BANKS, WALTER
--Terminal attachment program : final report

Terminal Attachment Program

Final Report

by

Walter Banks, Principal Investigator
Computer Communications Networks Group
University of Waterloo
Waterloo, Ontario, Canada

Submitted to

Department of Communications
Ottawa, Ontario, Canada

February 28, 1978

DSS File: 07SU-36100-7-9525

checked 11/83

SECTION I. INTRODUCTION

The Terminal Attachment Program (TAP) sponsored by the Federal Department of Communications (DOC) was initiated in response to the growing number of non-carrier devices attached to the various communication networks throughout the country. Such devices range in variety from telephone amplifiers to high speed data links for computers. Carriers, users, and manufacturers all agree that such devices will continue to be developed and used. There is also universal agreement on the need for consistent interface standards for communication networks. Carriers, users, and manufacturers each have strong individual interests and each view the Terminal Attachment Program quite differently. The carriers see TAP as a method of protecting network integrity. The manufacturers see the program as providing standards and guidelines for new equipment design. The users are relieved to find a move towards equipment compatability.

SECTION II. SCOPE:

It is intended in this report to restrict coverage to those devices not utilizing voice as their data means. It will cover computer modems, facsimile, and medical data links.

This report presents the results of a survey of data terminal equipment. The wide usage of non-carrier devices is shown by this survey.

Finally, this report reviews existing network interface standards and proposes alternative implementation of certification standards of non-carrier devices. It is hoped that the alternatives will reflect the special Canadian requirements.

SECTION III. DATA NON-ADDRESSING EQUIPMENT

A data base has been constructed to determine the variety and extent of Non-Addressing equipment. The data base was generated from several sources. The bulk of the entries came from published literature in various trade journals and periodicals. In addition, literature was solicited from known manufacturers. The address lists were compiled from equipment buyer's directories.

The data base containing terminal equipment specifications was implemented on an H66/60 time sharing computer. A specialized data base retrieval program was implemented to facilitate access of the data base. Appendix A contains a summary and a short description of the commands used for data base access.

Appendix B contains a list of manufacturers represented in the survey. The response to our mailed requests for literature was extremely good, with suppliers and manufacturers cooperating to their fullest.

The last addendum, Appendix C, contains a complete dump of the data base. The data presented has not been processed in order to give complete information available.

SECTION IV. CERTIFICATION STANDARDS

As stated before, all parties involved: users, carriers, and equipment suppliers, agree on two points.

1) There will be continued use of non-carrier devices on common carrier communication networks.

2) High technical standards of interface equipment should be maintained.

The first point is a "motherhood" statement. It indicates the wide and varied use of communication networks. Carriers can support the mainstream requirements of users, but specialized applications involving individual or few users cannot realistically be supported by the carriers. Users have specific individual requirements for communication. If these requirements happen to be unique, they are forced to seek specific solutions or conform to existing facilities. There are many cases where they simply cannot do this, for example, highly reliable data communication or security systems involving unique encoding and decoding. Finally, the equipment suppliers (whether they be manufacturers or distributors) are dedicated to filling a requirement in the market place. The suppliers thrust in two directions.

1) Supply of equipment necessary to satisfy specialized requirements.

2) Supply of more cost effective equipment, directly competing with existing equipment and services already supplied by the common carriers.

This last point has caused untold anguish to representatives of the common carriers. They have to face an encroaching monopoly on their own networks. More importantly, they face the possibility of competition only in those profitable areas of their operation. This in some ways discourages introduction of services which might be viewed as essential for the "common good of all" but because of its nature must be supported in part by other profits.

High technical standards rate second only to profit as a motivating force for equipment suppliers. Equipment suppliers (both manufacturers and distributors) face an elaborate game of "Twenty Questions" in determining equipment compatability to the network. At present, equipment suppliers are notified only if their equipment causes problems in the common carriers' networks. Unfortunately this only encourages suppliers to develop equipment to the point where it no longer visibly interferes with the network. This can lead to possible gradual widespread degradation of the network.

If an elaborate program of equipment testing is installed, the high technical standards of the network will be maintained to the satisfaction of the common carriers. The equipment supplier still is faced with a more elaborate ver-

sion of "Twenty Questions". Testing will tell him whether equipment is acceptable or not, but will not provide corrective solutions to his problem.

The equipment supplier is not really directly concerned with the operation of the communication network. His interest in the carrier is to transport information from one point and reproduce it at another place. The problem of the equipment supplier is generally one of adding terminal equipment to the existing communication network.

In many cases, to the equipment supplier, even terminals are a small part of his product. For example, communication is only a very small part of medical electronics or facsimile. Simple, straightforward standards and testing procedures are required. Guidelines and technical assistance are welcome and will be used by manufacturers whose product is only a small part of communications equipment. For example, communication is a very small part of medical electronics or facsimile.

A second alternative exists to maintain high technical standards. In the United States, equipment suppliers are urged to submit an exhaustive technical report demonstrating compatability. This report is required to show both the test methods and results. The contents of the reports are public documents and may be scanned and challenged by any interested party. This, like the other scheme described, has both advantages and disadvantages to all parties in-

volved. The equipment supplier will likely be well informed on technical requirements of the network after completing testing programs. However he is faced with the large cost of testing independently from others and the possibility of being challenged at some point in the future (in some cases long after he began to produce and ship his product).

Although the standards generated will be high, no broad overseeing control will exist to ensure general good standards development.

The carriers are faced with an expensive and lengthy process of checking each submission for compliance with their standards and challenging those which appear to fail to meet them. Failure to do this will cost the carriers control over the technical standards of their own networks.

The three principal parties, users, carriers, and suppliers, have individual interests. The carriers are concerned about the technical integrity of the communications network. The users are concerned about the functional aspects of their communication problem. The suppliers are not particularly concerned about the actual communication networks, but are concerned about special or more cost effective products. It is acknowledged that it is normally the suppliers' responsibility to ensure that their equipment does not interfere with the network. However when equipment is required by users that cannot be supplied by the carriers it becomes the responsibility of both parties (the suppliers and carriers) to ensure that the network is protected.

Suppliers of terminal equipment currently face a rather large number of tests for certification as an acceptable non-carrier device (CS-01). Each new device is faced with the same network requirement. It can also be noted that the bulk of the testing concerns only the appearance of the electrical device to the network (Impedances, Dielectric strengths, Potentials). The remaining tests have to do with the signals associated with the data under normal operating conditions.

There are two general terminal characteristics measured during the certification procedures. The terminal independent characteristics include terminal impedances, insulation dielectric strengths and residual AC and DC potentials. The terminal dependent characteristics include signal strength, and frequency spectrum content of signal information.

It is suggested that serious consideration be given to the development of a standard network interface which would ensure the terminal independent characteristics. A standard interface design would allow streamlined testing and minimize certification costs.

SECTION V. SUMMARY

V.1 DATA BASE RESULTS

A data base of Data Non-addressing equipment has been constructed. It contains between three and four hundred entries of equipment currently in use. An alphabetic listing of all the equipment by manufacturers is presented in Appendix C.

The most significant point of the data base is the extent to which non-carrier devices are being used. The bulk of the equipment comes from the United States (to be expected) through their Canadian distributors and from small (with notable exceptions) Canadian firms. In general, the Canadian firms involved have responsible outlooks toward supporting their products and ensuring compatibility.

V.2 COMMENTS ON CERTIFICATION STANDARDS (CS-02)

Preservation of high technical standards is required by the common carriers and is generally considered in the interest of the common good.

CS-02 Draft Certification standard outlines a series of tests which are necessary for technical acceptance. A majority of tests measure items related to terminal impedances, dielectric strength and residual voltage levels (terminal independent tests).

The remaining terminal dependent tests deal with the characteristics of the communication signals. The terminal dependent tests include signal strength and spectrum content. It is recommended that consideration be given to the development of a standard interface to the network.

The design of the standard interface should be concerned with terminal independent interface properties. These include ensuring proper network interface impedances, protective dielectric properties of the terminal, and the maintenance of proper residual AC and DC voltage levels.

If a standard interface were used, certification would require tests to be conducted to ensure compliance of the terminal dependent data signals.

An equipment supplier would have a choice to use the standard interface or use an interface of his own design. Those who chose to use the standard interface could be certified with a minimum of certification testing.

SECTION VI. APPENDIX A

VI.1 DATA BASE COMMAND SUMMARY The following is a list of valid commands. To use any command, type its name. If more information is needed, a prompt will be given.

bye	to sign off
done	to choose another area of interest
entries	to find out how many entries there are
explain	to find out how to use the commands correctly
get	to get entries which contain specific data
headings	to get a list of valid headings
help	to see this list of commands
lines	to set the maximum number of lines printed per page
mail	to send messages to the persons at University of Waterloo about these programs, or questions about the system
print	to print the selected entries
restart	to 'unget' the entries and start over
sort	to sort the entries into alphabetical or numerical order
test	to see how the output of the print command will look
width	to set the maximum number of characters printed per line

Detailed explanation of the Data Base Commands

BYE

To sign off the system, just type the word bye.

DONE

If you want to go back to the beginning of the session and choose another area of interest (such as facsimile, modems, or medical equipment), type the word done to indicate that you are done with the current files and wish to make a different choice.

ENTRIES

To find out how many entries are currently available, just type the word entries.

GET

The get command is the most necessary one in this system. In most cases, the user will not want to see all of the available data, but will instead want to restrict the output to those cases meeting certain criteria. This is the purpose of get--to get the proper entries from among all the ones stored.

To use the get command, type the word get. The program will then ask for a set of conditions to be met. The proper format is: HEADING followed by LOGICAL-OPERATOR followed by VALUE. The HEADING can be any valid one as listed by the

HEADINGS command. The LOGICAL-OPERATOR is one of:

.eq. equal to

.ne. not equal to

.gt. greater than

.lt. less than

.ge. greater than or equal to

.le. less than or equal to

.co. contains

The VALUE is used as the basis for the comparison. Note that there should be no spaces in the statement other than the ones which are a necessary part of the value. Examples follow.

1. To get only those entries which are manufactured by Datapoint the correct condition would be

   mfr.eq.Datapoint

2. To get all entries whose cost is under $200 you would enter

   cost.lt.$ 200

   note the space in the price. This is because all prices have a total of four digits, i.e., 0200 above, which are right justified in their columns. This keeps the decimal points lined up for proper comparisons.

3. To get all entries whose baud rate is under 1200 bps try this:

   speed.le. 1200

note the space again--speeds all have five digits

4. To get entries whose manufacturer name contains the phrase data you would enter

   mfr.co.data

   note here that upper and lower case are considered to be unlike and therefore the condition mfr.co.Data will NOT get the same results.

All LOGICAL-OPERATORS except for .co. compare the VALUE you have entered against the entire line of data stored. If they meet the given condition, the data is retained; otherwise, it is discarded. A count of the number of entries remaining is given when the get command finishes. The .co. operator works in a similar manner except that the data is retained if the VALUE entered by the user is contained anywhere in the line of data.

HEADINGS

The headings command will give you a brief list of the valid headings and their meanings. Just type the word headings.

HELP

The help command will give you a brief list of the valid commands and their uses. Just type the word help.

LINES

To find out the current setting of the number of lines per page, just type the word lines. To change the number of lines per page, type the word lines followed by a number to

indicate how many lines you would like; example: to set lines to 25 per page type lines 25 . When you first sign on, the lines are set to 20 for most video terminals. When the print command is used, the terminal will stop after the preset number of lines have been printed. To continue printing, just hit the return key.

MAIL

To send questions or messages to the people at the University of Waterloo, type the word mail. You will get a brief summary of how to use mail, and then a dot at the left margin. This indicates that the system is ready. Just type in your message and hit return. You will get another dot, and may enter more lines if you wish. To finish, enter an empty line by hitting the return key instead of typing a line.

PRINT

The print command is used to display the data of the selected entries (see the get command). You may see all or any part of the available data. After typing the word print and hitting return, you will be asked which headings you wish to see. Enter these in the order you want them to be printed, separated by commas. For example: if you want to see the manufacturer, the model number, the cost, and the speed, you would type: mfr,model,cost,speed If you want to see all of the headings, you may enter the word all instead of having to enter all of the names separately. To find out the names of the valid headings, type the command headings.

The layout of the data on the page is controlled by the lines and width commands.

RESTART

When the get command is used, all entries which do not fit the given conditions are discarded. To return all entries to the tables, type the word restart.

SORT

The sort command is used to arrange the remaining entries into numerical or alphabetical order. After typing the word sort, you will be asked which headings you wish the sort to be done on. You may enter any of the valid headings separated by commas. If more than one is entered, the first one takes precedence over the second, and the second over the third, etc. This means that if you want, for example, the data arranged in order of manufacturer, and the ones of the same manufacturer arranged in order of speed you would enter: mfr,speed . To get a list of the valid headings see the command headings.

TEST

The test command allows the user to see how the results of the print command will look on the page. In this way he can judge whether or not the number of lines on a page or the width of the page needs to be changed. To use the test command, just type the word test. When the computer asks which headings , enter the same heading names that

you will be using when you type the print command.

APPENDIX A

WIDTH

The width command tells the computer what size of paper (or screen) you are using. When you first sign on, the width is set to 80 for use with most video terminals. To find out what the current width is set to, just enter the word width. To change the width, type the word width, followed by the size of your screen or paper to be used. For example, to set the width to 120 characters, as used on some printing terminals, type: width 120 . Note that there is a space between the word and number.

HEADINGS

The following are valid headings: belltype the equivalent Bell System model (if any)

cost the cost in dollars

comments any special features

duplex one of simplex, half or full-duplex

equalize the type (if any) of equalization setting (manual or auto)

linecond the type of line conditioning required (C1, D1, etc.)

linetype the type of line used (2 wire, 4 wire, acoustic coupled)

loop loopback capability (remote or local)

mfr manufacturer

model the model number

modulate the type of modulation method used

originat	whether the entry is originate, answer, or both
reverse	reverse channel capability, and its speed (if known)
signal	the type of signal used to connect to the user's device (RS232C, etc.)
speed	the baud rate
synch	one of synchronous or asynchronous
voice	whether the modem is data only or voice/data

SECTION I. APPENDIX B

I.1 REPRESENTED COMPANIES

3M Co. Headquarters;Information Center;3M Center;
St. Paul MN 55101;U.S.A

Acrodyne Data Sycs. Inc.;1217 Summit Av.;
Union City NJ 07087;U.S.A.

Adaptive Sys. Inc.;499 SW Flagler Av.;
Pompano Beach FL 33060;U.S.A.

Adv. Terminal Sys. Inc.;P.O. Box 9012;
Los Angeles CA 90009;U.S.A.

