

March 25, 1980

TO: Ed Krakauer
FROM: Dave Chandler
SUBJECT: THOUGHTS ABOUT MACRO COSMOS' MICROTERMINAL

GENERAL THOUGHTS: My sensing is that:

- 1) home data communications is going to happen in a large way. It is the next major revolution to affect the American way of life.
- 2) contrary to some thinking, I believe it will happen relatively quickly. I expect it to be widespread within two to three years - maybe sooner.
- 3) because it is home centered and involves entertainment, self-improvement, and the whole family, Mattel Electronics should play a major role. The question is what role, and what process to get there?

THE MICROTERMINAL: The MicroTerminal concept, as presented to us by Macro Cosmos, offers two particular advantages. One is its portability; the other is the fact that they provide a headstart on a standard system protocol. The standard system protocol could be the basis for getting some standardization in this field, and in that light could be extremely important. It could be used more widely than for just the MicroTerminal. For instance, our Keyboard Component could become a terminal in the same system and utilize the same protocol for accessing the data bases which MicroTerminal is oriented toward. The portability of the MicroTerminal is gained at the expense of some features which might be limiting in the in-home application. Here again, the MicroTerminal could be one terminal in the system with something like our Intellivision being another optional terminal. Intellivision would provide the capability for full picture graphics as well as full page alphanumeric, whereas the MicroTerminal would provide the ability to communicate in alphanumeric format only, but in a portable fashion.

Unlike Viewdata, the MicroTerminal and its operating system is designed to operate from the more common communication format that exists today in the United

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States on a number of the major networks and data banks. The Viewdata format is somewhat different and would require a different set of processing to condition it for presentation. It is perfectly feasible for an Intellivision modem and associated software to be configured to interface with both Viewdata and the operating system protocol that Macro Cosmos has developed.

APPLICATIONS: Near the end of the attached set of presentation sheets, which were given to us by Micro Cosmos, is one sheet which indicates services which are available on line today which would be suitable for use with MicroTerminal or with Intellivision and a modem. On the following two pages are lists of additional services which could be implemented by the 1981 time period, according to Macro Cosmos. I would tend to agree with their predictions as to the feasibility of the 1981 implementation of those services.

BANKING: Home banking is perhaps one of the more immediate services with particular interest to the in-home application. We are, of course, already in discussions with several banks, relative to using Intellivision as a part of a home banking system. The most prevalent form being considered there, is a special adaptor to be connected to the Master Component through the cartridge port to provide a usable terminal for the home banking application. Clearly, a Keyboard Component with a modem would provide the ability to do a major portion of this as well. Macro Cosmos is proposing that their MicroTerminal would also be a suitable terminal for doing the home banking task. A feature which the banks presently feel is important is that of having a card reader as a part of the terminal and the thinking on their part is that the adaptor for the Master Component would, among other things, contain a card reader as the means of identifying the user. Macro Cosmos proposes to have a unique identifying number built into each of their terminals and it would seem that we should also plan on doing that in any Intellivision application to this type of use. Whether the banks will ultimately accept that identifying number instead of a card reader to read the individual card, is not clear. In either event, all three of these modes of dealing with the home banking application are feasible, and in fact, it may be appropriate to have all three available simultaneously.

STANDARDIZATION: As is true for most major systems, it would be highly desirable to get established a standard central system with its protocol. It is not necessary that the terminals be identical, but they ought to interface with a standard communication means and a standard protocol associated with it. One of the real advantages that I see in working with Macro Cosmos is that they have done sufficient homework

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in that area that with the proper haste in implementing the system, it may be possible to establish the standard by virtue of being there sufficiently early to have created a standard.

PURSUIT OF THE MICROTERMINAL CONCEPT: As was discussed somewhat at Macro Cosmos, implementation of a system of this sort on an early basis would require the activities of several companies. Macro Cosmos proposes that there be established a committee from several companies who would pursue the details of the system protocol to be sure that the implementation, in fact, has the features necessary to make it usable by all of the types of companies that should ultimately participate in such a system. Clearly, Macro Cosmos should be a part of this. Mattel would provide a unique capability to provide a fast implementation of the system and should at least participate in the discussions. To have all of the companies that would ultimately be users represented on a committee to formulate the details is probably unrealistically optimistic. On the other hand, it would be important to have at least representative companies from each of the major types of applications. The types of representation which should be there should be, in addition to Macro Cosmos and Mattel Electronics, a network company and GTE is perhaps the best candidate for that; at least one of the banks, and TTI may be the appropriate interface there - although they are thinking in a different direction in terms of the details of the terminal, at the moment; a Viewdata company, and again GTE could fill that role; a retailer that might be likely to be an early implementer of electronic sales in the home - here, JS&A might be one kind of participant that might be of value, a company like JC Penney's who appears to be moving in that direction somewhat might also be a viable candidate. There should be a representative of at least one of the standard data banks, perhaps more. Here Macro Cosmos already has a good interface with that. We might want to include some of our own MIS people to share in that side of things. GE's Tymeshare would be a valuable candidate in this category as well. There should be a representative, perhaps more than one, of the reservations kind of applications. Here candidates would be one of the airlines; Hertz; hotel chains; and Ticketron.

I believe it would be practical to pull together a group that would have this kind of representation, which could also work effectively together to help polish the details of the type of protocol and central system characteristics that Macro Cosmos has started. If we elected to do it, I could believe that the MicroTerminal and perhaps the modem version of our Intellivision could both be implemented for the

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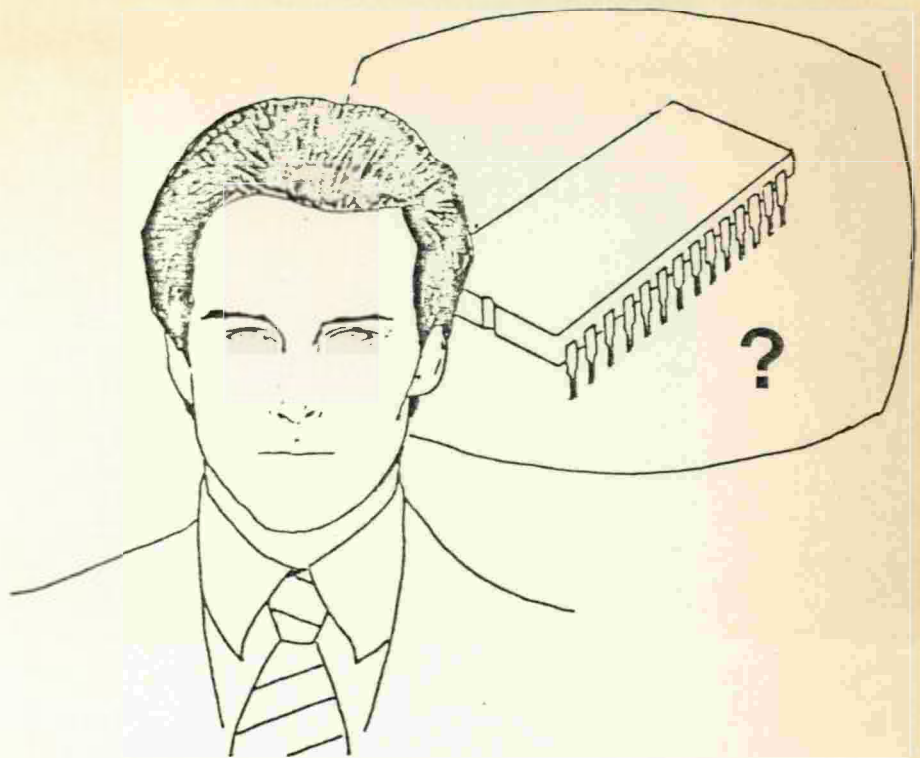
1981 timeframe.

SOFTWARE IMPLICATIONS: In addition to the fact that Mattel Electronics will almost certainly be offering software to reside in central data banks, either of the Viewdata variety or perhaps some of the others, the system proposed by Macro Cosmos offers another possibility for Mattel to consider. This would be the software which would put a major user such as Sears on line in the system. This is a different type of software - one in which each package will be uniquely tailored for the application but which will still be limited to a realitively small number of end users and, therefore, would be practical for Mattel to do if we elected to move into that type of application. It would not be necessary for Mattel to fill that role for this total system to go, however, so if we elected not to participate in that side of it it would be possible to get other companies who could take on that role.

Dave

DPC/lw

cc: Jeff Rochlis
Tim Huber
Alan Secor



**In the 1980's the computing power of
an IBM 360 will be on a single chip.**

What will we do with it? What will it do for us?

Will it cost only a few dollars like today's chips?

Will it be in every home? In every office? In every briefcase?

What are the essential elements needed to transform today's home computer into a truly popular mass market personal computer?

