



## ANNUAL REPORT 1998

**T**he ADSL Forum has now completed its fourth full year of operation, and 1998 was clearly a landmark year in the advancement of the Forum's goals. The Board of Directors would like to thank the delegates of our member companies for their contributions to the successful work of the Forum and for their efforts in advancing ADSL. As 1998 comes to a close it appears that the stage is set for the initiation of a mass market for ADSL beginning in 1999. This, in large part, is directly due to the efforts of the ADSL Forum membership.

The ADSL Forum has achieved significant milestones in the development of ADSL as a mainstream technology for high-speed broadband delivery of multimedia, data, entertainment, Internet services and more. As we gather in Washington, DC for the Annual Meeting of the ADSL Forum on March 2, 1999, we can be proud of our accomplishments, which collectively constitute a giant step toward fulfilling the primary goal of the ADSL Forum:

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***“To Create A Global Mass Market for ADSL.”***

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ADSL deployment has begun in North America, Europe and Asia. Continuing trials on five of the world's seven continents have facilitated the evolution of end-to-end architectures as defined by the ADSL Forum. We know the technology works and this has led to the initial deployment of commercial services.

During the past year, the ADSL Forum has grown substantially and made significant progress in its technical work to support end-to-end architectures. At the same time, the Forum's marketing and public relations programs have increased awareness of ADSL, its key benefits and the fact that ADSL remains the most viable option for providing virtually ubiquitous delivery of broadband services to the consumer mass market. Our work continues as dynamic developments in the marketplace accelerate the growing momentum for ADSL.

This Annual Report is intended to share our substantive accomplishments in 1998 and highlight some of our plans for 1999.

## ACCOMPLISHMENTS

The ADSL Forum is a non-profit industry association working cooperatively to promote ADSL. We've forged a powerful alliance of service providers and companies from virtually every sector of the communications, networking and computer industries to focus on developing end-to-end solutions.

By drawing upon the tremendous collective expertise of our members and joining forces to develop a focused strategy, we have directed significant resources toward the development of end-to-end solutions. Moreover, we have pooled efforts to promote ADSL in the media, analyst community, communications industry, and other markets, ensuring that ADSL gets the recognition it deserves as an affordable, secure and continuous high-speed remote access solution and enabler of interactive multimedia applications.

Forum meetings, Summits and other activities not only keep participants abreast of industry news and technical developments, they provide a crucial platform for influencing ADSL market and technical developments.

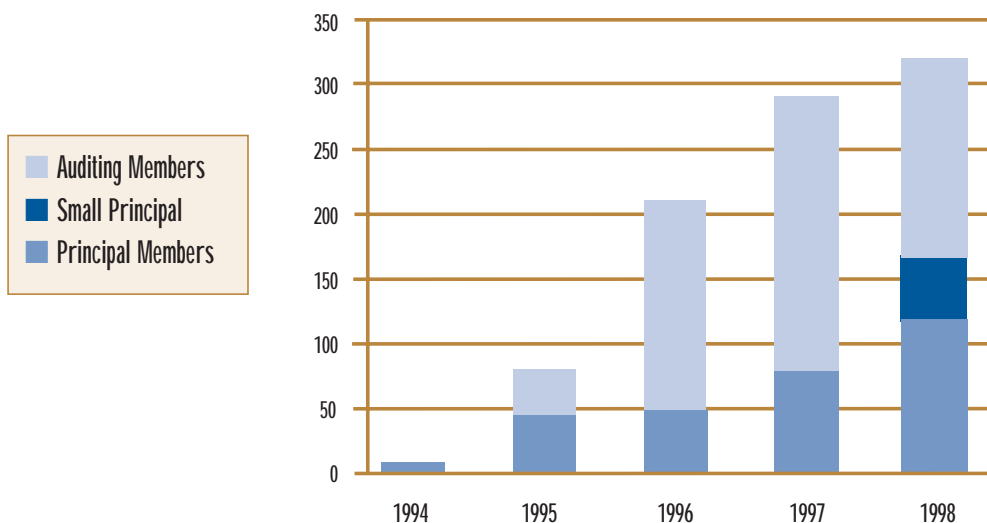
Membership increased again during 1998, growing to 309 member companies by year-end. This growth reflects the

accelerating market momentum for ADSL as providers begin deploying commercial services and others realize its tremendous potential. In 1998 the Forum created a new "Small Company Principal" membership class to foster an environment where small companies can get an equal vote in the advancement of ADSL. Significantly, several Auditing members upgraded to Principal or Small Company Principal memberships in 1998. This was key to getting broad industry consensus on the end-to-end architectures created in the Forum this past year. Voting members increased from 74 to 164 in number from 1997 to 1998. As a result, the Forum's documents represent the broadest industry support.