Alden Electronics;Washington St.;Westboro MA 01581;U.S.A.

All Sys.;344 New Albany Rd.;Moorestown NJ 08057;U.S.A.

American Systems

Anaren Microwave Inc.;185 Ainsley Dr.;Syracuse NY 13205;
U.S.A.

Anderson Jacobson, Inc.;1065 Horse Ave.;
Sunnyvale CA 94086;U.S.A.

Anderson Jacobson, Inc.;521 Charcot Avenue;
San Jose CA 95131

Applied Electronics Ltd.;299 Evans Avenue;Toronto, Ontario;
CANADA;M8Z 1K2

Astrocom Corp.;15012 Minnetonka Ind.;Minnetonka MN 55343;
U.S.A.

Aydin Monitor Sys.;401 Commerce Dr.;
Fort Washington PA 19034;U.S.A.

Bell System

Burroughs Corp/GEM Sls;400 N. Sierra Madre Villa;
Pasedena CA 91109;U.S.A.

Cambridge Instrument Co. Inc.;73 String St.;
Ossining NY 10562;U.S.A.

Carterfone Coms.;2639 Walnut Hill Ln.;Dallas TX 75229;
U.S.A.

Catel;1400D Stierlin Rd.;P.O. Box 1389;
Mountain View CA 94042;U.S.A.

Cincinnati Elecs. Corp;2630 Glendl-Milford;
Cincinnati OH 45241;U.S.A.

Codex Corp.;15 Riverdale Av.;Newton MA 02195;U.S.A.

Coherent Comm. Sys. Corp.;850 Hoffman Ln.;
Central Islip NY 11722;U.S.A.

Colden Assoc.;P.O. Box 626;Old Bridge NJ 08857;U.S.A.

Collins Radio Group;1200 N. Alma Rd.;Richardson TX 75080;
U.S.A.

Comdata

Computer Conversions Corp.;6 Dunton Ct.;
E. Northport NY 11731;U.S.A.

Computer Transmissions Corp.;2352 Utah Av.;
El Segundo CA 90245;U.S.A.

Control Technology;41-16 29 St.;Long Island Cty. NY 11101;
U.S.A.

Cubic Indl. Corp.;4285 Ponderosa;San Diego CA 92123;U.S.A.

Data Control Sys. Inc.;Commerce Dr.;Danbury, CT 06100;

U.S.A.

Datapoint

Dataproducts;6219 De Soto Av.;Woodland Hills CA 91364;

U.S.A.

Dest Data Corp;1285 Forgewood Ave.;Sunnyvale CA 94086;

U.S.A.

Digital Coms. Corp.;19 First Field Rd.;

Gaithersburg MD 20760;U.S.A.

Digital Techniques;1604 E. Avis Dr.;

Madison Heights, Michigan 48071

ESE Ltd.;1780 Albion Road;Rexdale, Ont. M9V 1C1

Econolite, A Div. of Altec Corp.;3360 E. LaPalma Av.;

Anaheim CA 92806;U.S.A.

Edmunde Newhall;268 Galaxy Blvd.;Rexdale, Ont. M9W 5R8

Engelmann Microwave Co.;Skyline Dr.;Montville NJ 07045;

U.S.A.

F & M Sys. Co.;2525 Walnut Hill In.;Dallas TX 75220;U.S.A.

FG Engrg.;P.O. Box 506;Phoenix AZ 85020;U.S.A.

Fork Standards Inc.;211 Main St. W.;Chicago IL 60185;

U.S.A.

Fujitsu Ltd.;2-chome 6-1 Chiyoda-ku;Tokyo;JAPAN

GTE Information Sys.;One Stamford Forum;Stamford CT 06904

GTE Lenkurt Electric;3610 Nashua Drive, Unit 10;

Mississauga, Ontario;L4V 1L2

GTE Lenkurt Inc.;1105 County Road;San Carlos CA 94070;

U.S.A.

GTE Sylvania;1 Stamford Forum;Stamford CT 06904;U.S.A.

Gandalf;9 Slack Road;Ottawa, Ont.

General Atronics Corp.;1201 E. Mermaid Ln.;
Philadelphia PA 19118;U.S.A.

General Data Com. Ind. Inc.;131 Danbury Rd.;
Wilton CT 06897;U.S.A.

General Datacomm

General Electric;Data Com. Prod.;GE Dr.;
Waynesboro VA 22980;U.S.A.

Goodyear Aerospace Corp.;PO Box 85;Litchfield Pk AZ 85340;
U.S.A

Graphic Sciences Inc.;Commerce Pk.;Danbury CT 06180;U.S.A

Harris Corp.;55 Public Sq.;Cleveland OH 44113;U.S.A

Hewlett-Packard Ltd.;175 Wyman St.;Waltham, Mass. 02154;
attn Mr. Phil Hadley

Honeywell Inc.;Honeywell Plaza;Minneapolis MN 55408;U.S.A.

Hughes Aircraft Co.;PO Box 90515;Los Angeles CA 90009;
U.S.A

Hughes Aircraft Co.;Centinela & Teale St.;
Culver City CA 90230;U.S.A.

Hycom Inc.;16841 Armstrong Ave.;Irvine CA 92705;U.S.A.

IBM;Don Mills, Ont.

ICC/Milgo

Infolink Corp.;3900 N Rockwell St.;Chicago IL 60618;U.S.A

Integrated Microsystems;1215 Terra Bella Av.;
Mt. View CA 94040;U.S.A.

Intertel

Intl. Coms. Corp.;Migo Co.;8600 NW 41st St.;
Miami FL 33166;U.S.A.

Kantronics Inc.;1202 E St.;Lawrence KS 66044;U.S.A.

Kontron Scientific Ltd.;1000 Roche Blvd.;Vandreuil, Quebec;
J7V 5V7

Leasco Lata Coms. Corp.;26030 Century Blv;
Germantown MD 20767;U.S.A.

Litton Systems Inc.;1770 Walt Whitman Rd.;
Melville NY 11746;U.S.A

Livermore Data Sys Inc.;2050 Research Dr.;
Livermore CA 94550;U.S.A.

MI2 Corporation;1212 Kinnear Rd.;Columbus OH 43212

Marquette Electronics Inc.;PO Box 8039;8200 W. Tower Ave.;
Milwaukee WI 53223

Metric Systems Corp.;736 N. Beal St.;
Ft. Walton Beach FL 32548;U.S.A.

Milgo Elecs. Corp.;8600 G NW 41 St.;Miami FL 33166;U.S.A.

Mohawk Data Sciences;Corporate Headquarters;
Utica NY 13503;U.S.A.

Muirhead Inc.;1101 Bristol Rd.;Mountainside NJ 07092;U.S.A

MultiTech

Natel Engrg. Co. Inc.;8954 Mason Av.;Canoga Park CA 91306;
U.S.A.

Norman N Axelrod Assoc's;445 E 86 St.;New York NY 10028;
U.S.A.

Novation

Omnitec Corp.;2405 S 20 St.;Phoenix AZ 85034;U.S.A.

Cpt. Ind. Inc.;300 Red School Ln.;Phillipsburg NJ 08865;
U.S.A.

Outlook Engineering Corp.;PO Box 2185;Alexandra VA 22301;
U.S.A

Parke-Davis;Medical Instruments Division;100 Bear Hill Rd.;
Waltham, Mass. 02154

Penril Corp.;5520 Randolph Rd.;Rockville MD 20852;U.S.A.

Prentice

Pulsecom Div. Harvey Bubbel Inc.;5714 Columbia;
Pike Falls Church VA 22041;U.S.A.

Pye TMC;8580 Darnley;Montreal, P.Q.

QEI Inc.;60 Fadem Rd.;Springfield NJ 07081;U.S.A.

Quinton Instruments;390 Progress Ave., Unit 1;
Scarborough, Ontario

RFL Ind. Inc.;Coms. Div.;Dept C;Powerville Rd. 23;
Boonton NJ 07005;U.S.A.

RHG Electronics;161 East Industry Court;
Deer Park NY 11729;U.S.A.

Resdel Engrg. Corp.;300 E. Live Oak Av.;Arcadia CA 91006;
U.S.A.

Rixon Inc. Sub Sangamo;2120 Indl. Pkwy;
Silver Springs MD 20904;U.S.A.

Rockwell Intl.;331 Miraloma Ave.;Anaheim CA 92803;U.S.A.

Sanders Data Sys.;Daniel Webster Highway S.;

Nashua NH 03060;U.S.A.

Sidreal Corp.;P.O. Box 1042;Portland OR 97207;U.S.A.

Singer Co.;256 Crossways Park Dr.;Woodbury NY 11797;U.S.A.

Solid State Elecs.;15321 Rayen St.;Sepulveda CA 91343;
U.S.A.

Sonex Inc.;2339 Philmont Av.;Huntingdon Valley PA 19006;
U.S.A.

Spectron

Sperry Univac;322 N. 22 W.;Salt Lake City UT 84116;U.S.A.

Stelma

Stewart Warner Datafax Corp.;1300 N Kostner Ave.;
Chicago IL 60651;U.S.A

Syntech Corp.;11810 Parklawn Dr.;Rockville MD 20852;U.S.A.

TRG Division Alpha Industries Inc.;20 Sylvan Rd.;
Woburn MA 01801;U.S.A.

TTS;2928 Nebraska Av.;Los Angeles CA 90404;U.S.A.

Talos Systems Inc.;7419 E Helm Dr.;Scottsdale AZ 85260;
U.S.A

Telautograph Corp.;8730 Bellana Ave.;Los Angeles CA 90045;
U.S.A

Teledynamics;AMBAC Ind.; 525 Virginia Dr.;
Fort Washington PA 19034;U.S.A.

Texas Controls Inc.;2525 Walnut Lane;P.O. Box 59469;
Dallas TX 75229;U.S.A.

Timeplex

Tran

Tuck;235 Market St.;New Cumberland PA 17070

Tycom Sys. Corp.;26 Just Rd.;Fairfield NJ 07006;U.S.A.

Universal Data Sys.;2611 Leeman Ferry;Huntsville AL 35805;
U.S.A.

Vadic Corp.;505 E. Middlefield Rd.;Mtn. View CA 94034;
U.S.A.

VenTel

SECTION VIII. APPENDIX C

Acrodyne VTC1

belltype	-103A
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-acoustic;2 wire
linecondition	-
signal	-RS232B/C;contact
equalization	-
reverse	-
voice	-
originate	-orig
loopback	-
comments	-
cost	-$ 325

Acrodyne VTC2

belltype	-103A
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-acoustic;2 wire
linecondition	-
signal	-RS232B/C
equalization	-
reverse	-
voice	-
originate	-auto ans
loopback	-
comments	-
cost	-$ 625

American Systems 8403B

belltype	-403D/E
speed	- 10
modulation	-fsk
synch/asynch	-a
duplex	-simplex
linetype	-2 wire
linecondition	-
signal	-RS232C;contact
equalization	-fixed
reverse	-
voice	-
originate	-orig/auto ans
loopback	-
comments	-receives Touch Tones
cost	-not available

Anderson Jacobson A242

belltype	-103A
speed	- 450
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-acoustic
linecondition	-
signal	-RS232B;teletype
equalization	-
reverse	-
voice	-
originate	-orig
loopback	-
comments	-
cost	-$ 365

Anderson Jacobson A246

belltype	-103A
speed	- 450
modulation	-fsk
synch/asynch	-a
duplex	-full
linetype	-acoustic
linecondition	-
signal	-RS232C;TTL
equalization	-
reverse	-
voice	-
originate	-orig
loopback	-
comments	-OEM only
cost	-$ 210

Anderson Jacobson AD342

belltype	-103A
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-acoustic;2 wire
linecondition	-
signal	-RS232B;teletype
equalization	-
reverse	-
voice	-
originate	-orig/ans
loopback	-
comments	-
cost	-$ 435

Anderson Jacobson ADAC1200

belltype	-202C
speed	- 1200
modulation	-fsk
synch/asynch	-a
duplex	-simplex/half
linetype	-acoustic
linecondition	-
signal	-RS232B
equalization	-
reverse	-
voice	-
originate	-
loopback	-
comments	-
cost	-$ 985

Anderson Jacobson ADC212

belltype	-
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-full
linetype	-acoustic
linecondition	-
signal	-CCITT
equalization	-
reverse	-
voice	-
originate	-
loopback	-
comments	-U.K. version
cost	-$ 495

Anderson Jacobson AM211

belltype	-
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-acoustic;2 wire
linecondition	-
signal	-CCITT
equalization	-
reverse	-
voice	-
originate	-
loopback	-
comments	-fits European handset
cost	-$ 495

Anderson Jacobson DCM151

belltype	-
speed	- 150
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-IBM type
equalization	-
reverse	-
voice	-
originate	-orig/ans
loopback	-
comments	-limited distance
cost	-$ 165

Anderson Jacobson L142

belltype	-103F
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-
equalization	-
reverse	-
voice	-
originate	-
loopback	-
comments	-
cost	-$ 240

Anderson Jacobson L145

belltype	-103F
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-
equalization	-
reverse	-
voice	-
originate	-auto ans
loopback	-
comments	-
cost	-$ 240

Anderson Jacobson L150/12 series

belltype	-
speed	- 600
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C
equalization	-
reverse	-
voice	-
originate	-orig/ans
loopback	-rem/loc
comments	-
cost	-$ 155 to $ 200

Anderson Jacobson L184/12

belltype	-103F
speed	- 450
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2 wire
linecondition	-
signal	-RS232C
equalization	-
reverse	-
voice	-
originate	-ans
loopback	-rem/loc
comments	-
cost	-$ 180

Anderson Jacobson MU1291/12

belltype	-202C/D
speed	- 1200
modulation	-fsk
synch/asynch	-a
duplex	-simplex/half
linetype	-DAA;2/4 wire
linecondition	-
signal	-RS232C
equalization	-man
reverse	-rev
voice	-
originate	-orig/auto ans
loopback	-rem/loc
comments	-
cost	-$ 350

Anderson Jacobson MU290/12 series

belltype	-103A/E
speed	- 450
modulation	-fsk
synch/asynch	-a
duplex	-full
linetype	-DAA
linecondition	-
signal	-RS232C
equalization	-
reverse	-
voice	-
originate	-orig/auto ans
loopback	-rem/loc
comments	-
cost	-$ 210

Anderson Jacobson TMU330K

belltype	-103A
speed	- 150
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-teletype
equalization	-
reverse	-
voice	-
originate	-orig/ans
loopback	-
comments	-mounted in teleprinter
cost	-$ 320

Astrocom 110

belltype	-103;113
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-simplex/half/full
linetype	-acoustic;2 wire
linecondition	-
signal	-RS232B/C;teletype
equalization	-
reverse	-
voice	-
originate	-orig
loopback	-
comments	-
cost	-$ 295