COMMUNICATIONS

**ACCESS TO DATA AND
COMPUTERS ANYWHERE**

PORTABILITY

**ACCESS
FROM ANYWHERE**

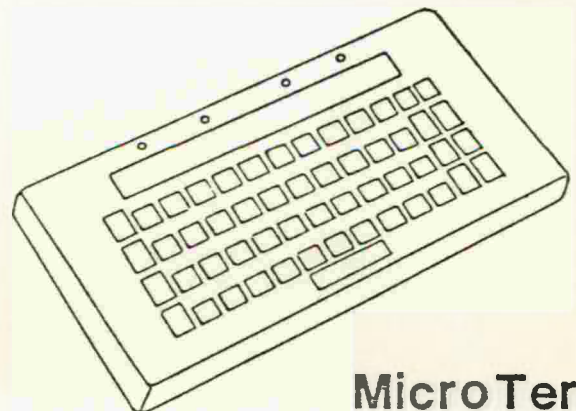
SIMPLE TO USE

EASY ACCESS

PRICE \$200

LOW-COST ACCESS

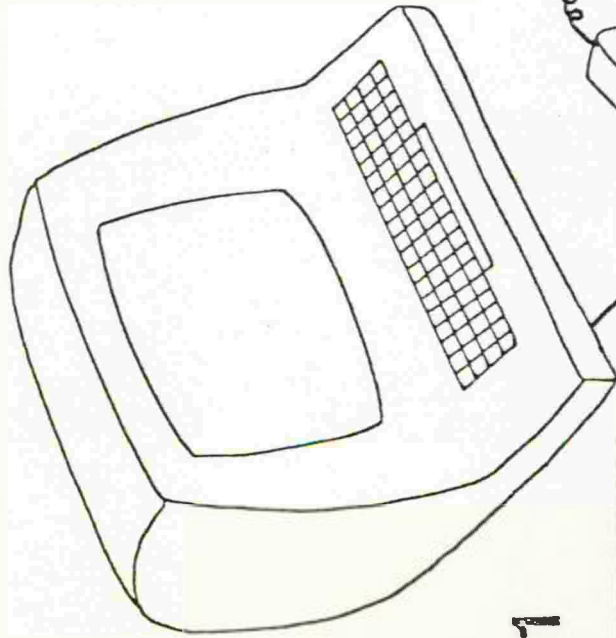
LOTS OF USES



Micro Terminal

What does MicroTerminal replace?

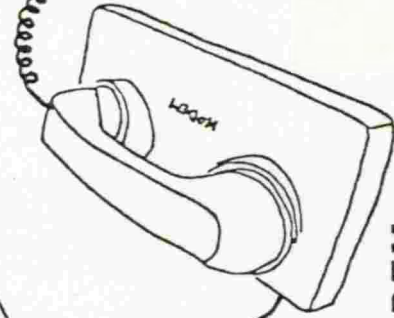
At what cost?