Membership at the end of 1998 was as follows:

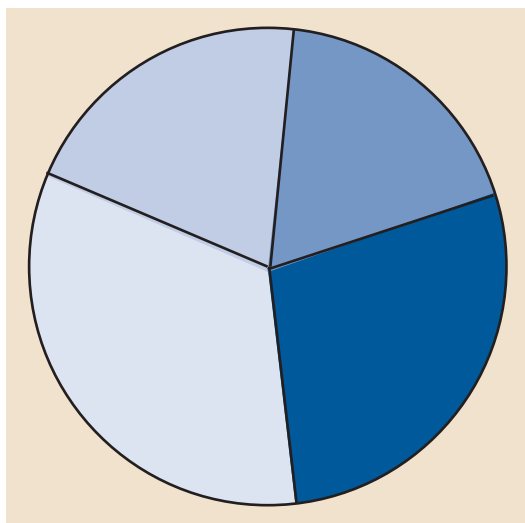
<b>Principal Members:</b>	<b>117</b>
<b>Small Company Principal Members:</b>	<b>47</b>
<b>Auditing Members:</b>	<b>145</b>

ADSL FORUM MEMBERSHIP GROWTH



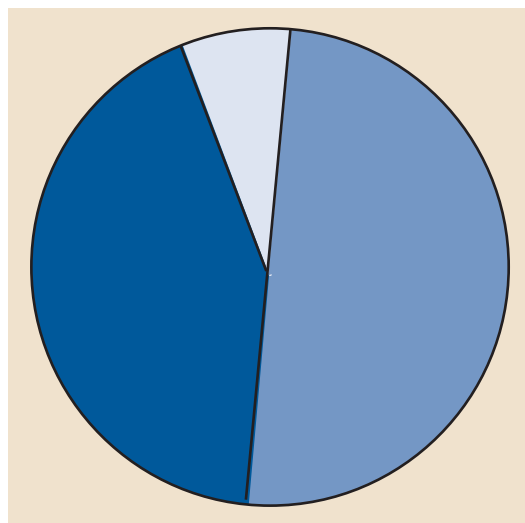
**Figure 1** shows the development of the total number of members since the creation of the ADSL Forum.

MEMBERSHIP DEMOGRAPHICS



- Service Providers
- Equipment Manufacturers
- Technology Providers
- Others

GLOBAL REPRESENTATION



- North America
- European
- Asia

As a result of a comprehensive public relations program, the ADSL Forum is now considered as the primary source of information on matters relating to ADSL and broadband access in general. In addition, our public relations representatives have generated considerable media coverage of ADSL and the Forum. This has been accomplished through news releases about our accomplishments, via editorial opportunities pursued by working closely with key editors and analysts and other publicity in the form of interviews and editorial contributions written by Forum officers that have been published in trade magazines.

Our communication strategy is to elevate awareness of ADSL to potential users and to reinforce the value of the ADSL Forum to industry stakeholders. We have established strong ties with influential analysts and editors while articulating a clear and consistent message to educate them about the relative benefits of ADSL over other access technologies.

In 1999, the Forum's public relations representatives will expand their focus to directly address the user community through appropriate media outlets. Now that ADSL services are available through multiple sources, it is appropriate to undertake a Consumer Awareness Program to educate and inform potential users of the benefits of ADSL. This will be an aggressive program that incorporates all basic public relations tools to generate editorial coverage and assist in market stimulation.

ADSL Forum Ambassadors have been speaking at an increasing number of conferences and ADSL related events in the US, Europe, and Asia/Pacific. The Forum's Ambassador Program has been extremely successful, dispatching speakers to conferences and industry events where they explain the group's mission and make the case for ADSL.

During 1998 three ADSL Forum Summits were held. These events provided an excellent platform for updates on ADSL developments and to discuss key issues. We held our first Asian ADSL Forum Summit in Singapore in September providing an opportunity to focus on developments in the Asia-Pacific region. The ADSL Forum Summit held in Los Angeles

last November was especially successful in drawing a significant percentage of attendees from non-member organizations, therefore spreading the word that ADSL is accelerating momentum to a wider audience. This Summit featured a User Group Panel that provided real insight into how ADSL meets the current and future need and showed how the technology is used to deliver value and benefit. An excellent panel of Service Providers also helped to make this ADSL Forum Summit one of the highlights of the year.

