Public Data Network

U.S. Access Telephone Numbers

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Telenet

A US Sprint Company

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Telenet's Dial Access Services provide you access to the Telenet® Public Data Network 24 hours a day for reliable data transmission across town and worldwide.

You can access the Telenet network nationwide with a local phone call from thousands of cities and towns or by using Telenet's In-WATS service. The network is also accessible from over 75 international locations.

Depend on Telenet's Dial Access Services for:

- Dial-up flexibility with access on demand
- Error protected network transmission, and
- 24-hour customer service and network management.

For customer service, call toll-free 1-800/336-0437.
From overseas locations with non-WATS access, call 703/689-6400.

How to Use This Directory

This directory is filled with hundreds of Dial Access Services telephone numbers. The following guide can help you determine which telephone number to use for Asynchronous Dial Service. A similar format is used for X.25 Dial Service.

State Access Center	300/1200 bps	2400 bps	Class
ARIZONA—①			
602 ② Phoenix	254-0244	256-6955	A
③ Glendale	⑤	⑥	⑦
④ Mesa			
Scottsdale			
Tempe			

(1) The state from which you wish to use Telenet's Dial Access Services.
(2) The area code for the region of the state from which you are calling.
(3) The location of a Telenet Access Center, which provides users with network connectivity on a local dial-up or permanent connection basis. Each Telenet Access Center may include one or more Telenet Central Offices (TCOs), which provide local concentration and switching for the network. (Consult your sales representative about Access Centers that accommodate permanent network connections.)

(4) Listed for your convenience are some of the cities and towns within the local calling area of the Telenet Access Center. *Always consult your local telephone company concerning your location and whether additional local charges apply to dialing the Telenet Access Center.*
(5) The access telephone number to use when you are transmitting data at 300 or 1200 bps without local error protection. In some cases, two or more of these numbers are provided for an Access Center.
(6) The access telephone number to use when you are transmitting data at 2400 bps and when using local error protection at 300, 1200 and 2400 bps.
(7) The class denoting a city's pricing arrangement. (Consult the Public Network Rate Schedule or your sales representative for details.)

NOTE: New Telenet Access Centers, service upgrades to 2400 bps, and Access Center name and telephone number changes are highlighted in this guide for your quick reference. Please consult Telenet's online listing of U.S. Access Telephone Numbers for updates.

How to Access an Online Listing

Telenet's online listing contains the latest information on Telenet Access Center locations and telephone numbers. Consult it regularly and use these access procedures:

U.S Access Telephone Numbers
Dial the access telephone number for your Telenet Access Center. When you have established a network connection, you will receive the prompt sign "@".

Then type:
MAIL
User Name? PHONES
Password? PHONES

International Access Telephone Numbers
Within the U.S.:

Establish a network connection. When you receive the prompt sign "@" on your terminal screen, type:

MAIL
User Name? INTL/ASSOCIATES
Password? INTL

Outside the U.S.:

Follow your PTT local access procedures to connect to the International Information System. At the prompt sign, type:

311020200142
User Name? INTL/ASSOCIATES
Password? INTL

DIAL ACCESS SERVICES

About Asynchronous Dial Service

- for asynchronous applications
- at 300, 1200 and 2400 bps
- with optional local error protection

Asynchronous Dial Service enables you to conveniently access the Telenet network from anywhere in the U.S. For areas without local access use Telenet's In-WATS service.

In-WATS access is available in all U.S. locations: For 300-1200 bps service, dial 1-800/424-9494. For 2400 bps service and local error protection, dial 1-800/238-0631. (Consult the Public Network Rate Schedule for In-WATS pricing.)

Service Requirements

Speed:	Modem Type:
300 bps	Bell 103 compatible
1200 bps	Bell 212A compatible
2400 bps	V.22 bis compatible

When using local error protection, your modems must be MNP™ compatible. Or you can use MNP compatible software in your PC.

NOTE: Dial the 2400 bps access number when using local error protection at 300, 1200 or 2400 bps.

Asynchronous Dial Service

State Access Center		300/1200 bps	2400 bps	Class
ALABAMA				
205	Anniston	236-9711		B
205	Birmingham	328-2310	251-1885	B
205	Decatur	355-0206		B
205	Dothan	793-5034		B
205	Florence	767-7960		B
205	Huntsville	539-2281		B
205	Mobile	432-1680	438-6881	B
205	Montgomery	269-0090	832-4314	B
205	Tuscaloosa	752-1472		C
ALASKA[1]				
907	Anchorage	258-7222		
907	Barrow	852-2425		
907	Bethel	543-2411		
907	Cold Bay	532-2371		
907	Cordova	424-3744		
907	Deadhorse	659-2777		
907	Delta Junction	895-5070		
907	Dillingham	842-2688		
907	Fairbanks	456-3282		
907	Glennallen	822-5231		
907	Homer	235-5239		
907	Iliamna	571-1364		
907	Juneau	789-7009		
907	Ketchikan	225-1871		
907	King Salmon	246-3049		
907	Kodiak	486-4061		
907	Kotzebue	442-2602		
907	McGrath	524-3256		
907	Nome	443-2256		
907	Northway	778-2301		
907	Palmer	745-0200		
907	Prudhoe Bay	659-2777		
907	St Paul	546-2320		
907	Seward	224-3126		
907	Sitka	747-5887		
907	Soldotna	262-1990		
907	Talkeetna	733-2227		
907	Tanana	366-7167	(300 bps only)	
907	Valdez	835-4987		
907	Whittier	472-2467		
907	Yakutat	784-3453		

[1]Service is provided by Alascom, Inc. via Alaskanet, which is restricted to collect call access to U.S. hosts connected to the Telenet network. If prepaid access is required, contact a Telenet representative. For sign-on information, call Alascom Customer Service at 907/264-7391 (inside Alaska) or 1-800/544-2233 (outside Alaska).

State Access Center		300/1200 bps	2400 bps	Class
ARIZONA				
602	**Phoenix**	**254-0244**	**256-6955**	**A**
	Glendale			
	Mesa			
	Scottsdale			
	Tempe			
602	**Tuscon**	**747-0107**	**747-9395**	**B**
ARKANSAS				
501	**Ft Smith**	**782-2852**		**C**
501	**Little Rock**	**372-4616**	**374-2861**	**B**
CALIFORNIA				
805	**Bakersfield**	**327-8146**		**B**
916	**Chico**	**894-6882**		**B**
714	**Colton**	**824-9000**	**824-8976**	**B**
	Fontana	Riverside		
	Redlands	San Bernardino		
	Rialto			
213	**Compton**	**516-1007**		**C**
415	**Concord**	**827-3960**	**674-0127**	**C**
	Martinez			
	Walnut Creek			
619	**Escondido**	**741-7756**		**B**
	Poway			
	Rancho Bernardo			
	Vista			
707	**Eureka**	**444-3091**		**B**
	Arcata			
209	**Fresno**	**233-0961**	**441-1861**	**B**
	Clovis			
714	**Garden Grove**	**898-9820**	**895-1207**	**B**
	Alamitos			
	Anaheim			
	Cypress			
	Westminster			
818	**Glendale**	**507-0909**	**246-3886**	**B**
	Burbank			
	La Crescenta			
	Pasadena			
415	**Hayward**	**881-1382**		**B**
	Fremont			
	Newark			
213	**Los Angeles**	**937-3580 or 624-2251**	**622-1138**	**A**
	Alhambra	Inglewood		
	Beverly Hills	Mar Vista		
	Culver City	Montebello		

State Access Center		300/1200 bps	2400 bps	Class
CALIFORNIA (continued)				
213	**Marina Del Ray**	**306-2984**	**306-4922**	**B**
	El Segundo			
	Hawthorne			
	Santa Monica			
209	**Merced**	**383-2557**		**B**
209	**Modesto**	**576-2852**		**B**
	Turlock			
408	**Monterey**	**646-9092**		**C**
	Carmel			
213	**Norwalk**	**404-2237**		**C**
	Buena Park	Lakewood		
	Downey	Pico Rivera		
	La Habra	Whittier		
415	**Oakland**	**836-4911**	**834-3194**	**B**
	Berkeley			
619	**Oceanside**	**430-0613**		**C**
	Carlsbad			
	Fallbrook			
415	**Palo Alto**	**856-9995**	**856-0484**	**B**
	Los Altos			
	Mountain View			
714	**Pomona**	**626-1284**		**C**
	Azusa	Diamond Bar		
	Chino	Ontario		
	Claremont	Upland		
	Covina			
916	**Sacramento**	**448-6262**	**443-7434**	**B**
	Fair Oaks			
	Folsom			
408	**Salinas**	**443-4940**		**B**
415	**San Carlos**	**591-0726**	**595-8870**	**B**
	Belmont			
	Redwood City			
	San Mateo			
619	**San Diego**	**233-0233**	**231-1703**	**B**
	Chula Vista	La Mesa		
	Coronado	Linda Vista		
	El Cajon	Mira Mesa		
	La Jolla	National City		
415	**San Francisco**	**956-5777**	**788-0825**	**A**
	Alameda			
	South San Francisco			
408	**San Jose**	**294-9119**	**286-6340**	**B**
	Campbell			
	Los Gatos			
	Santa Clara			
	Sunnyvale			
213	**San Pedro**	**548-6141**	**514-1590**	**B**
	Gardena	Redondo		
	Lomita	Torrance		
	Long Beach			

State Access Center		300/1200 bps	2400 bps	Class
CALIFORNIA (continued)				
415	**San Rafael**	**472-5360**		**C**
	Mill Valley			
	Novato			
415	**San Ramon**	**829-6705**		**B**
	Danville			
	Livermore			
	Pleasanton			
714	**Santa Ana**	**558-7078**	**550-4625**	**B**
	Huntington Beach			
	Irvine			
	Newport Beach			
	Orange			
805	**Santa Barbara**	**682-5361**		**B**
408	**Santa Cruz**	**429-6937**		**C**
707	**Santa Rosa**	**578-4447**		**C**
	Petaluma			
209	**Stockton**	**957-7610**		**C**
805	**Thousand Oaks**	**495-3693**		**B**
415	**Vallejo**	**724-4200**		**C**
	Pinole			
	Richmond			
805	**Ventura**	**656-6760**		**B**
	Oxnard			
209	**Visalia**	**627-1201**		**B**
818	**West Covina**	**915-5151**		**C**
	Arcadia	El Monte		
	Baldwin Park	La Puente		
	Brea	Pico Rivera		
818	**Woodland Hills**	**887-3160**	**348-7141**	**B**
	Canoga Park	San Fernando		
	Malibu	Simi Valley		
	Reseda	Van Nuys		
COLORADO				
719	**Colorado Springs**	**635-5361**	**578-0950**	**B**
303	**Denver**	**337-6060**	**696-0159**	**A**
	Arvada	Broomfield	Golden	
	Aurora	Castlerock	Lakewood	
	Boulder	Englewood	Littleton	
303	**Ft Collins**	**493-9131**		**B**
303	**Grand Junction**	**241-3004**		**C**
303	**Greeley**	**352-8563**		**B**
719	**Pueblo**	**542-4053**		**C**
CONNECTICUT				
203	**Bridgeport**	**335-5055**	**367-9130**	**B**
	Fairfield			
	Milford			
	Stratford			

State Access Center		300/1200 bps	2400 bps	Class
CONNECTICUT (continued)				
203	**Danbury**	**794-9075**		**B**
	New Milford			
203	**Hartford**	**247-9479**	**724-9396**	**B**
	Bloomfield	Wethersfield		
	East Hartford	Windsor		
	Manchester	Windsor Locks		
	West Hartford			
203	**Middletown**	**344-8217**		**B**
	Meriden			
203	**New Britain**	**225-7027**		**B**
	Farmington			
	Newington			
	Southington			
203	**New Haven**	**624-5954**	**773-3569**	**B**
	Branford	North Haven		
	Hamden	Wallingford		
	Madison	West Haven		
203	**New London**	**447-8455**		**B**
	Groton			
	Mystic			
	Norwich			
203	**Norwalk**	**866-7404**		**B**
	Westport			
203	**Stamford**	**348-0787**	**359-9404**	**B**
	Greenwich			
203	**Waterbury**	**753-4512**		**C**
	Woodbury			
DELAWARE				
302	**Dover**	**678-8328**		**B**
302	**Newark**	**454-7710**	**737-4340**	**B**
	Delaware City			
	New Castle			
	Wilmington			
DISTRICT OF COLUMBIA				
202	**Washington**	**429-7800 or 429-7896**	**429-0956**	**A**
	Alexandria, VA	Clinton, MD	Laurel, MD	
	Arlington, VA	Engleside, VA	Layhill, MD	
	Berwyn Heights, MD	Fairfax, VA	McLean, VA	
	Bethesda, MD	Falls Church, VA	Oxon Hill, MD	
	Bowie, MD	Gaithersburg, MD	Rockville, MD	
	Capitol Heights, MD	Hyattsville, MD	Silver Spring, MD	
	Chevy Chase, MD	Kensington, MD	Vienna, VA	

State Access Center	300/1200 bps	2400 bps	Class
FLORIDA			
407 **Boca Raton** Delray Beach	338-3701		C
813 **Cape Coral** Ft Myers North Ft Myers	275-7924		C
407 **Cocoa Beach** Cocoa Merritt Island Titusville	267-0800		B
904 **Daytona Beach**	255-2629		C
305 **Ft Lauderdale** Coral Springs Deerfield Beach Hollywood	764-4505	524-5304	B
904 **Gainesville**	338-0220 or 371-6990[2]		B
904 **Jacksonville** Jacksonville Beach Mandarin Orange Park	353-1818	791-9201	B
813 **Lakeland** Bartow Plant City Winter Haven	683-5461		C
407 **Melbourne**	242-8247		C
305 **Miami** Homestead Perrine	372-0230	372-1355	A
813 **Naples**	263-3033		C
904 **Ocala**	351-3790		C
407 **Orlando** Apopka Lake Buena Vista Oviedo Winter Park	422-4088	422-8858	B
904 **Pensacola**	432-1335		C
305 **Pompano Beach**	941-5445		C
813 **St Petersburg** Clearwater	323-4026	327-1163	B
813 **Sarasota** Bradenton Venice	923-4563		C
904 **Tallahassee**	681-1902		B
813 **Tampa**	224-9920	223-5859	B
407 **West Palm Beach** Boynton Beach Jupiter	833-6691	655-2993	B

[2]Service is provided by BellSouth Advanced Networks (BSAN) via PulseLink, which is restricted to collect call access to U.S. hosts connected to the Telenet network. If prepaid access is required, contact a BSAN representative. For sign-on information, call BSAN Customer Service at 1-800/NCC-BSAN (822-2726).

State Access Center		300/1200 bps	2400 bps	Class
GEORGIA				
912	**Albany**	**888-3011**		**C**
404	**Athens**	**548-5590** or **354-0614**[2]		**B**
404	**Atlanta**	**523-0834** or **261-4633**[2]	**584-0212**	**A** **B**
	Austell	Duluth	Marietta	
	Chamblee	Fairburn	Norcross	
	Conyers	Fayetteville	Stone Mountain	
	Doraville	Jonesboro	Tucker	
	Douglasville	Lawrenceville	Woodstock	
404	**Augusta**	**724-2752**	**724-4494**	**B**
	Martinez			
404	**Columbus**	**571-0556** or **324-5771**[2]		**B**
	Phenix City, AL			
912	**Macon**	**743-8844**		**C**
	Warner Robins			
404	**Rome**	**234-1428**		**B**
912	**Savannah**	**236-2605**		**B**
HAWAII[3]				
808	**Oahu**	**528-0200**		
800	**All Other Islands**	**272-5299**		
IDAHO				
208	**Boise**	**343-0611**		**B**
208	**Lewiston**	**743-0099**		**C**
ILLINOIS				
312	**Aurora**	**896-0620**		**B**
	Naperville			
	St Charles			
	Wheaton			
309	**Bloomington**	**827-7000**		**B**
312	**Chicago**	**938-0600**	**938-8725**	**A**
	Evanston	Oaklawn		
	Forest Park	Oak Park		
	Maywood	Skokie		
217	**Decatur**	**429-0235**		**C**
815	**Dekalb**	**758-2623**		**B**
815	**Joliet**	**726-0070**		**C**
	Lockport			

[2]Service is provided by BellSouth Advanced Networks (BSAN) via PulseLink, which is restricted to collect call access to U.S. hosts connected to the Telenet network. If prepaid access is required, contact a BSAN representative. For sign-on information, call BSAN Customer Service at 1-800/NCC-BSAN (622-2726).

[3]Service is provided by Telenet under FCC Tariff No. 1.

State Access Center		300/1200 bps	2400 bps	Class
ILLINOIS (continued)				
309	**Peoria**	**637-8570**	**637-8582**	**B**
815	**Rockford**	**965-0400**	**965-0696**	**B**
217	**Springfield**	**753-1373**		**B**
217	**Urbana**	**384-6428**	**328-0317**	**B**
	Champaign			
INDIANA				
812	**Bloomington**	**332-1344**		**C**
812	**Evansville**	**424-7693**	**428-2522**	**B**
219	**Ft Wayne**	**426-2268**	**422-3431**	**B**
219	**Gary**	**882-8800**		**B**
	East Chicago	Merrillville		
	Hammond	Portage		
	Highland			
317	**Indianapolis**	**299-0024**	**299-6766**	**B**
	Carmel			
	Fishers			
	Greenwood			
	Plainfield			
317	**Kokomo**	**455-2460**		**C**
317	**Lafayette**	**742-6000**		**C**
317	**Muncie**	**282-6418**		**C**
	Anderson			
219	**South Bend**	**233-7104**	**233-4031**	**B**
	Mishawaka			
812	**Terre Haute**	**232-5329**		**C**
IOWA				
515	**Ames**	**233-6300**		**C**
319	**Cedar Rapids**	**364-0911**	**362-2764**	**B**
319	**Davenport**	**324-2445**		**C**
	East Moline, IL			
	Moline, IL			
	Rock Island, IL			
515	**Des Moines**	**288-4403**	**288-6206**	**B**
319	**Dubuque**	**556-0783**		**C**
319	**Iowa City**	**351-1421**		**C**
712	**Sioux City**	**255-1545**		**C**
319	**Waterloo**	**232-5441**		**B**
	Cedar Falls			
KANSAS				
816	**Kansas City**	**221-9900**	**472-1430**	**A**
	Mission			
	Overland Park			
	Shawnee			

State Access Center		300/1200 bps	2400 bps	Class
KANSAS (continued)				
913	**Lawrence**	**843-8124**		**B**
913	**Manhattan**	**537-0948**		**B**
913	**Salina**	**825-7900**		**B**
913	**Topeka**	**233-9880**	**233-4660**	**B**
316	**Wichita**	**262-5669**	**262-7961**	**B**
KENTUCKY				
502	**Bowling Green**	**782-7941**		**B**
502	**Frankfort**	**875-4654**		**B**
606	**Lexington**	**233-0312**	**233-7217**	**B**
502	**Louisville**	**589-5580**	**583-1006**	**B**
	Jeffersonville, IN			
	New Albany, IN			
502	**Owensboro**	**686-8107**		**B**
LOUISIANA				
318	**Alexandria**	**445-1053**		**B**
504	**Baton Rouge**	**343-0753**	**343-0771**	**A**
318	**Lafayette**	**233-0002**	**234-8451**	**B**
318	**Lake Charles**	**436-0518**		**C**
318	**Monroe**	**387-6330**		**B**
504	**New Orleans**	**524-4094**	**522-3967**	**A**
318	**Shreveport**	**221-5833**		**B**
MAINE				
207	**Augusta**	**622-3123**		**B**
207	**Brewer**	**989-3081**		**C**
	Bangor			
207	**Lewiston**	**784-0105**		**C**
	Auburn			
207	**Portland**	**761-4000**		**C**
MARYLAND				
301	**Annapolis**	**224-8550**		**B**
	West River			
301	**Baltimore**	**727-6060**	**752-5555**	**A**
	Catonsville	Glen Burnie	Severna Park	
	Cockeysville	Parkville	Sykesville	
	Columbia	Pikesville	Towson	
	Dundalk	Randallstown	Waterloo	
	Ellicott City	Reisterstown	Woodlawn	
	Essex	Severn		
301	**Frederick**	**293-9596**		**B**
	Hagerstown			
	Myersville			

State Access Center		300/1200 bps	2400 bps	Class
MASSACHUSETTS				
617	**Boston**	**292-0662**	**574-9244**	**A**
	Arlington	Jamaica Plain	Quincy	
	Belmont	Malden	Revere	
	Brighton	Medford	Roxbury	
	Brookline	Milton	Somerville	
	Cambridge	Newton	Watertown	
	Dorchester			
617	**Brockton**	**580-0721**		**B**
	Randolph			
617	**Fall River**	**677-4477**		**B**
617	**Framingham**	**879-6798**		**B**
	Marlboro			
	Natick			
617	**Lawrence**	**975-2273**		**B**
	Andover			
	Salem			
617	**Lexington**	**863-1550**	**863-1745**	**B**
	Burlington			
	Somerville			
	Waltham			
	Woburn			
617	**Lowell**	**937-5214**		**B**
	Billerica			
	Wilmington			
617	**New Bedford**	**999-2915**		**B**
413	**Northampton**	**586-0510**		**C**
	Amherst			
413	**Pittsfield**	**499-7741**		**B**
617	**Salem**	**744-1559**		**B**
	Beverly			
	Lynn			
	Peabody			
413	**Springfield**	**781-3811**		**B**
	Chicopee			
	Holyoke			
617	**Woods Hole**	**540-7500**		**C**
	Cataumet			
	Falmouth			
	Osterville			
617	**Worcester**	**755-4740**		**B**
	Shrewsbury			
	Westboro			
MICHIGAN				
313	**Ann Arbor**	**996-5995**	**665-2900**	**A**
	Plymouth			
	Ypsilanti			
616	**Battle Creek**	**968-0929**		**B**
313	**Detroit**	**964-2988**	**963-2274**	**A**
313	**Flint**	**235-8517**		**B**
616	**Grand Rapids**	**774-0966**		**B**

State Access Center		300/1200 bps	2400 bps	Class
MICHIGAN (continued)				
517	**Jackson**	**782-8111**		**C**
616	**Kalamazoo**	**345-3088**	**345-3122**	**B**
	Otsego			
517	**Lansing**	**484-0062**	**484-6301**	**B**
517	**Midland**	**832-7068**		**B**
	Freeland			
616	**Muskegon**	**726-5723**		**C**
313	**Pontiac**	**332-5120**		**B**
	Bloomfield	Mayfair		
	Commerce	Rochester		
	Drayton Plains			
313	**Port Huron**	**982-8364**		**B**
517	**Saginaw**	**790-5166**	**799-3190**	**B**
	Bay City			
313	**Southfield**	**827-4710**		**B**
	Birmingham			
	Farmington			
616	**Traverse City**	**946-2121**		**C**
	Glen Lake			
313	**Warren**	**575-9152**		**B**
	Centerline			
	Roseville			
	Royal Oak			
MINNESOTA				
218	**Duluth**	**722-1719**		**B**
	Superior			
612	**Minneapolis**	**341-2459**	**338-1661**	**A**
	St Paul			
507	**Rochester**	**282-5917**		**C**
612	**St Cloud**	**253-2064**		**C**
MISSISSIPPI				
601	**Gulfport**	**863-0024**		**B**
601	**Jackson**	**969-0036**		**B**
601	**Meridian**	**482-2210**		**B**
601	**Starkville**	**324-2155**		**B**
MISSOURI				
314	**Columbia**	**449-4404**		**B**
314	**Jefferson City**	**634-5178**		**C**
816	**Kansas City**	**221-9900**	**472-1430**	**A**
	Bethel, KS	Melrose, KS		
	Gladstone	Raytown		
	Independence			
816	**St Joseph**	**279-4797**		**C**

State Access Center		300/1200 bps	2400 bps	Class
MISSOURI (continued)				
314	**St Louis**	**421-4990**	**421-0381**	**A**
	Bridgeton	Granite City, IL	Overland	
	East St Louis, IL	Kirkwood	Riverview	
	Ferguson	Ladue	Spanish Lake	
	Florissant	Mehlville	Webster Groves	
417	**Springfield**	**864-4814**		**B**
MONTANA				
406	**Billings**	**245-7649**		**C**
406	**Great Falls**	**771-0067**		**B**
406	**Helena**	**443-0000**		**B**
406	**Missoula**	**721-5900**		**C**
NEBRASKA				
402	**Lincoln**	**475-4964**	**475-3839**	**B**
402	**Omaha**	**341-7733**	**346-6419**	**B**
NEVADA				
702	**Las Vegas**	**737-6861**	**737-5466**	**B**
	Boulder City			
	Henderson			
702	**Reno**	**827-6900**	**827-5290**	**B**
NEW HAMPSHIRE				
603	**Concord**	**224-1024**		**B**
603	**Durham**	**868-2924**		**B**
	Dover			
603	**Manchester**	**627-8725**	**625-8088**	**B**
603	**Nashua**	**880-6241**		**C**
	Derry			
	Salem			
603	**Portsmouth**	**431-2302**		**B**
NEW JERSEY				
609	**Atlantic City**	**348-0561**		**B**
	Ocean City			
	Pleasantville			
	Somers Pt			
201	**Freehold**	**780-5030**		**B**
	Holmdel			
	Lakewood			
	Matawan			
201	**Hackensack**	**488-6567**	**488-2063**	**B**
	Cliffside	Oradell		
	Dumont	Teaneck		
	Englewood	Union City		
	Leonia	Westwood		

State Access Center		300/1200 bps	2400 bps	Class
NEW JERSEY (continued)				
609	**Marlton**	**596-1500**	**596-8659**	**B**
609	**Merchantville**	**663-9297**	**665-6860**	**B**
	Beaver Park	Haddonfield		
	Camden	Haddon Heights		
	Cherry Hill	Moorestown		
	Collingswood	Pennsaukin		
201	**Morristown**	**455-0275**	**644-4745**	**B**
	Bernardsville			
	Dover			
	Madison			
	Rockaway			
201	**New Brunswick**	**745-2900**	**745-7010**	**B**
	Boundbrook	Somerville		
	Dunellen	South River		
	Piscataway			
201	**Newark**	**623-0469**	**623-7122**	**A**
	Bayonne	Jersey City	Nutley	
	Belleville	Kearny	Orange	
	Bloomfield	Livingston	South Orange	
	Elizabeth	Millburn	Unionville	
201	**Passaic**	**778-5600**	**773-3674**	**B**
	Lynhurst			
	Mountainview			
	Rutherford			
201	**Paterson**	**684-7560**	**742-4415**	**B**
	Fair Lawn			
	Little Falls			
	Ridgewood			
	Wayne			
609	**Princeton**	**799-5587**		**A**
	Hightstown			
	Mercerville			
	Plainsboro			
201	**Rahway**	**815-1885**		**B**
	Cranford	Roselle		
	Linden	Westfield		
	Metuchen	Woodbridge		
	Plainfield			
201	**Redbank**	**571-0003**		**B**
	Asbury Park			
	Eatontown			
	Long Branch			
201	**Roseland**	**227-5277**	**227-6722**	**B**
	Boonton			
	Caldwell			
	Whippany			
201	**Sayreville**	**525-9507**		**B**
	Keyport			
	Matawan			
	Perth Amboy			
	South Amboy			

State Access Center		300/1200 bps	2400 bps	Class
NEW JERSEY (continued)				
609	**Trenton**	**989-8847**		**B**
	Ewing			
NEW MEXICO				
505	**Albuquerque**	**243-4479**	**242-1742**	**B**
505	**Las Cruces**	**526-9191**		**B**
505	**Santa Fe**	**473-3403**		**C**
NEW YORK				
518	**Albany**	**465-8444**	**465-8632**	**B**
	Colonie			
	Schenectady			
	Troy			
607	**Binghamton**	**772-6642**		**B**
	Endicott			
716	**Buffalo**	**847-1440**	**847-1825**	**B**
	East Aurora	West Seneca		
	Lancaster	Williamsville		
	Tonawanda			
516	**Deer Park**	**667-5566**	**243-1105**	**B**
	Babylon	Huntington		
	Bay Shore	Melville		
	Brentwood			
516	**Hempstead**	**292-3800**	**485-3380**	**B**
	Brookville	Hicksville	Oyster Bay	
	Cedarhurst	Levittown	Port Washington	
	Floral Park	Long Beach	Rockville Center	
	Freeport	Lynbrook	Syosset	
	Garden City	Manhasset	Valley Stream	
	Glen Cove	Massapequa	Wantagh	
	Great Neck	Mineola	Westbury	
607	**Ithaca**	**277-2142**		**C**
212	**New York City**	**620-6000** **741-4950** **or** **741-8100**	**645-0560**	**A**
	Bronx			
	Brooklyn			
	Queens			
716	**Niagara Falls**	**282-1462**		**C**
518	**Plattsburgh**	**562-1890**		**C**
914	**Poughkeepsie**	**473-2240**	**473-3200**	**B**
	Wappingers Falls			
716	**Rochester**	**454-1020**	**454-5730**	**B**
	East Rochester			
	Fairport			
	Webster			
315	**Syracuse**	**472-5583**	**479-5445**	**B**
315	**Utica**	**797-0920**		**B**

State Access Center		300/1200 bps	2400 bps	Class
NEW YORK (continued)				
914	**White Plains**	**328-9199**	**682-3505**	**B**
	Elmsford	Port Chester		
	Mamaroneck	Scarsdale		
	Pleasantville	Tarrytown		
NORTH CAROLINA				
704	**Asheville**	**252-9134**		**B**
704	**Charlotte**	**332-3131**	**333-6204**	**A**
919	**Fayetteville**	**323-8165**		**C**
704	**Gastonia**	**865-4708**		**B**
919	**Greensboro**	**273-2851**	**275-1251**	**B**
919	**High Point**	**889-7494**		**B**
	Thomasville			
919	**North Wilkesboro**	**838-9034**		**C**
919	**Raleigh**	**834-8254**	**834-8254**	**B**
919	**Research Triangle Pk**	**549-8139**	**541-9096**	**B**
	Cary			
	Chapel Hill			
	Durham			
919	**Tarboro**	**823-0578**		**C**
	Rocky Mount			
919	**Wilmington**	**763-8313**		**C**
919	**Winston-Salem**	**725-2126**	**777-0312**	**B**
NORTH DAKOTA				
701	**Fargo**	**235-7717**		**C**
	Moorhead, MN			
701	**Mandan**	**663-2256**		**B**
	Bismarck			
OHIO				
216	**Canton**	**452-0903**		**B**
	Massillon			
	North Canton			
513	**Cincinnati**	**579-0390**	**241-8008**	**A**
	Boone			
	Covington			
216	**Cleveland**	**575-1658**	**771-6480**	**A**
	Independence			
614	**Columbus**	**463-9340**	**461-9044**	**A**
	Gahanna			
	Worthington			
513	**Dayton**	**461-5254**	**461-0755**	**B**
	Vandalia			
216	**Elyria**	**323-5059**		**C**
513	**Hamilton**	**863-4116**		**B**
216	**Kent**	**678-5115**	**678-5043**	**A**
	Akron			

State Access Center		300/1200 bps	2400 bps	Class
OHIO (continued)				
216	**Lorain**	**960-1771**		**C**
	Amherst			
419	**Mansfield**	**526-0686**		**C**
419	**Sandusky**	**627-0050**		**B**
513	**Springfield**	**324-1520**		**C**
419	**Toledo**	**255-7881**	**255-1906**	**B**
	Sylvania			
216	**Warren**	**394-0041**		**C**
216	**Youngstown**	**743-1296**	**743-6843**	**B**
	Girard			
OKLAHOMA				
918	**Bartlesville**	**336-3675**		**B**
405	**Lawton**	**353-0333**		**B**
405	**Oklahoma City**	**232-4546**	**232-9513**	**B**
	Bethany	Moore		
	Britton	Norman		
	Edmond	Yukon		
	Midwest City			
405	**Stillwater**	**624-1112**		**B**
918	**Tulsa**	**584-3247**	**587-2774**	**B**
	Broken Arrow			
	Jenks			
OREGON				
503	**Corvallis**	**754-9273**		**C**
	Albany			
503	**Eugene**	**683-1460**		**C**
	Springfield			
503	**Hood River**	**386-4405**		**C**
503	**Medford**	**779-6343**		**B**
503	**Portland**	**295-3028**	**241-0496**	**A**
	Beaverton			
	Lake Oswego			
	Tigard			
503	**Salem**	**378-7712**		**B**
PENNSYLVANIA				
215	**Allentown**	**435-3330**	**770-1405**	**B**
	Bethlehem			
	Easton			
	Emmaus			
717	**Carlisle**	**249-9311**		**C**
717	**Danville**	**271-0102**		**C**
	Bloomsburg			
814	**Erie**	**899-2241**		**B**
717	**Harrisburg**	**236-6882**	**236-2007**	**B**
	Hershey			
	Mechanicsburg			

State Access Center		300/1200 bps	2400 bps	Class

PENNSYLVANIA (continued)

814	**Johnstown**	**535-7576**		**B**
215	**King of Prussia**	**337-4300**	**337-2850**	**B**
	Ambler	Norristown		
	Conshohocken	Valley Forge		
	Lansdale	Wayne		
717	**Lancaster**	**295-5405**		**C**
215	**Philadelphia**	**574-9462**	**574-0990**	**A**
412	**Pittsburgh**	**288-9950 or 288-9974**	**471-6430**	**A**
215	**Reading**	**376-8750**		**C**
	Mt Penn			
717	**Scranton**	**961-5321**		**B**
	Pittston			
814	**State College**	**231-1510**		**C**
	Bellefonte			
717	**Wilkes-Barre**	**829-3108**		**B**
	Kingston			
717	**Williamsport**	**494-1796**		**C**
	Loyalsock			
717	**York**	**846-6550**		**B**

RHODE ISLAND

401	**Providence**	**751-7912**	**831-3990**	**B**
	Bristol	Warren		
	East Providence	Warwick		
	Greenwich	West Warwick		
	Pawtucket			

SOUTH CAROLINA

803	**Charleston**	**722-4303**		**B**
803	**Columbia**	**254-0695**	**252-0328**	**B**
803	**Greenville**	**233-3486**	**271-0231**	**B**
803	**Spartanburg**	**585-1637**		**B**

SOUTH DAKOTA

605	**Pierre**	**224-0481**		**B**
605	**Rapid City**	**348-2621**		**C**
605	**Sioux Falls**	**336-8593**	**336-6438**	**B**

TENNESSEE

615	**Bristol**	**968-1130**		**C**
	Bristol, VA			
615	**Chattanooga**	**756-1161**	**265-7929**	**B**
	Rossville, GA			
615	**Clarksville**	**552-0032**		**B**
615	**Johnson City**	**282-6645**		**C**
	Midway			

State Access Center		300/1200 bps	2400 bps	Class
TENNESSEE (continued)				
615	**Knoxville**	**523-5500**	**521-5072**	**B**
	Concord			
901	**Memphis**	**521-0215**	**527-5175**	**B**
615	**Nashville**	**244-3702**	**255-2608**	**B**
	Franklin			
615	**Oak Ridge**	**481-3590**		**C**
TEXAS				
915	**Abilene**	**676-9151**		**B**
806	**Amarillo**	**373-0458**	**373-1833**	**B**
214	**Athens**	**677-1712**		**C**
512	**Austin**	**928-1130**	**929-3622**	**B**
	Round Rock			
512	**Brownsville**	**542-0367**		**C**
409	**Bryan**	**822-0159**		**C**
	College Station			
512	**Corpus Christi**	**884-9030**	**884-6946**	**B**
214	**Dallas**	**748-6371**	**745-1359**	**A**
	Addison	Farmers Branch	Lewisville	
	Carrollton	Garland	Mesquite	
	Duncanville	Grand Prairie	Plano	
	Euless	Irving	Richardson	
915	**El Paso**	**532-7907**		**B**
817	**Ft Worth**	**332-4307**	**332-6794**	**A**
	Arlington			
	Grapevine			
	Kennedale			
	North Richland Hills			
409	**Galveston**	**762-4382**		**B**
713	**Houston**	**227-1018**	**227-8208**	**A**
	Baytown			
	Deer Park			
	Katy			
	Sugar Land			
512	**Laredo**	**724-1791**		**C**
214	**Longview**	**236-4205**		**C**
806	**Lubbock**	**747-4121**		**C**
512	**McAllen**	**686-5360**		**C**
	Edinburg			
	Mission			
	Pharr			
915	**Midland**	**561-9811**	**561-8597**	**B**
	Odessa			
	Terminal			
409	**Nederland**	**722-3720**		**B**
	Beaumont			
	Port Arthur			
915	**San Angelo**	**944-7621**		**B**
512	**San Antonio**	**225-8004**	**225-3444**	**B**
	Universal City			

State Access Center		300/1200 bps	2400 bps	Class
TEXAS (continued)				
214	**Sherman**	**893-4995**		**B**
817	**Temple**	**773-9723**		**C**
214	**Tyler**	**597-8925**		**C**
817	**Waco**	**752-9743**		**C**
817	**Wichita Falls**	**322-3774**		**B**
UTAH				
801	**Ogden**	**627-1630**		**C**
	Clearfield			
801	**Provo**	**373-0542**		**B**
	Orem			
801	**Salt Lake City**	**359-0149**	**359-0578**	**B**
	Bountiful	Kearnes		
	Cottonwood	Magna		
	Holladay	Midvale		
	Kaysville	Murray		
VERMONT				
802	**Burlington**	**864-0808**		**B**
	Essex Junction			
802	**Montpelier**	**229-4966**		**B**
	Barre			
802	**Rutland**	**775-1676**		**C**
802	**White River Junction**	**295-7631**		**C**
	Hanover, NH			
VIRGINIA				
703	**Blacksburg**	**552-9181**		**C**
	Radford			
804	**Charlottesville**	**977-5330**		**C**
703	**Covington**	**962-2217**		**C**
703	**Fredericksburg**	**371-0188**		**B**
703	**Harrisonburg**	**434-7121**		**C**
703	**Herndon**	**435-1800**	**481-6807**	**B**
	Fairfax			
	Vienna			
804	**Lynchburg**	**845-0010**		**C**
804	**Newport News**	**596-6600**		**B**
	Hampton			
804	**Norfolk**	**625-1186**	**625-2408**	**B**
	Portsmouth			
	Virginia Beach			
804	**Richmond**	**788-9902**	**353-0219**	**B**
	Mechanicsville			
	Midlothian			
703	**Roanoke**	**344-2036**	**344-2404**	**B**
	Salem			

State Access Center		300/1200 bps	2400 bps	Class
WASHINGTON				
206	**Auburn**	**939-9982**		**B**
	Des Moines			
	Kent			
206	**Bellingham**	**733-2720**		**B**
206	**Everett**	**775-9929**		**C**
	Lynwood			
206	**Longview**	**577-5835**		**B**
206	**Olympia**	**754-0460**		**C**
509	**Richland**	**943-0649**		**B**
	Kennewick			
	Pasco			
206	**Seattle**	**625-9612**	**623-9951**	**A**
	Bellevue			
509	**Spokane**	**455-4071**	**838-9065**	**B**
206	**Tacoma**	**627-1791**		**B**
206	**Vancouver**	**693-6914**		**B**
509	**Wenatchee**	**663-6227**		**B**
509	**Yakima**	**575-1060**		**B**
WEST VIRGINIA				
304	**Charleston**	**345-6471**	**345-7140**	**B**
304	**Huntington**	**523-2802**		**C**
304	**Morgantown**	**292-0104**		**C**
	Westover			
304	**Wheeling**	**233-7732**		**B**
WISCONSIN				
608	**Beloit**	**362-5287**		**B**
	Janesville			
715	**Eau Claire**	**836-9295**		**C**
414	**Green Bay**	**432-2815**	**432-0346**	**B**
414	**Kenosha**	**552-9242**		**C**
	Parkside			
608	**La Crosse**	**784-0560**		**B**
608	**Madison**	**257-5010**	**257-8472**	**B**
	Middleton			
414	**Milwaukee**	**271-3914**	**278-8007**	**A**
	Brookfield			
	Menomonee Falls			
	Waukesha			
414	**Neenah**	**731-0620**		**C**
	Appleton			
414	**Racine**	**632-6166**		**C**
414	**Sheboygan**	**452-3995**		**C**
715	**Wausau**	**845-9589**		**B**
414	**West Bend**	**334-2206**		**B**

State Access Center		300/1200 bps	2400 bps	Class
WYOMING				
307	**Casper**	**265-5167**		**C**
307	**Cheyenne**	**638-4421**		**B**
307	**Laramie**	**721-5878**		**C**

About X.25 Dial Service

- for asynchronous, SDLC, 3270 BSC and 2780/3780 applications
- at 1200 and 2400 bps
- with built-in local error protection

X.25 Dial Service sends your data in the enhanced X.25 protocol directly from a single terminal or a large cluster of terminals attached to a terminal concentrator supporting X.25.

The service takes full advantage of your advanced equipment's speeds, built-in memory and processing capabilities. It supports up to 35 concurrent host sessions on a single call. X.25 protocol and application software interfaces should be selected based on customer communications requirements. For areas without local access use Telenet's In-WATS service.

In-WATS access for X.25 Dial Service is available from all U.S. locations: Dial 1-800/358-5880. (Consult the Public Network Rate Schedule for In-WATS pricing.)

Service Requirements

Speed:	Modem Type:
1200 bps	Bell 212A compatible
2400 bps	V.22 bis compatible

X.25 Dial Service

State Access Center	1200/2400 bps	Class

CALIFORNIA

213	**Los Angeles**	**622-4913**	**A**
	Alhambra	Inglewood	
	Beverly Hills	Mar Vista	
	Culver City	Montebello	
916	**Sacramento**	**446-9811**	**B**
	Fair Oaks		
	Folsom		
415	**San Francisco**	**397-0815**	**A**
	Alameda		
	South San Francisco		
714	**Santa Ana**	**648-0311**	**B**
	Huntington Beach		
	Irvine		
	Newport Beach		
	Orange		

COLORADO

303	**Denver**	**745-1580**		**A**
	Arvada	Broomfield	Golden	
	Aurora	Castlerock	Lakewood	
	Boulder	Englewood	Littleton	

CONNECTICUT

203	**Hartford**	**549-5498**	**B**
	Bloomfield	West Hartford	
	East Hartford	Wethersfield	
	Farmington	Windsor	
	Manchester	Windsor Locks	
	Newington		

DISTRICT OF COLUMBIA

202	**Washington**	**857-0781**		**A**
	Alexandria, VA	Clinton, MD	Laurel, MD	
	Arlington, VA	Engleside, VA	Layhill, MD	
	Berwyn Heights, MD	Fairfax, VA	McLean, VA	
	Bethesda, MD	Falls Church, VA	Oxon Hill, MD	
	Bowie, MD	Gaithersburg, MD	Rockville, MD	
	Capitol Heights, MD	Hyattsville, MD	Silver Spring, MD	
	Chevy Chase, MD	Kensington, MD	Vienna, VA	

FLORIDA

305	**Miami**	**374-1775**	**A**
	Homestead		
	Perrine		
813	**Tampa**	**229-6714**	**B**

State Access Center		1200/2400 bps		Class
GEORGIA				
404	**Atlanta**	**688-4650**		**A**
	Austell	Duluth	Marietta	
	Chamblee	Fairburn	Norcross	
	Conyers	Fayetteville	Stone Mountain	
	Doraville	Jonesboro	Tucker	
	Douglasville	Lawrenceville	Woodstock	
ILLINOIS				
312	**Chicago**	**781-0961**		**A**
	Evanston	Oaklawn		
	Forest Park	Oak Park		
	Maywood	Skokie		
INDIANA				
317	**Indianapolis**	**293-3273**		**B**
	Carmel			
	Fishers			
	Greenwood			
	Plainfield			
MASSACHUSETTS				
617	**Boston**	**292-9572**		**A**
	Arlington	Jamaica Plain	Quincy	
	Belmont	Malden	Revere	
	Brighton	Medford	Roxbury	
	Brookline	Milton	Somerville	
	Cambridge	Newton	Watertown	
	Dorchester			
MICHIGAN				
313	**Detroit**	**961-2922**		**A**
MISSISSIPPI				
601	**Jackson**	**354-2795**		**B**
NEW JERSEY				
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	Lake Oswego			
	Tigard			
PENNSYLVANIA				
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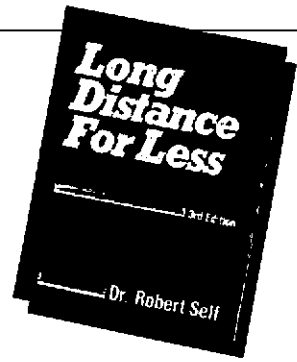
NEW!!

LONG DISTANCE FOR LESS

THIRD EDITION

The Official Guide to Long Distance Telephone Services in the US



Dr. Robert Self
580 pages, 1989, $75.00 *Code P40001*

This is the third, revised, updated and expanded edition of the most popular telephone management book ever. Thousands of companies — from Fortune 500 to five-person companies — have used this book to save up to 50% on their long distance bills.

The purpose of this book is very simple: **It's to help you understand and save money on your business's long distance bills.**

Today there are at least 300, perhaps 500, long distance companies in the US. Most of these sell five to 10 outgoing services. Several companies offer 800 service; most offer travel services. In many cases pricing for different services — outward, inward, travel — are linked.

You want to choose a long distance company that will not only cut your costs, but also make your business run better. You want a service with good quality and many features. You want convenience and accurate bills — bills that make it easier to manage and control your long distance costs.

In today's market where each long distance company has many services, it's just as important to pick the right service (or combination of services) as it is to pick the "right" long distance company.

Did you know:

- There are at least 1,500 ways to call between most major cities.
- Prices for making long distance calls can vary by as much as 2,000%.
- Traditional banded WATS, still used by many businesses, is usually not a good deal today. It costs too much, has fewer features, and is more hassle than newer services.
- Some long distance companies still may bill you when you get no answer.
- Some may still bill you when you get a busy signal, or a call doesn't go through.
- Yet, many customers are better off with this "inferior" billing.
- Some companies give you many calls under one minute for free.
- Sometimes it's cheaper to buy a service which costs 30 cents per minute than one which costs 25 cents per minute.
- Sometimes you can just tell your long distance company to quit billing you some of your monthly charges. You save the money — and your service will not change one bit.

THE TELECONNECT GUIDE TO AUTOMATIC CALL DISTRIBUTORS

by Steven C. Grant and Yvonne Brooks Grant
second edition, 256 pages, 1985, $30.00
Code P08001

More and more companies are using 800 IN-WATS, FX (foreign exchange) and other inbound lines to take orders and handle customer questions and complaints. The most powerful tool for handling incoming calls efficiently is the *Automatic Call Distributor.*

The ACD is a telephone switch specially designed to handle large volumes of incoming calls. It is unquestionably the most important cost-saving, revenue-producing communications tool available to communications professionals in the 1980s.

The ACD, and its incoming call center, are visible to upper management as profit-earners. Every other communications "thing" — e.g. a PBX — is seen as an uncontrolled expense.

A properly working ACD with correctly trained and motivated agents can mean substantial extra sales and much improved customer goodwill. ACDs typically cost **eight to 12 times** what PBXs cost. ACDs are the most expensive switches you'll ever buy. This book is designed to help you choose and best use an automatic call distributor.

DATA COMPRESSION

by Gilbert Held
206 pages, Second Edition, 1987, $39.95
Code P40016

Data compression techniques are important for economic and reliable data transmission. This book fills the void which existed concerning practical data-compression methods, and covers compression algorithms, implementation techniques, hardware and software. Plenty of diagrams, tables, and program listings.

Contents:
• Rationale and Utilization • Techniques • Systems and Data Analysis • Using Compression-Performing Devices • Data Codes and Compression-Indicating Characters • Datanalysis Program Descriptions and Listings • Shrink Program Descriptions and Listings

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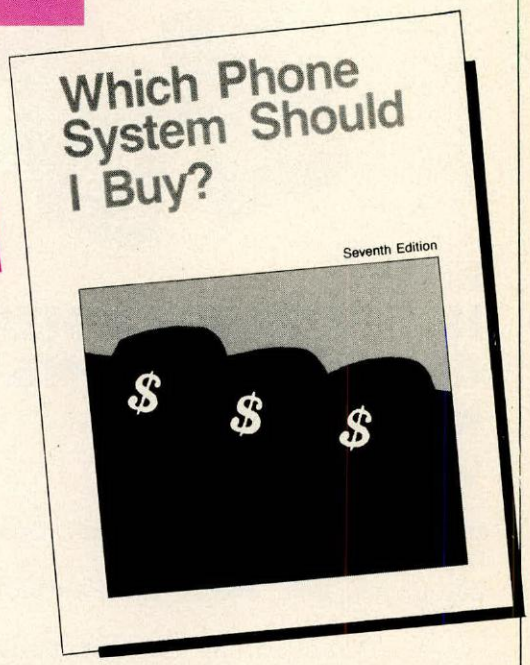

A COMPLETE GUIDE TO KEY SYSTEMS & MINI PBXS — 7TH EDITION

by Harry Newton and
The *TELECONNECT Magazine* Research Group
460 pages, 1989, $39.95
Code P03001

This book will give you the practical information you need to acquire a telephone system for as few as two, to as many as 200 people.
This book answers seven important questions you face when buying a phone system:

1. What's available — an Overview? There's a chart organized by size. Every phone system available is the U.S. — more than 230 domestic and imported — is listed.

2. What's available — in Particular? The book describes each phone system in depth, analyzing its design strongpoints, its features — standard and optional, voice and data — how it fits into the maker's "family" of products, and its expansion capabilities.

3. How do I choose the features, the equipment, and the options I need? What criteria are most important in a Request for Proposal — formal or informal?

4. How do I make the best deal with my vendor? The best price? The best service arrangements? The best purchase contract?

5. What are the biggest, most expensive mistakes others have made acquiring phone systems? How can I avoid making the same mistakes? And thus how can I save myself a lot of money?

6. How do I keep my chosen phone system running perfectly and my maintenance costs low?

7. Where do I acquire the equipment? The book includes a complete list of all manufacturers.

This book is non-technical. Perfect for the businessperson buying a phone system. Especially useful for salespersons selling phone systems.

Contents:

Ch. 1. A General Look At What's Available. Two-line phones. Key telephone Systems. Hybrid key/PBX phone systems. PBXs (Private Branch Exchanges, i.e. "dial 9" phone systems).
Ch. 2. How To Buy A Telephone System. Sizing. Wiring. How much wiring to install. Designing your telephone "place" or room. Features provided by phone systems. Dealing with your local phone company. *The Phone System Acquisition Checklist.* How to buy Cheap.
Ch. 3. Comparison Charts of All Available Systems- over 230 phone systems compared
Ch. 4. Key System Features Explained and Defined
Ch. 5. 1A2 Key Service Units (older key systems)
Ch. 6. 1A2 Key Telephone Sets
Ch. 7. Electronic Key Systems — 121 pages, the book's core
Ch. 8. Small PBXs For Business — Why you should or should not buy a PBX
Ch. 9. PBXs — 74 pages, the book's second core
Ch.10. Telephone accessories — call accounting systems, automated attendants, voice mail, dialers, headsets, etc.
Ch.11. How to keep your phone system running well. *Before you call the serviceman. A Checklist.*
Ch.12. Centrex Service from Bell telephone cos.
Ch.13. Glossary of Telephonese
Ch.14. Manufacturers — addresses & phone numbers

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NEW!! INTEGRATED DIGITAL COMMUNICATIONS NETWORKS
Volume 1

by Guy Pujolle, Dominique Seret, Danielle Dromard & Eric Horlait
288 pages, 1988, $49.95 ***Code P41007***

At a time of exciting developments within the networks field (e.g. digitization, the advent of integrated services digital networks and open systems interconnection) many professionals need an understanding of integrated and data communications. In these two volumes, the authors aid this understanding by establishing the fundamental principles and describing in detail the developments that are already taking place. These volumes focus on current techniques and OSI protocols for information exchange, and outline different communication architectures for computer networks.

Included are numerous examples of popular networks such as Local Area, Wide Area and public networks; vendor architectures; satellite networks and communications applications.

These two volumes will be invaluable for professionals in computer science who need to understand the basic principles and the main products in data communications and computer networks. They will also be useful for telecommunications staff, office automation professionals and students working on computer communications and distributed systems.

Contents:
1. Information Transmission
2. Information Coding
3. Error Protection
4. Cryptography
5. The Components of a Computer Communications System
6. Network Architecture and Switching
7. The Interconnection Medium
8. The Physical Layer: Level 1
9. The Link Layer: Level 2
10. The Network Layer: Level 3
11. The Transport Layer: Level 4
12. The Session Layer: Level 5
13. The Presentation Layer: Level 6
14. The Application Layer: Level 7

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NEW!! INTEGRATED DIGITAL COMMUNICATIONS NETWORKS
Volume 2

by Guy Pujolle, Dominique Seret, Danielle Dromard & Eric Horlait
299 pages, 1988, $49.95 ***Code P41008***

Contents:
1. Telephone Network and its Evolution
2. Examples of Public Data Communications Networks
3. Manufacturers' Networks
4. Closely Interconnected Networks: Buses
5. Local Networks
6. Satellite Networks
7. Network Interconnection
8. Network Design and Performance
9. Telematics
10. Videotex
11. Teletex
12. Sound and Image Telematics

NEW!! ISDN
An Introduction

William Stallings
418 pages, 1989, $45.95 ***Code P41006***

The ISDN, the most important development in the computer-communications industry, will have a dramatic effect on communications providers, component manufacturers, and both residential and business telecommunications users. Although the technology and standards for ISDN are still evolving, a clear picture of the architecture, design approaches and services of ISDN is emerging.

The objective of this book is to provide a comprehensive introduction to the underlying technology and user-visible architecture of ISDN. The book explores key topics related to ISDN in the following general categories:

Underlying technology: The ISDN is based on the development of digital transmission and switching technologies and their use to construct an integrated digital network (IDN) for telecommunications.

Architecture: The architecture of the ISDN exploits the emerging application of digital technology to integrate voice and data transmission services for the end user.

Standards: A massive effort is underway to develop standards covering the broad spectrum of ISDN protocols, architecture and services.

Services: The ISDN supports a wide variety of current and new digital services, including facsimile, teletex and videotex.

ISDN Cont'd

Contents:
Ch 1. Introduction: Introduces the concept of ISDN and discusses the evolution toward ISDN.
Ch 2. Circuit switching: Discusses circuit-switching mechanisms, network design and common-channel signaling.
Ch 3. Packet switching: Examines the mechanisms of packet switched networking, including routing and congestion control. X.25 and fast packet switching are also examined.
Ch 4. IDN technology: Presents the technology of integrated digital networks, including digital subscriber loops. The role of Signaling System #7 (SS #7) is also examined.
Ch 5. ISDN overview: Provides a general introduction to ISDN, plus a look at the structure of the ISDN standards.
Ch 6. ISDN services: Presents the basic framework for specifying services for ISDN. This is followed by a look at specific services (Teletex, facsimile, X.400) supported by ISDN.
Ch 7. ISDN architecture: Looks at issues relating to the architecture of ISDN, including transmission structure, physical configuration, and the issues of addressing and interworking.
Ch 8. ISDN protocols: Looks at the three layers of standards specifically designed for use in ISDN. The key protocols at each layer are examined. A portion of SS#7 that is directly related to ISDN is also examined.
Ch 9. Broadband ISDN: Examines the latest development in ISDN technology and standards.
Appendix A: Flow control, error detection, and error control.
Appendix B: The OSI reference model.

THE INTEGRATED SERVICES DIGITAL NETWORK:
From Concept to Application

by John Ronayne
230 pages, 1988, $34.95 *Code P41017*

The book introduces the developing technology and the emerging dilemmas of the ISDN at a time when the proposed architecture of the ISDN is defined in broad principles and experience has been gained with early implementations. It will provide the necessary background for sensible appreciation of the opportunities and problems which the ISDN presents. The subject is approached from three directions: what is now possible, planned or implemented; the international and national standard agreements necessary to make the ISDN possible; and, finally, the network development most suited to ISDN with, in contrast, the current network developments which prejudice the orderly introduction of ISDN.

Contents:
The ISDN Objective; The Network before ISDN; ISDN Tools: Intelligent Terminals; ISDN Tools: Common Channel Signaling and Open Systems; Progress toward ISDN; The Technical Risks of the ISDN; The Network Integrated; In Perspective; References; Glossary; Index.

DIGITAL COMMUNICATIONS

X.25 EXPLAINED PROTOCOLS FOR PACKET SWITCHING NETWORKS
SECOND EDITION

by R.J. Murphy
304 pages, 1987, $29.95 *Code P26006*

Data transmission today is inexpensive and easy using packet switched networks based on the international standard X.25. This book, addressed to computer scientists, engineers, physicists and students, introduces the International Standards Organization's seven-layer model for Open Systems Interconnection, and specifically covers the lower four layers which provide the communications subsystem. The book is very concise, and covers all the things you need to know to understand technical discussions of communications under the X.25 standard.

Contents:
• The ISO Seven Layer Model • The Physical Level • The Link Level • The Packet Level • The Transport Level • "Triple X"

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TELECOMMUNICATION NETWORKS:
Protocols, Modeling and Analysis

by Mischa Schwartz
747 pages, 1987, $49.95 *Code P35006*

This is a technical book by a world-renown engineering professor, who is currently the director of the Columbia Center for Telecommunications Research. The book is organized around the layered architecture of the OSI Model. This is probably the most up-to-date book on data networks. This book is invaluable for telecommunication engineers, managers, network planners, system analysis, designers and programmers.

Contents:
• Queuing theory • Layered architectures in data networks • Data link layer • Network layer; flow and congestion control • Network layer; routing function • Transport layer • Polling and random access in data networks • Local area networks • Circuit switching • Call processing in circuit switching networks • The evolution toward integrated networks

WEEKEND FUN READING

THE DEAL OF THE CENTURY

The Breakup of AT&T

by Steve Coll
400 pages, 1986, $8.95 *Code P40017*

This is a "fun" weekend read. Steve Coll has made the breakup of the Bell System not only educational, but entertaining. Our publisher couldn't put it down one whole weekend. Captures all the drama of the decade-long war to break-up AT&T, once the world's largest corporation. All the intrigue, romance and politicking. Must reading for anybody in telecom.

Contents:
The Whites of Their Eyes • The First Shot • The New Trustbusters • The Decision to Decide • Legacy of a Scandal • "I Intend to Bring Action" • Stillborn • McGowan's Gambit • DeButts' Last Stand • The Red and Blue Teams • Severed Limbs • The Answer Man • The New Realism • Crimson Sky • Two Lawyers • The Sky Falls • Litigating to the Eyeballs • Connell's Deception • Saunders and McGowan • The Baldrige Proposal • The Disengaged Presidency • Escalation • Baxter's Finesse • A Judicial Temperament • Judgement Day • The Inter-Intra Split • Court of Last Resort • Fence with a One-Way Hole • The Two Pager • Apres Ski • January 8 • "This Case Is History"

DISCONNECTING PARTIES

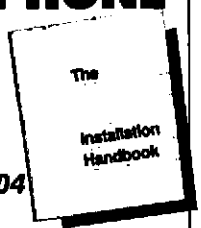
Managing the Bell System Breakup: An Inside View

by W. Brooke Tunstall, VP AT&T
226 pages, pub 1985, $17.95 *Code P07004*

This book by the Director of Divestiture Planning of the then-Bell System tells how the biggest and most successful telephone company was broken up. This book draws back the curtain of those halcyon days when decisions were made on the fly, because there was no time to clarify the twists and turns of the latest Modified Final Judgment. If you're in this industry, you know *what* this book is about. Now learn *how* it happened. Our catalog copywriter found it so fascinating he took the book home and actually read it.

Contents:
The Historical Context: AT&T Under Siege • Divestiture Planning Diary • Restructuring — "Balkanizing Bell" • Cultural Transformation • Lessons Learned: Managing the Transition • Lessons Learned: Managing Before and After • Crucial Questions for the Future • A Final Reflection • The Lighter Side of Divestiture • Modification of Final Judgment

THE CELLULAR TELEPHONE INSTALLATION HANDBOOK



by Michael Losee
237 pages, 1988, $49.95 *Code P41004*

If you install cellular telephones, if you manage or own an installation facility or if you're involved in the sales and marketing of cellular equipment or services, this book is written for you. This handbook is a step-by-step guide that teaches the latest and most effective installation, troubleshooting and repair techniques. Antenna theory and selection are explained, along with sections on system theory, test equipment, tools, phone placement and selection, plus much more. It's loaded with tips and tricks of the trade that would otherwise take years to learn. Everything you need to know is presented using easy-to-follow language, which is complemented by more than 100 illustrations.

Contents:
A History of Cellular Telephones; Theory and operation of a cellular system; Test Equipment and Tools; Cellular Telephone Equipment; Antenna Theory and Selection; Vehicle Installations; Marine Installations; Rural Installations; Troubleshooting and Repairing Installations; Glossary; Directory of Manufacturers.

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THE CELLULAR CONNECTION

A Guide to Cellular Telephones Second Edition

by Josef Bernard
152 pages, 1987, $10.95 *Code P40018*

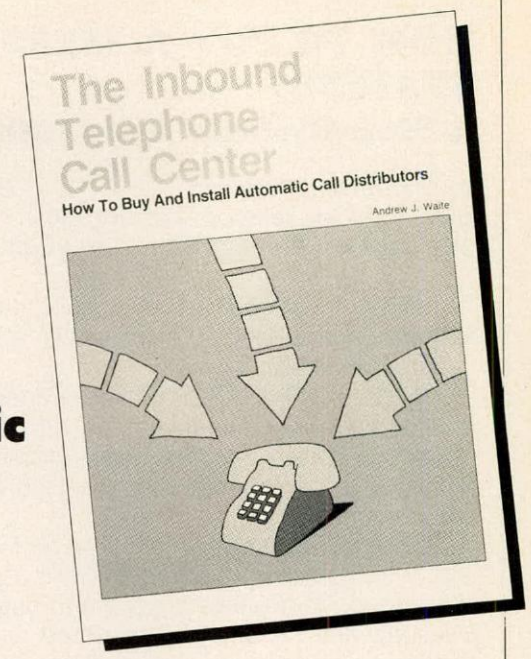
If you are interested in cellular telephones, this book is a quick and easy read that will give you all the highlights of this interesting new technology. Already a hot seller, it tells you how the system works, what features and services are available, how to choose equipment and a carrier, how to deal with operational difficulties, and even how to send data via your phone's computer interface. Lots of photos and illustrations, a handy list of "roamer" numbers, glossary of cellular terms.

Chapters Include:
• Cellular Phone Equipment • The business of Cellular Phones • Getting Cellular Service • The Bill, Please • Roaming • Options and Accessories • Portable and Transportable Phones • Dealing with Operational Difficulties • Safety and Security • The Future

NEW!!! #7 BEST SELLER!!!

THE INBOUND TELEPHONE CALL CENTER

How To Buy And Install Automatic Call Distributors



by Andrew Waite, publisher of *INBOUND/OUTBOUND Magazine*
170 pages, 1989, $49.95 *Code P40027*

If you do business by phone — and who doesn't these days? — this book is for you. This book will teach you how to choose and use the right equipment to help you win sales and keep customers. In particular, the book covers inbound telephone equipment for the following tasks:

- **Sales** — taking orders.
- **Sales and Marketing Support** — literature delivery, inquiry fulfillment, order processing, add-on sales, dealer location, etc.
- **Technical Support** — Getting buyers up and running with help, advice and "bug fixes."
- **Field Service** — Where and how to get it.
- **Service Dispatching** — Sending technicians out into the field.
- **Market Administration** — Market research, dealer support, etc.
- **Credit and Collections** — Extending credit and collecting it.

Andrew Waite has spent 10 years using, marketing, selling and installing Automatic Call Dstributors. The book answers hundreds of questions facing a buyer. It's filled with an insider's insights, tips, shortcuts, mistakes to avoid and plain old-fashioned common sense.

Some of the issues discussed:

1. What's at stake in a call center?
2. When do I buy an ACD system and why should I consider an application-specific box?
3. Selling upper management on an effective system.
4. Why the keepers of technology at your company don't understand your problems or don't deem them critical. How to change that perception.
5. What's around? An overview — a chart and listing of every system we can find in the US — 25 vendors and 41 systems.
6. What features are important, why, and who's got them.
7. The biggest and most expensive mistakes, and how to avoid them.

The book is designed to lead a buyer or user of these centers through the maze of technologies and techniques. It will be useful to Call Center managers, marketing departments, buyers and sellers.

Contents:

Chapter 1. Why a call center — the opportunity, the value of a call, the cost of a call
Chapter 2. The implications and applications of establishing a center with accountability and adequate authority.
Chapter 3. The call center structure: the whys and logic of the structure and the location.
Chapter 4. Telephone service and traffic issues: dealing with phone companies and long distance providers.
Chapter 5. Staffing issues
Chapter 6. The small user options: key telephone systems and automatic call sequencers. The secondary market.
Chapter 7. The automatic call distributor, definitions, switching systems.
Chapter 8. System categories, the vendors, capacity, growth strategies. Who has what.
Chapter 9. How they work, routing control elements, call processing and what it means to your business goals.
Chapter 10. Bulletproofing the center. There's nothing as dead (or as depressing) as a dead call center, especially when your ad is running today in the *Wall Street Journal.* The strategies to beat this devastating problem.
Chapter 11. The terminals or agent telephone sets: what works and what to expect.
Chapter 12. The management information strategy: measuring and managing the effectiveness of your center.
Chapter 13. Advanced ACDs, strategies and anticipated developments: where this business is going and how to avoid being caught with low-tech, no-tech, slow-tech or yestertech.
Chapter 14. Acquiring an ACD system.

Appendices:

• The vendors • Automatic call sequencers • Key system/ACDs • PBX/ACDs • Central-office based ACDs • Standalone ACDs • Secondary market

HOW TO BUY A TELEPHONE SYSTEM:
A Step-By-Step Approach

by Richard A. Kuehn
published by Telecom Library Inc.
102 pages, 1984, $24.95 *Code P04001*

This manual is a practical guide to the selection and acquisition of a telephone system for a business or a governmental agency.

Mr. Kuehn, the author, has been one of the nation's leading telephone consultants for 20 years. He buys millions of dollars worth of phone systems every year for his clients — far more than most individual Fortune 500 companies.

The goal of this book is to take a novice and allow him or her to design a *Request for Proposal* (a sample is included); to evaluate suppliers through a *Suppliers Questionnaire,* to analyze the Price Quotations and financing alternatives; to analyze the Telephone Systems Bid Responses; to draw up a *Purchase Contract* and to draw up a solid *Maintenance Contract.*

Phone systems are not cheap. They cost between $550 and $1,500 per installed phone. They have limited resale value. Mistakes can be very costly. In acquiring a modern phone system, you can gain for your company, business or governmental agency:

1. Substantial pre-and after-tax dollar savings on your equipment bills,
2. A large drop in the cost of your long distance calling,
3. Many valuable, time-saving, productivity-enhancing features,
4. A sharp drop in the future cost of moving your phones and changing your telephone system around, and
5. Far better service to your users. (Your users and your customers will be happier.)

This book lays out a logical, businesslike approach to buying a phone system. It does not analyze the technical features of one phone system versus another by brand name. For that, you should get *Which Phone System Should I Buy*

NEW!!
INTRODUCTION TO TELECOMMUNICATION ELECTRONICS

A. Michael Noll
359 pages, 1988, $44.00 *Code P41005*

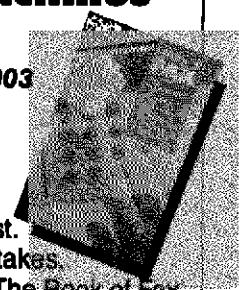
This book is intended as an introduction to the fundamental electrical and electronic concepts and principles that underlie modern communication systems and products. The objective of the material is to help nontechnical persons become literate in the terminology and concepts used by communication engineers in designing and developing communication systems and products.

The book is divided into three narrow topics which are necessary for the common background that we need to explain and to understand the broader principles and concepts of communication systems. Periodic and aperiodic signals, the time and frequency representation of a signal, spectrum and bandwidth, filters, electricity and Ohm's law, direct current and alternating current and capacitance and inductance are some of the topics initially explained in the text.

The book then moves on to communication systems concepts. The multiplexing together of a number of signals through frequency-division and time-division multiplexing is described. Covered is the amplitude modulation and frequency modulation — with emphasis on their bandwidth and noise-immunity aspects.

The book winds up with digital computers and data communications. The interplay between computer hardware and software is described along with the communication of data between computers including the use of devices called modems, which make data communication possible via analog transmission systems.

NEW!!
THE BOOK OF FAX
An Impartial Guide to Buying & Using Facsimile Machines



by Daniel Fishman and Elliot King
134 pages, 1988, $12.95 *Code P41003*

You'll learn how to:

- Evaluate whether you need fax.
- Choose the most economical fax.
- Decide which fax features are best.
- Avoid common, costly buying mistakes.

If you already own fax equipment, The Book of Fax helps you:

- Manage fax in your office.
- Take advantage of important features, such as polling, broadcasting and more.
- Stop fax "junk mail."
- Make informed decisions on your next fax purchase.

In addition, important checklists help you:

- Determine how much money fax can save.
- Select the most cost-effective machine.
- Decide which features to buy.

A special chapter on Personal Computer fax add-on boards provides a thorough overview of this important new alternative. Easy to read and understand, this book will keep you up-to-date on the latest in facsimile technology.

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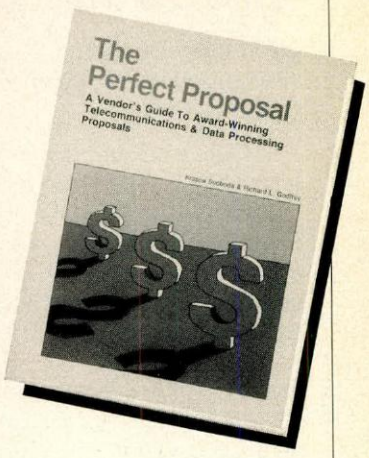


NEW!! #9 BEST SELLER!!!

THE PERFECT RFP

A Practical Guide to Buying Telecommunications and Computer Hardware and Services

by Krasna Svoboda & Richard L. Godfrey
280 pages, 1988, $59.95 ***Code P41012***

This book, with its accompanying three diskettes, is a unique source of how-to information on the RFP process, end-to-end. It is a must for anyone who needs to buy a telecommunications or a computer system. It coaches you on every step in the acquisition process — from understanding your needs, through writing a clear and effective Request For Proposal (RFP), to evaluating and scoring responses.

Using the included diskettes, it will almost write the whole RFP for you. The diskettes contain a model text and a complete case study for an RFP, with cost proposal life cycle analysis. You load the model RFP into your word processor, (MS-Word, Wordperfect, Wordstar or Macwrite) edit it, print it and ship it out.

Chapters:

1. Organize!
2. Sources & Resources
3. Style & Other Shiny Objects
4. Case Study
5. First Things First: The Requirements Analysis
6. Developing the Game Plan: The Evaluation
7. Introduction and Proposer Instructions
8. Technical Specifications
9. Ongoing Service & Maintenance Specifications
10. Performance Specifications
11. Implementation Specifications
12. Contractual Specifications
13. Pricing Specifications
14. RFP Appendices
15. Planning the Evaluation
16. Behind Closed Doors: Inside the Functional Evaluation
17. Lies, Damn Lies, and the Cost Proposal
18. Last Things Last: Final Scoring and Selection
19. Glossary of Unavoidable Technical Terms
20. The Case Study RFP

NEW!!

THE PERFECT PROPOSAL

A Vendor's Guide To Award-Winning Telecommunications & Data Processing Proposals

Krasna Svoboda & Richard L. Godfrey
280 pages, 1989, $39.95 ***Code P41011***

This book was written primarily for people in sales and marketing. The information it contains is based on the actual experiences and needs of exactly these people. It was designed to show you how, step-by-step, to create an excellent proposal. It is for people doing their first proposals, for those who want to do a better job on their proposals, and for those who simply want to spend less time doing them. It uses examples and input from the information technology industry, but is valid for sales people, sales managers or sales staff in any field. Concrete advice, checklists and examples of what to do and pitfalls to avoid supplement the text in each chapter, and a model proposal is included to get you going on your winning proposals.

Professionally written proposals sell large phone and computer systems. More than 90% of large systems (and increasingly, smaller systems) are bought because of the written answers salespeople give to user-written RFPs (Request For Proposals). These written sales responses are often the weakest link in the sale. Good companies with good products, good sales representatives and good technical support can, and do lose sales every day because their proposals aren't good enough — or because their salespeople are afraid of writing proposals, and don't.