1

TERMINAL
er COMPUTER
with RS232C
Interface

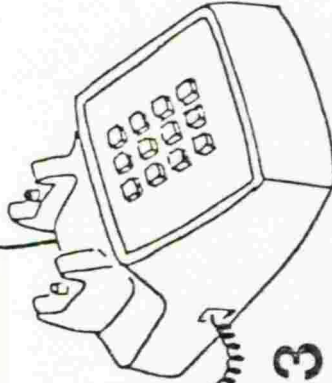
\$800 up



2

MODEM

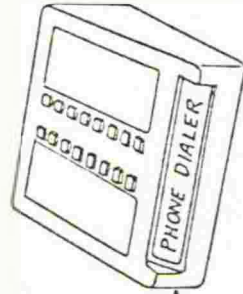
\$199



3

TELEPHONE

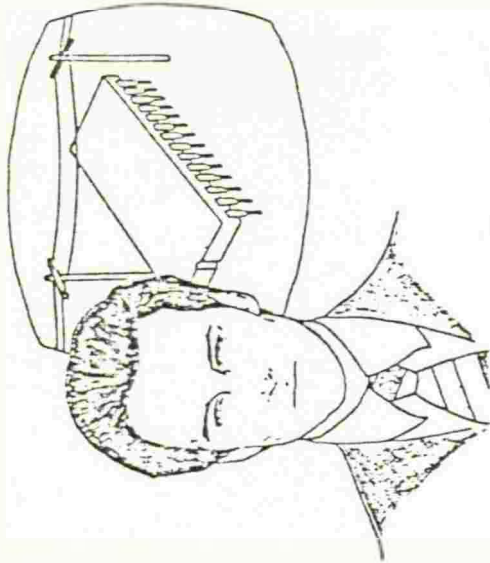
\$40



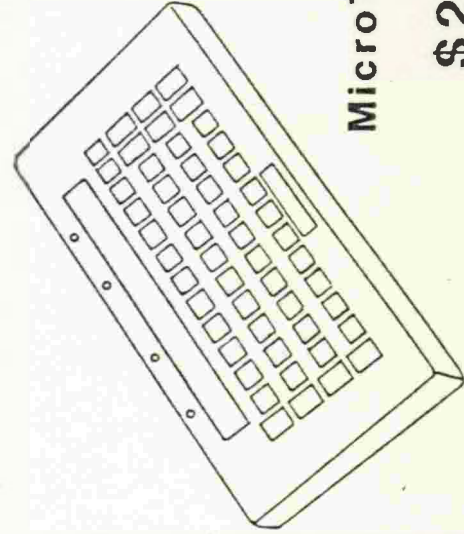
4

MEMORY
DIALER

\$99

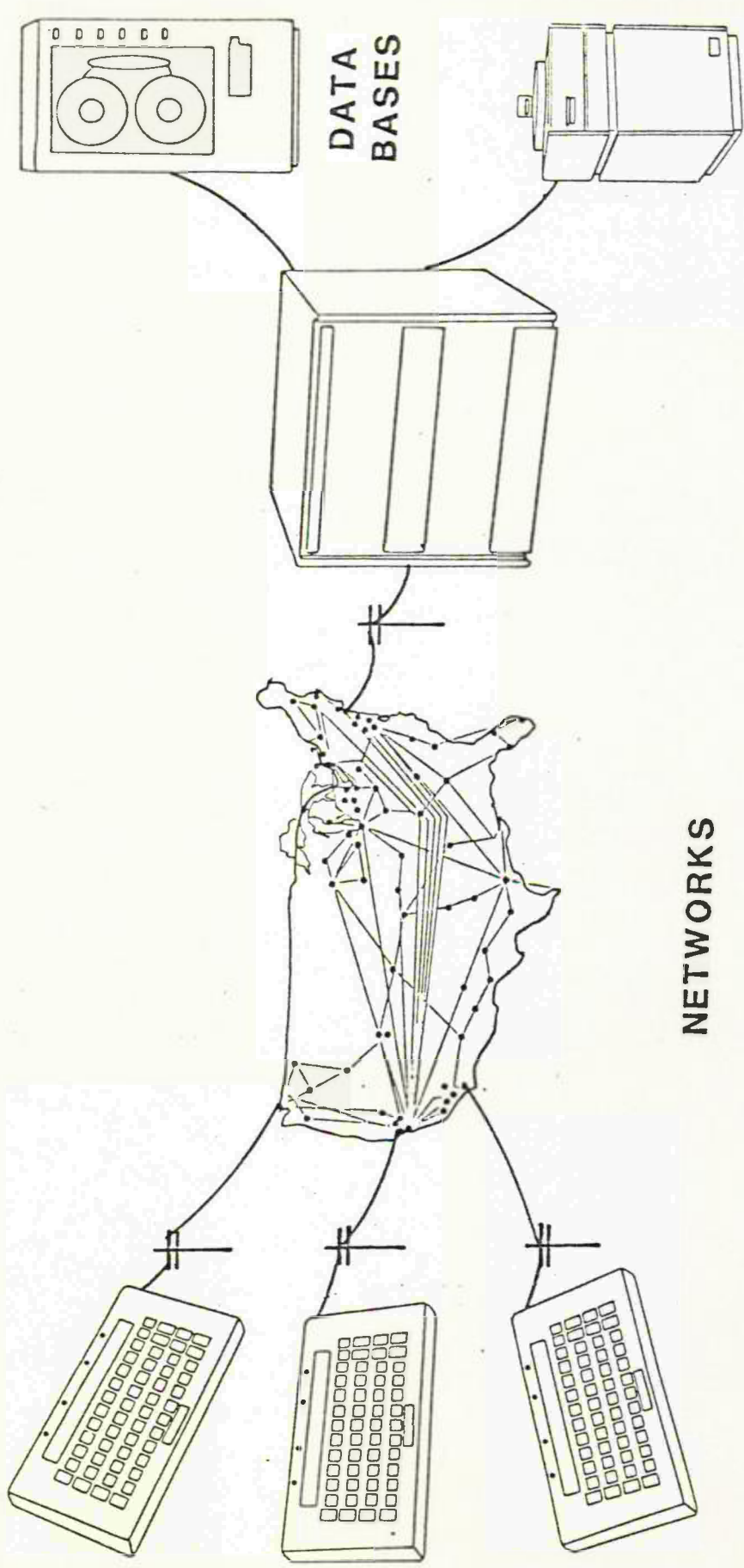


5 INTELLIGENCE



MicroTerminal

\$200



SERVICES

MacroTerminals

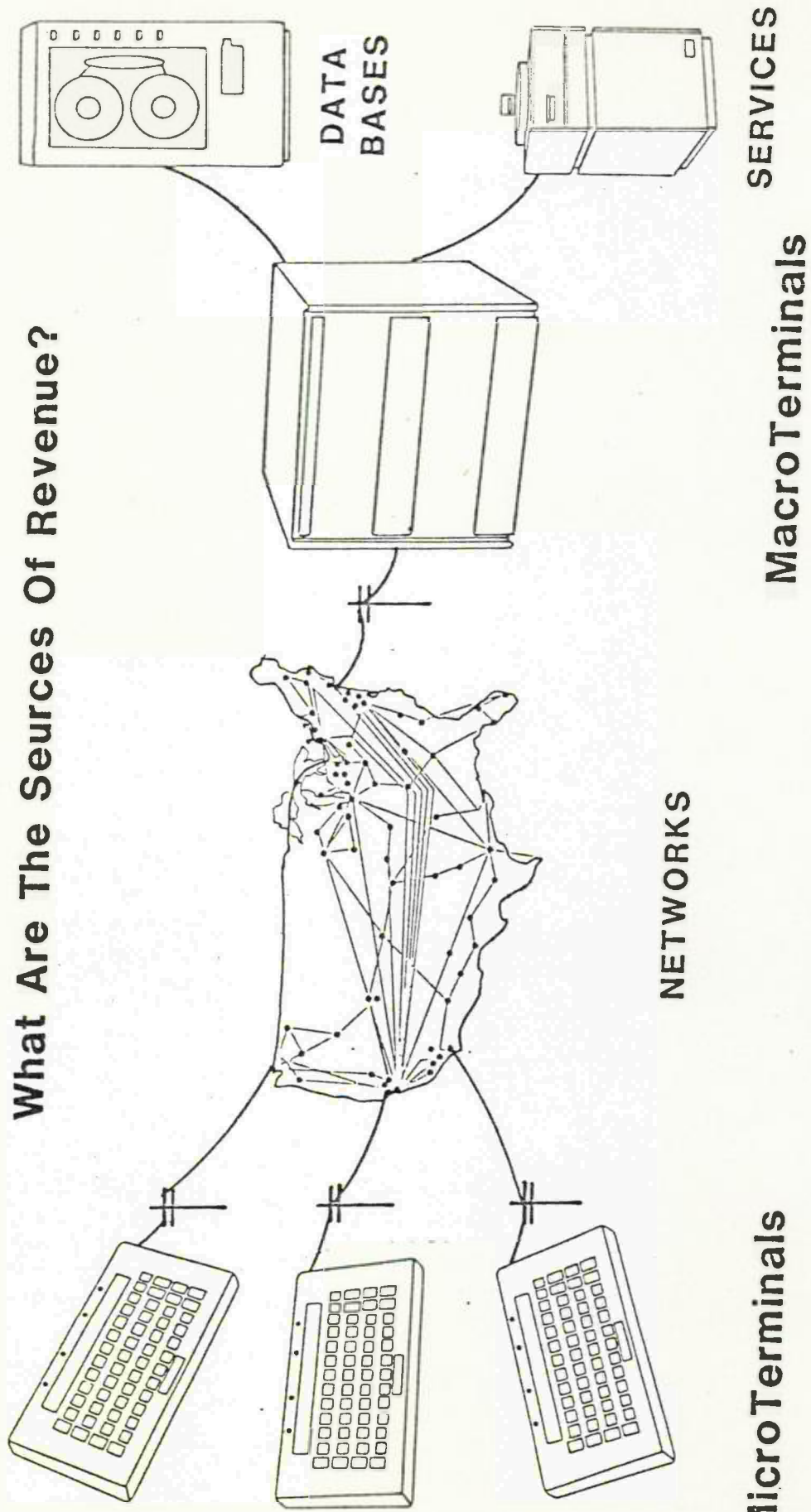
NETWORKS

MicroTerminals

**PROVIDE
ACCESS**

MicroTerminals

What Are The Sources Of Revenue?



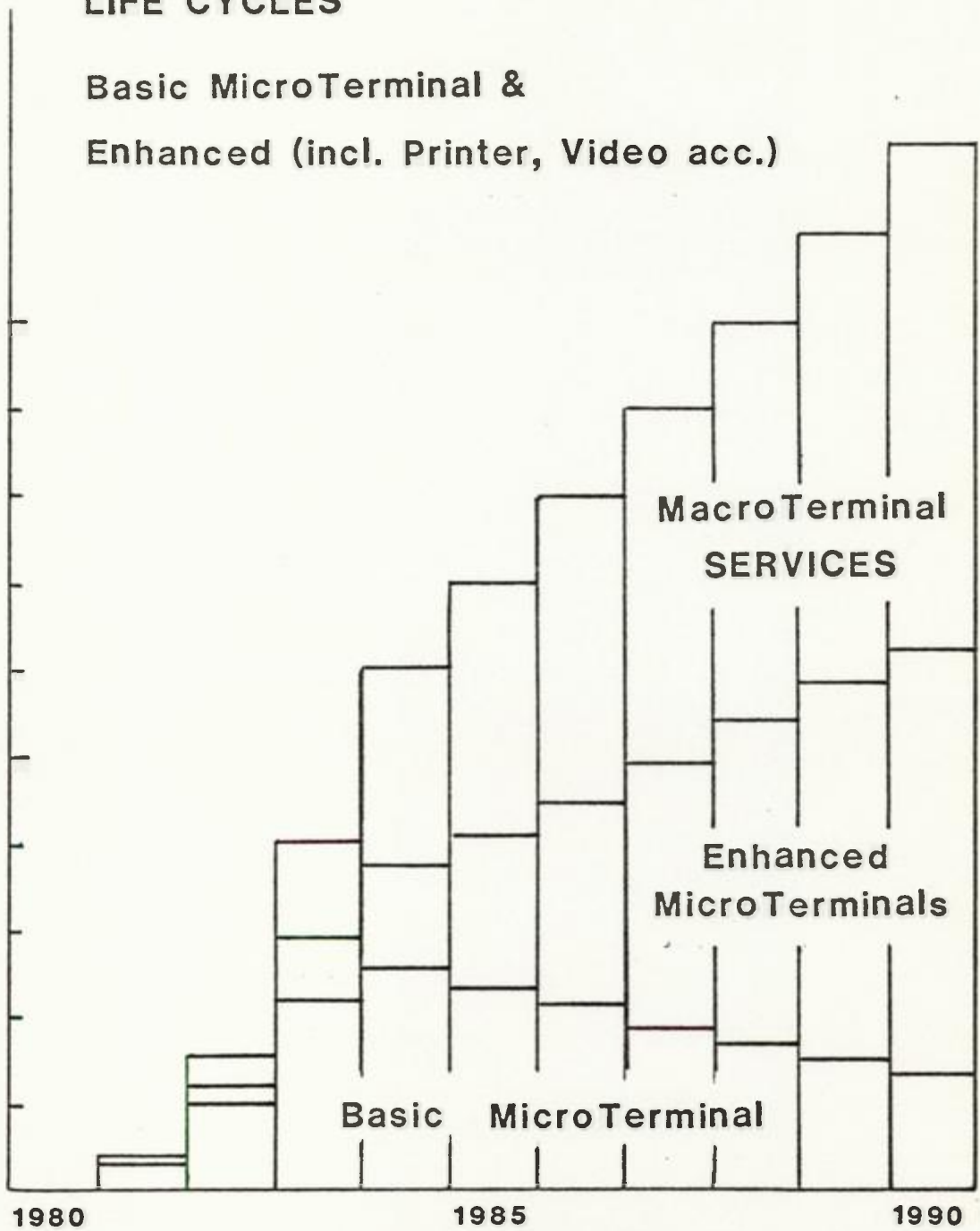
\$ Million

LIFE CYCLES

Basic MicroTerminal &
Enhanced (incl. Printer, Video acc.)