During the past year the ADSL Forum has participated in several key trade shows.. These included ISPCon, Comdex, CommunicAsia and two Network+Interops. At the May 1998 Network Interop in Las Vegas, the Forum hosted an ADSL Hotspot in which 20 member companies participated. This event focused on ADSL and it's applications with live demonstrations, educational material and a live presentation held throughout the show. Participation in these shows provides a significant educational opportunity among trade audiences, a platform for editorial interviews and a focus for capitalizing on the work of the Forum.

1999 promises to be an even more exciting year for the marketing work of the Forum with trade show participation planned at CeBit, ISPCon, Comdex, XDSL ComForum and SuperComm. At SuperComm, the ADSL Forum will co-sponsor a multi-vendor event with the UAWG. The focus will be on ADSL interoperability and it's importance in accelerating the deployment of ADSL.

The ADSL Forum's web site is another useful vehicle for disseminating key information about ADSL. It is a valuable resource for anyone interested in ADSL, drawing 35,000+ hits a month from editors, analysts, industry observers and the general public. We unveiled a new design for the Forum web site during our last Annual Meeting in Barcelona. The "Members Only" section has developed into a highly useful working tool for all members with automated facilities for registering contributions and archiving important documents.

In 1999 we are launching a new Users' Web Site that will provide many important services to potential ADSL users including, basic education on ADSL and its benefits, referral to services available in the user's area and a chat room where

users can communicate with one another. This site will play a big role in stimulating a mass market and in informing ADSL Forum members on user needs.

The ADSL Forum also commissioned a comprehensive market research study to analyze the regional market environments in North America, Europe and Asia-Pacific, collect statistics on key telecommunications market indicators and identify trends. This study, published in June 1998, was made available free to our Principal members, a reduced fee to our Auditing members and at a fee to non-members. The report provides definitive data on the current and immediate future of ADSL worldwide and created a valuable publicity vehicle for the Forum.

## TECHNICAL

During 1998, the Technical Committee reorganized itself to re-align its work and working group structure with the evolving needs of the DSL industry. The Network Migration, SNAG and Packet Mode groups completed their technical reports and thus, having met their objectives, were discontinued. Architectural work was then focused in the ATM group whose technical recommendation on "PPP over ATM" has been widely endorsed by vendors in numerous product announcements and deployments. The Test & Operations group was split into two separate groups to give increased focus on these two key areas that are vital for the mass deployment of ADSL, namely Testing & Interoperability to facilitate interoperable high performance products and also understanding and resolution of operational barriers. New work items on VDSL resulted in the formation of a combined technical/marketing VDSL study group which has subsequently revised its scope to cover other new and emerging DSL variants including SDSL. In addition to this emerging DSL study group, the technical committee of the ADSL Forum is now comprised of the following working groups: ATM (split into Architecture and Transport break-out sub-groups), CPE/CO-Configurations & Interfaces, Operations, Testing & Interoperability and Network Management.

In 1998 the Technical Committee adjusted its operating procedures to increase focus and productivity. A technical roadmap was introduced that gives new and old members an

up-to-date view of the scope and planned deliverables for each working group together with the details of key members of the Technical Committee. This is now available on the Forum's web site. It is also valuable as a way of communicating the technical work of the Forum to the Marketing Committee.

The increased productivity achieved by the Technical Committee and its working groups has resulted in some impressive achievements. There is now a substantial body of work that has been produced by the Technical Committee.

In addition to these completed Technical Reports, there are also a number of Working Texts either under development or in the ballot process. At the time of writing the status was as follows:

### Reference Models

- ADSLForumTR-001: ADSL Forum System Reference Model
- ADSLForumTR-010: Requirements & Reference Models for ADSL Access Networks: The "SNAG" Document

### Network Migration

- ADSLForumTR-004: Network Migration

### Packet Mode ADSL Systems

- ADSLForumTR-003: Framing and Encapsulation Standards for ADSL: Packet Mode
- ADSLForumTR-008: Default VPI/VCI Addresses for FUNI Mode Transport: Packet Mode
- ADSLForumTR-009: Channelization for DMT and CAP ADSL Line Codes: Packet Mode
- ADSLForumTR-011: An End-to-End Packet Mode Architecture with Tunneling and Service Selection

### ATM Mode ADSL Systems

- ADSLForumTR-002: ATM over ADSL Recommendations
- ADSLForumTR-012: Broadband Service Architecture for Access to Legacy Data Networks over ADSL ("PPP over ATM")

