTV, video and audio streaming, and video-on-demand.

Historically, almost all of our sales were derived directly or indirectly from sales of fiber optic transmission systems to cable television operators. With the introduction of digital headend products beginning in 1997, we have broadened our product offering to enable delivery of digital video, voice and data over satellite and wireless networks and cable systems.

In order to further expand our digital systems capability, Harmonic completed its merger with C-Cube Microsystems Inc. in May 2000, pursuant to the terms of a merger agreement dated October 27, 1999. Under the terms of the merger agreement, C-Cube spun off its semiconductor business as a separate publicly traded company. C-Cube then merged into Harmonic and Harmonic therefore acquired C-Cube's DiviCom business, which provides MPEG-2 encoding products and systems for digital television. The merger was structured as a tax-free exchange of stock and has been accounted for under the purchase method of accounting. In the merger, each share of common stock of C-Cube was converted into 0.5427 shares of Harmonic common stock. The purchase price, including merger-related costs, was approximately \$1.8 billion. The purchase price was allocated to the assets acquired and liabilities assumed, resulting in allocation of approximately \$1.7 billion to identified intangibles and goodwill. As of December 31, 2000, the Company determined that there was an impairment and recorded an impairment charge of \$1.4 billion, eliminating goodwill and reducing identified intangibles acquired to \$79.3 million. See Note 3 of the Notes to Consolidated Financial Statements.

The merger closed on May 3, 2000, and Harmonic has consolidated the results of the DiviCom business in its financial statements from that date forward. The merged company has been organized into two operating divisions, Broadband Access Networks, or BAN, for fiber optic systems and Convergent Systems, or CS, for digital headend systems. While the two divisions have been organized generally around the pre-merger Harmonic fiber optics systems and the DiviCom digital headend systems, respectively, these divisions do not correspond to the pre-merger companies in significant ways. For example, some of Harmonic's product lines are now part of the CS division.

Harmonic's net sales decreased 23% in 2001 due to significantly lower sales within the BAN division, partially offset by increased sales within the CS division. BAN division sales decreased by 57% in 2001, principally due to weak cable industry capital spending on transmission upgrades, particularly by AT&T Broadband and RCN. These two customers accounted for a total of 23% of sales in 2000 compared to a combined total of less than 5% of sales in 2001. CS division sales increased 47% during 2001 reflecting the shipment of new next-generation digital products and inclusion of only eight months of sales for the DiviCom business during 2000.

Net sales were below expectations during each quarter from the second quarter of 2000 through the first quarter of 2001 as certain customers canceled or delayed orders with Harmonic and other vendors, reducing capital spending. The factors contributing to this slow-down in capital spending included uncertain worldwide economic conditions, reduced access to capital markets for certain new and existing customers and inventory levels held by some operators in excess of deployment requirements. Net sales increased sequentially in the second and third quarters of 2001, due primarily to the introduction of the new digital products, and were up 27% during the second half of 2001. However, sales decreased modestly during the fourth quarter and are expected to decline slightly on a sequential basis during the seasonally slow first quarter of 2002 as capital spending generally remains weak, particularly for BAN products.

## [Table of Contents](#)

In order to reduce operating losses, Harmonic implemented a series of measures to control costs and improve operating efficiencies during 2001. These measures included a reduction in our work force of approximately 30% since the beginning of 2001. The operating results in 2001 include charges of \$75.6 million, consisting of \$39.2 million for excess and obsolete inventories, \$30.1 million for excess facility costs, \$3.3 million for fixed asset impairment, and \$3.0 million for severance and other costs. Harmonic expects to report a loss through the first half of 2002, and cannot predict when it will return to profitability.

The provisions for excess and obsolete inventories resulted from significant reductions in the demand for our products, principally BAN division products; in accordance with our policy we established provisions for inventory levels in excess of our demand forecasts. We recorded excess facility charges for facilities that we no longer occupy, do not intend to occupy, or will vacate during 2002. We plan to sublease these facilities and have estimated the associated loss based on the expected timing and amount of sublease income.

Historically, a majority of Harmonic's net sales have been to relatively few customers, and due in part to the consolidation of ownership of cable television and direct broadcast satellite systems, we expect this customer concentration to continue in the foreseeable future. In 2001, sales to DirecTV and Charter Communications accounted for 13% and 11% of net sales, respectively, compared to less than 10% for each of these customers in 2000 and 1999. In 2000, sales to AT&T Broadband accounted for 12% of net sales compared to 41% in 1999. In addition, in 2000 sales to RCN represented 11% of net sales.

In 2001, 2000 and 1999, sales of BAN products accounted for approximately 37%, 67% and 95% of net sales, respectively, while CS products accounted for approximately 63%, 33% and 5% of net sales, respectively. CS sales prior to the merger in May 2000 consisted of sales of Harmonic's TRANsend and CyberStream product lines.

Sales to customers outside of the United States in 2001, 2000 and 1999 represented 40%, 36% and 30% of net sales, respectively. A significant portion of international sales are made to distributors, which are generally responsible for importing the products and providing installation and technical support and service to customers within their territory. We expect international sales to continue to account for a substantial portion of our net sales for the foreseeable future.

Harmonic often recognizes a substantial portion of its revenues in the last month of the quarter. Harmonic establishes its expenditure levels for product development and other operating expenses based on projected sales levels, and expenses are relatively fixed in the short term. Accordingly, variations in timing of sales can cause significant fluctuations in operating results. In addition, because a significant portion of Harmonic's business is derived from orders placed by a limited number of large customers, the timing of such orders can also cause significant fluctuations in our operating results. Harmonic's expenses for any given quarter are typically based on expected sales and if sales are below expectations, our operating results may be adversely impacted by Harmonic's inability to adjust spending to compensate for the shortfall. As a result of these and other factors, Harmonic's operating results in one or more future periods may fail to meet or exceed the expectations of securities analysts or investors. In that event, the trading price of our common stock would likely decline.

Due to lower than expected sales during each quarter from the second quarter of 2000 through the first quarter of 2001, Harmonic failed to meet the expectations of securities analysts, and the price of our common stock declined significantly. See "Factors That May Affect Our Future Operations — Our Operating Results Are Likely To Fluctuate Significantly And May Fail To Meet Or Exceed The Expectations Of Securities Analysts Or Investors, Causing Our Stock Price To Decline."

### **Critical Accounting Policies, Judgments and Estimates**

The preparation of financial statements requires Harmonic to make estimates and assumptions that affect the reported amounts of assets and liabilities, the disclosure of contingencies and the reported

## [Table of Contents](#)

amounts of revenue and expenses in the financial statements. Material differences may result in the amount and timing of revenue and expenses if different judgments or different estimates were utilized. See Note 1 of Notes to Consolidated Financial Statements for details of Harmonic's accounting policies. Critical accounting policies, judgments and estimates which we believe have the most significant impact on Harmonic's financial statements are set forth below:

- Revenue recognition;
- Allowances for doubtful accounts, returns and discounts;
- Valuation of inventories;
- Valuation of goodwill, other intangible assets and other long-lived assets;
- Restructuring costs and accruals for excess facilities;
- Assessment of the probability of the outcome of current litigation; and
- Accounting for income taxes.

### *Revenue Recognition*

Harmonic recognizes revenue when persuasive evidence of an arrangement exists, delivery has occurred or services have been provided, the sale price is fixed or determinable and collectibility is reasonably assured. Revenue from product sales is generally recognized upon shipment, and allowances are provided for estimated returns, discounts and warranties. Such allowances are adjusted periodically to reflect actual and anticipated experience. Revenue on solution sales, which typically includes Harmonic and third-party product, and services such as design, integration and installation, is generally recognized using the percentage of completion method. Under the percentage of completion method, revenue recognized reflects the portion of the anticipated contract revenue that has been earned, equal to the ratio of labor costs expended to date to anticipated final labor costs, based on current estimates of labor costs to complete the project. If the estimated costs to complete a project exceed the total contract amount, indicating a loss, the entire anticipated loss is recognized. Revenue from services is generally recognized as services are performed. Maintenance services are recognized ratably over the maintenance term, which is typically one year.

Revenue recognition in each period is dependent on our application of these accounting policies. If all conditions to recognize revenue are not met, we are required to defer revenue recognition. Our application of percentage-of-completion accounting is subject to our estimates of labor costs to complete each project. In the event that actual results differ from these estimates or we adjust these estimates in future periods, our operating results for a particular period could be adversely affected.

### *Allowances for Doubtful Accounts, Returns and Discounts*

We establish allowances for doubtful accounts, returns and discounts for specifically identified doubtful accounts, returns and discounts based on credit profiles of our customers, current economic trends, contractual terms and conditions and historical payment, return and discount experience. As of December 31, 2001, the allowance for doubtful accounts, returns and discounts was \$8.6 million. During 2001 \$9.8 million was charged to revenue and \$4.0 million was charged to operating expenses for returns, discounts and bad debts. In the event that actual returns, discounts and bad debts differ from these estimates or we adjust these estimates in future periods, our operating results and financial position could be adversely affected.

### *Valuation of Inventories*

Harmonic states inventories at the lower of cost or market. We establish provisions for excess and obsolete inventories after evaluation of historical sales, current economic trends, forecasted sales, product

## [Table of Contents](#)

lifecycles and current inventory levels. During 2001, \$39.2 million was charged to cost of sales for excess and obsolete inventories. In the event that we adjust our estimates, such as forecasted sales and expected product lifecycles, our operating results and financial position could be adversely affected.

### *Valuation of Goodwill, Other Intangible Assets and Other Long-lived Assets*

We assess goodwill, other intangible assets, and other long-lived assets for recoverability whenever events or changes in circumstances indicate that their carrying value may not be recoverable through the estimated undiscounted future cash-flows resulting from the use of the assets. When we determine that the carrying value of goodwill, other intangible assets, and other long-lived assets may not be recoverable, we measure any impairment by using the projected discounted cash flow method to determine fair value with a discount rate we determine to be commensurate with the risk inherent in our current business. As of December 31, 2000, Harmonic recorded an impairment charge of approximately \$1.4 billion to writedown the goodwill and other intangibles associated with the acquisition of C-Cube's DiviCom business completed in May 2000.

### *Restructuring Costs and Accruals for Excess Facilities*

In accordance with the provisions of Emerging Issues Task Force, or EITF, No. 94-3, "Accounting for Restructuring Charges," and Staff Accounting Bulletin No. 100, "Restructuring and Impairment Charges," we record restructuring costs when the Company commits to an exit plan and significant changes to the exit plan are not likely. As a result of the restructuring plans implemented in 2001, Harmonic recorded \$3.0 million related to severance and other costs and \$30.1 million for excess facilities. The estimated loss on facilities which we intend to sublease is based on estimates of the timing and amount of sublease income. We reassess this liability quarterly based on market conditions. Revisions to our estimates of this liability could materially impact our operating results and financial position in future periods if anticipated events and key assumptions, such as the timing and amounts of sublease rental income do not materialize or change.

### *Assessment of the Probability of the Outcome of Current Litigation*

Harmonic records accruals for loss contingencies when it is probable that a liability has been incurred and the amount of loss can be reasonably estimated. Based on Harmonic's review of the complaints filed in the securities class action and other pending litigation, Harmonic believes that it has meritorious defenses and accordingly no loss contingencies have been accrued.

### *Accounting for Income Taxes*

In preparation of our financial statements we estimate our income taxes for each of the jurisdictions in which we operate. This involves estimating our actual current tax exposure and assessing temporary differences resulting from differing treatment of items, such as reserves and accruals, for tax and accounting purposes. These differences result in deferred tax assets and liabilities, which are included within our consolidated balance sheet. Based on our judgment that the likelihood that our deferred tax assets will be recovered from future taxable income is not assured, we established a valuation allowance of \$63 million in 2001 which fully reserved for our net deferred tax assets related to temporary differences, net operating loss and tax credit carryforwards.

Significant management judgment is required in determining our provision for income taxes, our deferred tax assets and liabilities and our future taxable income for purposes of assessing our ability to realize any future benefit from our deferred tax assets. In the event that actual results differ from these estimates or we adjust these estimates in future periods, our operating results and financial position could be materially affected.

**Results of Operations**

Harmonic's historical consolidated statements of operations data for each of the three years ended December 31, 2001, 2000, and 1999 as a percentage of net sales, are as follows:

	Fiscal Year Ended December 31,		
	2001	2000	1999
Net sales	100%	100%	100%
Cost of sales	99	71	56
Gross profit	1	29	44
Operating expenses			
Research and development	25	19	9
Selling, general and administrative	53	25	19
Impairment of goodwill and other intangibles	—	525	—
Amortization of goodwill and other intangibles	6	84	—
Acquired in-process technology	—	15	—
Total operating expenses	84	668	28
Income (loss) from operations	(83)	(639)	16
Interest and other income, net	1	4	1
Income (loss) before income taxes	(82)	(635)	17
Provision for (benefit from) income taxes	—	(6)	4
Net income (loss)	(82)%	(629)%	13%

*Net Sales*

Harmonic's net sales decreased 23% to \$203.8 million in 2001, from \$263.0 million in 2000. The decrease in net sales was due to significantly lower sales within the BAN division, partially offset by increased sales within the CS division. BAN division sales decreased by 57% in 2001, principally due to weak capital spending on transmission upgrades, particularly reduced capital spending by AT&T Broadband and RCN. These two customers accounted for a total of 23% of sales in 2000 compared to a combined total of less than 5% of sales in 2001. CS sales increased 47% during 2001, principally due to sales of new next-generation digital products including the MV50 encoder and Narrowcast Services Gateway, or NSG, which commenced volume shipment in the second quarter of 2001. This increase was also attributable to the fact that net sales for 2000 included only eight months of sales for the DiviCom business as the C-Cube merger was accounted for as a purchase transaction and closed on May 3, 2000. International sales represented 40% of net sales in 2001, compared to 36% in 2000 due principally to the higher international sales mix of the DiviCom business. Net sales increased 43% to \$263.0 million in 2000, from \$184.1 million in 1999. The increase in net sales was due to higher CS division sales primarily attributable to inclusion of sales from the DiviCom business, as well as higher unit sales of TRANsend and CyberStream. BAN division sales were essentially unchanged in 2000 compared to 1999, as higher unit sales of PWRBlazer Scalable Nodes were offset by lower unit sales of METROLINK DWDM systems and lower selling prices. International sales represented 36% of net sales in 2000 compared to 30% in 1999 due to unusually high domestic sales in 1999 and the higher international sales mix of the DiviCom business.

*Gross Profit*

Gross profit decreased to \$1.6 million (1% of net sales) in 2001, from \$75.2 million (29% of net sales) in 2000. The decrease in gross profit was primarily due to decreased sales and associated lower fixed cost absorption as a result of lower production levels and purchasing volumes. In addition, approximately \$40.9 million of the reduction in gross profit was attributable to the recording of provisions for excess and obsolete inventories, the impairment of certain fixed assets and severance and other costs resulting from

## [Table of Contents](#)

streamlining our product lines in both divisions. The provisions for excess and obsolete inventories resulted from significant reductions in demand for our products, principally BAN division products; in accordance with our policy we established provisions for inventory levels in excess of our demand forecasts. The decreases in gross profit and gross margins were partially offset by the inclusion of DiviCom for the entire year in 2001. Gross margins, excluding provisions for excess and obsolete inventories and charges for fixed asset impairment, severance and other costs, and amortization of intangibles, decreased from 37% in 2000, to 25% in 2001, due principally to lower sales, lower pricing and changes in product mix. However, gross margins excluding special charges improved sequentially during each quarter in 2001 due to the launch of new products and cost reduction efforts, and were 33% in the fourth quarter.

Gross profit decreased to \$75.2 million (29% of net sales) in 2000, from \$80.6 million (44% of net sales) in 1999. The decrease in gross profit was due to lower gross profit in the BAN division which was partially offset by the inclusion of the DiviCom business. The significant decrease in gross margins was due to lower margins within each business segment. BAN division margins decreased primarily due to a less favorable product mix which included a higher percentage of node products, lower fixed cost absorption due to lower than expected production volumes and a significant increase in provisions for excess and obsolete inventories. CS division margins decreased principally due to high fixed costs of the professional services and integration operations, and lower pricing.

### *Research and Development*

Research and development expenses increased to \$51.3 million (25% of net sales) in 2001 from \$49.3 million (19% of net sales) in 2000. The increase in absolute dollars was primarily due to inclusion of DiviCom for the entire year in 2001, which historically has spent a higher percentage of net sales on research and development than has Harmonic, partially offset by lower headcount and associated expenses. The increase in research and development expenses as a percentage of net sales was primarily attributable to decreased net sales, but also attributable to the inclusion of DiviCom for the entire year in 2001. Research and development expenses increased to \$49.3 million (19% of net sales) in 2000 from \$17.3 million (9% of net sales) in 1999. The increases in 2000 were due principally to the inclusion of DiviCom and higher payroll and prototype expenses. Harmonic anticipates that research and development expenses will be lower in absolute dollars in 2002, although they may vary as a percentage of net sales.

### *Sales, General and Administrative*

Selling, general and administrative expenses increased to \$106.3 million (53% of net sales) in 2001 from \$67.0 million (25% of net sales) in 2000. The increase in absolute dollars was due principally to \$32.8 million of excess facility, severance and other costs, and the inclusion of DiviCom for the entire year in 2001, partially offset by lower headcount and associated expenses. The increase as a percentage of net sales was also attributable to the decrease in net sales. Excluding the excess facility charges and severance and other costs, selling, general and administrative expenses were \$73.5 million (36% of net sales) in 2001. Selling, general and administrative expenses increased to \$67.0 million (25% of net sales) in 2000 from \$34.0 million (19% of net sales) in 1999. The increases in 2000 were primarily due to inclusion of DiviCom, as well as higher payroll, consulting and recruiting expenses associated with expansion of the sales, marketing and administrative organizations to provide greater customer focus and new product support, and to support Harmonic's overall growth in headcount and operations. Harmonic expects that selling, general and administrative expenses will be lower in absolute dollars in 2002, although they may vary as a percentage of net sales.

### *Goodwill, Other Intangibles and Impairment*

Goodwill and other intangible assets of approximately \$1.8 billion were recorded in connection with the acquisitions of the DiviCom business of C-Cube, Cogent and New Media Communications. As of December 31, 2000, an impairment charge of approximately \$1.4 billion was recorded to write down long lived assets associated with the DiviCom business to fair value based on management's estimate of

## [Table of Contents](#)

discounted future cash flows. As a result of this impairment charge, amortization of goodwill and other intangibles decreased to \$20.7 million in 2001 from \$234.4 million in 2000. Amortization of goodwill and other intangibles increased to \$234.4 million in 2000 from \$1.3 million in 1999 due to the acquisitions of the DiviCom business of C-Cube and Cogent. In July 2001, the Financial Accounting Standards Board, or FASB, issued Statement of Financial Accounting Standards, or SFAS No. 142 "Goodwill and Other Intangible Assets," which requires, among other things, the discontinuance of goodwill amortization. See New Accounting Pronouncements on pages 25 and 26. Harmonic plans to adopt SFAS No. 142 effective January 1, 2002 and will cease amortization of goodwill. Harmonic expects to record approximately \$15 million in amortization of intangibles in 2002.

### *Acquired in-Process Technology*

Harmonic recorded charges to operations of \$39.8 million in 2000 for acquired in-process technology in connection with the C-Cube merger and Cogent acquisition. See Note 2 of Notes to Consolidated Financial Statements. These amounts were expensed on the acquisition dates in accordance with generally accepted accounting principles because the acquired technology had not yet reached technological feasibility and had no future alternative uses.

### *Stock-Based Compensation*

Harmonic recorded no charges for stock-based compensation in 2001, 2000 and 1999, respectively. As of December 31, 2001, however, based on employee participation rates and its stock price, Harmonic believes that it has insufficient shares reserved for issuance under its Employee Stock Purchase Plan, or ESPP, to cover all expected purchases under offering periods that have commenced and which run through June 2003. Although Harmonic has sufficient authorized shares to satisfy purchases during the six month purchase period ending June 2002, Harmonic believes that approximately 365,000 additional shares will be required to meet expected purchases for future six month purchase periods ending December 31, 2002 and June 30, 2003. The issuance of these additional shares requires board and stockholder approval. Harmonic expects to request stockholder approval in May 2002. To the extent that the board of directors and stockholders authorize the reservation of additional shares for issuance for these purchase periods, stock-based compensation may result. The projected compensation charges are subject to a number of assumptions and limitations, including the authorization by our board of directors and stockholders of additional shares for issuance under the ESPP, the timing and amount of employee contributions under the ESPP, the possible amendment and termination of the ESPP and fluctuations in the fair market value of our common stock.

If additional shares are authorized, final measurement of stock-based compensation expense will be determined quarterly, will be recognized as earned, will fluctuate as the price per share of Harmonic common stock fluctuates and could be significant. For example, based on the market value of our common stock of \$12.02 on December 31, 2001, and the average stock purchase price of \$5.09 per share under open purchase periods of the ESPP, if the fair market value of our common stock was unchanged on the purchase dates, we could incur a non-cash stock-based compensation charge totaling approximately \$2.5 million in relation to the approximately 365,000 shares that may be purchased. For each \$1.00 increase or decrease in the price of our common above or below the December 31, 2001 closing price, we would expect an increase or decrease in the non-cash stock-based compensation charge of approximately \$365,000. Final measurement of any stock-based compensation expense which may be incurred will occur on the stock purchase date at the end of each six month purchase period.

### *Interest and Other Income, Net*

Interest and other income, net, was \$1.6 million in 2001, \$10.5 million in 2000 and \$2.6 million in 1999. The decrease in 2001 was principally due to lower average cash and short term investments. Lower interest rates also contributed to the decrease. The increase in 2000 was due primarily to interest earned on cash received in the merger, and to a lesser extent, interest earned on cash proceeds resulting from



## [Table of Contents](#)

Harmonic's public offering of common stock in April 1999. The majority of the cash received in the merger was used in 2000 to pay taxes incurred on the spin-off of C-Cube's semiconductor business.

### *Income Taxes*

Harmonic recorded a benefit from income taxes of only \$0.8 million despite a loss before income taxes of \$167.2 million in 2001. This was principally due to the establishment of a valuation allowance for the full amount of Harmonic's net deferred tax assets of \$63 million, as realization of any future benefit from deductible temporary differences, net operating loss and tax credit carry forwards cannot be sufficiently assured. For 2000, Harmonic recorded a benefit from income taxes of only \$18.6 million, principally due to non-deductible goodwill impairment and amortization, and acquired in-process technology related to the acquisition of DiviCom. The provision for income taxes for 1999 was based on an estimated annual tax rate of 25%.

In 2002, Harmonic expects to record a provision for income taxes due principally to foreign income taxes. This estimate is based on current tax laws, current estimates of 2002 operating results and the expected distribution of income among various tax jurisdictions, all of which is subject to change. In addition, Harmonic is liable for C-Cube's taxes for periods prior to the merger. See "Factors That May Affect Future Results of Operations — We Are Liable For C-Cube's Pre-Merger Tax Liabilities, Including Tax Liabilities Resulting From The Spin-Off of Its Semiconductor Business."

### **Liquidity and Capital Resources**

As of December 31, 2001, cash and cash equivalents and short term investments totaled \$54.3 million compared to \$99.7 million as of December 31, 2000. Cash used in operations was \$24.7 million in 2001 compared to cash used in operations of \$359.5 million in 2000. The decrease in cash used in operations was due primarily to payments of approximately \$320 million in 2000 for estimated tax liabilities related to the spin-off of C-Cube's semiconductor business and for other tax liabilities that Harmonic assumed. Cash used in operations during 2001 was significantly less than the net loss of \$166.4 million due principally to provisions for excess and obsolete inventory and charges for depreciation and amortization, amortization of goodwill and intangibles, excess facility costs, and fixed asset impairment, and a decrease in accounts receivable of \$35.6 million. During 2001, Harmonic received income tax refunds of \$25.6 million. Under the terms of the merger agreement with C-Cube, Harmonic is generally liable for C-Cube's pre-merger tax liabilities. Approximately \$21 million of pre-merger tax liabilities remain outstanding and Harmonic expects final settlement, and payment, of these obligations to a variety of taxing authorities and LSI Logic during 2002. These amounts are included in accrued liabilities.

Additions to property, plant and equipment were \$29.0 million during 2001 compared to \$29.9 million in 2000. Capital expenditures in each year consisted of manufacturing, test and computer equipment. In addition, approximately \$15 million of the capital expenditures in each year represented leasehold improvements and related furniture, fixtures and equipment in connection with relocation of former DiviCom employees to new facilities in Sunnyvale, and the implementation of Harmonic's new enterprise resource planning software system. These major capital programs commenced during the second half of 2000 and were substantially completed during the first half of 2001. As a result of these major programs, capital expenditures were significantly higher during 2000 and 2001 than historic levels for the combined company and expected future levels. Harmonic expects capital expenditures to be approximately \$10 million during 2002.

Harmonic has a bank line of credit facility, which provides for borrowings up to \$10.0 million with a \$6.0 million secured equipment term loan sub-limit. The facility was amended in December 2001 and extended until April 2003. The facility contains certain financial and other covenants, with which Harmonic is in compliance at December 31, 2001. Future borrowings pursuant to the line bear interest at the bank's prime rate (prime rate plus 2.0%-3.0% under the equipment term loan) and are payable monthly, and are secured by Harmonic's assets. During 2001, Harmonic borrowed \$3.2 million under its secured equipment

## [Table of Contents](#)

term loan, of which \$2.7 million was outstanding as of December 31, 2001. The term loan, bears interest at 7.75% to 10.0% annually on outstanding borrowings which mature at various dates through June 2004. There were no other outstanding borrowings under the line as of December 31, 2001. Harmonic also has a facility which provides for the sale of trade receivables on a non-recourse basis up to \$12.5 million and expires in April 2003. Trade receivables sold under the facility are discounted based on the bank's prime rate plus 1.5% for North American customers and 2.0% for all other customers. Harmonic utilized \$6.8 million of the facility to sell qualifying trade receivables as of December 31, 2001.