Astrocom 110A

belltype	-103;113
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-acoustic;2 wire
linecondition	-
signal	-RS232C;teletype
equalization	-
reverse	-
voice	-
originate	-orig/ans
loopback	-loc
comments	-
cost	-$ 345

Astrocom 120 series

belltype	-202
speed	- 1200/1800
modulation	-fsk
synch/asynch	-a
duplex	-simplex/half
linetype	-2/4 wire
linecondition	-C2
signal	-RS232B/C
equalization	-fixed
reverse	-rev
voice	-
originate	-orig/auto ans
loopback	-
comments	-has indicators
cost	-$ 245 to $ 500

Astrocom 130 series

belltype	-103
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-full
linetype	-2 wire
linecondition	-
signal	-RS232B/C
equalization	-
reverse	-
voice	-
originate	-orig/auto ans
loopback	-
comments	-has indicators
cost	-$ 145 to $ 415

Astrocom 140

belltype	-
speed	- 1200
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2 wire
linecondition	-
signal	-RS232B/C
equalization	-
reverse	-rev
voice	-
originate	-orig/auto ans
loopback	-
comments	-signal status indicator
cost	-$ 430

Astrocom 320

belltype	-201A/B/C
speed	- 300
modulation	-pm
synch/asynch	-s
duplex	-simplex/half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232B/C
equalization	-fixed
reverse	-
voice	-
originate	-orig/ans
loopback	-loc
comments	-self test
cost	-$1200

Astrocom MOS/2

belltype	-
speed	- 2400 to 19200
modulation	-pm
synch/asynch	-s
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232B/C
equalization	-
reverse	-
voice	-
originate	-orig/ans
loopback	-rem/loc
comments	-limited distance
cost	-$ 725

Astrocom SC200

belltype	-
speed	- 2000 to 19200
modulation	-pm
synch/asynch	-s
duplex	-simplex/half/full
linetype	-2/4 wire private
linecondition	-
signal	-RS232B/C
equalization	-
reverse	-
voice	-
originate	-orig/ans
loopback	-rem
comments	-self test;limited distance
cost	-$ 920 to $1525

Astrocom SC400

belltype	-
speed	-10000 to 100000
modulation	-pm
synch/asynch	-s
duplex	-simplex/half/full
linetype	-2/4 wire private
linecondition	-
signal	-RS232B/C
equalization	-
reverse	-
voice	-
originate	-orig/ans
loopback	-
comments	-limited distance
cost	-$1825

Bell System 103A

belltype	-101;103;113
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2 wire
linecondition	-
signal	-RS232C
equalization	-fixed
reverse	-
voice	-v/d
originate	-orig/auto ans
loopback	-
comments	-integral handset
cost	-not available

Bell System 103J

belltype	-101;103;113
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2 wire
linecondition	-
signal	-RS232C
equalization	-fixed
reverse	-
voice	-v/d
originate	-orig/auto ans
loopback	-rem/loc
comments	-
cost	-not available

Bell System 113A

belltype	-101;103;113B
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2 wire
linecondition	-
signal	-RS232C
equalization	-fixed
reverse	-
voice	-v/d
originate	-orig
loopback	-
comments	-integral handset
cost	-$ 12/mo

Bell System 113B

belltype	-101;103;113A
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2 wire
linecondition	-
signal	-RS232C
equalization	-fixed
reverse	-
voice	-v/d
originate	-auto ans
loopback	-
comments	-integral handset
cost	-$ 10.50/mo

Bell System 113D

belltype	-101;103;107
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-half full
linetype	-2 wire
linecondition	-
signal	-RS232C
equalization	-fixed
reverse	-
voice	-v/d
originate	-auto ans
loopback	-rem digital
comments	-
cost	-not available

Bell System 201A

belltype	-201A
speed	- 2000
modulation	-4 phase pm
synch/asynch	-s
duplex	-half/full
linetype	-2/4 wire
linecondition	-C2
signal	-RS232C;contact
equalization	-fixed
reverse	-
voice	-v/d
originate	-orig/auto ans
loopback	-
comments	-integral handset
cost	-$ 55 to $ 70 /mo.

Bell System 201B

belltype	-201B/C
speed	- 2400
modulation	-4 phase pm
synch/asynch	-s
duplex	-half/full
linetype	-2/4 wire
linecondition	-C2
signal	-RS232C;contact
equalization	-fixed
reverse	-
voice	-v/d
originate	-orig/auto ans
loopback	-
comments	-integral handset
cost	-$ 55 /mo.

Bell System 201C

belltype	-201B/C
speed	- 2400
modulation	-4 phase pm
synch/asynch	-s
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C
equalization	-fixed
reverse	-
voice	-
originate	-orig/auto ans
loopback	-rem/loc
comments	-self test
cost	-$ 59.55 /mo.

Bell System 201LSI

belltype	-
speed	- 2000/2400
modulation	-pfk
synch/asynch	-s
duplex	-
linetype	-2/4 wire
linecondition	-
signal	-RS232C
equalization	-adaptive
reverse	-150 bps
voice	-v/d
originate	-
loopback	-rem/loc
comments	-
cost	-not available

Bell System 202C

belltype	-202A/D/E/R/S
speed	- 1200/1800
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2/4 wire
linecondition	-C1/C2
signal	-RS232C
equalization	-fixed
reverse	-rev
voice	-v/d
originate	-orig/auto ans
loopback	-
comments	-
cost	-$ 30 to $ 35 /mo.

Bell System 202D

belltype	-202A/C/E/T
speed	- 1800
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2/4 wire
linecondition	-C1/C2
signal	-RS232C;contact
equalization	-fixed
reverse	-rev
voice	-v/d
originate	-orig/auto ans
loopback	-
comments	-
cost	-$ 30 to $ 40 /mo.

Bell System 202E

belltype	-202A/C/D/S
speed	- 1800
modulation	-fsk
synch/asynch	-a
duplex	-half
linetype	-2/4 wire
linecondition	-C1/C2
signal	-RS232C
equalization	-fixed
reverse	-rev
voice	-v/d
originate	-orig/auto ans
loopback	-
comments	-
cost	-$ 14 /mo.

Bell System 202R

belltype	-202A/C/D/E
speed	- 1800
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2/4 wire
linecondition	-C1/C2
signal	-RS232C
equalization	-fixed
reverse	-
voice	-v/d
originate	-orig/ans
loopback	-
comments	-
cost	-$ 18 to $ 20 /mo.

Bell System 202S

belltype	-202C
speed	- 1200
modulation	-fsk
synch/asynch	-a
duplex	-half
linetype	-2 wire
linecondition	-
signal	-RS232C
equalization	-fixed
reverse	-rev
voice	-v/d
originate	-orig/auto ans
loopback	-rem/loc
comments	-self test
cost	-$ 32.50 /mo.

Bell System 202T

belltype	-202D/R
speed	- 1800
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2/4 wire
linecondition	-C2
signal	-RS232C
equalization	-fixed
reverse	-rev
voice	-v/d
originate	-orig/ans
loopback	-rem/loc
comments	-
cost	-$ 24.85 /mo.

Bell System 208A

belltype	-
speed	- 4800
modulation	-8 phase pm
synch/asynch	-s
duplex	-half/full
linetype	-4 wire
linecondition	-
signal	-RS232C
equalization	-auto
reverse	-
voice	-v/d
originate	-orig/ans
loopback	-rem/loc
comments	-self test
cost	-$ 135 /mo.

Bell System 208B

belltype	-
speed	- 4800
modulation	-8 phase pm
synch/asynch	-s
duplex	-half
linetype	-2 wire
linecondition	-
signal	-RS232C
equalization	-auto
reverse	-
voice	-v/d
originate	-orig/auto ans
loopback	-rem/loc
comments	-self test
cost	-$ 135 /mo.

Bell System 209A

belltype	-
speed	- 9600
modulation	-quam
synch/asynch	-s
duplex	-half/full
linetype	-4 wire
linecondition	-D1
signal	-RS232C
equalization	-auto
reverse	-
voice	-v/d
originate	-orig/ans
loopback	-rem/loc
comments	-self test
cost	-$ 249 /mo.

Bell System 212A

belltype	-101;103;113
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2 wire
linecondition	-
signal	-RS232C
equalization	-fixed
reverse	-
voice	-v/d
originate	-orig/auto ans
loopback	-rem/loc
comments	-
cost	-not available

Bell System 212A

belltype	-212A
speed	- 1200
modulation	-fsk
synch/asynch	-s
duplex	-full
linetype	-2 wire
linecondition	-
signal	-RS232C
equalization	-fixed
reverse	-
voice	-v/d
originate	-orig/auto ans
loopback	-rem/loc
comments	-
cost	-not available

Bell System 300 series

belltype	-
speed	-19200 to 230400
modulation	-
synch/asynch	-s
duplex	-
linetype	-series 5000/8000 common channe
linecondition	-
signal	-
equalization	-
reverse	-
voice	-
originate	-
loopback	-
comments	-built into terminals-not avail
cost	-

Bell System 300/1200

belltype	-101;103;113
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2 wire
linecondition	-
signal	-RS232C
equalization	-fixed
reverse	-
voice	-v/d
originate	-orig/auto ans
loopback	-rem/loc
comments	-
cost	-not available

Bell System 407A

belltype	-401
speed	- 10
modulation	-fsk
synch/asynch	-a
duplex	-simplex
linetype	-2 wire
linecondition	-
signal	-voltage;contact
equalization	-fixed
reverse	-
voice	-v/d
originate	-auto ans
loopback	-
comments	-receives Touch Tones
cost	-not available

Bell System 407B

belltype	-401
speed	- 10
modulation	-fsk
synch/asynch	-a
duplex	-simplex
linetype	-2 wire
linecondition	-
signal	-voltage;contact
equalization	-fixed
reverse	-
voice	-v/d
originate	-auto ans
loopback	-
comments	-receives Touch Tones
cost	-not available

Bell System 407C

belltype	-401
speed	- 110 to 300
modulation	-fsk
synch/asynch	-a
duplex	-half
linetype	-2 wire
linecondition	-
signal	-RS232C;contact
equalization	-
reverse	-
voice	-v/d
originate	-auto ans
loopback	-
comments	-uses Touch Tones
cost	-not available

Bell System Codex 9600

belltype	-
speed	-9600
modulation	-phase ampl.
synch/asynch	-s
duplex	-
linetype	-4 wire
linecondition	-
signal	-RS232C
equalization	-auto
reverse	-
voice	-v/d
originate	-
loopback	-digital
comments	-
cost	-not available

Bell System GDC202T

belltype	-
speed	- 1200/1800
modulation	-fsic
synch/asynch	-a
duplex	-
linetype	-2/4 wire
linecondition	-
signal	-RS232C
equalization	-line
reverse	-rev
voice	-
originate	-
loopback	-loc
comments	-
cost	-not available

Bell System M103

belltype	-
speed	- 2400/4800
modulation	-qam
synch/asynch	-s
duplex	-
linetype	-4 wire
linecondition	-
signal	-RS232C
equalization	-adaptive
reverse	-
voice	-
originate	-
loopback	-loc
comments	-
cost	-not available

Burroughs TA2400 series

belltype	-201B
speed	- 2400
modulation	-psk
synch/asynch	-s
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C
equalization	-fixed
reverse	-
voice	-
originate	-orig/ans
loopback	-rem/loc
comments	-2403 has auto ans
cost	-$1600

Burroughs TA713

belltype	-202D
speed	- 1800
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C
equalization	-man
reverse	-
voice	-
originate	-orig/ans
loopback	-rem/loc
comments	-
cost	-$ 790

Burroughs TA714

belltype	-202C
speed	- 1200/1800
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2/4 wire
linecondition	-C2 (at 1200)
signal	-RS232C
equalization	-fixed
reverse	-
voice	-
originate	-orig/auto ans
loopback	-rem/loc
comments	-auto call
cost	-$1090

Burroughs TA714-1

belltype	-
speed	- 1800
modulation	-fsk
synch/asynch	-a
duplex	-
linetype	-2/4 wire
linecondition	-
signal	-RS232
equalization	-EIA
reverse	-
voice	-
originate	-
loopback	-yes
comments	-
cost	-$1700

Burroughs TA733-48

belltype	-
speed	- 4800
modulation	-8 phase psk
synch/asynch	-s
duplex	-half/full
linetype	-4 wire
linecondition	-C1
signal	-RS232C;CCITT
equalization	-
reverse	-
voice	-
originate	-orig/ans
loopback	-rem/loc
comments	-
cost	-$5000

Burroughs TA783

belltype	-202D
speed	- 1800
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-4 wire
linecondition	-
signal	-RS232C
equalization	-
reverse	-
voice	-
originate	-orig/ans
loopback	-rem/loc
comments	-
cost	-$ 950

Carterfone 403D

belltype	-403D
speed	- 10
modulation	-fsk
synch/asynch	-a
duplex	-half
linetype	-2 wire
linecondition	-
signal	-2-of-8;BCM;voltage
equalization	-
reverse	-
voice	-
originate	-auto ans
loopback	-
comments	-busy out diagnostic
cost	-$ 495

Carterfone DS103A

belltype	-103A
speed	- 440
modulation	-fsk
synch/asynch	-a
duplex	-full
linetype	-2/4 wire
linecondition	-
signal	-RS232B/C;teletype
equalization	-
reverse	-rev
voice	-v/d
originate	-orig/auto ans
loopback	-rem
comments	-integral handset
cost	-$ 425

Carterfone TWX/DDD model

belltype	-101C
speed	- 440
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2/4 wire;DAA
linecondition	-
signal	-RS232C;teletype
equalization	-
reverse	-
voice	-v/d
originate	-orig/auto ans
loopback	-rem
comments	-
cost	-$ 425 to $ 650

Carterfone Telex model

belltype	-
speed	- 75
modulation	-telex
synch/asynch	-a
duplex	-half
linetype	-telex
linecondition	-
signal	-telex
equalization	-
reverse	-
voice	-
originate	-orig/ans
loopback	-loc
comments	-
cost	-$ 330

Codex 4800

belltype	-
speed	- 4800
modulation	-qam
synch/asynch	-s
duplex	-
linetype	-4 wire
linecondition	-
signal	-RS232C;MIL188C;CCITT V-24
equalization	-auto
reverse	-150 bps
voice	-v/d
originate	-auto ans
loopback	-
comments	-
cost	-$4800

Codex 4800 dial

belltype	-
speed	- 4800
modulation	-qam
synch/asynch	-s
duplex	-half
linetype	-2/4 wire
linecondition	-
signal	-RS232C;CCITT
equalization	-auto
reverse	-rev
voice	-v/d
originate	-orig/auto ans
loopback	-rem/loc
comments	-
cost	-$5575