The current texts under development are:

#### *Network Architecture Group:*

- WT-031: References and Requirements for CPE Architectures for Data Access (currently in straw ballot)
- WT-032: Premises Architecture Recommendations (conditional on WT-031 progress)
- WT-033: Core Network Architecture for Access to Legacy Data Network over ADSL (targeted for straw ballot March 1999)

#### *Access Transport Group:*

- WT-021: Enhanced version of TR-002: ATM over ADSL Recommendations (currently in straw ballot)

### Physical Wiring Configurations & Interfaces

- ADSLForumTR-007: Interfaces and System Configurations for ADSL : Customer Premises

The current texts under development are:

- WT-018: Interfaces and System Configurations for ADSL : Central Office (currently in letter ballot)

White Paper on use of microfilters & splitters with DSL-Lite

### Operation of ADSL Systems

Current text under development:

- WT-026: The Operation of ADSL-Based Networks

### Network Management of ADSL Systems

- ADSLForumTR-005: ADSL Network Element Management
- ADSLForumTR-006: SNMP-Based ADSL Line MIB

The current texts under development are:

- WT-022: DMT Line Code Specific MIB Working Text (currently in letter ballot)
- WT-023: CAP Line Code Specific MIB Working Text (currently in letter ballot)
- WT-024: ADSL Network Management Architecture
- WT-025: CMIP Specification for ADSL Network Element Management (currently in letter ballot)

In addition, there are plans to update TR-005, TR-006 (ADSL Line MIB) version 2 after the IETF has finished standardizing the ADSL Line MIB.

**Testing and Interoperability of ADSL Systems**

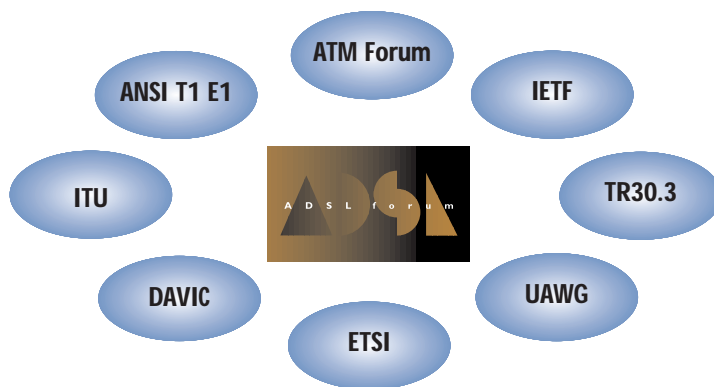
The current texts under development are:

- WT-027: Overview of ADSL Testing (currently in straw ballot)
- WT-028: ADSL Conformance Testing
- WT-029: ADSL Performance Measurements
- WT-030: ADSL Basic Interoperability Specification
- WT-034: T1.413 Issue 2 ADSL ICS

1998 has also seen increased liaison activity with other bodies in order to maintain coherence within the industry. In particular, the ATM group has been involved in several joint meetings with the ATM Forum who have contributed significantly to the review of the ADSL Forum work on ATM over ADSL. The Network Management group has downstreamed work to the IETF and now the ITU are keen to endorse work from this group for their Q.833.1 recommendations on access network management. TIA TR30.3 are beginning to look at ADSL testing and are keen to build on the work of our Testing and Interoperability group. This Testing and Interoperability group has already been working closely with members of the UAWG on testing and interoperability issues. We continued our regular dialogue with ETSI and ANSI on physical layer issues and have recently increased the communication with ITU-T SG15.

During the ADSL Forum meetings, 'Round Tables' have been held on various subjects to enable our members to discuss in an open manner issues of major interest and to determine if the Forum should address these issues through its committees and working groups. Among the topics covered in 1998 were VDSL, SDSL, Universal ADSL and strategy evolution.

The ADSL Forum is recognized by a number of Standardization Bodies and groups similar to the ADSL Forum and has established formal liaisons to these groups to help ensure that ADSL advances in the most expeditious manner.



In early 1998, some of the most influential corporations in the telecommunications, computing, semiconductor, and software industry created a new group: the Universal ADSL Working Group (UAWG). The ADSL Forum has established a formal liaison to the UAWG.

Throughout the year, there has been increasingly close cooperation between the UAWG and the ADSL Forum. We are currently engaged in an aggressive effort to stimulate interoperability among suppliers who will bring Universal ADSL products to market in mid-1999. This work is being pursued by the UAWG and it is the Forum's intention to carry on with this work when the UAWG disbands in June of 1999.