Future payments on borrowings pursuant to the equipment term loan and minimum lease payments under noncancelable operating leases, including \$22.8 million of minimum lease payments provided for as accrued excess facility costs, as of December 31, 2001, were as follows (in thousands):

	Equipment Term Loan	Non- Cancelable Operating Leases
2002	\$ 1,281	\$ 9,604
2003	1,338	10,552
2004	127	10,383
2005	—	10,513
2006	—	10,983
2007 and thereafter	—	\$ 47,183
	<u>\$ 2,746</u>	<u>\$ 99,218</u>

While Harmonic expects to report a loss through the first half of 2002, we believe that our existing liquidity sources, including our bank line of credit and trade receivable sale facilities, will satisfy our requirements for at least the next twelve months. We may need to raise additional funds if our estimates change or prove inaccurate or in order for us to respond to unforeseen technological or marketing hurdles, or to take advantage of unanticipated opportunities.

Our ability to raise funds may be adversely affected by a number of factors relating to Harmonic, as well as factors beyond our control, including increased market uncertainty following the terrorist attacks of September 11, 2001 and the ongoing U.S. war on terrorism. There can be no assurance that any financing will be available on terms acceptable to us, if at all. See Factors That May Affect Future Results of Operations, "Risk Factors — We May Need Additional Capital In The Future And May Not Be Able To Secure Adequate Funds On Terms Acceptable To Us."

### **New Accounting Pronouncements**

In July 2001, the FASB issued SFAS, No. 141, "Business Combinations." SFAS No. 141 addresses financial accounting and reporting for business combinations and supersedes Accounting Principles Board, or APB, Opinion No. 16, "Business Combinations," and SFAS No. 38, "Accounting for Preacquisition Contingencies of Purchased Enterprises." SFAS No. 141 requires applicable business combinations to be accounted for using one method, the purchase method. The provisions of SFAS No. 141 apply to all business combinations initiated after June 30, 2001. Historically, all of Harmonic's acquisitions have been accounted for using the purchase method of accounting. Harmonic does not expect that the adoption of SFAS No. 141 will have a significant impact on its operating results and financial position.

In July 2001, the FASB issued SFAS No. 142, "Goodwill and Other Intangible Assets," which is effective for fiscal years beginning after March 15, 2001. SFAS No. 142 requires, among other things, the discontinuance of goodwill amortization but continued amortization of other intangible assets. In addition, the standard includes provisions upon adoption for the reclassification of certain existing recognized intangibles including assembled workforce as goodwill, reassessment of the useful lives of existing recognized intangibles and the testing for impairment of existing goodwill and other intangibles. Harmonic is currently assessing the potential impact of adoption of SFAS No. 142 and does not expect a material impact on its

## [Table of Contents](#)

operating results and financial position, other than from the reclassification of assembled workforce to goodwill and the cessation of goodwill amortization. Harmonic recognized \$20.7 million in amortization of goodwill and other intangibles in 2001 and currently expects to record approximately \$15 million in amortization of other intangibles in 2002.

In October 2001, the FASB issued SFAS No. 144, "Accounting for the Impairment or Disposal of Long-Lived Assets," which addresses financial accounting and reporting for the impairment or disposal of long-lived assets. This Statement supersedes SFAS No. 121, "Accounting for the Impairment of Long-Lived Assets and for Long-Lived Assets to Be Disposed Of," and the accounting and reporting provisions of APB Opinion No. 30, "Reporting the Results of Operations — Reporting the Effects of Disposal of a Segment of a Business, and Extraordinary, Unusual and Infrequently Occurring Events and Transactions" for the disposal of a segment of a business. The provisions of SFAS No. 144 are required to be adopted during Harmonic's fiscal year beginning January 1, 2002. Harmonic is currently in the process of evaluating the potential impact of SFAS No. 144 and does not expect a material impact upon adoption on its operating results and financial position.

### **Factors That May Affect Future Results of Operations**

*We Depend On Cable And Satellite Industry Capital Spending For A Substantial Portion Of Our Revenue And Any Decrease Or Delay In Capital Spending In These Industries Would Negatively Impact Our Resources, Operating Results And Financial Condition.*

Prior to the merger with C-Cube, almost all of Harmonic's historic sales had been derived from sales to cable television operators and we expect these sales to constitute a significant portion of net sales for the foreseeable future. Almost all of the DiviCom business' historic sales had been derived from sales to satellite operators, telephone companies and cable operators. Demand for the combined company's products will depend on the magnitude and timing of capital spending by cable television operators, satellite operators, broadcasters and telephone companies for constructing and upgrading of their systems.

These capital spending patterns are dependent on a variety of factors, including:

- access to financing;
- annual budget cycles;
- the impact of industry consolidation;
- the status of federal, local and foreign government regulation of telecommunications and television broadcasting;
- overall demand for communication services and the acceptance of new video, voice and data services;
- evolving industry standards and network architectures;
- competitive pressures;
- discretionary customer spending patterns;
- general economic conditions.

In the past, specific factors contributing to reduced capital spending have included:

- uncertainty related to development of digital video and cable modem industry standards;
- delays associated with the evaluation of new services and system architectures by many cable television operators;
- emphasis on generating revenue from existing customers by cable television operators instead of new construction or network upgrades; and
- general economic conditions in domestic and international markets.

## [Table of Contents](#)

Recent developments in capital markets have reduced access to funding for new and existing customers causing delays in the timing and scale of deployments of our equipment, as well as the postponement of certain projects by our customers. During the past two years Harmonic and other vendors received notification from significant customers, including AT&T Broadband, RCN and Bell South, that they were canceling new projects, or delaying new orders to allow them to reduce inventory levels which were in excess of their current deployment requirements.

The timing of deployment of our equipment can be subject to a number of other risks, including the availability of skilled engineering and technical personnel, the availability of other equipment such as fiber optic cable, and the need for local zoning and licensing approvals. We believe that changes in our customers' deployment plans have in recent quarters delayed, and may in the future delay, the receipt of new orders or the release of existing backlog. Since the majority of our sales have been to relatively few customers, a delay in equipment deployment at any one customer has in the past and could have a material adverse effect on our sales in a particular quarter. In this regard, the Company's sales decreased each quarter from the second quarter of 2000 through the first quarter of 2001 and were below our expectations in the BAN and CS divisions as well as the expectations of securities analysts, and the price of our Common Stock declined significantly.

Cable television capital spending can be subject to the effects of seasonality, with fewer construction and upgrade projects typically occurring in winter months and otherwise being affected by inclement weather.

BAN division sales have decreased significantly from the third quarter of 2000 and were 57% lower in 2001 than in 2000. This was due to weak cable industry spending on transmission upgrades, particularly reduced spending by AT&T Broadband and RCN. These two customers accounted for a total of 23% of sales in 2000 compared to a combined total of less than 5% of sales in 2001. CS division sales from the second quarter of 2000 through the first quarter of 2001, consisting principally of DiviCom products, were below DiviCom's sales levels in 1999 and the first quarter of 2000, and were significantly below our expectations at the time the DiviCom merger was announced in October 1999. The lower CS sales were attributable principally to reduced spending by satellite operators. For a more detailed discussion regarding risks related to AT&T Broadband, RCN and other major customers, see "Our Customer Base Is Concentrated And The Loss Of One Or More Of Our Key Customers Would Harm Our Business. The Loss Of Any Key Customer Would Have A Negative Effect On Our Business."

CS division sales increased sequentially during the second and third quarters of 2001 and increased 58% during the second half of 2001 compared to the first half of the year, primarily due to demand for our next-generation digital systems such as the Narrowcast Services Gateway, or NSG, and the MV50 encoder. CS sales of the MV50 encoder during 2001 benefited in particular from the expansion of local channel offerings and compliance with FCC "must carry" regulations by domestic direct broadcast satellite, or DBS, operators. We anticipate that, in light of the announced merger of EchoStar and DirecTV and expectations that operators will add fewer new markets in 2002, our revenue from domestic DBS operators is likely to decline in 2002.

Due to the uncertainty of the capital spending plans of our customers and seasonal weakness, we expect a slight sequential sales decline during the first quarter of 2002. Harmonic expects to report a loss at least through the first half of 2002, and cannot predict when it will return to profitability.

*Our Customer Base Is Concentrated And The Loss Of One Or More Of Our Key Customers Would Harm Our Business. The Loss Of Any Key Customer Would Have A Negative Effect On Our Business.*

Historically, a majority of our sales and sales of DiviCom have been to relatively few customers, and due in part to the consolidation of ownership of cable television and direct broadcast satellite systems, we expect this customer concentration to continue in the foreseeable future. Sales to our ten largest customers in 2001, 2000, and 1999 accounted for approximately 49%, 52% and 75% of net sales, respectively. Although we are attempting to broaden our customer base by penetrating new markets such as the telco and

## [Table of Contents](#)

broadcast markets, we expect to see continuing industry consolidation and customer concentration due in part to the significant capital costs of constructing broadband networks. For example, Comcast and AT&T Broadband, and EchoStar and DirecTV have announced plans to merge. Both combinations are subject to regulatory and shareholder approvals, among other conditions. In 2001, sales to DirecTV and Charter Communications accounted for 13% and 11% of net sales, respectively, compared to less than 10% for each of these customers in 2000 and 1999. In 2000, sales to AT&T Broadband accounted for 12% of net sales compared to 41% in 1999. In addition, in 2000 RCN represented 11% of net sales. No other customer accounted for more than 10% of our net sales in 2001, 2000, or 1999. The loss of DirecTV or Charter Communications, or any other significant customer or any reduction in orders by DirecTV, Charter Communications or any significant customer, or our failure to qualify our products with a significant customer could adversely affect our business, operating results and liquidity. We cannot currently predict the impact of the acquisition of DirecTV by EchoStar, if approved, on our future sales. In addition, we cannot assure you that sales to other customers will compensate for the reduction in sales to AT&T Broadband and RCN nor can we predict the impact of the AT&T Broadband merger with Comcast on our future sales. Our sales are made on a purchase order or system contract basis, and none of our customers has entered into a long-term agreement requiring it to purchase our products. The loss of, or any reduction in orders from, a significant customer would harm our business.

*Our Operating Results Are Likely To Fluctuate Significantly And May Fail To Meet Or Exceed The Expectations Of Securities Analysts Or Investors, Causing Our Stock Price To Decline.*

Our operating results have fluctuated in the past and are likely to continue to fluctuate in the future, on an annual and a quarterly basis, as a result of several factors, many of which are outside of our control. Some of the factors that may cause these fluctuations include:

- the level and timing of capital spending of our customers, both in the U.S. and in foreign markets;
- changes in market demand;
- the timing and amount of customer orders;
- the timing of revenue from systems contracts which may span several quarters;
- competitive market conditions;
- our unpredictable sales cycles;
- new product introductions by our competitors or by us;
- changes in domestic and international regulatory environments;
- market acceptance of new or existing products;
- the cost and availability of components, subassemblies and modules;
- the mix of our customer base and sales channels;
- the mix of our products sold;
- our development of custom products and software;
- the level of international sales; and
- economic conditions specific to the cable and satellite industries, and general economic conditions.

In addition, we often recognize a substantial portion of our revenues in the last month of the quarter. We establish our expenditure levels for product development and other operating expenses based on projected sales levels, and expenses are relatively fixed in the short term. Accordingly, variations in timing of sales can cause significant fluctuations in operating results. In addition, because a significant portion of our business is derived from orders placed by a limited number of large customers, the timing of such orders

## [Table of Contents](#)

can also cause significant fluctuations in our operating results. Our expenses for any given quarter are typically based on expected sales and if sales are below expectations, our operating results may be adversely impacted by our inability to adjust spending to compensate for the shortfall. As a result of all these factors, our operating results in one or more future periods may fail to meet or exceed the expectations of securities analysts or investors. In that event, the trading price of our common stock would likely decline. In this regard, due to lower than expected sales in each quarter from the second quarter of 2000 through the first quarter of 2001, we failed to meet our internal expectations, as well as the expectations of securities analysts and investors, and the price of our common stock declined significantly.

As a result of the September 11, 2001 terrorist attacks in New York City and Washington, D.C., the United States and global economies have weakened and may continue to deteriorate, which may impair our ability to ship our products within the United States and internationally, and may result in further decreases in our revenues and cause our stock price to decline. In addition, it is anticipated that in the wake of these events, the United States and global capital markets will experience a period of continuing volatility. These events may have a negative impact on our business as a result of the cautious purchasing behavior of customers.

### *We May Need Additional Capital In The Future And May Not Be Able To Secure Adequate Funds On Terms Acceptable To Us.*

While we expect to report a loss at least through the first half of 2002, we currently believe that our existing liquidity sources, including bank line of credit and factoring facilities will satisfy our requirements for at least the next twelve months. We may need to raise additional funds if our estimates change or prove inaccurate or in order for us to respond to unforeseen technological or marketing hurdles, or to take advantage of unanticipated opportunities. Our ability to raise funds may be adversely affected by a number of factors relating to Harmonic, as well as factors beyond our control, including increased market uncertainty following the events of September 11, 2001 and the ongoing U.S. war on terrorism. There can be no assurance that such financing will be available on terms acceptable to us, if at all.

In addition, we may review other potential acquisitions that would complement our existing product offerings, enhance our technical capabilities or expand our marketing and sales presence. While we have no current agreements or negotiations underway with respect to any potential acquisition, any future transaction of this nature could require potentially significant amounts of capital. If adequate funds are not available, or are not available on acceptable terms, we may not be able to take advantage of market opportunities, to develop new products or to otherwise respond to competitive pressures.

### *We Depend On Our International Sales And Are Subject To The Risks Associated With International Operations, Which May Negatively Affect Our Operating Results.*

Sales to customers outside of the United States in 2001, 2000 and 1999 represented 40%, 36% and 30%, of net sales, respectively, and we expect that international sales will continue to represent a substantial portion of our net sales for the foreseeable future. Our international operations are subject to a number of risks, including:

- changes in foreign government regulations and telecommunications standards;
- import and export license requirements, tariffs, taxes and other trade barriers;
- fluctuations in currency exchange rates;
- difficulty in collecting accounts receivable;
- the burden of complying with a wide variety of foreign laws, treaties and technical standards;
- difficulty in staffing and managing foreign operations; and
- political and economic instability.

## [Table of Contents](#)

While our international sales have typically been denominated in U.S. dollars, fluctuations in currency exchange rates could cause our products to become relatively more expensive to customers in a particular country, leading to a reduction in sales or profitability in that country. Following implementation of the final phase of the Euro changeover effective January 1, 2002, we expect a higher portion of our European business to be denominated in Euros which may subject us to increased foreign currency risk. Gains and losses on the conversion to U.S. dollars of accounts receivable, accounts payable and other monetary assets and liabilities arising from international operations may contribute to fluctuations in operating results. Furthermore, payment cycles for international customers are typically longer than those for customers in the United States. Unpredictable sales cycles could cause us to fail to meet or exceed the expectations of security analysts and investors for any given period. In addition, foreign markets may not develop in the future.

### *We Must Be Able To Manage Expenses And Inventory Risks Associated With Meeting The Demand Of Our Customers.*

From time to time, we receive indications from our customers as to their future plans and requirements to ensure that we will be prepared to meet their demand for our products. If actual orders differ materially from these indications, our ability to manage inventory and expenses may be affected. In addition, if we fail to meet customers' supply expectations, we may lose business from such customers. If we enter into purchase commitments to acquire materials, or expend resources to manufacture products and such products are not purchased by our customers, our business and operating results could suffer. In this regard, our gross margins and operating results for the last five quarters were adversely affected by provisions for excess and obsolete inventories of approximately \$49 million.

### *The Markets In Which We Operate Are Intensely Competitive And Many Of Our Competitors Are Larger And More Established.*

The markets for cable television fiber optics systems and digital video broadcasting systems are extremely competitive and have been characterized by rapid technological change and declining average selling prices.

Harmonic's competitors in the cable television fiber optics systems business include corporations such as Arris (a company owned in part by Nortel and AT&T), C-Cor.net, Motorola, Philips and Scientific-Atlanta.

In the digital and video broadcasting systems business, we compete broadly with vertically integrated system suppliers including Motorola, Scientific-Atlanta, Tandberg, Thomson Multimedia and Philips, and in certain product lines with Cisco and Terayon and a number of smaller companies.

Most of our competitors are substantially larger and have greater financial, technical, marketing and other resources than Harmonic. Many of these large organizations are in a better position to withstand any significant reduction in capital spending by customers in these markets. They often have broader product lines and market focus and will therefore not be as susceptible to downturns in a particular market. In addition, many of our competitors have been in operation longer than we have and therefore have more long standing and established relationships with domestic and foreign customers. We may not be able to compete successfully in the future and competition may harm our business.

If any of our competitors' products or technologies were to become the industry standard, our business could be seriously harmed. For example, U.S. cable operators have to date mostly purchased proprietary digital systems from Motorola and Scientific-Atlanta. While certain operators have made limited purchases of the "open" systems provided by Harmonic, we cannot assure you that our digital products will find broad market acceptance with U.S. cable operators. In addition, companies that have historically not had a large presence in the broadband communications equipment market have begun recently to expand their market share through mergers and acquisitions. The continued consolidation of our competitors could have a significant negative impact on us. Further, our competitors, particularly competitors of our digital and

## [Table of Contents](#)

video broadcasting systems' business, may bundle their products or incorporate functionality into existing products in a manner that discourages users from purchasing our products or which may require us to lower our selling prices resulting in lower gross margins.

### *Broadband Communications Markets Are Relatively Immature And Characterized By Rapid Technological Change.*

Broadband communications markets are relatively immature, making it difficult to accurately predict the markets' future growth rates, sizes or technological directions. In view of the evolving nature of these markets, it is possible that cable television operators, telephone companies or other suppliers of broadband wireless and satellite services will decide to adopt alternative architectures or technologies that are incompatible with our current or future products. If we are unable to design, develop, manufacture and sell products that incorporate or are compatible with these new architectures or technologies, our business will suffer.

### *We Need To Develop And Introduce New And Enhanced Products In A Timely Manner To Remain Competitive.*

Broadband communications markets are characterized by continuing technological advancement, changes in customer requirements and evolving industry standards. To compete successfully, we must design, develop, manufacture and sell new or enhanced products that provide increasingly higher levels of performance and reliability. However, we may not be able to successfully develop or introduce these products, if our products:

- are not cost effective,
- are not brought to market in a timely manner,
- are not in accordance with evolving industry standards and architectures, or
- fail to achieve market acceptance.

In addition, to successfully develop and market our planned products, we must retain and continue to attract personnel with appropriate experience and expertise. Competition for qualified personnel is intense. We may not be successful in retaining and attracting qualified personnel.

Also, to successfully develop and market certain of our planned products for digital applications, we may be required to enter into technology development or licensing agreements with third parties. We cannot assure you that we will be able to enter into any necessary technology development or licensing agreement on terms acceptable to us, or at all. The failure to enter into technology development or licensing agreements when necessary could limit our ability to develop and market new products and, accordingly, could materially and adversely affect our business and operating results.

### *We Need To Effectively Manage Our Operations And The Cyclical Nature Of Our Business.*

The growth of our operations and cyclical nature of our business has placed, and is expected to continue to place, a significant strain on our personnel, management and other resources. This strain has been exacerbated by the acquisition of DiviCom and the subsequent loss of numerous employees, including senior management. In addition, we reduced our work force by approximately 30% during 2001 due to reduced industry spending and demand for our products. Our ability to manage our business effectively in the future, including any future growth, will require us to train, motivate and manage our employees successfully, to attract and integrate new employees into our overall operations, to retain key employees and to continue to improve our operational, financial and management systems. In particular, in April 2001 we implemented a new management information system. We believe this new system significantly affects many aspects of our business, including accounting, manufacturing operations, purchasing, sales and marketing functions. The successful operation of this system is critical to our business. While the initial phase of



## [Table of Contents](#)

implementation has been successful, there can be no assurance that we will complete the transition to the new system in an efficient, cost-effective or timely manner or that the new information system will be adequate to support all of our operations. If we fail to manage our existing operations or any future growth effectively, our business could suffer.

### *Competition For Qualified Personnel Is Intense, And We May Not Be Successful In Attracting And Retaining Personnel.*

Our future success will depend, to a significant extent, on the ability of our management to operate effectively, both individually and as a group. We are dependent on our ability to retain and motivate high caliber personnel, in addition to attracting new personnel. In spite of the current worldwide economic slowdown, competition for qualified technical and other personnel remains intense, particularly in the San Francisco Bay Area and Israel, and we may not be successful in attracting and retaining such personnel.

Competitors and others have in the past and may in the future attempt to recruit our employees. While our employees are required to sign standard agreements concerning confidentiality and ownership of inventions, we generally do not have employment contracts or noncompetition agreements with any of our personnel. The loss of the services of any of our key personnel, the inability to attract or retain qualified personnel in the future or delays in hiring required personnel, particularly engineers and other technical personnel, could negatively affect our business.

### *We Are Liable For C-Cube's Pre-Merger Tax Liabilities, Including Tax Liabilities Resulting From The Spin-Off Of Its Semiconductor Business.*

The spin-off of C-Cube's semiconductor business gave rise to a significant tax liability of approximately \$320 million based on a valuation of the semiconductor business of \$1.1 billion. The estimated liability was paid in 2000. Under state law, Harmonic generally is liable for all of C-Cube's debts, including C-Cube's liability for taxes resulting from the spin-off and other pre-merger tax liabilities. C-Cube retained and transferred to Harmonic in the merger an amount of cash and other consideration sufficient to pay this liability as well as all other tax liabilities of C-Cube and its subsidiaries for periods prior to the merger. The merger agreement stipulates that Harmonic will be indemnified by the spun-off semiconductor business if the cash reserves are not sufficient to satisfy all of C-Cube's tax liabilities for periods prior to the merger. If for any reason, the spun-off semiconductor business does not have sufficient cash to pay such taxes, or if there are additional taxes due with respect to the non-semiconductor business and Harmonic cannot be indemnified by C-Cube, Harmonic generally will remain liable, and such liability could have a material adverse effect on Harmonic. The spun-off semiconductor business was recently acquired by LSI Logic, which assumed these obligations to Harmonic.

### *Due To The Structure Of The Merger Transaction, Harmonic Is Liable For C-Cube's General Pre-Merger Liabilities And Any Liabilities Relating To C-Cube's Semiconductor Business For Which The Spun-off Semiconductor Business Is Unable To Indemnify Harmonic.*

The merger of C-Cube into Harmonic, with Harmonic as the surviving entity, resulted in our assuming all of the liabilities of C-Cube at the time of the merger. Pursuant to the merger agreement, Harmonic is indemnified by the spun-off semiconductor business for liabilities associated with C-Cube's historic semiconductor business. However, if LSI Logic is unable to fulfill its indemnification obligations to Harmonic or if general liability claims not specifically associated with C-Cube's historic semiconductor business are asserted, we would have to assume such obligations. Those obligations could adversely effect our financial condition.

### *We May Be Subject To Risks Associated With Other Acquisitions.*

We have made and may make investments in complementary companies, products or technologies. If we make acquisitions, we could have difficulty assimilating or retaining the acquired companies' personnel

## [Table of Contents](#)

and operations or integrating the acquired technology or products into ours. These difficulties could disrupt our ongoing business, distract our management and employees and increase our expenses. Moreover, our operating results may suffer because of acquisition-related expenses, amortization of intangible assets and impairment of acquired goodwill or intangible assets. Furthermore, we may have to incur debt or issue equity securities to pay for any future acquisitions, the issuance of which could be dilutive to our existing shareholders. If we are unable to successfully address any of these risks, our business, financial condition and operating results could be harmed.

### *Difficulties In The Development And Production Of Video Encoding Chips By C-Cube's Spun-off Semiconductor Business May Adversely Impact Us.*

The DiviCom business and C-Cube semiconductor business collaborated on the production and development of two video encoding microelectronic chips prior to the merger. In connection with the merger, Harmonic and the spun-off semiconductor business entered into a contractual relationship under which Harmonic will have access to certain of the spun-off semiconductor business technologies and products which the DiviCom business previously depended on for its product and service offerings.

However, under the contractual relationships between Harmonic and the spun-off semiconductor business, which was recently acquired by LSI Logic, the semiconductor business does not have a firm commitment to continue the development of video encoding microelectronic chips. As a result, the semiconductor business may choose not to continue future development of the chips for any reason. The semiconductor business may also encounter in the future technological difficulties in the production and development of the chips. If the spun-off semiconductor business is not able to or does not sustain its development and production efforts in this area, we may not be able to fully recognize the benefits of the acquisition. See "Supply, License and Development Agreement" at page 60 of the joint proxy statement filed with the Securities and Exchange Commission on March 23, 2000, for further details of Harmonic's business relationship with the spun-off semiconductor business after the merger.

### *If Sales Forecasted For A Particular Period Are Not Realized In That Period Due To The Unpredictable Sales Cycles Of Our Products, Our Operating Results For That Period Will Be Harmed.*

The sales cycles of many of our products, particularly our newer products and products sold internationally, are typically unpredictable and usually involve:

- a significant technical evaluation;
- a commitment of capital and other resources by cable, satellite, and other network operators;
- capital expenditures;
- time required to engineer the deployment of new technologies or services within broadband networks; and
- testing and acceptance of new technologies that affect key operations.