1000

500



MacroTerminal
SERVICES

Enhanced
MicroTerminals

Basic MicroTerminal

1980

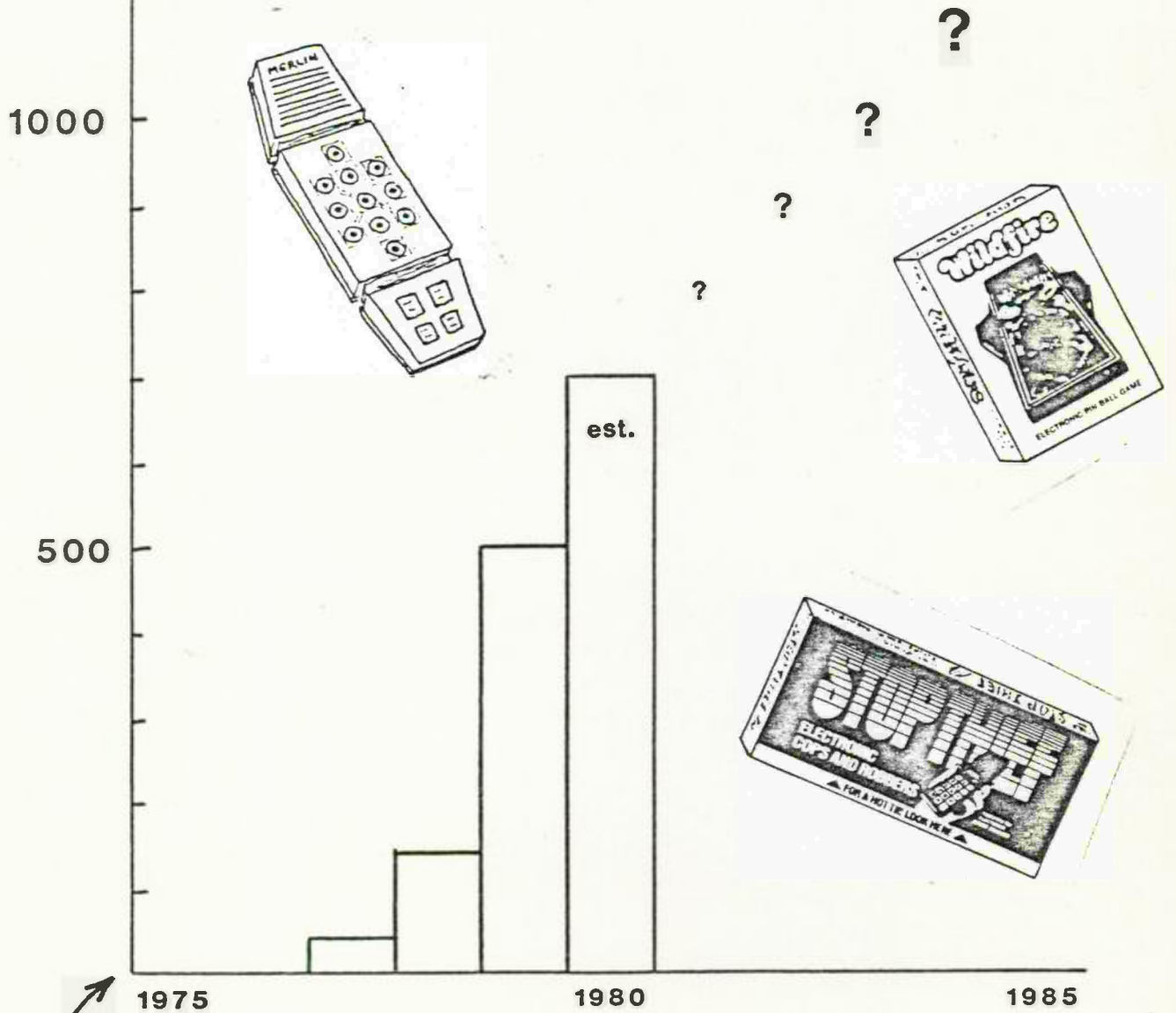
1985

1990

\$ Million

ELECTRONIC COMPUTER GAMES

Retail Sales



FIRST PROTOTYPES

Source:

The New York Times

MicroTerminal Uses

MicroTerminal USES - CONSUMER

NOTE: Most consumer uses will also be valuable to businessmen, possibly of direct business value. They will not always be listed again in the Business Uses list below. This list is in approximate order of interest, based on consumer market tests.

BANKING SERVICES

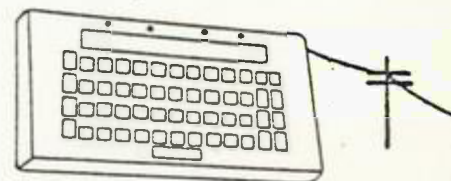
- Bill-paying services
- Checking account balances, activity reports.
- Loan applications
- Transfer savings funds to checking
- Credit limits on charge accounts

HOUSEHOLD BUDGETING

- Monthly expenses by category
- Income Tax data collection

INCOME TAX

- Returns preparation



SHOPPING

- To get lowest possible prices on major purchases - Sears, Penney, etc.

RESERVATIONS

- Travel -
 - Airlines
 - Bus, Train, Ship
 - Car Rental
 - Directions, Routing Assistance
 - Weather Conditions Anywhere
- Accommodations -
 - Hotels
 - Athletic Facilities
- Entertainment -
 - Concerts
 - Theater
 - Sports
 - Locator - Where's It Playing & When?
- Library loans

2

MicroTerminal USES - CONSUMER, cont.

LOCATOR SERVICES - Computer-sorted Classified Ads

Real Estate
AutoMate Used and New Car purchases/sales
Employment - Job Locator
Personals - DateMate
Bulletin Board by subject

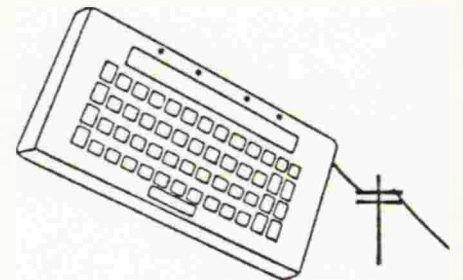
FINANCIAL INVESTMENTS

Stock Brokerage - Stock Quotes
 Buy, Sell

Portfolio Analysis

SCHEDULE REMINDER

Appointments
Events
Birthdays



NEWS SERVICES

Personalized news - by subject, e.g. Sports News
 Politics, Business, etc.

 by region - local weather, etc.

EDUCATIONAL

Languages
Math
Encyclopedia
Almanac
History Events Chronology by date, subject

LANGUAGE TRANSLATOR

MicroTerminal USES - CONSUMER, cont.

ENTERTAINMENT

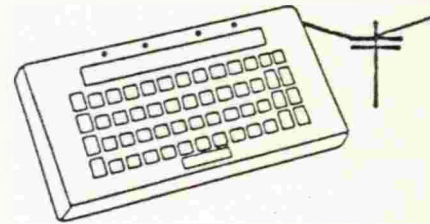
Games - Adventure/Dungeon
Word Games

Dear Computer Letters

Horoscope Advice

Guinness World Records

Day of Birth, Biorhythms



MEDICAL HELP

Symptom reporting - quick diagnosis, suggestion
Computer-maintained personal medical records
Telephone prescription orders
Out-patient report status

FILING SYSTEM

Telephone & Address Directory

- Includes Christmas Card Sublist

Important Numbers - Family Medical
Credit cards
Clothing Sizes
Serial Numbers

Household Inventory - Insurance requirement
Policy numbers

Recipes

Menu Plans - Includes Shopping Lists

ELECTRONIC MAIL

Short notes & reminder memos
Including language translation service

4

MicroTerminal USES - CONSUMER, cont.

INFORMATION RETRIEVAL

Computer search for information
Help students
Bibliographic references



TELEPHONE DIRECTORY ASSISTANCE

Include addresses, zip codes

REPAIR SERVICE INFORMATION

Product Manufacturers help debug small problems

REMOTE ACCESS TO HOME COMPUTER

Home Security System
Home Energy Control
Change Lighting Patterns in empty house
Start Air Conditioning or Heat just before return

STENOGRAPHIC

Type in text, remote printer sends perfect copy

TELE-TYPE CALL

At 5¢/minute coast-to-coast, some users (and all the deaf or hearing-impaired) will have a real-time dialogue with one another by typing back and forth.

VOTING SYSTEMS

Electronic Town Meeting
Opinion Research
Note Continuous Market Research Aspect of MicroTerminal

MicroTerminal USES - BUSINESS

NOTE: Business uses for MicroTerminal which are specific to one or a few types of businesses are listed separately by USER.

ELECTRONIC MAIL/MESSAGE SYSTEM

- Easy to address memo to multiple readers
- Instant transmission, no paperwork
- Confirmation of receipt
- Message does not interrupt work in progress
- Compatible interface with corporate TWX/TELEX

EXECUTIVE CALENDAR/SCHEDULER

- Including Executive Locator
- Plans meetings to minimize costs or difficulties of travel

EXPENSE ACCOUNT MAINTENANCE

ORDER ENTRY for COMPANY'S SALESMEN from Customer premises.

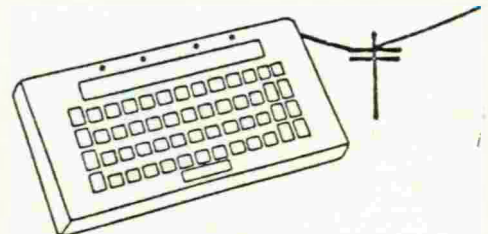
- Including verification, estimated shipping date, etc

ON-LINE CUSTOMER INFORMATION

- Account #, Contact names, Addresses, Phone Numbers, Credit

ON-LINE PARTS/PRODUCTS CATALOGS

- For own company and all major suppliers



MicroTerminal USES - BUSINESS, cont.

ON-LINE SUPPLIER/VENDOR INFORMATION

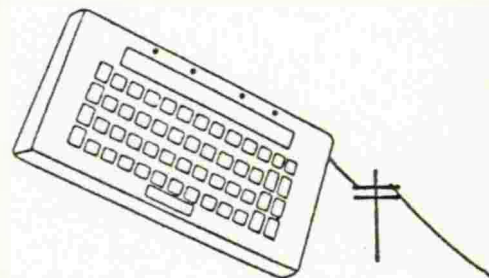
Account #, Contact names, Addresses, Phone Numbers, Credit

INVENTORY STATUS INFORMATION

Including reorder points, delivery times

DISTRIBUTION STATUS, SHIPPING INFORMATION

By waybill, order #, customer #, etc.
Where is a given shipment at the moment?



TEXT ENTRY

Low-cost text entry station
Can supplement expensive word processing stations
Can be taken home by workers to complete tasks

Executive can make corrections to first-draft letters

DATA ENTRY

Low-cost Remote Job Entry station
Can be taken home
Jobs can be supervised at hours company closed

INFORMATION RETRIEVAL - DOCUMENT LOCATION (and Filing Assistance)

Search Data Bases, supply abstracts and document identification numbers to facilitate facsimile or hard copy retrieval

Personnel Files, Company Reports, Correspondence (If Word-Processor System integrated), etc.

Guide executive through classifying documents for later retrieval

MEMO-TO-FILE

Maximum security memos to file are seen only by the executive creating them.
Especially important for personnel issues.