Several questions have been put forward with respect to the UAWG and the ADSL Forum. It is important to note here that the nature of the two organizations is quite different. The ADSL Forum, by its nature, has to follow the Antitrust Laws in the US and elsewhere, whereas the UAWG is a group of companies working together for a limited period of time to achieve a clear objective. In addition, the UAWG is addressing issues at the physical layer, whereas the ADSL Forum focuses on developing end-to-end solutions at the upper layers.

The UAWG, whose members to a large extent are the same as the members of the ADSL Forum, has provided the result of its work as inputs to the International Telecommunication Union

(ITU) for issues relating to the physical layer, and to the ADSL Forum for the upper layers.

The fact that the UAWG has been created and nearly completed its mission, is a further sign of confidence in ADSL as a technology and its future role as a means to enable broadband access on a very large scale.

Additionally, the fact that the ITU is now working on issuing specifications on various ADSL related topics, including G.992, gives ADSL true world-wide applicability and a platform for the ADSL Forum to continue to provide Technical Recommendations, supported by the largest group of companies possible, on End-To-End Network Architectures. This work is rapidly moving to include End-To-End Service Architectures.

Based on input from our members, the Board of Directors has decided to give the following topics highest priority in the work to be performed in the ADSL Forum during 1999:

**INTEROPERABILITY:** Interoperability is crucial for the further development of ADSL. The ADSL Forum will take leadership to ensure that the various independent initiatives to work towards interoperability will proceed in a coordinated manner inside the ADSL Forum

**END-TO-END ARCHITECTURES:** Continuing the work on End-to-End Network Architectures but move rapidly to include End-to-End Service Architectures

Both technical and marketing committees will need to continue to work closely with the UAWG in order to determine the best organizational structure within the ADSL Forum to continue the work of the UAWG on DSL-Lite once the UAWG invokes its sunset clause. This will further increase the focus in the Testing and Interoperability group to keep up momentum on vendor interactions to progress interoperability of products. The Operations and Network management groups will work together even more closely to break down barriers to mass market provisioning and management of services over ADSL-based networks. A workshop on March 1st is an indication of the way these two working groups are soliciting the views of

ILECS, CLECs and ISPs to help define the key issues and priorities. The ATM group will expedite work on premises and core architectures to augment their successful work on ATM over ADSL in order to give a complete end-to-end network architecture view. The emerging DSL study group will seek further opportunities to reuse the ADSL recommendations of the Forum for SDSL and VDSL where appropriate. The Technical Committee will also be examining the best way of organizing work on Voice over DSL which looks set to "arrive" in 1999.

It is the view of the Board of Directors of the ADSL Forum that 1999 will be one of formidable challenges. Many expectations have been created around ADSL and the whole industry needs to live up to them, maintain the momentum, and carefully manage the expectations around new developments to come.

As the preferred solution for secure, continuous high-speed remote access in the local loop, ADSL is well positioned to win new converts in the years ahead. We look forward to your continuing participation and support as we usher in an exciting future.

## ORGANIZATION

By drawing upon the tremendous collective expertise of our members and joining forces to develop a focused strategy, the ADSL Forum can direct significant resources toward the development of end-to-end solutions.

Last year, as the Forum continued to grow, the Board of Directors' Membership & Nominations Committee reviewed membership categories to ensure that the Forum could advance its work expeditiously even as our numbers swelled. The Committee recommended that membership categories be broadened to meet the requirements of the wide range of organizations with a stake in ADSL and to provide them with a level of participation that fits their needs.

## ORGANIZATION

Membership Classes of the ADSL Forum starting from January 1, 1998:

- Principal Members* (full rights and membership fee)
- Small Company Principal Members* (full rights and reduced membership fee)
- Auditing Members* (no voting rights, no right to nominate Officers, admission to Plenary Meeting only, full information, reduced membership fee)

Each year, members elect new officers to the ADSL Forum Board of Directors to lead the effort to promote ADSL. Board members themselves serve on several internal committees to focus on specific areas of management.

- Finance & Audit*
- Membership & Nominations*
- Technical Management*
- Marketing Management*

In early February 1998, the Board of Directors held a full-day strategic planning session to discuss the issues that we and our members felt should be addressed in the coming months. The Board also explored ways to increase the productivity of our committees and working groups.

As a result, during 1998 the work method and the organization of ADSL Forum meetings have been gradually changed in order to enable more productive work during and in between meetings.