Contents:

1. Understanding Customer Requirements
2. Deciding to Propose. . .Or Not
3. The Proposal Project
4. The Proposal Contents
5. The Proposal Document
6. Problem Proposals & Problem Proposals
7. Ten Benefits From Every Proposal

The TELECONNECT Guide on How To Sell Call Accounting

by Wayne Barnett
172 pages, pub. Spring 1986, $24.95
Code P05004

Call accounting is today's second most requested feature on a telephone system (after least cost routing).

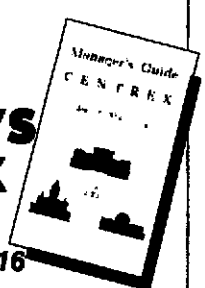
As a *feature,* telephone accounting can help sell **more** PBXs and key systems by providing a significant edge over competition. As a *sales* tool, telephone accounting will generate customer savings and revenues so significant they can cost justify an entire phone system proposal. As a *sales revenue generator,* telephone accounting can achieve profit margins only dreamed of in PBX and key system sales. As a *future revenue generator,* it is the perfect entree to selling to the *Installed Base Market,* the major market of the 1990s.

The best parts of this book are the very detailed Appendices, which lay out sample letters, proposals, checklists, trial programs, cost justification worksheets, and sample proposals. If you sell for an interconnect company, a call accounting supplier or a long distance company — or, if you're trying to sell call accounting to your management — you **must** have this book.

Contents include:

- **Selling to the installed base:**
  Program overview; Program implementation; Results analysis/Program modification
- **Cost justifying PBXs and key systems**
  Overview; User group identification; Existing mode of operation; Proposed mode of operation; Computing the value of your system
- **Appendices**
  Financial ratios
  Telephone accounting benefit review
  Introductory letters — general business, professional services, hospitals/colleges, hotel/motel
  Trial program *Checklist*
  Sample trial program *Agreement*
  Trial installation program tracker.
  Cost justification work sheet

NEW!! MANAGER'S GUIDE TO CENTREX



by John R. Abrahams
106 pages, 1988, $66.00 ***Code P41016***

This book addresses the advantages and disadvantages of using Centrex (CENTRal EXchange) services to provide telephone and data communications. Information about Centrex and the experiences of its users are of vital concern to telecommunication and information systems managers in most businesses, institutions and governmental organizations in the US and Canada.

Since a large number of digital central office systems have been installed, Centrex is experiencing a significant resurgence. Some experts believe that 20% of all business telephone lines will be provided through Centrex within five years; Centrex thus represents a serious competitive threat to private branch exchange (PBX) and key systems suppliers.

Case studies have been included to illustrate the use of Centrex in financial, retail and government services.

Contents:
Centrex in Review; Centrex Systems and Features; Management of Centrex Systems; Data Communications Through Centrex; Centrex and ISDN; Evaluating Centrex Systems; Centrex in Financial Service; Centrex in Retailing; Centrex in Government and Universities; Implementing a Centrex System.

NEW!! THE COMPLETE MCI MAIL HANDBOOK

by Stephen Manes
498 pages, 1988, $22.95 ***Code P41018***

This handbook is the first book to detail every aspect of this vast service. It provides clear explanations, covers "undocumented features" (also known as bugs and quirks) and suggests uses you may never have even considered. Best of all, it helps you save time and money.

With MCI Mail and this book, you'll be able to:

- Communicate instantly with more than 100,000 MCI Mail users around the country and around the world.
- Prepare mail electronically and let MCI Mail deliver it on paper — or by courier — even to people who have no computer equipment.
- Access hundreds of thousands of telex addresses worldwide — without owning any equipment more exotic than a personal computer and modem.
- Provide on-line forms to collect data quickly and easily from customers or employees in the field.
- Send messages and paper mail to huge mailing lists — instantly and effortlessly.
- "Telepublish" camera-ready documents, complete with graphics, on MCI Mail's laser printers.
- Create your own public and private bulletin boards to share information with others, and investigate boards already on line.
- Use dozens of little-known time-saving shortcuts built into the MCI Mail system.

Contents:
Getting Started; Getting On-line; Beginners Only: The 99-Cent Tour; MCI Mail Basics — and Some Advanced Considerations; Viewing and Capturing Messages; Creating Messages:Basics; Creating Instant Messages — and Sending Them; Editing Messages; Creating Paper Mail; Manipulating Your Mailbox: ANS, FORWARD, INCLUDE and DELETE; Uploading Envelopes; Using Private Lists; Using Shared Lists; Bulletin Boards; Scripts: An Introduction; Telex Transmissions; Corresponding with Other E-mail Services; Access from Afar; Information from Dow Jones; On-line Help; Using Lotus Express; Lotus Express Advanced Services; Using Desktop Express; Other Software for MCI Mail; Thinking Big; The System and Security — and the Future; MCI Mail Telephone Access Numbers: U.S. and Canada; Telex Country Codes and Directories; Where to Find . . .; MCI Mail Prices.

LAN MAGAZINE EDITORS CHOICE

ZEDIT

THE SOFTWARE ROSE

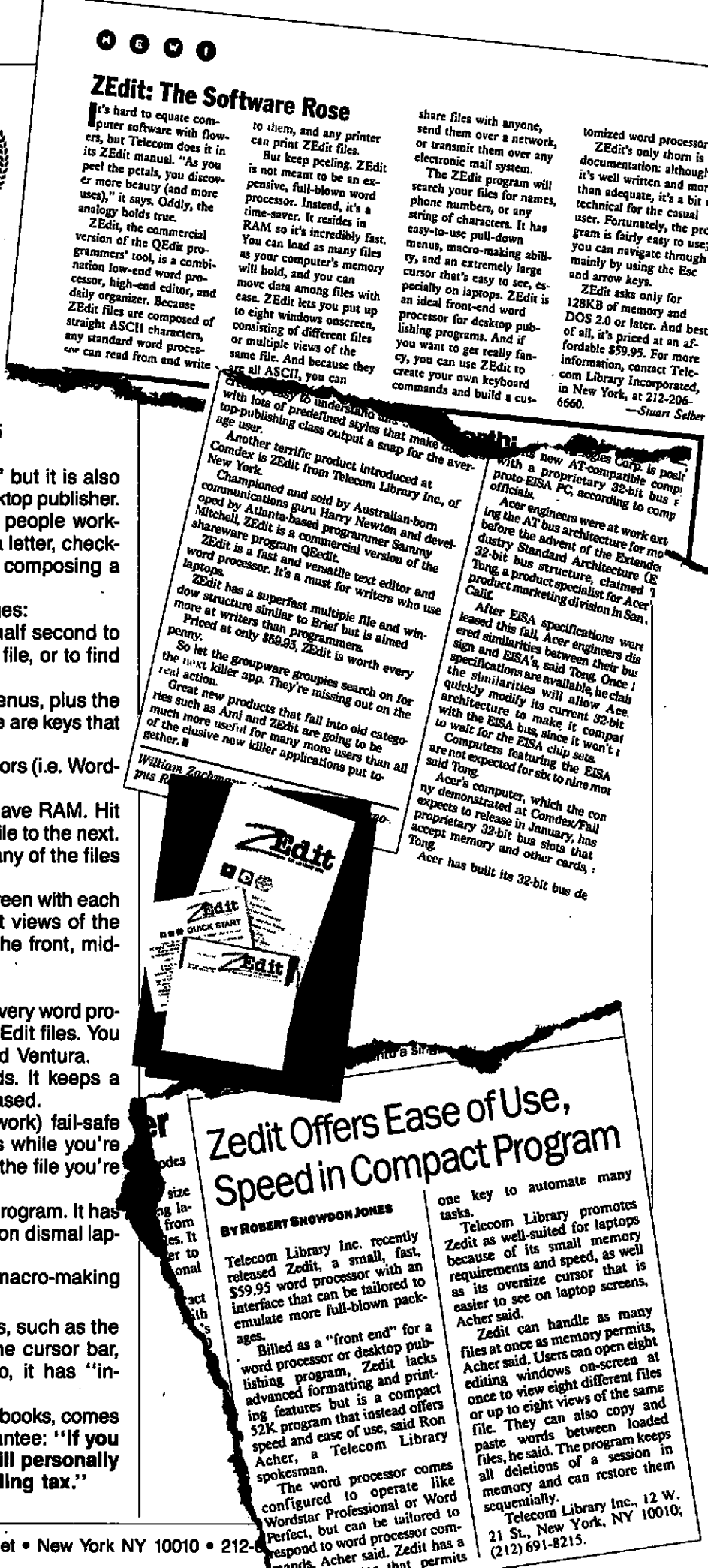
by Harry Newton
86 pages, 1988, $59.95 *Code P41015*

ZEdit is not only "our first software" but it is also the first front-end word processor and desktop publisher. The program has major advantages for people working on many projects at once — writing a letter, checking a phone number, proofing a report, composing a memo, etc. . .

Here are some of ZEdit's advantages:

- It's blazingly fast. It takes under a half second to go from the top to the bottom of a 200K file, or to find anything in a 200K file.
- It's easy to use with the pull-down menus, plus the Help screen you write yourself. Also there are keys that you can program yourself.
- ZEdit can act like other word processors (i.e. Wordstar Professional 4.0).
- You can load as many files as you have RAM. Hit one function button and move from one file to the next.
- You are able to move stuff between any of the files at any time.
- 8 windows can be available on the screen with each window having different files or different views of the same file. You can simultaneously edit the front, middle or end of a document.
- ZEdit is small. It's only 52K.
- ZEdit files are 100% straight ASCII. Every word processor in the world can read and write ZEdit files. You can feed ZEdit files into Pagemaker and Ventura.
- ZEdit has lots of fail-safe safeguards. It keeps a huge memory of all the stuff you've erased.
- ZEdit has big LAN (local area network) fail-safe features. If your LAN file server crashes while you're in ZEdit, no sweat. Change the name of the file you're working on and save it elsewhere.
- ZEdit is the perfect laptop computer program. It has an enormous cursor — one you can find on dismal laptop screens.
- ZEdit has its own built-in keyboard macro-making ability. You don't need SuperKey.
- ZEdit has lots of other useful features, such as the fact that ZEdit moves the text behind the cursor bar, rather than the other way around. Also, it has "intelligent" box drawing.

This book, along with all of the other books, comes with Harry Newton's old fashioned guarantee: **"If you are not 100% satisfied with ZEdit, I will personally refund all your purchase price, including tax."**



ZEdit: The Software Rose

It's hard to equate computer software with flowers, but Telecom does it in its ZEdit manual. "As you peel the petals, you discover more beauty (and more uses)," it says. Oddly, the analogy holds true.

ZEdit, the commercial version of the QEdit programmers' tool, is a combination low-end word processor, high-end editor, and daily organizer. Because ZEdit files are composed of straight ASCII characters, any standard word processor can read from and write to them, and any printer can print ZEdit files.

But keep peeling. ZEdit is not meant to be an expensive, full-blown word processor. Instead, it's a time-saver. It resides in RAM so it's incredibly fast. You can load as many files as your computer's memory will hold, and you can move data among files with ease. ZEdit lets you put up to eight windows onscreen, consisting of different files or multiple views of the same file. And because they are all ASCII, you can

share files with anyone, send them over a network, or transmit them over any electronic mail system.

The ZEdit program will search your files for names, phone numbers, or any string of characters. It has easy-to-use pull-down menus, macro-making ability, and an extremely large cursor that's easy to see, especially on laptops. ZEdit is an ideal front-end word processor for desktop publishing programs. And if you want to get really fancy, you can use ZEdit to create your own keyboard commands and build a customized word processor.

ZEdit's only thorn is documentation: although it's well written and more than adequate, it's a bit technical for the casual user. Fortunately, the program is fairly easy to use; you can navigate through mainly by using the Esc and arrow keys.

ZEdit asks only for 128KB of memory and DOS 2.0 or later. And best of all, it's priced at an affordable $59.95. For more information, contact Telecom Library Incorporated, in New York, at 212-206-6660.

—*Stuart Selber*

with lots of predefined styles that make

top-publishing class output a snap for the average user.

Another terrific product introduced at Comdex is ZEdit from Telecom Library Inc., of New York.

Championed and sold by Australian-born communications guru Harry Newton and developed by Atlanta-based programmer Sammy Mitchell, ZEdit is a commercial version of the shareware program QEdit.

ZEdit is a fast and versatile text editor and word processor. It's a must for writers who use laptops.

ZEdit has a superfast multiple file and window structure similar to Brief but is aimed more at writers than programmers.

Priced at only $59.95, ZEdit is worth every penny.

So let the groupware groupies search on for the next killer app. They're missing out on the real action.

Great new products that fall into old categories such as Ami and ZEdit are going to be much more useful for many more users than all of the elusive new killer applications put together. ■

William Zachm

pus R

Corp. is posi

with a proprietary 32-bit bus

officials.

Acer engineers were at work ext

ing the AT bus architecture for mo

before the advent of the Extende

dustry Standard Architecture (E

32-bit bus structure, claimed

Tong, a product specialist for Acer

product marketing division in San

Calif.

After EISA specifications were

leased this fall, Acer engineers dis

ered similarities between their bus

sign and EISA's, said Tong. Once

specifications are available, he clai

the similarities will allow Ace

quickly modify its current 32-bit

architecture to make it compat

with the EISA bus, since it won't

to wait for the EISA chip sets.

Computers featuring the EISA

are not expected for six to nine mo

said Tong.

Acer's computer, which the con

ny demonstrated at Comdex/Fall

expects to release in January, has

proprietary 32-bit bus slots that

accept memory and other cards,

Tong.

Acer has built its 32-bit bus de

into a Sin

Zedit Offers Ease of Use, Speed in Compact Program

BY ROBERT SNOWDON JONES

Telecom Library Inc. recently released Zedit, a small, fast, $59.95 word processor with an interface that can be tailored to emulate more full-blown packages.

Billed as a "front end" for a word processor or desktop publishing program, Zedit lacks advanced formatting and printing features but is a compact 52K program that instead offers speed and ease of use, said Ron Acher, a Telecom Library spokesman.

The word processor comes configured to operate like Wordstar Professional or Word Perfect, but can be tailored to respond to word processor commands, Acher said. Zedit has a one key to automate many tasks.

Telecom Library promotes Zedit as well-suited for laptops because of its small memory requirements and speed, as well as its oversize cursor that is easier to see on laptop screens, Acher said.

Zedit can handle as many files at once as memory permits, Acher said. Users can open eight editing windows on-screen at once to view eight different files or up to eight views of the same file. They can also copy and paste words between loaded files, he said. The program keeps all deletions of a session in memory and can restore them sequentially.

Telecom Library Inc., 12 W. 21 St., New York, NY 10010; (212) 691-8215.

NEW!! TELECOMMUNICATIONS AND THE LAW Volume 1

by Walter Sapronov
443 pages, 1988, $50.00 *Code P41002*

This book is an indispensable reference to the legal and regulatory issues associated with the telecommunications industry. Ranging in coverage from 1934 to the present, the text includes excerpts from arguments presented to the MFJ Court and such landmark works as Richard McKenna's preemption essay and former FCC Chairman Mark Fowler's famous "Back to the Future" article.

It is written for computer/communications equipment manufacturers and carriers, information service providers, attorneys, economists, policy makers, regulators, consultants, large communications users and others involved in this rapidly expanding field.

Important topics include:

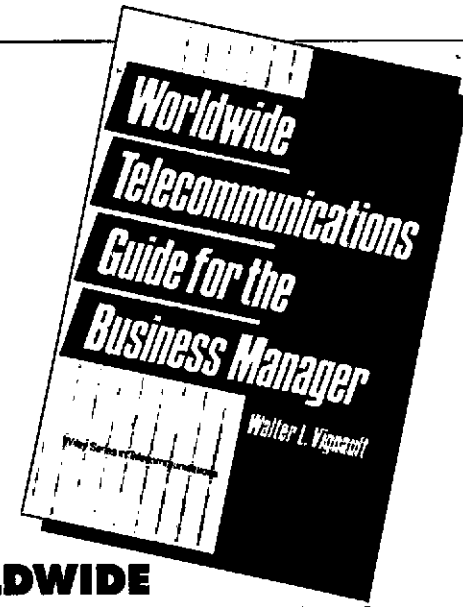
- A review of US and international telecommunications policies.
- The Communications Act of 1934.
- Legal and regulatory issues affecting the telecommunications industry today.
- Federal and state preemption issues.
- The AT&T trial and Bell Operating Company divestiture.
- Equal access.
- Computer Inquiry III.
- An analysis of the industry's progression from regulated monopoly to competition.
- Contracting in the new environment.
- "Intelligent buildings."
- The technical and regulatory issues affecting the progress of integrated services digital networks (ISDN).

INNOVATIVE MANAGEMENT USING TELECOMMUNICATIONS

by Herbert Dordick & Frederick Williams
226 pages, 1986, $32.95 *Code P40014*

This book starts from the perspective that telecom management is too important to be left to the engineering staff. It cuts through the hype, jargon and big promises to show you what it can really mean for your company. Busy managers will find solid criteria for evaluating virtually any telecom product or application. Structured in four parts, the book focuses on opportunity and how to gain competitive advantage.

Chapters:
• Put Telecom to work for You • An Executive tour of the New Telecom • Management Innovations Through Telecom • The Intelligent Telephone • The Voice/Data PBX • Long Distance Networks • Personal Computer Communications • Local Area Networks • Mobile Phones and Paging: Making Travel Time Productive • Facsimile Transmission • Telebanking • Teleresearching (Databases) • Telemailing • Teleconferencing • Telecommuting • Telemarketing • Teletraining • Six Steps to Better Management with the New Telecommunications • References • Glossary • Appendix: A Planning Checklist • Appendix: Managing the Use of Video Display Terminals



WORLDWIDE TELECOMMUNICATIONS GUIDE FOR THE BUSINESS MANAGER

by Walter Vignault
417 pages, 1987, $51.95 *Code P40009*

Written for all business professionals doing business internationally, this one-of-a-kind guide presents a thorough discussion of the many aspects of data and telecommunications covering both domestic and international markets. Quick access to information, examples for calculating telco charges, and alternatives for voice and data communications, message texts, electronic mail, teletex and videotex are provided.

Chapters include:
• Information Centers • International Information Flow • Network Attachment Products • Office Systems • Digital Voice and Data Networks • US Network Services and Alternatives • Value Added Network Services • Telematics • Satellite Communications

NEW!! 1989 TELEPHONE INDUSTRY DIRECTORY AND SOURCEBOOK

Phillips Publishing, Inc.
1,200 pages, 1989, $157.00 *Code P33001*

The All-New 1989 Telephone Industry Directory puts you in touch with virtually every key industry player throughout the entire world. . .and also helps you locate the suppliers of any products & services you may need in a hurry.

How will you use the Directory?

- To Solicit Bids
- To Sell Directly
- To Plan Ahead
- To Keep in Touch with On-The-Move Colleagues
- To Make New Contacts

#8 BEST SELLER!!!

NEGOTIATING TELECOMMUNICATIONS CONTRACTS

The Official Guide to Buying Telecommunications Products and Services

BELONGS IN EVERY LAWYER'S OFFICE

by Chet Thaker
276 pages, 1988, $39.95 ***Code P40024***

The deregulation of the telecommunications industry has drastically changed the relationship between suppliers and users of telecom systems. In the absence of simple tariff-regulated procedures, contracts have become essential. Yet few attorneys, and probably fewer businessmen, are aware of the intricacies of telecom issues — until the systems they bought quit working. Then they find they have little or no recourse to the supplier.

In this superbly comprehensive work, the author provides the single source of critical information and strategy needed by telecom professionals who must buy systems. It is also needed by their attorneys, and by vendors and their sales reps who must understand both the buyers' concerns and the legal issues involved.

The author argues convincingly that the contract negotiation process need not be adversarial, but rather should be a careful spelling-out of buyer's and seller's needs, rights, obligations and expectations.

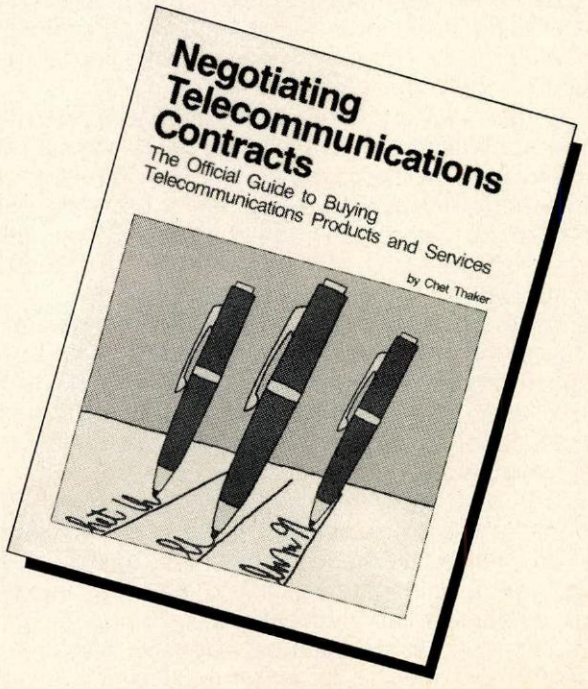
Full of practical advice and examples, the book discusses all the underlying legal statutes, the Uniform Commercial Code, the major components of a successful contract, and provides checklists of technological, monetary, legal and recourse issues.

A major highlight of the book is its coverage of the different issues to watch out for in contracting for equipment, network services, and consulting.

If you have to ever go anywhere near a telecom contract, you ***must*** have this book!

Contents:

Chapter 1. The Contractual Imperative
Chapter 2. Overview of Contracts
Chapter 3. The Uniform Commerical Code
Chapter 4. Getting Organized: Purpose and Definitions
Chapter 5. Price, Payments and Taxes
Chapter 6. Title, Risk of Loss and Shipment
Chapter 7. Installation and Wiring
Chapter 8. Acceptance and Training
Chapter 9. Warranty
Chapter 10. Repair, Maintenance and Growth
Chapter 11. Remedies
Chapter 12. Indemnity and Insurance
Chapter 13. Miscellaneous Issues
Chapter 14. Comparison of Boilerplate Contracts
Chapter 15. Issues to Watch for — Equipment
Chapter 16. Issues to Watch for — Network Services
Chapter 17. Issues to Watch for — Consultants
Glossary: Legal Terms and Acronyms.



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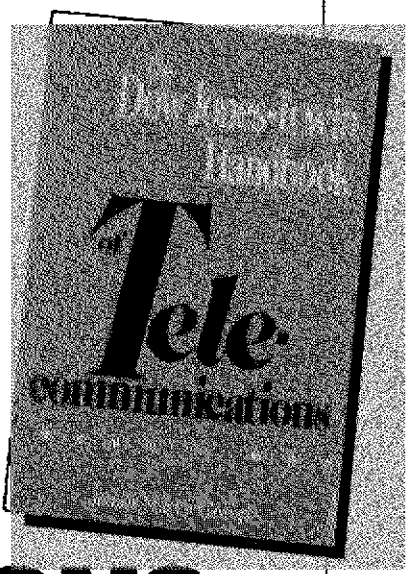
THE ENCYCLOPEDIA OF TELECOM



THE DOW JONES-IRWIN HANDBOOK OF TELECOMMUNICATIONS

#6 BEST SELLER!!!

by James Harry Green
715 pages, 1986, $65.00 *Code P33008*

This book belongs on the bookshelf of every telecom professional — user or vendor. But this is not an academic book left to accummulate dust. This is a book **every** professional can use **every** day. For Green's book is not a handbook as much as an encyclopedia.

Want a quick painless update on local area networks? Here it is. Want a quick update on satellites? Want an update on signaling systems? Cellular radio? Testing? Network design concepts? Microwave radio? PBXs? Multiplexing? PCM? Digital carriers?

This is the book we go to find out how it works, what the technology is, what its features are, what the buzzwords are, and who the major manufacturers are.

Owning this book is like having a kindly professor ready to patiently deliver you a one-hour lecture on any telecom subject you like.

Some of us have been in this industry 20 years (i.e. the person writing this). We think we're knowledgeable. But the new stuff has creeped up on us. We feel uncomfortable. This book makes us feel comfortable. You can read the average 25-page chapter in 30 minutes. Then you have a very thorough grounding on virtually any subject in telecommunications.

What's nice is you won't be overwhelmed with technical things. There's not a single equation. Not a single incomprehensible diagram. Any telecom professional can understand the book's technical explanations, because they're well-illustrated and well-explained.

This is a monumental piece of work. All 715 information-crammed pages. Nothing approaches it.

You'll also find equal access, fiber optics, ISDN, digital versus analog transmission, voice/data integration and satellite communications.

Each chapter contains an extensive glossary, a listing of relevant standards, an applications section that explains the main evaluation criteria from a buyer's point of view, and a buyer's guide to products and services.

With this handbook, telecom managers, telecom users, data users, marketing people, teleco employees, telco engineers and consultants will learn more about those areas of telecommunications that they're not familiar with.

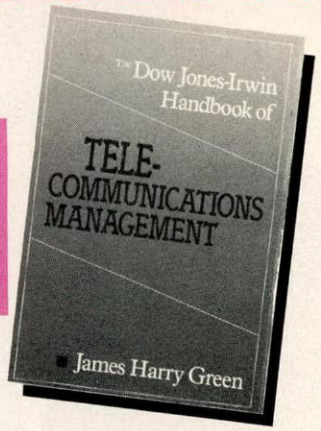
Chapters include:

1. Introduction to Telecommunications
2. Transmission Concepts
3. Data Communications systems
4. Pulse code Modulation and Digital Carrier
5. Frequency Division Multiplex
6. Station Equipment
7. Outside Plant
8. Signaling Systems
9. Circuit Switched Network Systems
10. Local Switching Systems
11. Private Branch Exchanges
12. Tandem Switching Systems
13. Network Design Concepts
14. Power, Distributing Frames, and Common Equipment
15. Microwave Radio
16. Lightwave Communications
17. Satellite Communications
18. Data Communications Networks
19. Local Area Networks
20. Video Systems
21. Facsimile Transmission
22. Mobile Radio
23. Testing Principles
24. Network Management
25. Future Developments in Telecommunications

Appendix A: Principles of Electricity Applied to Telecommunications
Appendix B: Sources of Technical Information
Appendix C: Selected Manufacturers and Vendors of Telecomuncations Products and Services
Index

DOW JONES-IRWIN HANDBOOK OF TELECOMMUNICATIONS MANAGEMENT

BUY BOTH DOW JONES-IRWIN BOOKS FOR ONLY $110.00 SAVE OVER 15% *Code P41030*



NEW!!

by James Harry Green
688 pages, 1988, $65.00 *Code P41001*

Telecommunications system management is really a diverse set of specialized tasks. This book is designed to be a working guide for corporate and government telecommunications managers. It explains the techniques managers must understand and the skills they must possess to manage a telecommunications system.

Green shows managers how to apply these techniques and skills with numerous case studies and examples of on-the-job problems and solutions. Designed to be both a reference and information source, this book is divided into four parts:

- How a company can diagnose its own telecommunications needs and requirements and put them into both long and short-range plans.
- How to list requirements and specifications into a request for proposals (RFP) from competing vendors.
- How to develop and administer a maintenance plan — including the financial implications of managing the complete telecommunications system.
- How to manage a telecommunications system — including a sample RFP, PBX and key telephone feature descriptions, a buyers' guide to PBXs and a list of key equipment.

Professional management of your company's telecommunications system is essential today. With the variety of technological options and vendors growing by leaps and bounds, the telecommunications manager is a key player in maintaining a reasonable balance between the cost and the service of your communication computer equipment.

In addition to a detailed introduction to telecommunications management, this groundbreaking book shows you how to:

- Create a strategic telecommunications plan.
- Have the most current telecommunication plan.
- Conduct a feasibility analysis.
- Forecast telecommunications services.
- Develop requirements and specifications.
- Write requests for proposals.
- Evaluate responses to requests for proposals.
- Select customer premises switching equipment.
- Select long distance services.
- Select data communications equipment and services.
- Choose the right contractor.
- Appropriately manage the project.
- Size and optimize voice and data circuits.
- Monitor telephone transmission.
- Control telecommunications systems costs.
- Develop a telecommunications operations plan.
- Plan effective telecommunications security.
- Conduct network maintenance and testing methods.

Contents:

1. Introduction to Telecommunications Management
2. Strategic Telecommunications Planning
3. Current Telecommunications Planning
4. Feasibility Analysis
5. Forecasting Telecommunications services
6. Requirements and Specifications
7. Requests for Proposals
8. Responses to Requests for Proposals
9. Selecting Customer Premises Switching Equipment
10. Selecting Long Distance Services
11. Selecting Data Communications Equipment and Services
12. Contracting Considerations
13. Wiring Plans and Equipment Rooms
14. Cutover Planning and Management
15. Project Management
16. Sizing and Optimizing Voice Circuits
17. Sizing and Optimizing Data Circuits
18. Telephone Transmission
19. Reselling Telecommunications Services
20. Controlling Telecommunications Systems Costs
21. Developing a Telecommunications Operations Plan
22. Telecommunications Security
23. Network Maintenance and Testing Methods
24. Network Management Systems

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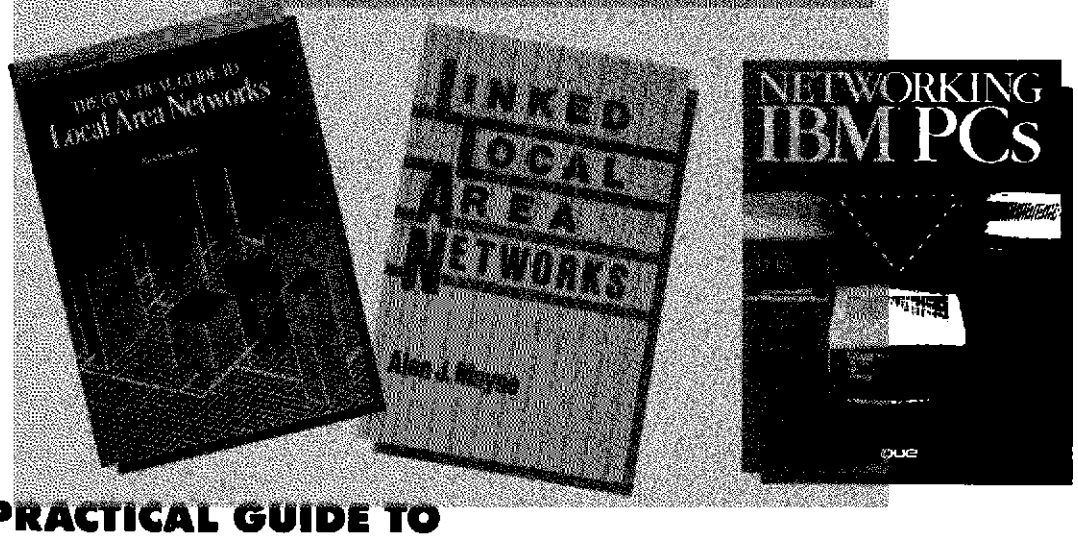


THE PRACTICAL GUIDE TO LOCAL AREA NETWORKS

by Rowland Archer
283 pages, 1986, $24.95 ***Code P35005***

Rowland Archer takes you from the evaluation and selection of a LAN through the process of planning your LAN installation, pointing out the advantages and potential pitfalls every step of the way — this way you won't be confronted with unexpected surprises after you make a purchase. Archer then applies the criteria he has developed to five of the most popular LANs available for the IBM PC and compatible computers. In addition, you'll find a summary of LAN specifications at the beginning of each product description and a detailed glossary of LAN terms.

LINKED LOCAL AREA NETWORKS
Second Edition

by Alan J. Mayne
628 pages, 1986, $51.95 ***Code P36005***

Detailed, comprehensive, expert reading. The aim of this book is to give intelligent users of information technology a moderately detailed picture of the available computer network systems, services, technologies and applications.

Just updated to reflect significant developments in computer networking, this book is a working guide to local area, wide area, and linked local area networks with local, national and international reach. The emphasis is on LANs.

Included is a guide to further reading, if the text isn't enough for you, along with many references. You will receive a very comprehensive guide to computer networks. This is the perfect book for people working in the computer network and LAN industries.

NETWORKING IBM PCs A PRACTICAL GUIDE

by Michael Durr
238 pages, 1984, $21.95 ***Code P36004***

Do you have more than two IBM PCs in your business? If so, this book is absolute reading. The title says it's a "practical guide" and after reading the book, we agree. It's not written for students of networking, it's written for **personal computing business** users.

This book is an overview of available alternatives in the PC LAN market. It starts with a cursory discussion of the fundamentals of network operation, and some discussion of different network standards. But most of the book is devoted to business applications. It will help businesspeople decide whether they need a network, which approach to networking is best for them and which of current products and options best suit their needs.

After reading this book you will understand your IBM PC networking options. You will know what advantages could be gained through networking your IBM PCs. You will better able to install and then administer your IBM PC network.

LANs — LOCAL AREA NETWORKS

TWO BOOKS AND A YEAR'S SUBSCRIPTION TO LAN MAGAZINE FOR ONLY $49.95 save 11%! CODE P36020

Local Area Networks

An Introduction to the Technology
by John E. McNamara
165 pages paperback, pub 1985, $29.95
Code P23002

This is a really good introductory book on Local Area Networks — LANs — by the man who wrote *"The DEC Technical Aspect Book."* This book not only tells you how LANs work, how they are configured, it also tells you the special problems they pose, with ways of overcoming them. Contents:

• Topologies and access methods • PBXs • Media • Physical considerations • How things work • Operations and maintenance • Protocols • Servers • Extending Local Area Networks • Administrative considerations for large networks • Standards.

The Local Area Network Book

by E.G. Brooner
124 pages, pub 1984, $7.95 *Code P36001*

If you know nothing about PC networking, if you know nothing about LANs, this is where you start. After reading this book you'll understand LAN vocabulary. you'll gain a working knowledge of LAN components and technology. you'll understand why a business would need a LAN.

Contents:

• What is a Network? • What Networks can do for Us • Network Components and Techniques • Standards and Protocols • Some Real Products • How some LAN Products Work • Some Real Working Products • How to Plan a Network • A Closer Look at Protocols • The Future of Networks.

LAN Magazine

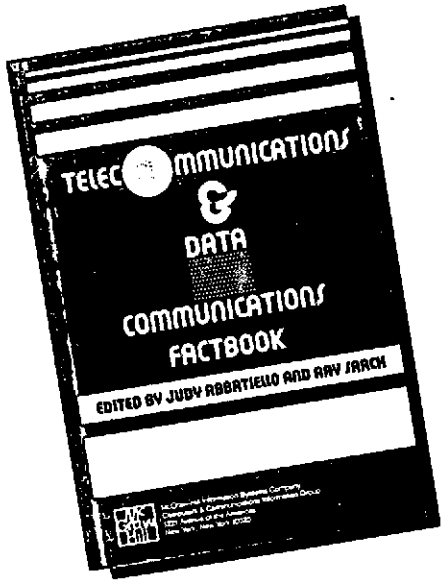
monthly, $18/year *Code P50001*

LAN Magazine is the only independent magazine devoted entirely to Local Area Network products, software and peripherals. Each month LAN Magazine covers the news, new products, trends, tutorials, test drives, network management, applications and people.

LAN Magazine is published by ***Telecom Library,*** publishers of ***TELECONNECT Magazine*** & ***INBOUND/OUTBOUND Magazine.***

TELECOMMUNICATIONS & DATA COMMUNICATIONS FACTBOOK

edited by Judy Abbateillo & Ray Sarch
325 pages, 1987, $49.95 *Code P40008*



For many, this book will be the first exposure to the communications industry. For others, it will be a handy reference tool, providing fundamental information on the full spectrum of communications management. But whether you are a newcomer to the field or a seasoned professional, you will find this ready reference contains all the basic information necessary for you to make knowledgeable, cost-efficient telecommunications decisions.

It starts out with a comprehensive dictionary, then the book goes on to provide reference tables, facts and formulas, directories and ends with 120 pages of small-print tutorials.

CCMI/McGraw-Hill and Data Communications Magazine have joined forces to present what we believe is the most comprehensive desk-top guide to telecommunications and data communications management.

Partial Contents:
• Definitions • Abbreviations • CCIT World Numbering Zone Map • International Area Code Directory • National LATA Map • Telecommunications Formulas and Conversion Factors • Traffic Formulas • Mileage Matrix Using Private Line Formula • Common Carrier Directory • Regulatory Agency Directory • Tariff Reference Directory

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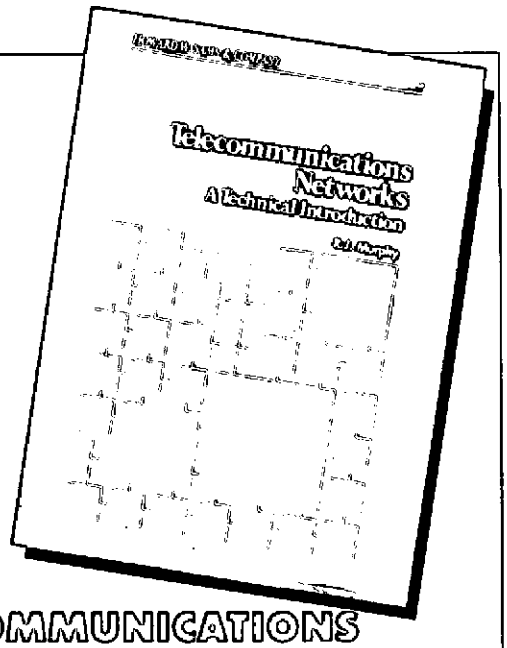

TELECOMMUNICATIONS NETWORKS:

A Technical Introduction

by R.J. Murphy
304 pages, 1987, $29.95 *CODE P40007*

Another very readable and understandable Howard W. Sams Publishing Company introductory textbook. *Telecommunications Networks* provides a technical perspective for the telecom professional on telecom networking, past, present and future.

Networks are crucial to the integration of computers and communications which is rapidly taking place as we move into the Information Age. This book makes the concepts crystal clear, without losing the reader in the technical details, or getting sidetracked away from telecom. Covers LANs, packet switching, network control centers, network management, private networks, fiber optics, ISDN. Thoroughly illustrated and indexed, all for rapid assimilation and reference. We use this book ourselves to check we've got it right.

TELECOM BASICS

Jack L. Dempsey
104 pages, 1988, $20.00 *Code P41010*

Whether new to the industry or just need a basic refresher in telecom, here's a quick, easy way to get up to speed in all major areas of telecommunications — how a phone works, transmission, switching, PBXs, key equipment, time division, traffic, ISDN, LANs and much more. AND, what you'll like most about this book is that it is literally stuffed with illustrations. For every telecom basic, there are several diagrams and illustrations that make the concepts easy for everyone. You don't have to be technically astute to understand this book. It is exactly what the title says, a book on basics. . . .a book for all seasons and all reasons. . .

Contents:
Fundamentals; Transmission I; PBXs I; Time Division; PBXs II; Key Equipment; Transmission II; Facilities; Traffic; Data Transmission I; Data Transmission II; Digital Data Service; Local Area Networks; Advanced PBX Concepts.

#5 BEST SELLER!!!

THE BEST BOOKS ON HOW THINGS WORK IN TELECOMMUNICATIONS

UNDERSTANDING TELEPHONE ELECTRONICS

by John Fike & George Friend
284 pages, second edition, pub 1984, $17.95
Code P32002

NEW!!

UNDERSTANDING DATA COMMUNICATIONS

by George Friend, John Fike, Charles Baker & John Bellamy
291 pages, second edition, pub 1988, $17.95
Code P32003

UNDERSTANDING COMMUNICATIONS SYSTEMS

by Don Cannon & Gerald Luecke
284 pages, second edition, pub 1984, $17.95
Code P32004

For years we wanted someone to write a readable, clearly illustrated, not-expensive book on how telecommunications works. We wanted technical material for nontechnical people like us. We wanted the book to be tightly-written, profusely-illustrated in two colors, with charts and diagrams. And we wanted quizzes at the end of each chapter, so we could see how we were doing.

These three books are what we would have written, had we the time and the talent. They're fabulous.

Nobody who makes this industry their profession should be without these books. They will tell you how everything works — from basic phones, to electronic phones, to central offices, to fiber optics, to local area networks, to satellites, and more.

PACKAGE DEAL
ALL 3 BOOKS FOR $47.95
an 11% SAVINGS
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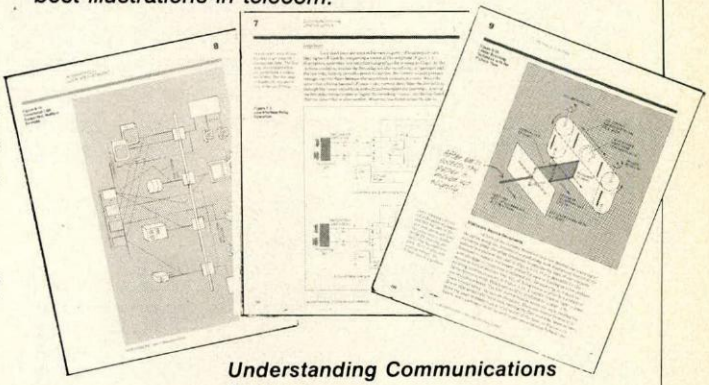
These books have some of the best illustrations in telecom.



It's impossible to detail the comprehensiveness of these books, except to list the various chapters:

Understanding Telephone Electronics

1. The Telephone System
2. The Conventional Telephone Set
3. Electronic Speech Circuits
4. Electronic Dialing & Ringing Circuits
5. A Microcomputer in the Telephone
6. Digital Transmission Techniques
7. Electronics in the Central Office
8. Network Transmission
9. Modems — phone service for computers
10. Wireless phones

Understanding Data Communications

1. An Overview of Data Communications
2. Data Terminals
3. Messages & Transmission Channels
4. Asynchronous Modems and Interfaces
5. Synchronous Modems & Digital Transmission
6. Fiber Optic and Satellite Communications
7. Protocol and Error Control
8. Alternatives in Local Area Networks
9. Architectures and Packet Networks
10. Network Design and Management

Understanding Communications Systems

1. The World of Communications
2. Using Electrical Signals for Communications
3. Basic System Functions and Conversions
4. Basic Electronic Communications Systems
5. The Communications Spectrum
6. Telephone & Telegraph Systems
7. Radio and TV Systems
8. Computer Networks and Systems
9. Facsimile
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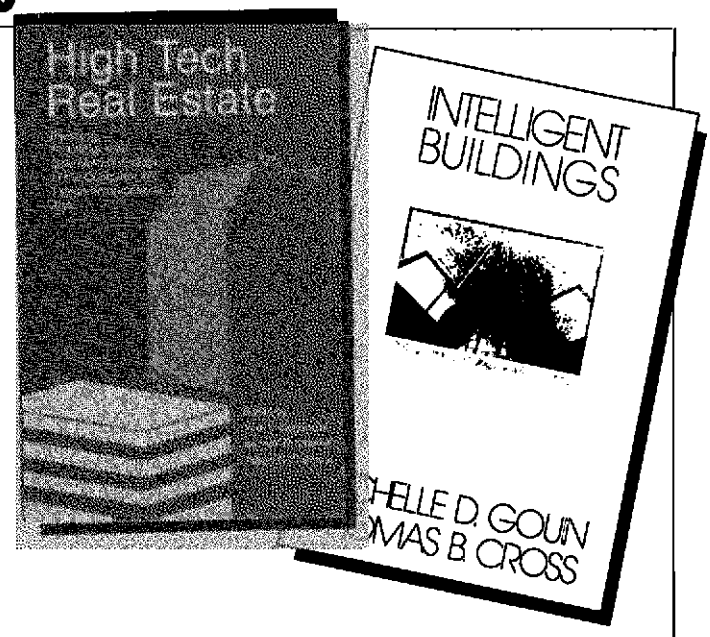


HIGH TECH REAL ESTATE

edited by Alan Sugarman, Andrew Lipman, Robert Cushman and 58 experts
637 pages, pub 1985, $54.95 *Code P09003*

The subtitle on this book is *"Planning, adapting and operating buildings in the computer and telecommunications age."* This book covers all aspects of the new "Telerealty" field. Chapters are from leading realtors, vendors, lawyers, architects and consultants. There's detailed information on wiring, energy management, consulting, law, contracts, regulation, transmission, equipment, teleports and more. There are real life case histories of smart buildings, successes and failures.

Ultimately, all buildings will be "smart." This is a major work on a very young industry. It's very impressive. There isn't a question left unanswered. There are 30 chapters covering revenue opportunities, technological trends, multi-tenant services, retrofitting existing buildings, operating the project, inside wiring, labor law aspects, legal issues, negotiating a shared tenant services contract, right of way, financial aspects, insurance and risk management, local cable and fiber optics, metropolitan digital networks, satellites and teleports.

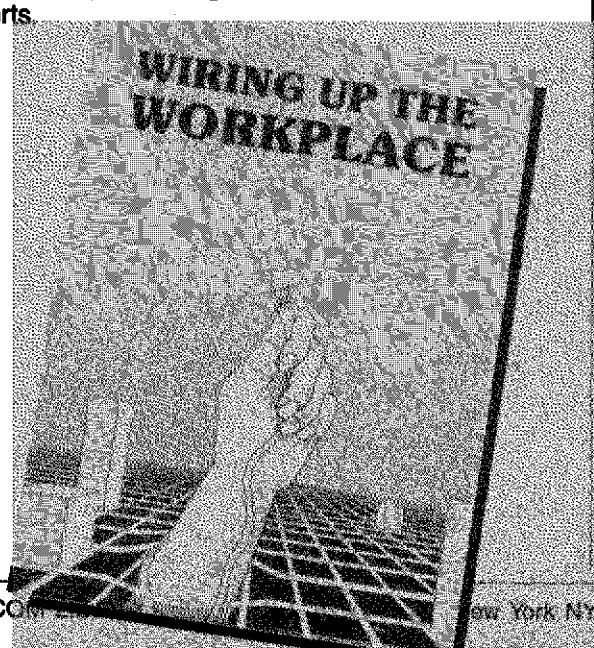
INTELLIGENT BUILDINGS
Strategies for Technology and Architecture

by Michelle D. Gouin and Thomas B. Cross
233 pages, pub 1986, $29.95 *Code P09004*

This book is a nontechnical, relatively simple overview of the information technology-filled "smart" building. If you're jumping into the intelligent building field — as a tenant, a developer or a provider of telecom services — this book will be a good intro for yourself and your people. It's written by two telecom consultants.

Chapters:
• What is an intelligent building? • The business case for intelligent buildings • Services an intelligent building offers tenants • The Building Information Center • Intelligent Building Information Systems • Automated Building Control Systems • Information Networking Architectures • Integrating the technologies.

Appendices:
• Intelligent building business • integrated voice/data features • PBX generations • software for intelligent buildings • SMDR (station message detail recording) • Centrex features • Broadband coaxial cable transmission • LAN Gateways and an Intelligent Building Resource Guide.



WIRING UP THE WORKPLACE

by Roger Camrass and Ken Smith
157 pages, 1987, $59.00 *Code P33004*

Employing a step-by-step approach to requirements planning, *Wiring Up the Workplace* provides the reader with an easy to understand practical guide to emerging communications needs in the office.

Contents:
• What are your current communications needs? • How are they likely to change? • How to evaluate different network technologies? • Selecting the appropriate network options • Planning a wiring scheme • Choosing products and suppliers • Project management for new network installations • Preparing for the office of the future

NEW FROM IBM!

THE BEST INTRODUCTORY TEXT —

BUSINESS TELECOMMUNICATIONS

#10 BEST SELLER!!!

by Stanford H. Rowe II
529 pages, 1988, $49.00 *Code P40004*

Business Telecommunications is our most beautiful, best laid-out college textbook on the subject. It is a complete intro into the telecom industry. Designed for a first course, it covers all facets of telecommunications.

Students with little or no background, from community colleges through graduate programs at universities, from technicians through salespeople, will learn from this book. The book's format features several excellent educational touches:

- Objectives at the beginning of every chapter
- Running case studies
- Extensive word lists at the end of each chapter
- Review questions for each chapter
- Problems and projects at the end of each chapter
- Glossary
- Telecom acronyms
- Bibliography of standard reference works and articles.

An **Instructor's Manual ($15.95 — *Code P40025)*** is available separately to go along with the text, making this an ideal book for use in company training courses or college programs.

The book is organized into three major parts:

1. Introduction to the Business Telecommunications Environment

2. The Technical Details of How Information is Communicated

3. Managing and Operating the Telecommunications Department.

It is richly illustrated throughout, with diagrams, photographs and outstanding use of color to highlight key points and speed learning. This book is a real gem. Another Editor's Choice!

Complete chapter listing:

• Basics of Telecommunications • Telecommunications Applications • Internal Influences on Telecommunications in the Enterprise • External Influences • Voice Communications • Coding and Digitizing • Data Terminals • Data Transmission and Modems • Communication Circuits and Networks • Data Link Control Protocols • Connecting the Circuit to the Computer • Telecommunications Architectures and Standards • Telecommunications Management • Network Design and Implementation • Network Operations and Technical Support • Future Directions in Telecommunications

NEW!

INTRODUCTION TO TELECOMMUNICATIONS: THE BUSINESS PERSPECTIVE

by Thomas Housel & William Darden
277 pages, 1988, $31.00 *Code P40003*

This book can be used as the primary text for an introductory course in telecommunications. It would also be useful as a supplement for any course that intends to provide students with an overview of the field from a business perspective. This makes it especially useful as a supplement in data communications courses or introduction to information systems courses that tend to focus exclusively on the data application to the exclusion of the voice, image and text applications.

Contents:

Historical Issues: Past to Present; Basic Telecommunications Concepts; Terminal Equipment; Network Services; Business Concerns; Telecommunications Regulations; New Applications and Services; Social and Organizational Impacts; Future of Telecommunications.

TELEPHONY ENGINEERING

SPECIAL OFFER!
Buy BOTH Telecommunications Transmission Handbook and Telecommunications System Engineering
BUY BOTH FOR $113.95
SAVE 12% *Code P25001*

Telecommunications Transmission Handbook — Second Edition

by Roger L. Freeman
700 pages, 1981, $69.95 ***Code P25003***

This is a technical book. At 700 pages, it is a **major** work. It is the first text to combine the technical expertise of 11 transmission subdisciplines into a unified telecommunications signal from source to link, focusing on speech telephony, data/telegraph and video.

Addressed to engineers specializing in one discipline wishing to learn others, this handbook serves as an excellent introduction to the problems of transmission engineering for the non-engineer.

Very partial contents:
• Transmission • Frequency Division Multiplex • High Frequency Radio • Radiolinks (line of sight microwave) • Tropospheric Scatter • Earth Station Technology • Transmission of Digital Data • Coaxial Cable Systems • Millimeter Wave Transmission • Digital Transmission Systems/PCM/Delta Modulation • Video Transmission • Facsimile • Fiber Optics • Digital Radio

Special Services Telephony

An Introduction To Transmission & Signaling
by Jim Cooper, Steven Slomka & Terry Hambel of Tellabs
250 pages, 1982, $24.95 ***Code P16002***

This is a training manual for the new technician on how telephony in general and special telephony circuits work. This manual is profusely illustrated with diagrams. It contains quizzes, summaries and all the helpful things which make learning technology as easy as you can make it.

This book can be used in a course led by an instructor, led by your own supervisor or studied independently.

Special Services Telephony begins with POTS (plain old telephone service) and goes all the way up through E&M, DX and SF signaling. There are exercises, quizzes and mock applications to work through. There are troubleshooting hints, a glossary of terms and a complete index of the course contents.

Contents
1. Transmission & Signaling Review
2. POTS — a review of terms and concepts
3. Extended circuits
4. Repeaters and dial long lines
5. Basic Four Wire Transmission
6. E&M and DX Signaling
7. SF Signaling
8. How to use a practice
9. Glossary

Telecommunications System Engineering

Analog and Digital Network Design
by Roger L. Freeman
480 pages, 1980, $58.95 ***Code P25002***

The HOWS and WHYS of planning, engineering, design and installation of modern telecommunications systems. Emphasis is on the interaction and coordination of the various disciplines, especially the linkage of transmission and switching in integrated digital communication systems. A great companion to *Telecommunication Transmission Handbook.*

Partial contents:
• Basics • Local Networks • Conventional switching techniques • Signalling for telephone networks • Introduction to transmission for telephony • Long Distance Networks • Transmission • Digital transmission and switching systems • Data networks • Telecommunication planning

Digital Telephony

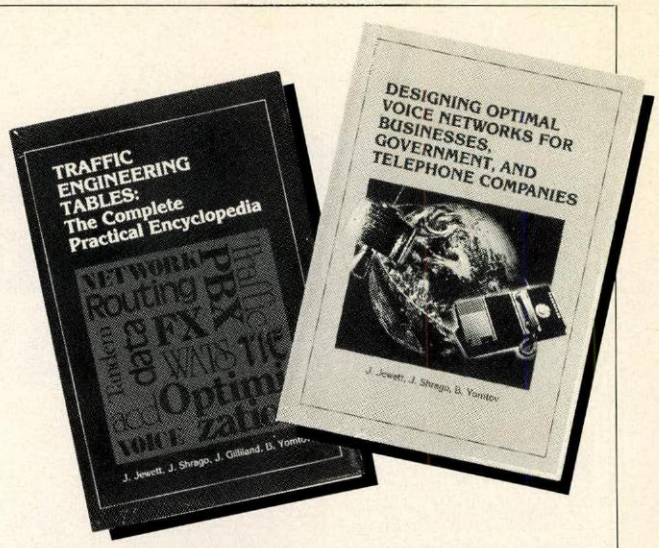
by John C. Bellamy
526 pages, 1982, $59.95 ***Code P25004***

This is the best technical overview of Digital Telephony. There's everything here—from voice digitization, digital transmission, digital switching, network synchronization, network control, and network analysis. The book stresses how systems operate and the rationale behind their design. Chapters include:

- An extensive overview of telephone systems terminology, equipment and operations, emphasizing those areas that influence the design needs of digital equipment.
- An in-depth discussion of why digital telephony is rapidly overtaking conventional analog technical for implementing voice communication networks.
- A comparative description of digital terminals, transmission links and switches—the three basic elements of a telephone network.
- Coverage of state of the art networks and a glimpse at what may be expected in digital communications in the future.

Very partial contents:
• Background and terminology • Why Digital? • Voice Digitization • Digital Transmission and Multiplexing • Digital Switching • Digital Radio • Network Synchronization, Control & Management • Digital Networks • Traffic Analysis • Appendix **A:** Derivation of Equations; **B:** Encoding/Decoding Algorithms for Segmented PCM; **C:** Analytical Fundamentals of Digital Transmission; **D:** Traffic Tables.

BEST TRAFFIC ENGINEERING



DESIGNING OPTIMAL VOICE NETWORKS

for Business, Government and Telephone Companies
by Jim Jewett, Jackie Shrago and Bernie Yomtov of Telco Research Corp.
240 pages, 1980, $39.95 *Code P16004*

Designing is a basic non-technical "teach-yourself" traffic engineering book. It's the only book on traffic engineering you can understand with **no** previous traffic engineering experience.

The book logically builds the readers' working knowledge of how different phone systems handle long distance calls. It explains how calling patterns vary among different organizations. It shows how to spot your organization's characteristics. It details step-by-step approaches to providing the best long distance service at the least possible price.

True facts:

- There are over 600 long distance companies in North America today.
- There are over 170 ways to make a long distance call between two major cities.
- The price of these 170 ways varies between 6 cents a minute and $1.20 a minute — a difference of 2,000 percent. This is a broader spread than any other industrial product in the world, including airline fares.
- 70-80% of most companies' or government organizations' monthly phone costs are **long distance.**
- A day or two on virtually any company's phone bill can slice 15% off its long distance bills.

All this makes learning traffic engineering for any telecom professional very important. Traffic engineering is the science of figuring the right number of lines from the right long distance companies at the right price.

This book is equally useful in helping you configure a single-node (one PBX) or multi-node (tandem or CCSA-type) network for optimal long distance calling.

This book is based on practical experience gained by Telco Research Corp. in optimally configuring more than 180 client networks. This work resulted in savings of more than $20 million a year.

The book includes more than 50 computer-generated traffic engineering tables. It covers gathering the data, understanding traffic tables, and explains things like: Extended Erlang B, Hold-on and Call-Back Queuing, Automatic route advancement, multi-circuit group policies, multi-location networks.

It makes an Excellent Companion to: *Traffic Engineering Tables: the complete practical encyclopedia.*

BUY BOTH TRAFFIC ENGINEERING BOOKS AND SAVE!!
$149.95 (save $15.00)
Code P16003

TRAFFIC ENGINEERING TABLES:

The Complete Practical Encyclopedia
by Jim Jewett, Jackie Shrago & Bernie Yomtov of Telco Research Corp.
480 pages, 1980, $125.00 *Code P16001*

No communications professional can afford to be without this book. Quite simply, it contains every traffic engineering table you'll ever need. The book will repay its investment many times — whether you are simply configuring trunks on a single switch, or you are designing a complex tandem or CCSA-type network.

Other traffic engineering table books are either incomplete or very hard to use. This work from **Telco Research Corp.**, experts in traffic engineering, has tables which that company uses itself. The tables are presented in an easy-to-use, logical, consistent format. Each table details traffic carried trunk-by-trunk, a unique feature, and one especially useful for performing trade-offs between full time and measured lines, etc.

This encyclopedia is the result of more than 15 man-years of research and development. It is organized into four sections:

Section One explains how to choose which table is appropriate for your needs, and why. And how to use the tables.

Section Two contains five tables for phone systems where there is no queue: Poisson, Erlang B, Extended Erlang B, Fast Retrial and Very Fast Retrial.

Section Three contains tables for systems where queues are present: Erlang C (Crommelin) and Equivalent Extended Erlang B for one, five and ten minute queues.

Section Four contains five non-random traffic tables: Erlang Engset and four tables of Equivalent Random Theory with a variance-to-mean ratio of 1.5, 2, 3 and 4.

THE FOUR BEST BOOKS TO MASTER DATA COMMUNICATIONS

SPECIAL OFFER: All Four Books for $160. Save 16%
Code P21008

NEW!

TECHNICAL ASPECTS OF DATA COMMUNICATIONS

THIRD EDITION

by John McNamara
383 pages, 1988, $44.95 *code P22002*

This is the third edition of the "DEC book." It continues to offer the best practical help for anyone building, buying, troubleshooting, learning or teaching data communications.

It lets you tackle and solve problems of datacom system design, avoid common pitfalls and know what to look for in hardware and software systems. It includes expanded coverage of hot topics such as LSI communication circuits, ISDN, LANs, T-1, error-correcting modems, new specs of EIA-530 and serial autodrivers.

Ideal for training courses and college programs of all kinds covering datacom, networks, telecom, i/o devices, DP applications and microprocessors. Nine appendices, glossary, bibliography, illustrations, charts, tables.

DATA COMMUNICATIONS NETWORKS AND SYSTEMS

edited by Thomas C. Bartee
359 pages, pub. 1985, $39.95 *Code P35004*

This hardcover boasts an assortment of expert contributors, all assembled to let you in on the latest developments in the data communications systems field.

Contents:
• Async Communications • A Single Line Async UART • Interface Standards • Beyond Interface Standards • Private Line Modem Control • A Single Line Async Interface with Private Line Modem Control • Asynchronous Multiplexers • Telephone Switching Systems • Switched Network Modem Control • Switched Network Async Modems • Automatic Calling Units • Async Multiplexers with Modem Control • Error Detection • Synchronous Communications • A Single Line Synchronous USRT • Protocols • Bisync and Character-Oriented Protocols • DDCMP and Byte Count-Oriented Protocols • SDLC and Bit Oriented Protocols • Multiplexer Enhancements • Sophisticated Modems • Digital Transmission • Packet Switching • ISDN • CCITT X.20 and X.21 • Local Area Networks

HANDBOOK OF DATA COMMUNICATIONS AND COMPUTER NETWORKS

by Dimitris N. Chorafas
560 pages, 1985, $59.95 *Code P22003*

A handbook is a reference book you have on your shelf because it contains more information than you can remember about the kinds of things you need to know every day. This one is the "classic" handbook.

Contents:
• Distributed information systems • R&D & semiconductor technology • Cost-benefit analysis with new technologies • Space, time, and frequency division multiplexing • Switching technology and the PBX • Transmission media from coaxial to satellites • Terminals • Modems • Multiplexers, Concentrators and Front-ends • Protocols • Circuit switching, polling/selecting • Bit-oriented protocols • The Nesting of protocols • Networking functions • X.25 • Session and presentation level control • Networks • International standards • Local Area Solutions • Backbone operations • Architectural Design • The Tradeoffs • Circuit, message and packet switching • Transaction-based systems • Message Theory • Electronic mail • Videotex • Communications software • Error detection • Journaling • Life cycle maintainability • Systems Maintenance • The Network Control Center • Network Diagnostics and Monitoring

DATA COMMUNICATIONS AND DISTRIBUTED NETWORKS

by Uyless D. Black
468 pages, pub 1987, $44.95 *CODE P22007*

A very, up-to-date semi-nontechnical book, including the latest standards — IEEE 802 LAN, CCITT ISDN, and the revised X.25, X.75, X.3, X.28 and X.29 standards.

Contents:
• Major components of a datacom system • Software and data bases • Transmission impairments • Data link controls/line protocols • Digital transmission • Network architectures • Local area networks • Distributed systems • Design considerations • Divestiture — a new era

THE TWO BEST BOOKS TO LEARN DATA COMMUNICATIONS

Both Books For $74.00. Save Over 15%

Code P21004

Beginner

Data Communications: A User's Guide

by Kenneth Sherman
second edition, 446 pages, 1985, $46.00
Code P21001

This is an excellent, intelligently-laid-out, well-written, very popular textbook on data communications. It has many diagrams, extensive explanations, and review questions at the end of each chapter. To give some idea of the book's broad scope, here are its chapters:

Background of Data Communications and Terminology • Carriers, Services, and Regulations • Communications Media • Circuit Types • Data Codes • Interfaces • Synchronous and Asynchronous • Protocols • Data Transmission Integrity, Forward Error Correction, Compression, Encryption • Modems and Modulation • Digital Transmission • Multiplexers • Other Network Hardware • Network Types and Services • Transmission Bandwidths and Impairments • Network Management and Control • Communication System Transactions, Applications, and Formats • Design Considerations • System Implementation and Support

Intermediate NEW!

BUSINESS DATA COMMUNICATIONS:

Basic Concepts, Security & Design SECOND EDITION

by Jerry Fitzgerald
708 pages, 1988, $42.95 ***Code P21003***

Our best-selling datacom book. Used by more colleges, universities, business schools and professionals than any other text. Ever! The Second Edition has been totally revised to ensure it is the most current datacom text on the market. New information includes:

- Micros in datacom. IBM's new PS/2 system.
- Local Area Networks, with a demonstration software package.
- Computer Network Design.
- Integrated Services Digital Networks (ISDN), deregulation, fiber optics, protocols, standards, network security.

Chapters:
• Introduction to Data Communications • Fundamental Communication Concepts • Data Communications Hardware • Network Configurations • Protocols and Software • Microcomputers and Communications • Local Area Networks • Network Management • Security and Control • Communication Services • Manual Network Design • Computerized Network Design

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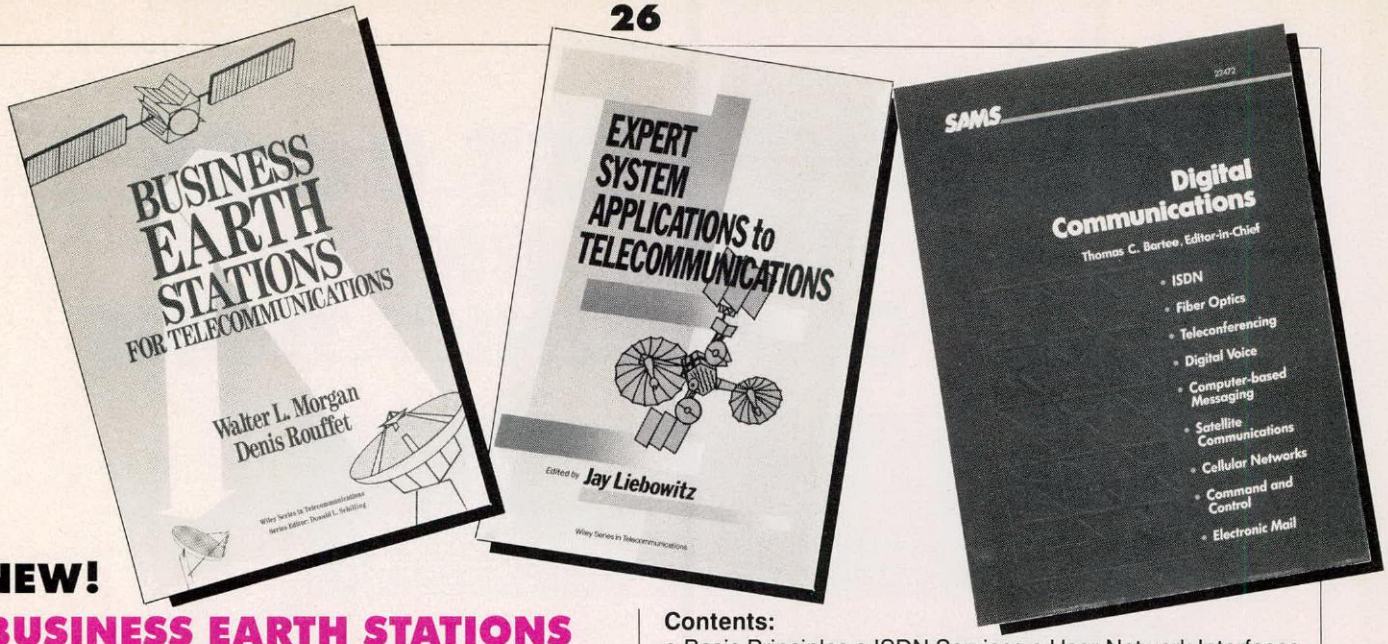

NEW!

BUSINESS EARTH STATIONS FOR TELECOMMUNICATIONS

by Walter Morgan & Denis Rouffet
234 pages, 1988 $36.95 *Code P40012*

Microterminal (or V-SAT) technology is one of the most promising telecom developments in the last decade. Corporate satellite transmission and earth station network technology is growing by leaps and bounds, as witness the globalization of the securities industry through satellite transmission. This is a very complete guide for businessmen who need to understand the essentials of this important emerging technology.

Chapters:
• General Description • What is a Microterminal • Microterminal Applications • Why Use Microterminals? • Who are the Users? • How is the Service provided? • Overview of the US Market • Network Operators • Economics of Microterminal versus Terrestrial Services • Microterminal Network Operations • Standards • Regulations • Technical Considerations • Space Segment Requirements • Microterminal Insurance Aspects

NEW!

DESIGN AND PROSPECTS FOR THE ISDN

by G. Dicenet
288 pages, 1987, $66.00 *Code P40010*

This is the most comprehensive examination of the techniques and benefits of ISDN that we have yet seen. It's not cheap, but if ISDN is going to be important to you, this book is a must.

The author is Director of the National Center for Telecommunications Research. He gives you the comprehensive understanding you will need, in a concise and clear manner. What's happened so far? Why is it important? How does it work? What equipment is required? How is it maintained? What has been the French experience? What lies on the horizon?

Contents:
• Basic Principles • ISDN Services • User-Network Interfaces • Transmission • Protocols • Terminals • User Installations • Switching • Operation and Maintenance • Evolution and Prospects

NEW!

EXPERT SYSTEM APPLICATIONS TO TELECOMMUNICATIONS

edited by Jay Liebowitz
371 pages, 1988, $41.95 *Code P40015*

Expert Systems are computer programs that emulate the behavior of human experts in narrow fields of knowledge. They are coming in all fields of business. This is the first book on Expert Systems for telecommunications. Fault diagnosis, network and spectrum management, LAN configuration and network monitoring and control are but a few of the topics in the extensive case studies on expert systems prepared by the over 35 contributors to this book. Divided into three parts: systems already developed, telecom-oriented methodologies and telecom areas with high expert system potential.

Chapter Headings:
• Applications to Network Management • Expert System Development • The FIS Troubleshooting Project • Application to Fault Isolation in a Satellite Communications Network • On-Line Expertise for Telecom • XTEL: An Expert System for Designing Telecom Architectures • Bellcore Network Management and Control • Expert Systems for Scheduling • Expert System Technology: Guidelines and Methods • Knowledge-Based Systems • Distributed Expert Systems • Network Control Center Applications • Radio Spectrum Management Application

DIGITAL COMMUNICATIONS

edited by Thomas Bartee
406 pages, 1986, $44.95 *Code P35007*

Nine leading experts have contributed one chapter on their speciality. Each subject is treated in depth.

The nine chapters include:
• Fiber Optic transmission technology by *Ira Jacobs* • Satellite Communications by *Irwin Lebow* • ISDN by *Eric Scace* • A business view of computer-based messaging by *Vinton G. Cerf* • Electronic mail systems by *Debra Deutsch* • Cellular networks by *Philip Porter* • Challenges in communications for command and control systems *John J. Lane* • Digital coding of speech by *N.S. Jayant* • Video teleconferencing by *Richard C. Harkness*

TELECOMMUNICATIONS:
Concepts, Development and Management

by John Blyth & Mary Blyth
325 pages, 1985, $41.95 *Code P17001*
Instructors' Guide: $7.95 *Code P17002*
Concepts and its Instructors' Guide — the two volume set, $48.00 *Code P17006*

This is a beautifully done textbook. It is perfect for a full semester course on telecommunications. The book covers everything from regulation to data, from buying a phone system to traffic engineering, from networking to the structure of the industry. It's well-organized, well-written and well-illustrated.

This book should be given to any newcomer to the industry — whether user, seller or technician. Every switch vendor — central office or PBX — should give one of these books to his students every time he holds a training session.

We don't have sufficient space to extol this book's many virtues. Suffice, we highly recommend it. We stand squarely behind it. Return for a full refund if you think we're wrong.

Contents:
1. History
2. Structure and Regulation of the Industry
3. Telephony
4. Telecommunications Networks
5. Data Processing and Communications
6. Data Communications Systems
7. Telecommunications Services
8. Principles of Telecommunications Management
9. Selecting and Implementing A New Telephone System
10. Principles of Traffic Engineering
11. Theory of Rate Making

P.S. If you're teaching or training, don't forget the **Instructors' Guide.**

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VOICE/DATA TELECOMMUNICATIONS SYSTEMS
An Introduction To Technology

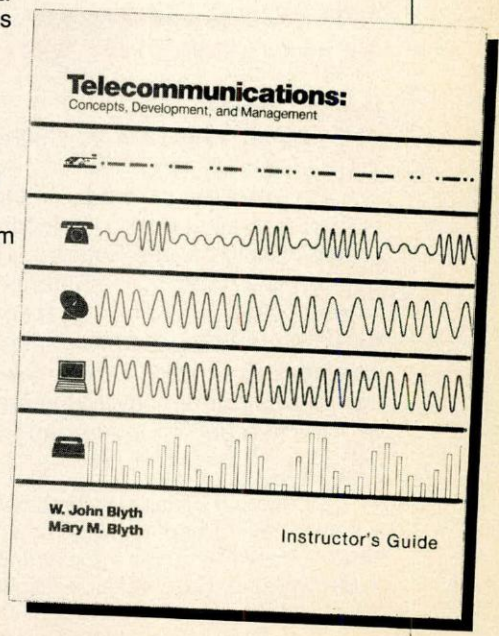
by M.L. Gurrie and P.J. O'Connor
373 pages, pub. 1986, $44.95 *Code P11001*

TELECONNECT Magazine called this *"the best book on managing telecom."* The magazine wrote: *"In every field, there's always one 'seminal' work that makes an avocation a discipline. This book may establish the discipline of telecommunications management."*

The magazine continued: *"Telecom management doesn't mean just users. If every vendor read, re-read and finally understood this book, our industry would achieve the professionalism it deserves."*

TELECONNECT's reviewer says *"I couldn't be more enthusiastic about this book. . . It's hard to review or even summarize a textbook. I can tell you the material is accurate. And there are lots of illustrations and each chapter ends with Review Questions. And I can tell you I'd be proud to be a teacher using this book as my textbook."*

Here's an excerpt from the book's extensive **Table of Contents:**
1. An overview of the industry
2. Analog Telecommunications Technology
3. Digital Telecommunications
4. Private Telecommunications Systems
5. PBX Features and Functions
6. Station Equipment
7. Transmission Media
8. Transmission Forms
9. Signaling
10. Switching and Networking
11. Private Networks and Routing
12. Emplacement of a Private Telecommunications System



COMMUNICATION NETWORKS MANAGEMENT

by Kornel Terplan
595 pages, 1987, $58.00 *Code P40005*

This is a very exhaustive and technically detailed guide to **data** communications network management. Written to give an in-depth technical understanding, it nevertheless will not lose you in formulas and equations. It has diagrams and tables which will help you focus on the essential concepts, so that you as a manager can understand what the engineers are talking about, while they do the calculations.