For these and other reasons, our sales cycles generally last three to six months, but can last up to 12 months. If orders forecasted for a specific customer for a particular quarter do not occur in that quarter, our operating results for that quarter could be substantially lower than anticipated.

As a result of the merger, a significant portion of our revenue is derived from solution contracts. A substantial portion of CS division revenues are from solution contracts that include a combination of product sales as well as design, installation and integration services. Revenue forecasts for solution contracts are based on the estimated timing of the design, installation and integration of projects. Because the solution contracts generally span several quarters and revenue recognition is based on progress under the contract, the timing of revenue is difficult to predict and could result in lower than expected revenue in any particular quarter.

*Our Failure To Adequately Protect Our Proprietary Rights May Adversely Affect Us.*

We currently hold 39 issued United States patents and 8 issued foreign patents, and have a number of patent applications pending. Although we attempt to protect our intellectual property rights through patents, trademarks, copyrights, licensing arrangements, maintaining certain technology as trade secrets and other measures, we cannot assure you that any patent, trademark, copyright or other intellectual property rights owned by us will not be invalidated, circumvented or challenged, that such intellectual property rights will provide competitive advantages to us or that any of our pending or future patent applications will be issued with the scope of the claims sought by us, if at all. We cannot assure you that others will not develop technologies that are similar or superior to our technology, duplicate our technology or design around the patents that we own. In addition, effective patent, copyright and trade secret protection may be unavailable or limited in certain foreign countries in which we do business or may do business in the future.

We believe that the future success of our business will depend on our ability to translate the technological expertise and innovation of our personnel into new and enhanced products. We generally enter into confidentiality or license agreements with our employees, consultants, vendors and customers as needed, and generally limit access to and distribution of our proprietary information. Nevertheless, we cannot assure you that the steps taken by us will prevent misappropriation of our technology. In addition, we have taken in the past, and may take in the future, legal action to enforce our patents and other intellectual property rights, to protect our trade secrets, to determine the validity and scope of the proprietary rights of others, or to defend against claims of infringement or invalidity. Such litigation could result in substantial costs and diversion of resources and could negatively effect our business, operating results, financial position and liquidity.

In order to successfully develop and market certain of our planned products for digital applications, we may be required to enter into technology development or licensing agreements with third parties. Although many companies are often willing to enter into such technology development or licensing agreements, we cannot assure you that such agreements will be negotiated on terms acceptable to us, or at all. The failure to enter into technology development or licensing agreements, when necessary, could limit our ability to develop and market new products and could cause our business to suffer.

Harmonic's industry is characterized by the existence of a large number of patents and frequent claims and related litigation regarding patent and other intellectual property rights. In particular, leading companies in the telecommunications industry have extensive patent portfolios. From time to time, third parties, including these leading companies, have asserted and may assert exclusive patent, copyright, trademark and other intellectual property rights against us or our customers. Indeed, a number of third parties, including leading companies, have asserted patent rights to technologies that are important to us. We expect to increasingly be subject to infringement claims asserted by third parties as the numbers of products and competitors in the telecommunications industry grow. In this regard, since December 2000, we have been in communication with several of Harmonic's customers who have been contacted by one of these leading companies that believes certain of our products require a license under a number of their patents. We currently are reviewing the identified patents to examine whether we consider a license necessary. While it is our understanding that the third party is willing to grant our customers a non-exclusive license under the identified patents, there can be no assurance that the terms of any offered license would be acceptable to our customers or that failure to obtain a license or the costs associated with any license would not cause our operating results to be materially adversely affected.

*We Purchase Several Key Components, Subassemblies And Modules Used In The Manufacture Or Integration Of Our Products From Sole Or Limited Sources, And We Are Increasingly Dependent On Contract Manufacturers.*

Many components, subassemblies and modules necessary for the manufacture or integration of our products are obtained from a sole supplier or a limited group of suppliers. Our reliance on sole or limited

## [Table of Contents](#)

suppliers, particularly foreign suppliers, and our increased reliance on subcontractors since the merger with C-Cube involves several risks, including a potential inability to obtain an adequate supply of required components, subassemblies or modules and reduced control over pricing, quality and timely delivery of components, subassemblies or modules. In particular, certain optical components have in the past been in short supply and are available only from a small number of suppliers, including sole source suppliers. While we expend considerable efforts to qualify additional optical component sources, consolidation of suppliers in the industry and the small number of viable alternatives have limited the results of these efforts. We do not generally maintain long-term agreements with any of our suppliers or subcontractors. An inability to obtain adequate deliveries or any other circumstance that would require us to seek alternative sources of supply could affect our ability to ship our products on a timely basis, which could damage relationships with current and prospective customers and harm our business. We attempt to limit this risk by maintaining safety stocks of these components, subassemblies and modules. As a result of this investment in inventories, we have in the past and in the future may be subject to risk of excess and obsolete inventories, which could harm our business. In this regard, our gross margins and operating results for the last five quarters were adversely affected by excess and obsolete inventory charges of approximately \$49 million.

### *We Face Risks Associated With Having Important Facilities And Resources Located In Israel.*

Harmonic maintains two facilities in the State of Israel with a total of approximately 80 employees. The personnel at these facilities represent a significant portion of our research and development operations. Accordingly, we are directly influenced by the political, economic and military conditions affecting Israel, and any major hostilities involving Israel or the interruption or curtailment of trade between Israel and its present trading partners could significantly harm our business. The September terrorist attacks, the ongoing U.S. war on terrorism and the escalation of terrorist attacks and hostilities within Israel have heightened these risks. We cannot assure you that the protraction or escalation of current tensions in the Middle East will not adversely affect our business and results of operations.

In addition, most of our employees in Israel are currently obligated to perform annual reserve duty in the Israel Defense Forces and are subject to being called for active military duty at any time. We cannot predict the effect of these obligations on Harmonic in the future.

### *We Are The Subject Of Securities Class Action Claims And Other Litigation Which, If Adversely Determined, Could Harm Our Business And Operating Results.*

Between June 28 and August 25, 2000, several actions alleging violations of the federal securities laws by Harmonic and certain of its officers and directors (some of whom are no longer with Harmonic) were filed in or removed to the United States District Court for the Northern District of California. The actions subsequently were consolidated.

A consolidated complaint, filed on December 7, 2000, was brought on behalf of a purported class of persons who purchased Harmonic's publicly traded securities between January 19 and June 26, 2000. The complaint also alleged claims on behalf of a purported subclass of persons who purchased C-Cube securities between January 19 and May 3, 2000. In addition to Harmonic and certain of its officers and directors, the complaint also named C-Cube Microsystems Inc. and several of its officers and directors as defendants. The complaint alleged that, by making false or misleading statements regarding Harmonic's prospects and customers and its acquisition of C-Cube, certain defendants violated sections 10(b) and 20(a) of the Securities Exchange Act of 1934. The complaint also alleged that certain defendants violated section 14(a) of the Exchange Act and sections 11, 12(a)(2), and 15 of the Securities Act of 1933 by filing a false or misleading registration statement, prospectus, and joint proxy in connection with the C-Cube acquisition.

On July 3, 2001, the Court dismissed the consolidated complaint with leave to amend. An amended complaint alleging the same claims against the same defendants was filed on August 13, 2001. Defendants moved to dismiss the amended complaint on September 24, 2001. Pursuant to the Court's July 3, 2001 order, no hearing on the motions will be held unless the Court sets one.

## [Table of Contents](#)

A derivative action purporting to be on behalf of Harmonic was filed against its then-current directors in the Superior Court for the County of Santa Clara on September 5, 2000. Harmonic also was named as a nominal defendant. The complaint is based on allegations similar to those found in the securities class actions and claims that the defendants breached their fiduciary duties by, among other things, causing Harmonic to violate federal securities laws. The derivative action was removed to the United States District Court for the Northern District of California on September 20, 2000. All deadlines in this action have been stayed pending resolution of the motions to dismiss the securities actions. A case management conference is scheduled for April 5, 2002.

Based on its review of the complaints filed in the securities class action, Harmonic believes that it has meritorious defenses and intends to defend itself vigorously. There can be no assurance, however, that Harmonic will prevail. An unfavorable outcome of this litigation could have a material adverse effect on Harmonic's business, operating results, financial position and liquidity.

In November 2001, we were sued in Tennessee state court by a company alleging breach of contract and breach of a Tennessee statute relating to retailers and suppliers. The suit has a claim for \$2.5 million and other unspecified damages, lost profits and attorneys' fees. The suit has since been removed to Federal Court and a trial date has been set for June 2003. Harmonic believes that it has meritorious defenses and will defend the suit vigorously. However, we cannot assure you that an unfavorable outcome will not adversely impact our business, operating results, financial position and liquidity.

### *Our Stock Price May Be Volatile.*

The market price of our common stock has fluctuated significantly in the past, particularly in recent years, and is likely to fluctuate in the future. In addition, the securities markets have experienced significant price and volume fluctuations and the market prices of the securities of technology companies have been especially volatile. Investors may be unable to resell their shares of our common stock at or above their purchase price. In the past, companies that have experienced volatility in the market price of their stock have been the object of securities class action litigation.

### *We Rely On A Continuous Power Supply To Conduct Our Operations, And California's Current Electrical And Natural Gas Crisis Could Disrupt Our Operations And Increase Our Expenses.*

We rely on a continuous power supply for manufacturing and to conduct our business operations. Interruptions in electrical power supplies in California in the early part of last year could recur in the future. In addition, the cost of electricity and natural gas has risen significantly. Power outages could disrupt our manufacturing and business operations and those of many of our suppliers, and could cause us to fail to meet production schedules and commitments to customers and other third parties. Any disruption to our operations or those of our suppliers could result in damage to our current and prospective business relationships and could result in lost revenue and additional expenses, thereby harming our business and operating results.

### *Our Certificate Of Incorporation And Bylaws And Delaware Law Contain Provisions That Could Discourage A Takeover.*

Provisions of our Amended and Restated Certificate of Incorporation, Bylaws, and Delaware law could make it more difficult for a third party to acquire us, even if doing so would be beneficial to our stockholders.

## **Item 7A. Quantitative and Qualitative Disclosures About Market Risk**

Market risk represents the risk of loss that may impact the operating results, financial position, or liquidity of Harmonic due to adverse changes in market prices and rates. Harmonic is exposed to market risk because of changes in interest rates and foreign currency exchange rates as measured against the U.S. Dollar and currencies of Harmonic's subsidiaries.

## [Table of Contents](#)

### *Foreign Currency Exchange Risk*

Harmonic has a number of international subsidiaries each of whose sales are generally denominated in U.S. dollars. Following implementation of the final phase of the Euro changeover effective January 1, 2002, we expect a higher proportion of our European business to be denominated in Euros which may subject us to increased foreign currency exchange risk. In addition, the Company has various international branch offices which provide sales support and systems integration services. While Harmonic does not anticipate that near-term changes in exchange rates will have a material impact on Harmonic's operating results, financial position and liquidity, Harmonic cannot assure you that a sudden and significant change in the value of local currencies would not harm Harmonic's operating results, financial position and liquidity.

### *Interest Rate Risk*

Exposure to market risk for changes in interest rates relate primarily to Harmonic's investment portfolio of marketable debt securities of various issuers, types and maturities and to Harmonic's borrowings under its bank line of credit facility. Harmonic does not use derivative instruments in its investment portfolio, and its investment portfolio only includes highly liquid instruments with an original maturity of less than two years. These investments are classified as available for sale and are carried at estimated fair value, with material unrealized gains and losses reported in other comprehensive income. There is risk that losses could be incurred if Harmonic were to sell any of its securities prior to stated maturity.

## **Item 8. Financial Statements and Supplementary Data**

### *(a) Index to Consolidated Financial Statements*

	<b>Page</b>
Report of Independent Accountants	39
Consolidated Balance Sheets as of December 31, 2001, and 2000	40
Consolidated Statement of Operations for the years ended December 31, 2001, 2000, and 1999	41
Consolidated Statement of Stockholders' Equity for the years ended December 31, 2001, 2000, and 1999	42
Consolidated Statement of Cash Flows for the years ended December 31, 2001, 2000, and 1999	43
Notes to Consolidated Financial Statements	44

(b) *Financial Statement Schedules*: The following are filed as part of this Annual Report on Form 10-K. See Item 14(a)(2):

- *Financial Statement Schedule II: Valuation and Qualifying Accounts and Reserves.*

All other financial statement schedules, have been omitted because the information is not required to be set forth herein, is not applicable or is included in the financial statements or notes thereto.

(c) *Selected Quarterly Financial Data*: The following table sets forth for the period indicated selected quarterly financial data for the Company.

**Quarterly Data (Unaudited)**

	2001				2000			
	4th	3rd	2nd	1st	4th	3rd	2nd	1st
(In thousands, except per share data)								
<b>Quarterly Data:</b>								
Net sales	\$ 56,733	\$ 57,473	\$ 49,330	\$ 40,274	\$ 52,049	\$ 68,171	\$ 79,963	\$ 62,863
Gross profit (loss)	16,440	(12,404)	8,279	(10,760)	(4,589)	19,119	30,845	29,796
Income (loss) from operations before impairment and amortization of goodwill and other intangibles and acquired in-process technology	(10,694)	(65,902)	(31,564)	(47,944)	(41,081)	(16,976)	2,878	13,999
Income (loss) from operations(1)	(13,713)	(69,374)	(34,660)	(51,040)	(1,504,556)	(101,324)	(91,078)	13,923
Net income (loss)(1)	(14,809)	(68,809)	(34,124)	(48,665)	(1,486,602)	(89,670)	(87,063)	9,327
Basic net income (loss) per share	(0.25)	(1.17)	(0.59)	(0.84)	(25.70)	(1.55)	(1.81)	0.30
Diluted net income (loss) per share	(0.25)	(1.17)	(0.59)	(0.84)	(25.70)	(1.55)	(1.81)	0.28

(1) In 2001, the loss from operations and net loss include charges of \$14.0 million, \$8.4 million, \$52.6 million and \$0.6 million in the first, second, third and fourth quarters, respectively, for excess and obsolete inventories, fixed asset impairment, excess facilities and severance and other costs. See Note 4 of Notes to Consolidated Financial Statements.

In 2000, the loss from operations and net loss include charges of \$38.7 million, and \$1.1 million in the second, and third quarters, respectively, for acquired in-process technology. The loss from operations and net loss in the fourth quarter includes a charge of \$1.4 billion for the impairment of goodwill and other intangibles related to the DiviCom acquisition. See Notes 2 and 3 of Notes to Consolidated Financial Statements.

## REPORT OF INDEPENDENT ACCOUNTANTS

To the Board of Directors and Stockholders of Harmonic Inc.

In our opinion, the consolidated financial statements listed in the accompanying index present fairly, in all material respects, the financial position of Harmonic Inc. and its subsidiaries at December 31, 2001 and 2000, and the results of their operations and their cash flows for each of the three years in the period ended December 31, 2001 in conformity with accounting principles generally accepted in the United States of America. In addition, in our opinion, the financial statement schedule listed in the accompanying index presents fairly, in all material respects, the information set forth therein when read in conjunction with the related consolidated financial statements. These financial statements and financial statement schedule are the responsibility of the Company's management; our responsibility is to express an opinion on these financial statements and financial statement schedule based on our audits. We conducted our audits of these statements in accordance with auditing standards generally accepted in the United States of America, which require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements, assessing the accounting principles used and significant estimates made by management, and evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

/s/ PRICEWATERHOUSECOOPERS LLP

---

PRICEWATERHOUSECOOPERS LLP

San Jose, CA

January 25, 2002



HARMONIC INC.

CONSOLIDATED BALANCE SHEETS

ASSETS

	December 31,	
	2001	2000
	(In thousands, except par value amounts)	
Current assets:		
Cash and cash equivalents	\$ 36,005	\$ 13,505
Short-term investments	18,272	86,164
Accounts receivable, net	34,402	67,726
Inventories	30,944	80,191
Deferred income taxes	9,065	30,506
Prepaid expenses and other assets	9,775	10,961
	<u>138,463</u>	<u>289,053</u>
Property and equipment, net	45,755	47,366
Intangibles and other assets	53,838	89,525
	<u>\$ 238,056</u>	<u>\$ 425,944</u>
	LIABILITIES AND STOCKHOLDERS' EQUITY	
Current liabilities:		
Current portion of long-term debt	\$ 1,281	\$ —
Accounts payable	10,296	32,783
Income taxes payable	2,804	1,109
Accrued liabilities	57,474	60,543
	<u>71,855</u>	<u>94,435</u>
Long-term debt, less current portion	1,465	—
Deferred income taxes	9,065	35,215
Accrued excess facility costs	19,563	—
Other non-current liabilities	1,054	592
	<u>103,002</u>	<u>130,242</u>
Commitments and contingencies (Notes 13 and 14)		
Stockholders' equity:		
Preferred Stock, \$.001 par value, 5,000 shares authorized; no shares issued or outstanding	—	—
Common Stock, \$.001 par value, 150,000 shares authorized; 59,063 and 57,891 shares issued and outstanding	59	58
Capital in excess of par value	1,959,043	1,952,784
Accumulated deficit	(1,824,207)	(1,657,800)
Accumulated other comprehensive income	159	660
	<u>135,054</u>	<u>295,702</u>
	<u>\$ 238,056</u>	<u>\$ 425,944</u>

The accompanying notes are an integral part of these consolidated financial statements.

## HARMONIC INC.

## CONSOLIDATED STATEMENT OF OPERATIONS

	Year Ended December 31,		
	2001	2000	1999
	(In thousands, except per share data)		
Net sales	\$ 203,810	\$ 263,046	\$184,075
Cost of sales	202,255	187,875	103,470
Gross profit	1,555	75,171	80,605
Operating expenses:			
Research and development	51,319	49,315	17,281
Selling, general and administrative	106,340	67,036	34,003
Impairment of goodwill and other intangibles	—	1,380,328	—
Amortization of goodwill and other intangibles	12,683	221,727	304
Acquired in-process technology	—	39,800	—
Total operating expenses	170,342	1,758,206	51,588
Income (loss) from operations	(168,787)	(1,683,035)	29,017
Interest and other income, net	1,574	10,456	2,556
Income (loss) before income taxes	(167,213)	(1,672,579)	31,573
Provision for (benefit from) income taxes	(806)	(18,571)	7,893
Net income (loss)	\$(166,407)	\$(1,654,008)	\$ 23,680
Net income (loss) per share:			
Basic	\$ (2.84)	\$ (34.06)	\$ 0.84
Diluted	\$ (2.84)	\$ (34.06)	\$ 0.76
Weighted average shares:			
Basic	58,540	48,564	28,290
Diluted	58,540	48,564	30,967

The accompanying notes are an integral part of these consolidated financial statements.

HARMONIC INC.

CONSOLIDATED STATEMENT OF STOCKHOLDERS' EQUITY

	Common Stock		Capital in Excess of Par Value	Accumulated Deficit	Accumulated Other Comprehensive Income	Stockholders' Equity	Comprehensive Income (Loss)
	Shares	Amount					
(In thousands)							
Balance at December 31, 1998	23,452	\$ 23	\$ 70,913	\$ (27,472)	\$ 10	\$ 43,474	
Net income	—	—	—	23,680	—	23,680	\$ 23,680
Unrealized loss on investments	—	—	—	—	(126)	(126)	(126)
Currency translation	—	—	—	—	214	214	214
Other comprehensive income							\$ 23,768
Tax benefit from exercise of employee stock options	—	—	8,244	—	—	8,244	
Issuance of Common Stock in public offering, net	4,100	5	58,231	—	—	58,236	
Issuance of Common Stock under option and purchase plans and warrant exercises	2,950	3	11,163	—	—	11,166	
Balance at December 31, 1999	30,502	31	148,551	(3,792)	98	144,888	
Net loss	—	—	—	(1,654,008)	—	(1,654,008)	\$ (1,654,008)
Unrealized gain on investments	—	—	—	—	271	271	271
Currency translation	—	—	—	—	291	291	291
Other comprehensive loss							\$ (1,653,446)
Issuance of Common Stock for acquisitions	26,686	26	1,798,778	—	—	1,798,804	
Issuance of Common Stock under option and purchase plans	703	1	5,455	—	—	5,456	
Balance at December 31, 2000	57,891	58	1,952,784	(1,657,800)	660	295,702	
Net loss	—	—	—	(166,407)	—	(166,407)	\$ (166,407)
Unrealized loss on investments	—	—	—	—	(164)	(164)	(164)
Currency translation	—	—	—	—	(337)	(337)	(337)
Other comprehensive loss							\$ (166,908)
Issuance of Common Stock under option and purchase plans	1,172	1	6,259	—	—	6,260	
Balance at December 31, 2001	59,063	\$ 59	\$ 1,959,043	\$ (1,824,207)	\$ 159	\$ 135,054	

The accompanying notes are an integral part of these consolidated financial statements.

**HARMONIC INC.**  
**CONSOLIDATED STATEMENT OF CASH FLOWS**

	Year Ended December 31,		
	2001	2000	1999
	(In thousands)		
<b>Cash flows from operating activities:</b>			
Net income (loss)	\$(166,407)	\$(1,654,008)	\$ 23,680
Adjustments to reconcile net income (loss) to net cash provided			
by (used in) operating activities:			
Impairment of goodwill and other intangibles	—	1,380,328	—
Amortization of goodwill and other intangibles	20,741	234,407	1,277
Acquired in-process technology	—	39,800	—
Depreciation and amortization	18,169	12,977	5,001
Provision for excess and obsolete inventories	39,190	10,000	—
Impairment and loss on disposal of fixed assets	12,523		
Deferred income taxes	(2,806)	(19,021)	(5,478)
Changes in assets and liabilities, net of effect of acquisitions:			
Accounts receivable	35,619	24,095	(17,775)
Inventories	10,038	(17,553)	(12,905)
Prepaid expenses and other assets	1,716	(7,921)	(2,617)
Accounts payable	(22,487)	(2,752)	11,412
Income taxes payable	1,763	(330,928)	2,114
Accrued and other liabilities	5,331	(8,909)	17,045
Accrued excess facilities costs	21,842	—	—
<b>Net cash provided by (used in) operating activities</b>	<b>(24,768)</b>	<b>(359,485)</b>	<b>21,754</b>
<b>Cash flows provided by (used in) investing activities:</b>			
Purchases of investments	(58,490)	(66,563)	(71,760)
Proceeds from sale of investments	126,150	45,393	5,826
Acquisition of property and equipment	(29,080)	(29,877)	(9,331)
Cash received from acquisitions, net	—	393,739	—
<b>Net cash provided by (used in) investing activities</b>	<b>38,580</b>	<b>342,692</b>	<b>(75,265)</b>
<b>Cash flows from financing activities:</b>			
Proceeds from issuance of Common Stock	6,260	5,454	69,401
Borrowings under bank line and term loan	3,203	—	840
Repayments under bank line and term loan	(457)	—	(1,270)
<b>Net cash provided by financing activities</b>	<b>9,006</b>	<b>5,454</b>	<b>68,971</b>
Effect of exchange rate changes on cash and cash equivalents	(318)	22	184
Net increase (decrease) in cash and cash equivalents	22,500	(11,317)	15,644
Cash and cash equivalents at beginning of period	13,505	24,822	9,178
<b>Cash and cash equivalents at end of period</b>	<b>\$ 36,005</b>	<b>\$ 13,505</b>	<b>\$ 24,822</b>
<b>Supplemental disclosure of cash flow information:</b>			
Income tax payments (refunds), net	\$ (25,623)	\$ 330,067	\$ 2,989
Interest paid during the period	\$ 125	\$ 28	\$ 60
<b>Non-cash financing activities:</b>			
Issuance of Common Stock for acquisitions	\$ —	\$ 1,798,804	\$ —

The accompanying notes are an integral part of these consolidated financial statements.

HARMONIC INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

**Note 1: Organization, Basis of Presentation and Summary of Significant Accounting Policies**

Harmonic designs, manufactures and sells a variety of broadband solutions that allow communications service providers around the world to deliver video, voice and data to their subscribers. Harmonic's technically advanced fiber optic, digital video and data delivery systems enable network operators to provide a range of interactive and advanced digital services that include digital video, high-speed Internet access, telephony, HDTV, video and audio streaming, and video-on-demand.

Historically, almost all of our sales were derived directly or indirectly from sales of fiber optic transmission systems to cable television operators. With the introduction of our digital headend products beginning in 1997, we broadened our product offering to enable delivery of digital video, voice and data over satellite and wireless networks and cable systems.

In order to further expand our digital systems capability, Harmonic completed its merger with C-Cube Microsystems Inc. in May 2000, pursuant to the terms of a merger agreement dated October 27, 1999. Under the terms of the merger agreement, C-Cube spun off its semiconductor business as a separate publicly traded company. C-Cube then merged into Harmonic and Harmonic therefore acquired C-Cube's DiviCom business, which provides MPEG-2 encoding products and systems for digital television. The merger was structured as a tax-free exchange of stock and has been accounted for under the purchase method of accounting. In the merger, each share of common stock of C-Cube was converted into 0.5427 shares of Harmonic common stock. The purchase price, including merger-related costs, was approximately \$1.8 billion. The purchase price was allocated to the assets acquired and liabilities assumed, resulting in allocation of approximately \$1.7 billion to identified intangibles and goodwill. As of December 31, 2000, Harmonic determined that there was an impairment and recorded an impairment charge of \$1.4 billion, eliminating goodwill and reducing identified intangibles to \$79.3 million. See Note 3.

The merged company has been organized into two operating divisions, Broadband Access Networks, or BAN, for fiber optic systems and Convergent Systems, or CS, for digital headend systems. While the two divisions have been organized generally around the pre-merger Harmonic fiber optics systems and the DiviCom digital headend systems, respectively, these divisions do not correspond to the pre-merger companies in significant ways. For example, certain Harmonic product lines are now part of the CS division.