Codex 4800l

belltype	-
speed	- 4800
modulation	-qam
synch/asynch	-s
duplex	-
linetype	-4 wire
linecondition	-
signal	-RS232C
equalization	-auto
reverse	-75/150 bps
voice	-v/d
originate	-
loopback	-
comments	-
cost	-$4800

Codex 4800C

belltype	-
speed	- 3200/4800
modulation	-qam
synch/asynch	-s
duplex	-simplex/half/full
linetype	-4 wire
linecondition	-
signal	-RS232C;CCITT;MIL188B
equalization	-auto
reverse	-150 bps
voice	-v/d
originate	-orig/ans
loopback	-rem/loc
comments	-multiplexing
cost	-$4500

Codex 4800I

belltype	-
speed	- 4800
modulation	-8 phase psk
synch/asynch	-s
duplex	-half/full
linetype	-4 wire
linecondition	-M102
signal	-CCITT
equalization	-auto
reverse	-rev
voice	-v/d
originate	-orig/ans
loopback	-rem/loc
comments	-multiplexing
cost	-$4500

Codex 4800MP

belltype	-
speed	- 4800
modulation	-psk
synch/asynch	-s
duplex	-full
linetype	-4 wire
linecondition	-C1
signal	-RS232C;CCITT
equalization	-auto
reverse	-rev
voice	-v/d
originate	-orig/ans
loopback	-rem/loc
comments	-
cost	-$4500

Codex 7200

belltype	-
speed	- 7200
modulation	-qam
synch/asynch	-s
duplex	-
linetype	-4 wire
linecondition	-
signal	-RS232C;MIL188;CCITT V-24
equalization	-auto
reverse	-
voice	-v/d
originate	-
loopback	-
comments	-
cost	-$7200

Codex 7200C

belltype	-
speed	- 4800/7200
modulation	-qam
synch/asynch	-s
duplex	-half/full
linetype	-4 wire
linecondition	-C2
signal	-RS232C;CCITT;MIL188B
equalization	-auto
reverse	-
voice	-v/d
originate	-orig/ans
loopback	-rem/loc
comments	-multiplexing
cost	-$6850

Codex 8200LDSU

belltype	-
speed	- 2400 to 19200
modulation	-pm
synch/asynch	-a/s
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C;MIL188B
equalization	-fixed
reverse	-
voice	-
originate	-orig/ans
loopback	-rem/loc
comments	-limited distance
cost	-$ 995

Codex 8300GBM

belltype	-
speed	-48000 to 64000
modulation	-psk
synch/asynch	-
duplex	-full
linetype	-4 wire wide band
linecondition	-
signal	-CCITT V.35
equalization	-fixed
reverse	-
voice	-v/d
originate	-orig/ans
loopback	-rem/loc
comments	-
cost	-$6450

Codex 9600

belltype	-
speed	- 9600
modulation	-qam
synch/asynch	-s
duplex	-
linetype	-4 wire
linecondition	-
signal	-RS232C;MIL188C;CCITT V-24
equalization	-auto
reverse	-
voice	-v/d
originate	-
loopback	-
comments	-
cost	-$9750

Codex 9600C

belltype	-
speed	- 4800/7200/9600
modulation	-qam
synch/asynch	-s
duplex	-half/full
linetype	-4 wire
linecondition	-C2
signal	-RS232C;CCITT;MIL188C
equalization	-auto
reverse	-
voice	-v/d
originate	-orig/ans
loopback	-rem/loc
comments	-multiplexing
cost	-$8900

Codex CT6

belltype	-
speed	-19200
modulation	-qam
synch/asynch	-
duplex	-full
linetype	-4 wire
linecondition	-C2
signal	-RS232C;Bell 303
equalization	-auto
reverse	-
voice	-v/d
originate	-orig/ans
loopback	-rem/loc
comments	-
cost	-$2400

Codex LSI4800

belltype	-
speed	- 2400/4800
modulation	-qam
synch/asynch	-s
duplex	-half/full
linetype	-4 wire
linecondition	-
signal	-RS232C;CCITT;MIL188C
equalization	-auto
reverse	-150
voice	-v/d
originate	-orig/ans
loopback	-rem/loc
comments	-multiplexing
cost	-$4325

Codex LSI48l

belltype	-
speed	- 2400/4800
modulation	-8 phase dpsk
synch/asynch	-s
duplex	-half/full
linetype	-4 wire
linecondition	-M102
signal	-RS232C;CCITT
equalization	-auto
reverse	-150 bps
voice	-v/d
originate	-orig/ans
loopback	-rem/loc
comments	-multiplexing
cost	-$4325

Codex LSI48FP

belltype	-
speed	- 2400/4800
modulation	-qam
synch/asynch	-s
duplex	-half/full
linetype	-4 wire
linecondition	-C1
signal	-RS232C;CCITT;MIL188C
equalization	-auto
reverse	-150 bps
voice	-v/d
originate	-orig/ans
loopback	-rem/loc
comments	-
cost	-$4500

Codex LSI7200

belltype	-
speed	- 4800/7200
modulation	-qam
synch/asynch	-s
duplex	-half/full
linetype	-4 wire
linecondition	-C2
signal	-RS232C;CCITT;MIL188C
equalization	-auto
reverse	-
voice	-v/d
originate	-orig/ans
loopback	-rem/loc
comments	-multiplexing
cost	-$6500

Codex LSI72FP

belltype	-
speed	- 4800/7200
modulation	-qam
synch/asynch	-s
duplex	-half/full
linetype	-4 wire
linecondition	-C2
signal	-RS232C;CCITT;MIL188C
equalization	-auto
reverse	-
voice	-v/d
originate	-orig/ans
loopback	-rem/loc
comments	-
cost	-$6725

Codex LSI96/V29

belltype	-
speed	- 9600
modulation	-qam
synch/asynch	-s
duplex	-half/full
linetype	-4 wire
linecondition	-M102
signal	-RS232C;CCITT
equalization	-fixed
reverse	-rev
voice	-v/d
originate	-orig/ans
loopback	-rem/loc
comments	-multiplexing
cost	-$9350

Codex LSI9600

belltype	-
speed	- 4800/7200/9600
modulation	-qam
synch/asynch	-s
duplex	-half/full
linetype	-4 wire
linecondition	-C2
signal	-RS232C;CCITT;MIL188C
equalization	-auto
reverse	-
voice	-v/d
originate	-orig/ans
loopback	-rem/loc
comments	-multiplexing
cost	-$8500

Codex LSI96FP

belltype	-
speed	- 4800/7200/9600
modulation	-qam
synch/asynch	-s
duplex	-half/full
linetype	-4 wire
linecondition	-C2
signal	-RS232C;CCITT;MIL188C
equalization	-auto
reverse	-
voice	-v/d
originate	-orig/ans
loopback	-rem/loc
comments	-
cost	-$8750

Coherent DAM1

belltype	-
speed	- 600
modulation	-fsk
synch/asynch	-asynch
duplex	-simplex/half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C;CCITT;MIL188B;contact
equalization	-
reverse	-rev
voice	-v/d
originate	-orig/ans
loopback	-
comments	-multiplexing
cost	-$ 600

Coherent DAM4

belltype	-
speed	- 600/1200
modulation	-fsk
synch/asynch	-async
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-CCITT
equalization	-
reverse	-75 bps
voice	-v/d
originate	-orig/ans
loopback	-rem/loc
comments	-output adjustable -12 to 0 dbm
cost	-$ 500

Coherent DAM4B

belltype	-
speed	- 1200
modulation	-fsk
synch/asynch	-a
duplex	-
linetype	-2/4 wire
linecondition	-
signal	-RS232C;CCITT V-24
equalization	-man
reverse	-75 bps
voice	-
originate	-
loopback	-
comments	-
cost	-$ 499

Coherent DAM50

belltype	-202C
speed	- 1800
modulation	-fsk
synch/asynch	-a
duplex	-simplex/half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C;CCITT;MIL188B
equalization	-
reverse	-rev
voice	-v/d
originate	-orig/ans
loopback	-loc
comments	-
cost	-$ 325 to $ 375

Coherent DAM5B

belltype	-
speed	- 1800
modulation	-fsk
synch/asynch	-a
duplex	-
linetype	-2/4 wire
linecondition	-
signal	-RS232C;CCITT V-24
equalization	-man
reverse	-75 bps
voice	-
originate	-
loopback	-
comments	-
cost	-$ 375

Coherent DAM5D

belltype	-
speed	- 1800
modulation	-fsk
synch/asynch	-asynch
duplex	-half/full
linetype	-2/4 wire
linecondition	-none/C1/C2
signal	-RS232C
equalization	-
reverse	-
voice	-
originate	-
loopback	-loc
comments	-
cost	-

Coherent TYM1

belltype	-
speed	- 150
modulation	-fsk
synch/asynch	-a
duplex	-simplex/half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C;CCITT;MIL188B;contact
equalization	-
reverse	-rev
voice	-v/d
originate	-orig/ans
loopback	-
comments	-multiplexing
cost	-$ 525

Collins FDM

belltype	-
speed	- 75 to 600
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C
equalization	-
reverse	-
voice	-
originate	-
loopback	-
comments	-
cost	-$ 600 to $ 750

Collins TE110

belltype -
speed - 110
modulation -fsk
synch/asynch -asynch
duplex -half/full
linetype -2/4 wire
linecondition-
signal -RS232C;TTL;CCITT
equalization -
reverse -
voice -
originate -orig/ans
loopback -
comments -output 0 to -12 Dbm strappable
cost -$ 600 to $ 750

Collins TE1200

belltype -202D
speed - 1800
modulation -fsk
synch/asynch -a
duplex -half/full
linetype -2/4 wire
linecondition-
signal -RS232C
equalization -
reverse -rev
voice -
originate -orig/auto ans
loopback -loc
comments -self test
cost -$ 475

Collins TE150

belltype -
speed - 150
modulation -fsk
synch/asynch -asynch
duplex -half/full
linetype -2/4 wire
linecondition-
signal -RS232C;TTL;CCITT
equalization -
reverse -
voice -
originate -orig/ans
loopback -loc
comments -output 0 to -12 Dbm strappable
cost -$ 600 to $ 750

Collins TE2400

belltype	-201B
speed	- 1200/2400
modulation	-4 phase pm
synch/asynch	-s
duplex	-simplex/half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C;CCITT
equalization	-compromise
reverse	-
voice	-v/d
originate	-orig/auto ans
loopback	-rem/loc
comments	-self test
cost	-$ 900 to $1800

Collins TE2400A

belltype	-
speed	- 1200/2400
modulation	-psk
synch/asynch	-synch
duplex	-
linetype	-
linecondition	-
signal	-RS232C;CCITT
equalization	-
reverse	-
voice	-
originate	-
loopback	-
comments	-output 0 to -15 Dbm strappable
cost	-

Collins TE300

belltype	-
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C
equalization	-
reverse	-
voice	-
originate	-orig/ans
loopback	-loc
comments	-output 0 to -12 dbm strappable
cost	-$ 600 to $ 750

Collins TE600

belltype	-
speed	- 600
modulation	-fsk
synch/asynch	-asynch
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C;TTL;CCITT
equalization	-
reverse	-
voice	-
originate	-
loopback	-
comments	-output 0 to -12 Dbm strappable
cost	-

Collins TE75

belltype	-
speed	- 75
modulation	-fsk
synch/asynch	-asynch
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C;TTL;CCITT
equalization	-
reverse	-
voice	-
originate	-
loopback	-
comments	-output 0 to -12 Dbm strappable
cost	-

Comdata 150 series

belltype	-
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-full
linetype	-acoustic;2/4 wire
linecondition	-
signal	-RS232C;CCITT
equalization	-
reverse	-
voice	-
originate	-
loopback	-
comments	-carrier indicator
cost	-$ 147 to $ 175

Comdata 201

belltype	-201
speed	- 2000/2400
modulation	-pm
synch/asynch	-s
duplex	-half/full
linetype	-2/4 wire
linecondition	-C2
signal	-RS232C
equalization	-man
reverse	-
voice	-v/d
originate	-orig/auto ans
loopback	-loc
comments	-
cost	-$ 895

Comdata 202

belltype	-202
speed	- 1800
modulation	-fsk
synch/asynch	-a
duplex	-full
linetype	-2/4 wire
linecondition	-
signal	-RS232C
equalization	-man
reverse	-rev
voice	-v/d
originate	-orig/auto ans
loopback	-loc
comments	-
cost	-$ 425

Comdata 330 series

belltype	-103;113
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-full
linetype	-2 wire;DAA
linecondition	-
signal	-RS232C;CCITT;MIL188B;teletype
equalization	-
reverse	-
voice	-
originate	-orig/auto ans
loopback	-loc
comments	-
cost	-$ 150 to $ 170

Datapoint 3400

belltype	-103
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-full
linetype	-acoustic
linecondition	-
signal	-RS232C
equalization	-
reverse	-
voice	-
originate	-orig
loopback	-loc
comments	-
cost	-$ 350

Datapoint 9401

belltype	-103
speed	- 300 to 440
modulation	-fsk
synch/asynch	-a
duplex	-full
linetype	-2 wire;CBT DAA
linecondition	-
signal	-RS232C
equalization	-man
reverse	-
voice	-
originate	-orig/auto ans
loopback	-loc
comments	-
cost	-$1500

Datapoint 9402

belltype	-202
speed	- 1200/1800
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2/4 wire
linecondition	-C2
signal	-Datapoint I/O
equalization	-man
reverse	-rev
voice	-
originate	-orig/auto ans
loopback	-loc
comments	-
cost	-$1500

ESE 48QM

belltype	-
speed	- 4800
modulation	-qam
synch/asynch	-s
duplex	-
linetype	-3002
linecondition	-
signal	-RS232C;MIL188
equalization	-auto
reverse	-rev
voice	-
originate	-
loopback	-
comments	-
cost	-not available

ESE 48QMP

belltype	-
speed	- 4800
modulation	-qam
synch/asynch	-s
duplex	-
linetype	-3002/DDD
linecondition	-
signal	-RS232C;MIL188
equalization	-adaptive
reverse	-rev
voice	-v/d
originate	-
loopback	-
comments	-
cost	-not available

ESE 96QMP

belltype	-
speed	- 9600
modulation	-qam
synch/asynch	-s
duplex	-
linetype	-3002
linecondition	-
signal	-RS232C;MIL188
equalization	-adaptive
reverse	-rev
voice	-v/d
originate	-
loopback	-
comments	-
cost	-not available

Edmunde Newhall 201B

belltype	-
speed	- 2400
modulation	-dpsk
synch/asynch	-s
duplex	-
linetype	-2/4 wire
linecondition	-
signal	-RS232C
equalization	-fixed
reverse	-
voice	-v/d
originate	-
loopback	-
comments	-
cost	-$1350