Thoroughly indexed and well laid out, with plentiful notations, indenting, recaps and chapter summaries, this book can be read straight through, or used to look up any specific item.

If you're planning or already have a complex datacom network, you need this very detailed and immensely useful book. An Editors' Choice.

Contents:
• Management of Communications Networks • Performance Impacts of Networking Components • Performance Indicators, Instrumentation, and Human Aspects • Network Technical Control-Oriented Information-Extraction Instruments • Network Performance-Control-Oriented Information-Extraction Instruments • Communication Software for Information Extraction • Network-Management Data Base • Network Modeling Instruments • Network Operational Control • Network Administration • Performance Analysis and Tuning • Network Capacity Planning • Integrated Communication Network Management • Cost Justification of Implementing Network Management • Future Trends of Managing Communication Networks • References • Index

INTRODUCTION TO TELECOMMUNICATIONS SYSTEMS

by P.H. Smale
153 pages, 1986, $14.95 *Code P40019*

An excellent starting point for anybody interested in the fascinating world of telecommunications. History. Theory. Basics. Uses. Future. . . Detailed and technical enough for hobbyists, students and telecom professionals, while still clear, practical and useful enough for those in business and management. Readers get crystal-clear explanations of how emerging technology transforms human communications and how telecom evolves to meet the ever-changing needs of business.

Contents:
• Telecommunications • Modulation • Radio Systems • Television • Telephone Instruments • Lines, Losses and Noise • Public Networks • Exchanges and Switches • Radar • Multiplexing • DataCom • Digital Networks • Teletext • Cable TV • Fiber Optics • Cellular Telephone

THE TELECONNECT GUIDE TO PROFESSIONAL SELLING

by Gerry Friesen
64 pages, pub. 1985, $5.95 *Code P09001*

Gerry Friesen writes the most popular articles in ***TELECONNECT Magazine.*** They have made him the most sought-after trainer in telecommunications. He has trained more sellers than any other single person. He's good. Here — for the first time and in one place — are 24 of his most popular articles on selling from ***TELECONNECT.*** This book is perfect for all your sellers.

Here you will find Friesen "Classics" including *Why I Abuse Sales Managers, You're Allowed to Hate Prospecting, Overcoming Prolonged Sales Inactivity, Lead Networking, Learning How to Relax, The Colombo Close, Track Selling, The Trial Close, Nonsense They Teach Salespeople* and *Negative Selling.*

If you subscribed to TELECONNECT two years ago, you probably have read the articles. This book is a great way to keep Gerry's articles organized. If you don't subscribe to TELECONNECT, but you sell for a living, you **must** have this book — if only to find out what your competitors are going to do next. If you're a sales manager, buy one for each of your sellers. Watch your sales soar.

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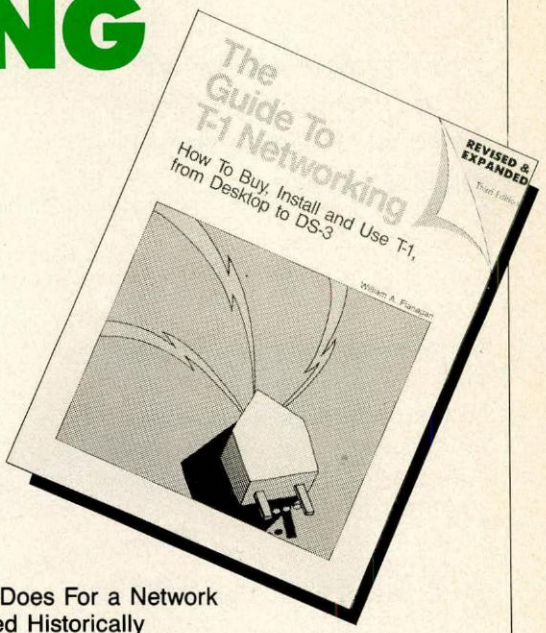

How To Buy, Install & Use T-1, From Desktop to DS-3 Third Edition

by William Flanagan
222 pages, 1988, $24.95 *Code P09002*

#1 BEST SELLER!!!

T-1 circuits save money. A T-1 network typically pays itself off in fewer than 12 months, sometimes less than six. As a result, T-1 lines are the fastest growing local and long distance lines in the country. T-1 is a digital service. Companies buy T-1 circuits because they're cheaper, faster to get, better quality and more flexible than the alternatives.

The 1988 update of this best-selling book, written by an expert on T-1, is a total introduction to buying, installing and using T-1 circuits and the equipment that goes along with them.

New features in this edition include the extension of digital networking throughout an enterprise to all sites, insights into emerging 45 Mbps DS-3 technology and a thorough discussion of the related network management and control issues. Make no mistake, all-digital networks are the future.

If you're thinking about digital networks, you have to know about T-1, and if you have to know about T-1, you HAVE to have this book.

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3. New Services. When users get a T-1 network, they can do things they couldn't do before. Things like videoconferencing and high-speed database exchanges.

4. Flexibility. Your president wants a teleconference in 30 minutes with five of his regional offices. With your own T-1 network, he can have it.

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Contents:

- What T-1 Does For a Network
- T-1 Defined Historically
- Digital Voice
- T-1 Circuits
- What T-1 Equipment You Will Need at Your Office
- How To Build a T-1 Network
- Beyond T-1: Desktop to DS-3
- Network Management and Control

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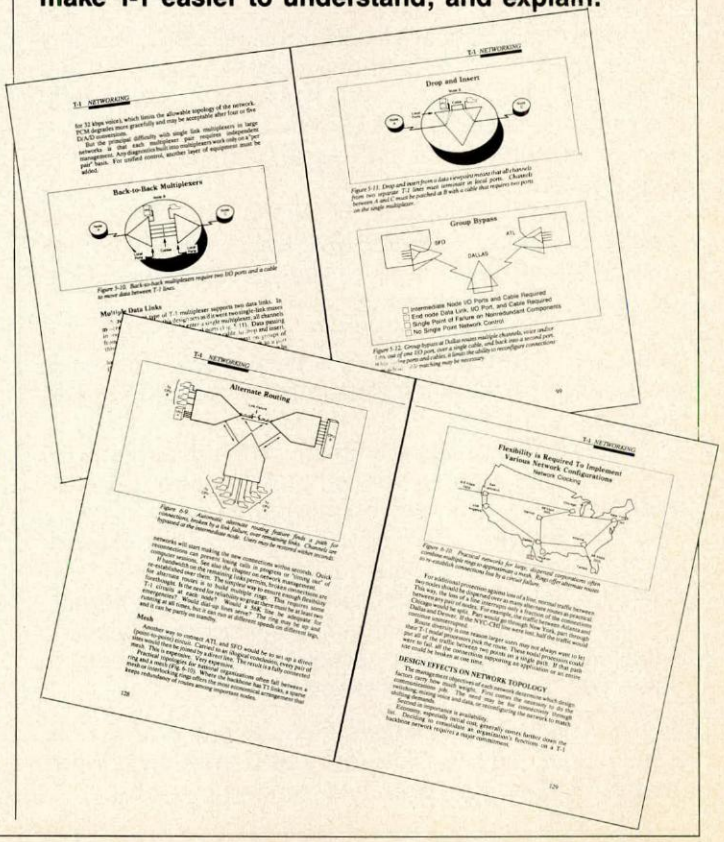


TELECOM LIBRARY'S FANTASTIC DICTIONARIES

TELECONNECT DICTIONARY

An Explanation of Telecommunications Terms, Acronyms and Jargon

by Harry Newton and The Telecom Library Research Group
160 pages,
pub. April 1987,
$9.95 *Code P08003*

#2 BEST SELLER!!!

Most technical dictionaries define terms tersely and leave you more confused than ever. Which is why we decided to write our own.

Our dictionary is different from any other. Some of our definitions take up a whole page. They tell you what the term is, what it does, how it works, how you use it (applications) and what the typical benefits of using it are. Our definitions on more important terms are actually *"mini-essays."*

As a result, we think it's the most relevant dictionary in the telephone/telecommunications industry — and especially interconnect, which has to do with telephone equipment that sits in peoples' offices, factories, motels, etc. . . customer premise equipment (CPE) as the jargon goes.

We have definitions of words you won't find elsewhere — features on PBXs, key systems, hybrids, automatic call distributors, call detail recorders and lots of data communications terms.

What's Camp-On? SMDR? AIOD? How much can you save with CDR? What's a Data PBX? How does a Modem work? What's Sidetone? Where did Tip and Ring come from?

We have definitions on many of the telephone circuits you can order — from off premise extensions, to WATS, to T-1, to ring-down tie-lines, etc.

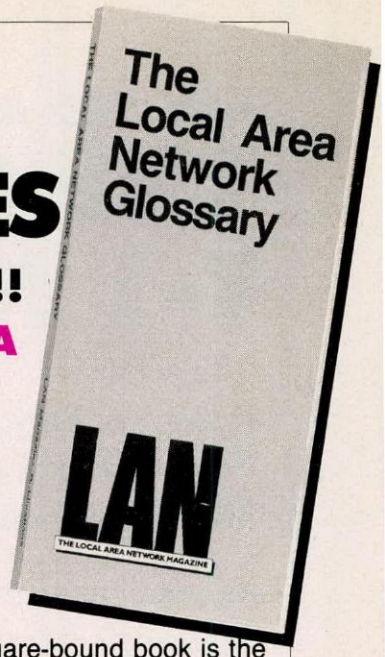
This is a **working** dictionary. You can use it every day. You can give it to your customers. It's 6" x 9". You can carry it in your briefcase without getting a hernia.

And you'll actually enjoy dipping into the dictionary — perhaps reading those sections relevant to your next sales call or your next presentation.

NOTE: This is **not** a dictionary of computer terms. For that, you should buy **Dictionary of Computers, Information Processing and Telecommunications.**

#4 BEST SELLER!!!

THE LOCAL AREA NETWORK GLOSSARY



by Aaron Brenner
114 pages, 1989,
$3.95 *Code P41014*

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This breastpocket size square-bound book is the **third edition** of the first-ever glossary of Local Area Network terminology. It's the most complete glossary of LAN terms ever compiled and now includes OS/2 terms. Over 30,000 of this best seller are in print. Some companies have found this glossary a great customer giveaway. They ask us to "customize" the glossary with their logos and addresses. The result is a super customer-winner. . . Buy $100 of books and receive this glossary for free.

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DICTIONARY OF COMPUTERS, INFORMATION PROCESSING AND TELECOMMUNICATIONS

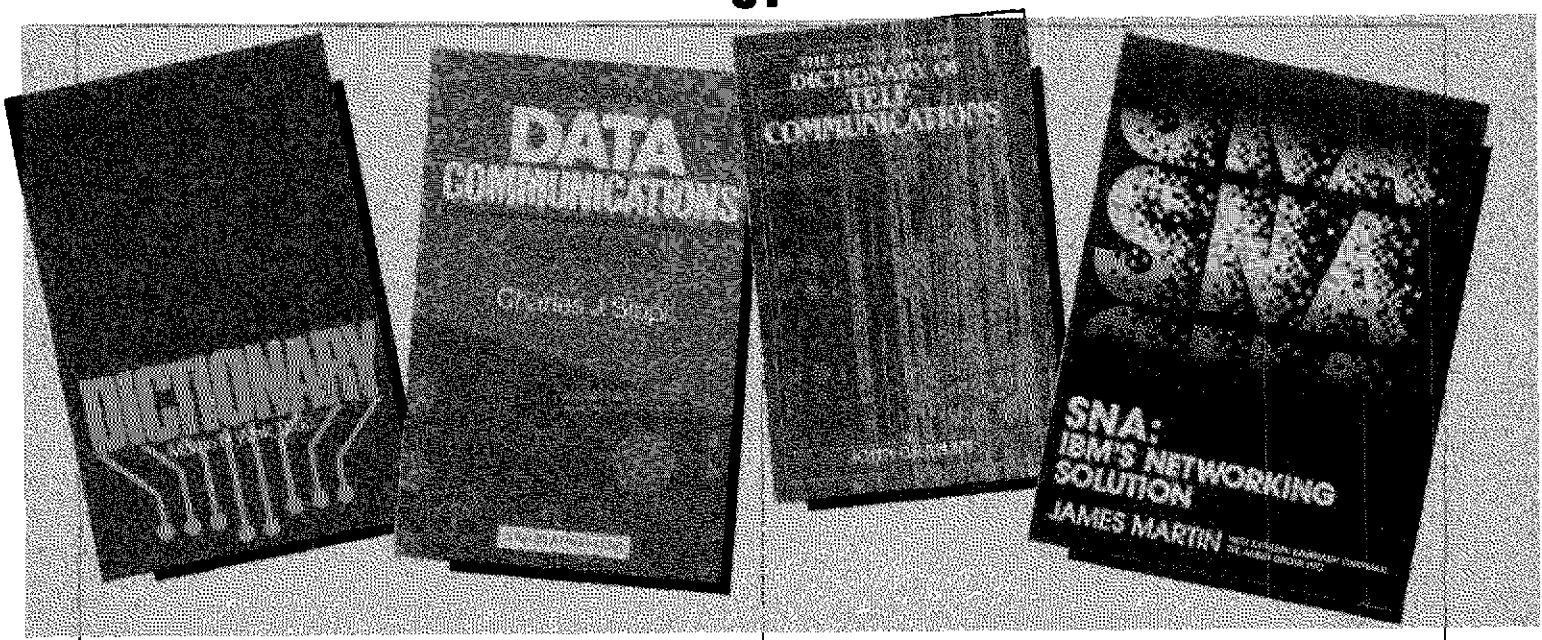
SECOND EDITION

by Jerry M. Rosenberg
734 pages, 1987, $44.95 *Code P28001*

Updated and expanded by more than 20% for the Second Edition, this is the second best dictionary of telecommunications (***The TELECONNECT Dictionary*** is Number 1), and the BEST dictionary for telecom AND information processing and computers.

Prepared in cooperation with leading edge corporations and government agencies, the dictionary reflects the latest usage, defines slang and obsolete usage and contains both general and specialized definitions, making it equally useful for the technical expert, the novice and the practical business user.

Beautifully laid out, with large, easy-to-read type, indentations, block listings and plentiful white space, this is THE reference work to have if your work requires familiarity with all the terminology of the Information Age.



TELEPHONY'S DICTIONARY

Second Edition
by Graham Langley
402 pages, second edition; pub. 1987, $40.00
Code P38006

This dictionary defines 16,000 words and terms. It is the biggest telecom dictionary around.

Dictionary Of Data Communications

Second Edition
by Charles J. Sippl
532 pages, pub 1985, $39.95 *Code P28002*

A good reference work that covers many of the computer terms you will find in the day-to-day workings of computer centers everywhere. If you're only an infrequent visitor to this confusing area, this dictionary will help you learn what those high-falutin' terms are that are going over your head.

The Facts On File

Dictionary of Telecommunications
edited by John Graham
200 pages, pub 1983, $17.95 *Code P28004*

Understanding the complex and technical language of telecommunications is vital for anyone who has a practical interest in this field. **The Facts On File Dictionary of Telecommunications** is an indispensable reference tool containing over 2,000 clear definitions for understanding the fundamental concepts in telephone & telegraph communications, switched communications and broadcast systems.

There are also 50 diagrams illustrating key telecommunication concepts. Extensive cross-references guarantee no one will waste time looking for the right term. Many of our manufacturer customers use this dictionary as a "giveaway" to their prospects and customers. They find it wins them enormous goodwill. Call our manager Kim Huy, and ask her for references on companies using it as a giveaway.

SNA: IBM'S NETWORKING SOLUTION

by James Martin, with
Kathleen Kavanagh
of the Arben Group Inc.
380 pages, 1987, $49.00 *Code P40002*

IBM has committed itself to SNA as its networking architecture into the '90s. The rapidly increasing rate at which networks of intelligent terminals, minicomputers, desktop workstations and programmable devices are proliferating requires standards. IBM is trying to establish SNA as *the* networking architecture to which everyone will conform.

This important book presents a detailed explanation of the concepts, protocols, functions and capabilities that make up SNA. It has the complete but easy to understand approach for which James Martin is noted, and is profusely illustrated.

It is presented in six sections: **Concepts, Advanced Facilities, Path Control Network, Transmission and Data Flow Control, Function Management and The Future of SNA.** Many of the concepts can be grasped just by following the diagrams and tables, and every chapter has a summary at the end. Contains some of the most effective use of two-tone color we've seen.

If knowing SNA is important to your job, this book will give it all to you!

Chapter Headings:
Network Architectures; SNA Concepts; SNA Functional Layers; Routing and Data Flow; SNA Services; SNA and the OSI Model; SNA Program Products; Advanced Program to Program Communication; Logical Unit 6.2 Implementation; Office Automation Architectures; SNA Distribution Services; SNA Network Interconnection; Data Link Control; SDLC Frames; SDLC Data Flow; SDLC Polling and Loop Operation; Path Control; Path Control Services; Transmission Control; Data Flow Control; End-User Services; The Function Management Header; Session Services; Session Termination and Outage Notification; Configuration Services; Switched Links and Network Deactivation; Maintenance and Management Services; The Future of SNA.

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Contents: Introduction to telephony; Electricity in a circuit; The telephone transmitter; The telephone receiver; The induction coil; Capacitance vs. self-inductance; Instrument circuit development; Anti-sidetone circuits; The generator principle; Principles of polarized based ringers; Principles of relays; Special purpose relays; Fundamentals of switching; Line lamp and supervisory circuits; Line protection; Methods of line protection; Subscriber signaling-rotary and touch dialing; Step-by-step switching; Crossbar; Electronic switching.

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91 pages, revised edition, 1986, $15.95
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Vol.3: Central Office Plant

by Frank E. Lee
56 pages, 1976, $14.95 ***Code P12003***

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Vol.4: Outside Plant: Engineering and Practice

by Frank E. Lee
87 pages, 1977, $15.95 ***Code P12004***

Contents: Planning additions to the outside plant; Plant expansion through carrier circuits; Carrier circuit impedance matching; Basic trunk carrier; Fundamental transmission; Introduction to loading coil theory; Cable loading; Loop plant design; Cable plant engineering; Underground service networks; Buried cable plant; Cable acceptance testing; Laying out the pole line; Poles for the telephone plant; Principles of pole line guying; Planning guy wire installations; Selecting and installing guy anchors; Aerial cable installation; Open wire plant.

Vol.5: Cable, Inside and Out

by Frank W. Horn
88 pages, 1978, $12.95 ***Code P12005***

Contents: Introduction to cable; Transmission; Paper and pulp insulated cable-design and manufacture; Paper and pulp insulated cable: lay-ups and color schemes; Plastic insulated conductor cable; Even count color code PIC core lay-ups; Special constructions; Cable sheaths; Cable armors and protections; Central office wire and cable station and cable outside wire; Interface cables; Factory testing; Filled cable; Aluminum conductor joining; Closures; Cable terminals; Installation; Maintenance; Special options; Choosing the right cable; Cable dictionary.

Vol.6: Understanding Station Carrier

by Kenneth C. Nelson
55 pages, 1975, $12.95 ***Code P12006***

Contents: Introduction to station carrier; Engineering considerations; Carrier theory and operation; Carrier frequency through cable; Signaling; Power requirements; Noise; Impedance, test equipment; Installation, measurement; Troubleshooting; Station carrier terminology; Circuit drawing symbols.

Vol.7: Understanding Transmission

by Eugene Riley & Victor E. Acuna
48 pages, 1976, $12.95 ***Code P13001***

Contents: An overall view; Propagation of speech sounds; Converting speech sounds to electrical energy to speech sounds; The decibel and other related units; Transmission media; Paired telephone cable design; Crosstalk between cable pairs; Primary parameters of cable pairs; Table of primary and secondary parameters (non-filled and totally filled).

Vol.8: Transmission Systems

by Eugene Riley & Victor E. Acuna
55 pages, 1976, $12.95 ***Code P13002***

Contents: Loading systems; Voice frequency subscriber loop design; Carrier transmission; Basic considerations in trunk design; Noise and interference; Digital carrier systems; Introduction to data transmission; Line engineering for PCM carrier systems; Optical fiber systems; Tables of loading cable secondary parameters.

Vol.9: Design Background for Telephone Switching

by L.F. Goeller

80 pages, 1978, $18.95 ***Code P13003***

This is an excellent volume for understanding PBXs!
Contents: System organization; Interfacing station lines; Interfacing trunks; User-oriented features; Data processing functions; Position systems for operators and attendants; Maintenance, reliability and response to abnormal conditions; Physical design.

Vol.10: Principles of Switching

by Paul Fleming

121 pages, 1979, $21.95 Code P13004

Contents: Control switching; the matrix; control; electronic switching; simplex; duplex; half-duplex; analog vs digital; two-wire vs four-wire transmission; signalization; tabulation of alternatives; multiple stations; types of switches; circuit, message, space division; single; two stage; grading; link systems; blocking and non-blocking matrices; TDM matrices; register systems; classes of service; automatic billing; AIOD; routing plans; memories; PAM and more.

Vol. 11: Data Communications Practice

by Bruce L. Meyer

55 pages, 1979, $20.95 ***Code P13005***

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by Gilbert Sharick

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Contents: Site survey; grounding arrangements; power & power equipment grounding; electronic systems grounds; bonding requirements; electronic systems grounds; shielding; filtering; telephone central office grounding; cable plant bonding and grounding; cathodic protection for corrosion control; electro-magnetic pulse radiation; test equipment.

Vol. 14: Power Line Interference: Problems & Solutions

by Russ Gundrum

50 pages, 1982, $20.95 ***Code P13008***

Contents: Nature of the problem: Power influence parameters; Susceptibility parameters; Multi-pair induction neutralizing transformers (INTs); Single circuit noise chokes; Inductive interference trends; Investigative considerations; Electromagnetic power line interference considerations.

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Management in Action

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Business Systems Options

by John Wilson

54 pages, 1978, $15.95 ***Code P14013***

All about buying a PBX.
Contents: Revamping an existing phone system; Special needs of a professional office; Preparing specifications; The best use of WATS, Tie lines; A reliable consultant; Records; Centrex; Digital PBX; City specs—special needs; Problem solving; Business system glossary.

Tables For Traffic Management & Design

by Theodore Frankel

70 pages, 1977, $15.95 ***Code P14014***

Contents: Traffic formulae; application examples; selected bibliography; Tables- Erlang B, poisson, Erlang C, Crommelin-Pollaczak, Engset, Binomial and Delay; Conversion chart- Erlangs; CCs; Call minutes.

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Contents: Introduction to traffic engineering; Traffic fundamentals; Measuring and describing traffic; Predicting traffic loads; Traffic capacity concepts; Traffic models; Network concepts; Trunking concepts; Economic routing principles; Network architectures and strategies; Public network terminology; Impact of Equal Access; Traffic impact on trunk technology; Local Area Network; Evolving network strategies; Traffic application example; Timing and sizing additions.

Elementary Queuing Theory and Telephone Traffic

by Peter Beckmann

48 pages, 1976, $15.95 ***Code P14015***

Contents: Review of elementary probability theory; The Poisson distribution; the exponential distribution; single-server systems; modifications for telephone traffic; multiple service without queuing; blocked calls cleared; multiple service with queuing; blocked calls held; limited sources; maintenance problems; efficiency and group size; delay times; first come first served; delay times; random order of service; Erlang Loss and Delay probabilities.

Voice Communication in Business

by L.F. Goeller

122 pages, 1982, $21.95 Code P14016

All about PBXs.

Contents: Part 1: Searching for the telephone company. Part 2: Requests for proposals, features. Part 3: Proposals and implementation. Planning & installing a business communication system-a case study; CO switching: is it a CU rip-off?; Those awful PBX proposals; System & Console features; Station & maintenance features. Part 4: Toys, add-ons & restrictors, recorders & routers-built-in or add on? Do-it yourself programming for call detail recorders. Part 5: The digital future.

Tele-cab-u-lary: The Telecom Dictionary

by Tom Smith

58 pages, 1982, $10.95 ***Code P14017***

An up-to-date glossary of telecommunications terms. A must for any telecommunications library. This handbook is divided into four categories — Telephone fundamentals; Customer equipment (terminals); Switching; and Transmission. Terms in one category can be cross-referenced with terms in other categories. There is also an alphabetical index for easy location of terms.

Basic Telephone Installation: A Guide for the Residential Installer or the Do-it-Yourselfer

50 pages, 1984, $10.95 ***Code P13009***

A step-by-step, non-technical guide for the residential or small business installer. Basic Telephone Installation procedures, with info on wiring to jacks, plugs and adapters. Extensive illustrations.

Contents: Getting started. Wire installation; Jacks, plugs, adapters and other accessories; The telephone set; Tools and miscellaneous hardware; Safety;

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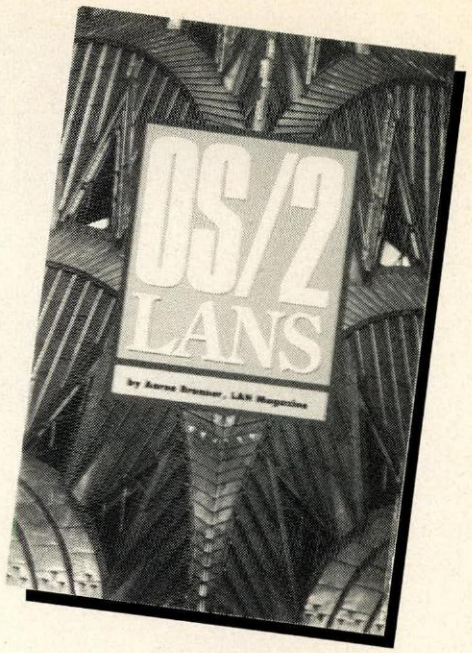

by Aaron Brenner
Editor-in-Chief, LAN Magazine
174 pages, 1988, $19.95 *Code P41020*

The book shows how OS/2 dramatically changes what can be done on a local area network (LAN). OS/2 LANs shows how the combination of the new OS/2 operating system and the latest LAN technology will allow small business organizations to do what only larger business organizations could do before — like create a company sales contact system or a company-wide library of documents, graphics and pictures.

OS/2 LANs instantly presents information to the user, in any form, from any computer on the LAN. A user will sit at his desk and have immediate access to every other computer in his business, simply by switching "windows" on his PC. All it takes is a mouse click.

OS/2 LANs describes how the basis for these new applications is distributed processing — the simultaneous work of many machines on the same job. By bringing many personal computers (PCs) to the same job at the same time, an OS/2 LAN can match, and often surpass, the processing power of a minicomputer or mainframe — at a much lower cost and with much less effort.

OS/2 LANs is not a How-To book. OS/2 LANs are not that defined, as yet. The book is a look at the future of PC networking.

OS/2 LANs looks at the OS/2 strategies of the LAN industry's biggest players, focusing on the products they have introduces and a critical analysis of where they fit with existing LAN products.

This book is divided into four parts. The first is a review of OS/2's capabilities. It concentrates on the multitasking and interprocess communications aspects of the operating system — the things that make it great for LANs.

The second part, along with the third part, is the heart of the book. The second part examines the impact of OS/2 on LANs. It lays out what LAN users should expect from OS/2 and should demand from OS/2 network software developers.

The third part looks at the network vendors' OS/2 solutions, proposed and available.

This part contains some warnings about the costs of OS/2 but also uses some examples as encouragement for you to experiment with the new operating system.

A glossary defines many of the words used in the book. It is written in clear English for those not so familiar with LAN jargon. There is also a list of major OS/2 LAN vendors giving the address and phone number of more than 50 manufacturers contributing OS/2 LAN products. Finally, an index will help you find topics of particular interests.

Contents:

Ch. 1. A Review of OS/2
Ch. 2. What OS/2 Brings to Networks
Ch. 3. Network Operating Systems
Ch. 4. OS/2 Network Applications
Ch. 5. The Future of OS/2 Networking
Appendix A: Named Pipes vs. Netbios
Appendix B: Vendor's View — **Microsoft**
Appendix C: Vendor's View — **3Com**
Appendix D: Vendor's View — **Novell**
Appendix E: Vendor's View — **Banyan Systems**
Appendix F: PC Hardware
Appendix G: LAN Terms Defined
Appendix H: Addresses

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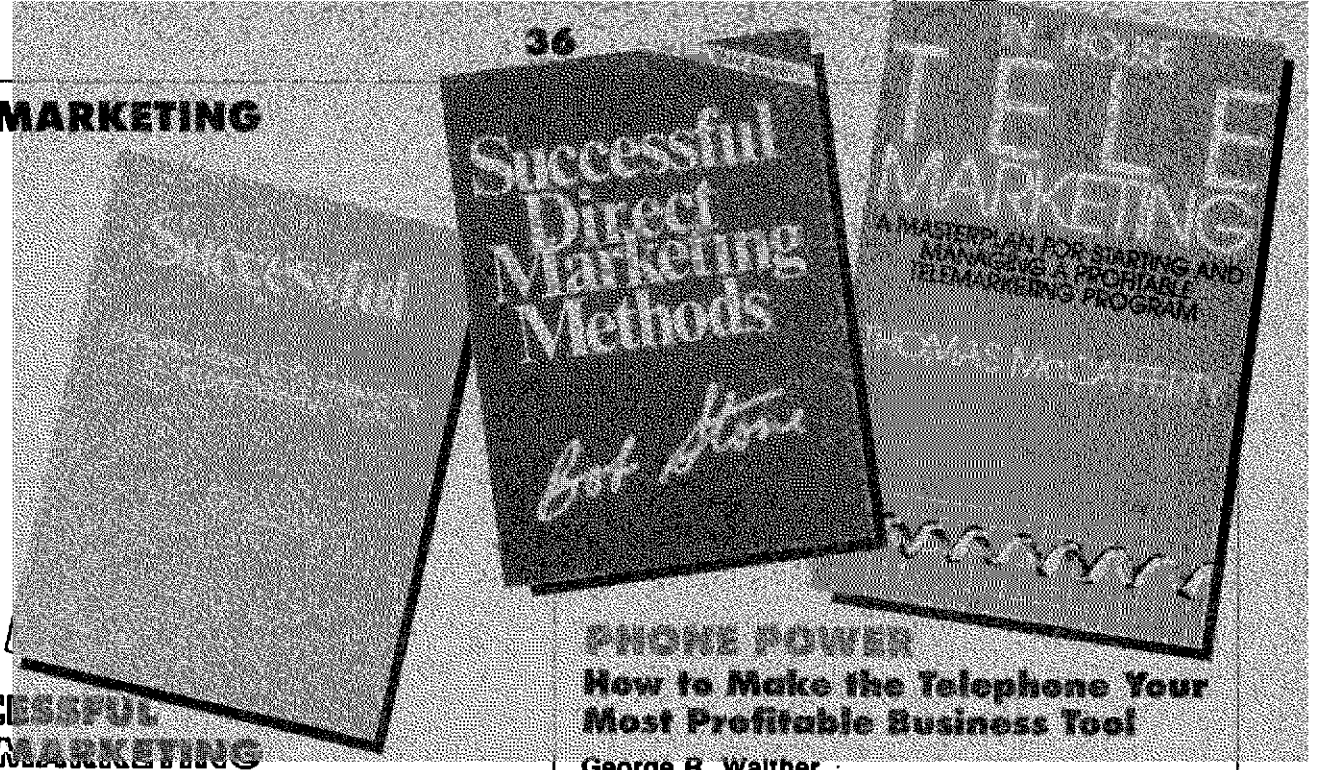

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H. Skip Weitzen
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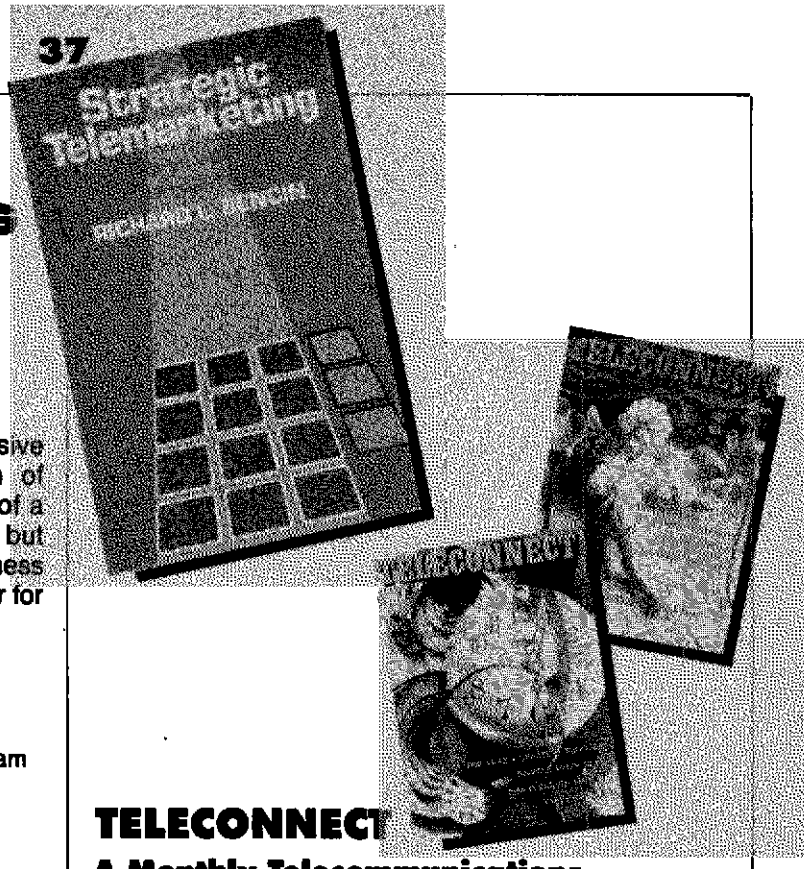

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7. Auditing the Results
8. How to Get Help
9. Catalog Telemarketing
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Appendix D: Telemarketing: How Consultants Can Help

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by Robert J McHatton
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TELECONNECT

A Monthly Telecommunications Magazine
published by Harry Newton & Gerry Friesen
published monthly, $15/year Code *P15001*

TELECONNECT originally was a distributor magazine for the interconnect industry, teaching that industry how to sell, install and service PBXs, key systems, hybrids and call-accounting systems. Then the industry expanded to automatic call distributors, voice mail, automated attendants, T-1, short-haul microwave, telemanagement software, headsets, facsimile, Centrex CPE, data PBXs and LANs. And it keeps growing, as reflected in each month's expanding and changing editorial.

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BUYING SHORT-HAUL MICROWAVE

The Official Guide to Choosing, Acquiring and Using A Short-Haul Microwave System in North America

by Steve Ditto
235 pages, 1988, $34.95 ***Code P40023***

Corporate short haul microwave networks are booming, and the sale of short haul microwave systems is one of the fastest growing segments in telecom.

This informative reference guide explains what's behind the short haul explosion, why short haul makes economic sense, and how any company can buy, install and benefit from a short haul microwave system.

Written for non-technical as well as technical readers, this book guides you through typical short haul microwave applications, how short haul microwave systems work and how to write a microwave Request For Proposal. It gives you criteria for comparing systems, cost justifying a system and details on planning for smooth and efficient implementation.

Illustrated with diagrams and charts, and accompanied by a comprehensive glossary, this book helps prospective short haul system buyers cut through technical jargon and make solid buying decisions.

Among its most valuable features, along with a fundamental presentation of available technology and equipment and complete up-to-date listings on systems and vendors, is a step-by-step description of how to obtain a microwave license from the FCC.

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Chapter 7. Typical Applications
Chapter 8. RFP For A Typical Short Haul Microwave System
Appendix 1. Logarithms
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- EDU
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" " BIT.NIC FOR USING IN DOMAIN NAMES REG.

TO GET NAME YOU MUST RUN A NAME SERVER FOR WHAT YOU WANT TO USE (CZ - EXAMPLE)

☆ CUFF PROVIDES NAME SERV. FOR TOP LEVEL DOMAINS

NEED: → CONNECTION
- S/W

PC RUNNING XENIX
386 RUNNING V

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NEED : 2 MODEMS & DEDICATED LINE

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- WILL PROVIDE NAME SERVICE & CHARGE FOR IT
- PROVIDE STORAGE & FORWARDING

SHORT RUN ALTERNATIVE

The WELL

by John Coate

I WORK AT THE WELL, Whole Earth's online computer conferencing network. The WELL itself sits in an air-conditioned closet at the Whole Earth office. A bunch of phone lines come into the building. There's a modem for each phone line. These modems in turn are wired up to a Vax computer. The Vax is about the size of a large dishwasher. We can handle up to 23 callers at a time, which we often do with over a thousand people logging in each month. When people visit us they like to go in and look at the equipment. When you see the lights on the modems flickering you know that conversations are happening. Minds are meeting.

Personal computers are amazing communication tools. Put a computer together with a modem and you can converse simultaneously with several people, collaborate on writing projects, find work, gather and refine ideas, get technical updates, swap some stories, argue politics, and get a recommendation on a good restaurant and movie without getting up from your desk. Online conferencing networks can be both a place where you meet people — like a neighborhood pub — and a tool for gathering and storing information.

As I sit at my desk in the WELL office shuttling between conferences, doing mail, writing pieces like this one, and talking online as well as on the phone to new users, I check to see who is logged in every few minutes. I know most of the names. Because we have had a lot of social gatherings I know many faces to go along with the names. Many have become my good friends.

Sometimes when I'm working I feel like I'm in the wheelhouse of a big Mississippi riverboat. On the decks people are strolling and talking as they lean against the rail. There's a casino and parlors and places to eat. Way down below they're talking shop with the machinists. There are regulars and newcomers. Everyone has a unique point of view. Sometimes it's choppy, but usually it's steady as she goes.

WELL stands for Whole Earth 'Lectronic Link. It's the collaborative brainchild of Whole Earth's Stewart Brand and Larry Brilliant, best known for his work with the SEVA Foundation and head of Network Technologies (NETI). Whole Earth and NETI each own half of the WELL. After spending time working on projects through the EIES network, Stewart and Larry conceived the WELL as a place where a variety of people could meet online without spending an arm and a leg. Early on Stewart said the WELL is the "kind of thing coffee shops were supposed to be about, but are pretty hard to find these days."

Although there is a lot of useful information stored on the WELL like in a library, it is through conversing in conferences, electronic mail (email) and real-time that the fabric of the community is knit.

There are over ninety WELL conferences. Some are computer specific, some are technical, and some consist of people throwing out their ideas, telling their stories or arguing social and political issues. After talking with people about all kinds of different things over time you get the feeling that you know that person even if you have never met face to face.

John Coate (left), on-line party host and Welcome Wagon Chairman; Cliff Figallo (right), WELLville Town Supervisor. Respectively, "tex" and "fig" on the WELL.

So you cruise around to different conferences and you find out what people think about things. The information moves "horizontally" among the peer group of the participants. Anyone can start a discussion topic in a conference. Topics can be linked between different conferences. After awhile I think the word "community" begins to describe what goes on better than does "network." In a community, the interactions are ongoing. You run into some of the same people every day. Over time, professional and personal interaction can overlap. There becomes a sense of place to it. It often reminds me of an electronic Greenwich Village. Logging in can be like going down to the street to check the action.

We don't have a lot of rules; we manage the WELL in a very low key style. It really can't be done any other way. The keystone of the WELL organization is the conference hosts. Every conference has a host. That word was very deliberately chosen. Public online conferences are a lot like ongoing parties and someone has to make sure there's ice in the cooler, food on the table, continuity in the discussions, and good general organization.

Online conferencing is talking by writing. You set up your context, get to the point, and get out. Because it's a conversation between sometimes fairly large groups, you don't want to "dominate the rap" and you don't want to be repetitive. You have to remember that people are looking at computer screens, which seem to put unique demands on people's ability to focus on long-winded pieces. If your "posting" runs longer than one or two screen lengths, it had better be pretty interesting. And you will hear from people if they think you ramble too much.

The flip side of that, though, is if you have a good story to tell or enjoy quality repartee, or can lay out and quickly back up an argument or insight, then the chemistry can be there for a kind of ad hoc think tank that has soul and is fun. We talk about everything from war and law, music, work, birth, death, where this "info age" is going, and AIDS to online talk shows, tales of past experiences and exploits, online gift notifications (better known as Pokeybux), your thoughts on human relationships, bugs in the latest version of PageMaker, reports of WELL weather, the Maddog Improvement Society, and critiques of the latest Grateful Dead show.

Ah yes, the Deadheads. There's plenty of action around the Grateful Dead. The Grateful Dead Conference is the WELL's largest, with people logging in from all over the country. It's mostly good talk, but some online collaboration happens too. Once we designed a WELL T-shirt together. We chose the design, had someone take the money and another person got them printed up.

The WELL is a confluence of social and cultural elements. Similar to Chesapeake Bay, where nine different rivers merge, the WELL's character comes from hackers, writers, artists, Deadheads, knowledge workers, fugitives from the counter-culture, educators, programmers, lawyers, musicians, and many more.

The Info conference, for example, is regularly visited by a magazine editor, a college journalism teacher, an author, a consultant to a state assembly committee, an info age muckraker, a retired Army colonel turned info age pioneer, a manager from Pacific Bell, a librarian, and members of the Congressional Office of Technology Assessment. We evaluate news, laws, discuss government hearings, and theorize about the forces at play that are attempting to capture their piece of the action as these new information tools become more widespread. It's exciting, relevant stuff because it has to do with basic Constitutional freedoms. In these discussions, age, race, or culture don't matter. Your contribution to the discussion is the only thing that counts.

I think if the WELL establishes one thing it is that meeting through computers doesn't have to be a step in some inexorable march toward an Orwellian society with people droning away at isolated terminals. There is a kind of magic to the fact that real human emotions, "vibes" if you will, can carry through the chips and wires.

If you can get your computer and modem to dial a phone number, you can log in to the WELL. Usually the default settings that come with the communications program work fine. The WELL does cost money to use, but at $8/month + $3/hour the rates are among the lowest in the country for comparable facilities.

Actually, the phone company makes more on this than we do. But we have ways of tipping the balance sheet more in your favor on the cost of the phone call. If you live outside of the San Francisco Bay Area you can save substantial money on the phone call by reaching the WELL via CPN. If you live in the Bay Area call us and we'll give you tips on cheaper phone access through special local lines. In addition, the WELL is one of the few places where an individual account has full access the the worldwide UNIX community through USENET and UUCP mail.

To sign up just call 415/332-6106 with your modem and type newuser <cr> at the Login: prompt. Or call us at 415/332-4335 if you'd like more information.

FROM SIGNAL, A WHOLE EARTH CATALOG - HARMONY BOOKS 1988

CONFERENCES ON THE WELL

Business - Education

Brainstorming	(g brain)	Classifieds	(g cla)	Consultants	(g consult)
Consumers	(g cons)	Design	(g design)	Desktop Publishing	(g desk)
Education	(g ed)	Entrepreneurs	(g entre)	Legal	(g legal)
Newsletter	(g per)	Stock Market	(g stock)	The Future	(g fut)
Translators	(g trans)	Travel	(g tra)	Work	(g work)

Social - Political - Humanities

AIDS	(g aids)	Archives	(g arc)	Berkeley	(g berk)
East Coast	(g east)	Emotional Health	(g bridges)	Environment	(g env)
Christian	(g cross)	Current Events	(g curr)	Drugs	(g dru)
Fringes of Reason	(g fringes)	Gay	(g gay)	Health	(g heal)
History	(g hist)	Jewish	(g jew)	Liberty	(g liberty)
Mind	(g mind)	Miscelaneous	(g unclear)	Men on the WELL**	(g mow)
Nonprofits	(g non)	Northwest	(g nw)	Parenting	(g par)
Peace	(g pea)	Poetry	(g poetry)	Philosophy	(g phi)
Politics	(g pol)	Psychology	(g psy)	San Francisco	(g sanfran)
Sexuality	(g sex)	Southern	(g south)	Spirituality	(g spirit)
Transportation	(g transport)	True Confessions	(g tru)	Words	(g words)
Whole Earth	(g we)	Women on the WELL*	(g wow)	Writers	(g wri)

** Private conference - send email to flash for entry
* Private conference - send email to carolg for entry

Arts - Recreation - Entertainment

ArtCom Electronic Net	(g acen)	Audio-Videophilia	(g aud)	Boating	(g wet)
Books	(g books)	CD's	(g cd)	Comics	(g comics)
Cooking	(g cook)	Flying	(g flying)	Fun	(g fun)
Games	(g games)	Gardening	(g gard)	Jokes	(g jokes)
MIDI	(g midi)	Movies	(g movies)	Motorcycling	(g ride)
Music	(g mus)	Pets	(g pets)	Radio	(g rad)
Restaurant	(g rest)	Science Fiction	(g sf)	Singles	(g sin)
Sports	(g spo)	Television	(g tv)	Weird	(g weird)

Grateful Dead

Grateful Dead	(g gd)	Deadlit	(g deadlit)	Feedback	(g feedback)
Tapes	(g tapes)	Tickets	(g tix)	Tours	(g tours)

Computers

AI/Forth	(g ai)	Amiga	(g amiga)	Apple	(g app)
Atari	(g ata)	Computer Books	(g cbook)	Art & Graphics	(g gra)
Hacking	(g hack)	HyperCard	(g hype)	IBM PC	(g ibm)
LANs	(g lan)	Laptop	(g lap)	Macintosh	(g mac)
Mactech	(g mactech)	Microtimes	(g microx)	OS/2	(g os2)
Printers	(g print)	Programmer's Net	(g net)	Software Design*	(g sdc)
Software/Programming	(g software)	Unix	(g unix)	Word Processing	(g word)

* Private conference - send email to mkapor for entry

Technical - Communications

Bioinfo	(g bioinfo)	Info	(g boing)	Media	(g media)
Netweaver	(g net)	Packet Radio	(g packet)	Photography	(g pho)
Science	(g science)	Technical Writers	(g tec)	Telecommunications	(g tele)
Usenet	(g usenet)	Video	(g vid)	Virtual Reality	(g vr)

The WELL Itself

Deeper	(g deeper)	Entry	(g ent)	General	(g gentech)
Help	(g help)	Hosts	(g hosts)	Policy	(g policy)
System News	(g news)	Test	(g test)		

The WELL

by John Coate

I WORK AT THE WELL, Whole Earth's online computer conferencing network. The WELL itself sits in an air-conditioned closet at the Whole Earth office. A bunch of phone lines come into the building. There's a modem for each phone line. These modems in turn are wired up to a Vax computer. The Vax is about the size of a large dishwasher. We can handle up to 23 callers at a time, which we often do with over a thousand people logging in each month. When people visit us they like to go in and look at the equipment. When you see the lights on the modems flickering you know that conversations are happening. Minds are meeting.

Personal computers are amazing communication tools. Put a computer together with a modem and you can converse simultaneously with several people, collaborate on writing projects, find work, gather and refine ideas, get technical updates, swap some stories, argue politics, and get a recommendation on a good restaurant and movie without getting up from your desk. Online conferencing networks can be both a place where you meet people — like a neighborhood pub — and a tool for gathering and storing information.

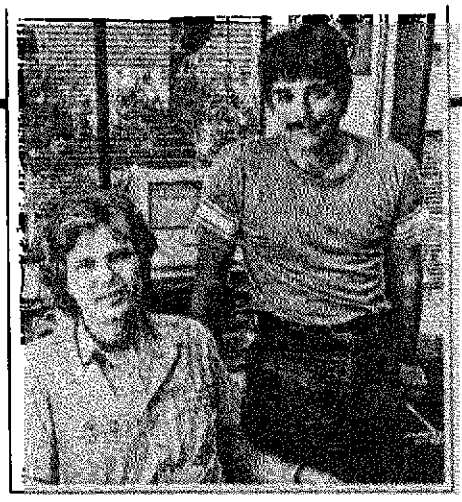
As I sit at my desk in the WELL office shuttling between conferences, doing mail, writing pieces like this one, and talking online as well as on the phone to new users, I check to see who is logged in every few minutes. I know most of the names. Because we have had a lot of social gatherings I know many faces to go along with the names. Many have become my good friends.

Sometimes when I'm working I feel like I'm in the wheelhouse of a big Mississippi riverboat. On the decks people are strolling and talking as they lean against the rail. There's a casino and parlors and places to eat. Way down below they're talking shop with the machinists. There are regulars and newcomers. Everyone has a unique point of view. Sometimes it's choppy, but usually it's steady as she goes.

WELL stands for Whole Earth 'Lectronic Link. It's the collaborative brainchild of Whole Earth's Stewart Brand and Larry Brilliant, best known for his work with the SEVA Foundation and head of Network Technologies (NETI). Whole Earth and NETI each own half of the WELL. After spending time working on projects through the EIES network, Stewart and Larry conceived the WELL as a place where a variety of people could meet online without spending an arm and a leg. Early on Stewart said the WELL is the "kind of thing coffee shops were supposed to be about, but are pretty hard to find these days."

Although there is a lot of useful information stored on the WELL like in a library, it is through conversing in conferences, electronic mail (email) and real-time that the fabric of the community is knit.

There are over ninety WELL conferences. Some are computer specific, some are technical, and some consist of people throwing out their ideas, telling their stories or arguing social and political issues. After talking with people about all kinds of different things over time you get the feeling that you know that person even if you have never met face to face.



John Coate [left], on-line party host and Welcome Wagon Chairman; Cliff Figallo [right], WELLville Town Supervisor. Respectively, "tex" and "fig" on the WELL.

So you cruise around to different conferences and you find out what people think about things. The information moves "horizontally" among the peer group of the participants. Anyone can start a discussion topic in a conference. Topics can be linked between different conferences. After awhile I think the word "community" begins to describe what goes on better than does "network." In a community, the interactions are ongoing. You run into some of the same people every day. Over time, professional and personal interaction can overlap. There becomes a sense of place to it. It often reminds me of an electronic Greenwich Village. Logging in can be like going down to the street to check the action.

We don't have a lot of rules; we manage the WELL in a very low key style. It really can't be done any other way. The keystone of the WELL organization is the conference hosts. Every conference has a host. That word was very deliberately chosen. Public online conferences are a lot like ongoing parties and someone has to make sure there's ice in the cooler, food on the table, continuity in the discussions, and good general organization.

Online conferencing is talking by writing. You set up your context, get to the point, and get out. Because it's a conversation between sometimes fairly large groups, you don't want to "dominate the rap" and you don't want to be repetitive. You have to remember that people are looking at computer screens, which seem to put unique demands on people's ability to focus on long-winded pieces. If your "posting" runs longer than one or two screen lengths, it had better be pretty interesting. And you will hear from people if they think you ramble too much.

The flip side of that, though, is if you have a good story to tell or enjoy quality repartee, or can lay out and quickly back up an argument or insight, then the chemistry can be there for a kind of ad hoc think tank that has soul and is fun. We talk about everything from war and law, music, work, birth, death, where this "info age" is going, and AIDS to online talk shows, tales of past experiences and exploits, online gift notifications (better known as Pokeybux), your thoughts on human relationships, bugs in the latest version of PageMaker, reports of WELL weather, the Maddog Improvement Society, and critiques of the latest Grateful Dead show.

Ah yes, the Deadheads. There's plenty of action around the Grateful Dead. The Grateful Dead Conference is the WELL's largest, with people logging in from all over the country. It's mostly good talk, but some online collaboration happens too. Once we designed a WELL T-shirt together. We chose the design, had someone take the money and another person got them printed up.

The WELL is a confluence of social and cultural elements. Similar to Chesapeake Bay, where nine different rivers merge, the WELL's character comes from hackers, writers, artists, Deadheads, knowledge workers, fugitives from the counter-culture, educators, programmers, lawyers, musicians, and many more.

The Info conference, for example, is regularly visited by a magazine editor, a college journalism teacher, an author, a consultant to a state assembly committee, an info age muckraker, a retired Army colonel turned info age pioneer, a manager from Pacific Bell, a librarian, and members of the Congressional Office of Technology Assessment. We evaluate news, laws, discuss government hearings, and theorize about the forces at play that are attempting to capture their piece of the action as these new information tools become more widespread. It's exciting, relevant stuff because it has to do with basic Constitutional freedoms. In these discussions, age, race, or culture don't matter. Your contribution to the discussion is the only thing that counts.

I think if the WELL establishes one thing it is that meeting through computers doesn't have to be a step in some inexorable march toward an Orwellian society with people droning away at isolated terminals. There is a kind of magic to the fact that real human emotions, "vibes" if you will, can carry through the chips and wires.

If you can get your computer and modem to dial a phone number, you can log in to the WELL. Usually the default settings that come with the communications program work fine. The WELL does cost money to use, but at $8/month + $3/hour the rates are among the lowest in the country for comparable facilities.

Actually, the phone company makes more on this than we do. But we have ways of tipping the balance sheet more in your favor on the cost of the phone call. If you live outside of the San Francisco Bay Area you can save substantial money on the phone call by reaching the WELL via CPN. If you live in the Bay Area call us and we'll give you tips on cheaper phone access through special local lines. In addition, the WELL is one of the few places where an individual account has full access the the worldwide UNIX community through USENET and UUCP mail.

To sign up just call 415/332-6106 with your modem and type newuser <cr> at the Login: prompt. Or call us at 415/332-4335 if you'd like more information.

FROM SIGNAL, A WHOLE EARTH CATALOG - HARMONY BOOKS 1988

CONFERENCES ON THE WELL

Business - Education

Brainstorming	(g brain)	Classifieds	(g cla)	Consultants	(g consult)
Consumers	(g cons)	Design	(g design)	Desktop Publishing	(g desk)
Education	(g ed)	Entrepreneurs	(g entre)	Legal	(g legal)
Newsletter	(g per)	Stock Market	(g stock)	The Future	(g fut)
Translators	(g trans)	Travel	(g tra)	Work	(g work)

Social - Political - Humanities

AIDS	(g aids)	Archives	(g arc)	Berkeley	(g berk)
East Coast	(g east)	Emotional Health	(g bridges)	Environment	(g env)
Christian	(g cross)	Current Events	(g curr)	Drugs	(g dru)
Fringes of Reason	(g fringes)	Gay	(g gay)	Health	(g heal)
History	(g hist)	Jewish	(g jew)	Liberty	(g liberty)
Mind	(g mind)	Miscelaneous	(g unclear)	Men on the WELL**	(g mow)
Nonprofits	(g non)	Northwest	(g nw)	Parenting	(g par)
Peace	(g pea)	Poetry	(g poetry)	Philosophy	(g phi)
Politics	(g pol)	Psychology	(g psy)	San Francisco	(g sanfran)
Sexuality	(g sex)	Southern	(g south)	Spirituality	(g spirit)
Transportation	(g transport)	True Confessions	(g tru)	Words	(g words)
Whole Earth	(g we)	Women on the WELL*	(g wow)	Writers	(g wri)

** Private conference - send email to flash for entry
* Private conference - send email to carolg for entry

Arts - Recreation - Entertainment

ArtCom Electronic Net	(g acen)	Audio-Videophilia	(g aud)	Boating	(g wet)
Books	(g books)	CD's	(g cd)	Comics	(g comics)
Cooking	(g cook)	Flying	(g flying)	Fun	(g fun)
Games	(g games)	Gardening	(g gard)	Jokes	(g jokes)
MIDI	(g midi)	Movies	(g movies)	Motorcycling	(g ride)
Music	(g mus)	Pets	(g pets)	Radio	(g rad)
Restaurant	(g rest)	Science Fiction	(g sf)	Singles	(g sin)
Sports	(g spo)	Television	(g tv)	Weird	(g weird)

Grateful Dead

Grateful Dead	(g gd)	Deadlit	(g deadlit)	Feedback	(g feedback)
Tapes	(g tapes)	Tickets	(g tix)	Tours	(g tours)

Computers

AI/Forth	(g ai)	Amiga	(g amiga)	Apple	(g app)
Atari	(g ata)	Computer Books	(g cbook)	Art & Graphics	(g gra)
Hacking	(g hack)	HyperCard	(g hype)	IBM PC	(g ibm)
LANs	(g lan)	Laptop	(g lap)	Macintosh	(g mac)
Mactech	(g mactech)	Microtimes	(g microx)	OS/2	(g os2)
Printers	(g print)	Programmer's Net	(g net)	Software Design*	(g sdc)
Software/Programming	(g software)	Unix	(g unix)	Word Processing	(g word)

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System News	(g news)	Test	(g test)		

This is The WELL . . .

The WELL is a teleconferencing system that lets you use your computer and modem to "talk" with other people by writing to them, either privately or in public discussions. Combining the best things about the telephone and the postal service, it improves your efficiency and lets you meet with people at any time without having to get up from your desk. The WELL is a mind pool, an information exchange, and a source for great conversation. It's a place where professional and personal interactions overlap, weaving a tapestry of interactivity that approaches a village-like quality in an electronic environment.

Winner -

***1990 Best Online Publication**
-Computer Press Association

***1988 Community Journalism Award**
-Bay Area Media Alliance

1200 or 2400 baud . . .

Dial 415/332-6106 for 1200 baud or 415/332-7358 for 2400 baud. You call will "hunt" through our many lines and connect you to the first available modem.

The WELL is fast . . .

The WELL runs on a speedy Sequent computer that quickly accepts your login and then responds almost instantly to your commands.

. . . and inexpensive.

Just **$8/month plus $3/hr** billed by the minute. You also get up to 500K free file storage in your personal WELL directory. Additional storage is available for a nominal charge.

Easy access:

Any combination of computer, modem, and communications software can log in to the WELL. You can reach the WELL through the CompuServe Packet Net, greatly reducing long distance access charges. The rate is $5/hr day or night from most U.S. cities. Save on international calls through CPN too. Call 800/848-8980 and ask for your nearest local CPN number. When you connect through CPN it will say **Host Name:** Type **well <cr>** and you'll see the WELL login prompt. If you are in the San Francisco Bay Area, call us and we'll give you tips on cheaper phone access through special local lines located in the East Bay. Plans for new Bay Area lines are in the works.

Easy dialup:

The default settings on your communications program work fine in most cases. IBM types prefer 7 bits/char, 1 stop bit, and even parity.

Easy registration:

When you get connected you will see the login banner. It will look like this:

```
This is the WELL

DYNIX (R) V 3.0.14 (well)
Type your user name or "newuser" to register
login:
```

Type **newuser** hit the <cr> and go through the self-explanatory registration. Your account opens after one business day if you pay with your credit card. Log in and read the Entry Conference to get oriented. You will receive a manual in the mail.

Send in this coupon when you join the WELL and **get five hours free!**

The WELL is an interactive Sunday paper, a business tool, a potluck for people who love ideas, discourse and language, a resource for technical help, and a place to get a good intellectual massage. Join us online!

Name _____ Login ID _____

Address _____

City _____ State ___ Zip_____

"A rebirth of community"
-John Markoff, New York Times

"The areas of expertise are astonishing in their diversity"
-Jon Carroll, San Francisco Chronicle

"One of the liveliest outposts of the electronic underground"
-Mike Miller, Wall Street Journal

The WELL

Information, networking, business, technical help, news, conversation, contacts, culture, friends, and fun.

The WELL
Whole Earth 'Lectronic Link

27 Gate Five Road, Sausalito, CA 94965
415/332-4335 (voice) 415/332-6106 (modem)

The Tools

Take part in public discussions:

Conferencing is a unique form of written public dialogue. By leaving written messages, any number of people can converse about any subject without having to meet at the same time or place. You check in at your convenience. The WELL has over ninety public "conferences", each hosted by an individual. Some are computer specific such as the Macintosh Conference, or the IBM Conference, some are technical like Telecomm and Science, and many consist of people putting forth their ideas, telling their stories, reviewing restaurants and movies, or discussing social and political issues. Active conferences are like ad hoc think tanks that are lively and sharp. Each conference consists of different topics, each one a specific conversation. Read online, download and read offline, or search for material by keyword. After each topic you may add your own comment to the conversation or move on to another topic. Words, Current Events, True Confessions, Parents, Health, and Sexuality are just a few of these fascinating forums. Any business, organization, or private group can have a private conference, accessible only to the members. There is no extra charge for these services. Call us for details.

Instant private communication with Electronic Mail:

The WELL has a fast and sophisticated electronic mail facility. Send mail to an individual or a group. Each time you log in, the WELL tells you if you have mail. After reading and responding to your messages you can delete them or store them in an electronic mailbox for future reference. There is also a "send/reply" facility that allows real time dialogue.

File management helps you stay organized:

Transfer text and program files between your computer and the WELL. Your own file directory is created when you register. Share documents or collaborate on work from remote locations. There is a large library of Macintosh software available for "downloading" through the WELL Macintosh Conference.

Connect to a worldwide network:

As a member of the WELL you have full access to a huge international communications network that connects universities, businesses, and research institutions. The WELL is one of the few public places where you can exchange email and participate in conferences to the thousands of sites around the globe.

The Community

The WELL is a meeting of minds, a confluence of diverse social and professional elements: programmers, writers, artists, knowledge workers, educators, lawyers, consultants, musicians, and many more. Quickly you will see that there is a real sense of place to it, like a neighborhood pub or a large dinner table. The fabric of community is knit through the conferences, email, and real-time conversations. Because these conversations range from technical and specific through theoretical and abstract to humorous or even surreal, you may come away from a WELL session with more than just the answer to a question. Professional and personal interactions often blend. Over time, trust develops. That is the real essence of networking.

THE CLEVELAND FREE-NET COMMUNITY COMPUTER PROJECT: YEAR I REPORT

July 1, 1986 - July 1, 1987

T.M. Grundner, Ed.D
Project Director

Sharron S. Carlson, M.S.L.S.
System Manager

Roger A. Bielefeld, Ph.D (Cand.)
Project Computer Scientist

The Cleveland Free-Net Project
Box 1983
Cleveland, Ohio 44106
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General Background

The Cleveland Free-Net has it's origins in an experiment conducted at the Case Western Reserve University School of Medicine in Cleveland, Ohio. In the Fall of 1984 Dr. Tom Grundner, of the Department of Family Medicine, set up a single phone line, computerized, "Bulletin Board" system to test the efficacy of using this media as a means of delivering general health information to the public. The heart of the system was an interactive area where laypeople could call in using their home or business computers, leave medically related questions and have them answered by a physician within 24 hours. The experiment proved so successful that it attracted the attention of the Information Systems Division of AT&T who funded a larger project to expand and develop this interactive concept.

Based on this donation, Dr. Grundner began work on a full scale "community computer system" on an AT&T 3B2/400 computer with 15 incoming phone lines. Known as the Cleveland Free-Net Project, it was designed to serve as a community information resource in areas as diverse as law, medicine, education, the arts and sciences, and government--including free electronic mail services for all citizens in northeast Ohio.

The following is a report on the first year's operation of that system.

Start-up Phase

The Cleveland Free-Net was officially opened on July 16th 1986 by Governor Richard Celeste of Ohio and Mayor George Voinovich of Cleveland as the nation's first, free, open-access community computer system. As one might expect, the first few months of operation, our start-up phase, was not easy.

We opened the system with our software only partially completed. The initial layout consisted of the electronic mail module plus two or three "buildings" of the much larger "electronic city" we were trying to create. We were hoping this would provide sufficient function to attract an initial user base while further development of the software continued. In this we were quite correct. What we didn't anticipate was a whole series of hardware problems involving memory chips, the hard disk, the operating system, and the

modems. These problems continued to mount into the Fall and radically slowed our programming progress.

By mid-December the hardware problems were solved and software development was picking up. The next major task was to obtain ongoing operational monies. We needed funds to pay for phone lines; to pay our programmer; to support some minimal level of clerical help; and to pay for the necessary mailings, xeroxing, and other related expenses. With the resolution of the hardware problems our user base was growing but our inability to do these basic clerical and operational tasks was seriously hampering the utility of the system.

Fortunately this crisis was alleviated in early January by a $44,100 donation from the Ohio Bell Telephone Company. This donation, coupled with an earlier donation from the Health Systems Management Center of University Hospitals, insured the survival of the system for at least it's first year of operation.

System Growth

At the time of the Ohio Bell donation we were averaging less than 150 calls per day on a registered user base of less than a thousand people. The system now has almost 4500 registered users with 50 to 100 new registrations coming in each week and we are currently drawing over 500 phone calls a day (see Appendix I for demographic analysis). To provide a point of comparison, if these calls were evenly distributed, they would represent a new logon every 2.8 minutes, 24 hours a day, seven days a week--but even these numbers do not present a true picture of system demand.

By April our user base had thoroughly outstripped the capacity of our equipment to handle the load and we had to take five modems offline in order to keep the computer "sane." While this considerably smoothed out the performance of our software, it meant that our users would be facing busy signals on the 10 remaining lines at almost any hour, day or night. (At the moment a wait of a half-hour or more to get online is not at all uncommon.) Thus, the 500 calls-per-day figure just cited does not represent the hundreds who are turned away by the busy signals.

We are working to rectify this situation by attempting to re-structure the software and by seeking funding for a larger machine. If we are able to do either of these, we believe we can immediately jump system usage by at least

another 200-250 calls per day. If we can add more phone lines this Fall, it will go up even further. Indeed, even after almost a year of operating this system, we still do not know where the demand peak is for this service in the Cleveland area. The more we open up access, the more system usage goes up. We have no idea where it will begin to taper, but it is clearly well beyond where we are now.

System Services

The Cleveland Free-Net is a computer system that is designed to be designed by the users. When we opened up in July we, in effect, put a skeleton system in place. We designed the major "buildings" and implemented some examples of what could be done with them, then stood back to see who from the community would come forth to expand on the concept by suggesting and operating areas of their own. Again, we were not prepared for the response.

At the moment we have over 140 people from all walks of life who are operating various areas of the system (see Appendix II - Sysop List). These range from physicians and dentists who manage files and answer questions in the "Hospital" area, to scientists from NASA and the Cleveland Museum of Natural History who handle information in the Air and Space and Natural History Museum areas, to lawyers providing general legal information, to tax accountants, to veterinarians, to clinical psychologists (see Appendix III for a current system "map").

In addition to these direct services we also have several research projects underway to help further explore and understand this new media; and the system is being routinely used as a part of the curricula in institutions ranging from CWRU's School of Dentistry and School of Nursing, to a variety of public and private secondary schools. We even have our first doctoral dissertation being written about the system by a communications student at the University of Indiana.

Development of the system has not stopped, however. We have always viewed the current version of the software as a pilot version, one on which we would try a variety of approaches and programming techniques and see which works the best. While this learning process is one that will never stop, we have learned enough to justify writing a new version of the software. Accordingly, on June 1st we froze the addition of any new features on the system and began work on Version II software. If all goes well, we expect it to be in place by mid- to late-August.

Many of the improvements to be found in Version II will not be visible to the user. They will involve internal changes in the programming which will make for more efficient memory use, program speed, disk access, and so forth. Other changes, however, will be quite visible and will include: an easy to use editor for the electronic mail system; a full range of "go" commands which will allow the user to directly move from any place, to any place, on the system; a "chat" mode whereby people will be able to communicate directly with each other in real time; and other features.

One of the major "buildings" to be included in the new version will be an "Industrial Park" that will be designed to meet the needs of Cleveland's business and industrial community. One of the surprises we experienced in the development of this system so far has been the extensive use that has been made of it by small and medium sized businesses as an inexpensive way of having "corporate electronic mail." In the new version, we plan to encourage this use even further by developing an area that will be oriented to the informational needs of the business user. Included will be special areas representing the automotive industry (sponsored by the Automotive Industry Action Group), the small business community (with staff from the SBA and SCORE), occupational medicine, business computer users, and others.

One final item to be included in the new version will be the communications hooks necessary to allow our system to communicate with other Free-Net systems around the country. It will be necessary to add this because the Free-Net is beginning to clone itself.

System Dissemination

Part of the original intent of creating the Free-Net was to make it widely available to other communities. To this end, we decided to offer the software to any other city in the country, who met appropriate qualifying standards, on a lease basis, for $1 per year. As a result of this offer, on July 24th 1987 we will open the Youngstown Free-Net as a joint project between Youngstown State University and St. Elizabeth's Hospital (see Appendix IV for initial system structure).

The Youngstown opening will be an event of some significance to our development. For decades futurologists have speculated that someday there would be such a thing as free, open-access, community computer systems; but there are

two things that must be proved to everyone's satisfaction before any such experiment can be deemed a success. First you have do prove you can do it at all, then you have to prove you can do it elsewhere. We have already demonstrated the first and, if we can get Youngstown off the ground and operating smoothly, we will have proved the second.

We see the Youngstown system, however, as only the beginning. Altogether there over a dozen major cities around the country that are in various stages of planning Free-Net systems--including several cities in Ohio. This particular interest from Ohio, however, has caused us to draw-up plans for an "Ohio Telecomputing Network" that we hope will someday see a community computer in every major city in the state, and will see all of those systems linked together into a common communications grid. It is a system that is both technologically and economically feasible and, because it would be the first of its kind, would substantively enhance this State's image as a technological leader. While we have a similar set of plans under submission to the government of another state (at their request), we would like to proceed on an "Ohio-first" basis and funding possibilities for such a proposal are currently being explored.

With or without an Ohio Telecomputing Network, however, it is clear to us that the Free-Net has implications beyond the Cleveland area and we have little doubt that it will eventually develop into a nationwide system. To meet the needs of this eventual network, a non-profit corporation was created called the "Society for Public Access Computing" (SoPAC).

The Society for Public Access Computing (SoPAC)

On April 7th 1987 we formed a non-profit organization called the Society for Public Access Computing. Modeled somewhat after the Cousteau Society, this organization will function on the national level to coordinate the dissemination of Free-Net community computer systems, establish quality control standards, and provide technical and other forms of assistance to those systems as they come online.

SoPAC will operate on a voluntary membership basis. In other words, people may voluntarily join and pay dues to one of several membership categories. The use of any Free-Net system, however, is NOT contingent on whether or not a person joins the Society. Free-Net usage is free to all users; the purpose of SoPAC is to keep it that way. To help

do this, one of SoPAC's principal functions will be to serve as a conduit to channel monies back to the individual Free-Net systems. Thus, if a Free-Net user joins SoPAC and lists a given affiliate as his or her "home" system, that affiliate will be rebated 60% of that member's dues. The Society will keep 40% to provide the membership with a quarterly magazine, establish phone links between systems, improve the Free-Net software, and establish more Free-Net systems.

Conclusion

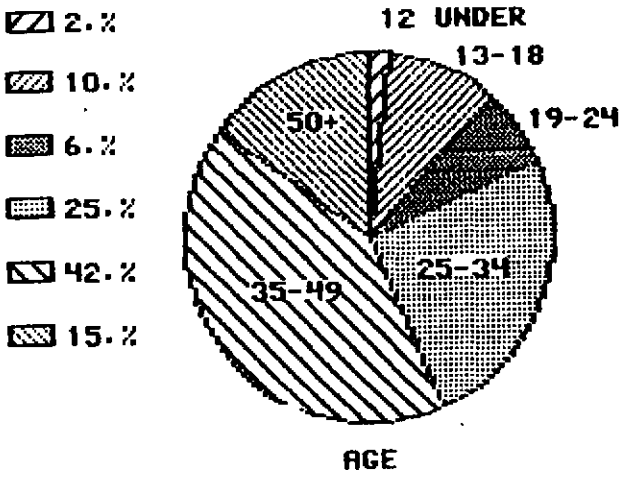
In short, this first year has seen a growth and development pattern far beyond anything we could have imagined. In September we thought if we ever broke 200 calls-per-day on the system we would be doing really well. We now routinely handle over 500 calls-per-day and the lines are jammed at all hours. In January we thought we had equipment that would meet our needs far into the future. Because of the incredible demand, however, we now find ourselves searching for funding for a larger more powerful machine and for monies to support further programming efforts. In April we thought it possible that someday other cities would want to have systems like ours and created the Society for Public Access Computing. In less than a month the Lt. Governor, the mayors of several cities, city councilmen, chamber of commerce representatives, and a host of other dignitaries will be opening up the next Free-Net in Youngstown, Ohio.

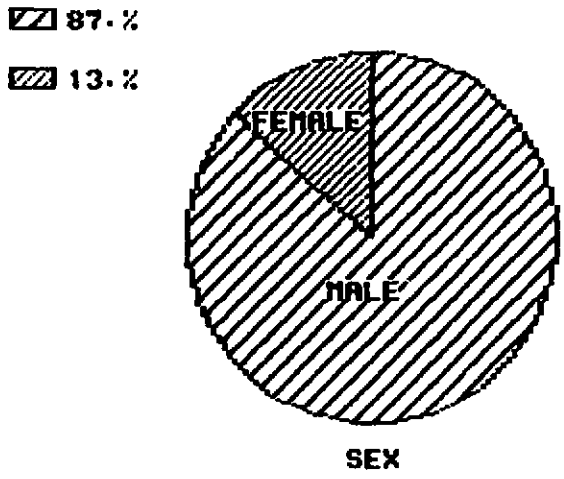
It is understatement to say we are very much looking forward to the coming year.