Market Channels

II.D.2 Manufacturing/Production/Supplier Channels (The Vertical Backward Market Structure)

a. MicroTerminal Manufacturers

ATT

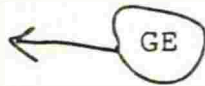
BURROUGHS

CDC

COMMODORE

DEC

EXXON



IBM

ITT

HEWLETT-PACKARD

HONEYWELL

GTE

MATTEL

NCR

RADIO SHACK

RCA

RAYTHEON

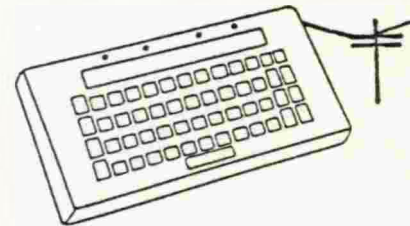
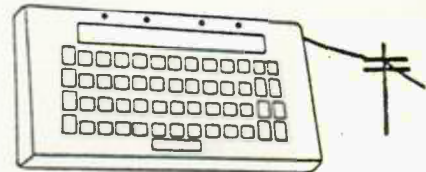
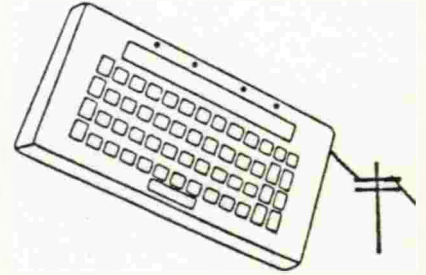
SPERRY

TI

TRW

WARNER(ATARI)

XEROX



II.D.2 Manufacturing/Production/Supplier Channels - cont.
(The Vertical Backward Market Structure)

a.-2. FOREIGN MANUFACTURERS

CASIO

CRAIG/FRIENDS AMIS

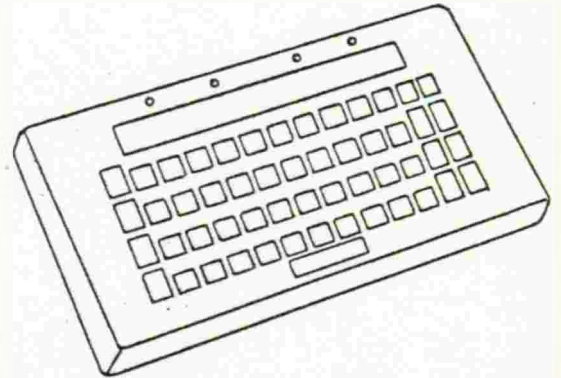
MATSUSHITA

NIXDORF(LEXICON)

PHILIPS

SHARP

SIEMENS



II.D.2 Manufacturing/Production/Supplier Channels
(The Vertical Backward Market Structure)

b. MicroTerminal Electronic Component Suppliers

AMI

GE

HUGHES

IBM

ITT

MITEL

MOTOROLA

NATIONAL

NCR

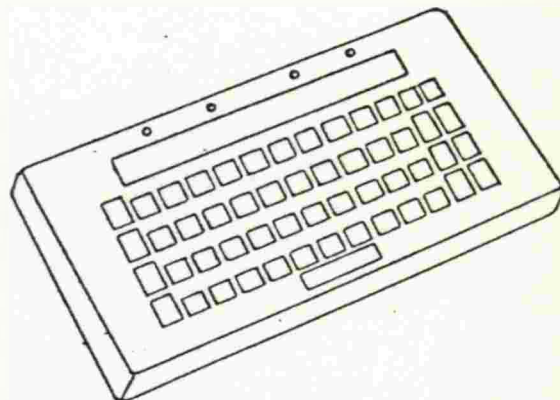
RCA

RETICON

ROCKWELL

TI

WESTERN ELECTRIC



b.-2. FOREIGN Component Suppliers

EPSON

MATSUSHITA

NEC

SHARP

SONY

II.D.2 Manufacturing/Production/Supplier Channels
(The Vertical Backward Market Structure)

c. Telecommunications Networks

ACS/ATT (1982?) DEC VAX DECnet -> X.25?

GRAPHNET

RCA

SBS/IBM (1981?)

TELENET/GTE

TYMNET/TYMSHARE

XTEN/XEROX (1981?)

c.-2 Foreign Networks

CABLE & WIRELESS

c.-3 Telecommunications Processors

COMTEN, INC.

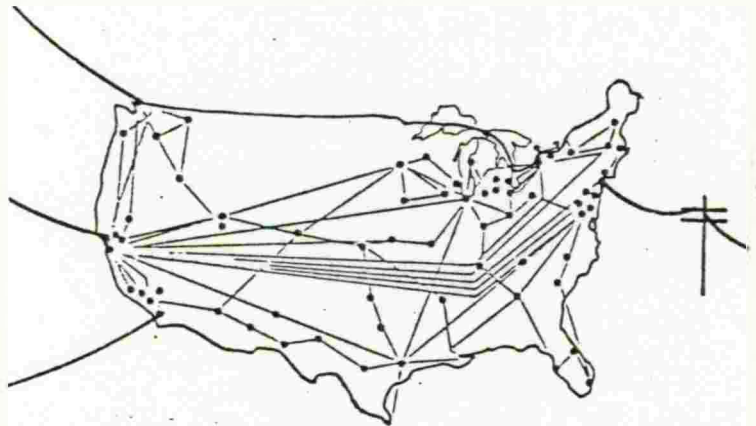
GTE/LENKURT

IBM

RAYTHEON

RCA

TYMNET



NETWORKS

II.D.2 Manufacturing/Production/Supplier Channels
(The Vertical Backward Market Structure)

d. MacroTerminal Hardware Suppliers

BASIC/FOUR

BURROUGHS

CDC

DATAPOINT

DATA GENERAL

DEC

HEWLETT-PACKARD

HONEYWELL

IBM

INTEL

MICRODATA

NATIONAL

NCR

PERKIN-ELMER

PRIME

QANTEL

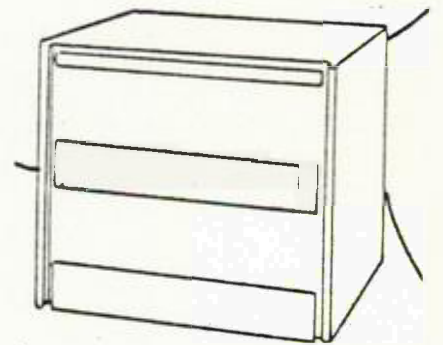
SPERRY

TANDEM

TI

WANG

XEROX



II.D.2 Manufacturing/Production/Supplier Channels
(The Vertical Backward Market Structure)

e. MacroTerminal Services Suppliers (Consumer)

AMERICAN EXPRESS

BANK OF AMERICA

CITICORP

COMPUSERVE

CONTROL DATA CORP. - (PLATO)

DOW-JONES

GENERAL ELECTRIC INFORMATION SERVICES

H&R BLOCK

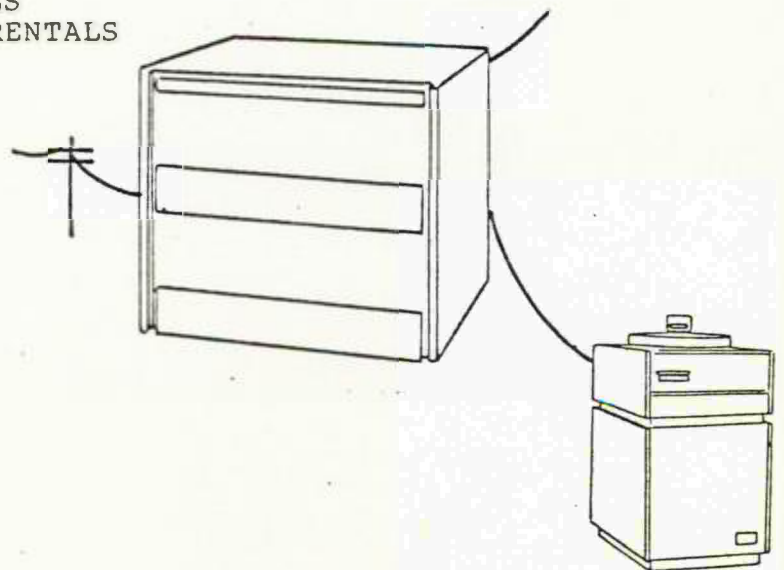
MERRILL, LYNCH

THE SOURCE (TCA)

TELEPHONE COMPANIES

TRAVEL

AIRLINES
HOTELS
CAR RENTALS



SERVICES

II.D.2 Manufacturing/Production/Supplier Channels
(The Vertical Backward Market Structure)

e. MacroTerminal Services Suppliers (Business)

AUTOMATIC DATA PROCESSING, INC.

BOEING COMPUTER SERVICES

COMPUTER SCIENCES CORP.

DATA RESOURCES - (McGRAW-HILL)

HONEYWELL

INTERACTIVE DATA CORP.

MARTIN MARIETTA SYSTEMS

McDONNELL DOUGLAS AUTOMATION COMPANY - (McAUTO)

NATIONAL CSS, INC.

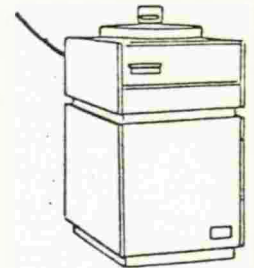
NATIONAL DATA CORP.

QUOTRON SYSTEMS, INC.

RAPIDATA, INC.

SERVICE BUREAU CORP. - (CDC)

UNIVERSITY COMPUTING COMPANY



SERVICES

e.-2 Services Software/Hardware Vendors

AUTOMATIC DATA PROCESSING, INC

BANK COMPUTER NETWORK CORP.