*Basis of Presentation.* The consolidated financial statements of Harmonic include the financial statements of the Company and its wholly-owned subsidiaries. All intercompany accounts and transactions have been eliminated. Harmonic's fiscal quarters end on the Friday nearest the calendar quarter end, except for the fourth quarter which ends on December 31.

*Use of Estimates.* The preparation of financial statements in conformity with generally accepted accounting principles requires management to make estimates and assumptions that affect the reported amount of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reported period. Actual results could differ from those estimates.

*Cash Equivalents.* Harmonic considers all highly liquid, investment-grade investments purchased with an original maturity date of three months or less at the date of purchase to be cash equivalents. Cash equivalents are stated at amounts that approximate fair value, based on quoted market prices.

*Investments.* Harmonic's investments are comprised of U.S. government, state, municipal and county obligations and corporate debt securities. Investments include instruments with maturities ranging from three months to two years. Harmonic classifies its investments as "available for sale" and carries its investments at estimated fair value using quoted market prices, with unrealized gains and losses reported in other comprehensive income. Interest and realized gains and losses are included in interest income.

HARMONIC INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

Realized gain and losses are recognized based on the specific identification method. Investments are anticipated to be used for current operations and are, therefore, classified as current assets, even though maturities may extend beyond one year.

*Fair Value of Financial Instruments.* The carrying value of Harmonic's financial instruments, including cash and cash equivalents, accounts receivable, accounts payable and accrued liabilities approximate fair value due to their short maturities.

*Revenue Recognition.* Harmonic recognizes revenue when persuasive evidence of an arrangement exists, delivery has occurred or services have been provided, the sale price is fixed or determinable and collectibility is reasonably assured. Revenue from product sales are generally recognized upon shipment, and allowances are provided for estimated returns, discounts and warranties. Such allowances are adjusted periodically to reflect actual and anticipated experience. Revenue on solution sales, which typically includes Harmonic and third-party product, and services such as design, integration and installation, is generally recognized using the percentage of completion method. Under the percentage of completion method, revenue recognized reflects the portion of the anticipated contract revenue that has been earned, equal to the ratio of labor costs expended to date to anticipated final labor costs, based on current estimates of labor costs to complete the project. If the estimated costs to complete a project exceed the total contract amount, indicating a loss, the entire anticipated loss is recognized. Revenue from services is generally recognized as services are performed. Maintenance services are recognized ratably over the maintenance term, which is typically one year. Deferred revenue represents billings in excess of revenue recognized.

*Inventories.* Inventories are stated at the lower of cost, using the weighted average method, or market. Harmonic establishes provisions for excess and obsolete inventories to reduce such inventories to their estimated net realizable value. Such provisions are charged to cost of sales.

*Property and Equipment.* Property and equipment are recorded at cost. Depreciation and amortization are computed using the straight-line method based upon the shorter of the estimated useful lives of the assets, which range from two to ten years, or the lease term of the respective assets, if applicable. Depreciation and amortization expense related to equipment and improvements for the years ended December 31, 2001, 2000 and 1999 were \$18.2 million, \$13.0 million and \$5.0 million, respectively.

*Intangibles and Other Assets.* Intangible assets represent purchased intangible assets and the excess of acquisition cost over the fair value of tangible and identified intangible net assets of businesses acquired, or goodwill. Purchased intangible assets include customer base, developed technology, trademark and tradename, assembled workforce and supply agreements. Goodwill and other intangible assets are being amortized using the straight-line method over a 5 year estimated life. In July 2001, the Financial Accounting Standards Board, or FASB, issued Statement of Financial Accounting Standards, or SFAS, No. 141 "Business Combinations" and SFAS No. 142, "Goodwill and Other Intangible Assets". Under SFAS No. 141, all business combinations initiated after June 30, 2001, must be accounted for using the purchase method. SFAS No. 142 requires, among other things, the discontinuance of goodwill amortization. In addition, the standard includes provisions upon adoption for the reclassification of certain existing recognized intangibles as goodwill, reassessment of the useful lives of existing recognized intangibles and the testing for impairment of existing goodwill and other intangibles. Harmonic plans to adopt SFAS No. 142 effective January 1, 2002.

Harmonic is currently assessing the potential impact of SFAS No. 141 and 142 and does not expect the adoption of these statements will have a material impact on its financial position and results of operations, other than from the reclassification of assembled workforce as goodwill and the cessation of goodwill amortization. For the year ended December 31, 2001, amortization of goodwill and assembled workforce amounted to approximately \$2.6 million.

HARMONIC INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

*Impairment of Long-Lived Assets.* Long-lived assets, such as goodwill, other intangibles and property and equipment are periodically evaluated for impairment when indicators of impairment are present and the undiscounted cash flows estimated to be generated by those assets are less than the carrying amounts of the assets. As of December 31, 2000, Harmonic recorded an impairment charge of approximately \$1.4 billion based on the discounted cash flow method. See Note 3. In October 2001, the FASB issued SFAS No. 144, "Accounting for the Impairment or Disposal of Long-Lived Assets", which addresses financial accounting and reporting for the impairment or disposal of long-lived assets. This Statement supersedes SFAS No. 121 and the accounting and reporting provisions of Accounting Principles Board, or APB, Opinion No. 30, "Reporting the Results of Operations-Reporting the Effects of Disposal of a Segment of a Business, and Extraordinary, Unusual and Infrequently Occurring Events and Transactions" for the disposal of a segment of a business. The provisions of SFAS No. 144 are required to be adopted during Harmonic's fiscal year beginning January 1, 2002. Harmonic is currently assessing the potential impact of SFAS No. 144 and does not believe it will have a material impact on its financial position and results of operations.

*Concentrations of Credit Risk.* Financial instruments which subject Harmonic to concentrations of credit risk consist primarily of cash and cash equivalents and accounts receivable. Cash and cash equivalents are maintained with high quality financial institutions and are invested in short-term, highly liquid investment-grade obligations of government and commercial issuers, in accordance with Harmonic's investment policy. The investment policy limits the amount of credit exposure to any one financial institution or commercial issuer. Harmonic's accounts receivable are derived from sales to cable, satellite, and other network operators and distributors as discussed in Note 12. Harmonic generally does not require collateral and performs ongoing credit evaluations of its customers and provides for expected losses. At December 31, 2001, receivables from two customers represented 16% and 10%, of total receivables, respectively. At December 31, 2000, receivables from one customer represented 18% of total receivables.

*Currency Translation.* Harmonic has a number of international subsidiaries whose functional currency is the U.S. dollar. All other foreign subsidiaries use the respective local currency as the functional currency. When the local currency is the functional currency, gains and losses from translation of these foreign currency financial statements into U.S. dollars are recorded as a separate component of other comprehensive income (loss). For subsidiaries where the functional currency is the U.S. dollar, gains and losses resulting from remeasuring foreign currency denominated balances into U.S. dollars are included in other income.

*Income Taxes.* Deferred income tax assets and liabilities are computed annually for differences between the financial statement and tax bases of assets and liabilities that will result in taxable or deductible amounts in the future based on enacted tax laws and rates applicable to the periods in which the differences are expected to affect taxable income. Valuation allowances are established when necessary to reduce deferred tax assets to the amount expected to be realized.

*Accounting for Stock-Based Compensation.* As permitted by SFAS No. 123, "Accounting for Stock-Based Compensation," Harmonic accounts for employee stock-based compensation in accordance with APB No. 25, "Accounting for Stock Issued to Employees", and FASB Interpretation, or FIN, No. 44, "Accounting for Certain Transactions Involving Stock-Based Compensation, an interpretation of APB 25" and related interpretations. Stock-based compensation related to non-employees is based on the fair value of the related stock options or warrants in accordance with SFAS No. 123, and its interpretations. Expense associated with stock-based compensation is amortized over the vesting period of each individual award on an accelerated basis using the multiple option method presented in FIN No. 28, "Accounting for Stock Appreciation Rights and Other Variable Stock Option or Award Plans".

HARMONIC INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

*Comprehensive Income.* Comprehensive income includes net income and other comprehensive income. Other comprehensive income includes cumulative translation adjustments and unrealized gains and losses on available-for-sale securities. Harmonic's comprehensive income has been presented in the Consolidated Statement of Stockholders' Equity.

*Accounting for Derivatives and Hedging Activities.* In June 1998, the FASB issued SFAS No. 133, "Accounting for Derivative Instruments and Hedging Activities". SFAS No. 133 established new standards of accounting and reporting for derivative instruments and hedging activities and required that all derivatives be recognized at fair value in the statement of financial position, and that the corresponding gains or losses be reported either in the statement of operations or as a component of comprehensive income, depending on the type of hedging relationship that exists. Effective January 1, 2001, Harmonic adopted SFAS No. 133, however, the adoption did not materially impact its financial position and results of operations.

Harmonic enters into foreign currency forward exchange contracts ("forward contracts") to manage exposure related to accounts receivable denominated in foreign currencies. The Company does not enter into derivative financial instruments for trading purposes. Harmonic had forward contracts outstanding of approximately \$2.4 million at December 31, 2001. The open contracts mature at various dates through March 2002 and hedge certain foreign currency transaction exposures in the British Pound Sterling and the Euro. The fair value of forward contracts at December 31, 2001 was negligible.

*Reclassification.* Certain amounts in prior years' financial statements and related notes have been reclassified to conform to the 2001 presentation. These reclassifications are not material.

**Note 2: Acquisitions**

*DiviCom Business*

On May 3, 2000, Harmonic completed its merger with C-Cube Microsystems Inc., or C-Cube, pursuant to the terms of an Agreement and Plan of Merger and Reorganization (the "Merger Agreement") dated October 27, 1999. Under the terms of the merger agreement, C-Cube spun off its semiconductor business as a separate publicly traded company prior to the closing. C-Cube then merged into Harmonic, and Harmonic therefore acquired C-Cube's DiviCom business. The merger was structured as a tax-free exchange of stock and was accounted for using the purchase method of accounting.

The purchase price of \$1.8 billion included \$1.6 billion of stock issued, \$155 million in stock options assumed, and \$9.6 million of transaction expenses incurred. The issued stock reflected the conversion of each share of C-Cube common stock into 0.5427 shares of Harmonic stock, totaling 26.4 million shares at an average market price per share of \$62.00. The average market price per share was based on the average closing price of Harmonic common stock for a period three days before and after the October 27, 1999 announcement of the merger.



**HARMONIC INC.****NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)**

Following is a table of the purchase price allocation prior to the impairment charge discussed in Note 3 below (in thousands):

Purchase price allocation:	
Net tangible assets of DiviCom business	\$ 138,400
Fair value adjustments:	
Accounts receivable	(12,400)
Deferred tax asset	15,500
Inventory	4,000
Accrued liabilities	(27,700)
<hr/>	
Total fair value of tangible net assets acquired	117,800
Identified intangible assets acquired:	
Customer base	112,700
Developed technology	78,300
Trademark and trade name	13,900
Assembled workforce	22,700
Supply agreement	8,100
<hr/>	
Total intangibles (excluding goodwill)	235,700
In-process research and development	38,700
Goodwill	1,505,700
Deferred tax liabilities	(96,600)
<hr/>	
Total purchase price allocation	\$1,801,300
<hr/>	

The tangible net assets acquired represented the historical net assets of the DiviCom business as of May 2, 2000 adjusted to eliminate intangibles of \$3.8 million arising from C-Cube's acquisition of the DiviCom business in 1996, plus additional cash of \$60 million received as a result of the merger. In addition, under the terms of the Merger Agreement, the Company is liable for all of C-Cube Microsystems' liabilities consisting principally of tax liabilities related to the spin-off of C-Cube's semiconductor business. The net assets acquired included \$333.7 million of cash and other consideration sufficient to pay these liabilities. As required under purchase accounting, the assets and liabilities have been adjusted to fair value.

The purchase price was allocated as set forth in the table above. The "Income Approach," which includes an analysis of the markets, cash flows and risks associated with achieving such cash flows, was the primary method used in valuing the identified intangibles acquired. The value of the assembled workforce was derived by estimating the costs to replace existing employees, including recruiting, hiring and training costs. Expected cash flows were discounted at the Company's weighted average cost of capital of approximately 17%. Because the in-process research and development had not reached the stage of technological feasibility at the acquisition date and had no alternative future use, the amount was immediately charged to operations. The amounts allocated to customer base, developed technology, trademark and tradename, assembled workforce and supply agreement are being amortized over an estimated useful life of five years. The excess amount of the purchase price over the fair market value of the identifiable assets acquired was accounted for as goodwill and was initially being amortized over its estimated useful life of five years prior to recording a \$1.4 billion impairment charge of December 31, 2000 (See Note 3). The valuation for the intangible assets has been determined using management's assumptions and the report from an independent appraiser.

The Supply, License and Development Agreement ("Supply Agreement") was entered into between Harmonic and C-Cube Semiconductor concurrent with the merger agreement. This separate agreement

**HARMONIC INC.****NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)**

covers the supply, licensing and development of two encoder chips for Harmonic by the spun-off semiconductor business. The value of the Supply Agreement was derived by using the Income Approach.

As of December 31, 2001, the Company recorded an adjustment reducing identified intangibles by \$14.4 million to reflect the revised assessment of certain pre-merger liabilities, principally taxes, and the collection of certain pre-merger accounts receivable.

The following unaudited pro forma summary presents the combined statement of operations as if the merger had been completed on January 1, 1999 and does not purport to be indicative of what would have occurred had the merger actually been completed on such date or of results which may occur in the future. The impairment described in Note 3 was assumed to have occurred as of December 31, 2000, thus the pro forma summary below includes amortization of goodwill and other intangibles based on the purchase price allocation prior to the impairment charge. The impairment charge was reduced by \$439.3 million of amortization that was assumed to have occurred from January 1999 through acquisition in May 2000.

	Pro Forma	
	2000	1999
	(Unaudited)	
	(In thousands, except per share data)	
Net sales	\$ 306,821	\$ 369,575
Net loss	(1,337,219)	(323,830)
Net loss per share		
Basic and diluted	\$ (23.78)	\$ (5.92)
Weighted average shares		
Basic and diluted	57,430	54,690

Adjustments made in arriving at the pro forma unaudited results of operations include amortization of goodwill and other intangibles and related tax adjustments. No effect has been given to cost savings or operating synergies that may be realized as a result of the merger.

*Cogent Technology, Inc.*

On July 1, 2000, Harmonic completed the acquisition of privately-held Cogent Technology, Inc. ("Cogent") of Santa Cruz, California, a developer of advanced MPEG-2 technology for the migration from analog to digital television on PCI based platforms. Harmonic issued approximately 286,000 shares of common stock at an average market price per share of \$23.78 to the shareholders of Cogent in the stock-for-stock transaction, which was accounted for as a purchase. The purchase price of \$7.9 million was allocated to the acquired assets, in-process research and development, goodwill and other intangible assets. A one-time charge of \$1.1 million was recorded in the third quarter of 2000 for in-process research and development acquired. Goodwill and other intangibles of \$9.1 million have been amortized on a straight-line basis over the estimated useful life of five years. The results of operations of Cogent have been included in the consolidated financial statements of Harmonic from the date of acquisition, but have not had a material impact on earnings. Cogent has been integrated into Harmonic's Convergent Systems division. Pro forma financial information has not been presented as this acquisition was immaterial.

**Note 3: Goodwill Impairment**

As of December 31, 2000, Harmonic recorded an impairment charge of approximately \$1.4 billion to write-down the goodwill and other intangibles associated with the acquisition of the DiviCom business completed in May 2000. DiviCom was acquired in a tax-free exchange of stock at a time when the market values of telecommunications equipment manufacturers were substantially higher. The impairment charge

**HARMONIC INC.****NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)**

represents the amount required to write-down long-lived assets to fair value based on management's best estimate of this operation's future discounted cash flows. As a result of the impairment charge, Harmonic wrote off the remaining unamortized goodwill and reduced the recorded value of other identified intangibles related to its acquisition of the DiviCom business to \$79.3 million.

**Note 4: Restructuring, Excess Facilities and Inventory Provisions**

In response to a significant reduction in spending, principally weak cable spending on transmission upgrades and the resulting adverse impact on Harmonic's operating results, the Company implemented a series of measures to control costs and improve operating efficiencies during 2001. These measures included three work force reductions, implemented during the first, second and fourth quarters of 2001, totaling approximately 300 employees or 30% of the work force. During 2001, Harmonic recorded and paid \$3.0 million for severance and other costs associated with these actions.

In conjunction with the implementation of these measures to control costs and improve operating efficiencies, Harmonic evaluated its facility requirements during 2001. During the second quarter of 2001, Harmonic recorded a charge of \$7.0 million for excess facility costs. In addition, during the third quarter of 2001, management committed to a plan to exit additional excess facilities and consolidate its operations, principally on Harmonic's Sunnyvale, California campus. The additional charge of \$23.1 million included \$14.8 million for excess facility lease costs and \$8.3 million for unrecoverable leasehold improvements. The total excess facilities charge of \$30.1 million was recorded to operating expenses. Harmonic incurred cash outlays of \$0.5 million in 2001 related to excess facilities. As of December 31, 2001, accrued liabilities for excess facilities that Harmonic does not intend to occupy, has exited or plans to exit in 2002 and does not expect to reoccupy totaled \$22.8 million. Harmonic expects to pay \$3.2 million of excess facility lease costs, net of estimated sublease income, in 2002 and to pay the remaining \$19.6 million, net of estimated sublease income, over the remaining lease terms of up to nine years. Harmonic plans to reassess this liability on a quarterly basis based on changes in the timing and amounts of expected sublease rental income.

As a result of the significant reduction in demand for its products, principally BAN division products, Harmonic recorded provisions of \$39.2 million during 2001 for excess and obsolete inventories in accordance with its policy and demand forecasts.

**Note 5: Cash Equivalents and Investments**

At December 31, 2001 and 2000, cash and money market accounts were \$36.0 million and \$13.5 million, respectively.

The following table summarizes the fair value of Harmonic's investments in securities as of December 31, 2001 and 2000, respectively.

	2001	2000
	(In thousands)	
U.S. government debt securities	\$ —	\$ 1,500
State, municipal and county government debt securities	—	34,111
Corporate debt securities	18,272	50,553
Total	\$18,272	\$86,164

The following table summarizes maturities of debt securities as of December 31, 2001:

	Fair Value
	(In thousands)
Less than one year	\$ 17,756
Due in 1 – 2 years	516
Total	\$ 18,272

## HARMONIC INC.

## NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

## Note 6: Balance Sheet Details

	December 31,	
	2001	2000
	(In thousands)	
Accounts receivable:		
Accounts receivable	\$ 41,642	\$ 69,724
Unbilled accounts receivable	1,355	4,922
	42,997	74,646
Less: allowance for doubtful accounts, returns and discounts	(8,595)	(6,920)
	<u>\$ 34,402</u>	<u>\$ 67,726</u>
Inventories:		
Raw materials	\$ 12,302	\$ 20,414
Work-in-process	3,920	13,000
Finished goods	14,722	46,777
	<u>\$ 30,944</u>	<u>\$ 80,191</u>
Property and equipment:		
Furniture and fixtures	\$ 7,449	\$ 4,041
Machinery and equipment	80,526	75,149
Leasehold improvements	25,927	16,409
	113,902	95,599
Less: accumulated depreciation and amortization	(68,147)	(48,233)
	<u>\$ 45,755</u>	<u>\$ 47,366</u>
Intangibles and other assets:		
Identified intangibles:		
Developed core technology	\$ 29,059	\$ 32,182
Assembled workforce	2,285	8,102
Customer base	33,295	37,791
Trademark and tradename	4,076	4,631
Supply agreement	3,107	3,530
	71,822	86,236
Goodwill	2,225	3,747
Other assets	836	1,366
	74,883	91,349
Less: accumulated amortization	(21,045)	(1,824)
	<u>\$ 53,838</u>	<u>\$ 89,525</u>
Accrued liabilities:		
Pre-merger and other taxes	\$ 25,503	\$ 14,338
Deferred revenue	6,579	15,033
Accrued compensation	6,533	9,278
Accrued warranty	4,073	3,256
Accrued excess facility costs	3,279	1,000
Customer deposits	2,308	7,695
Other	9,199	9,893
	<u>\$ 57,474</u>	<u>\$ 60,543</u>

## HARMONIC INC.

## NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

**Note 7: Net Income (Loss) Per Share**

The basic net income (loss) per share is computed by dividing the net income (loss) attributable to common stockholders for the period by the weighted average number of the common shares outstanding during the period. The diluted net loss per share is the same as the basic net loss per share for 2001 and 2000 because common equivalent shares and common shares issuable upon the exercise of stock options and warrants, are only considered when their effect would be dilutive. In 2001, 2000 and 1999, 4,901,394, 4,888,223, and 189,170 of weighted average antidilutive securities, including options and warrants, were excluded from the net income (loss) per share computations, respectively.

Following is a reconciliation of the numerators and denominators of the basic and diluted net income (loss) per share computations:

	2001	2000	1999
	(In thousands, except per share data)		
Net income (loss) (numerator)	\$(166,407)	\$(1,654,008)	\$23,680
Shares calculation (denominator):			
Weighted average shares outstanding — basic	58,540	48,564	28,290
Effect of Dilutive Securities:			
Potential Common Stock relating to stock options and warrants	—	—	2,677
Average shares outstanding — diluted	58,540	48,564	30,967
Net income (loss) per share — basic	\$ (2.84)	\$ (34.06)	\$ 0.84
Net income (loss) per share — diluted	\$ (2.84)	\$ (34.06)	\$ 0.76

**Note 8: Credit Facilities And Long-Term Debt**

Harmonic has a bank line of credit facility, which provides for borrowings up to \$10.0 million with a \$6.0 million secured equipment term loan sub-limit. The facility contains certain financial and other covenants, with which Harmonic was in compliance at December 31, 2001, and is available until April 2003. Borrowings pursuant to the line bear interest at the bank's prime rate (prime rate plus 2.0% – 3.0% under the equipment term loan) and are payable monthly, and are secured by Harmonic's assets. During 2001, Harmonic borrowed \$3.2 million under its equipment term loan, of which \$2.7 million was outstanding as of December 31, 2001. The term loan is payable monthly, and bears interest at 7.75% to 10.0% annually on outstanding borrowings which mature at various dates through June 2004. There were no other outstanding borrowings under the line as of December 31, 2001. Harmonic also has a facility which provides for the sale of trade receivables on a non-recourse basis up to \$12.5 million and expires in April 2003. Trade receivables sold under the facility are discounted based on the bank's prime rate plus 1.5% for North American customers and 2.0% for all other customers. Harmonic utilized \$6.8 million of the facility to sell qualifying trade receivables as of December 31, 2001.

**Note 9: Capital Stock**

*Stock Issuances.* During 2000, Harmonic issued approximately 26,400,000 shares of common stock for acquisition of the DiviCom business and approximately 286,000 shares of common stock for the acquisition of Cogent. See Note 2. In April 1999, Harmonic completed a public offering of 5,600,000 shares of common stock at a price of \$15.13 per share. Of these 5,600,000 shares, 4,000,000 shares were sold by Harmonic and 1,600,000 shares were sold by selling stockholders. An additional 100,000 shares were sold by Harmonic to the underwriters to cover over-allotments. Total net proceeds to Harmonic were approximately \$58.2 million, after underwriter discounts and commissions and

HARMONIC INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

expenses. The shares sold by selling stockholders included 1,440,000 shares held by Scientific-Atlanta, Inc. which acquired these shares upon the exercise of a warrant for which Harmonic received \$4.0 million.

*Stock Split.* Harmonic completed a two-for-one stock split, which was effected in the form of a stock dividend and distributed on October 14, 1999 payable to stockholders of record as of September 27, 1999. All references to share and per-share data for all periods presented have been adjusted to give effect to this two-for-one stock split.

**Note 10: Benefit and Compensation Plans**

*Stock Option Plans.* Harmonic has reserved 8,976,000 shares of Common Stock for issuance under various employee stock option plans. The options are granted for periods not exceeding ten years and generally vest 25% at one year from date of grant, and an additional 1/48 per month thereafter. Exercise prices of incentive stock option grants must be at least 100% of the fair market value of the stock at the date of grant, and for non-statutory stock options must be at least 85% of the fair market value of the stock at the date of grant.

*Director Option Plan.* Harmonic has reserved 100,000 shares of Common Stock for issuance under the 1995 Director Option Plan (the "Director Plan"). The Director Plan provides for the grant of non-statutory stock options to certain non-employee directors of Harmonic pursuant to an automatic, non-discretionary grant mechanism. Options are granted for at least 85% of the fair market value of the stock at the date of grant for periods not exceeding ten years and generally vest monthly over one year.

The following table summarizes activities under the Plans:

	Shares Available for Grant	Stock Options Outstanding	Weighted Average Exercise Price
(In thousands, except exercise price)			
Balance at December 31, 1998	532	4,246	\$ 5.80
Shares authorized	1,560	—	—
Options granted	(977)	977	30.76
Options exercised	—	(1,273)	4.80
Options canceled	205	(218)	9.04
Balance at December 31, 1999	1,320	3,732	12.48
Shares authorized	4,741	—	—
Options assumed in DiviCom acquisition	(2,703)	2,703	37.60
Options granted	(3,065)	3,065	24.29
Options exercised	—	(459)	5.95
Options canceled	458	(1,399)	33.22
Balance at December 31, 2000	751	7,642	22.73
Shares authorized	2,000	—	—
Options granted	(2,717)	2,717	9.06
Options exercised	—	(447)	5.50
Options canceled	1,777	(1,777)	19.72
Options expired	—	(970)	32.91
Balance at December 31, 2001	1,811	7,165	\$ 17.99

HARMONIC INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

The following table summarizes information regarding stock options outstanding at December 31, 2001:

Range of Exercise Prices	Stock Options Outstanding			Stock Options Exercisable	
	Number Outstanding at December 31, 2001	Weighted-Average Remaining Contractual Life (Years)	Weighted-Average Exercise Price	Number Exercisable at December 31, 2001	Weighted-Average Exercise Price
	(In thousands, except exercise price and life)				
\$ 0.23 – 5.75	997	5.8	\$ 4.40	595	\$ 3.82
5.88 – 8.81	938	6.5	7.49	692	7.41
8.85 – 11.50	1,972	8.7	9.49	268	10.37
11.55 – 23.56	1,950	8.4	21.76	681	22.15
23.75 – 39.17	840	7.5	28.59	493	28.05
39.24 – 121.68	468	8.1	69.10	269	67.87
	7,165	7.8	\$ 17.99	2,998	\$ 19.13

The weighted-average fair value of options granted was \$6.33, \$16.08 and \$18.79 for 2001, 2000, and 1999, respectively.