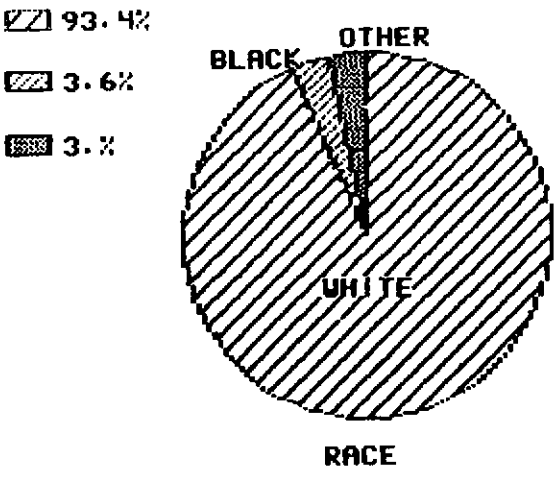
APPENDIX I

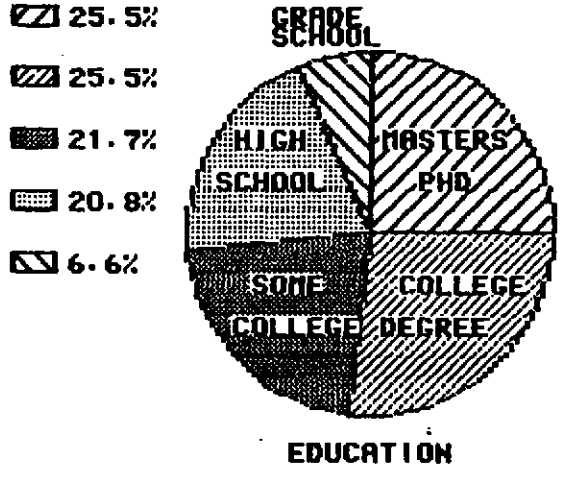
System Demographics

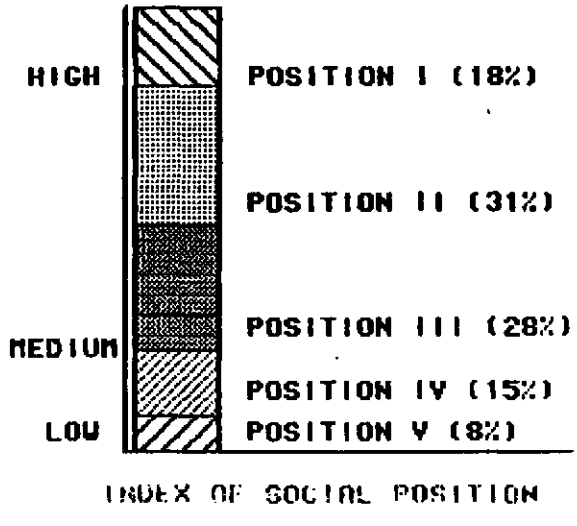
CLEVELAND FREE-NET DEMOGRAPHIC SUMMARY











CLEVELAND FREE-NET DEMOGRAPHIC SUMMARY
(Data representing 95.8% of total system population)

AGE:

12 or under	2%
13 to 18	10
19 to 24	6
25 to 34	25
35 to 49	42
50 or over	15

Mean	36.2
Median	36

SEX:

Male	87.3%
Female	12.7%

RACE:

White	93.4%
Black	3.6%
Other	3.0%

EDUCATION:

26.6%	Completed a graduate degree
27.3%	Completed a 4 year college degree
22.6%	Completed at least 1 year of college
11.7%	Completed high school
4.9%	Completed 10th or 11th grades
4.9%	Completed 7th, 8th or 9th grades
1.8%	Completed less than the 7th grade

OCCUPATION:

Hollingshead Scale:

19.8%	Higher executive, proprietors of large concerns and major professionals
27.9%	Business managers, proprietors of medium sized businesses, and lesser professionals
20.6%	Administrative personnel, small independent businesses, and minor professionals

13.8% Clerical and sales workers, technicians and owners of little businesses

7.9% Skilled manual workers

7.3% Machine operators and semi-skilled employees

2.7% Unskilled employees

INDEX OF SOCIAL POSITION: (*)

	Social Class	%
High Position	I	18.5%
	II	30.6%
Middle Position	III	28.2%
	IV	15.0%
Low Position	V	7.6%

Average Social Position Index: 2.95

(*) Based on Hollingshed's Two Factor Index of Social Position

6/26/87

CLEVELAND FREE-NET COMPARATIVE DEMOGRAPHIC SUMMARY

	Total US (for Ref)	Total PC Own	Modem Owner	Online Subscr	Free-Net Users
AGE:					
12 or under	20% (13 under)	5%	1%	1%	2%
13 to 18	6 (14-17)	15	12	7	10
19 to 24	12 (18-24)	8	7	6	6
25 to 34	17 (25-34)	19	19	18	25
35 to 49	13 (35-44)	32	39	44	42
50 or over	31 (45 over)	21	22	24	15
SEX:					
Male	49%	72%	81%	89%	87%
Female	51	28	19	11	13
RACE:					
White	83%	--	--	--	93%
Black	12	--	--	--	4
Other	5	--	--	--	3
EDUCATION:					
Masters/Ph.D	--	22%	30%	31%	27%
4 Year Degree	19 (all)	24	28	36	27
Some College	16	21	22	16	23
High School	57	25	18	14	22
Grade School	8	8	2	2	2

OCCUPATION: (Free-Net Data Only)

Hollingshead Scale

- 20% Higher executive, proprietors of large concerns and major professionals
- 28% Business managers, proprietors of medium sized businesses, and lesser professionals
- 21% Administrative personnel, small independent businesses, and minor professionals
- 14% Clerical and sales workers, technicians and owners of little businesses
- 8% Skilled manual workers
- 7% Machine operators and semi-skilled employees
- 3% Unskilled employees

INDEX OF SOCIAL POSITION: (*) (Free-Net Data Only)

Social Class		%
High Position	I	18%
	II	31
Middle Position	III	28
	IV	15
Low Position	V	8

Average Social Position Index - 2.95

(*) Based on Hollingshed's Two Factor Index of Social Position

6/26/87

The Society for Public Access Computing

THE FREE-NET COMMUNITY COMPUTER SYSTEM
(Multi-User Version)

Operational Information

T.M. Grundner, Ed.D -
Executive Director
The Society for Public Access Computing
Box 1987
Cleveland, Ohio 44106
(216) 368-2733

A Non-Profit Corporation
Developers of the Free-Net Community Computer Network

THE CONCEPT:

The Free-Net Community Computer software represents a relatively new concept in computing. It provides high volume electronic information and communications services to a community in much the same way as a public library, for example, serves a similar function with the printed word. It can be accessed by anyone with a home or office computer and a modem and, depending upon which modules you select for your system, can serve as everything from an electronic mail service, to a source of information about health care, education, technology, government, or just about anything else you would choose.

The software is being distributed by a non-profit corporation called the Society for Public Access Computing and is being made available to qualified parties, on a lease basis, for $1 per year.

With this system we are hoping to accomplish two major objectives. First, we are hoping to promote and develop the concept of community computing. Probably the best way to illustrate what we have in mind is by drawing an analogy to the development of the public library system in this country. In the mid-1800's, for all practical purposes, there was no such thing as the public library. When literacy finally got high enough (and the cost of books cheap enough) there was a tremendous interest in providing people with free, open access to the printed word. We believe a similar phenomena is occurring today where computer "literacy" is getting high enough (and the cost of equipment cheap enough) that there is now forming an analogous demand for free, open access, public computing systems. The reason we are making the Free-Net software available to any qualified party for $1 a year is to help promote this community computing concept. We believe this new media can and should be made accessible to the widest possible spectrum of people.

Second, the Free-Net is also a laboratory. It is a cliche to say that computing is in its infancy. But, cliche or not, it is true. As sophisticated as we think we have become with these machines we must remember that we are really doing nothing more than kicking the tires on a "Tin Lizzie." In the specific area of telecomputing, we are experimenting literally with a whole new media--one that is quite distinct from radio, television, and print, yet having characteristics of all three. We need to study it. We need to know much more about its exact nature and the best way of

harnessing its unique characteristics. That is the second objective of our work.

As the Free-Net concept expands, as more and more cities adopt Free-Net systems, the implications of these systems for large scale community education and information delivery become enormous.

THE SOFTWARE:

The Free-Net software is arranged utilizing an "electronic city" metaphor (See Attachment I). Following this metaphor, we have tried to provide a range of services that parallel those found in almost every real city. Thus you will see various areas of the system bearing titles such as: the "Post Office," the "Schoolhouse," the "Hospital," "Government House," etc.

The software is modular in design which allows the operator to tailor it to meet the needs and interests of their particular locale. At the moment there are seven basic modules that can be quickly "snapped" together to provide a wide variety of services and features. How these modules are used are limited only by your imagination and the needs of your community.

To visualize the functions of these modules you may want to refer to Attachment I which is a more or less up-to-date "map" of our current system or, better yet, log on to the system itself (216-368-3888 - 300/1200 baud) to see how these various modules work.

The six basic modules are:

TEXT FILE TYPE: When this module is selected a text file is "typed" (sent) to the users screen. Every 20 lines the typing will stop and provide the user with a "Press RETURN to Continue, Q to Quit" prompt. (Example: See any "Information Desk" or "About the..." option.)

MENU/TEXT FILE TYPE: This module presents the user with a numbered "menu" of items. Depending on the item selected, a file is typed to screen as described above. These are controlled areas where only system operators or other authorized people are allowed to post materials. (Example: See "What's New in the Electronic City")

ELECTRONIC MAIL: This refers to a true account-to-account private electronic mail system. Included are "Post Office Boxes" which store mail for the user, multiple

addressee mailing, complete editing capabilities, and even a spelling checker. (Example: See the Post Office/Send Mail) The basic elements of this module, by the way, are also used in almost any area where text is being placed on the system by a user.)

BULLETIN BOARD: This module allows the users to type-in or upload whatever information they would like. It is immediately displayed in a menu driven format for others to read. (Example: See Public Square/The Kiosk)

Q & A: This module allows the user to type in open-ended questions which are then sent to a buffered area of the computer. This buffer is accessible only to appropriately authorized individuals. When the answering individual (for example, one of the physicians working in the hospital area) comes online, he or she can go to this buffer, read these questions, answer them, and place them back on the general system for all to read. (Example: See the Hospital/Family Medicine Clinic)

DATABASE: An all-purpose module which allows people to search and retrieve information. This can range from information on other users, to calendars of events. (Example: See the Post Office/P.O. Box Directory)

CHAT: A module which allows users to "talk" directly to each other in real-time. A message typed by one person will appear on the screens of any others who are currently on the system and who have entered into "chat-mode" with that person. (Example: See Public Square/the Cafe)

In addition there are special software modules that are designed for use by the individuals in the community who will be operating most of the areas on your system. Access to this software occurs via the Main Menu. These individuals, known as "sysops," will have specially tagged ID numbers. If a regular user has, for example, ten choices on their main menu, when a sysop comes online he or she will see an 11th selection called System Administration. This will give the sysop access to the software he or she needs to upload and delete files, answer questions, etc. There is also a special area which allows you to monitor and manage the system as a whole.

We will provide you with a "Core System" (see Attachment II) which consists of the "What's New" feature, the Administration Building, The Post Office, Public Square, and System Administration. Off of this you can use the above mentioned modules to construct an "Electronic City"

that is tailored to the needs and interests of your own particular locale.

All software is written in "C" and operates in a Unix environment. Because we have not yet had the time to develop our own database system, however, you will find a commercial database program called "Informix" underlying portions of this system. We will provide the Free-Net software under the terms of the lease. **Because of copyright restrictions, however, for the time being you must provide your own copy of Informix.** In addition, your version of Unix must be the equivalent of Unix System V Version 2.1 or later (i.e. it must have "demand paging" as one of its features); and, of course, you will need a C compiler to run the software.

EQUIPMENT REQUIREMENTS:

As mentioned above, the program is written in "C" for a Unix operating environment which makes it transferable to a wide variety of computers. We happen to be using an AT&T 3B2/400 computer, with 4 mb of RAM and 144 mb of hard disk storage. We also have 15 incoming phone lines servicing the system although it now appears this number will have to be increased. Free-Net software will drop immediately into any AT&T 3B-series machine. We are prepared, however, to produce adapted versions for virtually any other kind of Unix/C equipment.

In general, we would recommend no less than two mb of RAM and no less than 72 mb of hard disk. (In both areas, more really is better.) The number of phone lines you have will depend on your potential user base. From our experience, however, it is difficult to imagine even a small urban area that would require less than five lines and a very large metropolitan area may require as many as 30 or more.

We also recommend that the Free-Net be operated on a dedicated machine, that is, that it NOT be run on a machine that is carrying other services. The reason for this is one of security. In most cases, a multiple-use Unix machine will allow its various users access to the "shell" -- the basic operating level of the system. Once into the shell it is difficult to keep an unscrupulous user from crossing into the the Free-Net area, there to possibly tamper with the program, compromise the electronic mail accounts, and so forth. This situation can be controlled only if a user can not get on the machine at all unless they are entering the

Free-Net program. Once in the program, the user's options are prescribed and certainly do not include shell access.

STAFF REQUIREMENTS:

We recommend a core staff of at least two and a half full-time equivalents--a project director, a system manager, and at least a half-time clerical person.

Project Director: The function of the Project Director is basically four-fold.

First, he or she must be a community organizer. This system runs because a wide variety of people IN THE COMMUNITY make it run. These people (the sysops) provide the time, effort, and expertise to operate its various components. The Project Director needs to be able to locate these individuals and/or the organizational sponsors of these individuals and get them to participate in the system. He or she ideally should have a broad base of contacts within the area's computer community, or be willing to develop them. (A bit of flair for PR and some experience working with the media won't hurt either.)

Second, he or she must be a fund raiser. In addition to seeking and landing grants and donations, he or she should be prepared to assist other organizations and individuals that are on the system to seek their own grants and donations.

Third, he or she must constantly be on the lookout for ways in which the system can be improved and new features added because the Free-Net must constantly be geared and re-geared to the information and communications needs of the community. This requires a genuine sensitivity to and understanding of the needs, abilities, and limitations of the user base.

Finally, and perhaps most importantly, he or she must be something of an entrepreneur. The person must always be on the lookout for new ways in which this media can be used and must be willing to spend the time and the effort necessary to make the contacts, land the grants, or whatever else is necessary to make things happen.

System Manager: The system manager is responsible for the day-to-day operations of the system. This includes everything from answering questions and complaints from both users and sysops, making sure the sysops are operating their respective areas properly, seeing that the clerical

functions are staying current, making sure that system back-ups and other routine system maintenance is occurring, and doing other miscellaneous tasks to keep things running smoothly.

The person must work very closely with the Project Director, must have a firm grasp of what the system is about, where it is going, and how it works. He or she must also have good communication skills and be able to work well with the general public.

Finally, the person should have a working knowledge of the Unix operating system--at least through the level of understanding the file structure, being able to copy and move files, and being able to use the vi or ed editors to create or modify text.

Clerical Person: Because the system uses a paper registration system (as opposed to an online registration system) a fairly high volume of paperwork must be handled. Registration forms must be mailed out to those requesting them; incoming forms must be processed, the data placed into the computer and ID numbers sent out; databases of user information must be maintained and other clerical functions need to be performed. At least a half time person (with good typing skills) is necessary.

For most systems, these three people will constitute an adequate core staff. The absolute minimum staff, we believe, would consist of a full-time project director, a half-time system administrator, at least a 33%-time clerical support person.

INSTALLATION AND TRAINING:

To install the system and train your personnel will require us to send out three people to your location for two days. We will send a project director, a system manager, and--assuming your equipment is in place, formatted, and ready to go--a programmer. There is no charge for these individuals' time but, at this point, we must ask that you re-imburse for transportation, lodging and meals.

COSTS OF OPERATING A SYSTEM

Obviously the costs of running a Free-Net system are going to vary widely from one area of the country to another, and by how much of the equipment and/or personnel might already be in place in a given location. Attachment

III presents a hypothetical "worst case" scenario where everything from equipment to office space must be obtained. You can scale these estimates up or down based upon your particular situation.

In our experience, however, we have found these systems to be generally quite "fundable." The innovative nature of the project and the impact these systems have on the community as a whole make them quite attractive to many local, state, and national funding agencies. In addition, we have established a further financial support mechanism through the Society for Public Access Computing.

FINANCIAL SUPPORT: SoPAC

As we are sure you are aware, saying that a Free-Net computer system is free to the user is not the same thing as saying that it costs nothing to operate. At the local level it will cost money to set-up these systems and to operate them over time. Furthermore, as Free-Net systems go up around the country, it is our intention to link those systems together into a nationwide network that will allow system-to-system communications and information exchange. Both of these objectives require the generation of ongoing monies.

Some of these monies will be generated through your own funding efforts--grants, donations and the like. But this does not insure a stable funding base over time and this stability is critical to the development of the entire concept.

To help with this problem we have created a nationally based <u>non-profit</u> organization to help promote and develop community computer systems. Similar to other special purpose organizations, such as the Cousteau Society for example, it is called the Society for Public Access Computing (SoPAC) and will function in this way.

As people in your area register on your system they will be giving you their mailing addresses so you can send them their ID's and passwords. As these addresses accrue, you will periodically forward them to SoPAC offices in Cleveland, Ohio. We will then mail a brochure and application form to these individuals in hopes of getting them to join the organization. It is important to point out here, however, that **<u>the use of any Free-Net system is in no way contingent upon joining this society</u>**. It is completely voluntary and would be somewhat analogous to joining, let's say, a "Friends of the Art Museum" group in your town. The

Art Museum is still free. The Friends of the... group is to help keep it that way.

In any event, there will be a variety of levels of membership dues, and the members will receive such benefits as an organization magazine, Society decal, etc. The dues we receive from the users of your system will be split 60/40--with **you** getting the 60%. So, let's say the average dues paid per person were $25 per year and you had 2000 users in your area that joined the Society. We would thus rebate $30,000 per year to you to be applied to the operations of your system. The remainder would go to help expand and link together the overall Network, publish a Society magazine, and so forth. The monies you receive from SoPAC would, of course, be in addition to any other monies you might raise via grants, donations, etc.

QUALIFYING FOR THE SOFTWARE:

The Free-Net Software is available on a lease basis for $1 per year. Before receiving the software, however, a formal document (the terms of the lease) will need to be signed. Included in this document will be items such as the following:

You must agree:

1. That access to the system and it's functions will be free to the user at all times--no charge for registration, no charge for system use.

2. That you will not release the software to anyone without our written permission.

3. That you will forward to SoPAC, on a monthly basis, the names and addresses of all registered users. As detailed above, these individuals will be sent a mailing soliciting membership in the Society.

4. That you will keep accurate records with regard to things such as: number of registered users, demographics of the registered users, number of calls per week, and other data as may be required, and will report them to the Society as prescribed.

5. To provide appropriate equipment and facilities to operate the system.

6. To provide guaranteed salary support for the core staff for a period of at least two years.

7. That the source code for any substantive modification, improvement, or addition to the Free-Net software that you develop will be submitted to SoPAC for possible re-distribution to the rest of the network. (SoPAC will own the copyright to any such changes. You will, of course, also receive copies of any modifications, improvements, or additions that have been made by any other affiliate.)

8. To make your system available to receive and send electronic communications from other affiliate systems around the country and from SoPAC when that service becomes available.

In return we will:

1. Provide you with the Free-Net software.

2. Install it and train your staff as outlined above.

3. Provide you with free copies of all program improvements or new modules created by us (or anyone else).

4. Provide ongoing technical and managerial advice and support.

5. Rebate to you 60% of all revenues received from SoPAC members who designate you as their home system. (Revenue disbursement will occur every six months. Any monies raised directly by you through grants, corporate donations, etc. is yours. However, you may not solicit in direct competition with the society.)

6. Automatically include your system in any future networking developments.

THE FREE-NET COMMUNITY COMPUTER SYSTEM

CORE MODULES

1. What's New in the Electronic City
2. The Administration Building
3. The Post Office
4. Public Square
5. ((Your Building))
6. ((Your Building))
7. ((Your Building))
8. ((et cetera))

1. WHAT'S NEW

A series of short articles listing new features or changes in the system.

2. THE ADMINISTRATION BUILDING

1. Information Desk
2. Obtaining the Free-Net Software
3. Index to Free-Net Services
4. User Directory
5. Comments to the Administrator
6. Online Users Guide
7. Change your Password
8. Receive FREE Registration Kit
9. Submitting a Proposal to Free-Net
10. The City Plaque
11. Who's Who on the Free-Net

3. THE POST OFFICE

1. Information Desk
2. Check Mail
3. Send Mail
4. P.O. Box Directory
5. Change your Password
6. Who's on the Free-Net
7. Change Personal Info.

4. PUBLIC SQUARE

1. Information Booth
2. The Podium (Electronic Speeches)
3. The Electronic Newspaper
4. The Cafe (Chat with other Users)
5. The Kiosk (Open Bulletin Board)
6. The Employment Office (Job Board)
7. The Computer Corner
8. Special Interest Groups

5. YOUR BUILDING

1. Information Desk
2.
3.
4.
5.
6.
7.
8.

6. YOUR BUILDING

1. Information Desk
2.
3.
4.
5.
6.
7.
8.

7. YOUR BUILDING

1. Information Desk
2.
3.
4.
5.
6.
7.
8.

8. YOUR BUILDING

1. Information Desk
2.
3.
4.
5.
6.
7.
8.

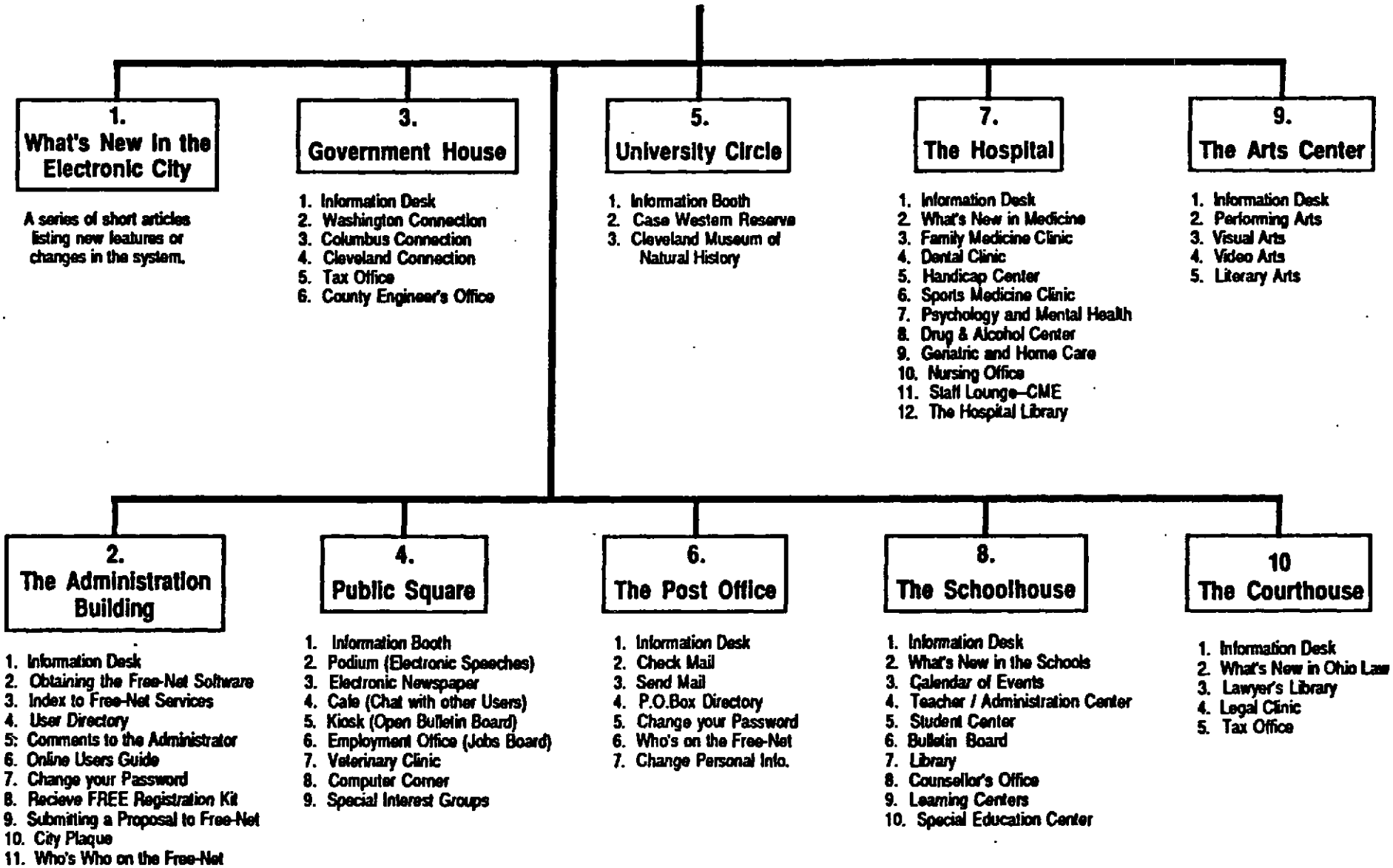
ETC.

ATTACHMENT II

Annual Cost Model for Community
Computer Operations
(First Year - Worst Case Scenario)

Staff	Salaries	Fringe (23.5%)		
Project Director	$35,000	$8225	$43225	
System Manager	25,000	5875	30875	
Clerical (1/2 time)	7,500	----	7500	
Sub-Total				$81600
Equipment				
AT&T 3B2/400 plus 10 modems ($45000) amortized over three years		$15000		
Administrative Microcomputer		2000		
Phone line installation (10 lines)		400		
Phone line rental (10 lines)		1800		
Sub-Total				19200
Office Space				
Office space rental for equipment and staff - Approx. 600 sq ft		$12000		
Office Equipment Purchase		5000		
Sub-Total				17000
Administrative Costs				
Xeroxing, Mailing, etc.		$6000		
Sub-Total				6000
Grand Total				$123,800

The Cleveland Free-Net Community Computer System
(216)-368-3888 [300/1200 baud]



Attachment 1

APPENDIX II

Community Volunteer (Sysop) List

The following is a list of the men and women in the Cleveland area who are operating the various areas of this system.

aa001	Tom Grundner, Ed.D	Instigator
aa002	Roger Bielefeld	Project Computer Scientist Sysop: UNIX SIG
aa003	Sharron Carlson	Project Manager
aa004	Jean Szucs	System Clerical Staff
aa005	Karen L. Jessen	Programming Assistant
aa006	Carla Martin	System Clerical Staff
aa200	Sandra Latonia	Coordinator of Handicapped Services
aa201	M.P. White, D.B.A.	Sysop: Science Fiction SIG
aa202	Steve Goldstine, DDS	Sysop: Dental Clinic - St. Silicon
aa203	Mèll Csicsila	Sysop: Public Square
aa204	Marti Bauschka, RN	Co-Sysop: Sports Medicine - St. Silicon
aa205	David Eros	Sysop: Cleveland Area BBS Listings
aa206	Gerri Gentile	Staff: Apple II SIG
aa207	Robert Garrett, MD	Former Chief of Staff: St. Silicon
aa208	Robert Kelly, MD	Ass't Chief of Staff: St. Silicon
aa209	Brian Callahan, MA	Sysop: The Schoolhouse
aa211	Aaron Leash, DVM	Staff: Cleve Museum of Nat. History
aa212	Ray Holan	Sysop: Alcohol & Drug Center
aa213	Francine Heckelman, RN	Sysop: Nursing & Home Care-St. Silicon
aa214	Edward Noe	Sysop: Chess SIG
aa215	Jorge Rangel, M.D.	Staff: St. Silicon
aa216	Jerry Sable, MD	Chief of Staff: St. Silicon
aa217	William Johannisson	Ass't Sysop: Science Fiction SIG
aa218	Mark Schmidt	Sysop: Cleve Museum of Natural History
aa219	Betsy Ruby	Liason: Mayor Voinovich's Office
aa221	Henry Greenwell, DDS	Ass't Sysop: Dental Clinic
aa222	Joe Cross, DVM	Sysop: Veterinary SIG
aa223	William Bohl, MD	Co-Sysop: Sports Medicine - St. Silicon
aa224	Carol Boscovitch	Co-Sysop: Apple SIG
aa225	Louise Acheson, MD	Staff: St. Silicon
aa226	Robert Bolster, MD	Staff: St. Silicon
aa227	Eric Celeste	Liason: Governor Celeste's Office
aa228	Sharon Comet-Epstein	Staff: Dental Clinic
aa230	Michael Landers, DDS	Staff: Dental Clinic
aa232	Stanley Hirsch, DDS	Staff: Dental Clinic
aa233	Elizabeth Robinson DDS	Staff: Dental Clinic
aa234	K. Ragunanthan, BDS	Staff: Dental Clinic
aa235	Mike Cover	Liason: Congressman Eckart's Ofc
aa236	Andrew Kosiorek	Sysop: Sinclair-Timex User Group
aa237	Robert Cederquist DDS	Staff: Dental Clinic
aa238	Patricia DeStadio	Staff: Dental Clinic
aa240	Henry Greenwell	Staff: Dental Clinic (Student)
aa241	Stan Michalski, DDS	Staff: Dental Clinic
aa243	Dan Labus	Staff: Sinclair-Timex User Group
aa244	Dick Sieg	Staff: Sinclair-Timex User Group
aa245	Robert Parish	Staff: Sinclair-Timex User Group
aa246	Dean Miller	Staff: Sinclair-Timex User Group

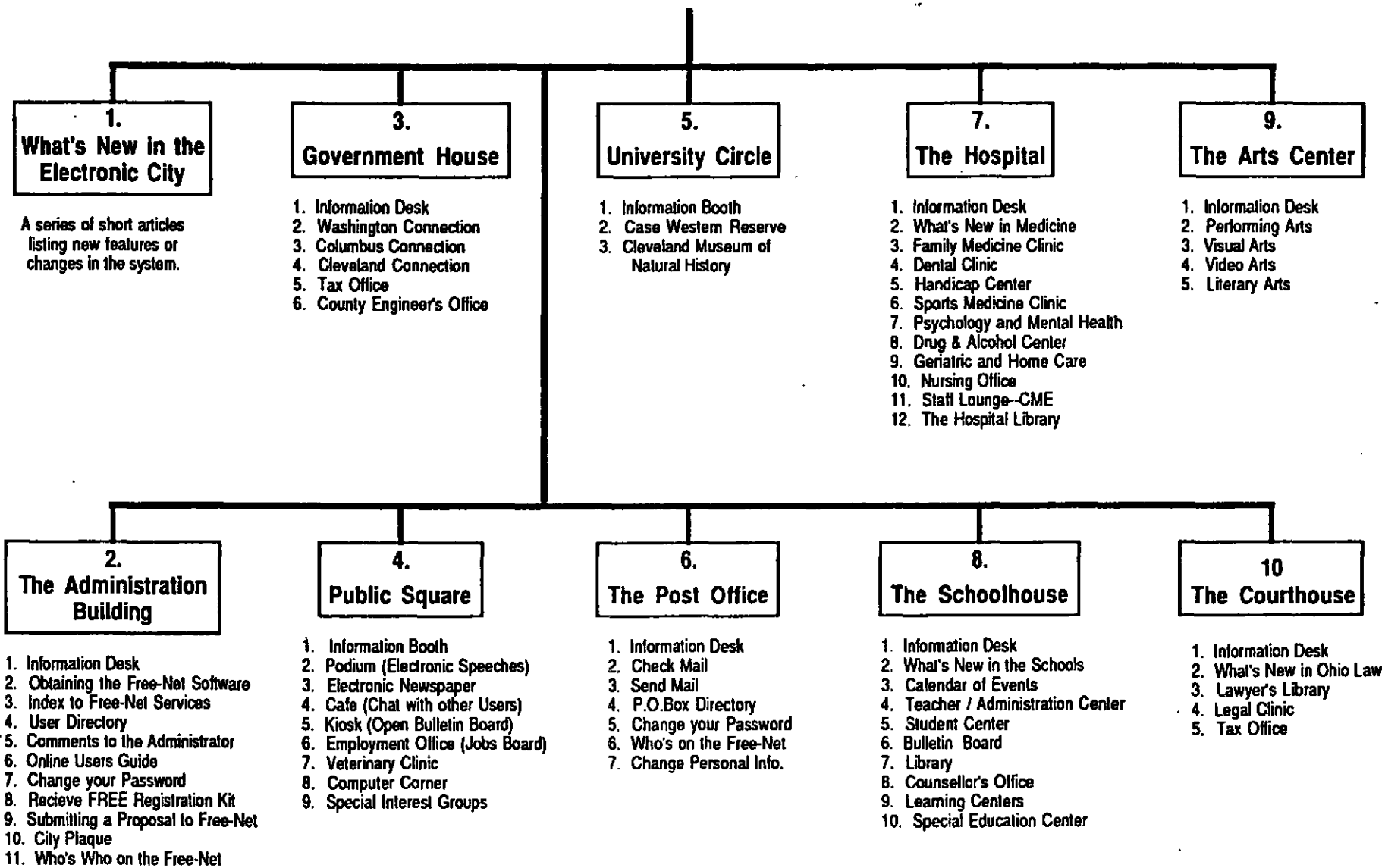
aa247	David Hosher	Staff: Sinclair-Timex User Group
aa248	Jason Chao, MD	Staff: St. Silicon
aa249	Charles Hogye	Sysop: MacIntosh SIG
aa251	Geza Terezhalmy, DDS	Staff: Dental Clinic
aa252	Tim Dedula	Co-Sysop: IBM SIG
aa253	Keven Pittsinger	Staff: Tandy SIG
aa255	Ted Fabian	Sysop: IBM SIG
aa256	Dr. Dino	Staff: Cleve Museum of Natural History
aa257	David Talan	Sysop: Texas Instruments SIG
aa258	Thomas Nellis	Co-Sysop: Texas Instruments SIG
aa259	Terry Vacha	Co-Sysop: Texas Instruments SIG
aa260	David Ellis	Sysop: CWRU Area
aa261	Rose Sherban	Staff: CWRU Area
aa262	Mary Beth Breckenridge	Staff: CWRU Area
aa263	Tom Shrout	Staff: CWRU Area
aa264	Michael Weil	Co-Sysop: Macintosh SIG
aa265	Lester Moes	Co-Sysop: The Schoolhouse
aa266	D.B. Cameron, DVM	Co-Sysop: The Veterinary SIG
aa267	Charles Mehozonek	Sysop: Commodore SIG
aa268	Jim Haynes	Sysop: Atari SIG
aa269	John Dille	Co-Sysop: Commodore SIG
aa271	John Suchy	Staff: Atari SIG
aa273	Joan Scholl	Staff: CWRU Area
aa274	James Claspill	Staff: Atari SIG
aa275	Todd Donovan	Paine Dealer: Weatherman
aa276	Eric Jessen	Ass't Sysop: Sci-Fi SIG
aa277	Robert Koren	Staff: Handicap SIG
aa278	Brian Wolf	Staff: CWRU Area
aa279	Peter Harmon	Staff: CWRU Area
aa280	Joel Armstrong	Staff: CWRU Area
aa281	Phil Newton	Staff: Dental Clinic (Student)
aa282	David Cegledi	Sysop: Tandy SIG
aa284	Holly Cook	Staff: Dental Clinic (Student)
aa285	Richard P. Szumita	Staff: Dental Clinic (Student)
aa286	Dhiraj Warman	Staff: Dental Clinic (Student)
aa287	Bob Montgomery	Staff: Dental Clinic (Student)
aa288	William Conroy, Jr.	Staff: Dental Clinic (Student)
aa289	Randall Niederkohr	Staff: Dental Clinic (Student)
aa291	Kimberly Rice	Staff: Dental Clinic (Student)
aa292	Carter Wright	Staff: Dental Clinic (Student)
aa293	Michael Rebeta	Sysop: The Tax Office
aa294	Ida C. Strozyk	Staff: The Tax Office
aa295	James Hamilton	Staff: Apple II SIG
aa296	Jeffery Gessler	Staff: The Tax Office
aa297	Peter Harmon	Co-Sysop: Amiga SIG
aa298	Scott Bessell	Co-Sysop: Amiga SIG
aa299	Melody Oakes	Staff: Cleve. Museum of Natural Hist
aa300	Jerry Murphy	Sysop: Tandy SIG
aa303	Arun Arora, BDS	Staff: Dental Clinic (Student)
aa304	John Bluck	Staff: Air and Space SIG
aa305	Marc Purdy	Staff: Dental Clinic (Student)
aa306	Tim Thomas	St. Silicon: Drug and Alcohol Center
aa307	Judith Olsen	Staff: Air and Space SIG
aa308	Ray Lark	Staff: Air and Space SIG

aa309	Lynn Bondurant, Ph.D	Staff: Air and Space SIG
aa310	James Dupuy	Staff: Sinclair SIG
aa311	Robert Sollod, Ph.D	Sysop: Psych. & Mental Health Area
aa312	Tom Hagesfeld, Ph.D	Staff: Psych. & Mental Health Area
aa313	Howard Goldstein, DSW	Staff: Psych. & Mental Health Area
aa314	Donald Spencer, Ph.D	Staff: Psych. & Mental Health Area
aa315	Fritz Foulke, M.D.	Staff: Family Medicine Clinic
aa316	Jack Joelson, Ph.D	Staff: Psych. & Mental Health Area
aa317	Michael Leach, Ph.D	Staff: Psych. & Mental Health Area
aa318	Douglas Moore, Ph.D	Staff: Psych. & Mental Health Area
aa319	Neil Zurcher	Sysop: Travel SIG
aa320	Lawrence Gmucs	Co-Sysop: Runner's SIG
aa321	Ken Lesure, Ph.D	Staff: Psych. & Mental Health Area
aa322	Susanne Lesure, Ph.D	Staff: Psych. & Mental Health Area
aa323	Joseph Volker, Ph.D	Staff: Psych. & Mental Health Area
aa324	Jim Dedula	Co-Sysop: Runner's SIG
aa325	Page Stephans	Co-Sysop: Skepticism SIG
aa326	Bob Lohman	Co-Sysop: Skepticism SIG
aa327	Penelope O'Conner	Co-Sysop: Skepticism SIG
aa328	Scott Harrod	Sysop: Culinary Arts SIG
aa329	Tracy Liston	Co-Sysop: Video Arts SIG
aa330	Neil Gould	Co-Sysop: Video Arts SIG
aa331	Steve Hilliard	Co-Sysop: Skepticism SIG
aa332	Daniel J. Ryan J.D.	Sysop: The Courthouse
aa333	Robert Hartman	Co-Sysop: Culinary Arts SIG
aa334	Cliff Swift	Project Researcher (Doctoral cand.)
aa335	William Beasley	Sysop: Gifted Education Area
aa336	Nick Poulos	Co-Sysop: Adam SIG
aa337	Herman Mason	Sysop: Adam SIG
aa338	Mark Leair	Co-Sysop: Adam SIG
aa339	Shiela Russell	Co-Sysop: County Engineer's Ofc.
aa340	Bill Taylor	Sysop: County Engineer's Ofc.
aa342	Douglas Sebring, Ph.D	Co-Sysop: Gifted Education Area
aa343	Les Moes	Co-Sysop: Math SIG
aa344	Roger Munger	Co-Sysop: Math SIG
aa345	Nancy Herron	Staff: Legal Clinic
aa246	Nick Sanduleak	Staff: Skepticism SIG

APPENDIX III

Cleveland Free-Net System Map

The Cleveland Free-Net Community Computer System
(216)-368-3888 [300/1200 baud]



APPENDIX IV

Youngstown Free-Net System Map
(Initial Configuration)

THE YOUNGSTOWN FREE-NET
COMMUNITY COMPUTER SYSTEM

(Initial Configuration)

1. What's New in the Electronic City
2. The Administration Building
3. The Post Office
4. Public Square
5. University Circle
6. The Hospital
7. (Government House)
8. (The Courthouse)
9. (The Schoolhouse)

1. WHAT'S NEW

A series of short articles listing new features or changes in the system.

2. THE ADMINISTRATION BUILDING

1. Information Desk
2. Obtaining the Free-Net Software
3. Index to Free-Net Services
4. User Directory
5. Comments to the Administrator
6. Online Users Guide
7. Change your Password
8. Receive FREE Registration Kit
9. Submitting a Proposal to Free-Net
10. The City Plaque
11. Who's Who on the Free-Net

3. THE POST OFFICE

1. Information Desk
2. Check Mail
3. Send Mail
4. P.O. Box Directory
5. Change your Password
6. Who's on the Free-Net
7. Change Personal Info.

4. PUBLIC SQUARE

1. Information Booth
2. The Podium (Electronic Speeches)
3. (The Electronic Newspaper)
4. (The Cafe - Chat with other Users
5. The Kiosk (Open Bulletin Board)
6. The Employment Office (Jobs Boar
8. The Computer Corner
9. Special Interest Groups

5. UNIVERSITY CIRCLE

1. Information Booth
2. Youngstown State Univ.
   1. Information Booth
   2. YSU Newsletter
   3. YSU SportsLine
   4. YSU Events
   5. The YSU Bulletin Board
   6. Admissions Office Q & A
   7. Graduate Office Q & A
   8. YSU Computer Center Info.
   9. The Continuing Educ. Ofc.
   10. Ohio Tech. Trans. Org. (OTTO)
   11. YSU Human Services Q & A
3. The Butler Museum
4. (The Arms Museum)

6. THE HOSPITAL

1. Information Desk
2. What's New in Health Care
3. Family Medicine Clinic
4. Dental Clinic
5. Poison Control Center
6. Health Information Center
7. Continuing Education Office
8. Health Career Information Ofc.
9. The Medical Library

7. GOVERNMENT HOUSE

(To be Developed)

8. THE COURTHOUSE

(To be developed)

9. THE SCHOOLHOUS

(To be developed

5/15/87

APPENDIX V

Sample Press Coverage
July 1986 - June, 1987

Gathered around a computer terminal at the official opening of the Handicap SIG last July are, clockwise from the center, Sandra Latonia, Gov. Richard Celeste of Ohio, Cleveland Mayor George Voinovich, and Thomas Grundner, Ed.D.

A Special Place for Special People

The Handicap Special Interest Group on Cleveland Free-Net covers a wide range of topics that concern the handicapped.

BY AMY ROFFMAN NEW

Deep in the heart of the Cleveland Free-Net, the fabulous "electronic city" BBS in Cleveland, Ohio [(216) 368-3888], there is an out-of-the-way neighborhood known by its users and coordinator as "A Special Place for Special People."

It's the Handicap Special Interest Group, and it's operated from a private home in Parma, Ohio, by a woman named Sandra Latonia, who is blind.

Sandra has retinitis pigmentosa, a disease that over the past 12 years has restricted her to two percent of normal vision. The tunnel vision which results from the disease allows Sandra to read only two to three words on the screen at a time.

About a year ago, Sandra's husband presented her with a Commodore 128, in the hope that it would give her the opportunity to communicate more efficiently with the outside world. "My husband bought me the computer to give me something to do to make me feel that I was contributing something. It opened up a whole new world," says Sandra.

Soon after receiving the computer, Sandra came across "St. Silicon's Information Dispensary," the BBS that was the forerunner of today's Cleveland Free-Net. In a series of e-mail correspondence, sysop Tom Grundner told her about his dream of an electronic city. Her offer of help was accepted; the Handicap SIG officially started operation in July of 1986 to serve as a source of information for anyone interested in issues affecting the handicapped.

From the main menu of Free-Net, a user might never choose to go to the Handicap SIG, perhaps assuming that it was for the handicapped only. Because users sign up for the SIG by name only, Sandra has no idea how many of the SIG's users are handicapped, although she guesses that as high as 50 percent are not.

The SIG itself consists of a variety of sections. "Ask Sandra" allows users to ask confidential handicap-related questions. The main bulletin board is for public discussion and information exchange between users, and covers a range of topics from information about braille versions of consumer appliance literature to a request for information on a polio support group. There is an informational section called Handi-Talk containing human interest articles. There are also sections offering news items of information on state park accessibility or resources for the handicapped.

There are no professionals running the SIG. Questions are answered by Sandra or other users. For accurate information, Sandra researches her answers at the Cleveland Public Library or Cleveland area agencies. Questions about strictly medical subjects might be referred to the medical Q&A section of Free-Net.

What is the most fulfilling part of the work she does? "Every time I dial (the Free-Net number) it's fulfilling," says Sandra. "Every letter I get is so sincere. I'm just glad that there is a place where they can feel that relaxed....If I can make one kid in a wheelchair smile by reading the letter on my Handicap SIG, there isn't any money in the world that can replace that."

Amy Roffman New is a freelance writer based in Springfield, Illinois.

NEWS & REVIEWS

COMPUTERS

Second City/ Welcome to Cleveland's free-access computer metropolis—the nation's first—where you can make speeches, post messages and ask experts about everything from health care to paleontology.

There exists a second Cleveland, and it's right at your fingertips. Like the city you know, this other Cleveland has a Public Square and University Circle, a post office, government building, hospital, center for the arts, and new buildings under construction and on the drafting table. The first Cleveland is built of bricks and steel. The second is words on a computer screen.

This "city," **the Cleveland Free-Net**, is the nation's first free, open-access community computer system. Its creator is forty-one-year-old Tom Grundner, who holds a doctorate in educational philosophy from the University of Southern California and is an assistant professor in the Case Western Reserve University School of Medicine's department of family medicine. Since last July, Grundner has been stocking his electronic community with everything except chuckholes.

Grundner's system operates on the same phone-connection principle as the many successful national for-profit systems (CompuServe, for instance, or the Source). Anyone with access to a personal computer and modem—the device that links, by telephone, a user's computer to the Free-Net computer system at CWRU—can be privy, at any hour of the day or night, to the Free-Net's surprises. But where the national companies charge fees for access to a massive storehouse of information—be it news and weather or up-to-the-minute tax and stock-market data—the Cleveland Free-Net costs the user only the price of a phone call and is specifically geared to northeastern Ohioans.

Once plugged into the Free-Net, your options are staggering. You may choose to first visit the "administration building," the system's informational hub, which provides the specifics of all the Free-Net's offerings. Then go to the "government house," which, with its question-and-answer forum, its ability to let you send electronic messages to your elected officials, and its stock of information on politics from the local level to the national, is a city hall without walls. Here you'll also find the recently opened "tax office," a place where tax attorneys soothe your IRS-caused headaches.

Founding father: Cleveland Free-Net's Tom Grundner

The question-and-answer forum, in the government house and all other buildings, is integral to the Free-Net. A user with a question—for instance, you might ask the tax office to explain the penalties for incorrectly filling out the new W-4 form—simply moves electronically to the appropriate building and types the question into his or her computer. Within a day, one of the Free-Net volunteers, an expert in the area of that specific question, types in an answer that the questioner, and anyone else using the system, can read. Though the volunteers usually tag their answers with their names and business phone numbers, they essentially are contributing their professional time and expertise without charge to make the Free-Net work.

Like everything else in the Free-Net city, the "post office" is open all night—you can send electronic messages to other users' "mailboxes" and check for mail left in your own. "Public Square" is just that—public. Step up to its "podium" and post a speech for all users to read. Leave a message on its "kiosk" about your lost basset hound. Stop at the "computer corner" and read about systems from Apple to Atari. Or visit any of its "special interest groups" (SIG's)—such as the "handicap" SIG, which is run singlehandedly by Sandra Latonia, a legally blind Parma woman—which are treasure-troves of information on particular subjects.

"University Circle" clues you in on events, news and information at CWRU and the Cleveland Museum of Natural History. (Been feeling curious lately about the geographical range of the fence lizard? Ask the museum's Dr. Dino.) The just-opened "arts center" tells you of upcoming local cultural events, and includes a place where writers in any genre can post their efforts. Finally, there is the hospital. "St. Silicon's Hospital and Information Dispensary" is the most densely developed area of the Free-Net; it provides medical information on topics ranging from sports medicine and home health care to root canals.

The Free-Net's users fall into two categories: the "registered users," who have written to Grundner and received a free password and identification number, and the "visitors." Both can go anywhere and read anything in the system for as much as forty-five minutes at a time; but only the registered users can send and receive electronic mail and post messages and questions.

Grundner, who co-wrote a computer column in *The Plain Dealer* from Easter 1983 to October 1984, as well as the 1984 book *The Complete Guide to Cleveland Computing*,

and who, incredibly, has had no formal training in computer science, says that nothing about the Free-Net stands on the cutting edge of computer technology. What is significant, and what has other cities taking notice, is Grundner's creative application of that technology. His activities constitute more than a soon-to-be-tiresome computer game. "There's a certain inevitability to almost everything we're doing here," he says. "I can't imagine a future date – pick a date, fifty years from now – in which there is not free, open-access public computing, just like there are free, open-access public libraries."

People familiar with computers will note that the Cleveland Free-Net is the large-scale equivalent of the popular single-phone-line bulletin-board systems (BBS's) operated by computer hobbyists from their homes. BBS's cater to clearly defined interests within the computer-user population. Someone interested in chess or model railroading can, by tracking down the right BBS, find a cluster of people who share that enthusiasm. Cleveland's community of eighty BBS's, says Grundner, is one of the largest and most active in the nation. Much of this community now comes under the Free-Net's umbrella, at "Public Square." Though comparing the sometimes short-lived, one-subject BBS's to the diverse, multiple-user Free-Net – which at present has fifteen incoming phone lines – is like comparing a fruit stand to a supermarket, BBS operators represent the inspiration, if not the pioneers, of Grundner's breakthrough.

In fact, in its earliest stages, the Free-Net *was* a single-line BBS. In October 1984, Grundner, using a cast-off Apple II+ and a pirated phone line, devised a BBS that allowed members of his medical-school department, then dispersed among five different clinics around Cleveland, to communicate with each other. Within two weeks the computer public discovered the access phone number and began leaving legitimate medical questions in hopes that a physician would respond. So Grundner rewrote the software to accommodate the public's need for health information. He christened the single-user system St. Silicon's and opened it to the public February 1, 1985.

His user-friendly electronic hospital was soon pulling in more than 200 calls a week on its single line. St. Silicon's blossomed even while confronting the complaint common to all popular one-line BBS's: Only one person can be on the system at a time, which means every other potential user must suffer through a busy signal. Still, the calls flowed in, and the physicians in Grundner's department altruistically contributed a few hours each week to answer the anonymous – and thus unusually candid – queries.

One day, in December 1985, an AT&T vice-president visited CWRU and happened to see and be impressed by St. Silicon in action; his offer to have AT&T's Information Systems Division fund an expansion of the project resulted in his corporation's donation of a powerful $50,000 multi-user computer system. Grundner recalls, "That's when I saw the possibility of developing a community computer system in which the medical component would be one part of a much larger system."

Upon delivery of the AT&T equipment in April 1986, Grundner solicited the prodigious programming talents of Roger Bielefeld, a CWRU doctoral candidate and an instructor in the computer and information science department at Cleveland State University. Bielefeld wrote the sophisticated program in a computer language standard enough to ensure that the Free-Net could be easily transferred to other cities. Most important, room was left for the system to grow and change. "We wanted to come up with a basic skeleton for the system," Grundner says, "and then let the community itself shape the future direction of it."

In retrospect, this is precisely what has happened. "One reason we can run this system with a staff of two and a half people," Grundner says, speaking of himself, system manager Sharron Carlson and a part-time programmer, "is that the system is literally operated by the community." Every part of the Free-Net, he says, "represents a collection of individuals who are donating their time or expertise to make this system operate." On July 16th last year, at the start of Summerfare 150, Cleveland's sesquicentennial celebration, Governor Richard Celeste, Mayor George V. Voinovich and Grundner, standing in a computer-stocked trailer at the city's real Public Square, officially opened the Cleveland Free-Net.

Though for six months no users were actively sought – this "shakedown period," says Grundner, was needed to attend to the equipment failures and inevitable software glitches – by December, some 2,000 registered users were on the system, and 350 to 400 calls a day were coming in.

"Now we're in a growth spurt," says Grundner. He foresees the Free-Net expanding to include a sports-information "domed stadium"; a "media house," in which journalists or journalism students take the reins of the Free-Net's "newspaper," *The Paine Dealer* (after Thomas Paine), and explore the possibilities of this electronic medium; and a "library," which, Grundner hopes, can be linked to the public library computer systems so that people can locate books they need.

Grundner also hopes for expansion of the currently existing "schoolhouse." He sees a day when teachers and administrators across the city can swap information and resources. His most ambitious plan is to eventually let Bielefeld program artificial intelligence into the Free-Net so that it can converse with users in English.

Grundner's biggest worry is funding. Though AT&T, Ohio Bell, University Hospitals of Cleveland and other contributors keep the Free-Net alive, Grundner is brainstorming for ways to put the system on solid financial ground. He sees as possibilities private, nonprofit support groups and, one day, government monies. "I want to keep the system free to the user," he says, "no matter what."

Meanwhile, Grundner is leasing the Free-Net's software formula to interested cities for one dollar a year. Sister systems to the Cleveland Free-Net are expected soon in Youngstown, Oberlin, Miami and Boston. Grundner is certain that Cleveland is the source of what will be a domino-like development of Free-Nets nationwide.

For more information, or to become a registered user of the Cleveland Free-Net, write to Grundner at the Cleveland Free-Net Project, Case Western Reserve University, Cleveland, Ohio, 44106. The system's phone access number, for all users, is 216-368-3888.

– Ken Kesegich

Ken Kesegich is assistant editor of LIVE.

CLASSICAL MUSIC

Celebration in Two Parts/ This month, the up-and-coming Canton Symphony Orchestra marks a half-century birthday, while at Baldwin-Wallace College, the stage is set to honor distinguished composer Witold Lutoslawski.

In Canton, a town not always thought of as a center for the arts, audiences pack McKinley High School's Umstattd Hall to hear the **Canton Symphony Orchestra**. Musicians drive many miles to play in it. Its management turns down prestigious job offers, and its commuting conductor of nearly seven years, Gerhardt Zimmermann, says of his job: "It's a blessing. Canton is a little gem in the ocean."

In the hierarchy of the American Symphony Orchestra League, Canton, with a budget of some $700,000, is listed among the metropolitan orchestras, after the majors (such as

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COMPUTERWORLD

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HANDS-ON

Cleveland writes a prescription for its electronic city

It started with a small electronic bulletin board designed to handle internal communication for the Department of Family Medicine at Case Western Reserve University's School of Medicine, which operated five clinical units at hospitals located in and around Cleveland.

The department connected a cast-off Apple Computer, Inc. Apple II+ microcomputer to a phone line with a 300 bit/sec. Hayes Microcomputer Products, Inc. Micromodem II and set up the bulletin board so that faculty and staff located in the various clinics could communicate with each other. Somehow, though, the number got out and people from outside the university started leaving messages.

In and of itself, that would not have been surprising, says Thomas Grundner, assistant professor in the School of Medicine and creator of the bulletin board, since access numbers frequently find their way into the hands of outsiders. What did surprise and interest Grundner as a medical educator, however, were the kinds of messages he was finding. They were serious medically related questions that people had obviously left in hope of receiving an answer. "When I saw that," he says, "I thought, 'Wait a minute, there's something interesting going on here. People are using this bulletin board to reach out for information and assistance.' "

Impressed by the significance of the phenomenon, Grundner sat down and wrote a program to accommodate these outside users, complete with menus and Help screens. This new system, called "St. Silicon's Hospital and Information Dispensary," was opened to both the public and other medical professionals in the Cleveland area in February 1985.

A medical clinic, or "doc-in-the-box" feature, formalized the spontaneous question-and-answer process. Faculty members who were certified family practitioners were deputized to monitor and respond to inquiries with general information. They were specifically instructed not to attempt to diagnose or treat.

Response to the system was rapid and enthusiastic. The St. Silicon's Hospital line logged more than 100 calls in its second week and eventually reached an average of 300 per week. According to Grundner, the questions asked fell into three general categories: ones that should have been posed in a doctor's office or that had been asked and inadequately answered, ones that callers hesitated to ask their own doctors because they seemed too trivial and ones that callers would have had difficulty asking face to face.

Just as St. Silicon's was beginning to stretch the limit of its facilities, AT&T Information Systems heard about the project and offered $50,000 worth of computer equipment and software.

The facility was equipped with an AT&T 3B2/400 computer with 4M bytes of random-access memory and 144M bytes of hard disk storage as well as 16 1,200/300 bit/sec. modems and custom-written Unix software. With these resources, Grundner decided he had the makings for not just an expanded electronic medical facility, but eventually an entire electronic city.

That city is now a reality called the Cleveland Free-Net. Opened officially July 16, the Free-Net is a free and open-access community computer system supported not just by the initial AT&T donation but also by contributions from Case Western Reserve's School of Medicine and university hospitals as well as a host of other organizations and individuals throughout the greater Cleveland area.

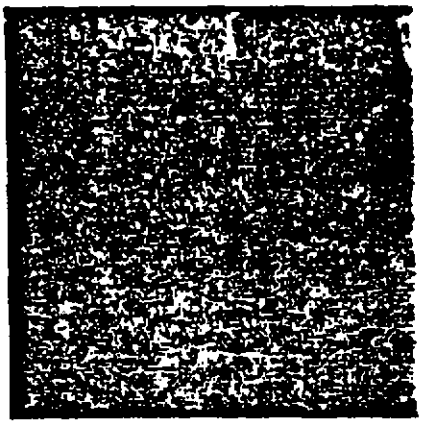
Although building continues, the Cleveland Free-Net already possesses much of what one would expect of a brick-and-mortar town. "Every city has a post office, and so do we," Grundner says. "We provide free electronic mail service to anyone in northeast Ohio who wants to register on the system."

There's also a courthouse, where volunteer lawyers answer users' questions about the law; a government house, which is an electronic connection to elected local, state and national officials; and a schoolhouse, which is an electronic communications system allowing both information exchange among Cleveland-area schools and the creation of common data bases that can be accessed by teachers, administrators, students and parents.

"When you start thinking about something like this in terms of the metaphor of a city, you realize that the possibilities are practically endless," Grundner says.

Grundner envisions similar free community computer systems spreading across the country. The Cleveland Free-Net is ready to do its part to help. Qualified groups from any other city are invited to lease the software on which the Free-Net is built for $1 a year.

PC WORLD



Password: Communicate

Q&A for Free

With the exception of local bulletin board systems, can you get free education and enjoyment through your modem? Case Western Reserve University (CWRU) in Cleveland, Ohio, has made a good start by founding the first free online question-and-answer service, Cleveland Free-Net. The service provides expert advice and information from professionals in law, medicine, natural history, education, and government.

Free-Net began in 1984 as an experiment in electronic distribution of medical information. Called St. Silicon Hospital and Informational Dispensary and sponsored by the Department of Family Medicine of the Medical School at CWRU, the venture was so successful that last year the Information Systems Division of AT&T provided major funding for the project. The system currently receives some 200 calls a day, and its services continue to grow in scope and popularity. To its stable of question-answering experts, Free-Net has added special interest groups (SIGs) devoted to various computers, science fiction, and veterinary medicine, as well as an electronic mail system.

You can use Free-Net as a visitor or as a registered user. Visitors can go anywhere and read any of the information on the system but cannot post their own questions or messages. Registered users can participate in all aspects of the system, such as sending and receiving electronic mail, making "speeches" to an electronic forum, joining a SIG, or posing questions to the experts.

Free-Net is completely menu-driven—it was designed for the convenience of first-time users and computer novices. Currently the system supports 300- and 1200-bps connections. Founder and SYSOP Tom Grundner anticipates that an additional grant will provide equipment for 2400-bps service in the near future.

After displaying a welcome screen, Free-Net asks if you are a visitor or a registered user. When you register, the service assigns you a user identification number and password. As a visitor, you're prompted to sign in to the system's Guest Book.

A couple of tips for your first log-on: If you're calling long distance, do so on a night or weekend; there's a lot to look at. Also, be prepared to download information to a disk file or printer, because you will probably want to save some of it.

Free-Net's main menu lists the major subdivisions of the system. The general-interest Q&A areas are called the Hospital, the Schoolhouse, and the Courthouse. Ohio residents can pose questions to elected officials through the Government House, and anyone can speak up or join a SIG in the Public Square.

Before you start exploring, go to the Administration Building. There you can sign up to have a registration kit mailed to you, or you can download it. Downloading takes a couple of minutes at 300 bps but makes for faster registration.

The registration form consists of three pages: an agreement to abide by the system's terms of participation; a general information form (name, address, and so on); and an optional personal information form for Free-Net to develop a user profile.

Free-Net's Q&A sections are the most popular attractions. Registered users post questions to attorneys in the Legal Clinic, to medical residents and medical school staff in the Family Medicine Clinic, to dental students under the supervision of dental school staff in the Dental Clinic, and to experts from the Cleveland Museum of Natural History in a section called Ask Dr. Dino. You'll find an answer waiting within 24 hours.

(continues)

The experts, who volunteer their time and knowledge, provide answers to on-line questions in plain English, which is great for those of us who don't understand the nuances of medicine, law, or natural history.

To demonstrate Free-Net's capabilities, I posted a simple, general-interest question in the Family Medicine Clinic: 'What is appendicitis and what are its symptoms?' When I logged on the next afternoon, the answer was ready. Compared to other questions on the system—on such topics as malignant hypertension, candidiasis, and macular edema—mine was rather tame. Dr. Robert Kelly, one of the system's volunteer physicians, offered this response: 'Appendicitis is an inflammation of the appendix—a small organ attached to the colon and about the size of a baby's finger. Symptoms would include abdominal pain (most often starting around the navel, then settling in the lower-right portion of the abdomen), fever, nausea, and vomiting. Since other problems can cause the same symptoms, it's best to let a physician evaluate any severe abdominal pain. If appendicitis is not treated in time, the appendix can rupture, causing an even more serious problem.'

Following every response in Q&A sections, this disclaimer appears: 'Please note: The information contained on this system is not intended to supplant individual professional consultation, but is offered as a community education service.'

The disclaimer is important, especially for medical or legal advice. In its professional Q&A sections, Free-Net offers just what it promises: education. This is a place to gather information, locate specialized help, or just learn more about a specific topic. It is not a place to seek help in a crisis. When necessary, Free-Net professionals suggest appropriate specialists to handle problems raised in the questions.

Navigating Free-Net is fairly simple. As noted, the system uses menus, and it has only a few commands. You cannot type ahead to avoid menus, however, and at some points you may see a burst of numbers on the screen if you enter a character that Free-Net does not recognize.

The system displays 20 lines of text and then stops, requesting 'Press <Return> to continue, Q to quit'. If you are reading from the screen, this pause is helpful; if you're downloading to disk, it's a nuisance. At any prompt you can move to the main menu by typing M or to a previous menu by typing P, or you can exit the system by typing X.

The work involved in maintaining such a comprehensive system is done by two paid staffers and a long list of volunteers. Anyone with expertise in a certain area is invited to propose a new section for the system through one of the menu options in the Administration Building.

In the hope of seeding similar information systems, Free-Net leases its software for $1 per year. The lease has certain conditions: The software must be used by an organization that can make a significant financial and time commitment, and it must be used to operate a system offering free public access.

Free-Net is like a great public library staffed by a diverse group of experts. You may use it the first time to find out something in particular, but eventually you'll go back just to browse.
—Amy Roffmann New

Cleveland Free-Net
Case Western Reserve University
Cleveland, OH 44106
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YOUR ONE-STOP SOURCE OF ELECTRONICS INFORMATION

MODERN ELECTRONICS

MODERN ELECTRONICS NEWS

COMMUNITY COMPUTER SERVICE. A free, open-access community computer information service has been started for the Cleveland metropolitan area. It's arranged like an electronic city, with a "post office" for electronic mail, a "schoolhouse" for use by Cleveland area public and private schools, and a "hospital" and "courthouse" where medical, dental and legal questions can be asked with answers by teams of qualified professionals. There's also a "government house" where area residents many contact their elected representatives and a "public square" with a "podium" where users can give electronic "speeches." Credit Tom Grundner, an assistant professor at Case Western Reserve University, for conceiving the system and a $50,000 donation from AT&T's Information System Division, as well as individuals and organizations in the Cleveland area who volunteer skills and time. Users can access the system with a computer and modem, dialing 216-368-3888 to read anything they wish. To place material on the computer and have electronic mail privileges, however, one simply needs to fill out a form, send it to CWRU (University Communication, 1 Adelbert Hall, Cleveland, OH 44106), and get an ID number and password in return. There's no charge. If any qualified group wishes to duplicate this system in other cities, the software is available for one dollar (that's $1).

health

Drug alert . . . unsmoking . . . Dr. by phone. BY MELVA WEBER

RETURN OF THE DOCTOR'S HOUSE CALL

"St. Silicon's Hospital and Information Dispensary" may sound like the title of a new television series. Actually, it's the name of a project of the Department of Family Medicine at Case Western Reserve University School of Medicine in Cleveland, Ohio. And instead of a venerable stone clinical building, it is, as its name suggests, a computer that makes house calls.

Medical questions from the public can be directed to the family physicians' staff at Case Western by anyone with a modem-equipped home computer or with access to a computer terminal. They'll be answered by a faculty member, usually within twenty-four hours. According to Tom Grundner, M.D., founder of St. Silicon's, its creation was unintentional. The project was started as a communication system for doctors within Case Western's various clinical units. "After a while the phone number got out, and people started calling up with their personal medical questions, hoping a doctor would answer. So we began to develop the system as a medium for community health education."

Robert Garrett, M.D., another St. Silicon's physician, adds: "We analyzed the kinds of questions people ask. Some are questions they have forgotten to ask while in the doctor's office—such as the side effects of prescribed medication. And we're also answering questions people think are too trivial or too costly to take to a doctor."

Dr. Grundner believes there's nothing like St. Silicon's elsewhere in the nation, "but it won't be long. Someday all professions will have community information services like this, and we believe St. Silicon's will be the model for them."

VOLUME 1/NUMBER 1
NOVEMBER/DECEMBER 1986

ONLINE ACCESS Guide

THE GATEWAY TO BUSINESS INFORMATION

WELCOME TO THE CLEVELAND FREE-NET

An Open-Access Community Computer System brought to you by

Case Western Reserve University School of Medicine
and
AT&T Information Systems Division

TM Grundner, Ed D
System Administrator

◆

CLEVELAND FREE-NET DIRECTORY

1 *What's New in the Electronic City*
2. *The Administrative Bldg.* (ADMIN)
3. *Government House* (GOVT)
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6. *The Post Office* (POST)
7. *The Hospital* (HOSP)
8 *The Schoolhouse* (SCHOOL)
9. *The Courthouse* (COURT)
10 *Electronic Birthday Card* (BIRTH)

FREE-NET: CLEVELAND'S ELECTRONIC CITY

Within Cleveland is another city, one devoted to the idea of free electronic information.

FreeNet is the nation's first free nationwide computer network, thanks to a grant from AT&T and the computing talent of Dr. Thomas Grundner, a professor of family medicine at Case Western University.

FreeNet's avenues of information lead to familiar-sounding civic landmarks. Entering the Courthouse, you'll find qualified lawyers who will answer the legal inquiries you leave behind. The Post Office handles the City's electronic mail, naturally enough.

Down the street is the Hospital, also known as St. Silicon and the nucleus of the larger system of bulletin boards that make up FreeNet. Animal lovers can stop nearby to leave questions for the "Vet-in-the-Box," a variation on St. Silicon's "Doc-in-the-Box."

Out on the Public Square, online debates will soon be raging at Hyde Park Corner.

The only charge for visiting FreeNet is the phone call, by the way; all advice, information and your "residency" is free.

"The development of this online community has created a real sense of community offline," Dr. Grundner says. Professionals are coming together willing to contribute their expertise in the

And FreeNet is flourishing. The schoolhouse, for example, is slated to open its doors in September, offering a communications channel for the school system. The Library will to the Cleveland Public Library logues. And electronic banking works.

The FreeNet group expects to software to any other interested for a charge of one dollar a year. "The concept of free public-access computer time has been kicked around for 20 years," Grundner comments. "Now its time has come."

AMAZING THINGS ARE HAPPENING AS THE HEALTH-CARE INDUSTRY GOES ONLINE. FOR A SURVEY OF THE SITUATION, YOU MIGHT VISIT...

St. Simon

PATRICK DOUDY

Just getting through the door at St. Silicon's Hospital and Information Dispensary, as it's called, can take a little time. Then, once you've been admitted, you're only allowed a 45 minute stay and the doctor you see never appears in person. Nonetheless, everyone agrees the institution is doing a great job.

Not surprisingly, the public is lining up to get into St. Silicon. That's because it's free for the price of a local phone call to anyone in the Cleveland area. The hospital is in fact a sophisticated medical information system developed at Case Western Reserve University's School of Medicine.

St. Silicon is the nucleus of what has become a remarkable bulletin board system called the "Cleveland Free-Net Directory" (see sidebar). Beginning with the dial-in information service originated by Dr. Thomas Grundner, a professor of family medicine at Case Western's medical school, the Free-Net is now an electronic city of public-service announcements and information enjoying the active support of Cleveland's computer community. Among the various city organizations listed on the Free-Net menu, you'll find St. Silicon.

Once inside its hospital corridors, you'll find the Doc-in-the-Box medical clinic, where hundreds of questions and answers on general medical topics are accessible to the public. The subjects range from "abdomen" to "Zyloprim," an anti-gout drug.

Then there's the Dent-in-the-Box, if you're gnawing on some problem of that sort. Shrink-in-the-Box is also open for business, but offers a somewhat crude interactive therapy program with questions like, "Do computers worry you? Why? And give me the REAL reason why?"

There's even a hospital newspaper called, regrettably enough, "The Pain Dealer."

All the "patients" at St. Silicon remain anonymous, so they are free to ask personal and even painful questions of the kind they might hesitate to ask their own physician. Veneral diseases, AIDS, and drug addiction are standard topics.

Sometimes the bulletin board reveals problems in doctor/patient relations. In one case, a former hospital patient asked the online doctor a series of questions about a particular disease. Finally, it dawned on the patient that he had indeed once contracted this disease and been cured of it by one of the local hospitals. But his doctor at the time had simply neglected to actually mention the name of the ailment to him or any details about it.

Improving the communication between staff and patients was not the original notion for St. Silicon. At first, Dr. Grundner only wanted to keep the professional staff of the university's five different Cleveland-area clinics in closer touch. Now, with incidents like that of the surprised former patient, he observes that better physician/patient communications must be a principal goal for St. Silicon as well.

"It is this kind of patient's dilemma, plus the evidence of the system's heavy use, that confirm our belief that St. Silicon is meeting a need that is not being met by other sources of health care information," Grundner stresses.

St. Silicon is growing and is receiving national media attention along the way. A recent issue of The New England Journal of Medicine gave it a sizable writeup and noted the system's efforts to treat all its patients courteously and with the best bedside manner.

All of this is not without some wry medical humor, however: when you decide to check out (log off) of the system, St. Silicon's board asks skeptically, "Are you sure you want to leave the hospital in YOUR condition?"

INTERNATIONAL
VIDEOTEX TELETEXT NEWS
November 1986

FREENET LAUNCHES CLEVELAND SERVICE; OFFERS SOFTWARE LICENSE FOR $1

Case Western Reserve University's School of Medicine in Cleveland is operating a free online community bulletin board in northeastern Ohio. CWRU is willing to lease its software for $1 per year to any institution willing to set-up a similar free service within its community. "Cleveland Freenet" started as a medical information experiment and has expanded to a full-featured ASCII bulletin board, supported by a $50,000 grant from AT&T Information Systems. As part of the grant, AT&T donated its high-end 3B2/400 microcomputer. CWRU developed the software.

Freenet is organized as a "City" and features "Post Office" for general electronic mail; "Hospital," through which users can ask medical questions and gather community health information; "Government" in which users can ask the Cleveland mayor and Ohio governor questions on a bulletin board; and "Public Square," a catch-all category for special interest groups. To participate in Freenet, users must fill out an electronic identification form. Visitors are permitted on the system but can only read publicly posted information and cannot add information. Freenet expects to have about 2,000 registered users by the end of November. The service receives from 200 to 250 calls per day.

Freenet Project Director Thomas Grunder hopes other universities, institutions or even corporations with a suitable host computer will take him up on the $1 per year software leasing deal to set up community networks. The software is leased to ensure that system operators do not charge users for the service. Four unnamed organizations have expressed serious interest in the software, Grunder says. However, to keep the Ohio operation online, Grunder needs funding beyond AT&T's contribution and is pursuing more grants. (Case Western Reserve University, Department of Family Medicine, Cleveland, OH 44106; 216-368-2000.)

TORONTO GLOBE AND MAIL
July 16, 1986

Doctors answer health questions through computer phone-in service

ARE APPLE SEEDS poisonous? Will a surgical scar grow with a child? What exactly is cancer and why is it so dangerous?

For the answers, plug in your personal computer and call 216-368-3888.