BUNKER RAMO (Banking)

COMPUTER CORPORATION OF AMERICA (Electronic Mail)

GTE (Financial System One, Hospital System Twenty-one)

TYMSHARE

II.D.2 Manufacturing/Production/Supplier Channels
(The Vertical Backward Market Structure)

f. MacroTerminal Data Base Suppliers (Consumer)

DOW JONES

INTERACTIVE DATA CORP. (Chase Econometrics)

I.P.SHARP ASSOCIATES

LOCKHEED INFORMATION SERVICES - DIALOG

McGRAW-HILL (Incl. Data Resources)

NEW YORK TIMES - INFORMATION BANK

OCLC, INC. - (Union Catalog, Encyclopedia)

OPTIMUM SYSTEMS, INC.

RAPIDATA

SCIENTIFIC TIME SHARING CORP.

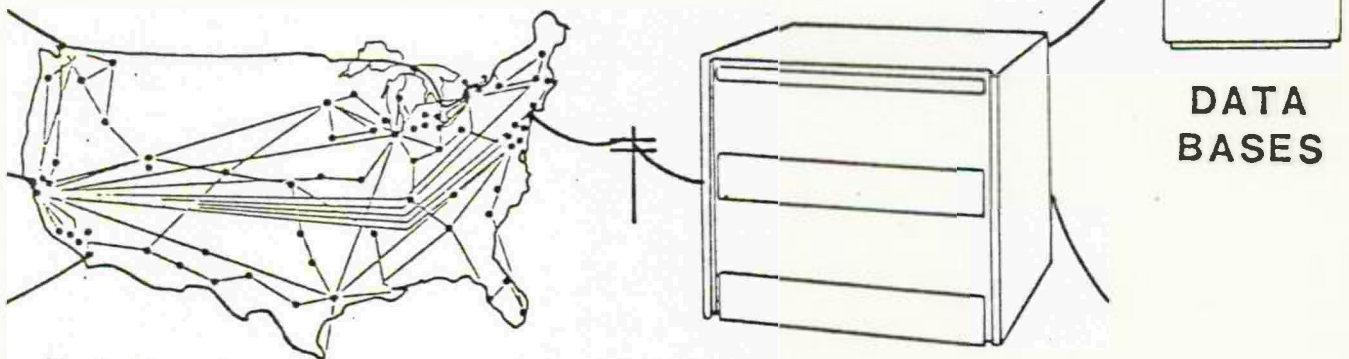
SYSTEM DEVELOPMENT CORP. - (Congress, Govt. reports)

TIME, INC.

AUTOMOBILES

REAL ESTATE

APARTMENTS



II.D.2 Manufacturing/Production/Supplier Channels
(The Vertical Backward Market Structure)

f.-2 Data Base Software/Hardware Vendors

APPLIED DATA RESEARCH

CINCOM SYSTEMS

COMPUTER CORPORATION OF AMERICA (Data Base Manager)

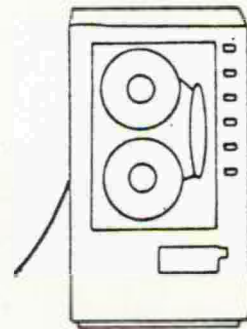
COMPUTER NETWORK CORP. - (COMNET)

COMPUTER SCIENCES CORP. - (INFONET)

CULLINANE CORP

MRI SYSTEMS/INTEL

ON-LINE SYSTEMS,INC.



**DATA
BASES**

Feb. 24, 1980

DIRECTORY OF SIMULATED MACROTERMINAL SERVICES - On MacroCosmos' Computer

SERVICE	COMMAND
1. Airline Reservations, (and car)	TRAVEL
2. Banking Services	BANK
a. Checkbook Balancing	CHECKBOOK, BALANCE
b. Bill Paying	BILLS, PAY
3. Doctor	DOCTOR
4. Stock Quotations	STOCK
5. Telephone Directory	TELEPHONE
6. Time	TIME
7. Catalog Ordering Service (e.g., Sears, Penney)	ORDER, SHOP
8. Salesman's Order Service	SALESMAN
9. Directory of Services	DIRECTORY, CATALOG
10. News Flash (Occurs automatically after fourth service request)	

Feb. 20, 1980

MACROTERMINAL SERVICES AVAILABLE ON-LINE TODAY

(Using the existing MicroTerminal, with some log-in difficulty, and in most cases with initial confusion as the service sends out "header" information meant to be typed across the top of a printer terminal.)

1. Electronic Mail - with true national access via TYMNET
2. Stock Quotations
 - a. DOW-JONES NEWS RETRIEVAL SERVICE (TYMNET)
 - b. The SOURCE (TELENET, TYMNET)
3. News
 - a. THE NEW YORK TIMES INFORMATION BANK (TELENET, TYMNET)
 - b. DOW-JONES NEWS RETRIEVAL SERVICE
 - c. The SOURCE
4. Classified Ads
 - a. COMMUNITY BULLETIN BOARD SYSTEMS
(We have about 100 phone numbers nationwide)
 - b. The SOURCE
5. Information Retrieval (Data Bases)
 - a. Lockheed DIALOG - 100 Data Bases in Education, Sciences,
Business, History, Magazine Index
6. Discount Shopping - The SOURCE

Feb. 20, 1980

THE EASIEST SERVICES TO IMPLEMENT BY 1981 MICROTERMINAL INTRODUCTION
CONSUMER SERVICES

Who Could Implement?

1. Electronic Mail on TELENET
GTE, using MacroTerminal Minicomputers at Network Nodes
- 1a. Tele-Type Calling
especially for the deaf.
same as above
2. Banking Services
A natural extension of Automatic Teller Machines
Initially 1 or 2 banks, Citicorp, Bank of America Telephone Bill Payment Society, Amer. Bank Asso.
3. Reservation Services

NOTE: At the moment all large telephone reservation systems utilize computerized telephone answering switches - automatic call director systems - to answer the phones. These systems supply the initial message "all our agents are busy at the moment", and could easily be programmed to listen briefly for a MicroTerminal data carrier tone. MicroTerminal calls could be switched through a MacroTerminal handler directly to the reservation computers.
- 3a. Hotel Reservations
probably the easiest to do because so few variables - date, room rate.
Start with big chains - Sheraton, Hyatt, Western, Marriott, Holiday, HoJo.
- 3b. Car Rental Reservations
again only date, car size, rate
Three Big Firms - Hertz, Avis, National
- 3c. Entertainment Reservations
now we have date, show, price, (possibly seat location)
Ticketron in the East
Datatix in the West
Both ready to go!
- 3d. Airline Reservations
this is hardest, but airlines are hurting to save labor costs and should be very supportive
American's Sabre oldest
United's Apollo biggest
MARC accesses all
(Multiple Airlines Reservation Computer)
4. Shopping
Utilize the systems set up for 1-800 TV promotions
CompUCard?, National Data J.C. Penney is a leader in computers in retail automation.
5. Real Estate Locator
Multiple Listing Service

EASIEST SERVICES TO IMPLEMENT BY 1981 MICROTERMINAL INTRODUCTION, cont.

6. Telephone Directory Assistance

GTE, ATT
ATT is testing Electronic
Information Service in
Albany, NY.

7. Income Tax Assistance

H&R Block just bought the
private data network from
CompuServe.

8. Reformat Viewdata Information

NOTE: Viewdata pages consist of frames of data with approximately 700 maximum characters of data in the form of an ASCII character stream plus up to another 300 or so characters used to format the screen with color, special large letters, etc. This information could clearly be reformatted with a different set of up to 300 control characters which would optimize the presentation of the data on MicroTerminal's limited display. The result would be a great widening of the user base for the Information Providers, and a synergistic explosion in MacroTerminal services.

BUSINESS SERVICES

Who Could Implement?

Mead Data Central (Lexis legal precedent retrieval, upcoming Nexis - a consumer service) is an outgrowth of a sophisticated remote computer terminal system supporting Mead Paper Company salesman in the field. Mead Data Central shows that they are looking for new markets for their accomplishments.

TVMNET TELEPHONE ACCESS

News/Retrieval Entry Cities & Access Telephone Numbers

CITY	STATE	PHONE	CITY	STATE	PHONE
RON	OHIO	216/535-1861	CHATTANOOGA	TENNESSEE	615/756-5856
ALBANY	NEW YORK	518/463-3111	CHICAGO	ILLINOIS	312/368-4607
ALHAMBRA	CALIFORNIA	213/572-0999	CHICAGO	ILLINOIS	312/368-4700
ALLENTOWN	PENNSYLVANIA	215/433-6131	CHICAGO	ILLINOIS	312/346-4961
ANN ARBOR	MICHIGAN	313/665-2627	CINCINNATI	OHIO	513/242-7040
ATLANTA	GEORGIA	404/659-6670	CLEVELAND	OHIO	216/781-7050
AUSTIN	TEXAS	512/444-3280	COLORADO SPRINGS	COLORADO	303/471-9815
BALTIMORE	MARYLAND	301/547-8100	COLUMBIA	S. CAROLINA	803/252-0840
BATON ROUGE	LOUISIANA	504/292-4050	COLUMBUS	OHIO	614/421-7270
BAYTOWN	TEXAS	713/427-1123	CORNING	NEW YORK	607/962-5071
BEAUMONT	TEXAS	713/832-2589	CORPUS CHRISTI	TEXAS	512/882-3641
BIRMINGHAM	ALABAMA	205/942-4141	CUPERTINO	(SEE SAN JOSE/CUPERTINO)	
BOISE	IDAHO	208/343-4851	DALLAS	TEXAS	214/638-5800
BOSTON	MASSACHUSETTS	617/482-4677	DANBURY	CONNECTICUT	203/743-1340
BOSTON	MASSACHUSETTS	617/482-5622	DARIEN	CONNECTICUT	203/655-8931
BRIDGEPORT	CONNECTICUT	203/579-7820	DAYTON	OHIO	513/223-3847
BUFFALO	NEW YORK	716/856-1400	DENVER	COLORADO	303/573-9981
BURLINGAME	CALIFORNIA	415/348-4992	DENVER	COLORADO	303/573-0177
CARSON CITY	(SEE RENO)		DES MOINES	IOWA	515/280-9600
CEDAR RAPIDS	IOWA	319/368-2482	DETROIT	MICHIGAN	313/963-3388
CHARLESTON	WEST VIRGINIA	304/345-2908	DURHAM	N. CAROLINA	919/549-0441
CHARLOTTE	N. CAROLINA	704/372-9730	EL PASO	TEXAS	915/544-9590
			EL SEGUNDO	CALIFORNIA	213/640-1570
			ENGLEWOOD CLIFFS	NEW JERSEY	201/894-8250