The work of the ADSL Forum is performed under two main committees, which were headed by the following chairpersons:

### *Technical Committee*

Chair: Gavin Young

Vice Chair: Frank van der Putten

### *Marketing Committee*

Chair: Dawn Difflumeri-Kelly

Vice Chair: Franz Starnberger

The Technical Committee is subdivided into a series of sub-committees or working groups that focus on specific areas in order to facilitate and expedite the technical work of the Forum.

The current Technical Committee structure includes the following sub-committees:

- ATM (split into Architecture and Transport breakout sub groups)*
- CPE/CO Configurations & Interfaces*
- Operations*
- Testing & Interoperability*
- Network Management*

Additionally the Forum recently created a "DSL Study Group" that bridges both the Technical and Marketing Committees.

The Marketing Committee also is subdivided into task-oriented groups which focus on increasing awareness of ADSL, educating key audiences about the many key benefits of ADSL and winning 'mind share' in the marketplace for ADSL. The current Marketing Committee structure includes the following sub-committees:

- Strategic Communications*
- Ambassador Program*
- Web Site*
- ADSL Forum Summits*

The Forum's public relations work has significantly increased during 1998, resulting in far more press coverage of ADSL, greater interest among industry and financial analysts, increased awareness about ADSL and a review of our overall communication strategy for the remainder of the decade. In September 98, Jansen Communications, the outside public relations consultancy contracted to manage public relations for the Forum in the Americas, resigned as the Forum's representative due to ill health. The Marketing Committee, with the support of the Board, issued an RFQ to contract a new firm. As a result of this effort, in October 1998 PR Unlimited, Inc. became the Forum's new public relations consultant for the Americas. Pielle Consulting continues their public relations work on behalf of the Forum in the European and Asia/Pacific regions.

The financial management of the ADSL Forum has been reviewed by our auditors, Cote & Company, Certified Public Accountants. The following gives an overview of the key financial figures and indicators of the ADSL Forum.

#### Statement of Revenues, Expenses & Change in Membership Equity:

<i>December 31</i>	<i>1998</i>	<i>1997</i>
<b>Revenues:</b>		
Membership Fees	\$942,000	\$706,500
Meeting Observer Fees	\$182,400	\$267,996
Sponsorship Revenues	\$147,000	\$30,000
Interest	\$32,322	\$13,931
Dividend Income	\$111	
Realized gains on investment sales	\$3,997	
Unrealized gains on investments	\$3,604	
CDA Donation	\$12,000	\$12,000
Other	\$13,616	\$3,303
	<b>\$1,337,050</b>	<b>\$1,033,730</b>
<b>Expenses:</b>		
Management Fees	\$287,557	\$250,285
Sales & Marketing	\$167,695	\$74,283
Consulting & Professional Fees	\$83,510	\$18,228
Meetings & Trade Shows	\$392,846	\$356,403
General & Administrative	\$44,598	\$30,679
	<b>\$976,206</b>	<b>\$729,878</b>
Increase In Membership Equity	\$360,844	\$303,852
Membership Equity, January 1st	\$489,034	\$185,182
Membership Equity, December 31st	<b>\$849,878</b>	<b>\$489,034</b>

#### Statement of Financial Position:

<i>December 31</i>	<i>1998</i>	<i>1997</i>
<b>Assets</b>		
Cash & Cash Equivalents	\$921,890	\$572,390
Prepaid Expenses	\$5,785	
<b>Total Assets</b>	<b>\$927,675</b>	<b>\$527,390</b>
<b>Liabilities &amp; Membership Equity</b>		
<b>Liabilities:</b>		
Accounts Payable	\$54,297	\$16,361
Deferred Membership Fee Revenue	\$23,500	\$21,995
<b>Total Liabilities</b>	<b>\$77,797</b>	<b>\$38,356</b>
<b>Membership Equity – Unrestricted</b>	<b>\$849,878</b>	<b>\$489,034</b>
<b>Total Liabilities &amp; Membership Equity</b>	<b>\$927,675</b>	<b>\$527,390</b>