These — and 12,997 other questions on all aspects of health — have been "posted" on a unique computer bulletin board in Cleveland, Ohio, known as the St. Silicon Hospital and Information Dispensary in the 17 months since it came into existence.

Anyone with a personal computer and the funds to pay for the call can phone the "hospital" for information. Every question, which is assigned a number to protect callers' anonymity, is answered within two days by a qualified physician.

The "hospital", which now receives so many calls that doctors answering questions can barely get time on-line themselves, began as an internal service so that physicians working at five clinical units of Case Western Reserve University School of Medicine could leave electronic notes for one another, said Dr. Robert Garrett, a family physician who runs the program with medical educator Thomas Grundner.

Now Dr. Garrett spends 30 to 45 minutes every morning — between his shower and breakfast — answering the 280 calls which come in every week.

"I'm usually on the system at 6 a.m. when I get up," he said in a telephone interview. "If not, I can't get on-line myself."

He answers most questions off the top of his head, but refers tougher ones to a dozen colleagues at the medical school before typing in the answer.

"The way the questions are phrased indicates the communication between the doctor and patient didn't go the way it should," Dr. Garrett said.

"Many times a patient is no longer ill but still doesn't understand what was wrong with him. They're the types of questions most people consider too trivial or embarrassing to ask in the doctor's office."

The largest single category of questions are those regarding medication and its proper use, Dr. Garrett said.

Many of the questions cover topics patients find difficult to tackle face to face with a physician, or anyone else: sexual practices, including homosexuality; venereal disease; and drug and alcohol abuse.

Most callers are young professional men who never see their doctor because they are too busy, Mr. Grundner said.

CAITLIN KELLY

Ninety three per cent of users are male and 63 per cent of them are between the ages of 20 and 59, which surprised the program's designer who expected to see the program used mostly by teen-age computer buffs.

"This is a medically underserved population," he said. "These men see their parents, their wives and their children, but they never see a doctor."

The increasing use of personal computers, not only by busy executives but by their wives, children and secretaries, is reflected in the growing number of women and minorities who are making use of the system, Mr. Grundner said.

(Every user must register with the hospital giving name, age, city, occupation, sex and race to help the program's designers keep track of who is using the program.)

A caller can check with the program's index to see if a similar question has already been answered — there are 850 answers on file.

For legal and ethical reasons, the "hospital" will not give callers any diagnosis or treatment, Mr. Grundner said.

The design of the software program, which is available to any qualified doctor who want to set up a similar system, includes a medical clinic, dental clinic and even a doctors "lounge" in which notices of upcoming conferences or other professional items of interest are posted.

A mention of the program in a recent article in the New England Journal of Medicine prompted a flood of mail from all over the world, Dr. Garrett said. He and his colleagues have received more than 150 letters from Hong Kong, Canada, Australia, Japan, Sweden, Holland and Britain from others interested in the idea.

The "hospital" which is expanding to include separate "clinics" dealing with sports medicine, medication, drug and alcohol abuse and home care, is teaching doctors as much as the callers who hook up with them from across North America, both men said.

It took a lot of searching to find out if apple seeds were poisonous, a possibility which seemed highly unlikely at the time of the call, Mr. Grundner said.

But a careful search of the medical literature showed that, in fact, the seeds contain a small amount of a chemical as lethal as cyanide — and that two cases have been recorded of deaths from apple-seed overdose.

THE PLAIN DEALER

OHIO'S LARGEST NEWSPAPER CLEVELAND, MONDAY, JULY 14, 1966

Free computer net here aims to go nationwide

By WILLIAM F. MILLER

STAFF WRITER

Cleveland Free-Net, the nation's first free, open-access community computer system, will debut on Public Square at noon Wednesday at the opening of Summerfare 150, a celebration of Cleveland's sesquicentennial.

Gov. Richard F. Celeste and Mayor George V. Voinovich will inaugurate the system, which initially will link computer users in Northeast Ohio to such services as electronic mail, community calenders and medical information.

A trailer with computer terminals will be on the southwest quadrant, where the public can try the new system throughout Summerfare 150.

Dr. Thomas M. Grundner, an assistant professor at Case Western Reserve University's School of Medicine, said he hoped the network would expand, enabling users to do their banking electronically, register for college courses, and receive the latest news, weather and sports reports, among many other uses.

Grundner likens Cleveland Free-Net to an electronic city that eventually will provide many community services.

Like the public library, it must be free, he said.

He said he hoped to interest enough cities in the system to make it available from coast to coast.

The system will not only give information, but answer users' questions.

Cleveland Free-Net will be available to anyone with access to a microcomputer and a modem, which connects the user's computer terminal, usually with a telephone, to the Free-Net Computer. A user would dial 368-3888 and follow instructions.

In an effort to make Cleveland Free-Net a nationwide system, Grundner will lease Free-Net software to any qualified community for $1 a year.

The system invented itself, said Grundner, a specialist in telecomputing systems.

He said he put together a bulletin board computer system to allow his department's scattered offices to communicate and leave messages. The telephone number got out and people started leaving messages in the hope that some qualified expert would answer medical questions. St. Silicon, the inspiration for Free-Net, was launched, with a physician answering 280 inquiries a week on a single phone line. The new system will have 15 lines.

To launch the project, American Telephone & Telegraph Co. has given $50,000 in equipment to Grundner's Free-Net. The School of Medicine and University Hospitals offered to help underwrite the system.

Life at 300 Baud

The electronic city

by Brock N. Meeks

In Cleveland, doctors make house calls—so do dentists, lawyers, and even veterinarians. But instead of reaching for a little black bag and hailing a cab, they boot a communications disk and fire up a modem.

Free-Net, an online computer system, puts several of Cleveland's community services within reach of anyone with a modem. Free-Net is the nation's first free, open-access community computer system to offer professional information to this extent.

Free-Net (216/368-3888, 300/1200 baud, 24 hrs/day) is located on the campus of Case Western Reserve University (CWRU). The mandate of Free-Net is to serve as a community "free clinic," dispensing all types of advice, including medical information, to the Cleveland metropolitan area. (However, anyone can use the service, regardless of location.)

Corporate donations made Free-Net a reality. Free-Net's primary benefactor is AT&T, which donated over $50,000 in computer hardware to start the system.

The software was custom designed to handle a question-and-answer forum. The program, written in C, runs under the UNIX operating system. Taking advantage of UNIX's multi-user capability, Free-Net can handle up to 15 callers simultaneously. Its "message administrator" is a hefty 44-megabyte hard disk.

But Free-Net did not start out so well-heeled.

St. Silicon

"In the fall of 1984, several medical clinics around Cleveland decided they needed to exchange information among themselves—without always having to call a meeting," said Dr. Thomas Grundner, assistant professor of family medicine at CWRU and Free-Net's sysop. "They decided that a bulletin board system would meet the need, so I set up a simple system for them on a 48K Apple computer with software I wrote myself."

The system set up by Grundner was an immediate success. It allowed the clinics to pass information to each other, post general-interest messages, and keep abreast of the latest medical news. The system worked so well that soon news of it reached the general public. The results were surprising.

"All of a sudden we had people coming on and leaving medical questions in the open message section," Grundner said. Had these questions gone unanswered, public use would have dropped off; but the questions didn't go unanswered.

"The doctors using the system began providing answers to those questions, and then we couldn't keep the public away," recalls Grundner. "As a medical educator, I was interested in this fascinating exchange of medical information to the public. In a sense these people were benignly crashing my system and turning it into something it was not intended to be: a public forum for the dispensing of medical information."

Grundner then developed a BBS designed to specifically handle a question-and-answer information exchange. He christened the new system "St. Silicon Hospital and Information Dispensary."

This public system, which was covered in an article in *The New England Journal of Medicine* (April 10, 1986) reached its saturation point within three weeks. Because the heavy usage outran the system's capability, St. Silicon went looking for larger quarters—a bigger computer.

An endowment from AT&T allowed Grundner to turn St. Silicon into the multi-user Free-Net system.

Free-Net opens

In July 1986, Free-Net was officially put online with pomp and circumstance. "Both Governor (Richard) Celeste and Mayor (George) Voinovich were at the ceremony," said Grundner. "They cut the ribbon, shook hands, and kissed 2.5 babies; Free-Net was online."

The entire system is set up to emulate the city it serves; it's an electronic city, of sorts, complete with the kinds of services you'd find in an actual city. The Post Office handles electronic mail; The Schoolhouse serves as an online PTA meeting in which users ask administrators of Cleveland public schools questions about curriculum and make

Free-Net emulates the city it serves; it offers the services you'd find in an actual city.

PHOTO BY R. S. POWERS

suggestions for improvements.

The Courthouse offers information on Ohio law for the layperson, and there's also a lawyers' library and a question-and-answer forum on legislation. The Legal Clinic operates much like St. Silicon, though it's not as diversified and compartmentalized. Lawyers answer all types of legal questions in a general forum.

In the University Circle section, users have access to CWRU officials and the curators of the Cleveland Museum of Natural History. Another feature is Government House, where users can contact elected officials at the local, state, and federal levels. There's also a Public Square that includes, among other things, a "free speech" podium, where users can air their gripes by submitting electronic essays.

St. Silicon thrives

The hospital section is the most extensive. When users first enter the hospital (still known as "St. Silicon"), they go to the "information desk," where they can search each of the hospital's message bases, called "question banks." Users can browse or search by specific topic.

They can also stop in at any of the associated medical clinics: family medicine, dental, handicap center, health enhancement center (which deals with fitness), sports medicine clinic (for the weekend athlete), alcohol and drug abuse information center, nursing and home care office, staff lounge (for the continuing education of medical professionals), and the hospital library.

Each of these sections has a question bank where users can leave medical questions. Medical conditions of all types, from sexual dysfunction to cystic fibrosis, are covered. In addition, there is a small information file on each of the different sections that provides an over-

Some back issues of *PROFILES* are still available. Highlights of recent issues are detailed below. We'll send you the desired issue(s) for $4.00 each, including the postage and handling charges. Enclose your name and address along with a check or money order payable to *PROFILES* and mail to:

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•CompuServe forums
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•Desktop publishing
•Learning to flowchart

•Electronic mail services
•BASIC tutorial, part 1

view of the services offered in that particular section.

"Although AT&T made it possible to set up the hardware part of the system," said Grundner, "it's the Cleveland community that makes the system work."

All sections of the system are moderated by individuals and organizations in the Cleveland area, and all are volunteers. The medical professionals participating on the system are all board certified in their respective fields; legal assistance is supplied through the CWRU law school.

Expanding the access

Critics of Free-Net contended that the system locked out those with no access to a computer and modem. Such critics claimed that for a system to be of value to the entire community, the computer "have nots" should somehow be allowed access, as well.

As this issue of *PROFILES* was being prepared, Grundner was answering such critics by explaining that Free-Net was at 80 percent of its operational power and that expansion of the system was planned for mid-winter. This expansion was expected to provide public computer terminals, in libraries, that would have access to Free-Net. There were plans to put terminals around the CWRU campus and maybe even in shopping malls.

Grundner sees a parallel between the rise of the free public library movement in the last century and the rise of a free public computing movement in this century.

"By the mid-1800s literacy had gotten high enough, and the cost of books cheap enough, that there was tremendous pressure for free public access to that information," he said. "We're seeing something similar happening now. As computer literacy gets higher, and the cost of computing equipment drops, more people will have access to a computer system and will be looking for a system like Free-Net. I think you'll see these types of systems spreading all over the country."

Free-Net is the prototype of a regional network that could sweep into several metropolitan areas. To ensure that the intent and spirit of Free-Net is spread to other cities, Grundner has set up a cloning process.

"We're making the software for Free-Net available to *qualified* medical groups," Grundner says, speaking in italics. "We want to make sure the software doesn't get into the hands of a teenager who decides to run a bogus medical system." The software is available for a license fee of $1 per year. Grundner also notes that the original St. Silicon software (the Apple-based version) is available to similarly qualified groups for a flat fee of $5.

Checking in with the doctor

Although access to the system is free, there are, in effect, two categories of users. Anyone may dial in as a "visitor" and read the messages, or visit any of the various online clinics. However, only registered users can place messages on the system.

To register, simply download the registration form (in the administration section) and send it in. In a few weeks your personal ID and password arrive in the mail. Registration is free. You should note, however, that the system carries some disclaimers.

Simply logging on to the system, either as a guest or registered user, you automatically agree not to hold Free-Net liable should any damage arise from following the advice received from the system's doctors. Grundner explained that doctors and lawyers are instructed to provide suggestions and general information; doctors do not diagnose or offer treatment information. In addition, users reading the questions and answers (all exchanges are open for public perusal) are presented with the following caveat: "The information contained on this system is not intended to supplant individual professional consultation, but is offered as a community education service. Advice on individual problems should be obtained directly from a professional."

Checkout time

"This system is something people have been talking about for 20 years," Grundner said. "We kept saying that someday you would be able to use a home computer to contact your kid's school, get medical information, send electronic mail to your neighbor, contact your senator, and so on. I'm glad to report that this is one futuristic 'someday' that has finally arrived."

Yankeevision

A publication of the Consumer & Technology Division

1987 – 1 January 1987

Interactive Healthcare Services

The most significant operator of healthcare interactive telecomputing is Case Western Reserve University School of Medicine. Known as St. Silicon's Hospital and Information Dispensary, it is a large-scale community electronic bulletin board. Largely through a "generous donation" from AT&T's Information Systems Division, St. Silicon upgraded from a 48K Apple computer-based system to an AT&T 3B2/400 computer system operating under AT&T's UNIX System V.

St. Silicon initially was created to promote better communications among the local medical clinics and Case Western's University hospital utilizing a simple electronic bulletin board. Within St. Silicon, the major offerings include such features as the Information Desk, Family Medicine Clinic, Dental Clinic, Hospital Pharmacy, Drug and Alcohol Information Center, etc. Under the Family Medicine Clinic, users can post medically-related inquiries on the bulletin board and a reply is posted within 24 hours . The anonymity of the Clinic encourages consumers to pose embarrassing or personal questions that they never might have asked in person.

This system, in turn, is enveloped in a core electronic community program called Cleveland Free-Net that offers a much broader level of community information and resources, very much like a text-based public access system. Usage of St. Silicon and the Cleveland Free-Net is free to all users, and organizations may lease the system software for $1 annual charge.

The primary success factor for St. Silicon is the basic premise that a community outreach program must be free to all users and that information, in general, must be free or low-cost. Concurrently, it provides enough offerings to prompt users to access the system for services other than medical inquiries. The Yankee Group believes that a viable commercial application of consumer medical online services necessitates a specialized, niche marketing approach that addresses specific segments of the current personal computer household population. For example, a service could be created whereby a general health information service is marketed jointly with an electronic sports clinic, an electronic diet clinic that offers free diet program software, etc. Also, one can envision an offering whereby a person with diabetes could transmit daily or weekly blood glucose level data and other key monitored parameters to the health institution or a clinic through an electronic service.

From the healthcare provider's perspective, medical online services provide an excellent forum for public outreach among the personal computer households. With the current volatile state of the healthcare industry, any "enhanced" service offerings extending the current realm of communications gives the healthcare providers a better understanding of consumer and patient needs.

NATURALLY

Aaron M. Leash

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Are you a:
  1. Visitor to the Free-Net
  2. Registered User

Type either a 1 or a 2 ==>
```

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<<< CLEVELAND FREE-NET DIRECTORY >>>

1. What's New in the Electronic City
2. The Administration Bldg.   (ADMIN)
3. Government House           (GOVT)
4. Public Square              (PUBLIC)
5. University Circle          (UNIV)
6. The Post Office            (POST)
7. The Hospital               (HOSP)
8. The Schoolhouse            (SCHOOL)
9. (The Arts Center)          (ARTS)
-------------------------------------
x  Exit the system (Good at any menu)

Your Choice ==>
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<<< CLEVE MUSEUM OF NATURAL HISTORY >>>

1. Information Desk
2. What's New at the Cleveland Museum
3. Museum Calendar
4. The Explorer Room
5. Natural History News
6. Ask Dr., Dino (Q & A)
7. Directory of Online Members
8. Sign-up for the Museum Directory
-----------------------
P  Back to University Circle
M  Back to the Main Menu

Your Choice ==>
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YOU'VE PROBABLY PLAYED ELECTRONIC GAMES. You might own an electronic oven. But let's talk about something a little larger. Something preposterous like an electronic "city." Don't laugh — there is one. In Cleveland, Ohio.

The electronic "city" is the brainchild of Dr. Tom Grundner of the Department of Family Medicine at the School of Medicine of Cleveland's Case Western Reserve University. In 1984 Tom established St. Silicon's Hospital and Information Dispensary, a medically-oriented electronic bulletin board system. All you needed to obtain medical information was a computer and a telephone modem. Once you gained access (admission) to St. Silicon's by dialing the telephone number, you could ask for medical information about whatever ailed or interested you simply by typing your questions on your computer keyboard. Your questions were posted electronically and answered by volunteer doctors within a 24-hour period. The questions and replies were available for all users of the system to access and read. St. Silicon's proved so popular that AT&T awarded Tom a sizable grant to expand the hospital concept into an entire city, of which the hospital would be a part.

The "city" was founded in July, 1986. It is called the Cleveland Free-Net. It is the nation's first free, open-access community computer system. That means there is no charge to the users, and anyone with a modem can dial in.

There are two categories of users. *Visitors* can utilize the entire Free-Net system with the exception of electronic mail (e-mail), which is reserved for *registered users*.

This is a bustling "city" that never sleeps. It receives over 500 calls each restless 24-hour day. The system is completely menu-driven. The user selects the areas of the "city" to visit from a series of choices (menus) that appear when the system is accessed. Free-Net uses 300 and 1200 baud connections. Baud is a measure of transmission speed. (Don't give up on me now. I promise not to use much more computerese.)

The growing city now has a post office where a *registered user* can send and receive electronic mail, a hospital with medical and dental offices, a schoolhouse, an art center, and a government house. There is also a veterinary clinic where pet lovers can learn about animal health. Special interest groups (SIGs — Oops! There I go again.) that have found homes in the "city" include science fiction fans, handicapped persons, runners (When do they have time for anything but running?), and computer enthusiasts.

And there is a museum! Let me tell you about it.

The museum is located in the electronic "city's" University Circle, not coincidentally the location of the Cleveland Museum of Natural History. What a superb way to publicize a museum calendar, which is easily updated as new events and exhibits are scheduled. What a marvelous way to educate. One of the most popular departments is "Ask Dr. Dino," which features questions posted by the users and fielded by the museum's SYSOP. (You might as well learn a little more computer jargon. SYSOP means system operator; in other words, the person in charge.) After a question is answered by a museum expert, the SYSOP types in the information in plain English for all interested users to read. These questions and answers are not erased and eventually will be part of an impressive volume of interesting natural history trivia and information.

The Explorer also is part of the electronic museum. Users can review the table of contents of the current volume year and a summary of each article. There's information on how to join an *Explorer* museum and receive *The Explorer* as a benefit.

Would you like to visit our electronic museum? Then dial, or program your computer to dial, 216-368-3888. Drop the area code if you live in the 216 area. If you're phoning long distance, you might want to place your call at night or on weekends (we're open 'round-the-clock). There is a lot to look at, so take advantage of the lower long distance phone rates during those hours. Be prepared to download information to a disk file or a printer. You can easily register and use all parts of the "city," including the post office, by signing up at Free-Net's administration building for a registration form or by downloading the three-page form, which takes only a couple of minutes to fill in, and returning it to Free-Net. Registration is free. Remember, only *registered users* have electronic mail privileges.

Wouldn't it be wonderful if all the *Explorer* cities and museums could link up electronically? Here's some good news about that. If your community has an organization that is willing to commit time and resources to this kind of system, Free-Net will lease the software for $1.00 per year. Want more information? Write to me. On second thought, don't write. Send me an electronic letter. That's 216-368-3888; and I'm au21l logging off. □

THE WALL STREET JOURNAL.

VOL. LXVI NO. 155 ★ ★ ★ MIDWEST EDITION THURSDAY, MAY 22, 1986

Doc-in-a-Box Explains Illness On Computer

By DAVID STIPP
Staff Reporter of THE WALL STREET JOURNAL

The personal computer is making it easier to learn about what ails you.

What causes heart palpitations? What are the different kinds of breast cancer? Do shock treatments help with schizophrenia?

Computer owners across the country who want answers to such questions can now call several national data banks and quickly summon up the latest technical papers on diseases and treatments.

In Cleveland, for example, computer users can call a computerized bulletin board run by Case Western Reserve University medical school. The system, called St. Silicon's Hospital and Information Dispensary, is an Apple computer programmed to send and receive messages via phone links with other personal computers. Computer owners post medical questions on the bulletin board and receive answers by computer within a day from volunteer doctors at the school.

The systems are not about to replace family doctors. The typical "doc-in-the-box," as St. Silicon's computerized physicians are called, offers personalized tips but not diagnoses. Still, such tips are just what the doctor ordered in many cases. A hurried professional who has no time to go to a physician can easily ask St. Silicon's about the side effects of a blood-pressure drug. And medical interns can tap the system to see how senior physicians answer patients' questions.

Disturbing Questions

"This new medium for health-care information is emerging because there's a critical mass of people with access to the technology," says Thomas Grundner, who developed St. Silicon's Hospital. "A lot of people have computers at work, and we get our peak usage around midday."

Rather than pose questions to the doc-in-the-box, many of St. Silicon's users just browse through the 700 past questions and answers stored on the system. Browsers include doctors who see the system as a continuing survey of patient concerns they often don't hear about. The most disturbing questions, Mr. Grundner says, are those that indicate a breakdown in communications between doctor and patient: One questioner who had had an infection that had been cured asked, "Just what is this disease and what causes it?"

St. Silicon's answers resemble those found in newspaper medical columns. To avoid legal problems, each answer is accompanied by a disclaimer emphasizing that the information "in no way" refers to specific cases. Many questioners are advised to see a doctor.

St. Silicon's and similar systems are a natural extension of the computerization of medical information for doctors. Hundreds of medical journals are now available through data-bank companies such as Dialog Information Services Inc. and CompuServe Inc.

"Doctors are under pressure to show their patients they are well-informed," says Jack Evjy, a Boston cancer specialist who is helping to develop a computerized cancer-information system. "You don't have time to go off to the library when you've got a busy office, and a patient asks you what you know about interleukin-2," a cancer drug.

Electronic Housecalls

Electronic housecalls typically cost consumers no more than a few dollars—to cover connection charges, if any, for the data base involved. Indeed, doctors rarely get paid for participating, and staffing a computer clinic is sometimes a problem.

"We answer only selected questions because we're limited by our staff size," says Todd Stern, a Pittsburgh physician who co-founded HealthNet, a service with 10 specialists in several cities.

Staffing isn't a big problem for Health Forum, a CompuServe offering in which many of the advisers are lay people. The system offers electronic conferences, mediated by physicians on medical topics participants choose. In one conference on arthritis treatments, a Health Forum physician who questioned the value of acupuncture and other nontraditional treatments found himself under fire from a CompuServe customer who claimed such treatments had worked well for her.

Increasing specialization is a major trend in electronic health care. St. Silicon's, for example, already offers a dentist; CompuServe offers a human-sexuality seminar. And handicapped people can rapidly reach others with the same afflictions using the systems.

Sandra Latonia, a Cleveland resident who is losing her vision because of a disease, is working to set up a department for the handicapped within St. Silicon's. "The best therapy is just being able to talk about your problem," she says. "But it's hard to relate to those who aren't in the same predicament."

The Weather
Sunny, hot and humid today and Friday. Clear tonight. Highs will be 90-95 degrees today and 90-95 Friday. The overnight low will be about 70 degrees.
Details on Page 2.

The Vindicator

The People's Paper

City EDITION

★ ★ ★ ½

YOUNGSTOWN, OHIO THURSDAY, JULY 23, 1987

Dispatches from AP, UPI, N.Y. Times, Washington Post, L.A. Times Scripps Howard, Knight-Ridder, N.Y. Daily News, Chicago Tribune

Computers to exchange information

A free community computer network, just the second of its kind in the nation, will be put into operation here Friday offering medical, cultural and sports information.

The Youngstown Free-Net Network, sponsored by Youngstown State University and St. Elizabeth Hospital Medical Center, will allow an exchange of information of interest to the community via computer.

The Youngstown network is an offspring of the Cleveland Free-Net system established in July 1986. Operating out of the Case Western Reserve University School of Medicine, the Cleveland network offers medical, legal, civic and community news.

Dr. Thomas Grundner, an assistant professor of family medicine at CWRU and director of Cleveland Free-Net, is credited with coming up with the concept of a community computer network. More than 4,500 Cleveland computer owners are registered users of the network.

Dr. Robert Kennedy, director of (Please turn to page 6, column 3)

Community information to be exchanged by computer

(Continued from page one)

medical information at St. Elizabeth's, contacted CWRU officials about implementing the system here six months ago, CWRU spokesman Robert Daniels said.

"He thought it was a neat idea and wondered if it could be brought to Youngstown," Daniels said.

The goal of the network is to have 1,000 people in Mahoning, Trumbull and Columbiana counties using the system by August, he said.

YSU and St. Elizabeth's are leasing the ready-made software equipment for $1 a year from the Cleveland group.

Home or office computer users need a telephone modem to hook into the Youngstown system. The modem number for Youngstown Free-Net is 742-3072.

Daniels said once the number is dialed, the word "connect" will appear on the screen. Computer users must hit the return button, and instructions on how to enter the network will appear on the screen.

Information on becoming a registered user of the network can be obtained through the system. Although any computer user with a modem can use the network, only registered users can send and receive computer mail as well as enter messages into the system.

YSU will provide information on admission policies, sports activities, university events and continuing education. St. Elizabeth's will offer medical information.

Butler Institute of American Art will offer information about exhibits and art. Butler will be the first art museum hooked up to the community in such a manner.

The system officially will go into service after a news conference Friday in YSU's Meshel Hall, where the system will be housed.

Cleveland Plain Dealer
Saturday, July 25th

Youngstown tries computer network

By RICHARD ELLERS
STAFF WRITER

YOUNGSTOWN — Hoping to help replace the rusty steel image of the Mahoning Valley with a picture of computer modernism, officials of St. Elizabeth Medical Center and Youngstown State University inaugurated America's second communitywide free public information system.

Known as Youngstown Free Net, the system is a child of the Cleveland Free Net, which made its debut just a year ago.

Like the parent system, Youngstown Free Net is a free community public service information and communications service.

YFN manager Lou J. Anschuetz, a Youngstown State computer manager, said the system had 50 professional volunteer information managers from the medical center, the university and the community.

"Usually within 24 hours, they will provide answers to questions about medicine, health, law, community activities and community schedules," he said.

Like the Cleveland Free Net, medical doctors will answer general questions about medicine, but will not diagnose illnesses nor prescribe medication, he added.

Within a few weeks, the Butler Institute of American Art will become part of the net, Anschuetz said.

Butler will post schedules of its exhibits, and provide information services about art in general, and the Butler collection in particular.

YFN was established with about $30,000 in grants from St. Elizabeth to buy the computer, and YSU's provision of 10 full-time telephone lines, plus the services of Anschuetz and a graduate student-system manager.

Among the YFN inauguration speakers was Case Western Reserve University Professor Thomas M. Grunder, who described the free net concept as a logical parallel to public libraries.

"In the last century, as more and more Americans became literate, and the cost of book publishing dropped, public libraries came along to give citizens free access to books.

"Today, American computer literacy is high enough, and the cost of computers low enough, we see a demand for open access to computer services," he explained.

Grunder spoke from his experience as the originator and developer of the Cleveland Free Net, which, he explained, began as a simple question-answer public service by CWRU's medical school to the Cleveland community.

He said Cleveland Free Net users included many small businesses that use the system to send and receive mail electronically among branches and customers.

CFN's complex software program is offered for lease at $1 a year to any community that will establish similar free nets.

Grunder hopes to establish a national network of Free Nets in all cities, so that users in one city can obtain information, or send electronic mail, instantly and without charge, to users in any other Free Net city.

date (?)

CLEVELAND FREE NET

The following is a list of the men and women who are operating the various areas of this system.

aa001 Tom Grundner, Ed.D Instigator
aa002 Roger Bielefeld Free-Net Programmer
Sysop: UNIX SIG
aa003 Sharron Carlson System Manager
aa004 Jean Szucs System Clerical Staff
aa005 Karen Jessen Programming Assistant
aa200 Sandra Latonia Coordinator of Handicapped Services
aa201 M.P. White, D.B.A. Sysop: Science Fiction SIG
aa202 Steve Goldstine, DDS Sysop: Dental Clinic - St. Silicon
aa203 Mell Csicsila Sysop: Public Square
aa204 Marti Bauschka, RN Co-Sysop: Sports Medicine - St. Silicon
aa205 David Eros Sysop: Cleveland Area BBS Listings
aa206 Gerri Gentile Staff: Apple II SIG
aa207 Robert Garrett, MD Former Chief of Staff: St. Silicon
aa208 Robert Kelly, MD Ass't Chief of Staff: St. Silicon
aa209 Brian Callahan, MA Sysop: The Schoolhouse
aa211 Aaron Leash, DVM Staff: Cleve Museum of Nat. History
aa212 Ray Holan Sysop: Alcohol & Drug Center - St. Silicon
aa213 Francine Heckelman, RN Sysop: Nursing & Home Care-St. Silicon
aa214 Edward Noe Sysop: Chess SIG
aa215 Jorge Rangel, M.D. Staff: St. Silicon
aa216 Jerry Sable, MD Chief of Staff: St. Silicon
aa217 William Johannisson Ass't Sysop: Science Fiction SIG
aa218 Mark Schmidt Sysop: Cleve Museum of Natural History
aa219 Betsy Ruby Liason: Mayor Voinovich's Office
aa221 Henry Greenwell, DDS Ass't Sysop: Dental Clinic - St. Silicon
aa222 Joe Cross, DVM Sysop: Veterinary SIG
aa223 William Bohl, MD Co-Sysop: Sports Medicine - St. Silicon
aa224 Carol Boscovitch Co-Sysop: Apple SIG
aa225 Louise Acheson, MD Staff: St. Silicon
aa226 Robert Bolster, MD Staff: St. Silicon
aa227 Eric Celeste Liason: Governor Celeste's Office
aa228 Sharon Comet-Epstein Staff: Dental Clinic
aa229 John A. Weidenfeller Staff: Dental Clinic (Student)
aa230 Michael Landers, DDS Staff: Dental Clinic
aa231 Juan J. Galvin Staff: Dental Clinic (Student)
aa232 Stanley Hirsch, DDS Staff: Dental Clinic
aa233 Elizabeth Robinson DDS Staff: Dental Clinic
aa234 K. Ragunanthan, BDS Staff: Dental Clinic
aa235 Mike Cover Liason: Congressman Eckart's Ofc
aa236 Andrew Kosiorek Sysop: Sinclair-Timex User Group
aa237 Robert Cederquist DDS Staff: Dental Clinic
aa238 Patricia DeStadio Staff: Dental Clinic
aa239 Mark Golian Staff: Dental Clinic (Student)
aa240 Henry Greenwell Staff: Dental Clinic (Student)
aa241 Stan Michalski, DDS Staff: Dental Clinic
aa242 Bingham, Mike Staff: Dental Clinic (Student)
aa243 Dan Labus Staff: Sinclair-Timex User Group
aa244 Dick Sieg Staff: Sinclair-Timex User Group
aa245 Robert Parish Staff: Sinclair-Timex User Group
aa246 Dean Miller Staff: Sinclair-Timex User Group
aa247 David Hosher Staff: Sinclair-Timex User Group
aa248 Jason Chao, MD Staff: St. Silicon

aa249 Charles Hogye Sysop: MacIntosh SIG
aa250 Veronica Coleman Staff: Dental Clinic (Student)
aa251 Geza Terezhalmy, DDS Staff: Dental Clinic
aa252 Tim Dedula Co-Sysop: IBM SIG
aa253 Keven Pittsinger Staff: Science Fiction SIG
aa255 Ted Fabian Sysop: IBM SIG
aa256 Dr. Dino Staff: Cleve Museum of Natural History
aa257 David Talen Sysop: Texas Instruments SIG
aa258 Thomas Nellis Co-Sysop: Texas Instruments SIG
aa259 Terry Vacha Co-Sysop: Texas Instruments SIG
aa260 David Ellis Sysop: CWRU
aa261 Rose Sherban Staff: CWRU
aa262 Mary Beth Breckenridge Staff: CWRU
aa263 Tom Shrout Staff: CWRU
aa264 Michael Weil Staff: Macintosh SIG
aa265 Lester Moes Co-Sysop: The Schoolhouse
aa266 D.B. Cameron, DVM Co-Sysop: The Veterinary SIG
aa267 Charles Mehozonek Sysop: Commodore SIG
aa268 Jim Haynes Sysop: Atari SIG
aa269 John Dille Co-Sysop: Commodore SIG
aa271 John Suchy Staff: Atari SIG
aa273 Joan Scholl Staff: CWRU
aa274 James Claspill Staff: Atari SIG
aa275 Todd Donovan Paine Dealer: Weatherman
aa276 Eric Jessen Ass't Sysop: Sci-Fi SIG
aa277 Robert Koren Staff: Handicap SIG
aa278 Brian Wolf Staff: CWRU
aa279 Peter Harmon Staff: CWRU
aa280 Joel Armstrong Staff: CWRU
aa281 Phil Newton Staff: Dental Clinic (Student)
aa282 David Cegledi Sysop: Tandy SIG
aa283 Richard S. Weiser Staff: Dental Clinic (Student)
aa284 Holly Cook Staff: Dental Clinic (Student)
aa285 Richard P. Szumita Staff: Dental Clinic (Student)
aa286 Dhiraj Warman Staff: Dental Clinic (Student)
aa287 Bob Montgomery Staff: Dental Clinic (Student)
aa288 William Conroy, Jr. Staff: Dental Clinic (Student)
aa289 Randall Niederkohr Staff: Dental Clinic (Student)
aa291 Kimberly Rice Staff: Dental Clinic (Student)
aa292 Carter Wright Staff: Dental Clinic (Student)
aa293 Michael Rebeta Sysop: The Tax Office
aa294 Ida C. Strozyk Staff: The Tax Office
aa295 James Hamilton Staff: Apple II SIG
aa296 Jeffery Gessler Staff: The Tax Office
aa297 Peter Harmon Co-Sysop: Amiga SIG
aa298 Scott Bessell Co-Sysop: Amiga SIG
aa299 Melody Oakes Staff: Cleve. Museum of Natural Hist
aa300 Jerry Murphy Sysop: Tandy SIG
aa301 Neil Gould Co-Sysop: Arts Center - Video area
aa302 Tracey Liston Co-Sysop: Arts Center - Video area
aa303 Arun Arora, BDS Staff: Dental Clinic (Student)
aa304 John Bluck Staff: Dental Clinic (Student)
aa305 Marc Purdy Staff: Dental Clinic (Student)
aa306 Tim Thomas St. Silicon: Drug and Alcohol Center

THE CENTURY 21 PROJECT: A Synopsis

October, 1987

T.M. Grundner, Ed.D
Assistant Professor
Department of Family Medicine
CWRU - School of Medicine
Cleveland, Ohio 44106
(213) 368-2733

BOX 1987
CLEV. OH 44106
216/368 2733

SHARON CARLSON 216/368 5121

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Appendix A: Century 21 Target Cities

Introduction

It is the intention of the Century 21 Project to establish and bring into stable operation free, open access, community computing systems in a minimum of 90 targeted cities, by the year 2000.

This document is intended to provide a very brief overview of the concept behind the project, an outline of its history and development, and a brief look at each of the three organizations that we believe will help the project be successful in accomplishing it's goal.

The development of community computing systems on the national scale proposed here rests upon a foundation of three interrelated organizations as shown in Figure I.

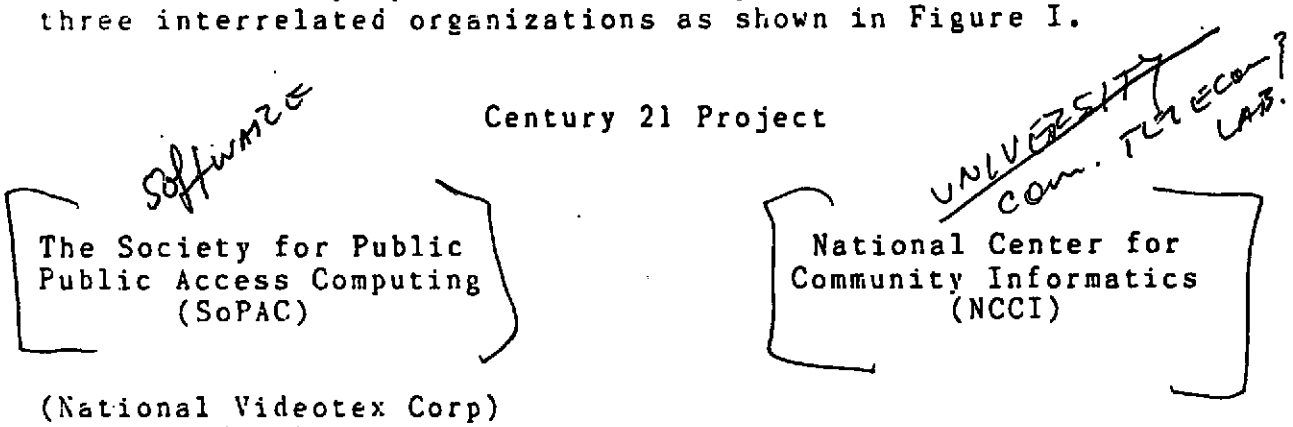


Figure I

The Society for Public Access Computing (SoPAC) and the National Center for Community Informatics (NCCI) are both non-profit organizations. SoPAC was incorporated in April 1987 and exists as a 501(c)(3) entity. It is hoped that NCCI will be operational on the campus of Case Western Reserve University no later than January 1st 1988. A third organization is proposed as a for-profit arm of SoPAC and is still in the planning stages. As yet an official name for this entity has not been selected. However, for purposes of this document, we will refer to it as the National Videotex Corporation.

Century 21 and the Concept of Community Computing

The advent of free, open-access, community computer systems represents a relatively new concept in computing. These systems provide high volume, multi-user, information and communications services to a community in much the same way as a public library, for example, serves a similar function with the printed word.

Operation of these systems is quite straight-forward. A computer is established at a central location in a metropolitan area. The location would be determined by the sponsoring agency, be it a university, city government, corporation, or some other institution. The machine is connected to several phone lines through a series of devices called "modems"--one modem per line. Running on the machine is a computer program that can provide its users with everything from electronic mail services, to information about health care, education, technology, government, recreation, or just about anything else the operators would like to place on the machine. The central system is generally operated by a paid staff of three people--a project director, a system manager, and a clerical assistant. These three people are called system administrators. The various services on the system are operated by volunteers from the community who have a particular professional or avocational skill or knowledge that they are willing to contribute into a common computerized pool. These individuals are known as system operators (or sysops).

Anyone in the community with access to home, office, or school computers and a modem can contact the system any time, 24 hours a day. They simply dial up a central phone number, make connection, and a series of "menus" appear on their screens which allows them to select the services they would like. All of it is free and all of it can easily be accomplished by a first-time user.

The technology for this system is very well worked out. Indeed, there currently exists numerous commercial networks (e.g. the Source, CompuServe, GEnie) that operate, for a fee, at a national level to provide many of these same kinds of services. There also exist tens of thousands of free local single phone line systems, usually run by home hobbyists on microcomputers, called "Bulletin Board Systems." All of these systems have been operating successfully for years.

The Community Computer represents, in effect, a new genre of telecomputing software occupying a middle ground

between these two extremes. It has the sophistication and ease of access of the multi-user commercial systems, yet is locally owned, and operated by the community itself--each system with its own distinct local flavor and set of interests.

History and Development

Completely free, open access, community computing has it's origins in an experiment conducted in the School of Medicine in the Fall of 1984. Dr. Tom Grundner, of the Department of Family Medicine, set up a single phone line, computerized, "Bulletin Board" system to test the efficacy of using this media as a means of delivering general health information to the public. The heart of the system was an interactive area where laypeople could call in using their home or business computers, leave medically related questions and have them answered by a physician with 24 hours. The experiment proved so successful that it attracted the attention of the Information Systems Division of AT&T who funded a larger project to expand and develop this interactive concept.

Based on this donation, Dr. Grundner began work on a full scale "community computer system" on an AT&T 3B2/400 computer with 15 incoming phone lines. This pilot project was designed to serve as a community information resource in areas as diverse as law, medicine, education, the arts and sciences, and government--including free electronic mail services for all citizens in northeast Ohio. On July 16, 1986 this system, called the "Cleveland Free-Net," was opened by Governor Richard Celeste of Ohio and Mayor George Voinovich of Cleveland and the project became recognized as the first completely free, open access, community computer system in the nation.

One of the central tenets of the project was to give the software the widest possible dissemination, yet still maintain quality control standards which, in turn, would lay the groundwork for the broader research and other kinds of applications the developers knew would follow. Accordingly, the software was made available on a <u>lease</u> basis for $1 a year to any qualified party from any city in the country. The $1 year figure placed the software within reach of any institution, and the terms of the "lease" formed the basis for quality control, future research, and other developmental plans.

In July of 1987 the first sister system went online under the terms of this $1 a year arrangement. Known as the

Youngstown Free-Net it is a joint project between Youngstown State University and St. Elizabeth's Hospital--a major tertiary care hospital in that city. As of this writing, it is expected that a third system will be online before the end of the year, and there are now about 30 other cities around the country that are in various stages of bringing Free-Net systems into existence.

The Society for Public Access Computing (SoPAC)

By early 1987 the Cleveland Free-Net had received dozens of requests for more information about their system from various cities. It was clear that an umbrella organization would be needed to help financially and technically support this growing network of community computers. To meet this need, on April 7, 1987 the Society for Public-Access Computing (SoPAC) was incorporated as a non-profit corporation in the District of Columbia. Non-profit tax status under article 501(c)(3) of the Internal Revenue Code was granted on July 20th 1987.

The central mission of this organization is four-fold:

1) To establish selection criteria for the establishment of Free-Net systems around the country;

2) To assist in the process of bringing those systems online with technical assistance, staff training, etc.;

3) To establish and enforce quality control standards for the operation of those systems after they come online; and

4) To help raise monies in support of both the individual systems as well as for the operation of the network as a whole.

The Society is governed by a nine member Board of Trustees which meets quarterly in Cleveland, Ohio. Supporting the Board of Trustees is a Board of Advisors which consists of major figures from within government, industry, education, science, and the professions. Final installation of these board members is expected to be completed by November 30th, 1987.

WHO ARE THEY? OBTAIN LIST!

SoPAC is designed to be a national membership organization similar to, for example, the Cousteau Society. It will be composed of people who are interested in promoting the development of free, open access, community

GET MEMB. INFO.

HAS THIS BEEN SUCCESSFUL? WHO DONATED $?

computer systems. SoPAC holds the copyright to the Free-Net software and is presently engaged in a variety of fund raising activities to secure the operational and development monies necessary to launch its formal membership and dissemination activities.

Targeted dissemination will focus on a list of 90 cities. These cities were selected because they each meet one or more of the following criteria: 1) they are a city with a very heavy volume of personal computer sales and usage; 2) they are one of the top 50 population centers in the country; and/or 3) they are a state capitol. (See Appendix A.)

As of the first of the year SoPAC will begin a recruiting drive to establish systems in an initial list of 28 targeted cities. These first 28 cities were selected because, in aggregate, they contain 91% of the current personal computer ownership in the nation. (It should be pointed out that groups from 12 of these 28 cities have already made spontaneous contact with SoPAC requesting information on setting up systems.)

It must be emphasized that this list is non-exclusive in nature. That is, it is our goal to establish systems in at least these 90 cities. We will also be establishing systems in as many other cities as are interested in having them and can support such an activity.

It is our belief however that if stable systems can be brought online in these 90 cities, that the future of free public access computing in all cities, large and small, will be assured.

The National Center for Community Informatics (NCCI)

The second leg of the triangle represents a very exciting opportunity to systematically explore and develop what amounts to a fourth medium.

It is, of course, a cliche to say that computing is in its infancy. But, cliche or not, it is quite true. In the specific area of telecomputing, we find ourselves experimenting literally with a new medium--one that is quite distinct from radio, television, and print, yet having characteristics of all three, plus additional ones of its own.

We need to know much more about it's exact nature and the best way of harnessing it's unique characteristics.

Indeed, the pilot "Cleveland Free-Net Project" has already begun research efforts into many of these areas including experimentation with third generation software which will include the coupling of natural language and artificial intelligence interfaces to our system's information and communications capabilities.

IS THIS NOW OPERATING?

To meet the challenges implied by the development of this new medium it has been proposed that a new research and development center be established at Case Western Reserve University. This new entity will be known as the National Center for Community Informatics (NCCI) and would have three basic divisions: research and development, education, and operations. The existing Cleveland Free-Net Project would be absorbed into the Operations Division of the Center and would serve as its primary research and development system. Advising the center would be a seven person Board of Directors composed of major figures from the telecommunications and computer industries, government, business, as well as representatives from CWRU.

The general objectives of this Center would be:

1) To promote and disseminate scientific inquiry into the nature of telecomputing as a new information and communications medium including its various social and educational implications.

2) To promote and disseminate educational activities designed to further develop the understanding and use of telecomputing systems in general and of community computer systems in specific. Such activities would not be limited to traditional formal academic and scholastic programs but would include informal educational activities designed for the general public at all levels of society.

3) To assist in the dissemination, development and support of free, open-access, community computer systems in cities across the country and, eventually, around the world.

WHAT WAS THE OUTCOME OF THIS?

The NCCI proposal is presently being considered by the president of the university with a decision expected in two to three weeks.

National Videotex Corporation (NVC)

The least developed of the three entities at the moment is a semi-commercial one. As mentioned above it is expected

that a for-profit corporation will eventually be set up to explore this avenue as a means of generating revenues for the non-profit SoPAC and NCCI organizations, and for the various Free-Net affiliate systems.

Community computing systems and the tremendous volume of traffic they carry offer a host of opportunities for commercial development. To briefly mention but a few of the more obvious ones:

- Specialized equipment sales: One of the characteristics of Free-Net Community Computer systems is that they radically drop telecomputing demographics by, in effect, opening up telecomputing to a vast middle class population. Opportunities for sales of specialized low cost terminals, modems, and various other telecomputing hardware and software to this user population abound.

- Information Gateway Services: The project is very close to perfecting database gateway software which functions very much like an information "travel agent." The user types in information which identifies the nature of the information he or she is seeking. The computer maintains, in effect, a database of databases which isolates where the user would need to go to get that information. If the user is a subscriber to the commercial service that carries that database, he or she will then be ported out to that service. To extend the travel agent analogy further, the possibility exists that these commercial services would be willing to rebate back to the company for this referral--just as airlines, etc. rebate back to travel agencies for directing clients their way.

- Online Shopping: Online locally oriented shopping services are a very definite possibility. A percentage of each transaction would go to the videotex company and a percentage to the host system. Company profits in turn would be split between the investors and the two non-profit organizations SoPAC and NCCI.

- Advertising: Because of the high volume of usage received by the system, online advertising is a very real possibility.

- Online "Yellow Pages": A directory of business and industrial goods and services would be available in a database search format to the users. Like the paper Yellow Pages, businesses would pay for their listing in the database.

It must be emphasized, however, that any commercial development of these systems will be conducted in an appropriate and legally permissible "arms-length" relationship to the non-profit organizations SoPAC and NCCI, and all who work for them. And second, that online NVC activities will be done only at the specific invitation of the individual host systems.

Summary

In general perhaps the best way of illustrating the overall objective of the Century 21 Project is by drawing an analogy to the development of the public library system in this country. In the mid-1800's, for all practical purposes, there was no such thing as the free public library. When literacy finally got high enough (and the cost of books cheap enough) there was a tremendous interest in providing people with free, open access to the printed word. We believe a similar phenomena is occurring today where computer "literacy" is getting high enough (and the cost of equipment cheap enough) that we are now seeing an analogous demand for free, open access, public computing systems.

The Cleveland Free-Net Project has developed the prototype software necessary to establish these public access computer systems nationwide and, as mentioned above, is making this software available to any qualified party, on a lease basis, for $1 a year. It will be up to the three entities described in this document--SoPAC, NCCI and the Videotex Company--to see that this software is developed, disseminated, operated and supported in a responsible fashion.

To be honest, we can not imagine a 21st Century in which there is NOT public access community computing services available in virtually every city and town in the country, just as today we find public libraries. Moreover, we are convinced that these community computer systems will have the same kind of impact on the 21st Century, that the free public library has had on ours.

It is the goal of the 21st Century Project to see that that happens.

CENTURY 21 PROJECT

Ninety Target Cities

It is the intention of the Century 21 Project to establish and bring into stable operation free, open access, community computing systems in a minimum of 90 targeted cities, by the year 2000.

Targeted dissemination will focus on the list of 90 cities shown below. These cities were selected because they each meet one or more of the following criteria: 1) they are a city with a very heavy volume of personal computer sales and usage (Top 28); 2) they are one of the top 50 population centers in the country; and/or 3) they are a state capitol.

It must be emphasized that this list is non-exclusive in nature. That is, it is our goal to establish systems in at least these 90 cities. During this period we will also be establishing systems in as many other cities as are interested in having them and can support such an activity.

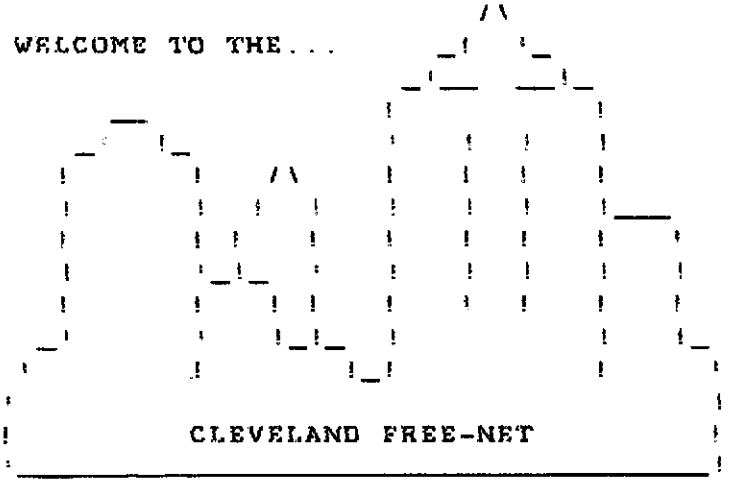
Albany, New York	Capital
Albuquerque, New Mexico	Pop. Rank 44
Annapolis, Maryland	Capital
Atlanta, Georgia	Capital, Top 28, Pop. Rank 31
Augusta, Maine	Capital
Austin, Texas	Capital, Top 28, Pop. Rank 34
Baltimore, Maryland	Pop. Rank 12
Baton Rouge, Louisiana	Capital, Pop. Rank 39
Bismark, North Dakota	Capital
Boise, Idaho	Capital
Boston, Massachusetts	Capital, Top 28, Pop. Rank 20
Buffalo, New York	Pop. Rank 46
Carson City, Nevada	Capital
Charleston, West Virginia	Capital
Charlotte, North Carolina	Pop. Rank 48
Cheyenne, Wyoming	Capital
Chicago, Illinois	Top 28, Pop. Rank 3
Chicago/Northern Indiana	Top 28
Cincinnati, Ohio	Pop. Rank 38
Cleveland, Ohio	Top 28, Pop. Rank 23
Columbia, South Carolina	Capital
Columbus, Ohio	Capital, Top 28, Pop. Rank 19
Concord, New Hampshire	Capital
Dallas, Texas	Top 28, Pop. Rank 7
Dayton, Ohio	Top 28

Denver, Colorado	Top 28, Pop. Rank 24
Des Moines, Iowa	Capital
Detroit, Michigan	Top 28, Pop. Rank 6
Dover, Deleware	Capital
El Paso, Texas	Pop. Rank 26
Frankfort, Kentucky	Capital
Ft. Worth, Texas	Top 28, Pop. Rank 32
Harrisburg, Pennsylvania	Capital
Hartford, Connecticut	Capital
Helena, Montana	Capital
Honolulu, Hawaii	Capital, Pop. Rank 11
Houston, Texas	Top 28, Pop. Rank 4
Indianapolis, Indiana	Capital, Pop. Rank 14
Jackson, Mississippi	Capital
Jacksonville, Florida	Pop. Rank 19
Jefferson City, Missouri	Capital
Juneau, Alaska	Capital
Kansas City, Missouri	Top 28, Pop. Rank 29
Lansing, Michigan	Capital
Lincoln, Nebraska	Capital
Little Rock, Arkansas	Capital
Long Beach, California	Pop. Rank 37
Los Angeles, California	Top 28, Pop. Rank 2
Madison, Wisconsin	Top 28
Miami, Florida	Top 28, Pop. Rank 34
Milwaukee, Wisconsin	Top 28, Pop. Rank 18
Minneapolis, Minnesota	Top 28, Pop. Rank 42
Montgomery, Alabama	Capital
Montpelier, Vermont	Capital
Nashville, Tennessee	Capital, Pop. Rank 27
Newark, New Jersey	Pop. Rank 49
New Orleans, Louisiana	Pop. Rank 22
New York City, New York	Top 28, Pop. Rank 1
Oakland, California	Pop. Rank 43
Oklahoma City, Oklahoma	Capital, Pop. Rank 28
Olympia, Washington	Capital
Omaha, Nebraska	Top 28, Pop. Rank 47
Philadelphia, Pennsylvania	Top 28, Pop. Rank 5
Phoenix, Arizona	Capital, Pop. Rank 9
Pierre, South Dakota	Capital
Pittsburgh, Pennsylvania	Pop. Rank 33
Portland, Oregon	Top 28, Pop. Rank 40
Providence, Rhode Island	Capital
Raleigh, North Carolina	Capital
Research Triangle, N.C.	Top 28
Richmond, Virginia	Capital
Sacramento, California	Capital
Salem, Oregon	Capital
Salt Lake City, Utah	Capital
San Antonio, Texas	Pop. Rank 10
San Diego, California	Pop. Rank 8

San Francisco, California	Top 28, Pop. Rank 13
San Jose, California	Pop. Rank 15
Santa Fe, New Mexico	Capital
Seattle, Washington	Top 28, Pop. Rank 25
Springfield, Illinois	Capital
St. Louis, Missouri	Top 28, Pop. Rank 30
St. Paul, Minnesota	Capital
Tallahassee, Florida	Capital
Toledo, Ohio	Pop. Rank 45
Topeka, Kansas	Capital
Trenton, New Jersey	Capital
Tucson, Arizona	Pop. Rank 41
Tulsa, Oklahoma	Pop. Rank 36
Virgina Beach, Virginia	Pop. Rank 50
Washington, D.C.	Capital, Pop. Rank 17

```
atDT2163683888
DIAL TONE
2163683888
CONNECT 1200

Please type '1', then RETURN: 1
```




```
        An Open-Access Community
             Computer System
            brought to you by


[ Press RETURN to continue, Q to quit ]

     Case Western Reserve University,
     The Ohio Bell Telephone Company
          University Hospitals
                and the
   Information Systems Division of AT&T

          T.M. Grundner, Ed.D
            Project Director

Are you a:
   1. Visitor to the Free-Net
   2. Registered User

Type either a 1 or a 2 ==> 1


Then WELCOME:

   As a visitor to the Cleveland Free-
Net you are allowed to go anywhere and
read anything on the system.  However,
to post messages in certain areas, and
send or receive electronic mail, you
must be a REGISTERED USER. To register,
simply go to the "Administration
Building" off the Main Menu here on
the system, and download the forms (or
leave us your name and address and we'll
send you the forms).  The registration
process and all system usage is FREE.
You are limited to 45 minutes per visit
but there is no limit to the number of
visits you can have per day.

   Before you enter the system however,
```

[Press RETURN to continue, Q to quit]

there are three things we need to tell you.

First we need to tell you that: By entering this system, in consideration for the privilege of using the Cleveland Free-Net and in consideration for having access to the free information contained on it, that you hereby release Free-Net, its operators, and any institutions with which they are affiliated for any and all claims of any nature arising from your use of this system. (See, aren't you glad we told you that?)

Second, once you are in the system you may want to try some of these commands from any menu prompt:

who - who is online with you.

[Press RETURN to continue, Q to quit]

finger - gives you info on any registered user. (You can also do directory searches in the Post Office.)
time - tells you the time ('case ya don't know).
go (name) - takes you to the place on the system you name (like a building or an area).
x - logs you off the system

Finally, we'd like to enter your name and the city from which you are calling into our "Guest Book"--which we will proceed to do forthwith...

<<< THE FREE-NET GUEST BOOK >>>

What is your FIRST name: Carl
What is your LAST name: Farrington
From what CITY: Berkeley
From what STATE: CA

<<< FROM THE ADMINISTRATOR >>>

NEW FREE-NET TO COME ONLINE: Plans were officially unveiled yesterday by the Summit County Council to bring online an AKRON/SUMMIT COUNTY FREE-NET community computer system.

County Councilman Mark Ravenscraft, who spearheaded the drive for the new system, said that the computer will be physically located in Akron, Ohio but will be operated by the county government for all the citizens of Summit County. The system is targeted to go online by the end of May.

All of us on the Cleveland and Youngs-
town Free-Nets extend a warm welcome to
our newest sister system.

[Press RETURN to continue, Q to quit]

The next system scheduled to go online
is the MIAMI FREE-NET in Miami, Florida.
Look for an announcement in the new few
months.

****

*** DENTAL HEALTH MONTH ***

The month of February has tradition-
ally been observed as National Child-
ren's Dental Health Month. However,
the Cleveland Free-Net has a tradition
all its own. Visit the the Dental
Clinic over in the Hospital (main menu
item #7) and help us celebrate this
special month. The Dental Clinic has
new information about dental health,
an expanded staff and FREE door prizes!

[Press RETURN to continue, Q to quit]

>>

There are currently 7 users online.

Wait...

[Press RETURN for Main Menu]

<<< CLEVELAND FREE-NET DIRECTORY >>>

1. What's New in the Electronic City
2. The Administration Bldg. (ADMIN)
3. Government House (GOVT)
4. Public Square (PUBLIC)
5. University Circle (UNIV)
6. The Post Office (POST)
7. The Hospital (HOSP)
8. The Schoolhouse (SCHOOL)
9. The Arts Center (ARTS)
10. The Courthouse (COURT)

```
 x  Exit the system (Good at any menu)

Your Choice ==> 1


<<< WHAT'S NEW IN THE ELECTRONIC CITY >>>

There are 5 items.
 1. WINTER PICNIC INFO and MAP (Jan 18)
 2. With thanks to our donors (Jan  4)
 3. What is SoPAC? (Nov 19)
 4. About Matching Gifts... (Nov 19)
 5. To Cancel Call Waiting... (Nov 10)
----------------------------------------
+ = More items
P = Main Menu
M = Main Menu

Your choice ==> +



There are no more items.

 1. WINTER PICNIC INFO and MAP (Jan 18)
 2. With thanks to our donors (Jan  4)
 3. What is SoPAC? (Nov 19)
 4. About Matching Gifts... (Nov 19)
 5. To Cancel Call Waiting... (Nov 10)
----------------------------------------
+ = More items
P = Main Menu
M = Main Menu

Your choice ==> 4


------------------------------------------------
Date: Thu Nov 19 12:58:16 1987
Subj: About Matching Gifts...


   One way of increasing the impact of your donation to the
Free-Net Funding Campaign is by having your employer match
your donation with one of their own.  If your employer appears
on the following list, please go to your Personnel or Human
Resources Office and fill out a matching gift policy form.
If you are not sure if they have a matching program, give them
a call and find out.  If they do, let us know so we can add their
name to this list.  (Also let us know if you think they might
otherwise be interested in contributing.)

   It only takes a few minutes and will be a big step toward
helping to keep the Free-Net Free!


Aloo Standard
Allied Corporation

[ Press RETURN to continue, Q to quit ]

American Express
AT&T
Arthur Andersen & Co.
Beatrice Foods Co.
```

Caterpillar Tractor
CitiCorp
Cleveland Electric Illuminating Co.
Consolidated Natural Gas
Corning Glass
Cross and Trecker
Deluxe Check Printing
Dexter & Associates
Digital
Earhart
Eaton
Gencorp
Gold Circle
B.F. Goodrich
Gulf & Western
Higbees
Honeywell, Inc.

[Press RETURN to continue, Q to quit]

International Business Machines
Johnson & Johnson
Johnson Controls
Lubrizol Corporation
M.A. Hanna Company
Master Builders
The May Company
McDonald's Restaurants
McGraw-Hill
Minnesota Mining and Manufacturing
NCR Corporation
Ohio Bell
Ohio Edison
Pickway
Piteny-Bowes
Pittway
Predicasts
Prentice-Hall
Standard Oil Company
TRW
United Parcel Service

[Press RETURN to continue, Q to quit]

Westinghouse
Xerox

[Press RETURN to continue]

 1. WINTER PICNIC INFO and MAP (Jan 18)
 2. With thanks to our donors (Jan 4)
 3. What is SoPAC? (Nov 19)
 4. About Matching Gifts... (Nov 19)
 5. To Cancel Call Waiting... (Nov 10)

+ = More items
P = Main Menu
M = Main Menu

Your choice ==> p

```
 1. What's New in the Electronic City
 2. The Administration Bldg.   <ADMIN>
 3. Government House            <GOVT>
 4. Public Square              <PUBLIC>
 5. University Circle           <UNIV>
 6. The Post Office             <POST>
 7. The Hospital                <HOSP>
 8. The Schoolhouse            <SCHOOL>
 9. The Arts Center             <ARTS>
10. The Courthouse             <COURT>
-----------------------------------------
 x   Exit the system (Good at any menu)

Your Choice ==> 6


<<< THE POST OFFICE >>>

1. About the Post Office
2. Check Mail
3. Send Mail
4. P.O. Box Directory
5. Change your Password
6. Who's on the Free-Net?
-------------------------------
M  Back to Main Menu

Type a number from 1 to 7 ==> 4


Search by:
   1. ID Number
   2. Name
   3. City
   4. Affiliations or School
   5. Interests
   6. Read all listings
--------------------------
P  Back to Post Office
M  Back to Main Menu

Type a number from 1 to 6 ==> (



'(' is not acceptable input at this point.

Please choose from p, m, x, 1, 2, 3, 4
, 5, 6

 or type '?' for help.

[ Press RETURN to continue ] 3

Search by:
   1. ID Number
   2. Name
   3. City
   4. Affiliations or School
   5. Interests
   6. Read all listings
--------------------------
P  Back to Post Office
M  Back to Main Menu
```

```
Type a number from 1 to 6 ==> 3


Please enter the City you're interested in: berkeley

DANNY YU (af158) is from BERKELEY, CA

[ Press RETURN to continue ]

Search by:
   1. ID Number
   2. Name
   3. City
   4. Affiliations or School
   5. Interests
   6. Read all listings
--------------------------
P  Back to Post Office
M  Back to Main Menu

Type a number from 1 to 6 ==> 5


Please enter the Interest you're interested in: communism

Sorry, there's no user with that interest.

Search by:
   1. ID Number
   2. Name
   3. City
   4. Affiliations or School
   5. Interests
   6. Read all listings
--------------------------
P  Back to Post Office
M  Back to Main Menu

Type a number from 1 to 6 ==> 6


THE ADMINISTRATOR (aa000    )
From CLEVELAND OH

Affiliations:
         None

Interests:
         None


TOM GRUNDNER (aa001    )
From CLEVELAND OH

Affiliations:
         EASTERN MICHIGAN UNIV.
         UNIV. OF SO. CALIF.
         CWRU

Interests:
         KEEPING THE FREE-NET GOING
         TELECOMPUTING
         MOTORCYCLING
```

FOOTBALL
APPLE COMPUTERS
WRITING

ROGER BIELEFELD (aa002)
From CLEVELAND HEIGHTS OH

Affiliations:
CSU DEPT OF COMPUTER SCIENCE (FACULTY)
CWRU MEDICAL SCHOOL (ADJUNCT FACULTY)
CWRU DEPT OF COMPUTER SCIENCE (STUDENT)
HARVARD UNIVERSITY (ADMINISTRATION)
UNIVERSITY OF KANSAS (STUDENT)
MIAMI UNIVERSITY (STUDENT)

ASSOCIATION FOR COMPUTING MACHINERY
AMERICAN ASSN FOR ARTIFICIAL INTELLIGENCE
IEEE COMPUTER SOCIETY
MATHEMATICAL ASSOCIATION OF AMERICA
SOCIETY FOR PUBLIC ACCESS COMPUTING
SOCIETY FOR COMPUTER SIMULATION

GREENPEACE
HUMANE SOCIETY OF THE U.S.
NATIONAL WILDLIFE FEDERATION
DEFENDERS OF WILDLIFE
NATIONAL AUDUBON SOCIETY
P.E.T.A.

Interests:
TNIS
SPANISH LANGUAGE
ENVIRONMENTAL ISSUES
MATHEMATICS

SHARRON CARLSON (aa003)
From CLEVELAND OH

Affiliations:
OBERLIN COLLEGE CONSERVATORY OF MUSIC,
CWRU
MEDICAL LIBRARY ASSOCIATION, ASIS

Interests:
MUSIC, INDIGENOUS HEALTH CARE PRACTICES, ART,
DANCE, HIKING, INFORMATION SYSTEMS, COMMUNITY COMP
LAUGHING

JEAN SZUCS (aa004)
From UNIVERSITY HEIGHTS OH

Affiliations:
None

Interests:
None

KAREN L. JESSEN (aa005)
From CLEVELAND OH

Affiliations:
CSU
UNIV.HOSP CLEVE

Interests:

ARTS (GRAPHIC)
ARTS (LITERARY)
ARTS (PERFORMING)
ASTRONOMY
CALCULUS
PHILOSOPHY (TAOIST)
PHILOSOPHY (ZEN)
PHYSICS
SPORTS (EQUESTRIAN)

SANDRA LATONIA (aa200)
From PARMA OH

Affiliations:
RP FOUNDATION
SIGHT CENTER
HANDICAP SIG
AVIATION CERTIFICATION ENTERPRISES, INC.
HANDI-TALK (LORAIN JOURNAL)

Interests:
MUSIC
LITERATURE
PSYCHOLOGY
HANDICAPS
FASHIONS
TELECOMMUNICATIONS
AVIATION
SIAMESE CATS
DANCING

M.P. WHITE, D.B.A. (aa201)
From CLEVELAND OH

Affiliations:
NORTH COAST SFX ASSOCIATION
DOCTOR WHO APPRECIATION SOCIETY
DOCTOR WHO FAN CLUB OF AMERICA
LUCASFILMS FAN CLUB
PARAMOUNT OFFICIAL STAR TREK FAN CLUB
SPORTS CAR CLUB OF AMERICA
DATA PROCESSING MANAGMENT ASSOCIATION
NORTHERN OHIO BUSINESS USERS GROUP
SIG SYSOP: SCIENCE FICTION SIG
FRATERNAL ORDER OF POLICE ASSOCIATES
THE DOCTOR WHO INFORMATION NETWORK
THE ITALIAN DOCTOR WHO FAN CLUB
THE AUSTRALASIAN DOCTOR WHO FAN CLUB
THE ROYAL CANADIAN DOCTOR WHO ASSOCIATION
STAR TREK APPRECIATION SOCIETY
THE AUSTRALIAN STAR TREK FAN CLUB
THE NIPON ANIMATION SOCIETY
MAYFIELD MESSENGER BBS
NORTH COAST TANDY USERS GROUP
CLEVELAND SYSLINK BBS
HEIGHTS FAST80PLUS BBS

Interests:
SCIENCE FICTION
DOCTOR WHO
PHOTOGRAPHY
AUTOMOBILE RACING & RALLYING
COMPU TELECOMMUNICATIONS
SYSTEMS ANALYSES
PROCEDURE ANALYSIS
CINEMATOGRAPHY

```
STEVE GOLDSTINE, DDS (aa202    )
From CLEVELAND OH

Affiliations: INCKLEY OH

Affiliations:
         HIGHLAND HIGH SCHOOL
         NORTH COAST COM



[ Press RETURN to continue ]
Search by:
   1. ID Number
   2. Name
   3. City
   4. Affiliations or School

5. Interests
   6. Read all listings
-----------------------------
P   Back to Post Office
M   Back to Main Menu

Type a number from 1 to 6 ==>


'' is not acceptable input at this point.

Please choose from p, m, x, 1, 2, 3, 4
, 5, 6

 or type '?' for help.

[ Press RETURN to continue ] p

Search by:
   1. ID Number
   2. Name
   3. City
   4. Affiliations or School
   5. Interests
   6. Read all listings
-----------------------------
P   Back to Post Office
M   Back to Main Menu

Type a number from 1 to 6 ==> p


<<< THE POST OFFICE >>>

1. About the Post Office
2. Check Mail
3. Send Mail
4. P.O. Box Directory
5. Change your Password
6. Who's on the Free-Net?
--------------------------------
M   Back to Main Menu

Type a number from 1 to 7 ==> 3
```

Sorry, visitors are only allowed to
read files on the system. To receive
a free registration kit, please go to
the Administration Building.

[Press RETURN to continue]

<<< THE POST OFFICE >>>

1. About the Post Office
2. Check Mail
3. Send Mail
4. P.O. Box Directory
5. Change your Password
6. Who's on the Free-Net?

M Back to Main Menu

Type a number from 1 to 7 ==> m

<<< CLEVELAND FREE-NET DIRECTORY >>>

1.	What's New in the Electronic City	
2.	The Administration Bldg.	<ADMIN>
3.	Government House	<GOVT>
4.	Public Square	<PUBLIC>
5.	University Circle	<UNIV>
6.	The Post Office	<POST>
7.	The Hospital	<HOSP>
8.	The Schoolhouse	<SCHOOL>
9.	The Arts Center	<ARTS>
10.	The Courthouse	<COURT>

---

x Exit the system (Good at any menu)

Your Choice ==> 4

PUBLIC SQUARE

<<< PUBLIC SQUARE >>>

1. Information Booth
2. The Podium (Electronic Speeches)
3. The Paine Dealer (Elec. Newspaper)
4. (The Cafe - Chat with other Users)
5. The Kiosk (Open Bulletin Board)
6. The Employment Office (Jobs Board)
7. The Veterinary Clinic
8. The Computer Corner
9. Special Interest Groups

M Main Menu

Your Choice ==> 5

<<< THE KIOSK >>>

1. About the Kiosk
2. General Bulletin Board
3. Wanted & For Sale

P Back to Public Square
M Back to the Main Menu

Your Choice ==> 1

A "kiosk" (which, if you're not familiar with it, is pronounced KEY-osk) is a kind of open pavilion that is used as a newsstand or message center. Our electronic version serves roughly the same function.

The KIOSK has two areas within it--a GENERAL MESSAGE BOARD and a WANTED AND FOR SALE board.

The GENERAL MESSAGE BOARD is the only non-specialized, open bulletin board on the system. Here you can place messages of whatever type and description, about whatever you would like, for everyone to read.

Please remember, however, that

[Press RETURN to continue, Q to quit]

this area should be used only for messages of GENERAL interest and that a number of other, more specialized, bulletin boards are available in various areas throughout the system.

The WANTED AND FOR SALE area is pretty much what the name implies--a place where you can post messages about anything you want to sell or buy.

[Press RETURN to continue]

<<< THE KIOSK >>>

1. About the Kiosk
2. General Bulletin Board
3. Wanted & For Sale

P Back to Public Square
M Back to the Main Menu

Your Choice ==> 2

<<< THE BULLETIN BOARD >>>

1. About the Bulletin Board
2. Search the Message Bank
3. Read/Scan the Messages
4. Post a Message
5. Delete Messages

P Back to The Kiosk
M Back to the Main Menu

```
Your Choice ==> 5


'5' is not acceptable input at this point.

Please choose from p, m, x, 1, 2, 3

 or type '?' for help.

( Press RETURN to continue )

<<< THE BULLETIN BOARD >>>

1. About the Bulletin Board
2. Search the Message Bank
3. Read/Scan the Messages
4. Post a Message
5. Delete Messages
---------------------------------------
P  Back to The Kiosk
M  Back to the Main Menu

Your Choice ==> 2


What would you like to search by...

   1. User ID
   2. Subject
-------------------------
P  Back to the Kiosk
M  Back to Main Menu

Your Choice ==> 2


-----------------------------------------


Sorry, this facility isn't available
yet.  Please see Option #1 (the "About
the..." file) for more details.


-----------------------------------------
( Press RETURN to continue )

What would you like to search by...