CITY	STATE	PHONE	CITY	STATE	PHONE
EVANSVILLE	INDIANA	812/423-6885	KANSAS CITY	MISSOURI	913/677-2833
ERIE	PENNSYLVANIA	814/453-7161	KNOXVILLE	TENNESSEE	615/637-3118
FREEMONT	ILLINOIS	815/233-5585	LAFAYETTE	LOUISIANA	318/235-3501
FRESNO	CALIFORNIA	209/445-0911	LAS VEGAS	NEVADA	702/386-1899
FT LAUDERDALE	FLORIDA	305/467-7550	LEXINGTON	KENTUCKY	606/253-3463
FT WAYNE	INDIANA	219/424-5162	LITTLE ROCK	ARKANSAS	501/372-5780
FORT WORTH	TEXAS	214/263-8271	LONG VIEW	TEXAS	214/758-1756
GRAND RAPIDS	MICHIGAN	616/459-5069	LOS ANGELES	CALIFORNIA	213/629-1561
GREENSBORO	N. CAROLINA	919/379-0034	LOS ANGELES	CALIFORNIA	213/629-3451
GREENSVILLE	S. CAROLINA	803/271-2418	LOS ANGELES	CALIFORNIA	213/683-0451
HARRISBURG	PENNSYLVANIA	717/236-1190	LOUISVILLE	KENTUCKY	502/361-3881
HARTFORD	CONNECTICUT	203/568-2610	LUBBOCK	TEXAS	806/762-0136
HAYWARD	CALIFORNIA	415/785-6520	LYNDHURST	NEW JERSEY	201/460-0100
HEMPSTEAD	NEW YORK	516/794-3390	MADISON	WISCONSIN	608/221-4211
HOUSTON	TEXAS	713/977-4080	MANCHESTER	NEW HAMPSHIRE	603/669-0493
HOUSTON	TEXAS	713/785-4411	MARINA DEL REY	CALIFORNIA	213/821-2257
HOUSTON	TEXAS	713/780-7390	MARION	INDIANA	317/662-0091
HUNTINGTON, L.I.	NEW YORK	516/673-5780	MEMPHIS	TENNESSEE	901/529-0170
INDIANAPOLIS	INDIANA	317/257-3461	MIAMI	FLORIDA	305/374-7120
IOWA CITY	IOWA	319/354-7371	MIDLAND	TEXAS	915/683-5645
JACKSON	MICHIGAN	517/787-9461	MILWAUKEE	WISCONSIN	414/257-3482
JACKSON	MISSISSIPPI	601/944-0860	MINNEAPOLIS	MINNESOTA	612/339-5200
JACKSONVILLE	FLORIDA	904/721-8100	MOORESTOWN	NEW JERSEY	609/235-3761

CITY	STATE	PHONE
MOUNTAIN VIEW	CALIFORNIA	415/941-8450
IASHUA	NEW HAMPSHIRE	603/889-8618
NASHVILLE	TENNESSEE	615/367-9382
NEWARK	NEW JERSEY	201/483-5937
NEW HAVEN	CONNECTICUT	203/789-0579
NEW ORLEANS	LOUISIANA	504/586-1071
NEW YORK	NEW YORK	212/683-0131
NEW YORK	NEW YORK	212/551-9322
NEW YORK	NEW YORK	212/344-7445
NEW YORK	NEW YORK	212/350-9100
NEWPORT BEACH	CALIFORNIA	714/540-9560
NIAGARA FALLS	NEW YORK	716/285-6691
NORFOLK	VIRGINIA	804/622-0435
OAKLAND	CALIFORNIA	415/465-7000
ODESSA	TEXAS	915/563-3745
OKLAHOMA CITY	OKLAHOMA	405/947-0561
OMAHA	NEBRASKA	402/392-2970
ORLANDO	FLORIDA	305/851-3530
OSHKOSH	WISCONSIN	414/235-4594
OXNARD	(SEE VENTURA)	
PALO ALTO	CALIFORNIA	415/856-9080
PENSACOLA	FLORIDA	904/434-0134
PEORIA	ILLINOIS	309/673-2156
PHILADELPHIA	PENNSYLVANIA	215/561-6120

CITY	STATE	PHONE
PHOENIX	ARIZONA	602/249-9261
PISCATAWAY	NEW JERSEY	201/981-7000
PITTSBURGH	PENNSYLVANIA	412/765-1520
PLYMOUTH	MICHIGAN	313/459-8900
PORTLAND	OREGON	503/231-4050
PRINCETON	NEW JERSEY	609/452-8970
PROVIDENCE	RHODE ISLAND	401/274-5783
RENO/CARSON CITY	NEVADA	702/882-7810
RICHLAND	WASHINGTON	509/375-1975
RICHMOND	VIRGINIA	804/649-3050
RIVERSIDE	CALIFORNIA	714/825-9372
ROCHESTER	NEW YORK	716/248-8000
ROCKFORD	ILLINOIS	815/398-6090
SACRAMENTO	CALIFORNIA	916/441-6550
SALT LAKE CITY	UTAH	801/582-8972
SAN ANTONIO	TEXAS	512/696-4002
SAN CLEMENTE	CALIFORNIA	714/498-3130
SAN DIEGO	CALIFORNIA	714/291-8700
SAN FRANCISCO	CALIFORNIA	415/391-9325
SAN FRANCISCO	CALIFORNIA	415/362-4307
SAN JOSE/CUPERTINO	CALIFORNIA	408/446-1470
SAN PEDRO	CALIFORNIA	213/830-0775
SANTA BARBARA	CALIFORNIA	805/687-6119
SANTA ROSA	CALIFORNIA	707/526-1000

CITY	STATE	PHONE
SAVANNAH	GEORGIA	912/352-7259
SEATTLE	WASHINGTON	206/625-9900
SOUTH BEND	INDIANA	219/233-4163
SOUTHFIELD	MICHIGAN	313/569-8350
SPRINGFIELD	ILLINOIS	217/753-7905
SPRINGFIELD	MASSACHUSETTS	413/781-6830
ST. JOSEPH	MICHIGAN	313/429-2568
ST. LOUIS	MISSOURI	314/421-5110
ST. PETERSBURG	FLORIDA	813/536-7823
SYRACUSE	NEW YORK	315/437-7111
TAMPA	FLORIDA	813/885-5485
TOLEDO	OHIO	419/243-3144
TOPEKA	KANSAS	913/233-0690
TUCSON	ARIZONA	602/622-2752
TULSA	OKLAHOMA	918/663-2220
VALLEY FORGE	PENNSYLVANIA	215/666-9190
VAN NUYS	CALIFORNIA	213/986-9503
VENTURA/OXNARD	CALIFORNIA	805/487-0482
WASHINGTON	D.C.	703/841-0200
WASHINGTON	D.C.	703/841-9560
WASHINGTON	D.C.	703/841-0265
WATERBURY	CONNECTICUT	203/755-1153
WAYNE	NEW JERSEY	201/785-4480
WEST BEACH	FLORIDA	305/622-2871

CITY	STATE	PHONE
WHITE PLAINS	NEW YORK	914/694-9361
WICHITA	KANSAS	316/265-1241
WILMINGTON	DELAWARE	302/658-5261
WINSTON-SALEM	N. CAROLINA	919/725-1414
YORK	PENNSYLVANIA	717/846-4802

TELENET

TELEPHONE ACCESS

<u>City</u>	<u>State</u>	<u>Phone Number</u>	
Bessemer	Alabama	205/251-2495	(Birmingham)
Birmingham	Alabama	205/251-2495	
Mesa	Arizona	602/257-1552	(Phoenix)
Phoenix	Arizona	602/257-1552	
Scottsdale	Arizona	602/257-1552	(Phoenix)
Tempe	Arizona	602/257-1552	(Phoenix)
Tucson	Arizona	602/791-7511	
Alhambra	California	213/956-8235	(Glendale)
Anaheim	California	714/558-6061	(Santa Ana)
Burlingame	California	415/595-0360	(San Carlos)
Cahoga Park	California	213/549-5150	(San Pedro)
Colton	California	714/824-1710	
Cupertino	California	408/279-8450	(San Jose)
El Monte	California	213/956-8235	(Glendale)
El Segundo	California	213/822-9287	(Marina Del Rey)
Fullerton	California	714/558-6061	(Santa Ana)
Glendale	California	213/956-8235	
Hollywood	California	213/624-5230	(Los Angeles)
Hollywood	California	213/937-3580	(Los Angeles)
Inglewood	California	213/624-5230	(Los Angeles)
Inglewood	California	213/937-3580	(Los Angeles)
Huntington Beach	California	714/558-6061	(Santa Ana)
Los Angeles	California	213/624-5230	
Los Angeles	California	213/937-3580	
Los Altos	California	415/856-9930	(Palo Alto)
Long Beach	California	213/549-5150	(San Pedro)
Marina Del Rey	California	213/822-9287	
Mountain View	California	415/856-9930	(Palo Alto)
Newport Beach	California	714/558-6061	(Santa Ana)
Oakland	California	415/362-6200	(San Francisco)
Oxnard	California	805/659-4660	(Ventura)
Palo Alto	California	415/856-9930	
Pasadena	California	213/956-8235	(Glendale)
Redwood City	California	415/595-0360	(San Carlos)
Riverside	California	714/824-1710	(Colton)
Sacramento	California	916/443-7921	
San Bernadino	California	714/824-1710	(Colton)
San Carlos	California	415/595-0360	
San Diego	California	714/231-1922	
San Francisco	California	415/362-6200	
San Jose	California	408/279-8450	
San Mateo	California	415/595-0360	(San Carlos)
San Pedro	California	213/549-5150	
Santa Ana	California	714/558-6061	
Santa Clara	California	408/279-8450	(San Jose)
Santa Monica	California	213/822-9287	(Marina Del Rey)
Sunnyvale	California	408/279-8450	(San Jose)