Edmunde Newhall 201L

belltype	-
speed	- 2400
modulation	-dpsk
synch/asynch	-s
duplex	-
linetype	-1/2 wire
linecondition	-
signal	-RS232C
equalization	-fixed
reverse	-
voice	-v/d
originate	-
loopback	-
comments	-
cost	-$1350

GTE Lenkurt 25C

belltype	-
speed	- 600
modulation	-fsk
synch/asynch	-a
duplex	-simplex;half;full
linetype	-2/4 wire
linecondition	-
signal	-RS232C
equalization	-
reverse	-
voice	-
originate	-orig/ans
loopback	-VF digital
comments	-multiplexing
cost	-$ 450

GTE Lenkurt 25D

belltype	-
speed	- 200
modulation	-fsk
synch/asynch	-a
duplex	-simplex/half/full
linetype	-2/4 wire
linecondition	-
signal	-teletype
equalization	-
reverse	-
voice	-
originate	-orig/ans
loopback	-VF
comments	-
cost	-$ 550

GTE Lenkurt 261A

belltype	-
speed	- 2400
modulation	-duobinary fm
synch/asynch	-s
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C;RS334
equalization	-man
reverse	-rev
voice	-v/d
originate	-orig/ans
loopback	-back-to-back
comments	-
cost	-$ 825

GTE Lenkurt 262A

belltype	-208A
speed	- 4800
modulation	-dps
synch/asynch	-s
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C;CCITT
equalization	-auto
reverse	-rev
voice	-v/d
originate	-orig/ans
loopback	-back-to-back/loopback
comments	-
cost	-$3500

GTE Lenkurt 262B

belltype	-208B
speed	- 4800
modulation	-8 phase pm
synch/asynch	-s
duplex	-half
linetype	-2 wire
linecondition	-
signal	-RS232C
equalization	-auto
reverse	-
voice	-
originate	-orig/auto ans
loopback	-rem/loc
comments	-
cost	-not available

GTE Lenkurt 26C

belltype	-
speed	- 1800/2400
modulation	-duobinary fm
synch/asynch	-a/s
duplex	-simplex/half/full
linetype	-2/4 wire
linecondition	-none/C1/C2
signal	-RS232B;MIL188B
equalization	-man
reverse	-rev
voice	-v/d
originate	-orig/ans
loopback	-rem/loc
comments	-
cost	-$1700 to $2200

GTE Lenkurt 26C40.8

belltype	-
speed	-20400/40800
modulation	-duobinary fm
synch/asynch	-
duplex	-simplex/half/full
linetype	-4 wire wide band
linecondition	-
signal	-current switching
equalization	-man
reverse	-
voice	-
originate	-orig/ans
loopback	-vf loop
comments	-
cost	-$1750 to $2000

Gandalf DNT300 series

belltype	-
speed	- 2400 to 19200
modulation	-pm
synch/asynch	-s
duplex	-simplex/half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C;CCITT
equalization	-man
reverse	-rev
voice	-
originate	-auto ans
loopback	-rem
comments	-limited distance
cost	-$1000

Gandalf LDS110

belltype	-
speed	- 4800
modulation	-fsk
synch/asynch	-a
duplex	-
linetype	-2/4 wire
linecondition	-
signal	-RS232C
equalization	-auto
reverse	-
voice	-
originate	-
loopback	-
comments	-
cost	-$ 280

Gandalf LDS120

belltype	-
speed	- 9600
modulation	-
synch/asynch	-a
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C;teletype
equalization	-
reverse	-
voice	-
originate	-
loopback	-
comments	-limited distance
cost	-$ 280

Gandalf LDS200 series

belltype	-
speed	- 2400 to 9600
modulation	-pm
synch/asynch	-s
duplex	-simplex/half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C;CCITT
equalization	-man
reverse	-
voice	-
originate	-
loopback	-rem/loc
comments	-
cost	-$ 560

Gandalf LDS200D

belltype	-
speed	- 9600
modulation	-delay encoded
synch/asynch	-s
duplex	-
linetype	-4 wire
linecondition	-
signal	-RS232C
equalization	-man
reverse	-
voice	-
originate	-
loopback	-
comments	-
cost	-$ 560

Gandalf LDS250

belltype	-
speed	- 9600
modulation	-pm
synch/asynch	-s
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C;CCITT
equalization	-man
reverse	-
voice	-
originate	-
loopback	-rem/loc
comments	-limited distance
cost	-$ 784

Gandalf LDS250/2

belltype	-
speed	-56000
modulation	-delay encoded
synch/asynch	-s
duplex	-
linetype	-4 wire
linecondition	-
signal	-RS232C
equalization	-man
reverse	-
voice	-
originate	-
loopback	-
comments	-
cost	-$1400

Gandalf LDS309

belltype	-
speed	- 1800 to 19200
modulation	-pm
synch/asynch	-s
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C;CCITT
equalization	-man
reverse	-rev
voice	-
originate	-
loopback	-rem/loc
comments	-limited distance
cost	-$ 784

General Datacomm 100 series

belltype	-103;113
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C;teletype;TTL
equalization	-
reverse	-
voice	-
originate	-orig/ans
loopback	-rem
comments	-
cost	-$ 215 to $ 440

General Datacomm 201 series

belltype	-201A/B/C
speed	- 2000/2400
modulation	-pm
synch/asynch	-s
duplex	-half/full
linetype	-2/4 wire
linecondition	-C2
signal	-RS232C
equalization	-
reverse	-
voice	-
originate	-auto ans
loopback	-rem/loc
comments	-
cost	-$ 700 to $1100

General Datacomm 202 series

belltype	-202C/D/E
speed	- 1200/1800
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C
equalization	-
reverse	-rev
voice	-
originate	-orig and/or answer
loopback	-rem
comments	-
cost	-$ 365 to $ 420

General Datacomm 208 series

belltype	-208A
speed	- 4800
modulation	-fsk
synch/asynch	-s
duplex	-half/full
linetype	-4 wire
linecondition	-
signal	-RS232C
equalization	-auto
reverse	-
voice	-v/d
originate	-orig/auto ans
loopback	-rem/loc
comments	-
cost	-$3200 to $3600

General Datacomm 402 series

belltype	-402D
speed	- 75
modulation	-fsk
synch/asynch	-a
duplex	-simplex
linetype	-2/4 wire
linecondition	-
signal	-contact
equalization	-
reverse	-rev
voice	-
originate	-orig
loopback	-
comments	-transmit only
cost	-$ 485 to $ 540

General Datacomm 9601

belltype	-
speed	- 4800/7200/9600
modulation	-am-vsb
synch/asynch	-s
duplex	-full
linetype	-
linecondition	-D1
signal	-RS232C
equalization	-auto
reverse	-
voice	-v/d
originate	-orig/ans
loopback	-rem/loc
comments	-
cost	-$6500

Hycom 502B

belltype	-
speed	- 4800
modulation	-qam
synch/asynch	-a/s
duplex	-
linetype	-2/4 wire
linecondition	-
signal	-RS232C
equalization	-auto
reverse	-130 bps
voice	-v/d
originate	-
loopback	-
comments	-
cost	-$2995

IBM 3872

belltype	-
speed	- 1200/2400
modulation	-dpsk
synch/asynch	-s
duplex	-half/full
linetype	-2/4 wire
linecondition	-C1
signal	-RS232C
equalization	-man/auto
reverse	-
voice	-v/d
originate	-orig/auto ans
loopback	-
comments	-line self test
cost	-$2575

IBM 3874

belltype	-
speed	- 2400/4800
modulation	-cpsk
synch/asynch	-s
duplex	-half/full
linetype	-2/4 wire
linecondition	-C1
signal	-RS232C
equalization	-auto
reverse	-
voice	-v/d
originate	-orig/auto ans
loopback	-
comments	-line- and self-test
cost	-$3570

IBM 3875

belltype	-
speed	- 3600/7200
modulation	-pm-am
synch/asynch	-s
duplex	-half/full
linetype	-4 wire
linecondition	-C2
signal	-RS232C
equalization	-man
reverse	-
voice	-v/d
originate	-orig/auto ans
loopback	-
comments	-line- and self-test
cost	-$7275

IBM Line Adapters

belltype	-
speed	- 134/600
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-IBM
equalization	-
reverse	-
voice	-
originate	-orig/ans
loopback	-
comments	-limited distance
cost	-$ 432 to $ 865

ICC 20LSI

belltype	-201A/B/C
speed	- 2000/2400
modulation	-4 phase pm
synch/asynch	-s
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C;CCITT;MIL188B
equalization	-fixed
reverse	-rev
voice	-
originate	-orig/auto ans
loopback	-rem/loc
comments	-self test
cost	-$1585

ICC 24LSI

belltype	-201A/B/C
speed	- 2000/2400
modulation	-4 phase pm
synch/asynch	-s
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C;CCITT;MIL188B
equalization	-fixed
reverse	-rev
voice	-
originate	-orig/auto ans
loopback	-rem/loc
comments	-self test
cost	-$1585

ICC 4500/48

belltype	-
speed	- 4800
modulation	-am-vsb
synch/asynch	-s
duplex	-full
linetype	-4 wire
linecondition	-
signal	-RS232B/C;CCITT;MIL188B
equalization	-auto
reverse	-
voice	-v/d
originate	-orig/ans
loopback	-
comments	-multiplexing;self test
cost	-$4980

ICC 4800/72

belltype	-
speed	- 4800/7200
modulation	-am-vsb
synch/asynch	-s
duplex	-full
linetype	-4 wire
linecondition	-C1/D1
signal	-RS232B/C;CCITT;MIL188B
equalization	-auto
reverse	-
voice	-v/d
originate	-orig/ans
loopback	-
comments	-multiplexing;self test
cost	-$6900

ICC 5500/96

belltype	-
speed	- 9600
modulation	-am-vsb
synch/asynch	-s
duplex	-full
linetype	-4 wire
linecondition	-C2/D1
signal	-RS232B/C;CCITT;MIL188B
equalization	-auto
reverse	-
voice	-v/d
originate	-orig/ans
loopback	-
comments	-self test;multiplexing
cost	-$7990

ICC 96

belltype	-
speed	- 9600
modulation	-
synch/asynch	-s
duplex	-full
linetype	-4 wire
linecondition	-C2/D1
signal	-RS232C;CCITT;MIL188C
equalization	-auto
reverse	-
voice	-v/d
originate	-
loopback	-rem/loc
comments	-multiplexing
cost	-$8750

ICC Com-Link II

belltype	-
speed	- 2400 to 19200
modulation	-pm
synch/asynch	-s
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C;CCITT;teletype
equalization	-man
reverse	-
voice	-
originate	-
loopback	-
comments	-self test;limited distance
cost	-$ 975

ICC Lineplexer II

belltype	-
speed	- 4800 to 19200
modulation	-
synch/asynch	-
duplex	-full
linetype	-4 wire
linecondition	-C2/D1
signal	-RS232C;CCITT;MIL188C
equalization	-
reverse	-
voice	-
originate	-
loopback	-rem/loc
comments	-device for biplexing 2 modems
cost	-$5250

ICC MPS48

belltype	-
speed	- 4800
modulation	-pm
synch/asynch	-s
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C;CCITT;MIL188B
equalization	-auto
reverse	-rev
voice	-v/d
originate	-orig/auto ans
loopback	-rem/loc
comments	-
cost	-$4475

ICC/Milgo 4700/48

belltype	-
speed	- 4800
modulation	-vsb
synch/asynch	-
duplex	-
linetype	-
linecondition	-
signal	-RS232C;MIL188
equalization	-
reverse	-
voice	-
originate	-
loopback	-
comments	-auto call
cost	-

Intertel MCS1200

belltype	-202C/D
speed	- 1800
modulation	-fsk
synch/asynch	-s/a
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232B/C;CCITT
equalization	-statistical
reverse	-rev
voice	-v/d
originate	-orig/auto ans
loopback	-rem/loc
comments	-
cost	-$ 960

Intertel MCS2400

belltype	-201B
speed	- 2400
modulation	-4 phase pm
synch/asynch	-s
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232B/C;CCITT
equalization	-statistical
reverse	-rev
voice	-v/d
originate	-orig/auto ans
loopback	-rem/loc
comments	-
cost	-$1750

Intertel MCS4800

belltype	-
speed	- 4800
modulation	-qam
synch/asynch	-s
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C;CCITT
equalization	-auto
reverse	-rev
voice	-v/d
originate	-orig/auto ans
loopback	-rem/loc
comments	-
cost	-$4400

Intertel MCS7200

belltype	-
speed	- 7200
modulation	-qam
synch/asynch	-s
duplex	-
linetype	-2/4 wire
linecondition	-
signal	-CDT/CBS for DDD
equalization	-auto
reverse	-150 bps
voice	-
originate	-
loopback	-
comments	-
cost	-$7100

Intertel MCS9600

belltype	-
speed	- 4800/7200/9600
modulation	-qam
synch/asynch	-s
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C;CCITT
equalization	-auto
reverse	-rev
voice	-v/d
originate	-orig/auto ans
loopback	-rem/loc
comments	-multiplexing
cost	-$8700

Livermore Data Systems 412

belltype	-202S/1
speed	- 1200
modulation	-fsk
synch/asynch	-a
duplex	-simplex/half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C;CCITT;MIL188B
equalization	-
reverse	-rev
voice	-
originate	-orig/auto ans
loopback	-rem
comments	-
cost	-$ 725

Livermore Data Systems 424

belltype	-201B/C
speed	- 2400
modulation	-4 phase pm
synch/asynch	-s
duplex	-simplex/half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C;CCITT;MIL188B
equalization	-auto
reverse	-rev
voice	-
originate	-orig/auto ans
loopback	-rem
comments	-
cost	-$ 875

Livermore Data Systems 440/48

belltype	-
speed	- 2400/4800
modulation	-dc-am
synch/asynch	-s
duplex	-full
linetype	-4 wire
linecondition	-
signal	-RS232C;CCITT
equalization	-auto
reverse	-
voice	-
originate	-orig/ans
loopback	-rem/loc
comments	-
cost	-$1995

Livermore Data Systems 76 series

belltype	-103;113A
speed	- 600
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-acoustic;2/4 wire
linecondition	-
signal	-RS232B/C;teletype
equalization	-
reverse	-
voice	-
originate	-orig
loopback	-
comments	-
cost	-$ 300 to $ 325

Livermore Data Systems ADS448

belltype	-
speed	- 1200 to 4800
modulation	-am-pm
synch/asynch	-a/s
duplex	-simplex/half/full
linetype	-2/4 wire
linecondition	-C2/C4
signal	-RS232C;CCITT;MIL188B;contact
equalization	-
reverse	-rev
voice	-v/d
originate	-orig/auto ans
loopback	-
comments	-integral handset
cost	-$1495