   1. User ID
   2. Subject
-------------------------
P  Back to the Kiosk
M  Back to Main Menu

Your Choice ==> p


<<< THE BULLETIN BOARD >>>

1. About the Bulletin Board
2. Search the Message Bank
3. Read/Scan the Messages
4. Post a Message
5. Delete Messages
```

```
P  Back to The Kiosk
M  Back to the Main Menu

Your Choice ==> 1


-------------------------------------------

   The GENERAL MESSAGE BOARD of the Kiosk
is the all-purpose message area.  Here
you can post messages about almost
anything (within the confines of good
taste and decorum, of course).

   Before you use this area, however, you
may want to keep in mind that we have
several other special purpose sections
that may suit your needs better than
this message area.  Included in these
is the "Wanted and For Sale" area if
you are selling something, the Employ-
ment Office if you are looking for a
job, and of course the Post Office if
you simply want to communicate with one
other user.

-------------------------------------------
[ Press RETURN to continue ]

<<< THE BULLETIN BOARD >>>

1. About the Bulletin Board
2. Search the Message Bank
3. Read/Scan the Messages
4. Post a Message
5. Delete Messages
-------------------------------------------
P  Back to The Kiosk
M  Back to the Main Menu

Your Choice ==> 3


<<< THE BULLETIN BOARD >>>

There are 82 items.
 1. To Terri, et al..... (Feb 23)
 2. >>> TERRI <<< (Feb 23)
 3. To Terri! (Feb 23)
 4. To Terri Babe!!! (Feb 23)
 5. GUITAR  (Feb 23)
 6. RE: ICE DANCING (Feb 23)
 7. Re: Ice Dancing (Feb 23)
 8. re:Yes it is all over (Feb 23)
 9. re:Ice Dancing (Feb 22)
10. Brazillian male honor:DBW (Feb 22)
11. Geesh! (Feb 22)
12. like spaghetti through a colander (Feb 22)
13. HIGH SCHOOL HOCKEY (Feb 22)
14. SAILING (Feb 21)
15. YES IT'S ALL OVER (Feb 21)
-------------------------------------------
+ = More items
P = Bulletin Board
M = Main Menu
```

```
Your choice ==> +


16. Hello Everyone! (Feb 21)
17. 6 more days... (Feb 21)
18. Ice Dancing in the Olympics (Feb 21)
19. chalk board (Feb 21)
20. C.I.L. (Feb 21)
21. Guitarists (Feb 20)
22. Cafe (Feb 20)
23. Re: Busy lines (Feb 20)
24. Busy Free-Net phone lines (Feb 20)
25. Help!!!!! (Feb 20)
26. FREE-NETS (query) (Feb 20)
27. Rolling in the.. (Feb 19)
28. Critics rave (Feb 19)
29. I'm not very creative (Feb 19)
30. Health HAZARD Ice Cube Chewing (Feb 19)
-----------------------------------
+ = More items
P = Bulletin Board
M = Main Menu

Your choice ==> 26


-----------------------------------------
Date: Sat Feb 20 02:59:54 1988
From: KEVIN ADAMS (af322)
Subj: FREE-NETS (query)

     I am curious to know, are any of the Free nets linked.
Is it possible to send mail to the youngstown freenet?  I think
it would be rather interesting to have them connected.  It would
probably cost a lot but it's still a thought!

K
 C
  A (af322)
-----------------------------------------
[ Press RETURN to continue ]

 1. To Terri, et al.............. (Feb 23)
 2. >>> TERRI <<< (Feb 23)
 3. To Terri! (Feb 23)
 4. To Terri Babe!!! (Feb 23)
 5. GUITAR  (Feb 23)
 6. RE: ICE DANCING (Feb 23)
 7. Re: Ice Dancing (Feb 23)
 8. re:Yes it is all over (Feb 23)
 9. re:Ice Dancing (Feb 22)
10. Brazillian male honor:DHW (Feb 22)
11. Geesh! (Feb 22)
12. like spaghetti through a collander (Feb 22)
13. HIGH SCHOOL HOCKEY (Feb 22)
14. SAILING (Feb 21)
15. YES IT'S ALL OVER (Feb 21)
-----------------------------------
+ = More items
P = Bulletin Board
M = Main Menu

Your choice ==> p
```

```
<<< THE BULLETIN BOARD >>>

1. About the Bulletin Board
2. Search the Message Bank
3. Read/Scan the Messages
4. Post a Message
5. Delete Messages
-----------------------------------
P  Back to The Kiosk
M  Back to the Main Menu

Your Choice ==> p


<<< THE KIOSK >>>

1. About the Kiosk
2. General Bulletin Board
3. Wanted & For Sale
-----------------------------------
P  Back to Public Square
M  Back to the Main Menu

Your Choice ==> m



  <<< CLEVELAND FREE-NET DIRECTORY >>>

 1. What's New in the Electronic City
 2. The Administration Bldg.   <ADM)N>
 3. Government House            <GOVT>
 4. Public Square             <PUBLIC>
 5. University Circle           <UNIV>
 6. The Post Office             <POST>
 7. The Hospital                <HOSP>
 8. The Schoolhouse           <SCHOOL>
 9. The Arts Center             <ARTS>
10. The Courthouse             <COURT>
-----------------------------------------
  n  Exit the system (Good at any menu)

Your Choice ==> 7


<<<   ST. SIL)CON'S HOSP)TAL   >>>
<<< AND INFORMATION DISPENSARY >>>

 1. The Information Desk
 2. What's New in Health Care
 3. Family Medicine Clinic
 4. Dental Clinic
 5. Handicap Center
 6. Sports Medicine Clinic
 7. Psychology and Mental Health
 8. The Cancer Center
 9. (Geriatric and Home Care Center)
10. The Nursing Office
11. Staff Lounge - Continuing Education
12. (The Hospital Library)
-----------------------------------
M  Main Menu

Your Choice ==> 3
```

<<< FAMILY MEDICINE CLINIC >>>

1. About the Family Medicine Clinic
2. Read/Scan Old Questions & Answers
3. Read/Scan Current Questions & Answers
4. Post a Question

P Back to the Hospital
M Back to the Main Menu

Your Choice ==> 3

<<< FAMILY MEDICINE CLINIC >>>

There are 881 items.
 1. BLOOD TEST INCONSISTENCIES (Feb 17)
 2. Rash (Feb 17)
 3. Birth Control Pills/Drug Interaction (Feb 15)
 4. pain during airplane flight (Feb 15)
 5. enderide & dimizide (Feb 14)
 6. classic migraine (Feb 14)
 7. EYE INFECTION (Feb 13)
 8. Rash? (Feb 12)
 9. Stranger than truth (Feb 11)
10. SLEEP (Feb 11)
11. Natural Diuretics (Feb 8)
12. SWINE FLU SHOTS (Feb 7)
13. Questran (Feb 6)
14. Chicken Pox? (Feb 5)
15. WEIGHT GAIN (Feb 4)

+ = More items
P = Family Medicine
M = Main Menu

Your choice ==>

16. Medication (Feb 2)
17. leaky bladder and probanthine for treat (Feb 2)
18. amputation (Feb 1)
19. ZINC (Jan 31)
20. EPT (Jan 30)
21. Pediculosis (Jan 30)
22. Estrogen (Jan 29)
23. Reye's Syndrome (Jan 28)
24. High Pitched ear noises (Jan 27)
25. Crohn's (Jan 26)
26. Stubbed my toe (Jan 26)
27. Estrogen (Jan 25)
28. Triglyceride level (Jan 25)
29. ulcers (Jan 24)
30. Intestinal Flu (Jan 24)

+ = More items
P = Family Medicine
M = Main Menu

Your choice ==>

31. Eye Problem postsurgical (Jan 22)
32. Drug effects (Jan 22)
33. colon (Jan 22)

34. Incision cysts (Jan 21)
35. angiogram (Jan 21)
36. Quarenteen (Jan 21)
37. Texas Research Oncology Network (TRON) (Jan 20)
38. HEAD PAINS (Jan 20)
39. EVER HEAR OF SOMETHING LIKE THIS? (Jan 20)
40. Medication Interaction (Jan 19)
41. Bowel movement (Jan 19)
42. BIRTH CONTROL (Jan 16)
43. What is Ataxia? (Jan 16)
44. Drug Interacions (Jan 16)
45. SMOKING (Jan 15)

\+ = More items
P = Family Medicine
M = Main Menu

Your choice ==> 36

Date: Thu Jan 21 09:36:20 1988
Subj: Quarenteen

I was wondering if people aren't quarenteened any more?
And if so, why not? This is particularly pertaining to AIDS.
I would think that quarenteening such a person would be for his own
good, and also for the good of others he is in contact with.
Would it not be deadly for an AIDS victem to come in contact
with any illness, even a common cold??? I can't understand why
such individuals insist on attending work, school, etc. if it could
mean signing their own death warrent, not to forget exposing others.
Many other with terminal illnesses are not able to participate in
a normal social life, so why the big deal for AIDS peoples?
And another question about AIDS: If an AIDS person were to be in
respiratory distress in public, appearing to be having a heart attack
or something like that, would it be risky to administer mouth to
mouth resesitation? I would not take such a risk. Again, I
feel they should be quarenteened for public safety!

** Answered by ROBERT KELLY, MD (aa208) on Fri Feb 12 14:04:13 1988 **

[Press RETURN to continue, Q to quit]

There are some who feel as you do, but I'm not one of them. People with
AIDS are not putting themselves or others at risk by being socially active.
Sexual activity is another thing, and someone who knows they have AIDS should
not have sexual contact with someone without informing them (and taking
precautions such as using condoms). It is possible, theoretically, to get
exposed to the AIDS virus by giving mouth to mouth rescussitation to someone
who has AIDS; this is probably not a reason to quarantine those with AIDS,
however.

To the reader:
The reason many questions are not answered promptly is usually
that our physician staff has as much trouble getting on the system as
anyone else does; we may also have less available time to let our home
computers do auto-redials and tie up the phone, etc. Please be patient
and do not re-post a question that seems to have been ignored.

PLEASE NOTE: The information contained on this system is not
intended to supplant individual professional consultation,
but is offered as a community education service. Advice on
individual problems should be obtained directly from a professional.

```
[ Press RETURN to continue, Q to quit ]


-----------------------------------------
[ Press RETURN to continue ]

 1. BLOOD TEST INCONSISTENCIES (Feb 17)
 2. Rash (Feb 17)
 3. Birth Control Pills/Drug Interaction (Feb 15)
 4. pain during airplane flight (Feb 15)
 5. enderide & dimoxide (Feb 14)
 6. classic migraine (Feb 14)
 7. EYE INFECTION (Feb 13)
 8. Rash? (Feb 12)
 9. Stranger than truth (Feb 11)
10. SLEEP (Feb 11)
11. Natural Diuretics (Feb  8)
12. SWINE FLU SHOTS (Feb  7)
13. Questran (Feb  6)
14. Chicken Pox? (Feb  5)
15.  WEIGHT GAIN (Feb  4)
-----------------------------------------
+ = More items
P = Family Medicine
M = Main Menu

Your choice ==> m



 <<< CLEVELAND FREE-NET DIRECTORY >>>

 1. What's New in the Electronic City
 2. The Administration Bldg.   <ADMIN>
 3. Government House            <GOVT>
 4. Public Square              <PUBLIC>
 5. University Circle           <UNIV>
 6. The Post Office             <POST>
 7. The Hospital                <HOSP>
 8. The Schoolhouse           <SCHOOL>
 9. The Arts Center             <ARTS>
10. The Courthouse             <COURT>
-----------------------------------------
 x  Exit the system (Good at any menu)

Your Choice ==> who


   ab947 (PETER LUTJEN)              UNIVERSITY HEIGHTS, OH
visitor (VISITOR)                    CLEVELAND, OH
     rab (ROGER BIELEFELD)           CLEVELAND HEIGHTS, OH
   aa214 (EDWARD NOE)                BROOKLYN, OH
   af370 (JOHN R. MARTIN)            BROOKLYN, OH
   aa355 (LINDA DUSH)                LYNDHURST, OH

Total: 6 users

[ Press RETURN to continue ]


 <<< CLEVELAND FREE-NET DIRECTORY >>>

 1. What's New in the Electronic City
 2. The Administration Bldg.   <ADMIN>
 3. Government House            <GOVT>
 4. Public Square              <PUBLIC>
```

```
 5. University Citole              (UNIV)
 6. The Post Office                (POST)
 7. The Hospital                   (HOSP)
 8. The Schoolhouse              (SCHOOL)
 9. The Arts Center                (ARTS)
10. The Courthouse                (COURT)
-----------------------------------------
 x  Exit the system (Good at any menu)

Your Choice ==> 2


<<< THE ADMINISTRATION BUILDING >>>

 1. Information Desk
 2. Obtaining the Free-Net Software
 3. (Index to Free-Net Services)
 4. User Directory
 5. Comments to the Administrator
 6. Online Users Guide
 7. Change your Password
 8. Receive FREE Registration Kit
 9. Submitting a Proposal to Free-Net
10. The City Plaque
11. Who's Who on the Free-Net
-----------------------------------------
M  Back to Main Menu

Type a number between 1 and 11 ==> 8


Registration forms are available through the
U.S. mail or may be downloaded from the FreeNet
to your computer or terminal.  Downloading the
registration form saves the FreeNet $$$ in postage.

Would you like to download the registration form? (Y/N) y


Please prepare your computer or terminal to receive
 the form.  Press RETURN when you're ready
```

INSTRUCTIONS

Thank you for downloading this registration information for the Cleveland Free-Net--a free, open-access, community computer system brought to you by Case Western Reserve University School of Medicine, in conjunction with the Information Systems Division of AT&T and University Hospitals of Cleveland.

The registration process is very simple. Below you will find three forms. The first of these is an agreement--the terms, if you will, of your participation on the system. This form MUST be signed and dated. The second is the registration form which provides us with, among other things, the information necessary to set up your "account" on the system and to enter you into the user directory. The third form is an optional one, but one we think is very important. It provides us with the basic information necessary to study the system and its utilization.

To register, simply fill out these forms and mail ALL THREE of them to:

The Cleveland Free-Net Project
Department of Family Medicine
Case Western Reserve University
Cleveland, Ohio 44106

There is NO CHARGE for this registration process and NO CHARGE to utilize the system.

We will send you your ID number, a temporary password and a brief Users Guide as soon as possible. In the meantime, feel free to use the Free-Net as a visitor. The number is the same as the old St. Silicon system (216) 368-3888 (300/1200 baud).

Thank you.

T.M. Grundner, Ed.D
System Administrator

---------- New Page

AGREEMENT

In exchange for the use of the Cleveland Free-Net Computer System, I understand and agree to the following:

1. That the use of the Cleveland Free-Net is a privilege which may be revoked by the administrators of that system at any time for abusive conduct. Such conduct would include, but not be limited to, the placing of unlawful information on the system, and the use of obscene, abusive or otherwise objectionable language in either public or, upon registration of complaint, private messages. The staff of the Cleveland Free-Net will be the sole arbiter of what constitutes obscene, abusive, or objectionable language.

2. That the Cleveland Free-Net reserves the right to review any material stored in files or programs to which all users have access and will edit or remove any material which the Cleveland Free-Net, in it's sole discretion, believes may be unlawful, obscene, abusive, or otherwise objectionable.

3. That all information contained on the Cleveland Free-Net is placed there for general informational and entertainment purposes and is, in no way, intended to refer or be applicable to any specific person, case, or situation.

4. That the Cleveland Free-Net does NOT warrant that the functions of this system will meet any specific requirement you may have; nor that it will be error free or uninterrupted; nor shall it be liable for any indirect, incidental or consequential damages (including lost data, information or profits) sustained or incurred in connection with the use, operation, or inability to use the system.

5. To abide by such rules and regulations of system usage as may be promulgated from time to time by the administrators of the Cleveland Free-Net.

6. In consideration for the privilege of using the Cleveland Free-Net and in consideration for having access to the information contained on it, I hereby release the Cleveland

Free-Net, its operators, and any institution with which they are affiliated for any and all claims of any nature arising from my use of the Free-Net.

_____

Signature

_____

Date

---------- New Page

_____ ID#: _____

Ent: _____

Dte: _____

DO NOT WRITE ABOVE THIS LINE

REGISTRATION FORM

Except where indicated, the following information will appear in the system's directory of users. "Affiliations" and "Interests" are optional, but we would like to suggest you fill these items out. The ability to easily locate others with interests and affiliations similar to yours is a major feature of this system and of telecomputing in general.

Please PRINT each item as you wish it to appear but, please, no "handles" or obvious false names or cities.

Required Items: (Please PRINT)

Name: _____

City (add State if NOT Ohio): _____

The following information is requested in case you should loose your ID or password. (It will allow us to identify that you are really you.) THIS INFORMATION WILL NOT BE SHOWN IN THE USER DIRECTORY.

Mother's Maiden Name: _____

YOUR Date of Birth: _____

Optional Items

Please separate each listed item with a comma.

Affiliations (including schools): _____

_____

Interests: _____

_____

To where/whom should we send your ID number and temporary password: THIS INFORMATION WILL NOT BE SHOWN IN THE USER DIRECTORY (And, again, PLEASE PRINT)

Name: _____

Address: _____

_____

City: _____ State: _____ Zip_____

---------- New Page

OPTIONAL PERSONAL INFORMATION

The Cleveland Free-Net is essentially an experimental system. It is a significant "first" in the field of computing and, because of that, we believe it will be the source of a great deal of study in the years to come.

To help facilitate our ability to learn more about this system and how it is used, we are asking that all registered users complete a brief questionnaire about themselves. This information will be kept completely confidential. At no time will it be made available in a form that is linked to your name, nor will it be made available to anyone for commercial purposes.

Answering these questions is optional. You will still be a fully registered user of the system if you do not fill them out. However, because of the unique nature of the system and the unusual opportunity we have here in Cleveland to study it properly from the beginning, we would like to urge you to help us out by completing these items.

Please fill in or check off the following:

1. What is your age? _____

2. What is your sex? _____ 1. Male
_____ 2. Female

3. What is your race?
_____ 1. White
_____ 2. Black
_____ 3. Asian
_____ 4. Hispanic
_____ 5. Other (Please specify _____

3. What is your educational background?
_____ 1. Completed a graduate degree
_____ 2. Completed a 4 year college degree
_____ 3. Completed at least one year of college
_____ 4. Completed high school
_____ 5. Completed the 10th or 11th grades
_____ 6. Completed the 7th, 8th or 9th grades
_____ 7. Completed less than the 7th grade

4. What is your occupation? (Please PRINT)

_____

THANK YOU FOR YOUR HELP!

The form has been sent. Press RETURN to resume normal operation y(

<<< THE ADMINISTRATION BUILDING >>>

1. Information Desk
2. Obtaining the Free-Net Software
3. (Index to Free-Net Services)
4. User Directory
5. Comments to the Administrator
6. Online Users Guide
7. Change your Password
8. Receive FREE Registration Kit
9. Submitting a Proposal to Free-Net
10. The City Plaque
11. Who's Who on the Free-Net

M Back to Main Menu

Type a number between 1 and 11 ==> 9

The Cleveland Free-Net is a COMMUNITY computer system. It is sponsored, supported and operated by a wide variety of agencies and individuals from throughout the Cleveland area.

To maintain and increase this community orientation, we are actively soliciting proposals from our users for new and different features that might be added to this system. We want and need your general ideas and suggestions, as well as, your specific formal proposals.

If you have a general idea or suggestion, please leave a note to the System Administrator in the "Comments" section of the Administration Build-

[Press RETURN to continue, Q to quit]

ing. If you have a specific proposal to make, it must follow this format:

1. Briefly outline your idea. What feature would you like to see on the system? What would it do and, in general terms, how would it work? Where would you put it on the system, or would it be a new building?

2. Describe the primary audience you think this feature would attract? Who do you think would use it and approximately how large do you think that audience would be?

3. If such a feature were made

available, can you identify at least
two people with appropriate skills
that would volunteer to operate it on
the system for a period of at least

[Press RETURN to continue, Q to quit]

one year.

In addition, to these items you should understand that: we will not charge you in any way for the hardware or software necessary to impliment your idea. On the other hand, you may not charge anyone else for it either. Finally, we retain the copyright on the software and the idea, and we may well make it available to other Free-Net systems around the country. We will not be making any profit on that, therefore, neither will you.

Please mail your proposals to:

T.M. Grundner, Ed.D
The Cleveland Free-Net Project
Case Western Reserve University
Cleveland, Ohio 44106

[Press RETURN to continue, Q to quit]

Free-Net: AA001

[Press RETURN to continue]

<<< THE ADMINISTRATION BUILDING >>>

1. Information Desk
2. Obtaining the Free-Net Software
3. (Index to Free-Net Services)
4. User Directory
5. Comments to the Administrator
6. Online Users Guide
7. Change your Password
8. Receive FREE Registration Kit
9. Submitting a Proposal to Free-Net
10. The City Plaque
11. Who's Who on the Free-Net

M Back to Main Menu

Type a number between 1 and 11 ==> !sh

'!sh' is not acceptable input at this point.

Please choose from p, m, x, 1, 2, 3, 4
, 5, 6, 8, 9, 10, 11

or type '?' for help.

[Press RETURN to continue]

```
<<< THE ADMINISTRATION BUILDING >>>

 1. Information Desk
 2. Obtaining the Free-Net Software
 3. (Index to Free-Net Services)
 4. User Directory
 5. Comments to the Administrator
 6. Online Users Guide
 7. Change your Password
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10. The City Plaque
11. Who's Who on the Free-Net
-----------------------------------------
M  Back to Main Menu

Type a number between 1 and 11 ==> 3


-----------------------------------------


Sorry, this facility isn't available
yet.  Please see Option #1 (the "About
the..." file) for more details.


-----------------------------------------
[ Press RETURN to continue ]

<<< THE ADMINISTRATION BUILDING >>>

 1. Information Desk
 2. Obtaining the Free-Net Software
 3. (Index to Free-Net Services)
 4. User Directory
 5. Comments to the Administrator
 6. Online Users Guide
 7. Change your Password
 8. Receive FREE Registration Kit
 9. Submitting a Proposal to Free-Net
10. The City Plaque
11. Who's Who on the Free-Net
-----------------------------------------
M  Back to Main Menu

Type a number between 1 and 11 ==> x


Are you sure you want to exit (Y/N)? y



Thank you for using the Free-Net.  Bye!

M2V1UEYY:

NO CARRIER

ATH0
OK
```

New 'Cleveland' springs up along banks of data

By Howard Swindell
Special to The Tribune

CLEVELAND—For more than a year, Tom Grundner has been, after a fashion, the mayor of Cleveland.

But it's not the Cleveland that we all know and love. It's Cleveland Free-Net, an electronic city populated by information—a city where, if there's an answer to your question or a solution to your problem, you can find it.

The electronic city, among other things, assists small and medium-size businesses by providing quick answers to economic questions and providing them with a communications link they could otherwise not afford.

Grundner founded his city a year and a half ago in the data banks of a computer at the Case Western Reserve University School of Medicine, where he is an assistant professor in the Department of Family Medicine and a specialist in medical computerization.

"It all began by accident," said Grundner, whose doctorate is in education. "In the fall of 1984, we were having the usual sort of communication problems that one finds in a department like ours.

"We had clinics scattered from one end of Cleveland to the other and we needed a way of keeping in touch, so I got the idea of setting up a simple little electronic bulletin board using a castoff Apple II computer."

A bulletin board system is a simple computer link used by hobbyists and other enthusiasts to communicate by computer with others who share similar interests.

"A couple of days after putting this thing up," Grundner said, "word got out in the lay community that this was up and we started getting people calling up the system and leaving medically related questions in hopes that a physician—any physician—would give them an answer.

"I asked, 'What have I got here? I have lay people crashing my humble little system seeking medical information.'

"Then I wondered what would happen if I set up a computerized system that intentionally encouraged people to call in."

So Grundner wrote a computer program called "St. Silicon's Hospital and Information Dispensary."

It was set up like an electronic hospital, and the heart of the project was the "medical clinic," where people could call in with their questions and have an answer from a physician within 24 hours.

"About two weeks after the thing went into operation, we were getting around 100 phone calls a week, and after a month we were getting about 200 calls a week," Grundner said.

"But after about six weeks, we were suddenly at the saturation point for this system—a single phone line at that time—of 280 phone calls a day. It was essentially back-to-back calls during the peak hours."

Photo by The Tribune by Bruce Zalaznik

Tom Grundner formed Cleveland's "electronic city" that gives firms a communications link they otherwise could not afford.

Calls must be made through a computer modem.

St. Silicon's became so well known in the computer community that American Telephone & Telegraph Co.'s computer division heard about it and donated $50,000 in computer hardware to encourage Grundner to experiment and expand on his concept.

"That's when I got the idea of putting together a free, open-access community computer network for everyone in the Cleveland area," Grundner said. "The equipment we received was multiuser, so lots of people could use it at the same time.

"I looked at the success we'd had with the electronic hospital, and I wondered what would happen if we created a whole electronic city."

While Cleveland Free-Net may exist only in silicon chips, the city is not without its impressive architecture:

- A Post Office where users send and receive electronic mail.
- A Schoolhouse that allows Cleveland area public and private schools to communicate.
- A Government House that puts voters in touch with their elected representatives.
- A Public Square for special interest groups that includes a "podium" where anyone can make an electronic speech "as long as it's not pornographic or libelous," Grundner said.
- A Court House that is a legal version of St. Silicon's, offering answers to legal questions.

Cleveland Free-Net has grown to about 10 buildings, including dental, veterinarian and psychological services. None of the professional services can diagnose or offer cures, Grundner stressed, but they can answer questions.

Ohio Bell has given financial support to the project, and from time to time, Grundner solicits voluntary donations from the system's users. But the project isn't too expensive because all the work on it—including the answering of questions by business, medical and other experts—is volunteered, according to Grundner.

And now Cleveland Free-Net

See Data banks, pg. 5

Chicago Tribune, Monday, January 4, 1988 Section 4 6 Business

4/4

Data banks

Continued from page 1

is about to do what the real Cleveland only wishes it could do. It's going to double in size. "We're hoping for funds to develop the software so we can expand Free-Net to 18 to 20 buildings by the early part of 1988," Grundner said.

Unlike similar facilities in the real city of fees and taxes, the amenities of Cleveland Free-Net are free. The 1988 expansion would create an "industrial park" to bring more amenities to the business community.

"One thing we discovered with our current system is that it's very heavily used by medium- and small-size businesses," said Grundner. The reason, he said, is that giant corporations already have "corporate electronic mail and all that other sophisticated stuff.

"But if you're a medium-size business, you may have a branch office in one suburb and a plant in another and the main office downtown, but you can't afford that sophisticated technology."

Free-Net, he said, fills the gap by linking organizations through electronic mail service.

Grundner said his industrial park would include:

- An Occupational Medicine Clinic that provides answers not only on occupational health issues, but also on toxic chemicals, new Environmental Protection Agency regulations and other health-related matters.
- A Small Business "Q&A" Section to aid those going into business for themselves with answers to such fundamental questions as how to make a business plan and how to cope with taxes, accounting and legal problems.
- An Information Center for data-processing professionals.
- An Automotive Industries Support Group to link area automotive suppliers with car manufacturers to facilitate ordering, parts distribution and inventory management industry-wide.
- A Real Estate Office containing government-related data bases that provide such property information as site boundaries, taxes and zoning restrictions.

"We've found that there are a lot of data bases constructed by tax dollars on the local, state and federal levels," Grundner said, "but the taxpayers—the people who paid for it—don't have access to them.

"We want to create more and more taxpayer data bases on our system and offer them on the community-free network."

Besides the industrial park, new buildings will include a "Trading Post," a "Religious Center" and an "Ethics Center," he said.

Eventually, Grundner would like to link the countryside library system, which includes the third largest public library in the nation, to provide answers not handled by the other buildings in Free-Net.

"In every one of the areas of Free-Net, we demand 'Q&A' service where users can get answers," Grundner said.

When Cleveland Free-Net's pioneers logged on in mid-1986, it was the first free community computer network in the nation. Today, similar silicon cities are sprouting up from coast to coast.

Grundner and his associates have provided support and software for several cities, including Miami and Santa Monica, Calif., which are starting community networks.

In Ohio, Youngstown recently began a network, and Akron will come on line soon, Grundner said.

"In fact, we've put together a proposal called the Ohio Telecommuting Network that would link all seven of Ohio's largest cities into a situation where we'd have a Free-Net operating in every city and they, in turn, would be linked at least by overnight electronic mail," said Grundner. "That would make Ohio the first state in the union to have anything like that."

If that should occur, Grundner would be the governor of Ohio Free-Net. And heaven knows what's in store for him if there'll ever a national network.

FACT SHEET

The Cleveland Free-Net Community Computer System

The Concept

The Cleveland Free-Net is a free, open-access, community computer system operating out of the Community Telecomputing Laboratory at Case Western Reserve University in Cleveland, Ohio.

Established in July 1986, the Free-Net computer has been programmed to allow anyone with a home, office, or school computer and a device called a modem, to call in 24 hours a day and access a wide range of electronic services and features. These services range from free electronic mail to information in areas such as health, education, technology, government, arts, recreation, and the law.

The key to the economics of operating a community computer system is the fact that the system is literally run by the community itself. Everything that appears on one of the these systems is there because there are individuals or organizations in the community who contribute their time, effort, and expertise to bring it online and operate it over time. Just as there is no charge to users to access the system, there is no charge to organizations to participate on it.

Usage

As a prototype system, the Free-Net attracted over 6,000 registered users and averaged between 500 and 600 calls a day on 10 incoming phone lines. The Free-Net will be moving out of prototype stage in the summer of 1989, and is expected to eventually generate a user base of 12-15,000 registered users in the Cleveland area. At present 86% of Free-Net users are over the age of 20 (average age 35.5 years) with a very deep "middle class" socio-economic penetration throughout the Cleveland metropolitan area.

Equipment

The original Free-Net system ran on an AT&T 3B2/400 computer with four megabytes of Random Access Memory (RAM) and 144 megabytes of hard disk storage. Free-Net II, scheduled to go online in summer 1989, will consist of 6 IBM-RT Model 135 super-microcomputers linked together to provide 96 megabytes of RAM, 2.3 gigabytes of hard disk storage, and the capacity to service 360 users simultaneously. In addition to connecting to Case Western Reserve University's new fiber-optic campus network, approximately 80 telephone lines will be available for modem access.

Funding Sources

The Cleveland Free-Net was originally made possible by donations from the Information Systems Division of AT&T and the Ohio Bell Telephone Company. These corporations were later joined by University Hospitals of Cleveland, Case Western Reserve University, and by the Free-Net users themselves who contributed over $10,000 in voluntary donations during the early days of the project. The project continues to operate via grants and donations from private foundations, corporations, governmental sources, and private donors.

The Community Telecomputing Laboratory

Case Western Reserve University authorized the development of the Community Telecomputing Laboratory (CTL) in September 1988. The CTL is the first non-proprietary research facility devoted exclusively to research on telecomputing as a new information and communications medium for the general public. Its four-fold mission revolves around research, education, community service, and Information Age technological development.

Software Dissemination

The software that operates the Cleveland Free-Net is available, on a lease basis, for $1 a year to qualified parties from any other city who wish to start a similar service.

Network One

Each Free-Net system that comes online will be an affiliate of Network One, which will provide inter-system electronic mail handling and other services. Eventually we expect to develop the concept of "cybercasting," whereby a wide variety of quality news and information services will be provided to the affiliates via Network One feed-- a concept very similar to that of National Public Radio or the Public Broadcasting System.

For More Information

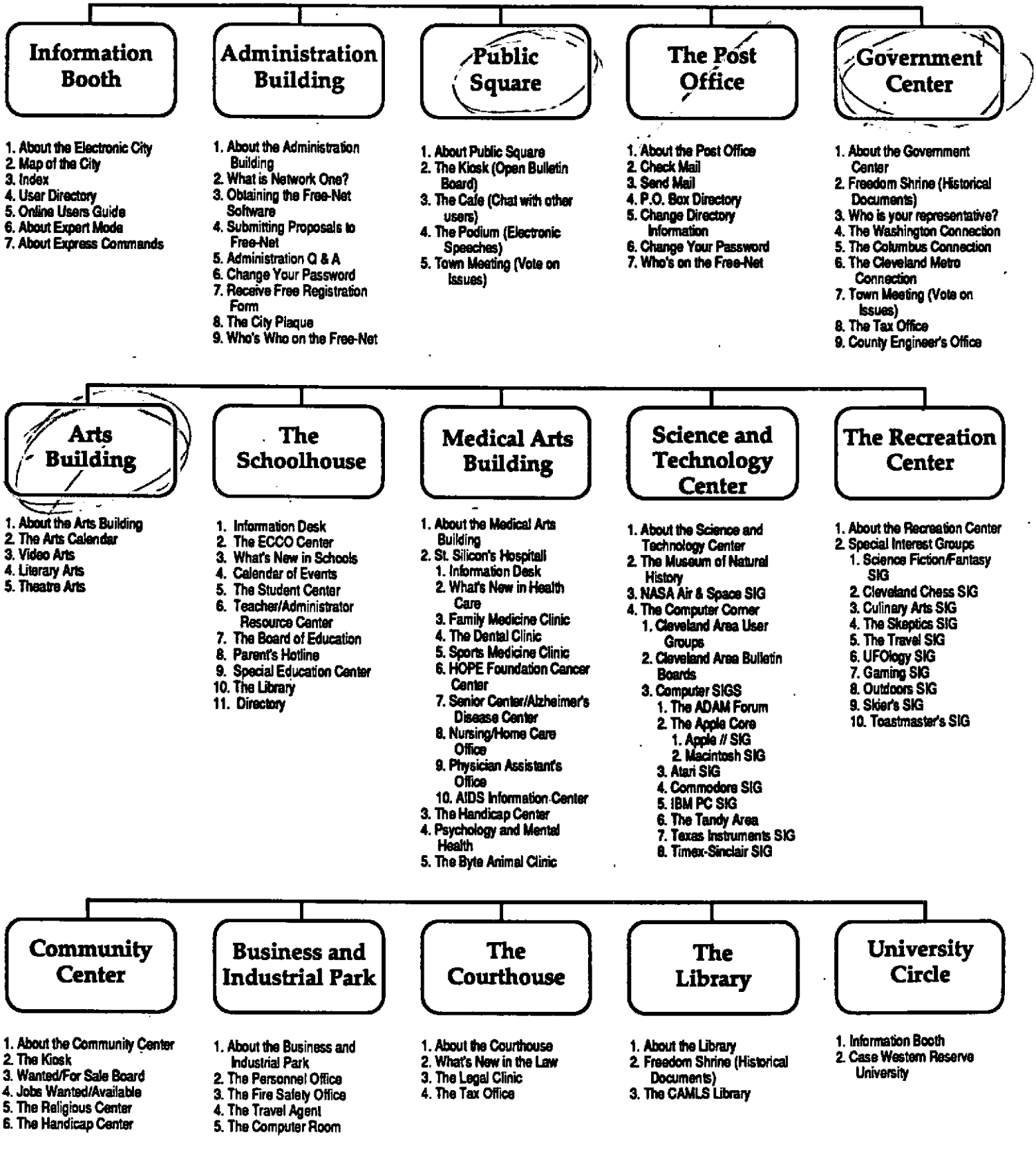
For more information about Cleveland Free-Net operations or other aspects of our work, please contact:

T.M. Grundner, Ed.D. - Director
Community Telecomputing Laboratory
319 Wickenden Building
Case Western Reserve University
Cleveland, Ohio 44106

(216) 368-2733

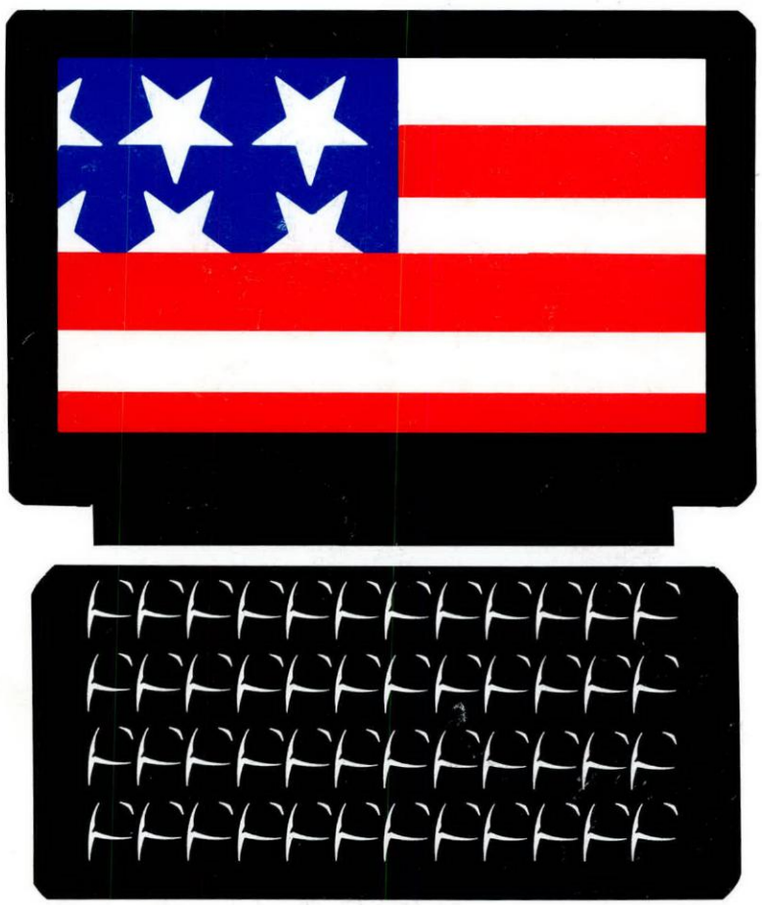
The Cleveland Free-Net Version II System Map

(Version II expected online: summer 1989)
(216) 368-3888 --- [300/1200/2400 baud]



FREE EXCHANGE OF INFORMATION

The right is two centuries old.
The means is a little younger.



Community Computing.
Envisioning the benefits.
Creating the reality.
The Society for Public Access Computing.

Where can I get more information?

For more information about SoPAC membership, community computing, or how to obtain Free-Net software for your community, please write:

T.M. Grundner, Ed.D
Executive Director
The Society for Public Access Computing
P.O.Box 1987
Cleveland, Ohio 44106

To see one of SoPAC's systems in action, please logon to Cleveland Free-Net. With your modem dial (216) 368-3888. 2400 baud users:after initial contact is made, send two "breaks" spaced about a second apart to roll over into the proper transmission speed.

Community Computing.
Will you be a founding father (or mother)?

The Society for Public Access Computing (SoPAC) is looking for candidates to help set up and host community computer systems. These parties will be at the center of a dynamic information network. They will have high visibility and access to a wealth of resources. SoPAC supports the development of such community computer systems.

Why have community computing?

The concept of free and open information exchange is as old as the public library. The computer is a new tool to foster this exchange. We each benefit from the maximum possible awareness of one another's services and knowledge.

The richness and diversity of our society stems from the voluntary participation and contributions of its citizens.

What is a community computer?

A community computer can be used by many people at once as a information and communication resource. It can be reached by anyone with a home, office, or school computer, and a telecommunications device called a modem. It is free of charge, twenty four hours a day.

By calling a local number users have access to electronic mail, information about health care, education, technology, government, recreation, or any other material the host operators place on the machine.

Who will help?

The Society for Public Access Computing is a non-profit 501(c)(3) organization that promotes public interest telecomputing in general, and the specific concept of public access community computing.

SoPAC's mission is:

To establish, develop, and support free, open access community computer systems in cities throughout the United States.

To support the dispersion of information resources to all levels of society through technological innovation and education.

To conduct systematic inquiry into the nature of telecomputing as a new communications medium.

To develop and implement new technologies and applications in support of these goals.

Services available include Free-Net software, staff training, system development, educational outreach programs, technical support, consulting, and specialized software development.

The Board of Directors, headquartered in Cleveland, Ohio, has seven members. Supporting them is a National Board of Advisors composed of major figures from government, industry, education, science, and other professions.

Membership is national, composed of organizations and individuals from all walks of life. These parties are interested in advancing telecomputing and promoting the development of free, open access, community computer systems.

The Society for Public Access Computing

How do you set up a system?
SoPAC will assist in the following steps.

Identifying a Host Institution

Local institutions willing to host the system for at least three years may include colleges and universities, city and county governments, service organizations, hospitals, boards of education, and others, alone or in combination.

Software and equipment.

The Free-Net software is written in the language "C", and operates in a Unix environment. Thus the software can run on dozens of brands of machines from multi-user microcomputers to mainframes. The software is leased from SoPAC for one dollar per year. SoPAC will help you calculate machine size, number of phone lines, types of modems, and other technical matters.

Staffing.

Key to the economics of community computing is community operation of the system. Each area is initiated and operated by individuals and organizations who contribute time, effort and expertise. These carefully selected voluntary information providers are called system operators. Staff requirements depend on system size. A small system will probably require at least a full time project director/system manager, and a half time clerical person. SoPAC provides expertise to train your core staff and system operators. Ongoing consulting is available for technical services, management, organizational development, fund raising, system development, and community support.

Funding.

Though free to the user, the system costs money to operate. External sources of support typically include city and county governments, local corporations, local and national foundations, community fund raising efforts, and direct support from SoPAC.

System Design

SoPAC provides software which is easily tailored to meet the particular needs and interests of your community. An "electronic city" motif allows you to construct "buildings" with different functions. These functions are primarily communication and information exchange. A few examples include an electronic post office where users may communicate by electronic mail; a hospital which offers information on many health topics and allows users to post individual questions to be answered by a health care professional; a government house which puts users in contact with their representatives and governmental services; a stadium with up to date local sports information; a town square where users may make electronic speeches and communicate with special interest groups on subjects like chess, ham radio, photography and car maintenance.

The Society for Public Access Computing.

AT&T
Hershey Foundation of Cleveland
Humbert Studio of Creative Photography

Designed by Philip Lewin
Cleveland Institue of Art
Gratis Graphics Program

Business

Chicago Tribune Monday, January 4, 1988

New 'Cleveland' springs up along banks of data

By Howard Swindell
Special to The Tribune

CLEVELAND—For more than a year, Tom Grundner has been, after a fashion, the mayor of Cleveland.

But it's not the Cleveland that we all know and love. It's Cleveland Free-Net, an electronic city populated by information—a city where, if there's an answer to your question or a solution to your problem, you can find it.

The electronic city, among other things, assists small and medium-size businesses by providing quick answers to economic questions and providing them with a communications link they could otherwise not afford.

Grundner founded his city a year and a half ago in the data banks of a computer at the Case Western Reserve University School of Medicine, where he is an assistant professor in the Department of Family Medicine and a specialist in medical computerization.

"It all began by accident," said Grundner, whose doctorate is in education. "In the fall of 1984, we were having the usual sort of communication problems that one finds in a department like ours.

"We had clinics scattered from one end of Cleveland to the other and we needed a way of keeping in touch, so I got the idea of setting up a simple little electronic bulletin board using a castoff Apple II computer."

A bulletin board system is a simple computer link used by hobbyists and other enthusiasts to communicate by computer with others who share similar interests.

"A couple of days after putting this thing up," Grundner said, "word got out in the lay community that this was up and we started getting people calling up the system and leaving medically related questions in hopes that a physician—any physician—would give them an answer.

"I asked, 'What have I got here? I have lay people crashing my humble little system seeking medical information.'

"Then I wondered what would happen if I set up a computerized system that intentionally encouraged people to call in."

So Grundner wrote a computer program called "St. Silicon's Hospital and Information Dispensary."

It was set up like an electronic hospital, and the heart of the project was the "medical clinic," where people could call in with their questions and have an answer from a physician within 24 hours.

"About two weeks after the thing went into operation, we were getting around 100 phone calls a week, and after a month we were getting about 200 calls a week," Grundner said.

"But after about six weeks, we were suddenly at the saturation point for this system—a single phone line at that time—of 280 phone calls a day. It was essentially back-to-back calls during the peak hours."

Photo for The Tribune by Bruce Zake/AP

Tom Grundner formed Cleveland's "electronic city" that gives firms a communications link they otherwise could not afford.

Calls must be made through a computer modem.

St. Silicon's became so well known in the computer commmunity that American Telephone & Telegraph Co.'s computer division heard about it and donated $50,000 in computer hardware to encourage Grundner to experiment and expand on his concept.

"That's when I got the idea of putting together a free, open-access community computer network for everyone in the Cleveland area," Grundner said. "The equipment we received was multiuser, so lots of people could use it at the same time.

"I looked at the success we'd had with the electronic hospital, and I wondered what would happen if we created a whole electronic city."

While Cleveland Free-Net may exist only in silicon chips, the city is not without its impressive architecture:

- A Post Office where users send and receive electronic mail.
- A Schoolhouse that allows Cleveland area public and private schools to communicate.
- A Government House that puts voters in touch with their elected representatives.
- A Public Square for special interest groups that includes a "podium" where anyone can make an electronic speech "as long as it's not pornographic or libelous," Grundner said.
- A Court House that is a legal version of St. Silicon's, offering answers to legal questions.

Cleveland Free-Net has grown to about 10 buildings, including dental, veterinarian and psychological services. None of the professional services can diagnose or offer cures, Grundner stressed, but they can answer questions.

Ohio Bell has given financial support to the project, and from time to time, Grundner solicits voluntary donations from the system's users. But the project isn't too expensive because all the work on it—including the answering of questions by business, medical and other experts—is volunteered, according to Grundner.

And now Cleveland Free-Net

See Data banks, pg. 5

Data banks

Continued from page 1

is about to do what the real Cleveland only wishes it could do. It's going to double in size. "We're hoping for funds to develop the software so we can expand Free-Net to 18 to 20 buildings by the early part of 1988," Grundner said.

Unlike similar facilities in the real city of fees and taxes, the amenities of Cleveland Free-Net are free. The 1988 expansion would create an "industrial park" to bring more amenities to the business community.

"One thing we discovered with our current system is that it's very heavily used by medium- and small-size businesses," said Grundner. The reason, he said, is that giant corporations already have "corporate electronic mail and all that other sophisticated stuff.

"But if you're a medium-size business, you may have a branch office in one suburb and a plant in another and the main office downtown, but you can't afford that sophisticated technology."

Free-Net, he said, fills the gap by linking organizations through electronic mail service.

Grundner said his industrial park would include:

- An Occupational Medicine Clinic that provides answers not only on occupational health issues, but also on toxic chemicals, new Environmental Protection Agency regulations and other health-related matters.
- A Small Business "Q&A" Section to aid those going into business for themselves with answers to such fundamental questions as how to make a business plan and how to cope with taxes, accounting and legal problems.
- An Information Center for data-processing professionals.
- An Automotive Industries Support Group to link area automotive suppliers with car manufacturers to facilitate ordering, parts distribution and inventory management industry-wide.
- A Real Estate Office containing government-related data bases that provide such property information as site boundaries, taxes and zoning restrictions.

"We've found that there are a lot of data bases constructed by tax dollars on the local, state and federal levels," Grundner said, "but the taxpayers—the people who paid for it—don't have access to them.

"We want to create more and more taxpayer data bases on our system and offer them on the community-free network."

Besides the industrial park, new buildings will include a "Trading Post," a "Religious Center" and an "Ethics Center," he said.

Eventually, Grundner would like to link the countywide library system, which includes the third largest public library in the nation, to provide answers not handled by the other buildings in Free-Net.

"In every one of the areas of Free-Net, we demand 'Q&A' service where users can get answers," Grundner said.

When Cleveland Free-Net's pioneers logged on in mid-1986, it was the first free community computer network in the nation. Today, similar silicon cities are sprouting up from coast to coast.

Grundner and his associates have provided support and software for several cities, including Miami and Santa Monica, Calif., which are starting community networks.

In Ohio, Youngstown recently began a network, and Akron will come on line soon, Grundner said.

"In fact, we've put together a proposal called the Ohio Telecomputing Network that would link all seven of Ohio's largest cities into a situation where we'd have a Free-Net operating in every city and they, in turn, would be linked at least by overnight electronic mail," said Grundner. "That would make Ohio the first state in the union to have anything like that."

If that should occur, Grundner would be the governor of Ohio Free-Net. And heaven knows what's in store for him if there's ever a national network.

THE BEACON JOURNAL

Wednesday, February 17, 1988 ▲ Akron, Ohio ★ ★ ★ 25 Cent

'Electronic county' is vision as Summit approves study

By Francisco Badillo
Beacon Journal staff writer

Have a question about services in Summit County?

Don't fret. Call Robo-County.

Well, the name is still up for grabs, but a source of information about government and community services in Summit County may someday be on computers in homes, libraries and schools.

The County Council on Tuesday approved a $7,200 proposal to study starting a system, patterned after one in Cleveland, that would allow computer users via phone links to get access to a variety of information.

It's an idea that Councilman Mark Ravenscraft envisions as a sort of "electronic county."

> **"There would be tremendous access to information that now cannot be accessed in any other way."**
>
> **Mark Ravenscraft**
> **County Council**

"There would be tremendous access to information that now cannot be accessed in any other way," said Ravenscraft, who sponsored the plan with Councilman Libert Bozzelli.

Ravenscraft said the county would take the lead on the proposal, which would attempt to draw participation from the local library system, Akron-area schools, the University of Akron and others.

The proposal was approved 6-1. Councilman Paul Gallagher voted against the expenditure because of the county's tight budget. Ravenscraft argues the proposal will save money in the long run as information requests decline.

Officials hope first-year costs, which could run as much as

See SUMMIT, page D1

Summit approves funds to study computer information project

Continued from page D1

$30,000 for hardware and another $80,000 for operations, would be paid with a combination of county dollars, contributions and foundation grants.

The study will be done by the Society for Public-Access Computing, an arm of Cleveland Free-Net that is helping duplicate the computer network in about 30 municipalities nationwide, including Los Angeles, Miami, Dayton and Cincinnati.

Cleveland Free-Net — which can be reached at 368-3888 through a phone hookup called a modem — was the first public access computer network of its kind in the country. It opened to the public in July 1986. Youngstown followed suit in July 1987.

Sharron Carlson, an associate director of the society, said the group's consultants would use county government as a cornerstone to attract other components to the system, such as the University of Akron and a hospital.

"We're very excited that a county government has come forward," Ms. Carlson said. Most inquiries have come from hospitals and universities, she said.

She said the system would be patterned after the Cleveland Free-Net model of a computer city. The Cleveland system includes information about government, University Circle, medicine, the arts, Public Square, schools and the courthouse.

Users, for example, can get updates on government offices, answers to medical or legal questions or activities scheduled at the Cleveland Museum of Natural History; make electronic speeches; or find out what's new in the schools.

THE PLAIN DEALER

OHIO'S LARGEST NEWSPAPER CLEVELAND, WEDNESDAY, FEBRUARY 17, 1988

Summit OKs public computer network

By RICHARD M. PEERY
STAFF WRITER

Summit County Council yesterday approved a $7,200 contract to establish a public computer information system for county residents.

Councilman Mark T. Ravenscraft said the system, called FreeNet, would let residents use computers to communicate with government agencies to get information or register complaints.

Personal computers may be placed in public buildings and shopping malls for those who do not own their own equipment, Ravenscraft said.

There are many privately operated FreeNet systems, but the county will be the first government in the nation to form one, he said.

Councilmen said the system would be designed by the Society for Public Access Computing, a group based at Case Western Reserve University.

Gathered around a computer terminal at the official opening of the Handicap SIG last July are, clockwise from the center, Sandra Latonia, Gov. Richard Celeste of Ohio, Cleveland Mayor George Voinovich, and Thomas Grundner, Ed.D.

A Special Place for Special People

The Handicap Special Interest Group on Cleveland Free-Net covers a wide range of topics that concern the handicapped.

—BY AMY ROFFMAN NEW—

Deep in the heart of the Cleveland Free-Net, the fabulous "electronic city" BBS in Cleveland, Ohio [(216) 368-3888], there is an out-of-the-way neighborhood known by its users and coordinator as "A Special Place for Special People."

It's the Handicap Special Interest Group, and it's operated from a private home in Parma, Ohio, by a woman named Sandra Latonia, who is blind.

Sandra has retinitis pigmentosa, a disease that over the past 12 years has restricted her to two percent of normal vision. The tunnel vision which results from the disease allows Sandra to read only two to three words on the screen at a time.

About a year ago, Sandra's husband presented her with a Commodore 128, in the hope that it would give her the opportunity to communicate more efficiently with the outside world. "My husband bought me the computer to give me something to do to make me feel that I was contributing something. It opened up a whole new world," says Sandra.

Soon after receiving the computer, Sandra came across "St. Silicon's Information Dispensary," the BBS that was the forerunner of today's Cleveland Free-Net. In a series of e-mail correspondence, sysop Tom Grundner told her about his dream of an electronic city. Her offer of help was accepted; the Handicap SIG officially started operation in July of 1986 to serve as a source of information for anyone interested in issues affecting the handicapped.

From the main menu of Free-Net, a user might never choose to go to the Handicap SIG, perhaps assuming that it was for the handicapped only. Because users sign up for the SIG by name only, Sandra has no idea how many of the SIG's users are handicapped, although she guesses that as high as 50 percent are not.

The SIG itself consists of a variety of sections. "Ask Sandra" allows users to ask confidential handicap-related questions. The main bulletin board is for public discussion and information exchange between users, and covers a range of topics from information about braille versions of consumer appliance literature to a request for information on a polio support group. There is an informational section called Handi-Talk containing human interest articles. There are also sections offering news items of information on state park accessibility or resources for the handicapped.

There are no professionals running the SIG. Questions are answered by Sandra or other users. For accurate information, Sandra researches her answers at the Cleveland Public Library or Cleveland area agencies. Questions about strictly medical subjects might be referred to the medical Q&A section of Free-Net.

What is the most fulfilling part of the work she does? "Every time I dial (the Free-Net number) it's fulfilling," says Sandra. "Every letter I get is so sincere, I'm just glad that there is a place where they can feel that relaxed....If I can make one kid in a wheelchair smile by reading the letter on my Handicap SIG, there isn't any money in the world that can replace that." ➡

Amy Roffman New is a freelance writer based in Springfield, Illinois.

NEWS & REVIEWS

COMPUTERS

Second City/ Welcome to Cleveland's free-access computer metropolis—the nation's first—where you can make speeches, post messages and ask experts about everything from health care to paleontology.

There exists a second Cleveland, and it's right at your fingertips. Like the city you know, this other Cleveland has a Public Square and University Circle, a post office, government building, hospital, center for the arts, and new buildings under construction and on the drafting table. The first Cleveland is built of bricks and steel. The second is words on a computer screen.

This "city," **the Cleveland Free-Net**, is the nation's first free, open-access community computer system. Its creator is forty-one-year-old Tom Grundner, who holds a doctorate in educational philosophy from the University of Southern California and is an assistant professor in the Case Western Reserve University School of Medicine's department of family medicine. Since last July, Grundner has been stocking his electronic community with everything except chuckholes.

Grundner's system operates on the same phone-connection principle as the many successful national for-profit systems (CompuServe, for instance, or the Source). Anyone with access to a personal computer and modem—the device that links, by telephone, a user's computer to the Free-Net computer system at CWRU—can be privy, at any hour of the day or night, to the Free-Net's surprises. But where the national companies charge fees for access to a massive storehouse of information—be it news and weather or up-to-the-minute tax and stock-market data—the Cleveland Free-Net costs the user only the price of a phone call and is specifically geared to northeastern Ohioans.

Once plugged into the Free-Net, your options are staggering. You may choose to first visit the "administration building," the system's informational hub, which provides the specifics of all the Free-Net's offerings. Then go to the "government house," which, with its question-and-answer forum, its ability to let you send electronic messages to your elected officials, and its stock of information on politics from the local level to the national, is a city hall without walls. Here you'll also find the recently opened "tax office," a place where tax attorneys soothe your IRS-caused headaches.

Founding father: Cleveland Free-Net's Tom Grundner

The question-and-answer forum, in the government house and all other buildings, is integral to the Free-Net. A user with a question—for instance, you might ask the tax office to explain the penalties for incorrectly filling out the new W-4 form—simply moves electronically to the appropriate building and types the question into his or her computer. Within a day, one of the Free-Net volunteers, an expert in the area of that specific question, types in an answer that the questioner, and anyone else using the system, can read. Though the volunteers usually tag their answers with their names and business phone numbers, they essentially are contributing their professional time and expertise without charge to make the Free-Net work.

Like everything else in the Free-Net city, the "post office" is open all night—you can send electronic messages to other users' "mailboxes" and check for mail left in your own. "Public Square" is just that—public. Step up to its "podium" and post a speech for all users to read. Leave a message on its "kiosk" about your lost basset hound. Stop at the "computer corner" and read about systems from Apple to Atari. Or visit any of its "special interest groups" (SIG's)—such as the "handicap" SIG, which is run singlehandedly by Sandra Latonia, a legally blind Parma woman—which are treasure-troves of information on particular subjects.

"University Circle" clues you in on events, news and information at CWRU and the Cleveland Museum of Natural History. (Been feeling curious lately about the geographical range of the fence lizard? Ask the museum's Dr. Dino.) The just-opened "arts center" tells you of upcoming local cultural events, and includes a place where writers in any genre can post their efforts. Finally, there is the hospital. "St. Silicon's Hospital and Information Dispensary" is the most densely developed area of the Free-Net; it provides medical information on topics ranging from sports medicine and home health care to root canals.

The Free-Net's users fall into two categories: the "registered users," who have written to Grundner and received a free password and identification number, and the "visitors." Both can go anywhere and read anything in the system for as much as forty-five minutes at a time; but only the registered users can send and receive electronic mail and post messages and questions.

Grundner, who co-wrote a computer column in *The Plain Dealer* from Easter 1983 to October 1984, as well as the 1984 book *The Complete Guide to Cleveland Computing*,

and who, incredibly, has had no formal training in computer science, says that nothing about the Free-Net stands on the cutting edge of computer technology. What is significant, and what has other cities taking notice, is Grundner's creative application of that technology. His activities constitute more than a soon-to-be-tiresome computer game. "There's a certain inevitability to almost everything we're doing here," he says. "I can't imagine a future date – pick a date, fifty years from now – in which there is not free, open-access public computing, just like there are free, open-access public libraries."

People familiar with computers will note that the Cleveland Free-Net is the large-scale equivalent of the popular single-phone-line bulletin-board systems (BBS's) operated by computer hobbyists from their homes. BBS's cater to clearly defined interests within the computer-user population. Someone interested in chess or model railroading can, by tracking down the right BBS, find a cluster of people who share that enthusiasm. Cleveland's community of eighty BBS's, says Grundner, is one of the largest and most active in the nation. Much of this community now comes under the Free-Net's umbrella, at "Public Square." Though comparing the sometimes short-lived, one-subject BBS's to the diverse, multiple-user Free-Net – which at present has fifteen incoming phone lines – is like comparing a fruit stand to a supermarket, BBS operators represent the inspiration, if not the pioneers, of Grundner's breakthrough.

In fact, in its earliest stages, the Free-Net *was* a single-line BBS. In October 1984, Grundner, using a cast-off Apple II+ and a pirated phone line, devised a BBS that allowed members of his medical-school department, then dispersed among five different clinics around Cleveland, to communicate with each other. Within two weeks the computer public discovered the access phone number and began leaving legitimate medical questions in hopes that a physician would respond. So Grundner rewrote the software to accommodate the public's need for health information. He christened the single-user system St. Silicon's and opened it to the public February 1, 1985.

His user-friendly electronic hospital was soon pulling in more than 200 calls a week on its single line. St. Silicon's blossomed even while confronting the complaint common to all popular one-line BBS's: Only one person can be on the system at a time, which means every other potential user must suffer through a busy signal. Still, the calls flowed in, and the physicians in Grundner's department altruistically contributed a few hours each week to answer the anonymous – and thus unusually candid – queries.

One day, in December 1985, an AT&T vice-president visited CWRU and happened to see and be impressed by St. Silicon in action; his offer to have AT&T's Information Systems Division fund an expansion of the project resulted in his corporation's donation of a powerful $50,000 multi-user computer system. Grundner recalls, "That's when I saw the possibility of developing a community computer system in which the medical component would be one part of a much larger system."

Upon delivery of the AT&T equipment in April 1986, Grundner solicited the prodigious programming talents of Roger Bielefeld, a CWRU doctoral candidate and an instructor in the computer and information science department at Cleveland State University. Bielefeld wrote the sophisticated program in a computer language standard enough to ensure that the Free-Net could be easily transferred to other cities. Most important, room was left for the system to grow and change. "We wanted to come up with a basic skeleton for the system," Grundner says, "and then let the community itself shape the future direction of it."

In retrospect, this is precisely what has happened. "One reason we can run this system with a staff of two and a half people," Grundner says, speaking of himself, system manager Sharron Carlson and a part-time programmer, "is that the system is literally operated by the community." Every part of the Free-Net, he says, "represents a collection of individuals who are donating their time or expertise to make this system operate." On July 16th last year, at the start of Summerfare 150, Cleveland's sesquicentennial celebration, Governor Richard Celeste, Mayor George V. Voinovich and Grundner, standing in a computer-stocked trailer at the city's real Public Square, officially opened the Cleveland Free-Net.

Though for six months no users were actively sought – this "shakedown period," says Grundner, was needed to attend to the equipment failures and inevitable software glitches – by December, some 2,000 registered users were on the system, and 350 to 400 calls a day were coming in.

"Now we're in a growth spurt," says Grundner. He foresees the Free-Net expanding to include a sports-information "domed stadium"; a "media house," in which journalists or journalism students take the reins of the Free-Net's "newspaper," *The Paine Dealer* (after Thomas Paine), and explore the possibilities of this electronic medium; and a "library," which, Grundner hopes, can be linked to the public library computer systems so that people can locate books they need.

Grundner also hopes for expansion of the currently existing "schoolhouse." He sees a day when teachers and administrators across the city can swap information and resources. His most ambitious plan is to eventually let Bielefeld program artificial intelligence into the Free-Net so that it can converse with users in English.

Grundner's biggest worry is funding. Though AT&T, Ohio Bell, University Hospitals of Cleveland and other contributors keep the Free-Net alive, Grundner is brainstorming for ways to put the system on solid financial ground. He sees as possibilities private, nonprofit support groups and, one day, government monies. "I want to keep the system free to the user," he says, "no matter what."

Meanwhile, Grundner is leasing the Free-Net's software formula to interested cities for one dollar a year. Sister systems to the Cleveland Free-Net are expected soon in Youngstown, Oberlin, Miami and Boston. Grundner is certain that Cleveland is the source of what will be a domino-like development of Free-Nets nationwide.

For more information, or to become a registered user of the Cleveland Free-Net, write to Grundner at the Cleveland Free-Net Project, Case Western Reserve University, Cleveland, Ohio, 44106. The system's phone access number, for all users, is 216-368-3888.

– Ken Kesegich

Ken Kesegich is assistant editor of LIVE.

Classical Music

Celebration in Two Parts/ This month, the up-and-coming Canton Symphony Orchestra marks a half-century birthday, while at Baldwin-Wallace College, the stage is set to honor distinguished composer Witold Lutoslawski.

In Canton, a town not always thought of as a center for the arts, audiences pack McKinley High School's Umstattd Hall to hear the **Canton Symphony Orchestra**. Musicians drive many miles to play in it. Its management turns down prestigious job offers, and its commuting conductor of nearly seven years, Gerhardt Zimmermann, says of his job: "It's a blessing. Canton is a little gem in the ocean."

In the hierarchy of the American Symphony Orchestra League, Canton, with a budget of some $700,000, is listed among the metropolitan orchestras, after the majors (such as

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

COMPUTERWORLD

$2 COPY, $44 YEAR | NOVEMBER 3, 1986 | VOL. XX, NO. 44

HANDS-ON

Cleveland writes a prescription for its electronic city

It started with a small electronic bulletin board designed to handle internal communication for the Department of Family Medicine at Case Western Reserve University's School of Medicine, which operated five clinical units at hospitals located in and around Cleveland.

The department connected a cast-off Apple Computer, Inc. Apple II+ microcomputer to a phone line with a 300 bit/sec. Hayes Microcomputer Products, Inc. Micromodem II and set up the bulletin board so that faculty and staff located in the various clinics could communicate with each other. Somehow, though, the number got out and people from outside the university started leaving messages.

In and of itself, that would not have been surprising, says Thomas Grundner, assistant professor in the School of Medicine and creator of the bulletin board, since access numbers frequently find their way into the hands of outsiders. What did surprise and interest Grundner as a medical educator, however, were the kinds of messages he was finding. They were serious medically related questions that people had obviously left in hope of receiving an answer. "When I saw that," he says, "I thought, 'Wait a minute, there's something interesting going on here. People are using this bulletin board to reach out for information and assistance.' "

Impressed by the significance of the phenomenon, Grundner sat down and wrote a program to accommodate these outside users, complete with menus and Help screens. This new system, called "St. Silicon's Hospital and Information Dispensary," was opened to both the public and other medical professionals in the Cleveland area in February 1986.

A medical clinic, or "doc-in-the-box" feature, formalized the spontaneous question-and-answer process. Faculty members who were certified family practitioners were deputized to monitor and respond to inquiries with general information. They were specifically instructed not to attempt to diagnose or treat.

Response to the system was rapid and enthusiastic. The St. Silicon's Hospital line logged more than 100 calls in its second week and eventually reached an average of 300 per week. According to Grundner, the questions asked fell into three general categories: ones that should have been posed in a doctor's office or that had been asked and inadequately answered, ones that callers hesitated to ask their own doctors because they seemed too trivial and ones that callers would have had difficulty asking face to face.

Just as St. Silicon's was beginning to stretch the limit of its facilities, AT&T Information Systems heard about the project and offered $50,000 worth of computer equipment and software.

The facility was equipped with an AT&T 3B2/400 computer with 4M bytes of random-access memory and 144M bytes of hard disk storage as well as 16 1,200/300 bit/sec. modems and custom-written Unix software. With these resources, Grundner decided he had the makings for not just an expanded electronic medical facility, but eventually an entire electronic city.

That city is now a reality called the Cleveland Free-Net. Opened officially July 16, the Free-Net is a free and open-access community computer system supported not just by the initial AT&T donation but also by contributions from Case Western Reserve's School of Medicine and university hospitals as well as a host of other organizations and individuals throughout the greater Cleveland area.

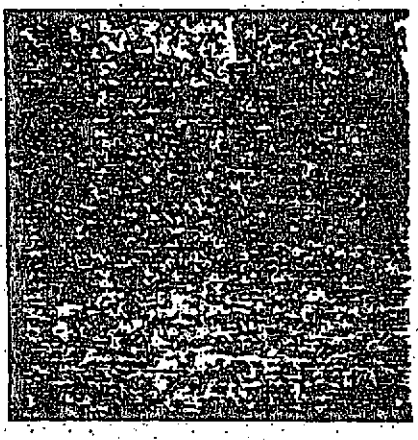
Although building continues, the Cleveland Free-Net already possesses much of what one would expect of a brick-and-mortar town. "Every city has a post office, and so do we," Grundner says. "We provide free electronic mail service to anyone in northeast Ohio who wants to register on the system."

There's also a courthouse, where volunteer lawyers answer users' questions about the law; a government house, which is an electronic connection to elected local, state and national officials; and a schoolhouse, which is an electronic communications system allowing both information exchange among Cleveland-area schools and the creation of common data bases that can be accessed by teachers, administrators, students and parents.

"When you start thinking about something like this in terms of the metaphor of a city, you realize that the possibilities are practically endless," Grundner says.

Grundner envisions similar free community computer systems spreading across the country. The Cleveland Free-Net is ready to do its part to help. Qualified groups from any other city are invited to lease the software on which the Free-Net is built for $1 a year.

PC WORLD



Password: Communicate

Q&A for Free

With the exception of local bulletin board systems, can you get free education and enjoyment through your modem? Case Western Reserve University (CWRU) in Cleveland, Ohio, has made a good start by founding the first free online question-and-answer service, Cleveland Free-Net. The service provides expert advice and information from professionals in law, medicine, natural history, education, and government.

Free-Net began in 1984 as an experiment in electronic distribution of medical information. Called St. Silicon Hospital and Informational Dispensary and sponsored by the Department of Family Medicine of the Medical School at CWRU, the venture was so successful that last year the Information Systems Division of AT&T provided major funding for the project. The system currently receives some 200 calls a day, and its services continue to grow in scope and popularity. To its stable of question-answering experts, Free-Net has added special interest groups (SIGs) devoted to various computers, science fiction, and veterinary medicine, as well as an electronic mail system.

You can use Free-Net as a visitor or as a registered user. Visitors can go anywhere and read any of the information on the system but cannot post their own questions or messages. Registered users can participate in all aspects of the system, such as sending and receiving electronic mail, making "speeches" to an electronic forum, joining a SIG, or posing questions to the experts.

Free-Net is completely menu-driven—it was designed for the convenience of first-time users and computer novices. Currently the system supports 300- and 1200-bps connections. Founder and SYSOP Tom Grundner anticipates that an additional grant will provide equipment for 2400-bps service in the near future.

After displaying a welcome screen, Free-Net asks if you are a visitor or a registered user. When you register, the service assigns you a user identification number and password. As a visitor, you're prompted to sign in to the system's Guest Book.

A couple of tips for your first log-on: If you're calling long distance, do so on a night or weekend; there's a lot to look at. Also, be prepared to download information to a disk file or printer, because you will probably want to save some of it.

Free-Net's main menu lists the major subdivisions of the system. The general-interest Q&A areas are called the Hospital, the Schoolhouse, and the Courthouse. Ohio residents can pose questions to elected officials through the Government House, and anyone can speak up or join a SIG in the Public Square.

Before you start exploring, go to the Administration Building. There you can sign up to have a registration kit mailed to you, or you can download it. Downloading takes a couple of minutes at 300 bps but makes for faster registration.

The registration form consists of three pages: an agreement to abide by the system's terms of participation; a general information form (name, address, and so on); and an optional personal information form for Free-Net to develop a user profile.

Free-Net's Q&A sections are the most popular attractions. Registered users post questions to attorneys in the Legal Clinic, to medical residents and medical school staff in the Family Medicine Clinic, to dental students under the supervision of dental school staff in the Dental Clinic, and to experts from the Cleveland Museum of Natural History in a section called Ask Dr. Dino. You'll find an answer waiting within 24 hours.

(continues)

The experts, who volunteer their time and knowledge, provide answers to on-line questions in plain English, which is great for those of us who don't understand the nuances of medicine, law, or natural history.

To demonstrate Free-Net's capabilities, I posted a simple, general-interest question in the Family Medicine Clinic: 'What is appendicitis and what are its symptoms?' When I logged on the next afternoon, the answer was ready. Compared to other questions on the system—on such topics as malignant hypertension, candidiasis, and macular edema—mine was rather tame. Dr. Robert Kelly, one of the system's volunteer physicians, offered this response: 'Appendicitis is an inflammation of the appendix—a small organ attached to the colon and about the size of a baby's finger. Symptoms would include abdominal pain (most often starting around the navel, then settling in the lower-right portion of the abdomen), fever, nausea, and vomiting. Since other problems can cause the same symptoms, it's best to let a physician evaluate any severe abdominal pain. If appendicitis is not treated in time, the appendix can rupture, causing an even more serious problem.'

Following every response in Q&A sections, this disclaimer appears: 'Please note: The information contained on this system is not intended to supplant individual professional consultation, but is offered as a community education service.'

The disclaimer is important, especially for medical or legal advice. In its professional Q&A sections, Free-Net offers just what it promises: education. This is a place to gather information, locate specialized help, or just learn more about a specific topic. It is not a place to seek help in a crisis. When necessary, Free-Net professionals suggest appropriate specialists to handle problems raised in the questions.

Navigating Free-Net is fairly simple. As noted, the system uses menus, and it has only a few commands. You cannot type ahead to avoid menus, however, and at some points you may see a burst of numbers on the screen if you enter a character that Free-Net does not recognize.

The system displays 20 lines of text and then stops, requesting 'Press <Return> to continue, Q to quit'. If you are reading from the screen, this pause is helpful; if you're downloading to disk, it's a nuisance. At any prompt you can move to the main menu by typing M or to a previous menu by typing P, or you can exit the system by typing X.

The work involved in maintaining such a comprehensive system is done by two paid staffers and a long list of volunteers. Anyone with expertise in a certain area is invited to propose a new section for the system through one of the menu options in the Administration Building.

In the hope of seeding similar information systems, Free-Net leases its software for $1 per year. The lease has certain conditions: The software must be used by an organization that can make a significant financial and time commitment, and it must be used to operate a system offering free public access.

Free-Net is like a great public library staffed by a diverse group of experts. You may use it the first time to find out something in particular, but eventually you'll go back just to browse.
—Amy Roffmann New

Cleveland Free-Net
Case Western Reserve University
Cleveland, OH 44106
216/368-3888 (modem only; available 24 hours a day, 7 days a week, at 300 or 1200 bps)

YOUR ONE-STOP SOURCE OF ELECTRONICS INFORMATION

MODERN ELECTRONICS

MODERN ELECTRONICS NEWS

COMMUNITY COMPUTER SERVICE. A free, open-access community computer information service has been started for the Cleveland metropolitan area. It's arranged like an electronic city, with a "post office" for electronic mail, a "schoolhouse" for use by Cleveland area public and private schools, and a "hospital" and "courthouse" where medical, dental and legal questions can be asked with answers by teams of qualified professionals. There's also a "government house" where area residents many contact their elected representatives and a "public square" with a "podium" where users can give electronic "speeches." Credit Tom Grundner, an assistant professor at Case Western Reserve University, for conceiving the system and a $50,000 donation from AT&T's Information System Division, as well as individuals and organizations in the Cleveland area who volunteer skills and time. Users can access the system with a computer and modem, dialing 216-368-3888 to read anything they wish. To place material on the computer and have electronic mail privileges, however, one simply needs to fill out a form, send it to CWRU (University Communication, 1 Adelbert Hall, Cleveland, OH 44106), and get an ID number and password in return. There's no charge. If any qualified group wishes to duplicate this system in other cities, the software is available for one dollar (that's $1).

VOGUE
APR.
$3.00

health

Drug alert . . . unsmoking . . . Dr. by phone. BY MELVA WEBER

RETURN OF THE DOCTOR'S HOUSE CALL

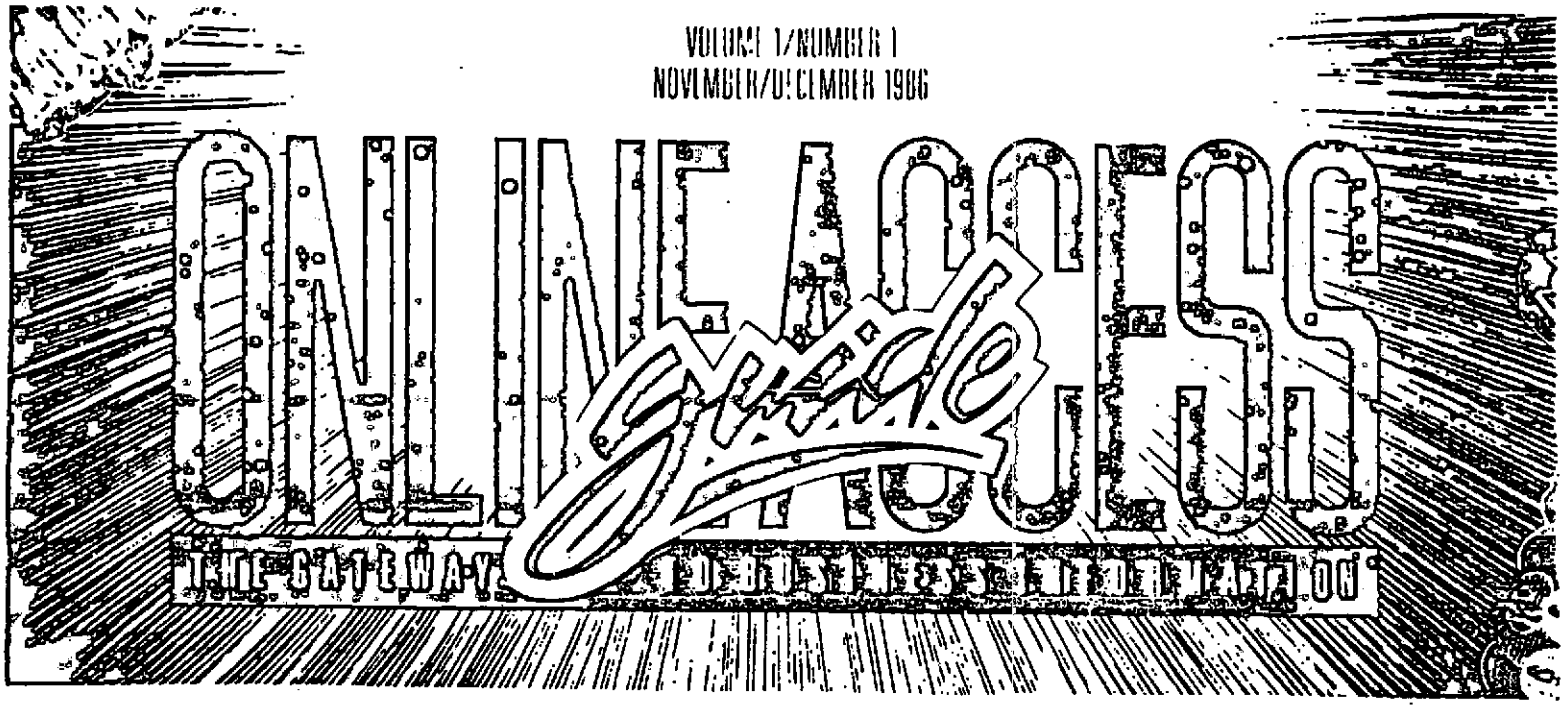
"St. Silicon's Hospital and Information Dispensary" may sound like the title of a new television series. Actually, it's the name of a project of the Department of Family Medicine at Case Western Reserve University School of Medicine in Cleveland, Ohio. And instead of a venerable stone clinical building, it is, as its name suggests, a computer that makes house calls.

Medical questions from the public can be directed to the family physicians' staff at Case Western by anyone with a modem-equipped home computer or with access to a computer terminal. They'll be answered by a faculty member, usually within twenty-four hours. According to Tom Grundner, M.D., founder of St. Silicon's, its creation was unintentional. The project was started as a communication system for doctors within Case Western's various clinical units. "After a while the phone number got out, and people started calling up with their personal medical questions, hoping a doctor would answer. So we began to develop the system as a medium for community health education."

Robert Garrett, M.D., another St. Silicon's physician, adds: "We analyzed the kinds of questions people ask. Some are questions they have forgotten to ask while in the doctor's office—such as the side effects of prescribed medication. And we're also answering questions people think are too trivial or too costly to take to a doctor."

Dr. Grundner believes there's nothing like St. Silicon's elsewhere in the nation, "but it won't be long. Someday all professions will have community information services like this, and we believe St. Silicon's will be the model for them."

VOLUME 1/NUMBER 1
NOVEMBER/DECEMBER 1986



WELCOME TO THE CLEVELAND FREE-NET

An Open-Access Community Computer System brought to you by

Case Western Reserve University School of Medicine
and
AT&T Information Systems Division

T.M. Grundner, Ed.D
System Administrator

◆

CLEVELAND FREE-NET DIRECTORY

1. What's New in the Electronic City
2. The Administrative Bldg. (ADMIN)
3. Government House (GOVT)
4. Public Square (PUBLIC)
5. University Circle (UNIV)
6. The Post Office (POST)
7. The Hospital (HOSP)
8. The Schoolhouse (SCHOOL)
9. The Courthouse (COURT)
10. Electronic Birthday Card (BIRTH)

FREE-NET: CLEVELAND'S ELECTRONIC CITY

Within Cleveland is another city, one devoted to the idea of free electronic information.

FreeNet is the nation's first free nationwide computer network, thanks to a grant from AT&T and the computing talent of Dr. Thomas Grundner, a professor of family medicine at Case Western University.

FreeNet's avenues of information lead to familiar-sounding civic landmarks. Entering the Courthouse, you'll find qualified lawyers who will answer the legal inquiries you leave behind. The Post Office handles the City's electronic mail, naturally enough.

Down the street is the Hospital, also known as St. Silicon and the nucleus of the larger system of bulletin boards that make up FreeNet. Animal lovers can stop nearby to leave questions for the "Vet-in-the-Box," a variation on St. Silicon's "Doc-in-the-Box."

Out on the Public Square, online debates will soon be raging at Hyde Park Corner.

The only charge for visiting FreeNet is the phone call, by the way; all advice, information and your "residency" is free.

"The development of this online community has created a real sense of community offline," Dr. Grundner says. "Professionals are coming together, willing to contribute their expertise to the [illegible]."

And FreeNet is flourishing. The Schoolhouse, for example, is slated to open its doors in September, offering a new communications channel for the [illegible] school system. The Library will [illegible] to the Cleveland Public Library [illegible] logues. And electronic banking [illegible] works.

The FreeNet group expects to [illegible] software to any other interested [illegible] for a charge of one dollar a year. "The concept of free public-access computer time has been kicked around for 20 years," Grundner comments. "Now its time has come."

AMAZING THINGS ARE HAPPENING AS THE HEALTH-CARE INDUSTRY GOES ONLINE. FOR A SURVEY OF THE SITUATION, YOU MIGHT VISIT...

Just getting through the door at St. Silicon's Hospital and Information Dispensary, as it's called, can take a little time. Then, once you've been admitted, you're only allowed a 45 minute stay and the doctor you see never appears in person. Nonetheless, everyone agrees the institution is doing a great job.

Not surprisingly, the public is lining up to get into St. Silicon. That's because it's free for the price of a local phone call to anyone in the Cleveland area. The hospital is in fact a sophisticated medical information system developed at Case Western Reserve University's School of Medicine.

St. Silicon is the nucleus of what has become a remarkable bulletin board system called the "Cleveland Free-Net Directory" (see sidebar). Beginning with the dial-in information service originated by Dr. Thomas Grundner, a professor of family medicine at Case Western's medical school, the Free-Net is now an electronic city of public-service announcements and information enjoying the active support of Cleveland's computer community. Among the various city organizations listed on the Free-Net menu, you'll find St. Silicon.

Once inside its hospital corridors, you'll find the Doc-in-the-Box medical clinic, where hundreds of questions and answers on general medical topics are accessible to the public. The subjects range from "abdomen" to "Zyloprim," an anti-gout drug.

Then there's the Dent-in-the-Box, if you're gnawing on some problem of that sort. Shrink-in-the-Box is also open for business, but offers a somewhat crude interactive therapy program with questions like, "Do computers worry you? Why? And give me the REAL reason why?"

There's even a hospital newspaper called, regrettably enough, "The Pain Dealer."

All the "patients" at St. Silicon remain anonymous, so they are free to ask personal and even painful questions of the kind they might hesitate to ask their own physician. Veneral diseases, AIDS, and drug addiction are standard topics.

Sometimes the bulletin board reveals problems in doctor/patient relations. In one case, a former hospital patient asked the online doctor a series of questions about a particular disease. Finally, it dawned on the patient that he had indeed once contracted this disease and been cured of it by one of the local hospitals. But his doctor at the time had simply neglected to actually mention the name of the ailment to him or any details about it.

Improving the communication between staff and patients was not the original notion for St. Silicon. At first, Dr. Grundner only wanted to keep the professional staff of the university's five different Cleveland-area clinics in closer touch. Now, with incidents like that of the surprised former patient, he observes that better physician-patient communications must be a principal goal for St. Silicon as well.

"It is this kind of patient's dilemma, plus the evidence of the system's heavy use, that confirm our belief that St. Silicon is meeting a need that is not being met by other sources of health care information," Grundner stresses.

St. Silicon is growing and is receiving national media attention along the way. A recent issue of The New England Journal of Medicine gave it a sizable writeup and noted the system's efforts to treat all its patients courteously and with the best bedside manner.

All of this is not without some wry medical humor, however: when you decide to check out (log off) of the system, St. Silicon's board asks skeptically, "Are you sure you want to leave the hospital in YOUR condition?"

INTERNATIONAL
VIDEOTEX TELETEXT NEWS
November 1986

FREENET LAUNCHES CLEVELAND SERVICE; OFFERS SOFTWARE LICENSE FOR $1

Case Western Reserve University's School of Medicine in Cleveland is operating a free online community bulletin board in northeastern Ohio. CWRU is willing to lease its software for $1 per year to any institution willing to set-up a similar free service within its community. "Cleveland Freenet" started as a medical information experiment and has expanded to a full-featured ASCII bulletin board, supported by a $50,000 grant from AT&T Information Systems. As part of the grant, AT&T donated its high-end 3B2/400 microcomputer. CWRU developed the software.

Freenet is organized as a "City" and features "Post Office" for general electronic mail; "Hospital," through which users can ask medical questions and gather community health information; "Government" in which users can ask the Cleveland mayor and Ohio governor questions on a bulletin board; and "Public Square," a catch-all category for special interest groups. To participate in Freenet, users must fill out an electronic identification form. Visitors are permitted on the system but can only read publicly posted information and cannot add information. Freenet expects to have about 2,000 registered users by the end of November. The service receives from 200 to 250 calls per day.

Freenet Project Director Thomas Grunder hopes other universities, institutions or even corporations with a suitable host computer will take him up on the $1 per year software leasing deal to set up community networks. The software is leased to ensure that system operators do not charge users for the service. Four unnamed organizations have expressed serious interest in the software, Grunder says. However, to keep the Ohio operation online, Grunder needs funding beyond AT&T's contribution and is pursuing more grants. (Case Western Reserve University, Department of Family Medicine, Cleveland, OH 44106; 216-368-2000.)

TORONTO GLOBE AND MAIL
July 16, 1986

Doctors answer health questions through computer phone-in service

ARE APPLE SEEDS poisonous? Will a surgical scar grow with a child? What exactly is cancer and why is it so dangerous?

For the answers, plug in your personal computer and call 216-368-3888.

These — and 12,997 other questions on all aspects of health — have been "posted" on a unique computer bulletin board in Cleveland, Ohio, known as the St. Silicon Hospital and Information Dispensary in the 17 months since it came into existence.

Anyone with a personal computer and the funds to pay for the call can phone the "hospital" for information. Every question, which is assigned a number to protect callers' anonymity, is answered within two days by a qualified physician.

The "hospital", which now receives so many calls that doctors answering questions can barely get time on-line themselves, began as an internal service so that physicians working at five clinical units of Case Western Reserve University School of Medicine could leave electronic notes for one another, said Dr. Robert Garrett, a family physician who runs the program with medical educator Thomas Grundner.

Now Dr. Garrett spends 30 to 45 minutes every morning — between his shower and breakfast — answering the 280 calls which come in every week.

"I'm usually on the system at 6 a.m. when I get up," he said in a telephone interview. "If not, I can't get on-line myself."

He answers most questions off the top of his head, but refers tougher ones to a dozen colleagues at the medical school before typing in the answer.

"The way the questions are phrased indicates the communication between the doctor and patient didn't go the way it should," Dr. Garrett said.

"Many times a patient is no longer ill but still doesn't understand what was wrong with him. They're the types of questions most people consider too trivial or embarrassing to ask in the doctor's office."

The largest single category of questions are those regarding medication and its proper use, Dr. Garrett said.

Many of the questions cover topics patients find difficult to tackle face to face with a physician, or anyone else: sexual practices, including homosexuality; venereal disease; and drug and alcohol abuse.

Most callers are young professional men

CAITLIN KELLY

who never see their doctor because they are too busy, Mr. Grundner said.

Ninety three per cent of users are male and 63 per cent of them are between the ages of 20 and 59, which surprised the program's designer who expected to see the program used mostly by teen-age computer buffs.

"This is a medically underserved population," he said. "These men see their parents, their wives and their children, but they never see a doctor."

The increasing use of personal computers, not only by busy executives but by their wives, children and secretaries, is reflected in the growing number of women and minorities who are making use of the system, Mr. Grundner said.

(Every user must register with the hospital giving name, age, city, occupation, sex and race to help the program's designers keep track of who is using the program.)

A caller can check with the program's index to see if a similar question has already been answered — there are 850 answers on file.

For legal and ethical reasons, the "hospital" will not give callers any diagnosis or treatment, Mr. Grundner said.

The design of the software program, which is available to any qualified doctor who wants to set up a similar system, includes a medical clinic, dental clinic and even a doctors "lounge" in which notices of upcoming conferences or other professional items of interest are posted.

A mention of the program in a recent article in the New England Journal of Medicine prompted a flood of mail from all over the world, Dr. Garrett said. He and his colleagues have received more than 150 letters from Hong Kong, Canada, Australia, Japan, Sweden, Holland and Britain from others interested in the idea.

The "hospital" which is expanding to include separate "clinics" dealing with sports medicine, medication, drug and alcohol abuse and home care, is teaching doctors as much as the callers who hook up with them from across North America, both men said.

It took a lot of searching to find out if apple seeds were poisonous, a possibility which seemed highly unlikely at the time of the call, Mr. Grundner said.

But a careful search of the medical literature showed that, in fact, the seeds contain a small amount of a chemical as lethal as cyanide — and that two cases have been recorded of deaths from apple-seed overdose.

THE PLAIN DEALER

OHIO'S LARGEST NEWSPAPER CLEVELAND, MONDAY, JULY 14, 1986

Free computer net here aims to go nationwide

By WILLIAM F. MILLER

STAFF WRITER

Cleveland Free-Net, the nation's first free, open-access community computer system, will debut on Public Square at noon Wednesday at the opening of Summerfare 150, a celebration of Cleveland's sesquicentennial.

Gov. Richard F. Celeste and Mayor George V. Voinovich will inaugurate the system, which initially will link computer users in Northeast Ohio to such services as electronic mail, community calenders and medical information.

A trailer with computer terminals will be on the southwest quadrant, where the public can try the new system throughout Summerfare 150.

Dr. Thomas M. Grundner, an assistant professor at Case Western Reserve University's School of Medicine, said he hoped the network would expand, enabling users to do their banking electronically, register for college courses, and receive the latest news, weather and sports reports, among many other uses.

Grundner likens Cleveland Free-Net to an electronic city that eventually will provide many community services.

Like the public library, it must be free, he said.

He said he hoped to interest enough cities in the system to make it available from coast to coast.

The system will not only give information, but answer users' questions.

Cleveland Free-Net will be available to anyone with access to a microcomputer and a modem, which connects the user's computer terminal, usually with a telephone, to the Free-Net Computer. A user would dial 368-3888 and follow instructions.

In an effort to make Cleveland Free-Net a nationwide system, Grundner will lease Free-Net software to any qualified community for $1 a year.

The system invented itself, said Grundner, a specialist in telecomputing systems.

He said he put together a bulletin board computer system to allow his department's scattered offices to communicate and leave messages. The telephone number got out and people started leaving messages in the hope that some qualified expert would answer medical questions. St. Silicon, the inspiration for Free-Net, was launched, with a physician answering 280 inquiries a week on a single phone line. The new system will have 15 lines.

To launch the project, American Telephone & Telegraph Co. has given $50,000 in equipment to Grundner's Free-Net. The School of Medicine and University Hospitals offered to help underwrite the system.

Life at 300 Baud

The electronic city

by Brock N. Meeks

In Cleveland, doctors make house calls—so do dentists, lawyers, and even veterinarians. But instead of reaching for a little black bag and hailing a cab, they boot a communications disk and fire up a modem.

Free-Net, an online computer system, puts several of Cleveland's community services within reach of anyone with a modem. Free-Net is the nation's first free, open-access community computer system to offer professional information to this extent.

Free-Net (216/368-3888, 300/1200 baud, 24 hrs/day) is located on the campus of Case Western Reserve University (CWRU). The mandate of Free-Net is to serve as a community "free clinic," dispensing all types of advice, including medical information, to the Cleveland metropolitan area. (However, anyone can use the service, regardless of location.)

Corporate donations made Free-Net a reality. Free-Net's primary benefactor is AT&T, which donated over $50,000 in computer hardware to start the system.

The software was custom designed to handle a question-and-answer forum. The program, written in C, runs under the UNIX operating system. Taking advantage of UNIX's multi-user capability, Free-Net can handle up to 15 callers simultaneously. Its "message administrator" is a hefty 44-megabyte hard disk.

But Free-Net did not start out so well-heeled.

St. Silicon

"In the fall of 1984, several medical clinics around Cleveland decided they needed to exchange information among themselves—without always having to call a meeting," said Dr. Thomas Grundner, assistant professor of family medicine at CWRU and Free-Net's sysop. "They decided that a bulletin board system would meet the need, so I set up a simple system for them on a 48K Apple computer with software I wrote myself."

The system set up by Grundner was an immediate success. It allowed the clinics to pass information to each other, post general-interest messages, and keep abreast of the latest medical news. The system worked so well that soon news of it reached the general public. The results were surprising.

"All of a sudden we had people coming on and leaving medical questions in the open message section," Grundner said. Had these questions gone unanswered, public use would have dropped off; but the questions didn't go unanswered.

"The doctors using the system began providing answers to those questions, and then we couldn't keep the public away," recalls Grundner. "As a medical educator, I was interested in this fascinating exchange of medical information to the public. In a sense these people were benignly crashing my system and turning it into something it was not intended to be: a public forum for the dispensing of medical information."

Grundner then developed a BBS designed to specifically handle a question-and-answer information exchange. He christened the new system "St. Silicon Hospital and Information Dispensary."

This public system, which was covered in an article in *The New England Journal of Medicine* (April 10, 1986) reached its saturation point within three weeks. Because the heavy usage cutran the system's capability, St. Silicon went looking for larger quarters—a bigger computer.

An endowment from AT&T allowed Grundner to turn St. Silicon into the multi-user Free-Net system.

Free-Net opens

In July 1986, Free-Net was officially put online with pomp and circumstance. "Both Governor (Richard) Celeste and Mayor (George) Voinovich were at the ceremony," said Grundner. "They cut the ribbon, shook hands, and kissed 2.5 babies; Free-Net was online."

The entire system is set up to emulate the city it serves; it's an electronic city, of sorts, complete with the kinds of services you'd find in an actual city. The Post Office handles electronic mail; The Schoolhouse serves as an online PTA meeting in which users ask administrators of Cleveland public schools questions about curriculum and make

Free-Net emulates the city it serves; it offers the services you'd find in an actual city.

PHOTO BY P.S. POWERS

suggestions for improvements.

The Courthouse offers information on Ohio law for the layperson, and there's also a lawyers' library and a question-and-answer forum on legislation. The Legal Clinic operates much like St. Silicon, though it's not as diversified and compartmentalized. Lawyers answer all types of legal questions in a general forum.

In the University Circle section, users have access to CWRU officials and the curators of the Cleveland Museum of Natural History. Another feature is Government House, where users can contact elected officials at the local, state, and federal levels. There's also a Public Square that includes, among other things, a "free speech" podium, where users can air their gripes by submitting electronic essays.

St. Silicon thrives

The hospital section is the most extensive. When users first enter the hospital (still known as "St. Silicon"), they go to the "information desk," where they can search each of the hospital's message bases, called "question banks." Users can browse or search by specific topic.

They can also stop in at any of the associated medical clinics: family medicine, dental, handicap center, health enhancement center (which deals with fitness), sports medicine clinic (for the weekend athlete), alcohol and drug abuse information center, nursing and home care office, staff lounge (for the continuing education of medical professionals), and the hospital library.

Each of these sections has a question bank where users can leave medical questions. Medical conditions of all types, from sexual dysfunction to cystic fibrosis, are covered. In addition, there is a small information file on each of the different sections that provides an over-

Some back issues of *PROFILES* are still available. Highlights of recent issues are detailed below. We'll send you the desired issue(s) for $4.00 each, including the postage and handling charges. Enclose your name and address along with a check or money order payable to *PROFILES* and mail to:

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view of the services offered in that particular section.

"Although AT&T made it possible to set up the hardware part of the system," said Grundner, "it's the Cleveland community that makes the system work."

All sections of the system are moderated by individuals and organizations in the Cleveland area, and all are volunteers. The medical professionals participating on the system are all board certified in their respective fields; legal assistance is supplied through the CWRU law school.

Expanding the access

Critics of Free-Net contended that the system locked out those with no access to a computer and modem. Such critics claimed that for a system to be of value to the entire community, the computer "have nots" should somehow be allowed access, as well.

As this issue of *PROFILES* was being prepared, Grundner was answering such critics by explaining that Free-Net was at 80 percent of its operational power and that expansion of the system was planned for mid-winter. This expansion was expected to provide public computer terminals, in libraries, that would have access to Free-Net. There were plans to put terminals around the CWRU campus and maybe even in shopping malls.

Grundner sees a parallel between the rise of the free public library movement in the last century and the rise of a free public computing movement in this century.

"By the mid-1800s literacy had gotten high enough, and the cost of books cheap enough, that there was tremendous pressure for free public access to that information," he said. "We're seeing something similar happening now. As computer literacy gets higher, and the cost of computing equipment drops, more people will have access to a computer system and will be looking for a system like Free-Net. I think you'll see these types of systems spreading all over the country."

Free-Net is the prototype of a regional network that could sweep into several metropolitan areas. To ensure that the intent and spirit of Free-Net is spread to other cities, Grundner has set up a cloning process.

"We're making the software for Free-Net available to *qualified* medical groups," Grundner says, speaking in italics. "We want to make sure the software doesn't get into the hands of a teenager who decides to run a bogus medical system." The software is available for a license fee of $1 per year. Grundner also notes that the original St. Silicon software (the Apple-based version) is available to similarly qualified groups for a flat fee of $5.

Checking in with the doctor

Although access to the system is free, there are, in effect, two categories of users. Anyone may dial in as a "visitor" and read the messages, or visit any of the various online clinics. However, only registered users can place messages on the system.

To register, simply download the registration form (in the administration section) and send it in. In a few weeks your personal ID and password arrive in the mail. Registration is free. You should note, however, that the system carries some disclaimers.

Simply logging on to the system, either as a guest or registered user, you automatically agree *not* to hold Free-Net liable should any damage arise from following the advice received from the system's doctors. Grundner explained that doctors and lawyers are instructed to provide suggestions and general information; doctors do not diagnose or offer treatment information. In addition, users reading the questions and answers (all exchanges are open for public perusal) are presented with the following caveat: "The information contained on this system is not intended to supplant individual professional consultation, but is offered as a community education service. Advice on individual problems should be obtained directly from a professional."

Checkout time

"This system is something people have been talking about for 20 years," Grundner said. "We kept saying that someday you would be able to use a home computer to contact your kid's school, get medical information, send electronic mail to your neighbor, contact your senator, and so on. I'm glad to report that this is one futuristic 'someday' that has finally arrived."

Yankeevision

A publication of the Consumer & Technology Division

1987 – 1 January 1987

Interactive Healthcare Services

The most significant operator of healthcare interactive telecomputing is Case Western Reserve University School of Medicine. Known as St. Silicon's Hospital and Information Dispensary, it is a large-scale community electronic bulletin board. Largely through a "generous donation" from AT&T's Information Systems Division, St. Silicon upgraded from a 48K Apple computer-based system to an AT&T 3B2/400 computer system operating under AT&T's UNIX System V.

St. Silicon initially was created to promote better communications among the local medical clinics and Case Western's University hospital utilizing a simple electronic bulletin board. Within St. Silicon, the major offerings include such features as the Information Desk, Family Medicine Clinic, Dental Clinic, Hospital Pharmacy, Drug and Alcohol Information Center, etc. Under the Family Medicine Clinic, users can post medically-related inquiries on the bulletin board and a reply is posted within 24 hours . The anonymity of the Clinic encourages consumers to pose embarrassing or personal questions that they never might have asked in person.

This system, in turn, is enveloped in a core electronic community program called Cleveland Free-Net that offers a much broader level of community information and resources, very much like a text-based public access system. Usage of St. Silicon and the Cleveland Free-Net is free to all users, and organizations may lease the system software for $1 annual charge.

The primary success factor for St. Silicon is the basic premise that a community outreach program must be free to all users and that information, in general, must be free or low-cost. Concurrently, it provides enough offerings to prompt users to access the system for services other than medical inquiries. The Yankee Group believes that a viable commercial application of consumer medical online services necessitates a specialized, niche marketing approach that addresses specific segments of the current personal computer household population. For example, a service could be created whereby a general health information service is marketed jointly with an electronic sports clinic, an electronic diet clinic that offers free diet program software, etc. Also, one can envision an offering whereby a person with diabetes could transmit daily or weekly blood glucose level data and other key monitored parameters to the health institution or a clinic through an electronic service.

From the healthcare provider's perspective, medical online services provide an excellent forum for public outreach among the personal computer households. With the current volatile state of the healthcare industry, any "enhanced" service offerings extending the current realm of communications gives the healthcare providers a better understanding of consumer and patient needs.

NATURALLY

Aaron M. Leash