<u>City</u>	<u>State</u>	<u>Phone Number</u>	
Torrance	California	213/822-9287	(Marina Del Rey)
Woodside	California	415/856-9930	(Palo Alto)
Ventura	California	805/659-4660	
Aurora	Colorado	303/623-0876	(Denver)
Boulder	Colorado	303/623-0876	(Denver)
Denver	Colorado	303/623-0876	
Lakewood	Colorado	303/623-0876	(Denver)
Greenwich	Connecticut	203/357-1800	(Stamford)
Hartford	Connecticut	203/522-0344	
Hilford	Connecticut	203/789-0211	(New Haven)
New Haven	Connecticut	203/789-0211	
Stamford	Connecticut	203/357-1800	
West Hartford	Connecticut	203/522-0344	(Hartford)
Washington	D.C.	202/347-1400	
Washington	D.C.	202/783-2050	
Wilmington	Delaware	302/737-8550	
Clearwater	Florida	813/224-9920	(Tampa)
Ft. Lauderdale	Florida	305/764-8880	
Jacksonville	Florida	904/356-0790	
Miami	Florida	305/374-6400	
Orlando	Florida	305/849-9604	
St. Petersburg	Florida	813/823-3223	
Tampa	Florida	813/224-9920	
Atlanta	Georgia	404/577-8911	
Honolulu	Hawaii	808/524-8110	
Arlington Heights	Illinois	312/372-4901	(Chicago)
Champaign	Illinois	217/384-0011	(Urbana)
Chicago	Illinois	312/372-4901	
Cicero	Illinois	312/372-4901	(Chicago)
East St. Louis	Illinois	314/231-8800	(St. Louis, MO)
Oak Park	Illinois	312/372-4901	(Chicago)
Skokie	Illinois	312/372-4901	(Chicago)
Springfield	Illinois	217/753-1362	
Urbana	Illinois	217/384-0011	
Indianapolis	Indiana	317/635-9630	
Mishawka	Indiana	219/234-9071	(South Bend)
Osceola	Indiana	219/234-9071	(South Bend)
South Bend	Indiana	219/234-9071	
Council Bluffs	Iowa	402/341-7570	(Omaha, NE)
Kansas City	Kansas	816/474-1600	(Kansas City, MO)
Louisville	Kentucky	502/459-7010	
New Orleans	Louisiana	504/568-1840	
Annapolis	Maryland	301/962-5010	(Baltimore)
Baltimore	Maryland	301/962-5010	
Bethesda	Maryland	202/347-1400	(Wash., D.C.)
Dundalk	Maryland	301/962-5010	(Baltimore)
Rockville	Maryland	202/347-1400	(Wash., D.C.)
Silver Spring	Maryland	202/347-1400	(Wash., D.C.)
Towson	Maryland	301/962-5010	(Baltimore)

<u>City</u>	<u>State</u>	<u>Phone Number</u>	
Arlington	Massachusetts	617/338-1400	(Boston)
Boston	Massachusetts	617/338-1400	
Brookline	Massachusetts	617/338-1400	(Boston)
Cambridge	Massachusetts	617/338-1400	(Boston)
Chicopee	Massachusetts	413/739-7221	(Springfield)
Holyoke	Massachusetts	413/739-7221	(Springfield)
Medford	Massachusetts	617/338-1400	(Boston)
Newton	Massachusetts	617/338-1400	(Boston)
Quincy	Massachusetts	617/338-1400	(Boston)
Somerville	Massachusetts	617/338-1400	(Boston)
Springfield	Massachusetts	413/739-7221	
Waltham	Massachusetts	617/338-1400	(Boston)
Ann Arbor	Michigan	313/996-0351	
Detroit	Michigan	313/961-5115	
Minneapolis	Minnesota	612/339-0150	
St. Paul	Minnesota	612/339-0150	(Minneapolis)
Florissant	Missouri	314/231-8800	(St. Louis)
Kansas City	Missouri	816/474-1600	
St. Louis	Missouri	314/231-8800	
Omaha	Nebraska	402/341-7570	
Las Vegas	Nevada	702/733-2158	
Bayonne	New Jersey	201/623-6818	(Newark)
Jersey City	New Jersey	201/623-6818	(Newark)
Newark	New Jersey	201/623-6818	
Passaic	New Jersey	201/742-0858	(Paterson)
Paterson	New Jersey	201/742-0858	
Trenton	New Jersey	609/392-6101	
Union City	New Jersey	201/623-6818	(Newark)
Albany	New York	518/445-9111	
Buffalo	New York	716/847-0600	
Hempstead	New York	516/292-0320	
New York	New York	212/736-0099	
New York	New York	212/736-7205	
Rochester	New York	716/454-3430	
Schenectady	New York	518/518-9111	(Albany)
Syracuse	New York	315/472-5503	
Troy	New York	518/445-9111	(Albany)
White Plains	New York	914/682-8777	
Charlotte	North Carolina	704/374-0371	
Davidson	North Carolina	919/549-8311	(Resch. Tri. Park)
Durham	North Carolina	919/549-8311	(Resch. Tri. Park)
Raleigh	North Carolina	919/549-8311	(Resch. Tri. Park)
Resch. Tri. Park	North Carolina	919/549-8311	
Winston-Salem	North Carolina	919/761-1957	
Akron	Ohio	216/762-9791	
Cincinnati	Ohio	513/621-7017	
Cleveland	Ohio	216/241-0940	
Columbus	Ohio	614/463-1400	
Dayton	Ohio	513/461-1570	

<u>City</u>	<u>State</u>	<u>Phone Number</u>	
Euclid	Ohio	216/241-0940	(Cleveland)
Kent	Ohio	216/762-9791	(Akron)
Parma	Ohio	216/241-0940	(Cleveland)
Toledo	Ohio	419/243-8871	
Youngstown	Ohio	216/743-2294	
Bethany	Oklahoma	405/232-4501	(Oklahoma City)
Norman	Oklahoma	405/232-4501	(Oklahoma City)
Oklahoma City	Oklahoma	405/232-4501	
Tulsa	Oklahoma	918/584-3215	
Portland	Oregon	503/243-2800	
Allentown	Pennsylvania	215/435-8268	
Penn Hills	Pennsylvania	412/288-9950	(Pittsburgh)
Philadelphia	Pennsylvania	215/574-0620	
Pittsburgh	Pennsylvania	412/288-9950	
Upper Darby	Pennsylvania	215/574-0620	(Philadelphia)
Providence	Rhode Island	401/272-9290	
Warwick	Rhode Island	401/272-9290	(Providence)
Memphis	Tennessee	901/525-2563	
Nashville	Tennessee	615/244-8310	
Austin	Texas	512/926-2160	
Dallas	Texas	214/748-0127	
Fort Worth	Texas	817/336-7791	
Houston	Texas	713/224-3380	
Lackland	Texas	512/227-7784	(San Antonio)
San Antonio	Texas	512/227-7784	
Salt Lake City	Utah	801/364-2644	
Alexandria	Virginia	202/347-1400	(Wash., D.C.)
Alexandria	Virginia	202/783-2050	(Wash., D.C.)
Annandale	Virginia	202/347-1400	(Wash., D.C.)
Annandale	Virginia	202/783-2050	(Wash., D.C.)
Chesapeake	Virginia	804/625-8291	(Norfolk)
Fairfax	Virginia	202/347-1400	(Wash., D.C.)
Fairfax	Virginia	202/783-2050	(Wash., D.C.)
Falls Church	Virginia	202/347-1400	(Wash., D.C.)
Falls Church	Virginia	202/783-2050	(Wash., D.C.)
Norfolk	Virginia	804/625-8291	
Portsmouth	Virginia	804/625-8291	(Norfolk)
Richmond	Virginia	804/358-1941	
Vienna	Virginia	202/347-1400	(Wash., D.C.)
Springfield	Virginia	202/347-1400	(Wash., D.C.)
Vienna	Virginia	202/347-1400	(Wash., D.C.)
Virginia Beach	Virginia	804/625-8291	(Norfolk)
Bellevue	Washington	206/447-9012	(Seattle)
Seattle	Washington	206/447-9012	
Madison	Wisconsin	608/251-5904	
Milwaukee	Wisconsin	414/271-2560	