*Employee Stock Purchase Plan.* Harmonic has reserved 791,123 shares for issuance under the Employee Stock Purchase Plan (the "Purchase Plan"). The Purchase Plan enables employees to purchase shares at 85% of the fair market value of the Common Stock at the beginning or end of each offering period. Each offering period has a maximum duration of two years and consists of four six month purchase periods. Offering periods and purchase periods generally begin on January 1 and July 1 of each year. The Purchase Plan is intended to qualify as an "employee stock purchase plan" under Section 423 of the Internal Revenue Code. During 2001, 2000, and 1999, stock issued under the Purchase Plan was 813,181, 244,712, and 201,826 shares at weighted average prices of \$4.80, \$11.22, and \$5.27, respectively. The weighted-average fair value of each right to purchase shares of common stock granted under the Purchase Plan was \$6.30, \$16.44, and \$4.17, for 2001, 2000, and 1999, respectively.

As of December 31, 2001, based on employee participation rates and its stock price, Harmonic believes that it has insufficient shares reserved for issuance under its Purchase Plan to cover all expected purchases under offering periods that have commenced and which run through June 30, 2003. Although Harmonic has sufficient authorized shares to satisfy purchases during its current six month purchase period ending June 30, 2002, Harmonic believes that approximately 365,000 additional shares will be required to meet expected purchases under the six month purchase periods ending December 31, 2002 and June 30, 2003. The issuance of these additional shares requires board and stockholder approval. Harmonic expects to request stockholder approval in May 2002. If additional shares are authorized to be issued in relation to these purchase periods, stock-based compensation expense may result. Stock-based compensation expense will be remeasured quarterly, will be recognized as earned using the multiple option method, will fluctuate as the price per share of Harmonic common stock fluctuates and could be significant. Final measurement of any stock-based compensation expense will occur on the stock purchase date at the end of each six-month purchase period.

*Fair Value Disclosures.* Harmonic accounts for its stock-based compensation plans in accordance with the provisions of Accounting Principles Board Opinion No. 25. If compensation cost for Harmonic's stock-based compensation plans had been determined based on the fair value method at the grant dates, as

HARMONIC INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

prescribed in SFAS No. 123, the Company's net income (loss) and net income (loss) per share would have been as follows:

	2001	2000	1999
(In thousands, except per share data)			
Net income (loss):			
As reported	\$(166,407)	\$(1,654,008)	\$23,680
Pro forma	(188,297)	(1,668,565)	17,223
Basic net income (loss) per share:			
As reported	\$ (2.84)	\$ (34.06)	\$ 0.84
Pro forma	(3.22)	(34.36)	0.61
Diluted net income (loss) per share:			
As reported	\$ (2.84)	\$ (34.06)	\$ 0.76
Pro forma	(3.22)	(34.36)	0.56

The fair value of each option grant is estimated on the date of grant using the Black-Scholes option pricing model with the following weighted average assumptions:

	Employee Stock Options			Employee Stock Purchase Plan		
	2001	2000	1999	2001	2000	1999
Dividend yield	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Volatility	112%	101%	90%	142%	127%	90%
Risk-free interest rate	4.2%	6.2%	5.7%	3.9%	6.2%	5.5%
Expected life (years)	4	4	4	2	2	2

*Retirement/Savings Plan.* Harmonic has a retirement/savings plan which qualifies as a thrift plan under Section 401(k) of the Internal Revenue Code. This plan allows participants to contribute up to 20% of total compensation, subject to applicable Internal Revenue Service limitations. Harmonic makes discretionary contributions to the plan of \$0.25 per dollar contributed by eligible participants up to a maximum contribution per participant of \$750 per year.

**Note 11: Income Taxes**

The provision for (benefit from) income taxes consists of the following:

	December 31,		
	2001	2000	1999
(In thousands)			
Current:			
Federal	\$ —	\$ —	\$11,611
Foreign	2,000	450	351
State	—	—	1,409
	2,000	450	13,371
Deferred:			
Federal	(1,580)	(17,329)	(4,143)
Foreign	—	—	—
State	(1,226)	(1,692)	(1,335)
	(2,806)	(19,021)	(5,478)
	\$ (806)	\$(18,571)	\$ 7,893



HARMONIC INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

Harmonic's provision for (benefit from) income taxes differed from the amount computed by applying the statutory U.S. federal income tax rate to income (loss) before income taxes as follows:

	December 31,		
	2001	2000	1999
	(In thousands)		
Provision for (benefit from) at statutory rate	\$(58,395)	\$(585,403)	\$11,051
Differential (benefit) in rates on foreign earnings	6,324	514	(20)
State taxes, net of federal benefit	(10,782)	39	48
Foreign sales corporation benefit	—	—	(307)
Acquired in-process technology and non-deductible goodwill	791	567,192	106
Utilization of net operating loss carryovers	—	—	(597)
Utilization of research credits	—	—	(548)
Future benefits not currently recognized	—	—	508
Realized deferred tax assets previously reserved	—	—	(3,249)
Valuation allowance	63,026	—	901
Others	(1,770)	(913)	—
Net provision for (benefit from) income taxes	\$ (806)	\$ (18,571)	\$ 7,893

Deferred tax assets (liabilities) comprise the following:

	December 31,		
	2001	2000	1999
	(In thousands)		
Deferred tax assets:			
Reserves and accruals	\$ 42,934	\$ —	\$ 332
Net operating loss carryovers	26,892	1,582	—
Depreciation and amortization	4,312	—	—
Research and development credit carryovers	2,265	—	—
Capitalized research and development costs	—	—	283
Other	7,716	28,924	4,863
Total deferred tax assets	84,119	30,506	5,478
Valuation allowance	(63,026)	—	—
Net deferred tax assets	21,093	30,506	5,478
Deferred tax liabilities:			
Intangibles	(21,093)	(35,215)	—
Total deferred tax liabilities	(21,093)	(35,215)	—
Net deferred tax assets (liabilities)	\$ —	\$ (4,709)	\$5,478

As of December 31, 2001, Harmonic had approximately \$70.8 million and \$36.7 million of net operating loss carryovers for federal and state tax reporting purposes, respectively, to offset future taxable income; such federal and state carryovers will expire in 2021 and 2006, respectively.

Harmonic has provided a valuation allowance for the full amount of its net deferred tax assets since realization of any future benefit from deductible temporary differences, net operating loss and tax credit carry forwards is uncertain at December 31, 2001.

**HARMONIC INC.****NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)**

Under the terms of the merger agreement with C-Cube, Harmonic is generally liable for C-Cube's pre-merger tax liabilities. Approximately \$21 million of pre-merger tax liabilities remain outstanding and Harmonic expects final settlement, and payment, of these obligations to a variety of taxing authorities and LSI Logic during 2002. These amounts have been included in accrued liabilities.

**Note 12: Segment Information**

Operating segments are defined as components of an enterprise that engage in business activities for which separate financial information is available and evaluated by the chief operating decision maker. Prior to the acquisition of the DiviCom business, Harmonic was organized as one operating segment ("Pre-Merger Harmonic"). On May 3, 2000, Harmonic completed the acquisition of the DiviCom business, thus changing its organizational structure. The merged company has been organized into two operating segments: Broadband Access Networks, or BAN, for fiber optic systems, and Convergent Systems, or CS, for digital headend systems. These segments do not correspond to the pre-merger companies in significant ways. For example, some of Harmonic's product lines are now part of the CS segment. Each of these operating segments require their own development and marketing strategies and therefore have separate management teams, with a worldwide sales and professional services and systems support organization supporting both divisions.

The results of the reportable segments are derived directly from Harmonic's management reporting system. These results reported below are based on Harmonic's method of internal reporting and are not necessarily in conformity with generally accepted accounting principles. Subsequent to the acquisition of DiviCom, management commenced measuring the performance of each segment based on several metrics, including revenue, and income or loss from operations. These results are used, in part, to evaluate the performance of, and allocate resources to each of the segments. Revenue for the periods prior to May 3, 2000 has been reclassified to reflect the new organizational structure. The reclassified revenue for the prior periods reflects only Harmonic's revenue, and not the historical revenue of the DiviCom business prior to its acquisition. However, income or loss from operations is not available and is impractical to prepare for the periods prior to the quarter ended June 30, 2000, and accordingly, has not been presented. Pre-merger Harmonic income from operations reflects Harmonic's net income for the three month period ended March 31, 2000. Net income or loss, and assets and liabilities are not internally reported by business segment.

*Segment Sales and Profit:*

	Year Ended December 31,		
	2001	2000	1999
	(In thousands)		
Net Sales:			
Broadband Access Networks	\$ 74,772	\$175,111	\$174,675
Convergent Systems	129,038	87,935	9,400
Total net sales	\$203,810	\$263,046	\$184,075

HARMONIC INC.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

	Year Ended December 31,	
	2001	2000
Loss from segment operations:		
Broadband Access Networks	\$ (60,103)	\$ (4,367)
Convergent Systems	(36,254)	(25,139)
Pre-Merger Harmonic	—	13,999
Loss from segment operations	(96,357)	(15,507)
Impairment of goodwill and other intangibles	—	(1,380,328)
Amortization of goodwill and other intangibles	(20,741)	(234,407)
Acquired in-process technology	—	(39,800)
Interest and other income, net	1,575	10,456
Corporate and unallocated income and expense, and eliminations	(51,690)	(12,993)
Loss before income taxes	<u>\$(167,213)</u>	<u>\$(1,672,579)</u>

*Geographic Information:*

	Year Ended December 31,		
	2001	2000	1999
	(In thousands)		
Net sales:			
United States	\$121,479	\$167,077	\$129,028
Foreign countries	82,331	95,969	55,047
Total	<u>\$203,810</u>	<u>\$263,046</u>	<u>\$184,075</u>
Property, equipment and intangibles:			
United States	\$ 96,472	\$131,746	
Foreign countries	2,285	3,779	
Total	<u>\$ 98,757</u>	<u>\$135,525</u>	

*Major Customers*

To date, a substantial majority of Harmonic's net sales have been to relatively few customers, and Harmonic expects this customer concentration to continue in the foreseeable future. In 2001, sales to DirecTV and Charter Communications accounted for 13% and 11% of net sales, respectively. In 2000, sales to AT&T Broadband accounted for 12% of net sales compared to 41% in 1999 respectively. In addition, in 2000, RCN represented 11% of net sales.

**Note 13: Commitments and Contingencies**

*Commitments — Facilities Leases.* Harmonic leases its facilities under noncancelable operating leases which expire at various dates through September 2010. Total rent expense related to these operating leases

## HARMONIC INC.

## NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)

was \$10,513,000, \$5,802,000, and \$1,647,000, for 2001, 2000 and 1999, respectively. Future minimum lease payments under noncancelable operating leases at December 31, 2001, are as follows (in thousands):

2002	\$ 9,604
2003	10,552
2004	10,383
2005	10,513
2006	10,983
Thereafter	47,183
	<hr/>
	\$99,218

As of December 31, 2001 \$22.8 million of these minimum lease payments were provided for as accrued excess facility costs. Sublease income was not material in 2001. See Note 4.

*Commitments — Royalties.* Harmonic has obtained research and development grants under various Israeli government programs that require the payment of royalties on sales of certain products resulting from such research. During 2001, 2000 and 1999 royalty expenses were not material to results of operations.

*Commitments — Contingencies.* Harmonic's industry is characterized by the existence of a large number of patents and frequent claims and related litigation regarding patent and other intellectual property rights. In particular, leading companies in the telecommunications industry have extensive patent portfolios. From time to time, third parties, including these leading companies, have asserted and may assert exclusive patent, copyright, trademark and other intellectual property rights against us or our customers. Such assertions and claims arise in the normal course of our operations. The resolution of assertions and claims cannot be predicted with certainty. Management believes that the final outcome of such matters would not have a materially adverse effect on Harmonic's business, operating results, financial position and liquidity.

**Note 14: Legal Proceedings**

Between June 28 and August 25, 2000, several actions alleging violations of the federal securities laws by Harmonic and certain of its officers and directors (some of whom are no longer with Harmonic) were filed in or removed to the United States District Court for the Northern District of California. The actions subsequently were consolidated.

A consolidated complaint, filed on December 7, 2000, was brought on behalf of a purported class of persons who purchased Harmonic's publicly traded securities between January 19 and June 26, 2000. The complaint also alleged claims on behalf of a purported subclass of persons who purchased C-Cube securities between January 19 and May 3, 2000. In addition to Harmonic and certain of its officers and directors, the complaint also named C-Cube Microsystems Inc. and several of its officers and directors as defendants. The complaint alleged that, by making false or misleading statements regarding Harmonic's prospects and customers and its acquisition of C-Cube, certain defendants violated sections 10(b) and 20(a) of the Securities Exchange Act of 1934. The complaint also alleged that certain defendants violated section 14(a) of the Exchange Act and sections 11, 12(a)(2), and 15 of the Securities Act of 1933 by filing a false or misleading registration statement, prospectus, and joint proxy in connection with the C-Cube acquisition.

On July 3, 2001, the Court dismissed the consolidated complaint with leave to amend. An amended complaint alleging the same claims against the same defendants was filed on August 13, 2001. Defendants moved to dismiss the amended complaint on September 24, 2001. Pursuant to the Court's July 3, 2001 order, no hearing on the motions will be held unless the Court sets one.

**HARMONIC INC.**

**NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (Continued)**

A derivative action purporting to be on behalf of Harmonic was filed against its then-current directors in the Superior Court for the County of Santa Clara on September 5, 2000. Harmonic also was named as a nominal defendant. The complaint is based on allegations similar to those found in the securities class actions and claims that the defendants breached their fiduciary duties by, among other things, causing Harmonic to violate federal securities laws. The derivative action was removed to the United States District Court for the Northern District of California on September 20, 2000. All deadlines in this action have been stayed pending resolution of the motions to dismiss the securities actions. A case management conference is scheduled for April 5, 2002.

Based on its review of the complaints filed in the securities class action, Harmonic believes that it has meritorious defenses and intends to defend itself vigorously. There can be no assurance, however, that Harmonic will prevail. An unfavorable outcome of this litigation could have a material adverse effect on Harmonic's business, operating results, financial position and liquidity.

In November 2001, Harmonic was sued in Tennessee state court by a company alleging breach of contract and breach of a Tennessee statute relating to retailers and suppliers. The suit has a claim for \$2.5 million and other unspecified damages, lost profits and attorneys' fees. The suit has since been removed to Federal Court and a trial date has been set for June 2003. Harmonic believes that it has meritorious defenses and will defend the suit vigorously. However, Harmonic cannot assure you that an unfavorable outcome will not adversely impact our business, operating results, financial position and liquidity.

### PART III

Certain information required by Part III is omitted from this Report on Form 10-K in that the Registrant will file its definitive Proxy Statement for its Annual Meeting of Stockholders to be held on May 17, 2002, pursuant to Regulation 14A of the Securities Exchange Act of 1934, as amended (the "2002 Proxy Statement"), not later than 120 days after the end of the fiscal year covered by this Report, and certain information included in the Proxy Statement is incorporated herein by reference.

#### **Item 10. Directors and Executive Officers of the Registrant**

(a) *Executive Officers* — See the section entitled "Executive Officers" in Part I, Item 1 hereof.

(b) *Directors* — The information required by this Item is incorporated by reference to the section entitled "Election of Directors" in the 2002 Proxy Statement.

#### **Item 11. Executive Compensation**

The information required by this Item is included in the 2002 Proxy Statement under the caption "Executive Compensation" and is incorporated herein.

#### **Item 12. Security Ownership of Certain Beneficial Owners and Management**

Information related to security ownership of certain beneficial owners and security ownership of management is set forth in the 2002 Proxy Statement under the caption "Security Ownership of Certain Beneficial Owners and Management" and is incorporated herein by reference.

#### **Item 13. Certain Relationships and Transactions**

Not applicable.

### PART IV

#### **Item 14. Exhibits, Financial Statement Schedules and Reports on Form 8-K**

(a)(1) Financial Statements. See Index to Financial Statements at Item 8 on page 36 of this Report:

(a)(2) Financial Statement Schedules. The following are filed as part of this annual report on Form 10-K:

- Financial Statement Schedule II — Valuation and Qualifying Accounts and Reserves.

All other financial statement schedules have been omitted because the information is not required to be set forth herein, is not applicable or is included in the financial statements or notes thereto.

**Schedule II**

**Valuation and Qualifying Accounts and Reserves**

**Allowance for Doubtful Accounts, Returns and Discounts**

	<b>Balance at Beginning of Period</b>	<b>Charges to Revenue</b>	<b>Charges to Expense</b>	<b>Deduction from Reserves</b>	<b>Balance at End of Period</b>
			(In thousands)		
2001	6,920	9,776	3,988	(12,089)	8,595
2000	1,529	14,816	250	(9,675)	6,920
1999	1,152	297	80	—	1,529

(a)(3) Exhibits. The documents listed on the Exhibit Index of this Report are filed herewith. Copies of the exhibits listed in the Exhibit Index will be furnished, upon request, to holders or beneficial owners of Harmonic's Common Stock.

(b) Reports on Form 8-K.

None.





## EXHIBIT INDEX

The following Exhibits to this report are filed herewith, or if marked with a (i), (ii), (iii), (iv), (v), (vi), (vii), (viii), or (ix) are incorporated herein by reference.

Exhibit Number	
2.1(ix)	Agreement and Plan of Merger and Reorganization by and among C-Cube Microsystems, Inc. and Harmonic Inc. dated October 27, 1999.
3.1	Certificate of Incorporation of Registrant as amended.
3.2	Bylaws of Registrant as amended.
4.1(i)	Form of Common Stock Certificate.
10.1(i)†	Form of Indemnification Agreement.
10.2(i)†	1988 Stock Option Plan and form of Stock Option Agreement.
10.3(i)†	1995 Stock Plan and form of Stock Option Agreement.
10.4(i)†	1995 Employee Stock Purchase Plan and form of Subscription Agreement.
10.5(i)†	1995 Director Option Plan and form of Director Option Agreement.
10.6(i)	Registration and Participation Rights and Modification Agreement dated as of July 22, 1994 among Registrant and certain holders of Registrant's Common Stock.
10.7(i)	Distributor Agreement dated June 15, 1994 by and between Registrant and Scientific-Atlanta, Inc.
10.8(i)	Warrant to purchase Common Stock of Registrant issued to Scientific-Atlanta, Inc. on June 15, 1994.
10.10(i)	Warrant to purchase Series D Preferred Stock of Registrant issued to Comdisco, Inc. on February 10, 1993.
10.14(ii)	Business Loan Agreement, Commercial Security Agreement and Promissory Note dated August 26, 1993, as amended on September 14, 1995, between Registrant and Silicon Valley Bank.
10.15(ii)	Facility lease dated as of January 12, 1996 by and between Eastrich No. 137 Corporation and Company.
10.16(iv)	Amended and Restated Loan and Security Agreement dated December 24, 1997 between Registrant and Silicon Valley Bank.
10.17(iii)†	Change of Control Severance Agreement dated March 27, 1997 between Registrant and Anthony J. Ley.
10.18(iii)†	Form of Change of Control Severance Agreement between Registrant and certain executive officers of Registrant.
10.19(iv)	Stock Purchase Agreement, dated September 16, 1997 among Registrant, N.M. New Media Communication Ltd., ("NMC") and Sellers of NMC.
10.20(v)	First Amendment to Stock Purchase Agreement, dated November 25, 1997 among Registrant, N.M. New Media Communication Ltd., ("NMC") and Sellers of NMC.
10.21(vi)	Registration Rights Agreement dated as of January 5, 1998 by and among the Registrant and the persons and entities listed on Schedule A thereto (the "NMC Shareholders").
10.22(vii)	Second Amended and Restated Loan and Security Agreement dated March 5, 1999 between Registrant and Silicon Valley Bank.
10.23(viii)	1997 Nonstatutory Stock Option Plan.
10.24(x)†	1999 Nonstatutory Stock Option Plan
10.25(x)	Amendment to Second Amended and Restated Loan and Security Agreement dated March 5, 1999, as amended June 10, 1999 and March 24, 2000, between Registrant and Silicon Valley Bank.
10.26(xi)	Lease Agreement for 603-611 Baltic Way, Sunnyvale, California.
10.27(xi)	Lease Agreement for 1322 Crossman Avenue, Sunnyvale, California.
10.28(xi)	Lease Agreement for 646 Caribbean Drive, Sunnyvale, California.
10.29(xi)	Lease Agreement for 632 Caribbean Drive, Sunnyvale, California.

## Table of Contents

<b>Exhibit Number</b>	
10.30(xi)	First Amendment to the Lease Agreement for 549 Baltic Way, Sunnyvale, California.
10.31	Amendment to Second Amended and Restated Loan and Security Agreement dated March 5, 1999, as amended June 10, 1999, March 24, 2000 and August 10, 2001 between Registrant and Silicon Valley Bank.
10.32	Restated Non-Recourse Receivables Purchase Agreement dated September 25, 2001 between Registrant and Silicon Valley Bank.
10.33	Modification to the Restated Non-Recourse Receivables Purchase Agreement dated September 25, 2001, as amended December 14, 2001 between Registrant and Silicon Valley Bank.
10.34	Amendment to Second Amended and Restated Loan and Security Agreement dated March 5, 1999, as amended June 10, 1999, March 24, 2000, August 10, 2001 and December 17, 2001 between Registrant and Silicon Valley Bank.
21.1	Subsidiaries of Registrant.
23.1	Consent of Independent Accountants.
24.1	Power of Attorney (see page 63).

- (i) Previously filed as an Exhibit to the Company's Registration Statement on Form S-1 No. 33-90752.
- (ii) Previously filed as an Exhibit to the Company's 10-K for the year ended December 31, 1995.
- (iii) Previously filed as an Exhibit to the Company's 10-K for the year ended December 31, 1996.
- (iv) Previously filed as an Exhibit to the Company's Current Report on 8-K dated September 29, 1997.
- (v) Previously filed as an Exhibit to the Company's Current Report on 8-K dated January 6, 1998.
- (vi) Previously filed as an Exhibit to the Company's Registration Statement on Form S-3 dated January 8, 1998.
- (vii) Previously filed as an Exhibit to the Company's 10-K for the year ended December 31, 1998 and as amended on April 7, 1999, February 23, 2000 and March 10, 2000.
- (viii) Previously filed as an Exhibit to the Company's Registration Statement on Form S-8 dated January 14, 1998.
- (ix) Previously filed as an Exhibit to the Company's current Report on Form 8-K dated November 1, 1999.
- (x) Previously filed as an Exhibit to the Company's Form 10-K for the year ended December 31, 1999.
- (xi) Previously filed as an Exhibit to the Company's Amendment to Quarterly Report on Form 10-Q/A for the quarter ended June 30, 2000.
- † Management Contract or Compensatory Plan or Arrangement required to be filed as an exhibit to this report on Form 10-K.
- \* Previously filed.

STATE OF DELAWARE  
SECRETARY OF STATE  
DIVISION OF CORPORATIONS  
FILED 11:00 AM 05/03/2000  
001224973 - 2493974

CERTIFICATE OF AMENDMENT  
OF THE  
RESTATED CERTIFICATE OF INCORPORATION  
OF  
HARMONIC INC.

The undersigned, Anthony J. Ley, does hereby certify that:

- 1. He is the President of Harmonic Inc., a Delaware corporation (the "Corporation");
- 2. The Restated Certificate of Incorporation of the Corporation is hereby amended by striking out the first paragraph of Article IV thereof and substituting in lieu of said paragraph the following new paragraph:

"The Corporation is authorized to issue two classes of stock to be designated, respectively, Preferred Stock, par value \$0.001 per share ("Preferred Stock"), and Common Stock, par value \$0.001 per share ("Common Stock"). The total number of shares of Preferred Stock that the Corporation shall have authority to issue is 5,000,000. The total number of shares of Common Stock that the Corporation shall have authority to issue is 150,000,000."

- 3. The amendment of the Certificate of Incorporation herein certified has been duly adopted in accordance with the provisions of Section 242 of the General Corporation law of the State of Delaware.

IN WITNESS WHEREOF, the Corporation has caused this Certificate of Amendment of the Restated Certificate of Incorporation to be signed by its President, on this 3rd day of May, 2000.

HARMONIC INC.

By: /s/ ANTHONY J. LEY  
-----  
ANTHONY J. LEY  
President & Chief Executive  
Officer

STATE OF DELAWARE  
SECRETARY OF STATE  
DIVISION OF CORPORATIONS  
FILED 12:00 PM 05/30/1995  
950118401 - 2493974

RESTATED CERTIFICATE OF INCORPORATION  
OF  
HARMONIC LIGHTWAVES, INC.