```
Are you a:
  1. Visitor to the Free-Net
  2. Registered User

Type either a 1 or a 2 ==>
```

```
<<< CLEVELAND FREE-NET DIRECTORY >>>

1. What's New in the Electronic City
2. The Administration Bldg.   <ADMIN>
3. Government House           <GOVT>
4. Public Square              <PUBLIC>
5. University Circle          <UNIV>
6. The Post Office            <POST>
7. The Hospital               <HOSP>
8. The Schoolhouse            <SCHOOL>
9. (The Arts Center)          <ARTS>
-----------------------------------
x  Exit the system (Good at any menu)

Your Choice ==>
```

```
<<< CLEVE MUSEUM OF NATURAL HISTORY >>>

1. Information Desk
2. What's New at the Cleveland Museum
3. Museum Calendar
4. The Explorer Room
5. Natural History News
6. Ask Dr. Dino (Q & A)
7. Directory of Online Members
8. Sign-up for the Museum Directory
---------------------------
P  Back to University Circle
M  Back to the Main Menu

Your Choice ==>
```

YOU'VE PROBABLY PLAYED ELECTRONIC GAMES. You might own an electronic oven. But let's talk about something a little larger. Something preposterous like an electronic "city." Don't laugh — there is one. In Cleveland, Ohio.

The electronic "city" is the brainchild of Dr. Tom Grundner of the Department of Family Medicine at the School of Medicine of Cleveland's Case Western Reserve University. In 1984 Tom established St. Silicon's Hospital and Information Dispensary, a medically-oriented electronic bulletin board system. All you needed to obtain medical information was a computer and a telephone modem. Once you gained access (admission) to St. Silicon's by dialing the telephone number, you could ask for medical information about whatever ailed or interested you simply by typing your questions on your computer keyboard. Your questions were posted electronically and answered by volunteer doctors within a 24-hour period. The questions and replies were available for all users of the system to access and read. St. Silicon's proved so popular that AT&T awarded Tom a sizable grant to expand the hospital concept into an entire city, of which the hospital would be a part.

The "city" was founded in July, 1986. It is called the Cleveland Free-Net. It is the nation's first free, open-access community computer system. That means there is no charge to the users, and anyone with a modem can dial in.

There are two categories of users. *Visitors* can utilize the entire Free-Net system with the exception of electronic mail (e-mail), which is reserved for *registered users*.

This is a bustling "city" that never sleeps. It receives over 500 calls each restless 24-hour day. The system is completely menu-driven. The user selects the areas of the "city" to visit from a series of choices (menus) that appear when the system is accessed. Free-Net uses 300 and 1200 baud connections. Baud is a measure of transmission speed. (Don't give up on me now. I promise not to use much more computerese.)

The growing city now has a post office where a *registered user* can send and receive electronic mail, a hospital with medical and dental offices, a schoolhouse, an art center, and a government house. There is also a veterinary clinic where pet lovers can learn about animal health. Special interest groups (SIGs — Oops! There I go again.) that have found homes in the "city" include science fiction fans, handicapped persons, runners (When do they have time for anything but running?), and computer enthusiasts.

And there is a museum! Let me tell you about it.

The museum is located in the electronic "city's" University Circle, not coincidentally the location of the Cleveland Museum of Natural History. What a superb way to publicize a museum calendar, which is easily updated as new events and exhibits are scheduled. What a marvelous way to educate. One of the most popular departments is "Ask Dr. Dino," which features questions posted by the users and fielded by the museum's SYSOP. (You might as well learn a little more computer jargon. SYSOP means system operator; in other words, the person in charge.) After a question is answered by a museum expert, the SYSOP types in the information in plain English for all interested users to read. These questions and answers are not erased and eventually will be part of an impressive volume of interesting natural history trivia and information.

The Explorer also is part of the electronic museum. Users can review the table of contents of the current volume year and a summary of each article. There's information on how to join an *Explorer* museum and receive *The Explorer* as a benefit.

Would you like to visit our electronic museum? Then dial, or program your computer to dial, 216-368-3888. Drop the area code if you live in the 216 area. If you're phoning long distance, you might want to place your call at night or on weekends (we're open 'round-the-clock). There is a lot to look at, so take advantage of the lower long distance phone rates during those hours. Be prepared to download information to a disk file or a printer. You can easily register and use all parts of the "city," including the post office, by signing up at Free-Net's administration building for a registration form or by downloading the three-page form, which takes only a couple of minutes to fill in, and returning it to Free-Net. Registration is free. Remember, only *registered users* have electronic mail privileges.

Wouldn't it be wonderful if all the *Explorer* cities and museums could link up electronically? Here's some good news about that. If your community has an organization that is willing to commit time and resources to this kind of system, Free-Net will lease the software for $1.00 per year. Want more information? Write to me. On second thought, don't write. Send me an electronic letter. That's 216-368-3888; and I'm aa211 logging off. □

THE WALL STREET JOURNAL.

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Doc-in-a-Box Explains Illness On Computer

By DAVID STIPP
Staff Reporter of THE WALL STREET JOURNAL

The personal computer is making it easier to learn about what ails you.

What causes heart palpitations? What are the different kinds of breast cancer? Do shock treatments help with schizophrenia?

Computer owners across the country who want answers to such questions can now call several national data banks and quickly summon up the latest technical papers on diseases and treatments.

In Cleveland, for example, computer users can call a computerized bulletin board run by Case Western Reserve University medical school. The system, called St. Silicon's Hospital and Information Dispensary, is an Apple computer programmed to send and receive messages via phone links with other personal computers. Computer owners post medical questions on the bulletin board and receive answers by computer within a day from volunteer doctors at the school.

The systems are not about to replace family doctors. The typical "doc-in-the-box," as St. Silicon's computerized physicians are called, offers personalized tips but not diagnoses. Still, such tips are just what the doctor ordered in many cases. A hurried professional who has no time to go to a physician can easily ask St. Silicon's about the side effects of a blood-pressure drug. And medical interns can tap the system to see how senior physicians answer patients' questions.

Disturbing Questions

"This new medium for health-care information is emerging because there's a critical mass of people with access to the technology," says Thomas Grundner, who developed St. Silicon's Hospital. "A lot of people have computers at work, and we get our peak usage around midday."

Rather than pose questions to the doc-in-the-box, many of St. Silicon's users just browse through the 700 past questions and answers stored on the system. Browsers include doctors who see the system as a continuing survey of patient concerns they often don't hear about. The most disturbing questions, Mr. Grundner says, are those that indicate a breakdown in communications between doctor and patient: One questioner who had had an infection that had been cured asked, "Just what is this disease and what causes it?"

St. Silicon's answers resemble those found in newspaper medical columns. To avoid legal problems, each answer is accompanied by a disclaimer emphasizing that the information "in no way" refers to specific cases. Many questioners are advised to see a doctor.

St. Silicon's and similar systems are a natural extension of the computerization of medical information for doctors. Hundreds of medical journals are now available through data-bank companies such as Dialog Information Services Inc. and CompuServe Inc.

"Doctors are under pressure to show their patients they are well-informed," says Jack Evjy, a Boston cancer specialist who is helping to develop a computerized cancer-information system. "You don't have time to go off to the library when you've got a busy office, and a patient asks you what you know about interleukin-2," a cancer drug.

Electronic Housecalls

Electronic housecalls typically cost consumers no more than a few dollars—to cover connection charges, if any, for the data base involved. Indeed, doctors rarely get paid for participating, and staffing a computer clinic is sometimes a problem.

"We answer only selected questions because we're limited by our staff size," says Todd Stern, a Pittsburgh physician who co-founded HealthNet, a service with 10 specialists in several cities.

Staffing isn't a big problem for Health Forum, a CompuServe offering in which many of the advisers are lay people. The system offers electronic conferences, mediated by physicians on medical topics participants choose. In one conference on arthritis treatments, a Health Forum physician who questioned the value of acupuncture and other nontraditional treatments found himself under fire from a CompuServe customer who claimed such treatments had worked well for her.

Increasing specialization is a major trend in electronic health care. St. Silicon's, for example, already offers a dentist; CompuServe offers a human-sexuality seminar. And handicapped people can rapidly reach others with the same afflictions using the systems.

Sandra Latonia, a Cleveland resident who is losing her vision because of a disease, is working to set up a department for the handicapped within St. Silicon's. "The best therapy is just being able to talk about your problem," she says. "But it's hard to relate to those who aren't in the same predicament."

The Weather

Sunny, hot and humid today and Friday. Clear tonight. Highs will be 90-95 degrees today and 90-95 Friday. The overnight low will be about 70 degrees.

Details on Page 2.

The Vindicator

The People's Paper

City EDITION

★ ★ ★ ★

YOUNGSTOWN, OHIO THURSDAY, JULY 23, 1987

Dispatches from AP, UPI, N.Y. Times, Washington Post, L.A. Times Scripps Howard, Knight-Ridder, N.Y. Daily News, Chicago Tribune

20

Computers to exchange information

A free community computer network, just the second of its kind in the nation, will be put into operation here Friday offering medical, cultural and sports information.

The Youngstown Free-Net Network, sponsored by Youngstown State University and St. Elizabeth Hospital Medical Center, will allow an exchange of information of interest to the community via computer.

The Youngstown network is an offspring of the Cleveland Free-Net system established in July 1986. Operating out of the Case Western Reserve University School of Medicine, the Cleveland network offers medical, legal, civic and community news.

Dr. Thomas Grundner, an assistant professor of family medicine at CWRU and director of Cleveland Free-Net, is credited with coming up with the concept of a community computer network. More than 4,500 Cleveland computer owners are registered users of the network.

Dr. Robert Kennedy, director of (Please turn to page 6, column 3)

Community information to be exchanged by computer

(Continued from page one)

medical information at St. Elizabeth's, contacted CWRU officials about implementing the system here six months ago, CWRU spokesman Robert Daniels said.

"He thought it was a neat idea and wondered if it could be brought to Youngstown," Daniels said.

The goal of the network is to have 1,000 people in Mahoning, Trumbull and Columbiana counties using the system by August, he said.

YSU and St. Elizabeth's are leasing the ready-made software equipment for $1 a year from the Cleveland group.

Home or office computer users need a telephone modem to hook into the Youngstown system. The modem number for Youngstown Free-Net is 742-3072.

Daniels said once the number is dialed, the word "connect" will appear on the screen. Computer users must hit the return button, and instructions on how to enter the network will appear on the screen.

Information on becoming a registered user of the network can be obtained through the system. Although any computer user with a modem can use the network, only registered users can send and receive computer mail as well as enter messages into the system.

YSU will provide information on admission policies, sports activities, university events and continuing education. St. Elizabeth's will offer medical information.

Butler Institute of American Art will offer information about exhibits and art. Butler will be the first art museum hooked up to the community in such a manner.

The system officially will go into service after a news conference Friday in YSU's Meshel Hall, where the system will be housed.

Cleveland Plain Dealer
Saturday, July 25th

Youngstown tries computer network

By RICHARD ELLERS
STAFF WRITER

YOUNGSTOWN — Hoping to help replace the rusty steel image of the Mahoning Valley with a picture of computer modernism, officials of St. Elizabeth Medical Center and Youngstown State University inaugurated America's second communitywide free public information system.

Known as Youngstown Free Net, the system is a child of the Cleveland Free Net, which made its debut just a year ago.

Like the parent system, Youngstown Free Net is a free community public service information and communications service.

YFN manager Lou J. Anschuetz, a Youngstown State computer manager, said the system had 50 professional volunteer information managers from the medical center, the university and the community.

"Usually within 24 hours, they will provide answers to questions about medicine, health, law, community activities and community schedules," he said.

Like the Cleveland Free Net, medical doctors will answer general questions about medicine, but will not diagnose illnesses nor prescribe medication, he added.

Within a few weeks, the Butler Institute of American Art will become part of the net, Anschuetz said.

Butler will post schedules of its exhibits, and provide information services about art in general, and the Butler collection in particular.

YFN was established with about $30,000 in grants from St. Elizabeth to buy the computer, and YSU's provision of 10 full-time telephone lines, plus the services of Anschuetz and a graduate student-system manager.

Among the YFN inauguration speakers was Case Western Reserve University Professor Thomas M. Grunder, who described the free net concept as a logical parallel to public libraries.

"In the last century, as more and more Americans became literate, and the cost of book publishing dropped, public libraries came along to give citizens free access to books.

"Today, American computer literacy is high enough, and the cost of computers low enough, we see a demand for open access to computer services," he explained.

Grunder spoke from his experience as the originator and developer of the Cleveland Free Net, which, he explained, began as a simple question-answer public service by CWRU's medical school to the Cleveland community.

He said Cleveland Free Net users included many small businesses that use the system to send and receive mail electronically among branches and customers.

CFN's complex software program is offered for lease at $1 a year to any community that will establish similar free nets.

Grunder hopes to establish a national network of Free Nets in all cities, so that users in one city can obtain information, or send electronic mail, instantly and without charge, to users in any other Free Net city.

The Society for Public Access Computing

AN INTRODUCTION TO FREE-NET COMMUNITY COMPUTING

T.M. Grundner, Ed.D
Executive Director
The Society for Public Access Computing
Box 1987
Cleveland, Ohio 44106
(216) 368-2733

A Non-Profit Corporation
Developers of the Free-Net Community Computer Network

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Appendix I: Annual Cost Model for a Free-Net System - First Year - Worst Case Scenario

The Concept of Community Computing

Perhaps the best way to illustrate the concept of community computing is by analogy to the development of the public library system in our country.

In the middle of the last century there was no such thing as the free public library. Eventually literacy got high enough (and the cost of books cheap enough) that the public library became feasible. In this century we have gotten to the point where computer "literacy" has gotten high enough (and the cost of equipment cheap enough) that a similar demand for free public access community computer systems has formed.

In effect, these systems represent a relatively new application in computing. A multi-user computer is established at a central location in a given area. The machine is connected to a number of telephone lines through a series of devices called "modems." Running on the machine is a computer program that provides its users with everything from electronic mail services, to information about health care, education, technology, government, recreation, or just about anything else the host operators would like to place on the machine.

Anyone in the community with access to a home, office, or school computer and a modem can contact the system any time, 24 hours a day. They simply dial up a central phone number, make connection, and a series of "menus" appears on their screen which allows them to select the information or communication services they would like. All of it is free and all of it can easily be accomplished by a first-time user.

The key to the economics of operating a community computer system is the fact that the system is literally run by the community itself. Everything that appears on one of these machines is there because there are individuals or organizations in the community who are prepared to contribute their time, effort, and expertise to place it there and operate it over time. This, of course, is in contrast to the commercial services which have very high personnel and information acquisition costs and must pass those costs on to the consumer.

Couple this volunteerism with the rapidly dropping costs of computing power, the use of inexpensive transmission technology, and the fact that the necessary software to operate these systems is available from a non-profit organization on a lease basis for $1 a year--and public access community computing becomes an economically viable entity.

Development of the Concept

The first system of this type, known as the Cleveland Free-Net, was opened on July 16th 1986 by Governor Richard Celeste of Ohio, and Mayor George Voinovich of Cleveland. In July of 1987 the Youngstown Free-Net in Youngstown, Ohio became the second system to go online; this July the Akron/Summit County system will become the third; and the Miami Free-Net in Miami, Florida is scheduled this summer to be the fourth. At the moment there are approximately 35 cities around the country that are in various stages of bringing Free-Net systems online.

As a result of the experience people have gained in working with and developing these systems, several conclusions with regard to community computing can be drawn.

First, it is clear that these community computers represent the leading edge of what can only be described as a new telecommunications medium.

Telecomputing is not radio, not television, not print; but has characteristics of all three plus additional ones of its own. It is literally a fourth medium. This fact alone will inevitably lead to developments and uses that we can not now even begin to imagine.

Second, experience in northeast Ohio indicates that a critical mass of people now exists who are prepared to utilize this new medium.

As more and more modem equipped microcomputers penetrate the home and especially the work environment, the utility of public access computerized information services goes up. It has been shown in northeast Ohio that people will not only heavily use these systems but will demand the ability to communicate and network with other users on other similar systems. We have no doubt that this consumer interest and ability to utilize this technology exists as much in other parts of the country as it does in northeast Ohio.

Third, for lack of better words, there is a certain sense of inevitability to the development of community computing.

Simply put, intuitively, we find ourselves unable to imagine a 21st Century in which we do NOT have community computer systems just as this century has had it's public libraries. Moreover, we believe that the community computer, as a resource, will have at least as much impact on the next century as the public library has had on ours.

There currently exists an entire generation in our secondary schools and colleges, for example, that have come to know the microcomputer as a routine personal productivity tool. By the turn of the century these people will be in a work place where microcomputers and computerized information retrieval will be ubiquitous. This, in turn, can not help but lead to a demand for similar functions in the home, even as the telephone migrated from being primarily a business tool to a home utility. The process, in effect, feeds on itself. Indeed, several sources are predicting that by the year 2000 over 32,000,000 households (40% of all households) will have some kind of in-home computing technology or information service.

Potential Impact on the Community

Who, exactly, benefits from community computing in a given locale? To cite just a few examples:

* The Residents First and foremost these community computer systems open up information services to very large populations that would otherwise not be able to afford it. Contrary to the demographics found on the large commercial networks, Free-Net systems deeply penetrate the middle-class and thereby bring information age services to the average person.

The price of accessing a Free-Net computer consists of the cost of having standard telephone service in the home or business, plus the price of the equipment needed to get online. This latter cost is now under $200 virtually anywhere and that is assuming the person purchases new equipment. If a person wishes to haunt a few garage sales, flea markets, or computer fairs, it could be considerably less.

* Public and Private Schools Via community computers, school systems finally have a cost effective way to teach telecomputing to their students thereby sending a new generation of information literate citizens into the work force. In addition, they allow students, teachers, parents, and administrators to communicate with each other and have access to information bases of interest and importance.

* Government Via a community computer, citizens have an inexpensive way to make contact with their elected representatives at the city, county, state, and eventually national level--contacts which include everything from obtaining information on governmental services, to providing access to tax-payer supported, governmentally produced,

databases. It should be pointed out also that these communications are not one way. Our elected representatives also have the ability to electronically communicate with their constituents.

* Small and Medium Sized Businesses Most major corporations have electronic mail and all manner of computer driven information services at their disposal. Most small and medium sized businesses do not. With a Free-Net system in place these smaller enterprises are finally able to afford to link their operations together via the free electronic mail services found on these systems and have access to a variety of useful business databases--something that will help to improve any location's business climate.

* Community Organizations and Institutions Each Free-Net is set up using an "Electronic City" motif. That motif was not selected by accident. To one degree or another virtually every institution in society has an information dissemination function of some kind--a need to tell others about itself and share their knowledge. The Free-Net makes it possible for any and all of them to utilize a new medium to accomplish that goal. From artistic and cultural organizations, to medical institutions, to hobbyists of all kinds--all can find a place on a community computer.

Cost of Establishing and Operating a Free-Net System

To establish and operate a Free-Net Community Computer system requires funding for five things: Staff, Hardware, Software, Office Space, and Administrative Costs.

Appendix I suggests a "worst case" financial scenario for the first year of a Free-Net's operation. By worst case we mean that everything must be paid for out of project funds--nothing is donated. Thus, under these circumstances, the first year total for the project would be about $76,000. If office space, for example, were provided, that would reduce those costs to about $66,000. If equipment were donated it would reduce it to around $45,000, and so on.

In general, these costs break down as follows:

Staff: Two staff are needed to operate a Free-Net system. The first of these would be a full time System Manager to serve as a quality control agent for system operations, community organizer, and fund raiser. The second would be a half-time Clerical Assistant to handle system registrations, mailings, and other administrative

matters. This is the largest single cost area and will total about $38,000 a year (assuming 23.5% for fringe).

Hardware: The size of the central machine will depend on the size of the population to be served. For purposes of this document we are assuming a urban situation with a population base of about 1 million people. Under those circumstances we would recommend that the central computer be an AT&T 3B2/600 or it's equivalent in another brand. (Smaller population areas, naturally, would not need a machine this large; bigger population areas might need an even larger machine.) Whatever machine is purchased would need to support a Unix operating system and a programming language called "C." In addition, given this population size, we estimate the machine would initially need 16 300/1200/2400 baud modems, two modem racks, and two dumb terminals so the administrative staff can tie directly into the central machine. The project would also need a microcomputer for administrative purposes, and 16 incoming telephone lines. Total cost for this area (assuming the central computer can be amortized over three years) is $20,533 per year.

Software: The Free-Net Community Computer software is available from a non-profit organization called the Society for Public Access Computing (SoPAC) on a lease basis for $1 per year. SoPAC is an outgrowth of the Cleveland Free-Net Community Computer Project and developed the software in conjunction with Case Western Reserve University. At the present time, however, the Free-Net depends on an additional piece of commercial software, a database program called Informix, to complete many of it's functions. Informix will cost approximately $1,100. Total cost for software: $1,101.

Office Space: Office space for both the computer and the staff is estimated at about 600 square feet, depending on how it is configured. In most areas that office space could be obtained for approximately $10 per square ft. Office equipment for two people, desks, chairs, etc., is estimated at $4,000. Total costs $10,000

Administrative Costs: Administrative costs would include printing and mailing costs for ID letters and other materials, travel reimbursements, telephones, etc. and would come to about $6,000.

Sources of Support

Saying that a Free-Net Community Computer System is free to the user is not the same thing as saying that it

costs nothing to operate. Nevertheless, there are a variety of funding possibilities that could be explored.

Some systems operate on a purely entrepreneurial basis, that is, the staff goes after grants, corporate donations and the like to keep the system going. Other systems have been established by dividing the cost between two or more major institutions (e.g. a university and a major hospital, two universities, etc.). Yet another approach has been to seek single source funding from either a major institution or a city or county government.

One approach that has proven particularly useful in defraying costs has been via the outright donation of equipment. Computer and modem companies may well be approached for the donation of the computer and modems in exchange for credit on the opening screen. From their standpoint, the donation is: a) tax deductible; and b) serves to showcase their equipment before thousands of people who are, by definition, computer purchasers and users.

The grantsmanship approach has also proved effective in many cases. Indeed, a high degree of interest has been expressed in developing these systems by a variety of non-profit institutions such as hospitals, colleges, and universities because the system is a net producer of revenue not a net consumer. It can be, as one person described it: "a giant grant machine."

Grants can be written for the service as a whole or for the operation of any part of it (e.g. the Schoolhouse, the Handicapped SIG, the Hospital, Government House, etc.). The possibilities are almost endless. Moreover, the impact of any given award is cumulative. For example an award to add, let's say, an online AIDS information service costs only a fraction of what it would cost to start such a service from scratch. The system would already exist. The users would already be there, and an online "hospital" would already exist that would be drawing hundreds of users a week. The "bang for the buck" (as it were) is very high and funding agencies love to see that in a proposal.

In general, the innovative nature of the project and the impact these systems have on the community as a whole make them quite attractive to many local, state, and national funding agencies and institutions. In addition, there is a further financial support mechanism through the Society for Public Access Computing.

The Society for Public-Access Computing (SoPAC)

By early 1987 the Cleveland Free-Net had received dozens of requests for more information about their system from various cities around the country. It was clear that an umbrella organization would be needed to help financially and technically support this growing network of community computer systems. To meet this need, on April 7, 1987 the Society for Public-Access Computing (SoPAC) was incorporated as a non-profit corporation in the District of Columbia. Non-profit tax status under article 501(c)(3) of the Internal Revenue Code was granted on July 20th 1987. SoPAC holds the copyright on the Free-Net software and is the agency through which the software is leased.

Similar to other special purpose membership organizations, such as the Cousteau Society for example, the central mission of SoPAC is four-fold: 1) To establish selection criteria for the establishment of Free-Net systems around the country; 2) To assist in the process of bringing those systems online with technical assistance, staff training, etc.; 3) To establish and enforce quality control standards for the operation of those systems after they come online; and 4) To help raise monies in support of both the individual systems as well as for the operation of the network as a whole. The way it does this latter item is as follows:

Each person who wishes to be a registered user on a Free-Net system has to fill out and send in a registration form. This form allows the operators to assign an ID number and password which, in turn, allows the user to have an electronic mailbox and use certain other features on the system. This ID number and password is provided by sending back a form letter. Included with the letter is a brochure soliciting the user to join SoPAC.

It is important to point out here that the use of any Free-Net system is in no way contingent upon joining this society. Membership is completely voluntary and would be somewhat analogous to joining, let's say, a "Friends of the Art Museum" group. The Art Museum is still free. The Friends of the... group is to help keep it that way.

In any event, there are a variety of levels of membership dues, and the members will receive such benefits as an organization magazine, Society decal, etc. SoPAC dues received from the users of any given system are split 60/40--with the host system getting the 60%. So, let's say the average dues paid per person were $25 per year and 1000 users from a given system joined the Society. SoPAC would

thus rebate $15,000 per year to be applied to the operations of that system. The remainder would go to help expand and link together the overall network, publish a Society magazine, and so forth.

In short, the host system would have a source of revenue that it wouldn't have to service (by producing a magazine for example), that they would get by including a brochure in a letter that they have to mail anyway. The monies they would receive from SoPAC would, of course, be in addition to any other monies that might be raised via grants, donations, etc.

Conclusion

That we are all going to be citizens of a computerized "Information Age" is no longer an issue. We are. The only remaining question is what we as a society are going to do about it.

By developing community computer systems, people will be doing more than providing a unique and valuable service to their schools, their business communities, and their fellow citizens. They will be placing themselves in a nationally visible leadership position with regard to an emerging and important 21st Century technology--the development of computerized, community-based, information services.

It is an idea whose time has come.

Appendix I
Annual Cost Model for a Free-Net System
First Year - Worst Case Scenario
(adjust as needed)

Staff	Salaries	Fringe (23.5%)		
* System Manager	25,000	5875	30875	
* Clerical (1/2 time)	7,500	----	7500	
Sub-Total				$38,375
Hardware				
* AT&T 3B2/600 computer ($34,000) 16 modems ($5600) Two modem racks ($2000) Two administrative terminals ($2000) Sub-Total $43,600) amortized over three years			$14,533	
* Administrative Microcomputer			2500	
* Phone line installation (16 lines X $40 each)			640	
* Phone line rental (16 lines X $15 X 12mo.)			2880	
Sub-Total				20,533
Software				
* Free-Net Community Computer Software			$1	
* Informix Database program			1100	
Sub-total				1,101
Office Space				
* Office space rental for equipment and staff - Approx. 600 sq ft X $10 per sq ft.			6,000	
* Office Equipment Purchase			4,000	
Sub-Total				10,000
Administrative Costs				
* Xeroxing, Mailing, etc.			$6000	
Sub-Total				6,000
Grand Total				$76,009

The Society for Public Access Computing

Testimony before the

CALIFORNIA LEGISLATURE

ASSEMBLY COMMITTEE ON UTILITIES AND COMMERCE

Hearings on

AN INFORMATION AGE FOR EVERYONE? TELECOMMUNICATIONS AND INFORMATION SERVICES IN CALIFORNIA'S FUTURE

February 1, 1988
Sacramento, California

T.M. Grundner, Ed.D
Executive Director
The Society for Public Access Computing
Box 1987
Cleveland, Ohio 44106
(216) 368-2733

Assemblywoman Moore, members of the Committee, ladies and gentlemen. My name is Dr. Tom Grundner. I am an assistant professor at Case Western Reserve University in Cleveland, Ohio and Director of the Cleveland Free-Net Project--the nation's first completely free, open-access community computer system. I am also Executive Director of the Society for Public Access Computing (SoPAC), a non-profit organization established to promote the development of community computers in cities around the country. It is in this latter capacity that I am testifying today.

One of the major purposes of this hearing is to discuss some of the telecommunications and information services that can be expected to appear in California's future. In my mind there is no doubt that among these will be the development of free public access community computer systems.

To explain this further I would like to briefly describe the concept behind community computing, some of the impact it will have on California and society in general, and recommend three specific policy measures this committee could take to help with its development. I firmly believe that you are in a unique position to help shape an important public service that will have a tremendous effect on your citizens, your schools, your business communities, and the communications industry in general.

The Concept of Community Computing

Perhaps the best way to illustrate the concept of community computing is by analogy to the development of the public library system in our country. In the middle of the last century there was no such thing as the free public library. Eventually literacy got high enough (and the cost of books cheap enough) that the public library became feasible. In this century we have gotten to the point where computer "literacy" has gotten high enough (and the cost of equipment cheap enough) that a similar demand for free public access community computer systems has formed.

In effect, these systems represent a relatively new concept in computing. A multi-user computer is established at a central location in a metropolitan area. The machine is connected to a number of telephone lines through a series of devices called "modems." Running on the machine is a computer program that provides its users with everything from electronic mail services, to information about health care, education, technology, government, recreation, or just about anything else the host operators would like to place on the machine.

Anyone in the community with access to a home, office, or school computer and a modem can contact the system any time, 24 hours a day. They simply dial up a central phone number, make connection, and a series of "menus" appears on their screen which allows them to select the information or communication services they would like. All of it is free and all of it can easily be accomplished by a first-time user.

The key to the economics of operating a community computer system is the fact that the system is literally run by the community itself. Everything that appears on one of these machines is there because there are individuals or organizations in the community who are prepared to contribute their time, effort, and expertise to place it there and operate it over time. This, of course, is in contrast to the commercial services who have very high personnel and information acquisition costs and must pass those costs on to the consumer.

Couple this volunteerism with the rapidly dropping costs of computing power, the use of inexpensive transmission technology, and the fact that the necessary software to operate these systems is available from SoPAC on a lease basis for $1 a year--and public access community computing becomes an economically viable entity.

Development and Expansion

The first system of this type, known as the Cleveland Free-Net, was opened in Cleveland, Ohio on July 16th 1986 by Governor Richard Celeste of Ohio, and Mayor George Voinovich of Cleveland. In July of 1987 the Youngstown Free-Net in Youngstown, Ohio became the second system to go online; in May of this year the Akron/Summit County Free-Net in Akron, Ohio, will become the third; and the Miami Free-Net in Miami, Florida is scheduled this summer to be the fourth. (The Miami system, by the way, will be our first bi-lingual English-Spanish system.) At the moment there are approximately 35 cities around the country that are in various stages of bringing Free-Net systems online.

In California, we have recently formed a committee in the Los Angeles area to bring online a seven system network to service the Los Angeles basin. While we haven't even begun our formal fund raising activities, last week we received our first donation of $10,000 from the H.O.P.E. Foundation of Los Angeles. In addition we have a working group forming in the Sausalito/San Francisco area and, of

course, we are very much interested in developing similar groups in San Diego and throughout California.

As a result of our experience in working with and developing these systems, we have arrived at several conclusions with regard to community computing.

First, it is clear that these community computers represent the leading edge of what can only be described as a new telecommunications medium.

Telecomputing is not radio, not television, not print; but has characteristics of all three plus some additional ones of its own. It is literally a fourth medium. This fact alone will inevitably lead to developments and uses that we can not now even begin to imagine. Indeed, one of the major functions of SoPAC and it's affiliates is to explore and develop this medium in a systematic, scientific fashion--free from the market forces that of necessity have shaped, for example, so much of the television industry.

Second, our experience in northeast Ohio indicates that a critical mass of people now exists who are prepared to utilize this new medium.

As more and more modem equipped microcomputers penetrate the home and especially the work environment, the utility of public access computerized information services goes up. It has been shown in northeast Ohio that people will not only heavily use these systems but will demand the ability to communicate and network with other users on other similar systems. We have no doubt that this consumer interest and ability to utilize this technology exists no less in California than it does in Ohio.

Third, for lack of better words, there is a certain sense of inevitability to the development of community computing.

Simply put, intuitively, we find ourselves unable to imagine a 21st Century in which we do NOT have community computer systems just as this century has had it's public libraries. Moreover, we believe that the community computer, as a resource, will have at least as much impact on the next century as the public library has had on ours.

There currently exists an entire generation in our secondary schools and colleges, for example, that have come to know the microcomputer as a routine personal productivity device. By the turn of the century these people will be in a work place where microcomputers and computerized informa-

tion retrieval will be ubiquitous. This, in turn, can not help but lead to a demand for similar functions in the home, even as the telephone migrated from being primarily a business tool to a home utility. The process, in effect, feeds on itself. Indeed, several sources are predicting that by the year 2000 over 32,000,000 households (40% of all households) will have some kind of in-home computing technology or information service. If current proportions hold true that means almost 6.5 million of these households will be located in California within the next 12 years.

The Impact of Community Computing

Who, exactly, benefits from community computing?

First and foremost our data indicates that these community computer systems open up telecomputing services to very large populations that would otherwise not be able to afford it. Contrary to the demographics found on the large commercial services, Free-Net systems deeply penetrate the middle-class--a vast and largely untapped audience for information services.

Because these systems are free to the user they address in large part the "information equity" issue that has been raised by many observers. The price of accessing a Free-Net computer consists of the cost of having telephone service in the home, plus the price of the equipment needed to get on-line. This latter cost is now under $200 virtually anywhere in California and that is assuming the person purchases new equipment. If a person wishes to haunt a few garage sales, flea markets, or computer fairs, it could be considerably less.

Second, these systems have significant implications for a variety of institutions and industries. To cite just a few examples:

* <u>government</u> at all levels, now has an inexpensive way for people to make contact with their city, county, state, and national governments--contacts which include everything from obtaining information on governmental services, to providing access to tax-payer supported, governmentally produced, databases.

* <u>public and private schools</u> finally have a cost effective way to teach telecomputing to their students thereby sending a new generation of information literate citizens into the work force;

* small and medium sized businesses, find they can afford to link their operations together via the free electronic mail services found on these systems and find they have access to a variety of useful business databases;

* telephone companies and information providers, who see (or at least should see) a tremendous potential user base forming around Free-Net systems for both existing and forthcoming services such as Intelligent Gateways and ISDN technology;

* computer companies; who now have a reasonable answer to the question "What can you DO with a home computer?"; and,

* modem manufacturers, who greatly benefit as more and more people find they have a reason to put modems on their home and office computers;

Policy Recommendations

In general we believe that free open-access community computing should be supported by government at all levels. Not only are these systems conceptually in the highest tradition of a democratic free society, but the benefits extend into virtually all segments of that society. In the specific case of California, we would recommend the following:

First, that the State of California adopt a policy of support for the concept of community computing and that it actively encourage and participate in it's development.

One immediate and critical role the state could play in this regard is by financially assisting in the development of "seed crystal" systems throughout the state--that is, pilot systems in various locations that would serve as models for the development of further privately supported projects. In addition to the many advantages cited above, support for such a project could make California the first state in the nation to have a community computer system in each of it's major cities, and the first to have those systems linked together into a state-wide network. The approximate costs would come to a TOTAL of less than $700,000 a year (for three years) to launch a six system network.

Second, we believe the State of California should adopt regulatory policy with regard to forthcoming Intell- igent Gateway services. More specifically, we believe each gateway should be required to have at least one community computer system on it as a free public service offering.

This is a proposition that makes good sense not only from the consumer's standpoint but from the business standpoint as well.

From the consumer's standpoint it goes back to the issue of "information equity" discussed earlier. If previous data is any indication and if Intelligent Gateways go up as a purely market driven resource, then most of the citizens of California will be functionally disenfranchised from it's benefits. The users of this service will bear the same demographic stamp as the current users of existing commercial services--$50,000+ household incomes, very well educated, overwhelmingly white, and overwhelmingly male. It is hardly necessary to point out that this is a relatively small sample of California's total population.

The telephone industry in this state was not built and sustained over time by people with incomes in excess of $50,000. Average families ordering simple home telephone service have invested billions of dollars into the phone system over the years and, while they might not be formal stockholders, have nevertheless acquired a certain amount of "accrued equity" in it. To establish an information network that, because of vendor cost factors, functionally locks out the majority of the population from it's benefits is simply not tenable. Information age telecommunications services are far too important for that.

On the other hand, having a public service offering on the gateways also makes a great deal of sense from a business standpoint as well. First, a Free-Net community computer will immediately bring thousands of users TO the gateway if for no other reason than to access that service. Once they are there, they will see the other connections that are possible and start using the gateway to access them. In short, it would function like a "loss-leader" in a department store--a sale that brings in large crowds so that other merchandise can be sold.

Second, one of the central questions facing the information industry at all levels is that of trying to figure out where their future customers are going to come from. The 50K+ household income group represents only about 15% of the national population and the patronage of that group has been divided, and sub-divided, and sub-sub-divided many

times over the years as each new commercial information service has come online. For the industry to grow and be strong--sooner or later--they must start expanding their demographic base. Community computer systems do exactly that, they open up telecomputing, first, to the middle class; and, second, they make it possible to teach telecomputing in the schools which will eventually place hundreds of thousands of information literate young people into the work force--each one a potential future customer of specialized information services.

Free public service offerings on a communications network is not without precedent. For decades those who have held license to the public airwaves--our radio and television stations--were required to devote a certain percentage of air time to free public service offerings. We feel that no less should be done with this medium while it too is in its infancy.

Third, we believe that legislation or policy should be established to declare databases that have been created with public funds available to free public access community computer systems at no cost other than the cost of the transfer medium itself.

We understand the arguments of the information industry that government not get into a competitive position with regard to information services. However, we believe the issue here is not necessarily whether the government is competing with the private sector, but rather whether the private sector is in effect hindering the government from fulfilling one of it's central functions in a democracy--namely the distribution of information to it's people.

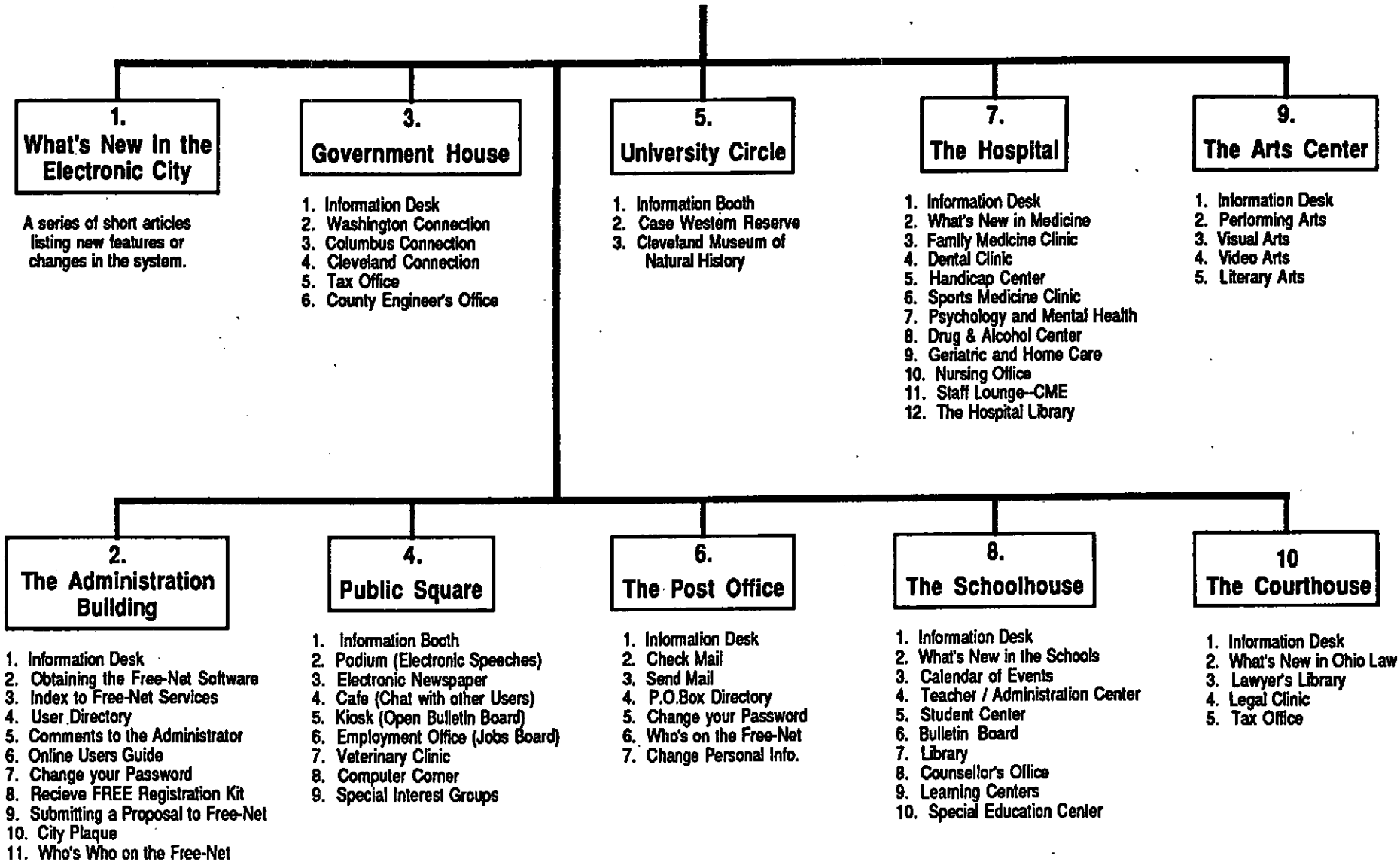
At the moment, databases created with public funds must, almost universally, be accessed via commercial vendors. This places the people of California in the unenviable position of having to pay twice for that information--first as tax-payers to produce it and again to the commercial houses to access it. Needless to say, this process winds-up excluding a lot of people along the way. We feel that public access community computers offer an alternative to that situation.

We believe James Madison perhaps said it best: "A popular government without popular information, or the means of acquiring it, is but a prologue to a farce or a tragedy, or perhaps both. Knowledge will forever govern ignorance, and a people who mean to be their own governors must arm themselves with the power which knowledge gives."

In conclusion I would like to thank you Assemblywoman Moore and the members of this committee for the opportunity to describe public access computing and to present our views.

California has traditionally been a world leader in technological innovation and we believe its prospects of remaining so are bright. But to do that you must continue the process you have begun with these hearings. You must look to the future and decide how best to make that future happen. We believe that public access community computing will eventually become a major institution in our society and we look forward to working with you and the people of California to help make that happen.

The Cleveland Free-Net Community Computer System
(216)-368-3888 [300/1200 baud]



The Society for Public Access Computing

T.M. Grundner, Ed.D
Executive Director
Box 1987
Cleveland, Ohio 44106
(216) 368-5436

Loren W. Hershey
General Counsel
300 Metropolitan Square
655 15th Street, N.W.
Washington, D.C. 20005
(202) 639-4049

August 17, 1988

Mr. Tom Nemcik
The Community Memory Project
2617 San Pablo Avenue
Berkeley, California 94702

Dear Tom,

Thank you for the phone call yesterday. Not knowing exactly what to send, I am enclosing a smattering of materials about the Cleveland Free-Net, including some testimony I gave earlier this year out in California about community computer systems.

I hope you will keep me posted on developments at the Community Memory. Should you folks decide to expand your services and not want to go through the hassle of writing the software--such a deal we can give you on ours, $1 a year. (But we are being hard-nosed about it. It must be in cash, no refunds, etc.)

If you have any questions or would like more information, please feel free to call me at my direct line (216) 368-2733.

Sincerely

Tom

T.M. Grundner, Ed.D
Director
The Cleveland Free-Net Project

WHAT IS THE CLEVELAND FREE-NET?

To put it in its simplist terms, the Cleveland FreeNet is a free, open access, community computer system.

WHAT DOES THAT MEAN?

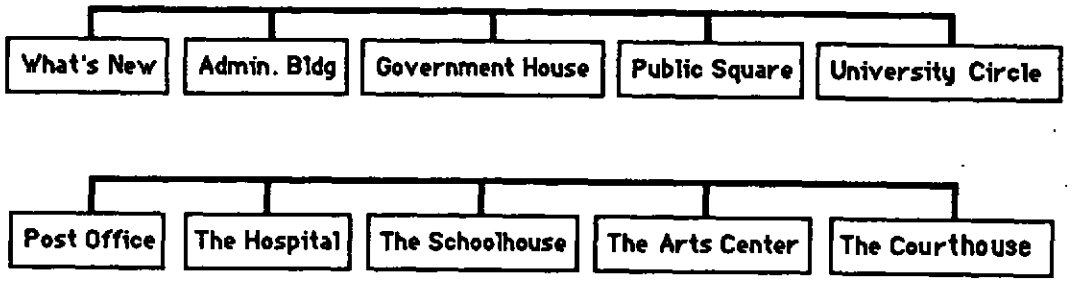
A computer located on the campus of Case Western Reserve University in Cleveland, Ohio has been programmed to serve as a community information and communications resource. The system will allow anyone with a home or an office computer (or a terminal) and a device called a "modem" to call in and have access to a wide variety of electronic services and features.

WHAT KINDS OF SERVICES AND FEATURES ARE AVAILABLE?

This is a difficult question to answer because the list is always growing. At present a partial list includes:

* Electronic Mail
* Electronic Contact with Elected Governmental Representatives
* Online Computer User Groups
* A "podium" for "electronic speeches"
* A variety of Special Interest Groups such as:
  - Air and Space
  - Handicapped
  - Science Fiction
  - Chess
  - Culinary Arts
* Online Medical Information
* Online Dental Information
* An electronic "schoolhouse" for teachers parents, students, and administrators
* And much more...

Cleveland Free-Net
System Map



WHO IS ALLOWED TO USE THE SYSTEM?

Quite Simply, anyone.

There are two categories of users: "visitors" and "registered users." A visitor can go anywhere, read anything, and use almost all of the system's features. In order to send and receive electronic mail, or post messages on some of the open "bulletin boards," you must be a registered user. To register, you can either download a registration form from the system, or ask us online to mail you one. You then fill it out, return it, and we will mail you a User ID and a password. That is all there is to it and ***there is no charge.***

WHAT KIND OF EQUIPMENT WILL I NEED?

You will need a microcomputer (or a computer terminal) that has a device called a "modem" attached to it. This device will allow your computer to connect to ours via a telephone line at either 300 or 1200 baud ("baud" is a transmission speed). You simply dial **(216) 368-3888**, follow the instructions for your particular computer or modem software, hit "RETURN," and you are on.

HOW MUCH WILL IT COST ME?

Nothing. It is free to the user in much the same way that a public library, for example, is free. It is a community resource.

THEN WHO IS PAYING FOR IT?

Good question! Saying that something like this is free to the user is not the same thing as saying it costs nothing to operate

This project was initially made possible by a donation from the Information Systems Division of AT&T, which was then joined by Ohio Bell Telephone Company, CWRU School of Medicine, and University Hospitals of Cleveland. Since these initial contributions we have received (and continue to receive) all manner of support from organizations and individuals throughout the Cleveland area.

WHO IS OPERATING IT?

The system is literally operated by the community.

The Cleveland Free-Net computer is physically located on the campus of Case Western Reserve University. The project director is Tom Grundner, an assistant professor in the School of Medicine, the project's computer scientist is Roger A. Bielefeld, and the system manager is Sharron Carlson.

Direct operation of the various areas of the system, however, is in the hands of hundreds of community volunteers called "sysops." These individuals--be they doctors, lawyers, space scientists, or simply hobbiests and enthusiasts--are the ones who contribute their time and talents to actually operate the system.

The Free-Net is truly a community computer.

HOW CAN OTHER CITIES SET UP SYSTEMS LIKE THIS ONE?

The software that drives the Cleveland Free-Net is owned by a non-profit corporation called the Society for Public Access Computing (SoPAC). It is being made available to qualified parties from any other city in the country who wish to start a similar system, on a lease basis, for $1 per year.

Anyone interested in receiving more information on how to start up a Free-Net system should write:

T.M. Grundner, Ed.D
Executive Director
The Society for Public Access Computing
Box 1987
Cleveland, Ohio 44106

WHY GO THROUGH ALL THE TROUBLE AND EXPENSE OF SETTING UP AND OPERATING A MULTI-USER COMMUNITY COMPUTER SYSTEM, THAT ANYONE CAN ACCESS, TO RECEIVE A WIDE VARIETY OF INFORMATION AND COMMUNICATIONS SERVICES -- FREE?

Because it's time.

SoPAC
THE SOCIETY FOR PUBLIC ACCESS COMPUTING

The Cleveland Free-Net is an affiliate of the Society for Public Access Computing

THE CLEVELAND FREE-NET COMMUNITY COMPUTER SYSTEM

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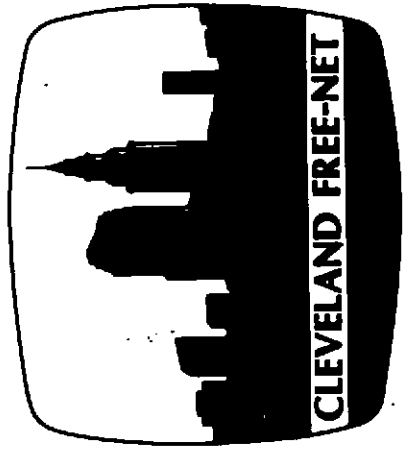
(216) 368-3888 -- 300/1200 Baud



Community
Telecomputing Laboratory

Case Western Reserve University • 319 Wickenden • Cleveland, Ohio 44106 • (216) 368-5121

Community Computing at Case Western Reserve University

The Concept of Community Computing

For the past four years, Case Western Reserve University has been experimenting with free, open-access, community computer systems as a new communications and information medium. Perhaps the best way to illustrate the concept behind this work, however, is by analogy to the development of the public library system in our country.

In the middle of the last century there was no such thing as the free public library. Eventually the literacy rate increased enough (and the cost of books decreased enough) that the public library became feasible. In this century, we believe we have reached the point where computer "literacy" has increased enough (and the cost of equipment decreased enough) that a similar demand has formed for free, public-access, community computer systems.

In effect, these systems represent a new application in computing. A multi-user computer is established at a central location in a given area and the machine is connected to the telephone system through a series of devices called modems. Running on the machine is a computer program that provides its users with everything from electronic mail services to information about health care, education, technology, government, recreation, or just about anything else the host operators would like to place on the machine.

Anyone in the community with access to a home, office, or school computer and a modem can contact the system any time, 24 hours a day. They simply dial a central phone number, make connection, and a series of menus appears on the screen which allows them to select the information or communication services they would like. All of it is free and all of it can easily be accomplished by a first-time user.

The key to the economics of operating a community computer system is the fact that the system is literally run by the community itself. Everything that appears on one of these machines is there because there are individuals or organizations in the community who are prepared to contribute their time, effort, and expertise to place it there and operate it over time. This, of course, is in contrast to the commercial services which have very high personnel and information-acquisition costs and must pass those costs on to the consumer.

Couple this volunteerism with the rapidly-dropping costs of computing power, the use of inexpensive transmission technology, and the fact that the necessary software to operate these systems is available on a lease basis for $1 a year-- and public access computing becomes an economically-viable entity.

Case Reserve's Involvement in Community Computing

The University's involvement in the development of community computer systems has its origins in an experiment conducted in the School of Medicine in the fall of 1984. Dr. Tom Grundner of the Department of Family Medicine, set up a single phone line, computerized, "Bulletin Board" system to test the efficacy of using this medium as a means of delivering general health information to the public. The heart of the

system was an interactive area where lay people could call in using their home, school, or business computers, leave medically-related questions, and have them answered by a physician within 24 hours. The experiment proved so successful that it attracted the attention of the Information Systems Division of AT&T and the Ohio Bell Telephone Company, who funded a larger project to expand and develop this interactive concept.

Based on these donations, Dr. Grundner began work on a full-scale "community computer system" on an AT&T 3B2/400 computer with 10 incoming phone lines. This pilot project was designed to serve as a community information resource in areas as diverse as law, medicine, education, arts, sciences, and government-- including free electronic mail services for the citizens of northeast Ohio. On July 16, 1986, this system, called the Cleveland Free-Net was opened by Ohio Governor Richard Celeste and Cleveland Mayor George Voinovich and the project was officially underway.

During its prototype stage, the Cleveland Free-Net gathered over 6000 registered users from throughout the Cleveland metropolitan area and handled between 500-600 calls per day on 10 incoming phone lines. In 1989 it moved out of prototype stage in a big way.

A new system was designed around six IBM-RT (Model 135) computers which would be linked together so that, from the user's standpoint, they would appear as one big machine. This new system provides the Cleveland Free-Net with 96 megabytes of RAM (96 million characters of Random Access Memory), 2.3 gigabytes of hard disk storage (2.3 billion characters of hard disk), and will be capable of supporting a minimum of 350 simultaneous users.

In June of 1989 the Free-Net will go up to 48 phone lines-- on its way to a projected 64 lines by August 1. By August, the Free-Net will also be connected to the CWRUNet fiber-optic campus network. This merger of a community computer system with a campus network will be a first and will provide an entirely new model for campus network development.

One of the central tenets of the project, however, was to give the Free-Net software the widest possible dissemination, yet still maintain quality-control standards which, in turn, would lay the groundwork for broader research applications. Accordingly, the software is being made available to qualified parties on a lease basis for $1 a year. The $1 a year figure places the software within reach of any institution, and the terms of the lease form the basis for quality control and future research. In July of 1987 the Youngstown Free-Net, a joint project between Youngstown State University and St. Elizabeth's Medical Center, became the first system to come online under the terms of this lease arrangement.

Development of the Concept

As a result of the experience we have gained in working with and developing these systems, several conclusions regarding community computing can be drawn.

First, it is clear that these community computers represent the leading edge of what can only be described as a new telecommunications medium. Telecomputing is not radio, not television, not print, but has characteristics of all three plus some additional ones of its own. This fact alone will inevitably lead to developments and uses that we cannot now even begin to imagine.

Second, experience in northeast Ohio indicates that a critical mass of people now exist who are prepared to utilize this new medium. As more and more modem-equipped microcomputers penetrate the home and especially the work environment, the utility of public-access computerized information services goes up. We have no doubt that this consumer interest and ability to utilize this technology exists at least as much in other parts of the country as it does in northeast Ohio.

Third, there is a certain sense of inevitability to the development of community computing. Simply stated, given the directions now being taken by the computer and communications industry, we find ourselves unable to imagine a 21st century in which we do NOT have community computer systems, just as this century has its public libraries. Moreover, we believe that the community computer, as a resource, will have at least as much impact on the next century as the public library has had on ours.

There currently exists an entire generation in our secondary schools and colleges, for example, that have come to know the microcomputer as a routine personal productivity tool. By the turn of the century, these people will be in a work place where microcomputers and computerized information retrieval will be ubiquitous. This, in turn, cannot help but lead to a demand for similar functions in the home, even as

the telephone migrated from being primarily a business tool to a home utility. The process, in effect, feeds on itself. Indeed, several sources are predicting that by the year 2000, over 32,000,000 households (40% of all households) will have some kind of in-home computing technology or information service.

A Civic Utility: Potential Impact on the Community

Who, exactly, benefits from community computing? To cite just a few examples:

•The Citizens: First and foremost, these community computer systems open up information services to very large populations that would otherwise not be able to afford it. The cost of utilizing a Free-Net community computer consists of the cost of having standard telephone service in the home or business, plus the price of the equipment needed to get online. This equipment is now well under $200 virtually anywhere, and that is assuming the person purchases new. If a person wishes to attend a few garage sales, flea markets, or computer fairs, it could be considerably less.

•Public and Private Schools: Via community computers, school systems finally have a cost-effective way to teach telecomputing to their students, thereby sending a new generation of information-literate citizens into the work force. In addition, these systems allow students, teachers, parents, and administrators to communicate with each other and have access to information bases of interest and importance.

•Government: Community computers provide citizens with an inexpensive and rapid way to make contact with their elected representatives at the city, county, state, and national levels– contacts which include everything from obtaining information on governmental services to providing access to tax-payer supported, governmentally-produced databases. It should also be pointed out that these communications are not one way. Elected representatives and other officials also have the ability to electronically communicate with their constituents.

•Small- and Medium-sized Businesses: Most major corporations have electronic mail and other computer-driven information services at their disposal. Most small- and medium-sized businesses do not. With a Free-Net system in place, these smaller enterprises are finally able to afford to link their operations together via the free electronic mail services found on these systems and have access to a variety of useful business databases-- something that cannot help but improve any location's business climate.

•The Agricultural Community: Among the segments in our society that were the first to embrace computing were our farmers. The reason was obvious. Farmers are business people too, but they have the disadvantages of, in general, being dispersed over wide geographic areas. A Free-Net system in a central location in a county allows the agricultural community to access common information bases, share solutions to farm-related problems, access up-to-date crop and price information, and make electronic connection with the County Agent and each other-- all without ever leaving home.

•The Telecommunications and Videotext Industry: For years the commercial videotext industry has been dividing, sub-dividing, and sub-sub-dividing essentially the same "up-scale" demographic group: $50,000+ yearly household incomes, very well educated, overwhelmingly white, and overwhelmingly male. If the industry is to survive and flourish, however, it is going to have to find a way to penetrate the middle class with its services. Free-Net community computers do exactly that. On the Cleveland system, for example, we draw as many users out of the demographically blue collar areas of the city as we do out of the wealthier sections. Demographic penetration such as this, on a nationwide basis, is vital if the telecomputing and videotext industry is to survive into the 21st century. It is also important to the telephone industry, which has spent millions of dollars on "intelligent gateway" technology, that videotext flourish and that their services be used.

•Community Organizations and Institutions: Each Free-Net is set up using an "Electronic City" motif. That motif was not selected by accident. To one degree or another, virtually every institution in society has an information dissemination function of some kind– a need to tell others about itself and share its knowledge. The Free-Net makes it possible for any and all of them to utilize a new medium to accomplish that goal. From artistic and cultural organizations to medical institutions to hobbyists of all kinds, all can find a place on a community computer.

Network One

As mentioned, one of the central objectives of the project was to give the software the widest possible dissemination; but to establish Free-Net systems in isolation from each other would make no sense. Therefore it was decided that as each system went online, we would attempt to connect them into a common network known as Network One.

Earlier we illustrated the concept of an individual Free-Net system by making an analogy to the public library. The illustrate the concept behind Network One we would use examples such as National Public Radio and the Public Broadcasting System. Each Free-Net system will be an affiliate of Network One that will provide inter-system electronic mail handling and other services. Eventually we expect to develop the concept of "cybercasting," whereby a wide variety of quality news and information services will be provided to the affiliates via Network One feed.

The Community Telecomputing Laboratory

To establish these systems and link them into a network is not enough, however. Videotext is a new, largely unexplored medium and we felt that a non-proprietary university-based research laboratory was needed to both promote and monitor the field's progress. With this in mind, the Community Telecomputing Laboratory was established at Case Western Reserve University in September of 1988. Its objectives are:

- To provide a place where non-proprietary research can be conducted into telecomputing as a new communications and research medium;
- To develop educational programs and materials designed to increase the understanding and use of telecomputing systems in general, and community computer systems in particular;
- To explore new and better ways of delivering computerized information and communication services; and
- To assist in the further development of the Cleveland Free-Net and in the dissemination and support of free, open-access, community computer systems in other cities around the country.

The Community Telecomputing Laboratory is located in the Wickenden Building on the campus of Case Western Reserve University and operates as an activity under the office of the Vice-President of Information Services, Dr. Raymond K. Neff. Its director, Dr. Tom Grundner, is the developer of St. Silicon, the Cleveland Free-Net, and the concept of Free-Net community computing.

For more information, write:

T.M. Grundner, Ed.D. - Director
The Community Telecomputing Laboratory
Case Western Reserve University
319 Wickenden Building
Cleveland, Ohio 44106
(216) 368-5121

FUTURE:

100 PHONE LINES
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NETWORK ONE

THE CENTURY 21 PROJECT: A Synopsis

October, 1987

T.M. Grundner, Ed.D
Assistant Professor
Department of Family Medicine
CWRU - School of Medicine
Cleveland, Ohio 44106
(213) 368-2733

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Appendix A: Century 21 Target Cities

Introduction

It is the intention of the Century 21 Project to establish and bring into stable operation free, open access, community computing systems in a minimum of 90 targeted cities, by the year 2000.

This document is intended to provide a very brief overview of the concept behind the project, an outline of its history and development, and a brief look at each of the three organizations that we believe will help the project be successful in accomplishing it's goal.

The development of community computing systems on the national scale proposed here rests upon a foundation of three interrelated organizations as shown in Figure I.

Century 21 Project

The Society for Public Public Access Computing (SoPAC)

National Center for Community Informatics (NCCI)

(National Videotex Corp) (NVC)

Figure I

The Society for Public Access Computing (SoPAC) and the National Center for Community Informatics (NCCI) are both non-profit organizations. SoPAC was incorporated in April 1987 and exists as a 501(c)(3) entity. It is hoped that NCCI will be operational on the campus of Case Western Reserve University no later than January 1st 1988. A third organization is proposed as a for-profit arm of SoPAC and is still in the planning stages. As yet an official name for this entity has not been selected. However, for purposes of this document, we will refer to it as the National Videotex Corporation.