## PRINCIPAL MEMBERSHIP

3Com  
ADC Telecommunications  
AG Communication Systems  
ASC  
AT&T Laboratories  
Accelerated Networks, Inc.  
Advanced Fibre Communications  
Advanced Hardware Architectures  
Advanced Micro Devices  
Alcatel Telecom  
Ameritech  
Amphenol Canada Corp.  
Analog Devices  
Applied Innovation  
Ascend Communications  
Assured Access Technology  
Atlantech Technologies  
Atlas Communication Engines, Inc.  
Aware  
Bay Networks  
Belgacom  
Bell Atlantic  
Bell Canada  
Bellcore  
BellSouth Telecommunications  
Bosch Telecom  
British Telecom  
Broadband Technologies  
Cable & Wireless  
Cabletron Systems Inc.  
Cayman Systems  
Centillum Technology  
Chunghwa Telecom Labs  
Cirrus Logic  
Cisco Systems  
Communications Technology, Inc.  
Compaq Computer  
Concentric Network  
Copper Development Association  
Copper Mountain Networks  
CopperCom, Inc.  
Covad Communications  
DSC Communications  
Design of Systems on Silicon (DS2)  
Diamond Lane Communications  
Diamond Multimedia  
Digi International  
ECI Telecom  
ELSA GmbH  
ENATELF  
EPL Ltd  
Efficient Networks Inc.  
Elantec Semiconductor  
Ericsson  
Escalate Networks  
FORE Systems  
Flowpoint  
Fluke Corporation  
France Telecom  
Fujitsu Limited  
GTE Corporation  
General DataComm, Inc.  
General Signal Networks  
GenRad  
Global Village Communication  
GloboLoop, Ltd.  
Globespan Semiconductor  
Gorham & Partners  
Harris & Jeffries, Inc.  
Harris Corporation  
Hayes  
Hekimian  
Helsinki Telephone Corporation  
Hewlett-Packard  
Hitachi  
ITRI  
Integrated Device Technology  
Integrated Telecom Express  
Intel  
Interspeed  
Intracom S.A.  
Inverness Systems, Inc.  
Italtel  
Iterated Systems  
Jetstream Communications  
KPN Telecom  
KTL  
LG Electronics  
LSI Logic Corporation  
Lucent Technologies  
MCI Worldcom  
Madge Networks  
Marconi S.p.A.  
Matsushita Electric Ind. Co. Ltd.  
Mathews Communications, Inc.  
Metalink  
Microsoft  
Milgo Solutions, Inc.  
Motorola Semiconductor  
NEC  
NTT  
National Semiconductor  
Netcom Systems  
Netspeed  
New Information Technologies, Inc. (NITECH)  
Next Level Communications  
Newbridge Networks Corporation  
Nokia Telecommunications  
Nortel  
OKI America Inc  
Objective Systems Integrators  
Orckit Communications  
PMC-Sierra Inc.  
PairGain Technologies  
Paradyne  
Philips Multimedia & Network Systems GmbH  
Promatory Communications, Inc.  
Pulse  
Pulsecom  
Raychem  
Redback Networks, Inc.  
Rhythms NetConnections  
Robertson, Stephens & Co.  
Rockwell Semiconductor  
Rosun Technologies, Inc.  
RouterWare  
SAGEM  
Samsung Electronics Co., Ltd.  
SBC Technology Resources  
Secant Network Technologies  
Shasta Networks  
Siecor  
Siemens AG  
Silicon Spice  
Sonera Corporation  
Sprint  
Starnet Technologies, Inc.  
STMicroelectronics  
Sun Microsystems  
TTC  
Tektronix  
Tele Danmark  
Telecom Italia  
Teledata Communications  
Telia AB  
Telos Technologies, Inc.  
Telrad  
Telstra  
Teradyne, Inc.  
Texas Instruments  
Tollgrade Communications  
Torrent Networking Technologies  
Toshiba Corp.  
Transcend Access Systems  
TranSwitch Corporation  
Tut Systems  
USN Communications  
UUNET Technologies  
VIT Electronics  
ViaGate Technologies  
VideoGate Technologies, Inc.  
Virata Ltd.  
Web Silicon Inc.  
Westell  
Yurie Systems, Inc.  
Zyxel Communications, Inc.