The following Restated Certificate of Incorporation of Harmonic Lightwaves, Inc. (the "Corporation") (i) amends and restates the provisions of the Certificate of Incorporation of Harmonic Lightwaves, Inc. originally filed with the Secretary of State of the State of Delaware on March 29, 1995, and (ii) supersedes the original Certificate of Incorporation and all prior amendments and restatements thereto (if any) in their entirety.

The name of this corporation is Harmonic Lightwaves, Inc. (the "Corporation").

## ARTICLE II

The address of the Corporation's registered office in the State of Delaware is Corporation Trust Center, 1209 Orange Street, Wilmington, Delaware 19801, County of New Castle. The name of its registered agent at such address is The Corporation Trust Company.

## ARTICLE III

The purpose of the Corporation is to engage in any lawful act or activity for which corporations may be organized under the General Corporation Law of Delaware.

## ARTICLE IV

The Corporation is authorized to issue two classes of stock to be designated, respectively, Preferred Stock, par value \$0.001 per share ("Preferred Stock"), and Common Stock, par value \$0.001 per share ("Common Stock"). The total number of shares of Preferred Stock that the Corporation shall have authority to issue is 5,000,000. The total number of shares of Common Stock that the Corporation shall have authority to issue is 50,000,000.

The Preferred Stock may be issued from time to time in one or more series. The Board of Directors is hereby authorized, subject to limitations prescribed by law and the provisions of this article IV, to fix by resolution or resolutions the designations, powers, preferences and rights of the shares of each such series and the qualifications, limitations or restrictions thereof.

The authority of the Board with respect to each series shall include, but not be limited to, determination of the following:

A. The number of shares constituting that series and the distinctive designation of that series.

B. The dividend rate on the shares of that series, whether dividends shall be cumulative, and, if so, from which date or dates, and the relative rights of priority, if any, of payment of dividends on shares of that series.

C. Whether that series shall have the voting rights in addition to the voting rights provided by law, and, if so, the terms of such voting rights.

D. Whether that series shall have conversion privileges, and, if so, the terms and conditions of such privileges, including provision for adjustment of the conversion rate in such events as the Board of Directors shall determine.

E. Whether or not the shares of that series shall be redeemable, and, if so, the terms and conditions of such redemption, including the date or dates upon or after which they shall be redeemable, and the amount per share payable in case of redemption, which amount may vary under different conditions and at different redemption rates.

F. Whether that series shall have a sinking fund for the redemption or purchase of shares of that series, and, if so, the terms and the amount of such sinking funds.

G. The rights of the shares of that series in the event of voluntary or involuntary liquidation, dissolution or winding up of the Corporation, and the relative rights of priority, if any, of payment of shares of that series.

H. Any other relative rights, preferences and limitations of that series.

The Board of Directors is further authorized to increase (but not above the total number of authorized shares of the class) or decrease (but not below the number of shares of any such series then outstanding) the number of shares of any series, the number of which was fixed by it, subsequent to the issue of shares of such series then outstanding, subject to the powers, preferences and

rights, and the qualifications, limitations and restrictions thereof stated in the resolution of the Board of Directors originally fixing the number of shares of such series. If the number of shares of any series is so decreased, then the shares constituting such decrease shall resume the status which they had prior to the adoption of the resolution originally fixing the number of shares of such series.

#### ARTICLE V

The Corporation is to have perpetual existence.

#### ARTICLE VI

A. The management of the business and the conduct of the affairs of the Corporation shall be vested in its Board of Directors. The number of directors which shall constitute the whole Board of Directors shall be designated in the Bylaws of the Corporation.

B. In furtherance and not in limitation of the powers conferred by the laws of the State of Delaware, the Board of Directors is expressly authorized to adopt, alter, amend or repeal the Bylaws of the Corporation.

C. The directors of the Corporation need not be elected by written ballot unless a stockholder demands election by written ballot at a meeting of stockholders and before voting begins or unless the Bylaws of the Corporation so provide.

-2-

D. At the election of directors of the Corporation, each holder of Common Stock shall be entitled to one vote for each share held. No stockholder will be permitted to cumulate votes at any election of directors.

#### ARTICLE VII

A. To the fullest extent permitted by the Delaware General Corporation Law as the same exists or as may hereafter be amended, no director of the Corporation shall be personally liable to the Corporation or its stockholders for monetary damages for breach of fiduciary duty as a director.

B. The Corporation may indemnify to the fullest extent permitted by law any person made or threatened to be made a party to an action or proceeding, whether criminal, civil, administrative or investigative, by reason of the fact that he, his testator or intestate is or was a director, officer or employee of the Corporation or any predecessor of the Corporation or serves or served at any other enterprise as a director, officer or employee at the request of the Corporation or any predecessor to the Corporation.

C. Neither any amendment nor repeal of this Article VII, nor the adoption of any provision of the Corporation's Certificate of Incorporation inconsistent with this Article VII, shall eliminate or reduce the effect of this Article VII, in respect of any matter occurring, or any action, suit, claim or proceeding accruing or arising or that, but for this Article VII, would accrue or arise, prior to such amendment, repeal, or adoption of an inconsistent provision.

#### ARTICLE VIII

Meetings of stockholders may be held within or without the State of Delaware, as the Bylaws may provide. The books of the Corporation may be kept (subject to any provision contained in the laws of the State of Delaware) outside of the State of Delaware at such place or places as may be designated from time to time by the Board of Directors or in the Bylaws of the Corporation.

#### ARTICLE IX

The Corporation reserves the right to amend, alter, change or repeal any provision contained in this Certificate of Incorporation, in the manner now or hereafter prescribed by the laws of the State of Delaware, and all rights conferred herein are granted subject to this reservation.

The Restated Certificate of Incorporation has been duly adopted by the

stockholders of the Corporation in accordance with the provisions of Sections 242 and 245 of the General Corporation Law of the State of Delaware, as amended.

IN WITNESS WHEREOF, the undersigned have executed this certificate on May 30, 1995.

/s/ ANTHONY J. LEY  
-----  
Anthony J. Ley, President

/s/ JEFFREY D. SAPER  
-----  
Jeffrey D. Saper, Secretary

-3-

The undersigned certify under penalty of perjury that they have read the foregoing Restated Certificate of Incorporation and know the contents thereof, and that the statements therein are true.

Executed at Palo Alto, California on May 30, 1995.

/s/ ANTHONY J. LEY  
-----  
Anthony J. Ley, President

/s/ JEFFREY D. SAPER  
-----  
Jeffrey D. Saper, Secretary

CERTIFICATE OF ADOPTION OF BYLAWS  
OF  
HARMONIC INC.

ADOPTION BY SOLE INCORPORATOR

The undersigned person appointed in the certificate of incorporation to act as the sole incorporator of Harmonic Inc. hereby adopts the foregoing bylaws as the Bylaws of the corporation.

Executed this 18th day of March, 1999.

/s/ ROBERT G. DAY

-----  
Robert G. Day, Sole Incorporator

CERTIFICATE BY SECRETARY OF ADOPTION BY SOLE INCORPORATOR

The undersigned hereby certifies that he is the duly elected qualified, and acting Secretary of Harmonic Inc. and that the foregoing Bylaws, comprising nineteen (19) pages, were adopted as the Bylaws of the corporation on March 18, 1999, by the person appointed in the certificate of incorporation to act as the sole incorporator of the corporation.

/s/ ROBERT G. DAY

-----  
Robert G. Day, Secretary

CERTIFICATE OF AMENDMENT  
OF BYLAWS OF  
HARMONIC LIGHTWAVES, INC.

The undersigned, being an Assistant Secretary of Harmonic Lightwaves, Inc., a Delaware corporation, hereby certifies as follows:

1. That the first sentence of Section 3.2 of Article III of the Bylaws of the corporation is hereby amended to read in its entirety as follows:

"The board of directors shall consist of six (6) members."

2. The amendment was adopted by the stockholders of the corporation at the Annual Meeting of Stockholders held on April 30, 1997.

Dated: April 30, 1997

/s/ PATRICK J. SCHULTHEIS

-----  
Patrick J. Schultheis,  
Assistant Secretary

BYLAWS  
OF  
HARMONIC LIGHTWAVES, INC.  
(A DELAWARE CORPORATION)

HARMONIC LIGHTWAVES, INC.  
(a Delaware corporation)

TABLE OF CONTENTS

	Page
	----
ARTICLE I - CORPORATE OFFICES.....	1
1.1 REGISTERED OFFICE.....	1
1.2 OTHER OFFICES.....	1
ARTICLE II - MEETINGS OF STOCKHOLDERS.....	1
2.1 PLACE OF MEETINGS.....	1
2.2 ANNUAL MEETING.....	1
2.3 SPECIAL MEETING.....	1
2.4 NOTICE OF STOCKHOLDERS' MEETINGS.....	2
2.5 ADVANCE NOTICE OF STOCKHOLDER NOMINEES AND STOCKHOLDER BUSINESS.....	2
2.6 MANNER OF GIVING NOTICE; AFFIDAVIT OF NOTICE.....	3
2.7 QUORUM.....	3
2.8 ADJOURNED MEETING; NOTICE.....	4
2.9 VOTING.....	4
2.10 VALIDATION OF MEETINGS; WAIVER OF NOTICE; CONSENT.....	4
2.11 STOCKHOLDER ACTION BY WRITTEN CONSENT WITHOUT A MEETING.....	5
2.12 RECORD DATE FOR STOCKHOLDER NOTICE; VOTING.....	5
2.13 PROXIES.....	6
2.14 ORGANIZATION.....	6
2.15 LIST OF STOCKHOLDERS ENTITLED TO VOTE.....	6
2.16 INSPECTORS OF ELECTION.....	6
ARTICLE III - DIRECTORS.....	7
3.1 POWERS.....	7
3.2 NUMBER OF DIRECTORS.....	7
3.3 ELECTION AND TERM OF OFFICE OF DIRECTORS.....	7
3.4 RESIGNATION AND VACANCIES.....	7
3.5 REMOVAL OF DIRECTORS.....	8
3.6 PLACE OF MEETINGS; MEETINGS BY TELEPHONE.....	8
3.7 FIRST MEETINGS.....	9
3.8 REGULAR MEETINGS.....	9
3.9 SPECIAL MEETINGS; NOTICE.....	9
3.10 QUORUM.....	10
3.11 WAIVER OF NOTICE.....	10
3.12 ADJOURNMENT.....	10
3.13 NOTICE OF ADJOURNMENT.....	10
3.14 BOARD ACTION BY WRITTEN CONSENT WITHOUT A MEETING.....	10

-i-

TABLE OF CONTENTS

(Continued)

	PAGE
	----
3.15 FEES AND COMPENSATION OF DIRECTORS.....	10
3.16 APPROVAL OF LOANS TO OFFICERS.....	10
3.17 SOLE DIRECTOR PROVIDED BY CERTIFICATE OF INCORPORATION.....	11
ARTICLE IV - COMMITTEES.....	11
4.1 COMMITTEES OF DIRECTORS.....	11
4.2 MEETINGS AND ACTION OF COMMITTEES.....	11
4.3 COMMITTEE MINUTES.....	12
ARTICLE V - OFFICERS.....	12
5.1 OFFICERS.....	12



5.2	ELECTION OF OFFICERS.....	12
5.3	SUBORDINATE OFFICERS.....	12
5.4	REMOVAL AND RESIGNATION OF OFFICERS.....	12
5.5	VACANCIES IN OFFICES.....	13
5.6	CHAIRMAN OF THE BOARD.....	13
5.7	PRESIDENT.....	13
5.8	VICE PRESIDENTS.....	13
5.9	SECRETARY.....	13
5.10	CHIEF FINANCIAL OFFICER.....	14
5.11	ASSISTANT SECRETARY.....	14
5.12	ADMINISTRATIVE OFFICERS.....	14
5.13	AUTHORITY AND DUTIES OF OFFICERS.....	15
ARTICLE VI - INDEMNIFICATION OF DIRECTORS, OFFICERS, EMPLOYEES AND OTHER AGENTS.....		15
6.1	INDEMNIFICATION OF DIRECTORS AND OFFICERS.....	15
6.2	INDEMNIFICATION OF OTHERS.....	15
6.3	INSURANCE.....	16
ARTICLE VII - RECORDS AND REPORTS.....		16
7.1	MAINTENANCE AND INSPECTION OF RECORDS.....	16
7.2	INSPECTION BY DIRECTORS.....	16
7.3	ANNUAL STATEMENT TO STOCKHOLDERS.....	16
7.4	REPRESENTATION OF SHARES OF OTHER CORPORATIONS.....	17
7.5	CERTIFICATION AND INSPECTION OF BYLAWS.....	17
ARTICLE VIII - GENERAL MATTERS.....		17
8.1	RECORD DATE FOR PURPOSES OTHER THAN NOTICE AND VOTING.....	17
8.2	CHECKS; DRAFTS; EVIDENCES OF INDEBTEDNESS.....	17
8.3	CORPORATE CONTRACTS AND INSTRUMENTS: HOW EXECUTED.....	17

-ii-

TABLE OF CONTENTS  
(Continued)

	PAGE
	----
8.4	STOCK CERTIFICATES; TRANSFER; PARTLY PAID SHARES..... 18
8.5	SPECIAL DESIGNATION ON CERTIFICATES..... 18
8.6	LOST CERTIFICATES..... 19
8.7	TRANSFER AGENTS AND REGISTRARS..... 19
8.8	CONSTRUCTION; DEFINITIONS..... 19
ARTICLE IX - AMENDMENTS..... 19	
ARTICLE X - DISSOLUTION..... 19	
ARTICLE XI - CUSTODIAN..... 20	
11.1	APPOINTMENT OF A CUSTODIAN IN CERTAIN CASES..... 20
11.2	DUTIES OF CUSTODIAN..... 20

-iii-

BYLAWS  
OF  
HARMONIC LIGHTWAVES, INC.  
(a Delaware corporation)

ARTICLE I

## CORPORATE OFFICES

### 1.1 REGISTERED OFFICE

The registered office of the corporation shall be fixed in the certificate of incorporation of the corporation.

### 1.2 OTHER OFFICES

The board of directors may at any time establish branch or subordinate offices at any place or places where the corporation is qualified to do business.

## ARTICLE II

### MEETING OF STOCKHOLDERS

#### 2.1 PLACE OF MEETINGS

Meetings of stockholders shall be held at any place within or outside the State of Delaware designated by the board of directors. In the absence of any such designation, stockholders' meetings shall be held at the principal executive office of the corporation.

#### 2.2 ANNUAL MEETING

The annual meeting of stockholders shall be held each year on a date and at a time designated by the board of directors. In the absence of such designation, the annual meeting of stockholders shall be held on the first Tuesday in May in each year at 9:00 a.m. However, if such day falls on a legal holiday, then the meeting shall be held at the same time and place on the next succeeding full business day. At the meeting, directors shall be elected, and any other proper business may be transacted.

#### 2.3 SPECIAL MEETING

A special meeting of the stockholders may be called at any time by the board of directors, or by the chairman of the board, or by the president, or by one or more stockholders holding shares in the aggregate entitled to cast not less than ten percent (10%) of the votes of all shares of stock owned by stockholders entitled to vote at that meeting.

If a special meeting is called by any person or persons other than the board of directors or the president or the chairman of the board, then the request shall be in writing, specifying the time of such meeting and the general nature of the business proposed to be transacted, and shall be delivered personally or sent by registered mail or by telegraphic or other facsimile transmission to the chairman of the board, the president, or the secretary of the corporation. No business may be transacted at such special meeting otherwise than specified in such notice. The

officer receiving the request shall cause notice to be promptly given to the stockholders entitled to vote, in accordance with the provisions of Sections 2.4 and 2.6 of these bylaws, that a meeting will be held at the time requested by the person or persons calling the meeting, so long as that time is not less than thirty-five (35) nor more than sixty (60) days after the receipt of the request. If the notice is not given within twenty (20) days after receipt of the request, then the person or persons requesting the meeting may give the notice. Nothing contained in this paragraph of this Section 2.3 shall be construed as limiting, fixing or affecting the time when a meeting of stockholders called by action of the board of directors may be held.

#### 2.4 NOTICE OF STOCKHOLDERS' MEETINGS

All notices of meetings of stockholders shall be sent or otherwise given in accordance with Section 2.5 of these bylaws not less than ten (10) nor more than sixty (60) days before the date of the meeting. The notice shall specify the place, date and hour of the meeting and (i) in the case of a special meeting, the purpose or purposes for which the meeting is called (no business other than that specified in the notice may be transacted) or (ii) in the case of the annual meeting, those matters which the board of directors, at the time

of giving the notice, intends to present for action by the stockholders (but any proper matter may be presented at the meeting for such action). The notice of any meeting at which directors are to be elected shall include the name of any nominee or nominees who, at the time of the notice, the board intends to present for election.

## 2.5 ADVANCE NOTICE OF STOCKHOLDER NOMINEES AND STOCKHOLDER BUSINESS

(a) To be properly brought before an annual meeting or special meeting, nominations for the election of directors or other business must be (i) specified in the notice of meeting (or any supplement thereto) given by or at the direction of the board of directors, (ii) otherwise properly brought before the meeting by or at the direction of the board of directors or (iii) otherwise properly brought before the meeting by a stockholder.

(b) For business to be properly brought before an annual meeting by a stockholder, the stockholder must have given timely notice thereof in writing to the Secretary of the corporation. To be timely, a stockholder's notice must be delivered to or mailed and received at the principal executive offices of the corporation not less than one hundred twenty (120) calendar days in advance of the date specified in the corporation's proxy statement released to stockholders in connection with the previous year's annual meeting of stockholders; provided, however, that in the event that no annual meeting was held in the previous year or the date of the annual meeting has been changed by more than thirty (30) days from the date contemplated at the time of the previous year's proxy statement, notice by the stockholder to be timely must be so received a reasonable time before the solicitation is made. A stockholder's notice to the Secretary shall set forth as to each matter the stockholder proposes to bring before the annual meeting: (i) a brief description of the business desired to be brought before the annual meeting and the reasons for conducting such business at the annual meeting, (ii) the name and address, as they appear on the corporation's books, of the stockholder proposing such business, (iii) the class and number of shares of the corporation which are beneficially owned by the stockholder, (iv) any material interest of the stockholder in such business and (v) any other information that is required to be provided by the stockholder pursuant to Regulation 14A under the Securities Exchange Act of 1934, as amended (the "Exchange Act"), in his capacity as a proponent to a stockholder proposal. Notwithstanding the foregoing, in order to include information with respect to a stockholder proposal in the proxy statement and form of proxy for a stockholders' meeting, stockholders must provide notice as required by the regulations promulgated under the Exchange Act. Notwithstanding anything in these bylaws to the contrary, no business shall be conducted at any annual meeting except in accordance with the procedures set forth in this Section 2.5. The chairman of the annual meeting shall, if the facts warrant, determine and declare at the meeting that business was not properly brought before the meeting and in accordance with the provisions of this Section 2.5, and, if he should so determine, he shall so declare at the meeting that any such business not properly brought before the meeting shall not be transacted.

-2-

(c) Only persons who are nominated in accordance with the procedures set forth in this paragraph (c) shall be eligible for election as directors. Nominations of persons for election to the Board of Directors of the corporation may be made at a meeting of stockholders by or at the direction of the Board of Directors or by any stockholder of the corporation entitled to vote in the election of directors at the meeting who complies with the notice procedures set forth in this paragraph (c). Such nominations other than those made by or at the direction of the Board of Directors, shall be made pursuant to timely notice in writing to the Secretary of the corporation in accordance with the provisions of paragraph (b) of this Section 2.5. Such stockholder's notice shall set forth (i) as to each person, if any, whom the stockholder proposes to nominate for election or re-election as a director: (A) the name, age, business address and residence address of such person, (B) the principal occupation or employment of such person, (C) the class and number of shares of the corporation which are beneficially owned by such person, (D) a description of all arrangements or understandings between the stockholder and each nominee and any other person or persons (naming such person or persons) pursuant to which the nominations are to be made by the stockholder and (E) any other information relating to such person that is required to be disclosed in solicitations of proxies for elections or directors, or is otherwise required, in each case pursuant to Regulation 14A under the Exchange Act (including without limitation such person's written consent to being named in the proxy statement, if any, as a nominee and to serving as a director if elected); and

(ii) as to such stockholder giving notice, the information required to be provided pursuant to paragraph (b) of this Section 2.5. At the request of the Board of Directors, any person nominated by a stockholder for election as a director shall furnish to the Secretary of the corporation that information required to be set forth in the stockholder's notice of nomination which pertains to the nominee. No person shall be eligible for election as a director of the corporation unless nominated in accordance with the procedures set forth in this paragraph (c). The chairman of the meeting shall, if the facts warrant, determine and declare at the meeting that a nomination was not made in accordance with the procedures prescribed by these bylaws, and if he should so determine, he shall so declare at the meeting, and the defective nomination shall be disregarded.

#### 2.6 MANNER OF GIVING NOTICE; AFFIDAVIT OF NOTICE

Written notice of any meeting of stockholders shall be given either personally or by first-class mail or by telegraphic or other written communication. Notices not personally delivered shall be sent charges prepaid and shall be addressed to the stockholder at the address of that stockholder appearing on the books of the corporation or given by the stockholder to the corporation for the purpose of notice. Notice shall be deemed to have been given at the time when delivered personally or deposited in the mail or sent by telegram or other means of written communication. If any notice addressed to a stockholder at the address of that stockholder appearing on the books of the corporation is returned to the corporation by the United States Postal Service marked to indicate that the United States Postal Service is unable to deliver the notice to the stockholder at that address, then all future notices or reports shall be deemed to have been duly given without further mailing if the same shall be available to the stockholder on written demand of the stockholder at the principal executive office of the corporation for a period of one (1) year from the date of the giving of the notice.

An affidavit of the mailing or other means of giving any notice of any stockholders' meeting, executed by the secretary, assistant secretary or any transfer agent of the corporation giving the notice, shall be prima facie evidence of the giving of such notice.

#### 2.7 QUORUM

The holders of a majority in voting power of the stock issued and outstanding and entitled to vote thereat, present in person or represented by proxy, shall constitute a quorum at all meetings of the stockholders for the transaction of business except as otherwise provided by statute or by the certificate of incorporation. If, however, such quorum is not present or represented at any meeting of the stockholders, then either (i) the chairman of the meeting or (ii) the holders of a majority of the shares represented at the meeting and entitled to vote thereat, present

-3-

in person or represented by proxy, shall have power to adjourn the meeting in accordance with Section 2.8 of these bylaws.

When a quorum is present at any meeting, the vote of the holders of a majority of the stock having voting power present in person or represented by proxy shall decide any question brought before such meeting, unless the question is one upon which, by express provision of the laws of the State of Delaware or of the certificate of incorporation or these bylaws, a different vote is required, in which case such express provision shall govern and control the decision of the question.

If a quorum be initially present, the stockholders may continue to transact business until adjournment, notwithstanding the withdrawal of enough stockholders to leave less than a quorum, if any action taken is approved by a majority of the stockholders initially constituting the quorum.

#### 2.8 ADJOURNED MEETING; NOTICE

Any stockholders' meeting, annual or special, whether or not a quorum is present, may be adjourned from time to time by (i) the chairman of the meeting or (ii) the vote of the holders of a majority of the shares represented at that meeting and entitled to vote thereat, either in person or by proxy. In the absence of a quorum, no other business may be transacted at that meeting except as provided in Section 2.7 of these bylaws.

When a meeting is adjourned to another time and place, unless these bylaws otherwise require, notice need not be given of the adjourned meeting if the time and place thereof are announced at the meeting at which the adjournment is taken. At the adjourned meeting the corporation may transact any business that might have been transacted at the original meeting. If the adjournment is for more than thirty (30) days, or if after the adjournment a new record date is fixed for the adjourned meeting, a notice of the adjourned meeting shall be given to each stockholder of record entitled to vote at the meeting.

## 2.9 VOTING

The stockholders entitled to vote at any meeting of stockholders shall be determined in accordance with the provisions of Section 2.12 of these bylaws, subject to the provisions of Sections 217 and 218 of the General Corporation Law of Delaware (relating to voting rights of fiduciaries, pledgors and joint owners, and to voting trusts and other voting agreements).

Except as may be otherwise provided in the certificate of incorporation or these bylaws, each stockholder shall be entitled to one vote for each share of capital stock held by such stockholder. Any stockholder entitled to vote on any matter may vote part of the shares in favor of the proposal and refrain from voting the remaining shares or, except when the matter is the election of directors, may vote them against the proposal; but, if the stockholder fails to specify the number of shares which the stockholder is voting affirmatively, it will be conclusively presumed that the stockholder's approving vote is with respect to all shares which the stockholder is entitled to vote.

## 2.10 VALIDATION OF MEETINGS; WAIVER OF NOTICE; CONSENT

The transactions of any meeting of stockholders, either annual or special, however called and noticed, and wherever held, shall be as valid as though they had been taken at a meeting duly held after regular call and notice, if a quorum be present either in person or by proxy, and if, either before or after the meeting, each person entitled to vote, who was not present in person or by proxy, signs a written waiver of notice or a consent to the holding of the meeting or an approval of the minutes thereof. The waiver of notice or consent or approval need not specify either the business to be transacted or the purpose of any annual or special meeting of stockholders. All such waivers, consents, and approvals shall be filed with the corporate records or made a part of the minutes of the meeting.

-4-

Attendance by a person at a meeting shall also constitute a waiver of notice of and presence at that meeting, except when the person objects at the beginning of the meeting to the transaction of any business because the meeting is not lawfully called or convened. Attendance at a meeting is not a waiver of any right to object to the consideration of matters required by law to be included in the notice of the meeting but not so included, if that objection is expressly made at the meeting.