Livermore Data Systems Classic series

belltype	-103A2
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-acoustic
linecondition	-
signal	-RS232B/C;teletype
equalization	-
reverse	-
voice	-
originate	-orig/ans
loopback	-
comments	-
cost	-$ 325

MI2 Corporation RCU-1

belltype	-
speed	- 50
modulation	-fsk
synch/asynch	-a
duplex	-half
linetype	-2 wire
linecondition	-
signal	-teletype
equalization	-
reverse	-
voice	-
originate	-orig/auto ans
loopback	-
comments	-
cost	-$ 350

MI2 Data Systems Design 1200

belltype	-
speed	- 1800
modulation	-fsk
synch/asynch	-a
duplex	-
linetype	-2/4 wire
linecondition	-
signal	-RS232C
equalization	-auto
reverse	-rev
voice	-
originate	-
loopback	-
comments	-
cost	-$ 600 to $1200

Multi-Tech 300

belltype	-103/113A
speed	- 450
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-acoustic/2 wire
linecondition	-
signal	-RS232B/C;teletype
equalization	-
reverse	-
voice	-
originate	-auto ans
loopback	-
comments	-
cost	-$ 210

Multi-Tech 310

belltype	-103/113A
speed	- 450
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-acoustic/2 wire
linecondition	-
signal	-RS232B/C;teletype
equalization	-
reverse	-
voice	-
originate	-auto ans
loopback	-loc
comments	-
cost	-$ 390

Multi-Tech 320

belltype	-103/113B
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2 wire
linecondition	-
signal	-RS232B/C
equalization	-
reverse	-
voice	-
originate	-auto ans
loopback	-rem
comments	-
cost	-$ 230 to $ 325

Multi-Tech FM1200

belltype	-202
speed	- 1200
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232B/C
equalization	-man
reverse	-
voice	-
originate	-orig/auto ans
loopback	-rem/loc
comments	-
cost	-$ 225 to $ 460

Multi-Tech FM30 series

belltype	-103;113A
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-acoustic
linecondition	-
signal	-RS232B/C;teletype;TTL
equalization	-
reverse	-
voice	-
originate	-orig
loopback	-
comments	-
cost	-$ 190 to $ 270

Multi-Tech FM300

belltype	-103;113A
speed	- 450
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-acoustic;2 wire
linecondition	-
signal	-RS232B/C;teletype
equalization	-
reverse	-
voice	-
originate	-orig
loopback	-
comments	-
cost	-$ 210

Multi-Tech FM310

belltype	-103;113A
speed	- 450
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-acoustic;2 wire
linecondition	-
signal	-RS232B/C;teletype
equalization	-
reverse	-
voice	-
originate	-orig/auto ans
loopback	-loc
comments	-
cost	-$ 390

Novation 202

belltype	-202C/D/E
speed	- 1200/1800
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2/4 wire
linecondition	-C2 at 1800
signal	-RS232B/C;TTL
equalization	-fixed
reverse	-rev
voice	-v/d
originate	-orig/auto ans
loopback	-rem
comments	-
cost	-$ 366

Novation 36

belltype	-103
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-acoustic
linecondition	-
signal	-RS232C;teletype;DAA
equalization	-
reverse	-
voice	-
originate	-
loopback	-
comments	-designed for DECwriter
cost	-$ 235

Novation ATM103D

belltype	-101C
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2 wire
linecondition	-
signal	-RS232B
equalization	-
reverse	-
voice	-v/d
originate	-auto ans
loopback	-rem/loc
comments	-integral handset
cost	-$ 350 to $ 520

Novation DC3100 series

belltype	-103
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-acoustic/2 wire
linecondition	-
signal	-RS232C;teletype;DAA
equalization	-
reverse	-
voice	-
originate	-orig/ans
loopback	-rem/loc
comments	-
cost	-$ 295 to $ 330

Novation EC100 series

belltype	-103
speed	- 440
modulation	-fsk
synch/asynch	-a
duplex	-full
linetype	-acoustic/2 wire
linecondition	-
signal	-TTL
equalization	-
reverse	-
voice	-
originate	-orig and/or ans
loopback	-
comments	-self test
cost	-$ 100

Omnitec 103

belltype -103
speed - 450
modulation -fsk
synch/asynch -a
duplex -half/full
linetype -acoustic
linecondition-
signal -RS232
equalization -
reverse -rev
voice -
originate -orig
loopback -
comments -
cost -$1698

Omnitec 1108

belltype -108
speed - 300
modulation -fsk
synch/asynch -a
duplex -half
linetype -private line
linecondition-
signal -RS232
equalization -fixed
reverse -
voice -v/d
originate -orig/ans
loopback -
comments -integral handset;meters for di
cost -$ 844

Omnitec 1200A

belltype -202C
speed - 1200
modulation -fsk
synch/asynch -a
duplex -half
linetype -acoustic;2 wire
linecondition-
signal -RS232
equalization -
reverse -rev
voice -
originate -orig/ans
loopback -
comments -
cost -$ 975

Omnitec 1202

belltype	-202C
speed	- 1200
modulation	-fsk
synch/asynch	-a
duplex	-half
linetype	-DAA;4 wire
linecondition	-
signal	-RS232
equalization	-
reverse	-rev
voice	-
originate	-orig/auto ans
loopback	-loc
comments	-
cost	-$ 825

Omnitec 202

belltype	-202
speed	- 1200
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-acoustic
linecondition	-
signal	-RS232
equalization	-
reverse	-rev
voice	-
originate	-orig
loopback	-
comments	-
cost	-$1698

Omnitec 401A

belltype	-103
speed	- 450/600
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-acoustic/2 wire
linecondition	-
signal	-RS232B
equalization	-
reverse	-
voice	-
originate	-orig
loopback	-rem/loc
comments	-
cost	-$ 300

Omnitec 401B

belltype	-103
speed	- 450/600
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-acoustic/2 wire
linecondition	-
signal	-RS232B
equalization	-
reverse	-
voice	-
originate	-orig
loopback	-rem/loc
comments	-
cost	-$ 300

Omnitec 401C

belltype	-103
speed	- 450/600
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-acoustic/2 wire
linecondition	-
signal	-RS232B
equalization	-
reverse	-
voice	-
originate	-orig
loopback	-rem/loc
comments	-
cost	-$ 300

Omnitec 4500

belltype	-101C
speed	- 110
modulation	-fsk
synch/asynch	-a
duplex	-half
linetype	-2 wire
linecondition	-
signal	-RS232;teletype
equalization	-
reverse	-
voice	-
originate	-orig/auto ans
loopback	-rem/loc
comments	-
cost	-$ 560 to $ 760

Omnitec 4700

belltype	-101C
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-half
linetype	-2 wire
linecondition	-
signal	-RS232;teletype
equalization	-
reverse	-
voice	-
originate	-orig/auto ans
loopback	-rem/loc
comments	-
cost	-$ 560 to $ 760

Omnitec 4900

belltype	-101C
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-half
linetype	-2 wire
linecondition	-
signal	-RS232;teletype
equalization	-
reverse	-
voice	-
originate	-orig/auto ans
loopback	-rem/loc
comments	-
cost	-$ 560 to $ 760

Omnitec 501A

belltype	-103
speed	- 110
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-acoustic
linecondition	-
signal	-teletype
equalization	-
reverse	-
voice	-
originate	-orig
loopback	-rem/loc
comments	-
cost	-$ 164

Omnitec 503A

belltype	-103
speed	- 450
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-
linecondition	-
signal	-
equalization	-
reverse	-
voice	-
originate	-orig
loopback	-rem/loc
comments	-designed for DECwriter
cost	-not available

Omnitec 700 series

belltype	-103
speed	- 300/450/600
modulation	-fsk
synch/asynch	-a
duplex	-simplex/half/full
linetype	-acoustic;2 wire
linecondition	-
signal	-RS232B/teletype
equalization	-
reverse	-
voice	-
originate	-orig and/or ans
loopback	-rem/loc
comments	-
cost	-$ 341 to $ 690

Omnitec 9113B

belltype	-103
speed	- 450
modulation	-fsk
synch/asynch	-a
duplex	-half;full
linetype	-2 wire
linecondition	-
signal	-RS232;teletype
equalization	-
reverse	-
voice	-
originate	-orig/ans
loopback	-
comments	-remote LED diagnostics
cost	-$ 342

Omnitec Bawdy 12

belltype	-
speed	- 1200
modulation	-fsk
synch/asynch	-a
duplex	-
linetype	-2 wire
linecondition	-
signal	-RS232C
equalization	-none
reverse	-rev
voice	-
originate	-
loopback	-
comments	-
cost	-$ 975

Paradyne Bisync 48

belltype	-
speed	- 4800
modulation	-pam
synch/asynch	-s
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C;MIL188C
equalization	-auto
reverse	-
voice	-v/d
originate	-orig/auto ans
loopback	-rem/loc
comments	-IBM BSC compatible
cost	-$4600

Paradyne LSD19200

belltype	-
speed	-19200
modulation	-
synch/asynch	-
duplex	-full
linetype	-4 wire
linecondition	-
signal	-RS232C;CCITT
equalization	-auto
reverse	-
voice	-v/d
originate	-orig/auto ans
loopback	-rem/loc
comments	-device for biplexing 2 modems
cost	-$5150

Paradyne LSI-48

belltype	-
speed	- 4800
modulation	-pam-vsb
synch/asynch	-s
duplex	-full
linetype	-4 wire
linecondition	-
signal	-RS232C;MIL188C
equalization	-auto
reverse	-
voice	-v/d
originate	-orig/auto ans
loopback	-rem/loc
comments	-
cost	-$3000

Paradyne LSI-72

belltype	-
speed	- 4800/7200
modulation	-pam-vsb
synch/asynch	-s
duplex	-full
linetype	-4 wire
linecondition	-
signal	-RS232C;MIL188C
equalization	-auto
reverse	-
voice	-v/d
originate	-orig/auto ans
loopback	-rem/loc
comments	-
cost	-$4000

Paradyne LSI-96

belltype	-
speed	- 4800 to 9600
modulation	-pam-vsb
synch/asynch	-s
duplex	-full
linetype	-4 wire
linecondition	-
signal	-RS232C;MIL188C
equalization	-auto
reverse	-
voice	-v/d
originate	-orig/auto ans
loopback	-rem/loc
comments	-
cost	-$4500

Paradyne M48

belltype	-
speed	- 4800
modulation	-pam-vsb
synch/asynch	-s
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C
equalization	-auto
reverse	-150 bps
voice	-v/d
originate	-orig/auto ans
loopback	-rem/loc
comments	-multiplexing
cost	-$3000

Paradyne M4800

belltype	-
speed	- 4800/7200
modulation	-dpsk
synch/asynch	-s
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C;CCITT
equalization	-auto
reverse	-rev
voice	-v/d
originate	-orig/auto ans
loopback	-
comments	-network analyzer
cost	-$3000

Paradyne M96

belltype	-
speed	- 4800 to 9600
modulation	-pam-vsb
synch/asynch	-s
duplex	-full
linetype	-4 wire
linecondition	-
signal	-RS232C;MIL188C
equalization	-auto
reverse	-
voice	-v/d
originate	-orig/auto ans
loopback	-rem/loc
comments	-multiplexing
cost	-$6500

Penril 1200/150

belltype	-202C/D
speed	- 1200
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2 wire
linecondition	-
signal	-RS232B/C;CCITT
equalization	-fixed
reverse	-rev
voice	-v/d
originate	-orig/auto ans
loopback	-rem/loc
comments	-integral handset
cost	-$ 300 to $ 400

Penril 1200/5

belltype	-202C/D
speed	- 1200
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2 wire
linecondition	-
signal	-RS232B/C;CCITT
equalization	-fixed
reverse	-rev
voice	-v/d
originate	-orig/auto ans
loopback	-rem/loc
comments	-integral handset
cost	-$ 300 to $ 400

Penril 1800

belltype	-202D
speed	- 1800
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2/4 wire
linecondition	-C2 (1800)
signal	-RS232B/C;CCITT
equalization	-fixed
reverse	-
voice	-
originate	-orig/auto ans
loopback	-rem/loc
comments	-
cost	-$ 320

Penril 2400/300

belltype	-
speed	- 1200/2400
modulation	-4 phase pm
synch/asynch	-s
duplex	-simplex/half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C;MIL188B
equalization	-fixed
reverse	-75 to 300 bps
voice	-
originate	-orig/auto ans
loopback	-rem/loc
comments	-
cost	-$1920

Penril 2400B1

belltype	-201B/C
speed	- 1200/2400
modulation	-4 phase pm
synch/asynch	-s
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232B/C;CCITT
equalization	-switch
reverse	-
voice	-v/d
originate	-orig/auto ans
loopback	-rem/loc
comments	-self test;integral handset
cost	-$1375

Penril 300 series

belltype	-103/113
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2 wire
linecondition	-
signal	-RS232B/C;current switching
equalization	-fixed
reverse	-rev
voice	-v/d
originate	-orig/auto ans
loopback	-rem/loc
comments	-integral handset
cost	-$ 200 to $ 250

Penril 48/Micro

belltype	-
speed	- 2400/4800
modulation	-qam
synch/asynch	-a/s
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C;CCITT;MIL188C
equalization	-auto
reverse	-110 bps
voice	-v/d
originate	-orig/auto ans
loopback	-rem/loc
comments	-integral handset;self- remote-
cost	-not available

Penril 48/Multi

belltype	-
speed	- 4800
modulation	-dpsk
synch/asynch	-s
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232B/C
equalization	-man
reverse	-
voice	-v/d
originate	-orig/ans
loopback	-rem/loc
comments	-integral handset;self test
cost	-$2800

Penril PSH 24/48/72/96

belltype	-
speed	- 2400 to 19200
modulation	-encoded fsk
synch/asynch	-s
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C;CCITT
equalization	-man
reverse	-
voice	-
originate	-orig/ans
loopback	-rem/loc
comments	-limited distance
cost	-not available

Penril PSH hi-speed

belltype	-
speed	-19200 to 1Mbps
modulation	-pm
synch/asynch	-s
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-Bell 301/303
equalization	-man
reverse	-
voice	-
originate	-orig/ans
loopback	-rem/loc
comments	-limited distance
cost	-not available

Prentice Line Adaptors

belltype	-
speed	- 600
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C;teletype
equalization	-
reverse	-
voice	-
originate	-orig/ans
loopback	-rem/loc
comments	-
cost	-$ 135 to $ 200