3CX  
 AKM  
 ATRI  
 AccessLan Communications  
 Aethra  
 American Research Group  
 Anritsu  
 Bel Fuse, Inc.  
 B.I.C.C. Communications  
 Burr-Brown Corporation  
 C-Com Corporation  
 CP Clare Corporation  
 Cadence Design Systems  
 Cellware  
 Centre for Development of Telematics  
 Centre for Wireless Communications  
 Cincinnati Bell Telephone  
 Comatlas  
 Commonwealth Telephone Enterprises  
 CommTech Corporation  
 Communications Technology Corporation  
 Conectiv Communications  
 Creatix  
 DNA Enterprises, Inc.  
 DTI  
 Daewoo Electronics Co. Ltd.  
 Davicom Semiconductor  
 DSET Corporation  
 Digicom S.p.A.  
 Digicon Systems, Inc.  
 Digital Link Corporation  
 Digital Technology, MA  
 Ess Technology, Inc.  
 ETRI  
 Edgcumbe Instruments Limited  
 Eicon Technology Corporation  
 ElCom  
 Epigram  
 Fantastic Corporation  
 GPT Ltd. Wound Components Division  
 GVC Corporation  
 GVN Technologies, Inc.  
 General Cable Corporation  
 Georgia Institute of Technology  
 Hi / fn Inc.  
 HarmonyCom  
 Hill Associates, Inc.  
 Hitachi Cable America  
 Huawei Technologies Co. Ltd.  
 Hyundai Electronics  
 IBM Global Services  
 IMPSAT  
 INET, Inc.  
 IPM Datacom  
 Information & Graphics Systems  
 Integral Access, Inc.  
 Integrated Network Corporation  
 JNA Telecommunications Ltd.  
 Japan Aviation Electronics Ind., Ltd.  
 Jersey Telecoms  
 KSA, Inc.  
 KAPSCH  
 Katron Technologies Inc.  
 Kingston Communications (Hull) PLC  
 Korea Telecom  
 LG Information & Communications Ltd.  
 Livingston Enterprises  
 MMC Networks  
 MachOne Communications  
 Midcom, Inc.  
 Mitel Semiconductor  
 Mitsubishi Electric Corporation  
 Motorola ISG  
 NEC Australia  
 Natural MicroSystems  
 NeoParadigm Lab., Inc.  
 NeoWave  
 NETMANSYS  
 NetQuest Corporation  
 Novell Inc.  
 Olicom, Inc.  
 OpenCon Systems  
 PC-TEL Inc.  
 Panasonic Singapore Laboratories  
 Parks S/A Comunicacoes Digitais  
 Personal Systems Group, Fujitsu Ltd.  
 Philips Consumer Communications  
 Porta Systems Corporation  
 Predictive Systems  
 Premisys Communications  
 Rad Data Communications  
 RELTEC  
 Ryan-Hankin-Kent  
 SESSI  
 Sage Instruments  
 Satronix, Inc.  
 Schmid Telecom AG  
 Schott Corporation  
 Scientific Generics  
 Sharp Laboratories of America  
 Shinkwang Telecommunications, Inc.  
 Shiva  
 Singapore Polytechnic  
 Singapore Telecommunications  
 Sony Electronics Inc.  
 Sony Semiconductor Europe  
 Southern Methodist University  
 Stentor Canadian Network Management  
 Sumitomo Electric U.S.A.  
 Superior Telecommunications  
 Taicom Data Systems Co., Ltd.  
 Tainet Communication System Corporation  
 Telamon Corporation  
 Telco Systems, Inc.  
 TeleChoice  
 Telefonica de España  
 TELEknowledge Group  
 Telenor  
 Tellabs OY  
 Telmax Communications  
 Telus Advanced Communications  
 Toko America, Inc.  
 Toucan Systems Ltd.  
 Transcendata  
 Trend Communications  
 UTStarcom  
 Universal Microelectronics Co., Ltd.  
 University of New Hampshire  
 University of Pretoria  
 Vacuumschmelze  
 Valor Electronics  
 Viacom  
 WaiLAN Communications  
 Wandel & Goltermann A.T.E. Systems, Inc.  
 Wavetek  
 Westport Technologies, Inc.  
 Wind River Systems, Inc.  
 Wong's International  
 XAVI Technologies Corp.  
 Xecom  
 Xedia  
 XIRCOM, Inc.  
 Yokogawa Electric Corporation

## CONCLUSION

The Board of Directors would like to take this opportunity to thank the delegates of our member companies for their continued contributions to the successful work of the Forum and for their efforts in advancing ADSL. We also thank them for their confidence in our officers and chairpersons. 1998 was a year of which the Forum and its members have much to be proud of. The ADSL Forum has performed its tasks and duties in a very professional and cooperative spirit during 1998. Its Officers have taken great care and made every effort to manage the Forum to the best of its members' interest.

Therefore, the Board of Directors proposes to the members present at the Annual Meeting to accept this Annual Report and approve the Financial Report provided by the Treasurer.

Hans-Erhard Reiter  
Chairman and President

William Rodey  
Vice President and Treasurer

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