## 2.11 STOCKHOLDER ACTION BY WRITTEN CONSENT WITHOUT A MEETING

Any action required or permitted to be taken at any annual or special meeting of stockholders may be taken without a meeting, without prior notice and without a vote, if a consent or consents in writing setting forth the action so taken shall be signed by the holders of outstanding stock having not less than the minimum number of votes that would be necessary to authorize or take such action at a meeting at which all shares entitled to vote thereon were present and voted. Such consents shall be delivered to the corporation by delivery to its registered office in the state of Delaware, its principal place of business, or an officer or agent of the corporation having custody of the book in which proceedings of meetings of stockholders are recorded. Delivery made to a corporation's registered office shall be by hand or by certified or registered mail, return receipt requested.

## 2.12 RECORD DATE FOR STOCKHOLDER NOTICE; VOTING

For purposes of determining the stockholders entitled to notice of any meeting or to vote thereat or entitled to give consent to corporate action without a meeting, the board of directors may fix, in advance, a record date, which shall not precede the date upon which the resolution fixing the record

date is adopted by the board of directors and which shall not be more than sixty (60) days nor less than ten (10) days before the date of any such meeting, and in such event only stockholders of record on the date so fixed are entitled to notice and to vote, notwithstanding any transfer of any shares on the books of the corporation after the record date.

If the board of directors does not so fix a record date:

(a) the record date for determining stockholders entitled to notice of or to vote at a meeting of stockholders shall be at the close of business on the business day next preceding the day on which notice is given, or, if notice is waived, at the close of business on the business day next preceding the day on which the meeting is held; and

(b) the record date for determining stockholders entitled to give consent to corporate action in writing without a meeting, (i) when no prior action by the board is required, shall be the day on which the first written consent is delivered to the Corporation as provided in Section 2.3(b) of the General Corporation Law of Delaware, or (ii) when prior action by the board is required, shall be at the close of business on the day on which the board adopts the resolution relating to that action.

A determination of stockholders of record entitled to notice of or to vote at a meeting of stockholders shall apply to any adjournment of the meeting unless the board of directors fixes a new record date for the adjourned meeting, but the board of directors shall fix a new record date if the meeting is adjourned for more than thirty (30) days from the date set for the original meeting.

The record date for any other purpose shall be as provided in Section 8.1 of these bylaws.

-5-

#### 2.13 PROXIES

Every person entitled to vote for directors, or on any other matter, shall have the right to do so either in person or by one or more agents authorized by a written proxy signed by the person and filed with the secretary of the corporation, but no such proxy shall be voted or acted upon after three (3) years from its date, unless the proxy provides for a longer period. A proxy shall be deemed signed if the stockholder's name is placed on the proxy (whether by manual signature, typewriting, telegraphic transmission, telefacsimile or otherwise) by the stockholder or the stockholder's attorney-in-fact. The revocability of a proxy that states on its face that it is irrevocable shall be governed by the provisions of Section 212(e) of the General Corporation Law of Delaware.

#### 2.14 ORGANIZATION

The president, or in the absence of the president, the chairman of the board, shall call the meeting of the stockholders to order, and shall act as chairman of the meeting. In the absence of the president, the chairman of the board, and all of the vice presidents, the stockholders shall appoint a chairman for such meeting. The chairman of any meeting of stockholders shall determine the order of business and the procedures at the meeting, including such matters as the regulation of the manner of voting and the conduct of business. The secretary of the corporation shall act as secretary of all meetings of the stockholders, but in the absence of the secretary at any meeting of the stockholders, the chairman of the meeting may appoint any person to act as secretary of the meeting.

#### 2.15 LIST OF STOCKHOLDERS ENTITLED TO VOTE

The officer who has charge of the stock ledger of the corporation shall prepare and make, at least ten (10) days before every meeting of stockholders, a complete list of the stockholders entitled to vote at the meeting, arranged in alphabetical order, and showing the address of each stockholder and the number of shares registered in the name of each stockholder. Such list shall be open to the examination of any stockholder, for any purpose germane to the meeting, during ordinary business hours, for a period of at least ten (10) days prior to the meeting, either at a place within the city where the meeting is to be held,

which place shall be specified in the notice of the meeting, or, if not so specified, at the place where the meeting is to be held. The list shall also be produced and kept at the time and place of the meeting during the whole time thereof, and may be inspected by any stockholder who is present.

## 2.16 INSPECTORS OF ELECTION

Before any meeting of stockholders, the board of directors may appoint an inspector or inspectors of election to act at the meeting or its adjournment. If no inspector of election is so appointed, then the chairman of the meeting may, and on the request of any stockholder or a stockholder's proxy shall, appoint an inspector or inspectors of election to act at the meeting. The number of inspectors shall be either one (1) or three (3). If inspectors are appointed at a meeting pursuant to the request of one (1) or more stockholders or proxies, then the holders of a majority of shares or their proxies present at the meeting shall determine whether one (1) or three (3) inspectors are to be appointed. If any person appointed as inspector fails to appear or fails or refuses to act, then the chairman of the meeting may, upon the request of any stockholder or a stockholder's proxy shall, appoint a person to fill that vacancy.

Such inspectors shall:

(a) determine the number of shares outstanding and the voting power of each, the number of shares represented at the meeting, the existence of a quorum, and the authenticity, validity, and effect of proxies;

(b) receive votes, ballots or consents;

-6-

(c) hear and determine all challenges and questions in any way arising in connection with the right to vote;

(d) count and tabulate all votes or consents;

(e) determine when the polls shall close;

(f) determine the result; and

(g) do any other acts that may be proper to conduct the election or vote with fairness to all stockholders.

## ARTICLE III

### DIRECTORS

#### 3.1 POWERS

Subject to the provisions of the General Corporation Law of Delaware and to any limitations in the certificate of incorporation or these bylaws relating to action required to be approved by the stockholders or by the outstanding shares, the business and affairs of the corporation shall be managed and all corporate powers shall be exercised by or under the direction of the board of directors.

#### 3.2 NUMBER OF DIRECTORS

The board of directors shall consist of seven (7) members. The number of directors may be changed by an amendment to this bylaw, duly adopted by the board of directors or by the stockholders, or by a duly adopted amendment to the certificate of incorporation. No reduction of the authorized number of directors shall have the effect of removing any director before that director's term of office expires. If for any cause, the directors shall not have been elected at an annual meeting, they may be elected as soon thereafter as convenient at a special meeting of the stockholders called for that purpose in the manner provided in these Bylaws.

#### 3.3 ELECTION AND TERM OF OFFICE OF DIRECTORS

Except as provided in Section 3.4 of these bylaws, directors shall be elected at each annual meeting of stockholders to hold office until the next annual meeting. Each director, including a director elected or appointed to fill a vacancy, shall hold office until the expiration of the term for which elected and until a successor has been elected and qualified.

### 3.4 RESIGNATION AND VACANCIES

Any director may resign effective on giving written notice to the chairman of the board, the president, the secretary or the board of directors, unless the notice specifies a later time for that resignation to become effective. If the resignation of a director is effective at a future time, the board of directors may elect a successor to take office when the resignation becomes effective.

-7-

Vacancies in the board of directors may be filled by a majority of the remaining directors, even if less than a quorum, or by a sole remaining director; however, a vacancy created by the removal of a director by the vote of the stockholders or by court order may be filled only by the affirmative vote of a majority of the shares represented and voting at a duly held meeting at which a quorum is present (which shares voting affirmatively also constitute a majority of the required quorum). Each director so elected shall hold office until the next annual meeting of the stockholders and until a successor has been elected and qualified.

Unless otherwise provided in the certificate of incorporation or these bylaws:

(i) Vacancies and newly created directorships resulting from any increase in the authorized number of directors elected by all of the stockholders having the right to vote as a single class may be filled by a majority of the directors then in office, although less than a quorum, or by a sole remaining director.

(ii) Whenever the holders of any class or classes of stock or series thereof are entitled to elect one or more directors by the provisions of the certificate of incorporation, vacancies and newly created directorships of such class or classes or series may be filled by a majority of the directors elected by such class or classes or series thereof then in office, or by a sole remaining director so elected.

If at any time, by reason of death or resignation or other cause, the corporation should have no directors in office, then any officer or any stockholder or an executor, administrator, trustee or guardian of a stockholder, or other fiduciary entrusted with like responsibility for the person or estate of a stockholder, may call a special meeting of stockholders in accordance with the provisions of the certificate of incorporation or these bylaws, or may apply to the Court of Chancery for a decree summarily ordering an election as provided in Section 211 of the General Corporation Law of Delaware.

If, at the time of filling any vacancy or any newly created directorship, the directors then in office constitute less than a majority of the whole board (as constituted immediately prior to any such increase), then the Court of Chancery may, upon application of any stockholder or stockholders holding at least ten (10) percent of the total number of the shares at the time outstanding having the right to vote for such directors, summarily order an election to be held to fill any such vacancies or newly created directorships, or to replace the directors chosen by the directors then in office as aforesaid, which election shall be governed by the provisions of Section 211 of the General Corporation Law of Delaware as far as applicable.

### 3.5 REMOVAL OF DIRECTORS

Unless otherwise restricted by statute, by the certificate of incorporation or by these bylaws, any director or the entire board of directors may be removed, with or without cause, by the holders of a majority of the shares then entitled to vote at an election of directors; provided, however, that, if and so long as stockholders of the corporation are entitled to cumulative voting, if less than the entire board is to be removed, no director may be removed without cause if the votes cast against his removal would be sufficient to elect him if then cumulatively voted at an election of the entire board of directors.

### 3.6 PLACE OF MEETINGS; MEETINGS BY TELEPHONE

Regular meetings of the board of directors may be held at any place within or outside the State of Delaware that has been designated from time to time by resolution of the board. In the absence of such a designation, regular



meetings shall be held at the principal executive office of the corporation. Special meetings of the board may be held at any place within or outside the State of Delaware that has been designated in the notice of the meeting or, if not stated in the notice or if there is no notice, at the principal executive office of the corporation.

-8-

STATE OF DELAWARE  
SECRETARY OF STATE  
DIVISION OF CORPORATIONS  
FILED 11:00 AM 05/03/2000  
001224973 -- 2493974

CERTIFICATE OF AMENDMENT  
OF THE  
RESTATED CERTIFICATE OF INCORPORATION  
OF  
HARMONIC INC.

The undersigned, Anthony J. Ley, does hereby certify that:

1. He is the President of Harmonic Inc., a Delaware corporation (the "Corporation");
2. The Restated Certificate of Incorporation of the Corporation is hereby amended by striking out the first paragraph of Article IV thereof and substituting in lieu of said paragraph the following paragraph:

"The Corporation is authorized to issue two classes of stock to be designated, respectively, Preferred Stock, par value \$0.001 per share ("Preferred Stock"), and Common Stock, par value \$0.001 per share ("Common Stock"). The total number of shares of Preferred Stock that the Corporation shall have authority to issue is 5,000,000. The total number of shares of Common Stock that the Corporation shall have authority to issue is 150,000,000."

3. The amendment of the Certificate of Incorporation herein certified has been duly adopted in accordance with the provisions of Section 242 of the General Corporation Law of the State of Delaware.

IN WITNESS WHEREOF, the Corporation has caused this Certificate of Amendment of the Restated Certificate of Incorporation to be signed by its President, on this 3rd day of May, 2000.

HARMONIC INC.

By: /s/ ANTHONY J. LEY

-----  
ANTHONY J. LEY  
President and Chief Executive Officer

RESTATED CERTIFICATE OF INCORPORATION  
OF  
HARMONIC LIGHTWAVES, INC.

The following Restated Certificate of Incorporation of Harmonic Lightwaves, Inc. (the "Corporation") (i) amends and restates the provisions of the Certificate of Incorporation of Harmonic Lightwaves, Inc. originally filed with the Secretary of State of the State of Delaware on March 29, 1995, and (ii) supersedes the original Certificate of Incorporation and all prior amendments and restatements thereto (if any) in their entirety.

ARTICLE I

The name of this corporation is Harmonic Lightwaves, Inc. (the "Corporation").

## ARTICLE II

The address of the Corporation's registered office in the State of Delaware is Corporation Trust Center, 1209 Orange Street, Wilmington, Delaware 19801, County of New Castle. The name of its registered agent at such address is The Corporation Trust Company.

## ARTICLE III

The purpose of the Corporation is to engage in any lawful act or activity for which corporations may be organized under the General Corporation Law of Delaware.

## ARTICLE IV

The Corporation is authorized to issue two classes of stock to be designated, respectively, Preferred Stock, par value \$0.001 per share ("Preferred Stock"), and Common Stock, par value \$0.001 per share ("Common Stock"). The total number of shares of Preferred Stock that the Corporation shall have authority to issue is 5,000,000. The total number of shares of Common Stock that the Corporation shall have authority to issue is 50,000,000.

The Preferred Stock may be issued from time to time in one or more series. The Board of Directors is hereby authorized, subject to limitations prescribed by law and the provisions of this Article IV, to fix by resolution or resolutions the designations, powers, preferences and rights of the shares of each such series and the qualifications, limitations or restrictions thereof.

The authority of the Board with respect to each series shall include, but not be limited to, determination of the following:

A. The number of shares constituting that series and the distinctive designation of that series.

B. The dividend rate on the shares of that series, whether dividends shall be cumulative, and, if so, from which date or dates, and the relative rights of priority, if any, of payment of dividends on shares of that series.

C. Whether that series shall have the voting rights in addition to the voting rights provided by law, and, if so, the terms of such voting rights.

D. Whether that series shall have conversion privileges, and, if so, the terms and conditions of such privileges, including provision for adjustment of the conversion rate in such events as the Board of Directors shall determine.

E. Whether or not the shares of that series shall be redeemable, and, if so, the terms and conditions of such redemption, including the date or dates upon or after which they shall be redeemable, and the amount per share payable in case of redemption, which amount may vary under different conditions and at different redemption rates.

F. Whether that series shall have a sinking fund for the redemption or purchase of shares of that series, and, if so, the terms and the amount of such sinking funds.

G. The rights of the shares of that series in the event of voluntary or involuntary liquidation, dissolution or winding up of the Corporation, and the relative rights of priority, if any, of payment of shares of that series.

H. Any other relative rights, preferences and limitations of that series.

The Board of Directors is further authorized to increase (but not above the total number of authorized shares of the class) or decrease (but not below the number of shares of any such series then outstanding) the number of shares of any series, the number of which was fixed by it, subsequent to the issue of

shares of such series then outstanding, subject to the powers, preferences and rights, and the qualifications, limitations and restrictions thereof stated in the resolution of the Board of Directors originally fixing the number of shares of such series. If the number of shares of any series is so decreased, then the shares constituting such decrease shall resume the status which they had prior to the adoption of the resolution originally fixing the number of shares of such series.

#### ARTICLE V

The Corporation is to have perpetual existence.

#### ARTICLE VI

A. The management of the business and the conduct of the affairs of the Corporation shall be vested in its Board of Directors. The number of directors which shall constitute the whole Board of Directors shall be designated in the Bylaws of the Corporation.

B. In furtherance and not in limitation of the powers conferred by the laws of the State of Delaware, the Board of Directors is expressly authorized to adopt, alter, amend or repeal the Bylaws of the Corporation.

C. The directors of the Corporation need not be elected by written ballot unless a stockholder demands election by written ballot at a meeting of stockholders and before voting begins or unless the Bylaws of the Corporation so provide.

-2-

D. At the election of directors of the Corporation, each holder of Common Stock shall be entitled to one vote for each share held. No stockholder will be permitted to cumulate votes at any election of directors.

#### ARTICLE VII

A. To the fullest extent permitted by the Delaware General Corporation Law as the same exists or as may hereafter be amended, no director of the Corporation shall be personally liable to the Corporation or its stockholders for monetary damages for breach of fiduciary duty as a director.

B. The Corporation may indemnify to the fullest extent permitted by law any person made or threatened to be made a party to an action or proceeding, whether criminal, civil, administrative or investigative, by reason of the fact that he, his testator or intestate is or was a director, officer or employee of the Corporation or any predecessor of the Corporation or serves or served at any other enterprise as a director, officer or employee at the request of the Corporation or any predecessor to the Corporation.

C. Neither any amendment nor repeal of this Article VII, nor the adoption of any provision of the Corporation's Certificate of Incorporation inconsistent with this Article VII, shall eliminate or reduce the effect of this Article VII, in respect of any matter occurring, or any action, suit, claim or proceeding accruing or arising or that, but for this Article VII, would accrue or arise, prior to such amendment, repeal, or adoption of an inconsistent provision.

#### ARTICLE VIII

Meetings of stockholders may be held within or without the State of Delaware, as the Bylaws may provide. The books of the Corporation may be kept (subject to any provision contained in the laws of the State of Delaware) outside of the State of Delaware at such place or places as may be designated from time to time by the Board of Directors or in the Bylaws of the Corporation.

#### ARTICLE IX

The Corporation reserves the right to amend, alter, change or repeal any provision contained in this Certificate of Incorporation, in the manner now or hereafter prescribed by the laws of the State of Delaware, and all rights conferred herein are granted subject to this reservation.

The Restated Certificate of Incorporation has been duly adopted by the stockholders of the Corporation in accordance with the provisions of Sections 242 and 245 of the General Corporation Law of the State of Delaware, as amended.

IN WITNESS WHEREOF, the undersigned have executed this certificate on May 30, 1995.

/s/ ANTHONY J. LEY

-----  
Anthony J. Ley, President

/s/ JEFFREY D. SAPER

-----  
Jeffrey D. Saper, Secretary

-3-

The undersigned certify under penalty of perjury that they have read the foregoing Restated Certificate of Incorporation and know the contents thereof, and that the statements therein are true.

Executed at Palo Alto, California on May 30, 1995.

/s/ ANTHONY J. LEY

-----  
Anthony J. Ley, President

/s/ JEFFREY D. SAPER

-----  
Jeffrey D. Saper, Secretary

-4-

LOAN MODIFICATION AGREEMENT

This Loan Modification Agreement is entered into as of August 10, 2001 between Harmonic, Inc. ("Borrower") and Silicon Valley Bank ("Bank").

1. DESCRIPTION OF EXISTING INDEBTEDNESS: Among other indebtedness which may be owing by Borrower to Bank, Borrower is indebted to Bank pursuant to, among other documents, a Second Amended and Restated Loan and Security Agreement, dated March 5, 1999, as may be amended from time to time, (the "Loan Agreement"). The Loan Agreement provided for, among other things, a Revolving Commitment in the original principal amount of Ten Million Dollars (\$10,000,000). Defined terms used but not otherwise defined herein shall have the same meanings as in the Loan Agreement.

Hereinafter, all Indebtedness owing by Borrower to Bank shall be referred to as the "Indebtedness."

Hereinafter, all other documents evidencing or securing the Indebtedness shall be referred to as the "Existing Loan Documents".

3. DESCRIPTION OF CHANGE IN TERMS.

A. Modification(s) to Loan Agreement

1. Section 6.8 entitled "Quick Ratio" is hereby amended to read as follows:

A ratio of Quick Assets to Current Liabilities of at least .85 to 1.00

2. Section 6.10 entitled "Maximum Loss" is hereby amended to read as follows:

Borrower may suffer losses not to exceed:

\$15,000,000 for the fiscal quarter ending September 30, 2001; and \$11,500,000 for the fiscal quarter ending December 31, 2001

B. Waiver of Covenant Default(s).

1. Bank hereby waives Borrower's existing default under the Loan Agreement by virtue of Borrower's failure to comply with the (i) Quick Ratio and (ii) Maximum Loss covenants as of quarter ended June 30, 2001. Bank's waiver of Borrower's compliance of these covenants shall apply only to the foregoing period. Accordingly, for the period ending September 30, 2001, Borrower shall be in compliance with these covenants, as amended herein.

Bank's agreement to waive the above-described default (1) in no way shall be deemed an agreement by the Bank to waive Borrower's compliance with the above-described covenant as of all other dates and (2) shall not limit or impair the Bank's right to demand strict performance of these covenants as of all other dates and (3) shall not limit or impair the Bank's right to demand strict performance of all other covenants as of any date.

4. CONSISTENT CHANGES. The Existing Loan Documents are hereby amended wherever necessary to reflect the changes described above.

5. PAYMENT OF LOAN FEE. Borrower shall pay to Bank a fee in the amount of Five Thousand Dollars (\$5,000) (the "Loan Fee") plus all out of pocket expenses.

6. NO DEFENSES OF BORROWER. Borrower (and each guarantor and pledgor signing

below) agrees that, as of the date hereof, it has no defenses against the obligations to pay any amounts under the indebtedness.

7. CONCERNING REVISED ARTICLE 9 OF THE UNIFORM COMMERCIAL CODE. The Borrower affirms and reaffirms that notwithstanding the terms of the Loan Agreement to the contrary, (i) that the definition of "Code", "UCC" or "Uniform Commercial Code" as set forth in the Loan Agreement shall be deemed to mean and refer to "the Uniform Commercial Code" as adopted by the State of California, as may be amended and in effect from time to time and (ii) the Collateral is all assets of the Borrower as set forth in the Loan Agreement. In connection therewith, the Collateral shall include, without limitation, the following categories of assets as defined in the Code; goods (including inventory, equipment and any accessions thereto), instruments (including promissory notes), documents, accounts (including health-care-insurance receivables, and license fees), chattel paper (whether tangible or electronic), deposit accounts, letter-of-credit rights (whether or not the letter of credit is evidenced by a writing), commercial tort claims, securities and all other investment property, general intangibles (including payment intangibles and software) as set forth in the Loan Agreement, supporting obligations and any and all proceeds of any thereof, wherever located, whether now owned or hereafter acquired.

8. CONDITIONS. The effectiveness of this Loan Modification Agreement is conditioned upon Bank's receipt of Loan Fee.

This Loan Modification Agreement is executed as of the date first written above.

BORROWER:

BANK:

HARMONIC, INC.

SILICON VALLEY BANK

Anthony Ley

By: \_\_\_\_\_

By: \_\_\_\_\_

Name: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Title: \_\_\_\_\_

[SILICON VALLEY BANK LOGO]

SILICON VALLEY BANK  
3003 Tasman Drive/HF 226  
Santa Clara, CA 95054  
(408) 654-1000 - Fax (408) 980-6410

This Restated NON-RECOURSE RECEIVABLES PURCHASE AGREEMENT effective as of September 25, 2001, restates that certain NON RECOURSE RECEIVABLES PURCHASE AGREEMENT (the "Agreement"), dated as of September 25, 2001, between SILICON VALLEY BANK, ("Buyer") and HARMONIC INC., ("Seller"), with its chief executive office at 549 Baltic Way, Sunnyvale, California 94089 and with a FAX number of (408) 542-2516.

1. Definitions. In this Agreement:

1.1 "Payment" is when Buyer has received payments equal to the Total Purchased Receivables.

1.2 "Purchased Receivables" is all accounts, receivables, chattel paper, instruments, contract rights, documents, general intangibles, letters of credit, drafts, bankers acceptances other rights to payment and all proceeds arising from the invoices and other agreements on the Schedule.

1.3 "Related Property" is all returned or rejected goods connected with the Purchased Receivables or books and records about the Purchased Receivables or returned or rejected goods; or proceeds from voluntary or involuntary dispositions, including insurance proceeds.

1.4 "Schedule" is the attached schedule showing the: Purchase Date, Due Date, Total Purchased Receivables, Discount Rate, Purchase Price, Administrative Fee and Interest Reserve amount.

2. Purchase and Sale of Receivables.

2.1 Sale and Purchase. On the Purchase Date, Seller sells and Buyer buys Seller's right, title, and interest (but none of Seller's obligations) to payment from any person liable on a Purchased Receivable, ("Account Debtors").

Each purchase and sale is at Buyer's and Seller's discretion. Buyer will not (i) pay Seller an aggregate outstanding amount exceeding \$10,000,000.00 or (ii) buy any Purchased Receivable after September 24, 2002 (the "Maturity Date"). Each purchase and sale will be on an assignment form acceptable to Buyer.

2.2 Payment of Purchase Price and Late Payment.

(a) Payment of Purchase Price. For each Purchased Receivable, Buyer will pay Seller, on the Purchase Date, the Purchase Price, less the Administrative Fee and legal fees (if any).

(b) Late Payment. If Payment is made after the Due Date, as listed on the Schedule, then on the earlier of Payment or 90 days, Seller will also pay Buyer the product of the Discount Rate and the average daily balance of the unpaid Purchased Receivable multiplied by the number of days between the scheduled payment date or the earlier of the date of actual payment or 90 days after the scheduled payment date, divided by 360.

1

2.3 Seller may not sell or convey any interest in Related Property without Buyer's prior written consent. Seller will sign UCC financing statements and any other instruments or documents to evidence, perfect or protect Buyer's interests in the Purchased Receivables and Related Property. Seller will deliver to Buyer all original instruments, chattel paper and documents about Purchased Receivables and Related Property.

3. Collections, Payments and Remittances.

3.1 Application of Payments. All payments for any Purchased Receivable, received by Seller or Buyer, are Buyer's property.

3.2 Collection by Seller.

(a) Buyer appoints Seller its attorney-in-fact to receive payments and enforce its rights and designates Seller its assignee for collection. Seller will use diligence and commercially reasonable means to collect Purchased Receivables. Buyer may revoke these appointments at any time.

(b) Seller will begin legal proceedings about Purchased Receivables in its name (as Buyer's assignee for collection or enforcement) or, with Buyer's prior written consent, in Buyer's name. Seller will not make Buyer party to any litigation or arbitration without Buyer's written consent.

(c) Seller will hold in trust for and give Buyer: (i) all payments made by Account Debtors, and (ii) all instruments, chattel paper and other proceeds of the Purchased Receivables.