Prentice P103

belltype	-103
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2 wire
linecondition	-
signal	-RS232C;teletype
equalization	-
reverse	-
voice	-
originate	-orig/ans
loopback	-rem/loc
comments	-
cost	-$ 135

Prentice P113

belltype	-113
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2 wire
linecondition	-
signal	-RS232C;teletype
equalization	-
reverse	-
voice	-
originate	-orig/ans
loopback	-rem/loc
comments	-
cost	-$ 195

Prentice P1200

belltype	-
speed	- 1200
modulation	-fsk
synch/asynch	-a
duplex	-full
linetype	-2 wire
linecondition	-
signal	-RS232C;teletype
equalization	-auto
reverse	-150 bps
voice	-
originate	-orig/auto ans
loopback	-rem/loc
comments	-
cost	-$ 400

Prentice P201B/C

belltype	-201B/C
speed	- 2400
modulation	-pm
synch/asynch	-s
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C
equalization	-auto
reverse	-
voice	-
originate	-orig/ans
loopback	-rem/loc
comments	-
cost	-$ 865

Prentice P202

belltype	-202C/D/R/T
speed	- 1200
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C;teletype
equalization	-
reverse	-rev
voice	-
originate	-orig/auto ans
loopback	-rem/loc
comments	-
cost	-$ 300 to $ 350

Prentice asynch line driver

belltype	-
speed	- 9600
modulation	-baseband
synch/asynch	-a
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C;teletype
equalization	-
reverse	-
voice	-
originate	-orig/ans
loopback	-loc
comments	-limited distance
cost	-$ 280

Prentice limited range adapters

belltype	-
speed	- 600 to 160000
modulation	-pm
synch/asynch	-s
duplex	-full
linetype	-2/4 wire
linecondition	-
signal	-RS232C;Bell 303
equalization	-auto
reverse	-
voice	-
originate	-orig/ans
loopback	-rem/loc
comments	-limited distance
cost	-$ 800 to $1200

Prentice synch line driver

belltype	-
speed	- 1200 to 28800
modulation	-delay
synch/asynch	-s
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C;Bell 303
equalization	-auto
reverse	-
voice	-
originate	-
loopback	-rem/loc
comments	-limited distance
cost	-$ 860

Pulsecom 4080 series

belltype	-108
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2 wire
linecondition	-
signal	-RS232P/C;teletype
equalization	-fixed
reverse	-
voice	-v/d
originate	-orig/auto ans
loopback	-rem/loc
comments	-
cost	-$ 225 to $ 300

Pulsecom 4321

belltype	-43A/B
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C;teletype
equalization	-
reverse	-
voice	-
originate	-orig/ans
loopback	-loc
comments	-
cost	-not available

Pye TMC 424

belltype	-
speed	- 2400
modulation	-phase
synch/asynch	-s
duplex	-
linetype	-2 wire
linecondition	-
signal	-RS232;CCITT
equalization	-auto
reverse	-rev
voice	-
originate	-
loopback	-
comments	-
cost	-not available

QEI Q70

belltype	-
speed	- 1200
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232B/C;CCITT
equalization	-
reverse	-rev
voice	-v/d
originate	-orig/ans
loopback	-loc
comments	-
cost	-$1000

QEI Q700

belltype	-
speed	- 1200
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232B/C;CCITT
equalization	-
reverse	-rev
voice	-v/d
originate	-orig/ans
loopback	-loc
comments	-
cost	-$ 515

QEI Q701

belltype	-
speed	- 300
modulation	-fsk
synch/asynch	-asynch
duplex	-
linetype	-2 wire
linecondition	-
signal	-teletype
equalization	-
reverse	-
voice	-
originate	-
loopback	-
comments	-output level -30 to 0 dbm fron
cost	-

QEI Q721

belltype	-
speed	- 1200
modulation	-fsk
synch/asynch	-asynch
duplex	-
linetype	-2 wire
linecondition	-
signal	-RS232C
equalization	-
reverse	-
voice	-
originate	-
loopback	-
comments	-output level -30 to 0 dbm fron
cost	-

QEI QDM

belltype	-
speed	- 1200
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232B/C;CCITT
equalization	-
reverse	-rev
voice	-v/d
originate	-orig/ans
loopback	-loc
comments	-QDM-113 has auto answer
cost	-$1000

RFL 32DR

belltype	-
speed	- 1200
modulation	-fsk
synch/asynch	-a
duplex	-full
linetype	-2 wire
linecondition	-C1
signal	-RS232C
equalization	-compromise
reverse	-rev
voice	-
originate	-orig/auto ans
loopback	-rem
comments	-
cost	-$ 940 to $1160

RFL 32DT

belltype	-
speed	- 1200
modulation	-fsk
synch/asynch	-a
duplex	-full
linetype	-2 wire
linecondition	-C1
signal	-RS232C
equalization	-compromise
reverse	-rev
voice	-
originate	-orig/auto ans
loopback	-rem
comments	-
cost	-$ 940 to $1160

RFL 5105

belltype	-101;103;113
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-acoustic;2/4 wire
linecondition	-
signal	-RS232C;teletype
equalization	-
reverse	-
voice	-
originate	-orig
loopback	-rem/loc
comments	-
cost	-$ 130

RFL 5220

belltype	-101;103;113
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-acoustic;2/4 wire
linecondition	-
signal	-RS232C;teletype
equalization	-
reverse	-
voice	-
originate	-auto ans
loopback	-rem/loc
comments	-
cost	-$ 275

RFL 6385

belltype	-202C
speed	- 1800
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C
equalization	-
reverse	-
voice	-
originate	-orig
loopback	-
comments	-
cost	-$ 235

Rixon DS1800

belltype	-202
speed	- 1800
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2/4 wire
linecondition	-C1/C2
signal	-RS232E/C
equalization	-fixed
reverse	-rev
voice	-v/d
originate	-orig/auto ans
loopback	-rem/loc
comments	-
cost	-$ 500

Rixon DS2401

belltype	-201B/C
speed	- 1200/2400
modulation	-4 phase pm
synch/asynch	-s
duplex	-simplex/half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232B;TTL
equalization	-man
reverse	-
voice	-v/d
originate	-orig/auto ans
loopback	-rem/loc
comments	-
cost	-$ 795

Rixon DS300

belltype	-103A/E/113
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-full
linetype	-2 wire
linecondition	-
signal	-RS232C;MIL188B
equalization	-
reverse	-
voice	-v/d
originate	-orig/auto ans
loopback	-rem
comments	-
cost	-$ 345

Rixon DS9601

belltype	-
speed	- 3600 to 9600
modulation	-am-vsb
synch/asynch	-s
duplex	-full
linetype	-4 wire
linecondition	-C2
signal	-RS232B/C;MIL188B
equalization	-auto
reverse	-
voice	-v/d
originate	-orig/ans
loopback	-rem/loc
comments	-
cost	-$8200

Rixon T103A2/3

belltype	-103A
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-full
linetype	-2 wire
linecondition	-
signal	-RS232B
equalization	-
reverse	-
voice	-
originate	-orig;auto ans
loopback	-
comments	-
cost	-$ 680

Rixon T103A2/3/F

belltype	-103/113
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-full
linetype	-2 wire
linecondition	-
signal	-RS232E/C
equalization	-
reverse	-
voice	-v/d
originate	-orig/auto ans
loopback	-loc
comments	-remote test
cost	-$ 435 to $ 480

Rixon T103GSB

belltype	-103/113
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-full
linetype	-DAA
linecondition	-
signal	-RS232B;teletype
equalization	-
reverse	-
voice	-v/d
originate	-orig/auto ans
loopback	-
comments	-remote test
cost	-$ 500

Rixon T113 series

belltype	-103A2/E/113B
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-full
linetype	-2 wire
linecondition	-
signal	-RS232B;teletype
equalization	-
reverse	-
voice	-v/d
originate	-orig and/or ans
loopback	-
comments	-remote test
cost	-$ 195

Rixon T113A

belltype	-101C;103B;103E
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-full
linetype	-2 wire
linecondition	-
signal	-RS232C
equalization	-
reverse	-
voice	-
originate	-orig
loopback	-
comments	-connects via modified 502 tele
cost	-$ 410

Rixon T113BDS

belltype	-103E;113A
speed	- 300
modulation	-fsk
synch/asynch	-asynch
duplex	-full
linetype	-2 wire
linecondition	-
signal	-RS232C
equalization	-
reverse	-
voice	-
originate	-auto ans
loopback	-
comments	-
cost	-$1100

Rixon T201C

belltype	-201B
speed	- 2400
modulation	-phase
synch/asynch	-synch
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C
equalization	-compromise
reverse	-
voice	-
originate	-orig/auto ans
loopback	-
comments	-
cost	-$1400

Rixon T202E

belltype	-202E
speed	- 1200
modulation	-fsk
synch/asynch	-a
duplex	-transmit only
linetype	-2 wire
linecondition	-
signal	-RS232B
equalization	-
reverse	-rev
voice	-v/d
originate	-auto ans
loopback	-
comments	-remote test
cost	-$ 475 to $ 570

Rixon T202S

belltype	-202
speed	- 1200
modulation	-fsk
synch/asynch	-asynch
duplex	-full
linetype	-2 wire
linecondition	-
signal	-RS232C
equalization	-fixed
reverse	-5 bps
voice	-v/d
originate	-orig/auto ans
loopback	-loc
comments	-
cost	-$ 600

Rixon T202T

belltype	-202
speed	- 1800
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2/4 wire
linecondition	-C2
signal	-RS232C
equalization	-fixed
reverse	-5 bps
voice	-v/d
originate	-orig
loopback	-loc/rem
comments	-
cost	-$ 525

Rixon T208A

belltype	-208A
speed	- 4800
modulation	-dc
synch/asynch	-s
duplex	-full
linetype	-4 wire
linecondition	-none/C2
signal	-RS232C
equalization	-auto
reverse	-
voice	-v/d
originate	-orig/ans
loopback	-rem/loc
comments	-
cost	-$3750

Rixon T208B

belltype	-208B
speed	- 4800
modulation	-pm
synch/asynch	-s
duplex	-half
linetype	-2 wire
linecondition	-
signal	-RS232C
equalization	-auto
reverse	-
voice	-v/d
originate	-orig/auto ans
loopback	-rem/loc
comments	-
cost	-$3750

Rixon TA201A/B

belltype	-201A
speed	- 2000/2400
modulation	-pm
synch/asynch	-s
duplex	-half/full
linetype	-2/4 wire
linecondition-	
signal	-RS232B;contact
equalization	-fixed
reverse	-
voice	-v/d
originate	-auto ans
loopback	-
comments	-remote test
cost	-$1075 to $1390

Sonex 2103

belltype	-103
speed	- 300/600
modulation	-fsk
synch/asynch	-a
duplex	-full
linetype	-2/4 wire
linecondition-	
signal	-RS232C;teletype;TTL
equalization	-auto
reverse	-
voice	-
originate	-orig/auto ans
loopback	-rem/loc
comments	-
cost	-$ 185

Sonex 2113

belltype	-113
speed	- 300/600
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2/4 wire
linecondition-	
signal	-RS232C;teletype;TTL
equalization	-auto
reverse	-
voice	-
originate	-orig/ans
loopback	-
comments	-multiplexing
cost	-$ 115

Sonex 2202

belltype	-202C/D/E
speed	- 1800
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2/4 wire
linecondition	-C2
signal	-RS232C
equalization	-auto
reverse	-5 bps
voice	-
originate	-orig/auto ans
loopback	-rem/loc
comments	-multiplexing
cost	-$ 435

Sonex 2404

belltype	-
speed	- 12
modulation	-Touch Tones
synch/asynch	-a
duplex	-half
linetype	-2 wire
linecondition	-
signal	-user-specified
equalization	-auto
reverse	-
voice	-
originate	-ans
loopback	-
comments	-
cost	-$ 175

Sonex 300

belltype	-103
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2 wire
linecondition	-
signal	-RS232C;teletype
equalization	-
reverse	-
voice	-
originate	-auto ans
loopback	-loc
comments	-
cost	-$2645

Sonex 31

belltype	-103
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2 wire
linecondition	-
signal	-RS232C;teletype
equalization	-
reverse	-
voice	-
originate	-orig
loopback	-
comments	-
cost	-$ 252

Sonex Autotone

belltype	-401J/403D/E/407
speed	- 10 to 20
modulation	-Touch Tones
synch/asynch	-a
duplex	-half
linetype	-2 wire
linecondition	-
signal	-RS232C;TTL;contact
equalization	-auto
reverse	-
voice	-v/d
originate	-auto ans
loopback	-
comments	-multiplexing
cost	-$ 325 to $ 550

Spectron DT401

belltype	-
speed	- 1200 to 19200
modulation	-
synch/asynch	-a/s
duplex	-full
linetype	-4 wire
linecondition	-
signal	-RS232C
equalization	-
reverse	-
voice	-
originate	-orig/ans
loopback	-rem/loc
comments	-limited distance
cost	-$ 400

Stelma 202 Plus

belltype	-
speed	- 1800
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C
equalization	-
reverse	-
voice	-
originate	-
loopback	-rem/loc
comments	-1800 150 bps channels
cost	-$1266 to $1450

Stelma 202R

belltype	-202R
speed	- 1200/1800
modulation	-fsk
synch/asynch	-a/s
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C
equalization	-
reverse	-
voice	-
originate	-
loopback	-rem/loc
comments	-
cost	-$ 422 to $ 710

Stelma 703AC

belltype	-103A
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-acoustic
linecondition	-
signal	-RS232C
equalization	-
reverse	-
voice	-
originate	-orig/ans
loopback	-
comments	-
cost	-$ 380

Stelma Datapak

belltype	-
speed	- 75 to 1800
modulation	-fsk
synch/asynch	-a/s
duplex	-simplex/half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C;CCITT;MIL188B;teketype
equalization	-
reverse	-
voice	-
originate	-orig/ans
loopback	-
comments	-multiplexing
cost	-$ 350 /channel end

Stelma Datapak 103

belltype	-103E/F
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C
equalization	-
reverse	-
voice	-
originate	-ans
loopback	-rem/loc
comments	-
cost	-$ 272 to $ 550

Stelma Datapak 113B

belltype	-113B
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C
equalization	-
reverse	-
voice	-
originate	-ans
loopback	-rem/loc
comments	-
cost	-$ 272 to $ 550

Syntech ESP201

belltype	-201A/B/C
speed	- 2000/2400
modulation	-4 phase pm
synch/asynch	-s
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C
equalization	-fixed
reverse	-
voice	-v/d
originate	-orig/auto ans
loopback	-rem/loc
comments	-self test
cost	-$1350