Century 21 and the Concept of Community Computing

The advent of free, open-access, community computer systems represents a relatively new concept in computing. These systems provide high volume, multi-user, information and communications services to a community in much the same way as a public library, for example, serves a similar function with the printed word.

Operation of these systems is quite straight-forward. A computer is established at a central location in a metropolitan area. The location would be determined by the sponsoring agency, be it a university, city government, corporation, or some other institution. The machine is connected to several phone lines through a series of devices called "modems"--one modem per line. Running on the machine is a computer program that can provide its users with everything from electronic mail services, to information about health care, education, technology, government, recreation, or just about anything else the operators would like to place on the machine. The central system is generally operated by a paid staff of three people--a project director, a system manager, and a clerical assistant. These three people are called system administrators. The various services on the system are operated by volunteers from the community who have a particular professional or avocational skill or knowledge that they are willing to contribute into a common computerized pool. These individuals are known as system operators (or sysops).

Anyone in the community with access to home, office, or school computers and a modem can contact the system any time, 24 hours a day. They simply dial up a central phone number, make connection, and a series of "menus" appear on their screens which allows them to select the services they would like. All of it is free and all of it can easily be accomplished by a first-time user.

The technology for this system is very well worked out. Indeed, there currently exists numerous commercial networks (e.g. the Source, CompuServe, GEnie) that operate, for a fee, at a national level to provide many of these same kinds of services. There also exist tens of thousands of free local single phone line systems, usually run by home hobbyists on microcomputers, called "Bulletin Board Systems." All of these systems have been operating successfully for years.

The Community Computer represents, in effect, a new genre of telecomputing software occupying a middle ground

between these two extremes. It has the sophistication and ease of access of the multi-user commercial systems, yet is locally owned, and operated by the community itself--each system with its own distinct local flavor and set of interests.

History and Development

Completely free, open access, community computing has it's origins in an experiment conducted in the School of Medicine in the Fall of 1984. Dr. Tom Grundner, of the Department of Family Medicine, set up a single phone line, computerized, "Bulletin Board" system to test the efficacy of using this media as a means of delivering general health information to the public. The heart of the system was an interactive area where laypeople could call in using their home or business computers, leave medically related questions and have them answered by a physician with 24 hours. The experiment proved so successful that it attracted the attention of the Information Systems Division of AT&T who funded a larger project to expand and develop this interactive concept.

Based on this donation, Dr. Grundner began work on a full scale "community computer system" on an AT&T 3B2/400 computer with 15 incoming phone lines. This pilot project was designed to serve as a community information resource in areas as diverse as law, medicine, education, the arts and sciences, and government--including free electronic mail services for all citizens in northeast Ohio. On July 16, 1986 this system, called the "Cleveland Free-Net," was opened by Governor Richard Celeste of Ohio and Mayor George Voinovich of Cleveland and the project became recognized as the first completely free, open access, community computer system in the nation.

One of the central tenets of the project was to give the software the widest possible dissemination, yet still maintain quality control standards which, in turn, would lay the groundwork for the broader research and other kinds of applications the developers knew would follow. Accordingly, the software was made available on a <u>lease</u> basis for $1 a year to any qualified party from any city in the country. The $1 year figure placed the software within reach of any institution, and the terms of the "lease" formed the basis for quality control, future research, and other developmental plans.

In July of 1987 the first sister system went online under the terms of this $1 a year arrangement. Known as the

Youngstown Free-Net it is a joint project between Youngstown State University and St. Elizabeth's Hospital--a major tertiary care hospital in that city. As of this writing, it is expected that a third system will be online before the end of the year, and there are now about 30 other cities around the country that are in various stages of bringing Free-Net systems into existence.

The Society for Public Access Computing (SoPAC)

By early 1987 the Cleveland Free-Net had received dozens of requests for more information about their system from various cities. It was clear that an umbrella organization would be needed to help financially and technically support this growing network of community computers. To meet this need, on April 7, 1987 the Society for Public-Access Computing (SoPAC) was incorporated as a non-profit corporation in the District of Columbia. Non-profit tax status under article 501(c)(3) of the Internal Revenue Code was granted on July 20th 1987.

The central mission of this organization is four-fold:

1) To establish selection criteria for the establishment of Free-Net systems around the country;

2) To assist in the process of bringing those systems online with technical assistance, staff training, etc.;

3) To establish and enforce quality control standards for the operation of those systems after they come online; and

4) To help raise monies in support of both the individual systems as well as for the operation of the network as a whole.

The Society is governed by a nine member Board of Trustees which meets quarterly in Cleveland, Ohio. Supporting the Board of Trustees is a Board of Advisors which consists of major figures from within government, industry, education, science, and the professions. Final installation of these board members is expected to be completed by November 30th, 1987.

SoPAC is designed to be a national membership organization similar to, for example, the Cousteau Society. It will be composed of people who are interested in promoting the development of free, open access, community

computer systems. SoPAC holds the copyright to the Free-Net software and is presently engaged in a variety of fund raising activities to secure the operational and development monies necessary to launch its formal membership and dissemination activities.

Targeted dissemination will focus on a list of 90 cities. These cities were selected because they each meet one or more of the following criteria: 1) they are a city with a very heavy volume of personal computer sales and usage; 2) they are one of the top 50 population centers in the country; and/or 3) they are a state capitol. (See Appendix A.)

As of the first of the year SoPAC will begin a recruiting drive to establish systems in an initial list of 28 targeted cities. These first 28 cities were selected because, in aggregate, they contain 91% of the current personal computer ownership in the nation. (It should be pointed out that groups from 12 of these 28 cities have already made spontaneous contact with SoPAC requesting information on setting up systems.)

It must be emphasized that this list is non-exclusive in nature. That is, it is our goal to establish systems in at least these 90 cities. We will also be establishing systems in as many other cities as are interested in having them and can support such an activity.

It is our belief however that if stable systems can be brought online in these 90 cities, that the future of free public access computing in all cities, large and small, will be assured.

The National Center for Community Informatics (NCCI)

The second leg of the triangle represents a very exciting opportunity to systematically explore and develop what amounts to a fourth medium.

It is, of course, a cliche to say that computing is in its infancy. But, cliche or not, it is quite true. In the specific area of telecomputing, we find ourselves experimenting literally with a new medium--one that is quite distinct from radio, television, and print, yet having characteristics of all three, plus additional ones of its own.

We need to know much more about it's exact nature and the best way of harnessing it's unique characteristics.

Indeed, the pilot "Cleveland Free-Net Project" has already begun research efforts into many of these areas including experimentation with third generation software which will include the coupling of natural language and artificial intelligence interfaces to our system's information and communications capabilities.

To meet the challenges implied by the development of this new medium it has been proposed that a new research and development center be established at Case Western Reserve University. This new entity will be known as the National Center for Community Informatics (NCCI) and would have three basic divisions: research and development, education, and operations. The existing Cleveland Free-Net Project would be absorbed into the Operations Division of the Center and would serve as its primary research and development system. Advising the center would be a seven person Board of Directors composed of major figures from the telecommunications and computer industries, government, business, as well as representatives from CWRU.

The general objectives of this Center would be:

1) To promote and disseminate scientific inquiry into the nature of telecomputing as a new information and communications medium including its various social and educational implications.

2) To promote and disseminate educational activities designed to further develop the understanding and use of telecomputing systems in general and of community computer systems in specific. Such activities would not be limited to traditional formal academic and scholastic programs but would include informal educational activities designed for the general public at all levels of society.

3) To assist in the dissemination, development and support of free, open-access, community computer systems in cities across the country and, eventually, around the world.

The NCCI proposal is presently being considered by the president of the university with a decision expected in two to three weeks.

National Videotex Corporation (NVC)

The least developed of the three entities at the moment is a semi-commercial one. As mentioned above it is expected

that a for-profit corporation will eventually be set up to explore this avenue as a means of generating revenues for the non-profit SoPAC and NCCI organizations, and for the various Free-Net affiliate systems.

Community computing systems and the tremendous volume of traffic they carry offer a host of opportunities for commercial development. To briefly mention but a few of the more obvious ones:

- Specialized equipment sales: One of the characteristics of Free-Net Community Computer systems is that they radically drop telecomputing demographics by, in effect, opening up telecomputing to a vast middle class population. Opportunities for sales of specialized low cost terminals, modems, and various other telecomputing hardware and software to this user population abound.

- Information Gateway Services: The project is very close to perfecting database gateway software which functions very much like an information "travel agent." The user types in information which identifies the nature of the information he or she is seeking. The computer maintains, in effect, a database of databases which isolates where the user would need to go to get that information. If the user is a subscriber to the commercial service that carries that database, he or she will then be ported out to that service. To extend the travel agent analogy further, the possibility exists that these commercial services would be willing to rebate back to the company for this referral--just as airlines, etc. rebate back to travel agencies for directing clients their way.

- Online Shopping: Online locally oriented shopping services are a very definite possibility. A percentage of each transaction would go to the videotex company and a percentage to the host system. Company profits in turn would be split between the investors and the two non-profit organizations SoPAC and NCCI.

- Advertising: Because of the high volume of usage received by the system, online advertising is a very real possibility.

- Online "Yellow Pages": A directory of business and industrial goods and services would be available in a database search format to the users. Like the paper Yellow Pages, businesses would pay for their listing in the database.

It must be emphasized, however, that any commercial development of these systems will be conducted in an appropriate and legally permissible "arms-length" relationship to the non-profit organizations SoPAC and NCCI, and all who work for them. And second, that online NVC activities will be done only at the specific invitation of the individual host systems.

Summary

In general perhaps the best way of illustrating the overall objective of the Century 21 Project is by drawing an analogy to the development of the public library system in this country. In the mid-1800's, for all practical purposes, there was no such thing as the free public library. When literacy finally got high enough (and the cost of books cheap enough) there was a tremendous interest in providing people with free, open access to the printed word. We believe a similar phenomena is occurring today where computer "literacy" is getting high enough (and the cost of equipment cheap enough) that we are now seeing an analogous demand for free, open access, public computing systems.

The Cleveland Free-Net Project has developed the prototype software necessary to establish these public access computer systems nationwide and, as mentioned above, is making this software available to any qualified party, on a lease basis, for $1 a year. It will be up to the three entities described in this document--SoPAC, NCCI and the Videotex Company--to see that this software is developed, disseminated, operated and supported in a responsible fashion.

To be honest, we can not imagine a 21st Century in which there is NOT public access community computing services available in virtually every city and town in the country, just as today we find public libraries. Moreover, we are convinced that these community computer systems will have the same kind of impact on the 21st Century, that the free public library has had on ours.

It is the goal of the 21st Century Project to see that that happens.

Appendix A

CENTURY 21 PROJECT

Ninety Target Cities

It is the intention of the Century 21 Project to establish and bring into stable operation free, open access, community computing systems in a minimum of 90 targeted cities, by the year 2000.

Targeted dissemination will focus on the list of 90 cities shown below. These cities were selected because they each meet one or more of the following criteria: 1) they are a city with a very heavy volume of personal computer sales and usage (Top 28); 2) they are one of the top 50 population centers in the country; and/or 3) they are a state capitol.

It must be emphasized that this list is non-exclusive in nature. That is, it is our goal to establish systems in at least these 90 cities. During this period we will also be establishing systems in as many other cities as are interested in having them and can support such an activity.

Albany, New York	Capital
Albuquerque, New Mexico	Pop. Rank 44
Annapolis, Maryland	Capital
Atlanta, Georgia	Capital, Top 28, Pop. Rank 31
Augusta, Maine	Capital
Austin, Texas	Capital, Top 28, Pop. Rank 34
Baltimore, Maryland	Pop. Rank 12
Baton Rouge, Louisiana	Capital, Pop. Rank 39
Bismark, North Dakota	Capital
Boise, Idaho	Capital
Boston, Massachusetts	Capital, Top 28, Pop. Rank 20
Buffalo, New York	Pop. Rank 46
Carson City, Nevada	Capital
Charleston, West Virginia	Capital
Charlotte, North Carolina	Pop. Rank 48
Cheyenne, Wyoming	Capital
Chicago, Illinois	Top 28, Pop. Rank 3
Chicago/Northern Indiana	Top 28
Cincinnati, Ohio	Pop. Rank 38
Cleveland, Ohio	Top 28, Pop. Rank 23
Columbia, South Carolina	Capital
Columbus, Ohio	Capital, Top 28, Pop. Rank 19
Concord, New Hampshire	Capital
Dallas, Texas	Top 28, Pop. Rank 7
Dayton, Ohio	Top 28

Denver, Colorado	Top 28, Pop. Rank 24
Des Moines, Iowa	Capital
Detroit, Michigan	Top 28, Pop. Rank 6
Dover, Deleware	Capital
El Paso, Texas	Pop. Rank 26
Frankfort, Kentucky	Capital
Ft. Worth, Texas	Top 28, Pop. Rank 32
Harrisburg, Pennsylvania	Capital
Hartford, Connecticut	Capital
Helena, Montana	Capital
Honolulu, Hawaii	Capital, Pop. Rank 11
Houston, Texas	Top 28, Pop. Rank 4
Indianapolis, Indiana	Capital, Pop. Rank 14
Jackson, Mississippi	Capital
Jacksonville, Florida	Pop. Rank 19
Jefferson City, Missouri	Capital
Juneau, Alaska	Capital
Kansas City, Missouri	Top 28, Pop. Rank 29
Lansing, Michigan	Capital
Lincoln, Nebraska	Capital
Little Rock, Arkansas	Capital
Long Beach, California	Pop. Rank 37
Los Angeles, California	Top 28, Pop. Rank 2
Madison, Wisconsin	Top 28
Miami, Florida	Top 28, Pop. Rank 34
Milwaukee, Wisconsin	Top 28, Pop. Rank 18
Minneapolis, Minnesota	Top 28, Pop. Rank 42
Montgomery, Alabama	Capital
Montpelier, Vermont	Capital
Nashville, Tennessee	Capital, Pop. Rank 27
Newark, New Jersey	Pop. Rank 49
New Orleans, Louisiana	Pop. Rank 22
New York City, New York	Top 28, Pop. Rank 1
Oakland, California	Pop. Rank 43
Oklahoma City, Oklahoma	Capital, Pop. Rank 28
Olympia, Washington	Capital
Omaha, Nebraska	Top 28, Pop. Rank 47
Philadelphia, Pennsylvania	Top 28, Pop. Rank 5
Phoenix, Arizona	Capital, Pop. Rank 9
Pierre, South Dakota	Capital
Pittsburgh, Pennsylvania	Pop. Rank 33
Portland, Oregon	Top 28, Pop. Rank 40
Providence, Rhode Island	Capital
Raleigh, North Carolina	Capital
Research Triangle, N.C.	Top 28
Richmond, Virginia	Capital
Sacramento, California	Capital
Salem, Oregon	Capital
Salt Lake City, Utah	Capital
San Antonio, Texas	Pop. Rank 10
San Diego, California	Pop. Rank 8

San Francisco, California	Top 28, Pop. Rank 13
San Jose, California	Pop. Rank 15
Santa Fe, New Mexico	Capital
Seattle, Washington	Top 28, Pop. Rank 25
Springfield, Illinois	Capital
St. Louis, Missouri	Top 28, Pop. Rank 30
St. Paul, Minnesota	Capital
Tallahassee, Florida	Capital
Toledo, Ohio	Pop. Rank 45
Topeka, Kansas	Capital
Trenton, New Jersey	Capital
Tucson, Arizona	Pop. Rank 41
Tulsa, Oklahoma	Pop. Rank 36
Virgina Beach, Virginia	Pop. Rank 50
Washington, D.C.	Capital, Pop. Rank 17

Cleveland's Cybernetic Elders

Ella has just returned home from Dr. Sullivan's office peeved at herself because she forgot to ask how her new blood pressure medication might interact with the champagne she anticipates enjoying at her granddaughter's wedding. She would be embarrassed to phone him with a seemingly frivolous question and instead dials a computer library that will search its drug data base for her answer. If she wanted to know more, she could file her question, to be answered the next afternoon by a genuine, board-certified family physician.

Ella is a hypothetical elder, but Cleveland's FreeNet, a "cybernetic city," is for real. According to T. M. Grundner, director of Community Telecomputing at Case Western Reserve (CWR) University, "Anyone in Cleveland with a microcomputer and modem can dial into FreeNet at no cost. It's sort of like a computerized public library."

Members of FreeNet have their computers at home or work attached to a modem, which converts their questions into data that can travel through the phone to the central computer on the CWR campus.

Grundner reports that even though less than 10% of FreeNet users are over age 60, research has led the program to conclude that "there is a breaking wave of seniors comfortable with microcomputers and other technology. The elders will access health information via microcomputer, and telecomputing is a largely untapped medium for health education of the aged."

He cited a 1988 Markel Foundation report on senior citizens and technology, indicating that older persons are not as adverse to high-tech as many assume: "If anything they are gravitating toward it." The Markel data show an upswinging curve of people interested in technology. For example, just 1% of today's FreeNet users are age 70 or older, while Grundner expects a boom in senior-related computing when today's 50- to 55-year-olds "enter the geriatric zone in the year 2000."

There is a breaking wave of seniors comfortable with microcomputers and other technology.

The Telecomputing Laboratory examined why those 55 and older seek medical information on FreeNet. They found that 36% felt doctors take too long to respond; 31% did ask a physician but wanted a second source of information; 26% said they did not understand their MD's answers; 20% did not want to bother the physician; 15% did feel their doctor receptive to such calls; 5% wanted to save money, and 2% were too embarrassed to ask in person. Three in four asked for themselves or for an immediate family member, and 56% considered asking a medical professional but decided to start with FreeNet.

Grundner explained, "Everything on the system has a question-and-answer program. On subjects from legal and government issues to hobbies, you can go on line and pose a question, then call back within 24 hours, and have your answer." In the medical area alone, the system has sections on family medicine, dentistry, mental health, handicapped services and other specialized fields.

Each area of information is sponsored by such institutions as CWR University's School of Medicine and the Family Medicine Clinic, operated by its Department of Family Medicine, and Cleveland State University's psychology and mental health departments.

"We're just moving out of prototype stage. We've held the group to about 6,000 registered users aged 7 to 87, who place from 550 to 600 calls a day through 10 dedicated phone lines," Grundner continued. Initial work on FreeNet started nearly five years ago, and it went on line in July 1986. By this August, FreeNet II will go full scale with 150 phone lines.

The FreeNet software is available to qualified people from any city in the country for $1 per year on a lease basis. "We don't want to give it out to just any computer enthusiast with a buck in his hand," Grundner said, "so users have to be with an agency, university, organization and so on. So far, we've cloned one system in Youngstown, Ohio, and this year we expect to open three more, in Akron and Medina, Ohio, and Peoria, Ill. There is a committee working in Miami, Fla., which should be on line soon (it will be our first bilingual system), and there is a very active committee in Los Angeles that's trying to put together a seven-system network to bring community computing to the Los Angeles basin."

In general, he said, "FreeNet is working far better than we ever anticipated. The next step in our development is that we will work with the Markel Foundation in New York and with SeniorNet in San Francisco. We want to train a group of seniors not just how to access information but how to telecompute, using the computer as a communications tool. We will turn them loose on the FreeNet and study exactly how they utilize a system like this.

For more information, contact T. M. Grundner, Director, Community Telecomputing Laboratory, 319 Wickenden Bldg., Case Western Reserve University, Cleveland, OH 44106; (216) 368-2733.

The National Public Telecomputing Network

Community Computing and the National Public Telecomputing Network

The National Public Telecomputing Network (NPTN)

The concept behind NPTN is not new. You are probably familiar with National Public Radio and Public Broadcasting on T.V. To understand NPTN, simply substitute community computer systems for radio or television stations, and you have the core of what we hope to accomplish—with two important differences. First, unlike NPR or PBS, we are NOT subsidized by the government; and second, unlike radio and television, our medium, telecomputing, is not yet as well established.

We are a nonprofit organization which is funded completely by voluntary membership dues from the users of our community computer systems, corporate and foundation grants and donations, and other fund-raising activities.

NPTN has objectives in five major areas:

1. *To assist in the development of free open access community computer systems in cities throughout the U.S. and abroad.* To this end, NPTN is making available the technical expertise and software necessary to develop and operate community computer systems virtually anywhere—for $1 per year.

2. *To establish ongoing electronic mail services between NPTN affiliates.* By Spring 1990 we expect to have, at a minimum, overnight electronic mail delivery between any two points on the NPTN network. We plan eventually to expand this to near instantaneous delivery.

3. *To establish "cybercasting" services to all NPTN affiliates.* Cybercasting (sorry, the word "broadcasting" was already taken) refers to the regular dissemination of high quality information features to NPTN affiliates. These services function like network feeds in the radio and television industry, where local station programming is supplemented on a regular basis by high quality network programs. Cybercasting services will be available in areas such as: health, education, business, science and technology, government, and other areas.

4. *To establish a national news organization to serve the community telecomputing public.* We would like to establish an independent news service which would produce a weekly interactive electronic "newspaper" for distribution throughout the network. Eventually, we would like to make this a daily service with full coverage of the day's events.

5. *To establish international connections between NPTN affiliates and overseas information resources.* One of the nice things about telecomputing is that it is not inherently bound by national borders. NPTN would like to capitalize on this fact with a program called "Global Dialog" which will attempt to establish international information and communication links between NPTN affiliates and existing resources in (initially) Japan, Europe, and the Soviet Union.

Background

NPTN has its origins in a series of research projects conducted at Case Western Reserve University (CWRU) in Cleveland, Ohio.

The initial project began in the fall of 1984 when Dr. Tom Grundner, then of CWRU's Department of Family Medicine, set up a single phone line, computerized, "bulletin board" system called "St. Silicon's Hospital and Information Dispensary" to test the effectiveness of telecomputing as a means of delivering health information to the public.

The heart of the system was an interactive area where lay people could call in using their home, school, or business computers, leave medically-related questions, and have them answered by a board certified family physician within 24 hours. The experiment proved so successful that it attracted the attention of the Information Systems Division of AT&T and the Ohio Bell Telephone Company, who supported a larger project to expand and develop this interactive concept.

Based on these donations, Dr. Grundner began work on a full-scale "community computer system" on an AT&T 3B2/400 computer with ten incoming phone lines. The initial system was designed to serve as a community information resource in areas as diverse as law, medicine, education, arts, sciences, and government—including free electronic mail services for the citizens of northeast Ohio. On July 16, 1986, this system, called the Cleveland Free-Net was opened by Ohio Governor Richard Celeste and Cleveland Mayor George Voinovich and the project was officially underway.

Version I of the Cleveland Free-Net gathered over 7000 registered users from throughout the Cleveland metropolitan area and handled between 500-600 calls per day. In 1989, however, it moved into a second phase of development in a big way.

A new system was designed around six IBM-RT (Model 135) computers which would be linked together so that, from the user's standpoint, they would appear as one big machine. This new system would provide the Cleveland Free-Net with 96 megabytes of RAM (96 million characters of Random Access Memory), 2.3 gigabytes of hard disk storage (2.3 billion characters of hard disk), and would be easily capable of supporting over 100 simultaneous users.

In August, 1989 the Cleveland super-system opened on 48 phone lines—32 designated for the community, 16 for CWRU faculty and students—plus a connection to CWRU's fiber-optic campus network called CWRUnet. Very quickly the system was averaging well over 2000 logins a day.

One of the central tenets of the project from the very beginning was that, if we were successful, we would attempt to give the software and our methodology the widest possible dissemination. With that goal in mind, in September 1989, the National Public Telecomputing Network was formed.

In July, 1986 the Cleveland Free-Net went online. In July, 1987, the Youngstown Free-Net began operation. In the first four months of 1990 we brought three more systems into the network: TriState Online in Cincinnati, Ohio; The Heartland Free-Net in Peoria, Illinois; and the Medina County Free-Net in Medina, Ohio—our first rural system.

From these beginnings, NPTN continues to develop and grow as the nation's first free public-access telecomputing network

The Concept of Community Computing

The development of community computer systems represents a new application in computing.

A multi-user computer is established at a central location and the machine is connected to the telephone system through a series of devices called modems. Running on the machine is a computer program that provides its users with everything from electronic mail services to information about health care, education, technology, government, recreation, or just about anything else the host operators would like to place on the machine.

Anyone in the community with access to a home, office, or school computer and a modem can contact the system 24 hours a day. They simply dial a central phone number, make connection, and a series of menus appear on the screen which allows them to select the information or communication services they would like. All of it is free and all of it can easily be accomplished by a first-time user.

The key to the economics of operating a community computer system is the fact that the system is literally run by the community itself. Everything that appears on one of these machines is there because there are individuals or organizations in the community who are prepared to contribute their time, effort, and expertise to place it there and operate it over time. This, of course, is in contrast to the commercial services which have very high personnel and information-acquisition costs and must pass those costs on to the consumer.

Couple this volunteerism with the rapidly-dropping costs of computing power, the use of inexpensive transmission technology, and the fact that the necessary software to operate these systems is available to NPTN affiliates for $1 a year, and public access computing becomes an economically viable entity.

A Civic Utility: Potential Impact on the Community

Who, exactly, benefits from community computing? To cite just a few examples:

• *The Citizens of a Given Community*: First and foremost, these community computer systems open up information services to very large populations that would otherwise not be able to afford it. The cost of utilizing a Free-Net community computer consists of the cost of having standard telephone service in the home or business, plus the price of the equipment needed to get online. Minimum equipment is now well under $250 virtually anywhere, and that is assuming the person purchases new. If a person wishes to attend a few garage sales, flea markets, or computer fairs, it could be considerably less. With the

addition of public access terminals in a city, anyone would be able to utilize one of these systems.

• *Public and Private Schools:* Via community computers, school systems finally have a cost-effective way to teach telecomputing to their students, thereby sending a new generation of information-literate citizens into the work force. In addition, these systems allow students, teachers, parents, and administrators to communicate with each other and have access to information bases of interest and importance.

• *Government:* Community computers provide citizens with an inexpensive and rapid way to make contact with their elected representatives at the city, county, state, and national levels—contacts which include everything from obtaining information on governmental services to providing access to tax-payer supported, governmentally-produced databases. It should also be pointed out that these communications are not one way. Elected representatives and other officials also have the ability to electronically communicate with their constituents.

• *Small- and Medium-sized Businesses:* Most major corporations have electronic mail and other computer-driven information services at their disposal. Most small- and medium-sized businesses do not. With a Free-Net system in place, these smaller enterprises are finally able to afford to link their operations together via Free-Net electronic mail services and have access to a variety of useful business databases—something that cannot help but improve the business infrastructure of any city.

• *The Agricultural Community:* Among the segments in our society that were the first to embrace computing were our farmers. The reason was obvious. Farmers are business people too, but they have the disadvantage of, in general, being dispersed over wide geographic areas. A Free-Net system in a central location in a county allows the agricultural community to access common information bases, share solutions to farm-related problems, access up-to-date crop and price information, and make electronic connection with the County Agent and each other—all without ever leaving home.

• *The Telecommunications and Videotex Industry:* For years the commercial videotex industry has been dividing, sub-dividing, and sub-sub-dividing essentially the same "up-scale" demographic group: $50,000+ yearly household incomes, very well educated, overwhelmingly white, and overwhelmingly male. If the industry is to survive and flourish, however, it is going to have to find a way to penetrate the middle class with its services. Free-Net community computers do exactly that. On the Cleveland system, for example, we draw as many users out of the demographically blue collar areas of the city as we do out of the wealthier sections. Demographic penetration such as this, on a nationwide basis, is vital if the telecomputing and videotex industry is to survive into the 21st century. It is also important to the telephone industry, which has spent millions of dollars on "gateway" technology, that telecomputing flourish and that their services be used.

• *Community Organizations and Institutions:* Each Free-Net is set up using an "Electronic City" motif. That motif was not selected by accident. To one degree or another, virtually every institution in society has an information dissemination function of some kind—a need to tell others about itself and share its knowledge. The Free-Net makes it possible for any and all of them to utilize a new medium to accomplish that goal. From artistic and cultural organizations to medical institutions to hobbyists of all kinds, all can find a place on a community computer.

The Greening of a Medium

As a result our experience in working with and developing these systems, we have learned several very important things.

First, it is clear that these community computers represent the leading edge of what can only be described as a new telecommunications medium. Telecomputing is not radio, not television, not print, but has characteristics of all three plus additional ones all its own. This fact alone will inevitably lead to developments and uses that we cannot now even begin to imagine.

Second, it is clear that a critical mass of people now exist who are prepared to utilize this new medium. As more and more modem-equipped microcomputers penetrate the home and especially the work environment, the utility of public-access computerized information services goes up.

And third, there is a certain sense of inevitability to the development of community computing. Simply stated, we find ourselves unable to imagine a 21st century in which we do NOT have community computer systems, just as this century has had public libraries. Moreover, we believe that the community computer, as a resource, will have at least as much impact on the next century as the public library has had on ours.

The library analogy we just used is equally valid as an historical analogy. Most people do not realize that in the latter part of the last century there was no such thing as the free public library, at least not as we know it today. Eventually the literacy rate became high enough (and the cost of books became cheap enough) that the public library became feasible. People in cities and towns all across the country banded together to make free public access to the printed word a reality. The result was a legacy from which virtually every person reading this document has, at one point or another, benefited.

In this century, we believe we have reached the point where computer "literacy" has gotten high enough (and the cost of equipment low enough) that a similar demand has formed for free, public-access, computerized information systems. Indeed, we believe we have reached a point where the question is no longer *whether* it will happen; the question is "who." Who will do it? Who will be first? Who will answer what is essentially the same call heard 100 years ago by our forefathers?

The National Public Telecomputing Network exists to make free public access to computerized communications and information services a reality—to hand down a legacy to our children's children as great as the one handed to us.

For More Information

If you would like to know more about NPTN and our work in developing community computer systems, please feel free to contact us at the following:

T.M. Grundner, Ed.D. - President
National Public Telecomputing Network
Box 1987
Cleveland, Ohio 44106

Voice: (216) 368-2733
FAX: (216) 368-5436
Internet: aa001@cleveland.freenet.edu
CompuServe: 72135,1536

ESTABLISHING A FREE-NET COMMUNITY COMPUTER SYSTEM

THE NATIONAL PUBLIC TELECOMPUTING NETWORK
Box 1987
Cleveland, Ohio 44106

(216) 368-2733

THE CONCEPT OF COMMUNITY COMPUTING

Free, open-access, community computer systems represent a relatively new concept in computing. These systems provide high volume, multi-user, information and communications services to a community in much the same way as a public library, for example, serves a similar function with the printed word.

A multi-user computer is established at a central location in a metropolitan area. The machine is connected to a number of telephone lines through a series of devices called "modems." Running on the machine is a computer program that provides its users with everything from electronic mail services, to information about health care, education, technology, government, recreation, or just about anything else the operators would like to place on the machine.

The central system is generally operated by a paid staff of three people--a project director, a system manager, and a clerical assistant. These three people are called system administrators. The various services on the system are maintained by volunteers from the community who have a particular professional or avocational skill or knowledge that they are willing to contribute into a common computerized pool. These individuals are known as system operators or "sysops."

Anyone in the community with access to a home, office, or school computer and a modem can contact the system any time, 24 hours a day. They simply dial up a central phone number, make connection, and a series of "menus" appears on their screen which allows them to select the services they would like. All of it is free and all of it can easily be accomplished by a first-time user.

In effect the Community Computer occupies a new middle ground between the large commercial systems, such as CompuServe and GEnie, and the single line BBS systems often operated by hobbyists. It has the sophistication and ease of access of the multi-user commercial systems, yet is locally owned, and operated by the community itself--each system with its own distinct local flavor and set of interests.

ESTABLISHING A FREE-NET SYSTEM

Setting-up a Free-Net (1) system, quite frankly, is not an "easy" task. It is NOT a hobbyists bulletin board system or BBS; it is a large, sophisticated, multi-user, community computer. To bring it online and operate it over time will require a lot of work and dedication on the part of many people. While starting a system is not easy, it is not impossible either--if you begin by carefully selecting a committee of people to share the many tasks involved.

This committee should be composed of people with a broad range of skills and significant contacts in the community, and who have a record of being able to get things done. Skills might include computer hardware and software, computerized communications, project organization and management, fund-raising, public relations, and so forth. Community contacts could include areas such as: education (both secondary schools and colleges, if possible), the business community, possibly government, possibly the local public library, the medical community, the legal community, and so forth.)

Honorary members, hangers-on, and people who are not "doers" are not what you need at this point.

In addition, the committee must be either licensed to do business in the state in which you are operating, or officially connected with an organization that is. This requirement can be met by simply filing nonprofit incorporation papers with your state Attorney General, or by affiliating with a sympathetic institution in your area. The reason for this is that eventually you will be signing an Affiliation Agreement with NPTN, and there has to be a legally recognizable entity at the other end of the contract in order for it to be valid.

Your committee should probably have, at a minimum, 10 to 12 members on it. This is because you will need about five sub-committees to handle the work and you should have at least two people on each sub-committee. These sub-committees are: Hardware and Software, System Design, Staff and Facilities, Ways and Means, and Network Relations. As you near your grand opening, you might also want to generate a "Publicity" sub-committee.

In this section we will briefly outline the duties of each committee, then follow it with more detailed information about each area.

The Hardware and Software sub-committee responsibilities would include recommending the kind and size of computer which will best meet your needs, the kind and number of modems to purchase, making arrangements for telephone lines to be installed and activated, and other similar technical tasks. Included also will be responsibility for the selection of the operating system (Berkeley 4.3 Unix or System V Unix) and for obtaining and/or possibly installing the Free-Net software when the time comes. Here's where you need to put your best computer and communications "teckies."

The System Design sub-committee responsibilities are primarily, as the name implies, to design the initial configuration of your system. The Free-Net software allows you extensive freedom to set-up your "electronic city" in almost any way you wish. This committee needs to make the recommendations as to exactly what kinds of features will initially be on the system, what they will be called, what functions will be in each, who will "sysop" them, and so forth. On this committee you should have people who really understand the Free-Net concept, are excited by it, and who are not reluctant to think about possibilities. They should also be people with a broad base of community contacts, as they will also be responsible for recruiting the initial group of sysops.

The Staff and Facilities sub-committee will be responsible for locating and recruiting the initial staff members for the project. In addition, they will need to find the project a physical home either by arranging for donated office space, or by identifying appropriate rental space. People with backgrounds in personnel management and proceedures will be useful here.

The Ways and Means sub-committee is perhaps the most important of all. These are the people who must either arrange for donations of equipment, phone lines, office space, etc., or raise the money to buy them--as well as pay the staff. Comparatively speaking, Free-Net systems are VERY inexpensive to operate. But "very inexpensive" is not the same thing as "free." On this committee should be people with backgrounds in costing and budgeting, grantsmanship, soliciting donations, and other forms of fund-

raising. They must know the right people to ask, how to ask, and not be afraid to ask.

Finally, the Network Relations sub-committee will be responsible for co-ordinating your activities with NPTN. This would involve keeping us posted on how you are doing, letting us know when you are getting close to being ready for the software, letting us know if you are having problems (we might well be able to help), and so on. When you get close to going online, these same people might also serve as a Publicity Committee to help get your system off to a big start.

Below is more detailed information on each of these areas.

THE HARDWARE

The Free-Net software is designed to be transferable to a wide variety of computers. On the Cleveland system, which is more or less our "flag-ship," we happen to be using a series of six IBM-RT Model 135 computers which are linked together to form an aggregate of 96 mb of RAM and 2.3 gigabytes of hard disk storage. We also have 32 phone lines coming in from the community, plus 16 lines for Case Western Reserve University faculty, staff, and students, plus a connection to the CWRU fiber-optic campus network. Your system does not necessarily have to be this large; and you do not necessarily have to be using IBM equipment. The Free-Net will run sucessfully on AT&T, Sun Microsystems, DEC, and many other kinds of machines. But whatever computer you choose, at this time it must be a Unix-based system.

In general, even for a small town, we would recommend no less than four mb of RAM and at least 100 mb of hard disk. In both areas, more really IS better--especially when it comes to hard disk storage. The number of phone lines you have will depend on your potential user base. From our experience, however, it is difficult to imagine any system that would have less than five telephone lines and a large metropolitan area may require as many as 30 to 50 or more.

We also recommend that the Free-Net be operated on a dedicated machine, that is, that it NOT be run on a machine that is carrying other services. The reason for this is one of security--both perceived and real. In most cases, a multiple-use Unix machine will allow its various users access to the "shell" -- the basic operating level of the system. Once into the shell it is difficult to keep an unscrupulous user from crossing into the Free-Net area, there to possibly tamper with the files, compromise the electronic mail accounts, and so forth. This situation can be controlled only if a user can not get on the machine at all unless they are entering the Free-Net program. Once in the program, the user's options are prescribed and certainly do not include shell access. Remember, not only must Free-Net systems be secure, they must be perceived as being secure by your user base.

SOFTWARE AND SYSTEM DESIGN

The Free-Net software is arranged utilizing an "electronic city" metaphor. Following this metaphor, you may provide a range of services that parallel those found in almost every real city. Thus you will see

various areas of a Free-Net system bearing titles such as: the "Post Office," the "Schoolhouse," the "Medical Arts Building," "Government Center," etc.

The software is modular in design which allows you to tailor it to meet the needs and interests of your particular locale. At the moment there are seven basic modules that can be quickly "snapped" together to provide a wide variety of services and features. How these modules are used are limited only by your imagination and the needs of your community.

To better visualize the functions of these modules you may want to log on to the Cleveland Free-Net to see how these various modules work (216-368-3888 - 300/1200/2400 baud), or to any of the NPTN affiliate systems shown in Appendix I.

The six basic software modules are:

TEXT FILE TYPE: When this module is selected a text file is "typed" (sent) to the users screen. Every 20 lines the typing will stop and provide the user with a "Press RETURN to Continue, Q to Quit" prompt. (Example: See any "Information Desk" or "About the..." option.)

MENU/TEXT FILE TYPE: This module presents the user with a numbered "menu" of items. Depending on the item selected, a file is typed to the screen as described above. These are controlled areas where only system operators or other authorized people are allowed to post materials. (Example: See "What's New in the Electronic City")

ELECTRONIC MAIL: This refers to a true account-to-account private electronic mail system. Included are "Post Office Boxes" which store mail for the user, multiple addressee mailing, complete editing capabilities, and even a spelling checker. Through Free-Net electronic mail, your users will also be able to send mail to any other NPTN affiliate, or around the world through NPTN's connection with Internet--at no cost to them. (Example: See the Post Office/Send Mail) The basic elements of this module, by the way, are also used in almost any area where text is being placed on the system by a user.

BULLETIN BOARD: This module allows the user to type-in or upload whatever information they would like. It is immediately displayed in a menu driven format for others to read. (Example: See Public Square/The Kiosk)

Q & A: This module allows the user to type in open-ended questions which are then sent to a buffered area of the computer. This buffer is accessible only to appropriately authorized individuals. When the answering individual (for example, one of the physicians working in the hospital area) comes online, he or she can go to this buffer, read these questions, answer them, and place them back on the general system for all to read. (Example: See the Hospital/Family Medicine Clinic)

DATABASE: An all-purpose module (currently under development) which allows users to search and retrieve information. This can range from information on other users, to calendars of events. (Example: See the Post Office/P.O. Box Directory)

CHAT: A module which allows users to "talk" directly to each other in real-time. A message typed by one person will appear on the screens of any

others who are currently on the system and who have entered into "chat-mode" with that person. (Example: See Public Square/the Cafe)

In addition there are special software modules that are designed for use by the individuals in the community who will be operating most of the areas on your system. Access to this software occurs via the Post Office menu. These individuals, known as "sysops," have specially tagged ID numbers. If a regular user has, for example, seven choices on their Post Office menu, when a sysop comes online he or she will see an eighth selection called System Administration. This will give the sysop access to the software he or she needs to upload and delete files, answer questions, etc. There is also a special area which allows you to monitor and manage the system as a whole.

Once your "core software" is in place, you can begin the process of creating an "electronic city" which is tailored to meet the needs and interests of your particular locale literally by using a word processor. All Free-Net menus are external to the program and reside in text-files. Thus, creating new areas on your system, or modifying old ones, is as easy as calling up a file into a word processor, making the change, and saving it back again.

All software is written in "C" and operates in a Unix environment. Versions of the software are available for both Berkeley 4.3 as well as System V unix.

STAFF AND FACILITIES

For most locations we recommend a paid core staff of at least two and a half full-time people--a project director, a system manager, and at least a half-time clerical person.

Project Director: The function of the Project Director is basically four-fold.

First, he or she must be a community organizer. This system runs because a wide variety of people IN THE COMMUNITY make it run. These people (the sysops) donate their time, effort, and expertise to operate its various components. The Project Director needs to be able to locate these individuals and/or the organizational sponsors of these individuals and get them to participate in the system. He or she ideally should have a broad base of contacts within the area's computer community, or be willing to develop them. (A bit of flair for PR and some experience working with the media won't hurt either.)

Second, he or she must be a fundraiser. In addition to seeking and landing grants and donations, he or she should be prepared to assist other organizations and individuals that are on the system to seek their own grants and donations.

Third, he or she must constantly be on the lookout for ways in which the system can be improved and new features added because the Free-Net must constantly be geared and re-geared to the information and communications needs of the community. This requires a genuine sensitivity to and understanding of the needs, abilities, and limitations of the user base.

Finally, and perhaps most importantly, he or she must be something of

an entrepreneur. The person must always be on the lookout for new ways in which this media can be used and must be willing to spend the time and the effort necessary to make the contacts, land the grants, or whatever else is necessary to make things happen.

System Manager: The system manager is responsible for the day-to-day operations of the system. This includes everything from answering questions and complaints from both users and sysops, to making sure the sysops are operating their respective areas properly, to seeing that the clerical functions are staying current, to making sure that system back-ups and other routine system maintenance is occurring, and doing other miscellaneous tasks to keep things running smoothly.

The person must work very closely with the Project Director, must have a firm grasp of what the system is about, where it is going, and how it works. He or she must also have good communication skills and be able to work well with the general public.

Finally, the person should have a working knowledge of the Unix operating system--at least through the level of understanding file structures, being able to copy and move files, and being able to use the vi or ed editors to create or modify text.

Clerical Person: Because the system uses a paper registration system (as opposed to an online registration system) a fairly high volume of paperwork must be handled. Registration forms must be mailed out to those requesting them; incoming forms must be processed, the data placed into the computer and ID numbers sent out; databases of user information must be maintained and other clerical functions need to be performed. At least a half time person (with good typing skills) is necessary.

For most systems, these three people will constitute an adequate core staff. The absolute minimum staff, we believe, would consist of a full-time project director/system administrator, and at least a 33%-time clerical support person.

Facilities: Free-Net computers do not require any special environment, such as a computer room, to operate. Virtually any location that is not in direct sunlight (which is bad for the computer) and is otherwise hospitible to human life, will do. In fact, the location of the machine is more often dictated by the convenience of locating the phone lines than anything else. We do recommend, however, that the machine not be placed in a room which is also someone's office. While the computer may not need special air-conditioning, it will probably be air-cooled via a fan, and that fan is much larger than what you would normally find on a personal computer. What initially sounds so quiet and innocent will start to sound like the prop-wash from a cargo plane after about a week of sitting next to it. (This is known as the Sharron Carlson clause. Sharron can now be visited at the Cleveland Psychiatric Institute between the hours of...)

Other office space should be appropriate to the number of staff you have. In addition, you should try to have someplace with a large table which can serve as a meeting/training room. Remember, you will be bringing on dozens, perhaps eventually hundreds, of sysops and many of them will need to be trained on the software. You need a place to do that.

INSTALLATION AND TRAINING

To install the system and train your core staff will require at least two days. It can best be accomplished either by sending your director, system manager and technical person to Cleveland, or by bringing our people to you. If we come to you, there is no charge for these individuals' time but, at this point, we must ask that you reimburse for transportation, lodging and meals.

WAYS AND MEANS

Obviously the costs of running a Free-Net system are going to vary widely from one area of the country to another, and by how much of the equipment and/or personnel might already be in place in a given location. Attachment II presents a hypothetical "worst case" scenario where everything from equipment to office space to salaries must be obtained--nothing is donated. You can scale these estimates up or down based upon the economic realities of your particular area, and whether all or part of your needs can be met through donations.

FUNDING THE SYSTEM

As you have no doubt figured out, saying that a Free-Net Community Computer System is free to the user is not the same thing as saying that it costs nothing to operate. Make no mistake, it will cost money to set-up your system and additional money to operate it over time.

No one dominant model for funding community computer systems has yet emerged. Some systems operate on a purely entrepreneurial basis, that is, the staff goes after grants, corporate donations and the like to keep the system going. Other systems have been established by dividing the cost between two or more major institutions (e.g. a university and a major hospital, two universities, etc.). Yet another approach has been to seek single source funding from, for example, a city or county government, or a corporation.

One approach that has proven particularly useful in defraying costs has been via the outright donation of equipment. Computer and modem companies may well be approached for the donation of the computer and modems in exchange for credit on the opening screen. From their standpoint, the donation is: a) tax deductible; and b) serves to showcase their equipment before thousands of people who are, by definition, computer purchasers and users.

The grantsmanship approach has also proved effective in many cases. Indeed, a high degree of interest has been expressed in developing these systems by a variety of non-profit institutions such as colleges and universities because the system is a net producer of revenue not a net consumer. It can be, as one person described it: "a giant grant machine."

Grants can be written for the service as a whole or for the operation of any part of it (e.g. the Schoolhouse, the Handicapped SIG, the Hospital, Government House, etc.). The possibilities are almost endless. Moreover, the impact of any given award is cumulative. For example an award to add,

let's say, an online AIDS information service costs only a fraction of what it would cost to start such a service from scratch. The system already exists; the users are already there; and an online "hospital" already exists that is drawing hundreds of users a week. The "bang for the buck" (as it were) is very high and funding agencies love to see that in a proposal.

In general, the innovative nature of the project and the impact these systems have on the community as a whole make them quite attractive to many local, state, and national funding agencies and institutions. In addition, monies can be obtained through NPTN.

THE NATIONAL PUBLIC TELECOMPUTING NETWORK (NPTN)

The concept behind NPTN is not new. You are probably familiar with National Public Radio and Public Broadcasting on T.V. To understand NPTN simply substitute community computer systems for radio and television stations, and you have the core of what we hope to accomplish--with two important differences. First, unlike NPR or PBS, we are NOT subsidized by the government; and second, unlike radio and television, our medium, telecomputing, is not yet as well established. We are a nonprofit organization which is funded by voluntary membership dues from the users of our community computer systems, corporate and foundation grants and donations, and other fund-raising activities.

Each Free-Net will be an affiliate of the National Public Telecomputing Network (NPTN) which will entitle them to certain services. One of these is inter-system electronic mail handling so that all Free-Net systems will be connected by, at a minimum, overnight electronic mail as well as offering world-wide electronic mail services through NPTN's connection with the Internet. In addition, "cybercasting" (1) services are now available whereby high quality news and information features will be provided to the affiliates via NPTN feed.

In return, we would like you to help us with soliciting membership to NPTN from among your users. The way that would work is as follows:

Each person who wants to be a registered user on your system has to fill out and send in a registration form. This form allows you to assign an ID number and password which, in turn, allows them to have an electronic mailbox and use certain other features on the system such as "chat" etc. You provide them this ID number and password by sending them a form letter. Once a month you would send us a mailing list of the names and addresses of the people who have registered on your system that month so we can solicit them to join NPTN. In return, YOU will receive a 15% rebate on the membership fees collected from the users of your system. These are non-contingent monies and may be spent for any Free-Net related purpose you feel appropriate.

It is important to point out here that **the use of any Free-Net system is in no way contingent upon joining NPTN.** It is completely voluntary and would be somewhat analogous to contributing to public television or radio. All NPTN members will also be receiving a quarterly magazine and other benefits.

NETWORK RELATIONS

By establishing an NPTN/Free-Net system you are joining a much larger family of community computer operators. Take advantage of that fact. In addition to putting up the first Free-Net, we have helped many other people do the same--people who are just like you and who at some point felt as overwhelmed by it all as you probably will (if you haven't already). I don't know that we've "seen it all" but, if we haven't, we're pretty close to it. We have learned a lot of lessons over the years--sometimes the hard way--and we are prepared to help bring you online, and keep you online, with the highest quality system possible.

To do that effectively, we need to have an initial contact person or persons who can keep us abreast of how things are going, what snags you are encountering, what successes you are having, and so forth. This person can also help with getting the affiliation agreement in place and other miscellaneous network tasks.

As you get closer to your grand opening these same people can help co-ordinate your activities, construct and mail press releases, etc.

OBTAINING THE SOFTWARE

The Free-Net Software is licensed to qualified parties for $1 a year. Before receiving the software, however, a formal document (the terms of the license) will need to be signed. Included in this document will be items such as the following:

You must agree:

1. That access to the system and it's functions will be free to the user at all times--no charge for registration, no charge for system use.

2. That you will not release the software to anyone without our written permission.

3. That you will provide NPTN with the names and addresses of your users for membership solicitation purposes.

4. That you will keep accurate records with regard to things such as: number of registered users, demographics of the registered users, number of calls per week, and other data as may be required, and will report them to NPTN as prescribed. (Much of this is gathered automatically by the system.)

5. To provide appropriate equipment and facilities to operate the system.

6. To provide guaranteed salary support for the core staff for a period of at least two years.

7. That the source code for any substantive modification, improvement, or addition to the Free-Net software that you develop will be submitted to NPTN for possible re-distribution to the rest of the network. (NPTN will own the copyright to any such changes. You will, of course, also receive copies of any modifications, improvements, or additions that have been made by any other affiliate.)

8. To make your system available to receive and send electronic mail from NPTN and other affiliate systems around the country, as well as receive cybercasting services from NPTN.

In return we will:

1. Provide you with the Free-Net software.

2. Help you install it and train your staff as outlined above.

3. Provide you with free copies of all program improvements or new modules created by us (or anyone else).

4. Provide ongoing technical and managerial advice and support.

5. Automatically include your system in all networking developments.

6. Make available various promotional and marketing items for your system as they become available.

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(1) The words "Free-Net" and "Cybercasting" are registered service marks of the National Public Telecomputing Network.

Attachment I

NPTN Affiliate Systems

THE CLEVELAND FREE-NET
Cleveland, Ohio

Modem: (216) 368-2733 - 300/1200/2400 Baud
Equipment: Six IBM-RT Model 135 computers - 32 modems
Sponsor: Case Western Reserve University

THE YOUNGSTOWN FREE-NET
Youngstown, Ohio

Modem: (216) 742-3072 - 300/1200 Baud
Equipment: AT&T 3B2/400 computer - 10 lines
Sponsors: Youngstown State University, St. Elizabeth's Medical Center

TRISTATE ONLINE
Cincinnati, Ohio

Modem: (513) 579-1990 - 300/1200/2400 Baud
Equipment: AT&T 3B2/1000 computer - 21 modems
Sponsor: Cincinnati Bell Telephone Co.

THE HEARTLAND FREE-NET
Peoria, Illionis

Modem: (309) 674-1100 - 300/1200/2400 Baud
Equipment: IBM-RT Model 135 - 10 modems
Sponsors: Heartland Free-Net, Inc.; Caterpillar, Inc.; The Peoria Journal-Star; IBM Corporation; Ameritech Services; The Bielfeldt Foundation; and various community groups.

MEDINA COUNTY FREE-NET
Medina, Ohio

Modem: (216) 723-6732
Equipment: IBM-RT Model 115 computer - 5 modems
Sponsors: Medina General Hospital, Medina County Public Library

Attachment II

Annual Cost Model for Community Computer Operations
First Year - Worst Case Scenario - Medium Sized City
(adjust as needed)

Staff	Salaries	Fringe (23.5%)		
Project Director	$35,000	$8225	$43225	
System Manager	25,000	5875	30875	
Clerical (1/2 time)	7,500	----	7500	
Sub-Total				$81600
Hardware				
AT&T 3B2/400 computer ($14,500) plus 15 modems ($5250) amortized over three years (Total $19,750)			$6583	
Administrative Microcomputer			2000	
Phone line installation (15 lines)			600	
Phone line rental (15 lines)			2700	
Sub-Total				11883
Software				
Free-Net Community Computer Software			$1	
Sub-total				1
Office Space				
Office space rental for equipment and staff - Approx. 600 sq ft			$12000	
Office Equipment Purchase			5000	
Sub-Total				17000
Administrative Costs				
Xeroxing, Mailing, etc.			$6000	
Sub-Total				6000
Grand Total				$116,484

The Cleveland Free-Net Community Computer System

Thank you for requesting registration information for the Cleveland Free-Net -- a free, open-access, community computer system brought to you by: The Society for Public Access Computing, in conjunction with Case Western Reserve University, the Information Systems Division of AT&T, Ohio Bell Telephone Co., and University Hospitals of Cleveland.

The registration process is very simple. Inside this brochure you will find a three part form. The first part is an agreement -- the terms, if you will, of your participation on the system. **This section MUST be signed and dated.** The second section is a form which provides us with, among other things, the information necessary to set up your account on the system and to enter you into the user directory. The third section is optional, but one we think is very important. It provides us with the basic information necessary to study the system and its utilization.

To register, simply fill out these forms and send back this entire document to:

The Cleveland Free-Net Project
Box 1983
Cleveland, Ohio 44106

There is NO CHARGE for this registration process and NO CHARGE to use the system.

We will send you your ID number and a temporary password as soon as possible. In the meantime, please feel free to use the Free-Net as a visitor. (216-368-3888 -- 300/1200 baud)

Thank you.

The Cleveland Free-Net Staff

The Cleveland Free-Net
Box 1983 Cleveland, Ohio 44106

Non-profit Organization
U.S. POSTAGE
PAID
CLEVELAND, OHIO
Permit No:1402

Agreement

In exchange for the use of the Cleveland Free-Net Community Computer System, I understand and agree to the following:

1. That the use of the Cleveland Free-Net is a privilege which may be revoked by the administrators of that system at any time for abusive conduct. Such conduct would include, but not be limited to, the placing of unlawful information on the system, and the use of obscene, abusive or otherwise objectionable language in either public or, upon registration of complaint, private messages. The staff of the Cleveland Free-Net will be the sole arbiter of what constitutes obscene, abusive, or objectionable language.

2. That the Cleveland Free-Net reserves the right to review any material stored in files or programs to which all users have access and will edit or remove any material which the Cleveland Free-Net, in it's sole discretion, believes may be unlawful, obscene, abusive, or otherwise objectionable.

3. That all information contained on the Cleveland Free-Net is placed there for general informational and entertainment purposes and is, in no way, intended to refer or be applicable to any specific person, case, or situation.

4. That the Cleveland Free-Net does not warrant that the functions of this system will meet any specific requirement you may have; nor that it will be error free or uninterupted; nor shall it be liable for any indirect, incidental or consequential damages (including lost data, information, or profits) sustained or incurred in connection with the use, operation, or inability to use the system.

5. To abide by such rules and regulations of system usage as may be promulgated from time to time by the administrators of the Cleveland Free-Net.

6. In consideration for the privilege of using the Cleveland Free-Net and in consideration for having access to the information contained on it, I hereby release the Cleveland Free-Net, it's operators, and any institutions with which they are affiliated for any and all claims of any nature arising from my use of the Free-Net.

_____
Signature

_____
Date

Registration Form

Except where indicated, the following information will appear in the system's directory of users. Please PRINT each item as you wish it to appear but, please, no "handles" or obvious false names or cities.

Required Items:

Name: _____

City and State: _____

The following information is requested in case you should loose your ID or Password. It will allow us to identify that you are really you. THIS INFORMATION WILL NOT APPEAR IN THE USER DIRECTORY.

Mother's Maiden Name: _____

YOUR Date of Birth: _____

To where/whom should we send your ID number and password. THIS INFORMATION WILL NOT BE SHOWN IN THE USER DIRECTORY AND, AGAIN, PLEASE PRINT.

Name: _____

Address: _____

_____

City: _____ State: _____ Zip: _____

Optional Personal Information

The Cleveland Free-Net is essentially an experimental system. It is a significant "first" in the field of computing and, because of that, we believe it will be the source of a great deal of study in the years to come.

To help us learn more about this system and how it is used, we are asking that all registered users complete a brief questionnaire about themselves. **This information will be kept completely confidential.** At no time will it be made available in a form that is linked to your name.

Answering these questions is optional. You will still be a full registered user of this system if you do not fill it out. However, because of the unique nature of the system and the unusual opportunity we have here in Cleveland to study it from the beginning, we would like to urge you to help us out by completing these items.

Please fill-in or check-off the following:

1. What is your age: _____

2. What is your sex?

_____ 1. Male
_____ 2. Female

3. What is your race?

_____ 1. White
_____ 2. Black
_____ 3. Asian
_____ 4. Hispanic
_____ 5. Other (Please specify _____)

4. What is your educational background?

_____ 1. Completed a graduate degree
_____ 2. Completed a four year college degree
_____ 3. Completed at least one year of college
_____ 4. Completed high school
_____ 5. Completed the 10th or 11th grades
_____ 6. Completed the 7th, 8th, or 9th grades
_____ 7. Completed less than the 7th grade

5. What is your occupation? (Please PRINT)

_____

THANK YOU VERY MUCH FOR YOUR HELP!