(d) Unless an Event of Repurchase occurs and continues Seller will remit payments to Buyer on the last business day of each week ("Settlement Date") starting the week after the Purchase Date. On each Settlement Date Seller will deliver a report acceptable to Buyer of account activity (including dates and amounts of payments) and changes for each Purchased Receivable.

3.3 No Obligation to Take Action. Buyer has a right, but no obligation, to perform Seller's obligations or to take action on any Purchased Receivable (including on defaulted Purchased Receivables).

4. Non-Recourse; Repurchase Obligations.

4.1 Non-Recourse and Seller's Agreement to Repurchase. Buyer acquires Purchased Receivables without recourse, except Seller will, at Buyer's option, repurchase from Buyer any Purchased Receivable for a purchase price equal to the unpaid portion of any Purchased Receivable:

(a) For which there has been any breach of warranty, representation or covenant in this Agreement; or

(b) For which prior to full payment of such Purchased Receivable the Account Debtor asserts any discount, payment amount agreed to by Seller that is less than the value of the Purchased Receivable, allowance, or right not to pay such Purchased Receivable based on any defense, right of offset, right of return, warranty claim, or other dispute relating to the property or product whose sale generated the Purchased Receivable.

Seller will reimburse Buyer for Buyer's reasonable attorneys' and professional fees and expenses and all court costs for collecting Purchased Receivables and/or enforcing its rights under this Agreement.

4.2 Payment to Buyer. Seller will pay Buyer in immediately available funds.

5. Representations, Warranties and Covenants.

2

5.1 Purchased Receivables - Warranties, Representations and Covenants. Seller represents, warrants and covenants for each Purchased Receivable:

(a) It is the owner with legal right to sell, transfer and assign it;

(b) The correct amount is on the Schedule and is not disputed;

(c) No payment is contingent on any obligation or contract, and it has fulfilled all its obligations as of the Purchase Date;

(d) It is based on actual sale and delivery of goods



and/or services rendered, due no later than its Due Date and owing to Seller, it is not past due or in default, has not been previously sold, assigned, transferred, or pledged, and is free of any liens, security interests and encumbrances;

(e) There are no defenses, offsets, counterclaims or agreements in which the Account Debtor may claim any deduction or discount;

(f) It reasonably believes no Account Debtor is insolvent as defined in the United States Bankruptcy Code ("US Code") or the California Uniform Commercial Code ("UCC") and no Account Debtor has filed or had filed against it a voluntary or involuntary petition for relief under the US Code as of the purchase date; and

(g) No Account Debtor has objected to payment for or the quality or quantity of the subject of the Purchased Receivable.

5.2 Additional Warranties, Representations and Covenants.  
Seller represents, warrants and covenants:

(a) Its name, form of organization, chief executive office, and the place where the records about all Purchased Receivables are kept is shown at the beginning of this Agreement and it will give Buyer at least 10 days prior written notice of changes to its name, organization, chief executive office or location of records.

(b) It has not filed a voluntary petition or had filed against it an involuntary petition under the US Code and does not anticipate any filing;

(c) If Payment of any Purchased Receivable does not occur by its Due Date then Seller will provide a written report, within 10 days, of the reasons for the delay.

(d) While any Purchased Receivable is outstanding, Seller will give Buyer copies of all Forms 10-K, 10-Q and 8-K (or equivalents) within 5 days of its filing with the Securities and Exchange Commission.

6. Adjustments. If any Account Debtor asserts a discount, allowance, return, offset, defense, warranty claim, or the like (an "Adjustment") Seller will promptly advise Buyer and, with Buyer's approval, resolve the dispute. Seller will resell any rejected, returned, or recovered personal property for Buyer, at Seller's expense, with the proceeds payable to Buyer. While Seller has returned goods that are Buyer's property, Seller will segregate and mark them "property of Silicon Valley Bank." Buyer owns the Purchased Receivables and until Payment has the right to take possession of any rejected, returned, or recovered personal property.

#### 7. Indemnification.

(a) If any Account Debtor is released from any payment obligation for any Purchased Receivable because of: (i) Seller's act or omission; or (ii) any of the documentation about the Purchased Receivables which results in termination of any part of the Account Debtor's obligation for the

3

Purchased Receivables, then Seller will pay Buyer the lesser of the amount of the Purchased Receivable not payable or the unpaid portion of the Purchased Receivable.

(b) Seller indemnifies and holds Buyer harmless from any taxes from this transaction (except Buyer's income taxes) and costs, expenses and reasonable attorney fees if Buyer promptly notifies it of any taxes of which Buyer has notice.

#### 8. Repurchase Events. Any of the following is an Event of Repurchase:

(a) Seller fails to pay Buyer any amount when due under Section 2.2(b), 3.2(c), 3.2(d), 4.1, 7 or 10;

(b) An involuntary lien, garnishment, attachment or the like is issued against or attaches to the Purchased Receivables or Related Property; and

(c) Seller breaches a covenant, agreement, warranty, or representation in this Agreement and the breach is not cured to Buyer's satisfaction within 10 days after Buyer gives Seller oral or written notice. A breach that cannot be cured is an immediate default.

9. Repurchase Option. When an Event of Repurchase occurs Buyer shall have a right to require Seller to repurchase all of the affected Purchased Receivables for a purchase price equal to the amount(s) specified in Section 4.1. Buyer shall also have all rights and remedies under this Agreement and the law, including those of a secured party under the UCC, and the right to collect, dispose of, sell, lease or use all Purchased Receivables and Related Property.

10. Fees, Costs and Expenses. Immediately on demand Seller will pay all reasonable fees, costs and expenses (including attorney and professional fees) that Buyer incurs from (a) preparing, negotiating, administering and enforcing this Agreement or any other agreement, including amendments, waivers or consents, (b) litigation or disputes relating to the Purchased Receivables, the Related Property, this Agreement or any other agreement, (c) enforcing rights against Seller, (d) protecting or enforcing its title to the Purchased Receivables or its security interest in the Related Property, (e) collecting any amounts due from Seller or for a Purchased Receivable under a breach of Seller's representation, warranty or covenant and (f) any bankruptcy case or insolvency proceeding involving Seller.

11. Choice of Law, Venue and Jury Trial Waiver. California law governs this Agreement. Seller and Buyer each submit to the exclusive jurisdiction of the State and Federal courts in Santa Clara County, California.

SELLER AND BUYER EACH WAIVE ITS RIGHT TO A JURY TRIAL FROM ANY CAUSE OF ACTION RELATED TO AGREEMENT, INCLUDING CONTRACT, TORT, BREACH OF DUTY OR OTHER CLAIM. THIS WAIVER IS A MATERIAL INDUCEMENT FOR BOTH PARTIES TO ENTER THIS AGREEMENT. EACH PARTY HAS REVIEWED THIS WAIVER WITH ITS COUNSEL.

12. Notices. Notices or demands by either party about this Agreement must be in writing and personally delivered or sent by an overnight delivery service, by certified mail postage prepaid return receipt requested, or by FAX to the addresses below:

Seller: HARMONIC INC.  
549 Baltic Way  
Sunnyvale, California 94089  
Attn: Chief Financial Officer  
FAX: (408) 542-2513

Buyer: Silicon Valley Bank  
3003 Tasman Drive, HF 226

4

Santa Clara, CA 95054  
Attn: Credit Manager  
FAX: (408) 980-6410

A party may change notice address by written notice to the other party.

13. General Provisions.

13.1 Successors and Assigns. This Agreement binds and is for the benefit of successors and permitted assigns of each party. Seller may not assign this Agreement or any rights under it without Buyer's prior written consent which may be granted or withheld in Buyer's discretion. Buyer may, without the consent of or notice to Seller, sell, transfer, or grant participation in any part of Buyer's obligations, rights or benefits under this Agreement.

13.2 Indemnification. Seller will indemnify, defend and hold harmless Buyer and its officers, employees, and agents against: (a) obligations, demands, claims, and liabilities asserted by any other party in connection with the transactions contemplated by this Agreement; and (b) losses or expenses incurred, or paid by Seller from or consequential to transactions between Buyer and Seller (including reasonable attorneys fees and expenses), except for losses caused by Buyer's gross negligence or willful misconduct.

13.3 Time of Essence. Time is of the essence for performance of all obligations in this Agreement.

13.4 Severability of Provision. Each provision of this Agreement is severable from every other provision in determining the enforceability of any provision.

13.5 Amendments in Writing, Integration. All amendments to this Agreement must be in writing. This Agreement is the entire agreement about this subject matter and supersedes prior negotiations or agreements.

13.6 Counterparts. This Agreement may be executed in any number of counterparts and by different parties on separate counterparts and when executed and delivered are one Agreement.

13.7 Survival. All covenants, representations and warranties made in this Agreement continue in full force while any Purchased Receivable amount remains outstanding. Seller's indemnification obligations survive until all statutes of limitations for actions that may be brought against Buyer have run.

13.8 Confidential Information. Buyer will use the same degree of care in handling Seller's confidential information that it uses for its own proprietary information, but may disclose information; (i) to its subsidiaries or affiliates in connection with their business with Seller, (ii) to prospective transferees or purchasers of any interest in the Agreement, (iii) as required by law, regulation, subpoena, or other order, (iv) as required in connection with an examination or audit and (v) as it considers appropriate exercising the remedies under this Agreement. Confidential information does not include information that is either: (a) in the public domain or in Buyer's possession when disclosed, or becomes part of the public domain after disclosure to Buyer; or (b) disclosed to Buyer by a third party, if Buyer does not know that the third party is prohibited from disclosing the information.

SELLER: HARMONIC INC.

5

By \_\_\_\_\_

Title \_\_\_\_\_

BUYER: SILICON VALLEY BANK

By \_\_\_\_\_

Title \_\_\_\_\_

6

SCHEDULE DATED \_\_\_\_\_  
TO  
NON-RECOURSE RECEIVABLES PURCHASE AGREEMENT  
DATED AS OF SEPTEMBER 25, 2001

SELLER: HARMONIC INC.

BUYER: SILICON VALLEY BANK

PURCHASE DATE: \_\_\_\_\_

DUE DATE: \_\_\_\_\_ days from Purchase Date

TOTAL PURCHASED RECEIVABLES: \$ \_\_\_\_\_ (List of Receivables total)

DISCOUNT RATE: \_\_\_\_\_ % (Buyer's most recently announced Prime Rate plus 1.50% per annum (for domestic and Canadian receivables with a discount period of 90

days or less))  
\_\_\_\_\_ % (Buyer's most recently announced Prime Rate plus 2.00% per annum (for foreign receivables with a discount period of 90 days or less))

PURCHASE PRICE: \$ \_\_\_\_\_ (is \_\_\_\_\_ % of the Total Purchased Receivables which is the straight discount of the Total Purchased Receivables discounted from the Due Date to the Purchase Date at the Discount Rate).

ADMINISTRATIVE FEE: (a) If quarterly Total Purchased Receivables are equal to or less than \$2,500,000.00 then the Administrative Fee will be an amount equal to .50% multiplied by the Total Purchased Receivables;  
(b) If Total Purchased Receivable are greater than \$2,500,000.00 but less than \$7,499,999.99 then the Administrative Fee will be an amount equal to .25% multiplied by the Total Purchased Receivables;  
(c) No Administrative Fee if Total Purchased Receivables are equal to or greater than \$7,500,000.00.

Seller warrants and represents that (a) its warranties and representations in the Agreement are true and correct as of the date of this Schedule and (b) no Event of Default has occurred under the Agreement.

SELLER: HARMONIC INC.  
By: \_\_\_\_\_  
Title: \_\_\_\_\_

BUYER: SILICON VALLEY BANK  
By: \_\_\_\_\_  
Title: \_\_\_\_\_

CORPORATE RESOLUTION TO SELL

I, the Secretary or Assistant Secretary of HARMONIC INC. (the "Seller") CERTIFIES that:

The Seller is a Delaware corporation, and

Attachments 1 and 2 are copies of Seller's Articles of Incorporation and Bylaws which are currently effective, and

At a duly held meeting of Seller's directors at which a quorum was present (or by other authorized corporate action) the following resolutions were adopted:

"RESOLVED THAT any ( 1 ) of the following officers of Seller, whose signatures are below:

Name	Title	Signature
-----	-----	-----
-----	-----	-----
-----	-----	-----
-----	-----	-----

acting for Seller are authorized to:

EXECUTE PURCHASE AGREEMENT. To enter a Non-Recourse Receivable Purchase Agreement with Silicon Valley Bank ("Buyer") on terms agreed by them and Buyer for the sale of certain of Seller's accounts receivable and to execute renewals, extensions, modifications, refinancings, consolidations or substitutions of any accounts receivable and to do other acts and things and execute and deliver other documents that they consider necessary to carry out the effect of these Resolutions.

FURTHER ACTS. To designate other individuals as authorized to request that Buyer purchase additional accounts receivable under the Non-Recourse Receivable Purchase Agreement.

FURTHER RESOLVED THAT:

any acts authorized by these Resolutions but performed before their passage are ratified, and these Resolutions remain effective and Buyer may rely on them until it receives written notice of their revocation, but that notice will not affect any of Seller's agreements or commitments then effective."

I ALSO CERTIFY that the officers or agents above are duly elected or appointed by Seller and hold the positions opposite their names and that the their signatures are true and that the Resolutions are effective and have not been modified or revoked.

-----  
(signature) Assistant Secretary or Secretary

-----  
Date

RESTATED NON-RECOURSE RECEIVABLES PURCHASE  
MODIFICATION AGREEMENT

This Restated Non-Recourse Receivables Purchase Modification Agreement is entered into as of December 14, 2001, by and between Harmonic Inc. (the "Seller") and Silicon Valley Bank ("Buyer").

1. DESCRIPTION OF EXISTING OBLIGATIONS: Among other amounts which may be owing by Seller to Buyer, Seller is indebted to Buyer pursuant to, among other documents, a Restated Non-Recourse Receivables Purchase Agreement, dated September 25, 2001, by and between Seller and Buyer, as may be amended from time to time, (the "Non-Recourse Receivables Purchase Agreement"). Capitalized terms used without definition herein shall have the meanings assigned to them in the Non-Recourse Receivables Purchase Agreement.

Hereinafter, all obligations owing by Seller to Buyer shall be referred to as the "Obligations" and the Non-Recourse Receivables Purchase Agreement and any and all other documents executed by Seller in favor of Buyer shall be referred to as the "Existing Documents."

2. DESCRIPTION OF CHANGE IN TERMS.

A. Modification(s) to Non-Recourse Receivables Purchase Agreement:

The second paragraph under Section 2.1 entitled "Sales and Purchase" is hereby amended to read as follows:

Each purchase and sale is at Buyer and Seller's discretion. Buyer will not (i) pay Seller an aggregate outstanding amount exceeding \$12,500,000.00 or (ii) buy any Purchased Receivable after April 1, 2003 (the "Maturity Date"). Each purchase and sale will be on an assignment form acceptable to Buyer.

3. CONSISTENT CHANGES. The Existing Documents are each hereby amended wherever necessary to reflect the changes described above.

4. NO DEFENSES OF SELLER. Seller agrees that, as of this date, it has no defenses against the obligations to pay any amounts under the Obligations.

5. PAYMENT OF LOAN FEE. Seller shall pay to Buyer a fee in the amount of Two Thousand Five Hundred and 00/100 Dollars (\$2,500.00) (the "Loan Fee") plus all out-of-pocket expenses, for increasing and extending the line.

6. CONTINUING VALIDITY. Seller understands and agrees that in modifying the existing Obligations, Buyer is relying upon Seller's representations, warranties, and agreements, as set forth in the Existing Documents. Except as expressly modified pursuant to this Non-Recourse Receivables Purchase Modification Agreement, the terms of the Existing Documents remain unchanged and in full force and effect. Buyer's agreement to modifications to the existing Obligations pursuant to this Non-Recourse Receivables Purchase Modification Agreement in no way shall obligate Buyer to make any future modifications to the Obligations. Nothing in this Non-Recourse Receivables Purchase Modification Agreement shall constitute a satisfaction of the Obligations. It is the intention of Buyer and Seller to retain as liable parties all makers and endorsers of Existing Documents, unless the party is expressly released by Buyer in writing. No maker, endorser, or guarantor will be released by virtue of this Non-Recourse Receivables Purchase Modification Agreement. The terms of this paragraph apply not only to this Non-Recourse Receivables Purchase

1

Modification Agreement, but also to any subsequent Non-Recourse Receivables Purchase modification agreements.

7. CONDITIONS. The effectiveness of this Non-Recourse Receivables Purchase Modification Agreement is conditioned upon payment of the Loan Fee.

8. COUNTERSIGNATURE. This Non-Recourse Receivables Purchase Modification

Agreement shall become effective only when executed by Seller and Buyer.

SELLER: BUYER:
Harmonic Inc. Silicon Valley Bank
By: Name: Title:

2

SCHEDULE DATED TO
RESTATED NON-RECOURSE RECEIVABLES PURCHASE AGREEMENT
DATED AS OF SEPTEMBER 25, 2001

SELLER: HARMONIC INC.
BUYER: SILICON VALLEY BANK
PURCHASE DATE:
DUE DATE: days from Purchase Date
TOTAL PURCHASED RECEIVABLES: \$ (List of Receivables total)
DISCOUNT RATE: % (Buyer's most recently announced Prime Rate plus 1.50% per annum (for domestic and Canadian receivables with a discount period of 90 days or less))
PURCHASE PRICE: \$ (is % of the Total Purchased Receivables which is the straight discount of the Total Purchased Receivables discounted from the Due Date to the Purchase Date at the Discount Rate).
ADMINISTRATIVE FEE: (a) If quarterly Total Purchased Receivables are equal to or less than \$2,500,000.00 then the Administrative Fee will be an amount equal to .50% multiplied by the Total Purchased Receivables;
(b) If Total Purchased Receivable are greater than \$2,500,000.00 but less than \$7,499,999.99 then the Administrative Fee will be an amount equal to .25% multiplied by the Total Purchased Receivables;
(c) No Administrative Fee if Total Purchased Receivables are equal to or greater than \$7,500,000.00.

Seller warrants and represents that (a) its warranties and representations in the Agreement are true and correct as of the date of this Schedule and (b) no Event of Default has occurred under the Agreement.

SELLER: HARMONIC, INC.
By:
Title:

BUYER: SILICON VALLEY BANK

By: \_\_\_\_\_

Title: \_\_\_\_\_



## LOAN MODIFICATION AGREEMENT

This Loan Modification Agreement is entered into as of December 17, 2001 between Harmonic, Inc. ("Borrower") and Silicon Valley Bank ("Bank").

1. DESCRIPTION OF EXISTING INDEBTEDNESS: Among other indebtedness which may be owing by Borrower to Bank, Borrower is indebted to Bank pursuant to, among other documents, a Second Amended and Restated Loan and Security Agreement, dated March 5, 1999, as may be amended from time to time, (the "Loan Agreement"). The Loan Agreement provided for, among other things, a Revolving Commitment in the original principal amount of Ten Million Dollars (\$10,000,000). Defined terms used but not otherwise defined herein shall have the same meanings as in the Loan Agreement.

2. DESCRIPTION OF COLLATERAL. Repayment of the Indebtedness is secured by the Collateral as described in the Loan Agreement and in Intellectual Property Security Agreement dated May 18, 2001.

Hereinafter, the above-described security documents and guaranties, together with all other documents securing repayment of the Indebtedness shall be referred to as the "Security Documents". Hereinafter, the Security Documents, together with all other documents evidencing or securing the Indebtedness shall be referred to as the "Existing Loan Documents".

3. DESCRIPTION OF CHANGE IN TERMS.

A. Modification(s) to Loan Agreement

1. The following defined terms under Section 1.1 entitled "Definitions" are hereby amended to read as follows:

"Revolving Commitment" means a Credit Extension of up to \$10,000,000 increasing to \$12,500,000, upon (i) Borrower's close of new equity financing in an amount of \$10,000,000 (net of final tax liability related to DiviCom acquisition), or (ii) Borrower's close of new equity financing in a minimum amount of \$25,000,000.

"Revolving Maturity Date" is April 4, 2003.

"Term Loan Facility" means a Credit Extension of up to \$6,000,000.

2. Sub letter (b) entitled "Interest Rate" under Section 2.1.5 entitled "Term Loan Facility" is hereby amended to read as follows:

Except as set forth in Section 2.3 (b), each Term Loan Advances shall bear interest at a FIXED rate equal to a per annum rate of 3.00 percentage points above the then current Prime Rate. Any amounts prepaid shall be subject to the Prepayment Penalty.

3. Sub letter (a) of Section 6.3 entitled "Financial Statements, Reports, Certificates" is hereby amended to read as follows:

(a) as soon as possible, but in no event later than 45 days after the end of each month, a company prepared consolidated balance sheet and income statement covering Borrower's consolidated operation during such period, in a form and certified by an officer of Borrower reasonably acceptable to Bank.

4. The third paragraph of Section 6.3 entitled "Financial Statements, Reports, Certificates" is hereby amended to read as follows:

Within 30 days after the last day of each month, Borrower will deliver to Bank with the monthly financial statements a Compliance Certificate signed by a Responsible Officer.

5. Section 6.9 entitled "Debt- Net Worth Ratio" is hereby deleted in its entirety and replaced with Section 6.9 entitled "Tangible Net Worth" to read as follows:

TANGIBLE NET WORTH. Borrower shall maintain on a quarterly basis, a Tangible Net Worth of at least \$50,000,000.

6. Section 6.10 entitled "Maximum Loss" is hereby amended to read as follows:

Borrower may suffer losses (excluding non-cash expenses associated with acquisition costs) not to exceed \$15,000,000 in any fiscal quarter.

7. The following Section 6.13 entitled "Minimum Balance Sheet Cash" is hereby incorporated to read as follows:

MINIMUM BALANCE SHEET CASH. Borrower shall maintain on a monthly basis, cash on balance sheet equal to 1.5 times all Bank commitments to Borrower.

4. CONSISTENT CHANGES. The Existing Loan Documents are hereby amended wherever necessary to reflect the changes described above.

5. PAYMENT OF LOAN FEE. Borrower shall pay to Bank a fee in the amount of Five Thousand Dollars (\$5,000) (the "Loan Fee") plus all out of pocket expenses.

6. NO DEFENSES OF BORROWER. Borrower (and each guarantor and pledgor signing below) agrees that, as of the date hereof, it has no defenses against the obligations to pay any amounts under the Indebtedness.

7. CONCERNING REVISED ARTICLE 9 OF THE UNIFORM COMMERCIAL CODE. The Borrower affirms and reaffirms that notwithstanding the terms of the Security Documents to the contrary, (i) that the definition of "Code", "UCC" or "Uniform Commercial Code" as set forth in the Security Documents shall be deemed to mean and refer to "the Uniform Commercial Code as adopted by the State of Delaware, as may be amended and in effect from time to time and (ii) the Collateral is all assets of the Borrower. In connection therewith, the Collateral shall include, without limitation, the following categories of assets as defined in the Code: goods (including inventory, equipment and any accessions thereto), instruments (including promissory notes), documents, accounts (including health-care-insurance receivables, and license fees), chattel paper (whether tangible or electronic), deposit accounts, letter-of-credit rights (whether or not the letter of credit is evidenced by a writing), commercial tort claims, securities and all other investment property, general intangibles (including payment intangibles and software), supporting obligations and any and all proceeds of any thereof, wherever located, whether now owned or hereafter acquired.

8. CONTINUING VALIDITY. Borrower (and each guarantor and pledgor signing below) understands and agrees that in modifying the existing Indebtedness, Bank is relying upon Borrower's representations, warranties, and agreements, as set forth in the Existing Loan Documents. Except as expressly modified pursuant to this Loan Modification Agreement, the terms of the Existing Loan Documents remain unchanged and in full force and effect. Bank's agreement to modifications to the existing Indebtedness pursuant to this Loan Modification Agreement in no way shall obligate Bank to make any future modifications to the Indebtedness. Nothing in this Loan Modification Agreement shall constitute a satisfaction of the Indebtedness. It is the intention of Bank and Borrower to retain as liable parties all makers and endorsers of Existing Loan Documents, unless the party is expressly released by Bank in writing. Unless expressly released herein, no maker, endorser, or guarantor will be released by virtue of this Loan Modification

Agreement. The terms of this paragraph apply not only to this Loan Modification Agreement, but also to all subsequent loan modification agreements.

9. CONDITIONS. The effectiveness of this Loan Modification Agreement is conditioned upon Bank's receipt of Loan Fee.

BORROWER:

HARMONIC, INC.

By: /s/ ANTHONY J. LEY

-----  
Name: Anthony J. Ley

-----  
Title: Chairman, President and CEO  
-----

BANK:

SILICON VALLEY BANK

By: /s/ JOHN M. SWIFT

-----  
Name: John M. Swift

-----  
Title: Senior Vice Analyst  
-----

Exhibit 21.1

Subsidiary -----	State or Other Jurisdiction of Incorporation or Organization -----
Harmonic Inc.	Delaware
Harmonic Data Systems Inc.	Delaware
Harmonic Data Systems, Ltd.	Israel
Harmonic (Asia Pacific) Ltd.	Hong Kong
Harmonic Europe	France
Harmonic Germany GmbH	Germany
Harmonic International Inc.	Delaware
Harmonic International Limited	Bermuda
Harmonic Lightwaves (Israel) Ltd.	Israel
Harmonic (UK) Limited	United Kingdom

CONSENT OF INDEPENDENT ACCOUNTANTS

We hereby consent to the incorporation by reference in the Registration Statements on Form S-8 (No. 333-19777, 333-59248, and 333-43160) of Harmonic Inc. of our report dated January 25, 2002 relating to the financial statements and financial statement schedule, which appears in this Annual Report on Form 10-K.

/s/ PricewaterhouseCoopers LLP

San Jose, CA  
March 14, 2002