Syntech LDM series

belltype	-
speed	-19200
modulation	-fsk
synch/asynch	-a/s
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C
equalization	-man
reverse	-
voice	-v/d
originate	-orig/ans
loopback	-rem/loc
comments	-limited distance
cost	-$ 690 to $ 795

Syntech TT103

belltype	-102/113
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-full
linetype	-2 wire
linecondition	-
signal	-RS232C;TTL
equalization	-
reverse	-
voice	-v/d
originate	-orig/auto ans
loopback	-rem
comments	-
cost	-$ 375

Syntech TT201

belltype	-201A/B/C
speed	- 2000/2400
modulation	-4 phase pm
synch/asynch	-s
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C;TTL
equalization	-fixed
reverse	-
voice	-v/d
originate	-orig/auto ans
loopback	-rem/loc
comments	-
cost	-$1095

Syntech TT202

belltype	-202
speed	- 1800
modulation	-fsk
synch/asynch	-a/s
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C;TTL
equalization	-fixed
reverse	-rev
voice	-v/d
originate	-orig/auto ans
loopback	-rem/loc
comments	-
cost	-$ 450

Tele-Dynamics 7102A/D

belltype	-103/113
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-full
linetype	-acoustic;2 wire
linecondition	-
signal	-RS232C;CCITT;teletype;TTL
equalization	-
reverse	-
voice	-
originate	-orig/ans
loopback	-rem/loc
comments	-
cost	-$ 292

Tele-Dynamics 7103LC

belltype	-103/113
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2 wire
linecondition	-
signal	-RS232C;MIL188B;CCITT
equalization	-
reverse	-
voice	-v/d
originate	-orig/ans
loopback	-rem/loc
comments	-voice via Bell 804A
cost	-$ 292

Tele-Dynamics 7113LC4

belltype	-133A/B
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-full
linetype	-2 wire
linecondition	-
signal	-RS232C;teletype;CCITT;TTL
equalization	-
reverse	-
voice	-
originate	-orig/auto ans
loopback	-
comments	-
cost	-$ 207

Tele-Dynamics 7201A/B

belltype	-201A/B
speed	- 2000/2400
modulation	-4 phase pm
synch/asynch	-s
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C;CCITT
equalization	-fixed
reverse	-
voice	-
originate	-orig/auto ans
loopback	-rem/loc
comments	-
cost	-$ 895

Tele-Dynamics 7202D/E

belltype	-202D/E
speed	- 1800
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C;CCITT
equalization	-fixed
reverse	-rev
voice	-
originate	-orig/auto ans
loopback	-rem/loc
comments	-
cost	-$ 440

Tele-Dynamics 7208A

belltype	-208A
speed	- 4800
modulation	-pm
synch/asynch	-s
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C;CCITT
equalization	-auto
reverse	-
voice	-
originate	-orig/ans
loopback	-rem/loc
comments	-
cost	-$2750

Tele-Dynamics 7300

belltype	-
speed	- 1800 to 19200
modulation	-
synch/asynch	-s
duplex	-simplex/half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C
equalization	-fixed
reverse	-
voice	-
originate	-orig/ans
loopback	-rem/loc
comments	-limited distance
cost	-not available

Timeplex 103

belltype	-103
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-full
linetype	-2/4 wire
linecondition	-
signal	-RS232C;CCITT;contact
equalization	-
reverse	-
voice	-v/d
originate	-orig/auto ans
loopback	-rem/loc
comments	-
cost	-$ 185 to $ 325

Timeplex 202

belltype	-202
speed	- 2000
modulation	-fsk
synch/asynch	-a/s
duplex	-simplex/half/full
linetype	-2/4 wire
linecondition	-C2
signal	-RS232C;CCITT;MIL188B
equalization	-statistical
reverse	-rev
voice	-v/d
originate	-orig/auto ans
loopback	-rem/loc
comments	-
cost	-$ 285 to $ 425

Tran Connectran 650

belltype	-
speed	- 9600
modulation	-baseband
synch/asynch	-a
duplex	-half/full
linetype	-4 wire
linecondition	-
signal	-RS232C
equalization	-
reverse	-
voice	-
originate	-
loopback	-
comments	-limited distance
cost	-$ 295

Tran Directran

belltype	-103/113/202
speed	- 9600
modulation	-baseband
synch/asynch	-a
duplex	-half/full
linetype	-4 wire
linecondition	-
signal	-RS232C
equalization	-
reverse	-
voice	-
originate	-orig/ans
loopback	-rem/loc
comments	-limited distance
cost	-$ 325 to $ 520

Tran Intertran 911/931 series

belltype	-
speed	- 1200 to 19200
modulation	-pcm
synch/asynch	-s
duplex	-half/full
linetype	-4 wire
linecondition	-
signal	-RS232C
equalization	-
reverse	-
voice	-
originate	-
loopback	-rem/loc
comments	-limited distance
cost	-$1150 to $1250

Tran Intertran 916/936 series

belltype	-
speed	-19200 to 250000
modulation	-pcm
synch/asynch	-s
duplex	-half/full
linetype	-4 wire
linecondition	-
signal	-Bell 303
equalization	-
reverse	-
voice	-
originate	-
loopback	-rem/loc
comments	-limited distance
cost	-$1300 to $1650

Tran Intertran 918/938 series

belltype	-
speed	-48000 to 64000
modulation	-pcm
synch/asynch	-s
duplex	-half/full
linetype	-4 wire
linecondition	-
signal	-CCITT
equalization	-
reverse	-
voice	-
originate	-
loopback	-rem/loc
comments	-limited distance
cost	-$1250 to $1600

Tran Intertran 951/961

belltype	-
speed	- 2400 to 19200
modulation	-baseband
synch/asynch	-s
duplex	-half/full
linetype	-4 wire
linecondition	-
signal	-RS232C
equalization	-
reverse	-
voice	-
originate	-orig/ans
loopback	-rem/loc
comments	-limited distance
cost	-$ 745 to $ 900

Tran Intertran 956/966

belltype	-
speed	-19200 to 250000
modulation	-ppm
synch/asynch	-s
duplex	-half/full
linetype	-4 wire
linecondition	-
signal	-Bell 303
equalization	-
reverse	-
voice	-
originate	-orig/ans
loopback	-rem/loc
comments	-limited distance
cost	-$1050 to $1200

Tran Intertran 981

belltype	-
speed	- 2400 to 9600
modulation	-baseband
synch/asynch	-s
duplex	-half/full
linetype	-4 wire
linecondition	-
signal	-RS232C
equalization	-
reverse	-
voice	-
originate	-orig/ans
loopback	-rem/loc
comments	-limited distance
cost	-$ 485

Tuck 1600 series

belltype	-202
speed	- 1200
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C;TTL
equalization	-fixed
reverse	-5 bps
voice	-v/d
originate	-orig/auto ans
loopback	-rem
comments	-
cost	-$ 122 to $ 375

Tuck 1652

belltype	-
speed	- 2400
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C
equalization	-fixed
reverse	-
voice	-
originate	-orig/ans
loopback	-rem
comments	-limited distance
cost	-$ 325

Tuck 1810/1880/1881

belltype	-401A/E/H/J/403
speed	- 20
modulation	-am
synch/asynch	-
duplex	-half
linetype	-2 wire
linecondition	-
signal	-acoustic;contact
equalization	-
reverse	-
voice	-v/d
originate	-orig/auto ans
loopback	-
comments	-front panel LED
cost	-$ 225 to $ 595

Universal 103/113

belltype	-103/113
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-full
linetype	-2 wire
linecondition	-
signal	-RS232C;CCITT
equalization	-
reverse	-
voice	-
originate	-auto ans
loopback	-
comments	-answer via CBS DAA
cost	-not available

Universal 12-12

belltype	-
speed	- 1200
modulation	-psk
synch/asynch	-a/s
duplex	-full
linetype	-2 wire
linecondition	-
signal	-RS232C;CCITT
equalization	-
reverse	-
voice	-
originate	-
loopback	-rem/loc
comments	-
cost	-not available

Universal 201A/B/C

belltype	-201A/B/C
speed	- 2400
modulation	-psk
synch/asynch	-s
duplex	-half/full
linetype	-2/4 wir
linecondition	-
signal	-RS232C;CCITT
equalization	-
reverse	-
voice	-
originate	-auto ans
loopback	-
comments	-five diagnostic LED's
cost	-not available

Universal 202C/D

belltype	-202
speed	- 1200/1800
modulation	-fsk
synch/asynch	-s
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232B/C
equalization	-
reverse	-5/150 bps
voice	-
originate	-orig/auto ans
loopback	-rem/loc
comments	-
cost	-$ 445 to $ 495

Universal 202M5

belltype	-
speed	- 1800
modulation	-fsk
synch/asynch	-a
duplex	-half/full
linetype	-2/4 wire
linecondition	-C2
signal	-RS232C
equalization	-
reverse	-
voice	-
originate	-orig/ans
loopback	-rem/loc
comments	-
cost	-$ 675

Universal 202SS

belltype	-
speed	- 1200
modulation	-fsk
synch/asynch	-s
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C
equalization	-
reverse	-
voice	-
originate	-orig/ans
loopback	-rem/loc
comments	-
cost	-$ 560

Universal RM16

belltype	-103/113/201/202
speed	- 2400
modulation	-fsk psk
synch/asynch	-a/s
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-RS232C
equalization	-
reverse	-rev
voice	-
originate	-orig/auto ans
loopback	-rem/loc
comments	-
cost	-not available

Vadic LDA

belltype	-
speed	- 134/600
modulation	-fsk
synch/asynch	-a
duplex	-half
linetype	-2/4 wire
linecondition	-
signal	-RS232C
equalization	-
reverse	-
voice	-
originate	-orig/ans
loopback	-rem/loc
comments	-
cost	-$ 200

Vadic LLA

belltype	-
speed	- 134/600
modulation	-fsk
synch/asynch	-a
duplex	-half
linetype	-2/4 wire
linecondition	-
signal	-RS232C
equalization	-
reverse	-
voice	-
originate	-orig/ans
loopback	-rem/loc
comments	-
cost	-$ 200

Vadic SLA

belltype	-
speed	- 600/1200
modulation	-fsk
synch/asynch	-a
duplex	-half
linetype	-2/4 wire
linecondition	-
signal	-RS232C
equalization	-
reverse	-
voice	-
originate	-orig/ans
loopback	-rem/loc
comments	-
cost	-$ 200

Vadic VA1200

belltype	-202
speed	- 1800
modulation	-fsk
synch/asynch	-a
duplex	-half
linetype	-2/4 wire
linecondition	-C2
signal	-RS232B/C
equalization	-
reverse	-rev
voice	-
originate	-orig/auto ans
loopback	-rem/loc
comments	-
cost	-$ 285

Vadic VA21

belltype	-
speed	- 300
modulation	-fsk
synch/asynch	-
duplex	-
linetype	-2 wire
linecondition	-
signal	-CCITT V.24/V.28
equalization	-
reverse	-
voice	-
originate	-orig/auto ans
loopback	-rem/loc
comments	-IBM compatible
cost	-$ 600

Vadic VA23

belltype	-
speed	- 1200
modulation	-fsk
synch/asynch	-a/s
duplex	-half/full
linetype	-2/4 wire
linecondition	-
signal	-CCITT
equalization	-compromise
reverse	-rev
voice	-v/d
originate	-orig/auto ans
loopback	-rem/loc
comments	-integral handset
cost	-$ 600

Vadic VA2405

belltype	-201B/C
speed	- 2400
modulation	-dpsk
synch/asynch	-s
duplex	-half
linetype	-2/4 wire
linecondition	-
signal	-RS232C
equalization	-compromise
reverse	-
voice	-
originate	-orig/auto ans
loopback	-rem/loc
comments	-
cost	-$ 600

Vadic VA300 series

belltype	-103/113
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-full
linetype	-2 wire
linecondition	-
signal	-RS232C
equalization	-
reverse	-
voice	-
originate	-orig/auto ans
loopback	-rem/loc
comments	-
cost	-$ 215

Vadic VA3400

belltype	-
speed	- 1200
modulation	-
synch/asynch	-a
duplex	-full
linetype	-2 wire
linecondition	-
signal	-RS232B/C
equalization	-compromise
reverse	-
voice	-
originate	-orig/auto ans
loopback	-rem/loc
comments	-
cost	-$ 715

Ven-Tel AC103

belltype	-103/113
speed	- 300
modulation	-fsk
synch/asynch	-s
duplex	-full
linetype	-acoustic;2 wire
linecondition	-
signal	-RS232;CCITT;teletype
equalization	-
reverse	-
voice	-
originate	-orig/ans
loopback	-
comments	-
cost	-$ 265

Ven-Tel AC1212

```
belltype      -
speed         - 1200
modulation    -fsk
synch/asynch  -a
duplex        -full
linetype      -acoustic
linecondition-
signal        -RS232;CCITT;teletype
equalization  -
reverse       -
voice         -
originate     -orig/ans
loopback      -rem
comments      -has indicators
cost          -$ 530
```

Ven-Tel DCI120

```
belltype      -103/113
speed         -  300
modulation    -fsk
synch/asynch  -a
duplex        -full
linetype      -acoustic;2 wire
linecondition-
signal        -RS232;CCITT;teletype
equalization  -
reverse       -
voice         -
originate     -orig/ans
loopback      -
comments      -designed for DECwriter
cost          -$ 325
```

Ven-Tel MD103

```
belltype      -103
speed         -  300
modulation    -fsk
synch/asynch  -a
duplex        -full
linetype      -2 wire
linecondition-
signal        -RS232;CCITT
equalization  -
reverse       -
voice         -
originate     -orig/ans
loopback      -rem/loc
comments      -
cost          -$ 220
```

Ven-Tel MD113

belltype	-113
speed	- 300
modulation	-fsk
synch/asynch	-a
duplex	-full
linetype	-2 wire
linecondition	-
signal	-RS232;CCITT
equalization	-
reverse	-
voice	-
originate	-orig/auto ans
loopback	-rem/loc
comments	-
cost	-$ 200

Ven-Tel MD1212

belltype	-
speed	- 1200
modulation	-fsk
synch/asynch	-a
duplex	-full
linetype	-2 wire
linecondition	-
signal	-RS232;CCITT;current logic
equalization	-
reverse	-
voice	-
originate	-orig/auto ans
loopback	-rem
comments	-indicators
cost	-$ 450

3M 9600

speed	-35 sec./page
coupling	-daa
modulation	-fsk
linetype	-voice grade
comments	-digitally encodes data

3M VRC

speed	-4 or 6 min./page
coupling	-acoustic coupler or daa
modulation	-fm
linetype	-voice grade
comments	-output 0dbm adjustable

3M VRC 603

speed	-3 to 6 min./page
coupling	-integrated acoustic coupler
modulation	-fm
linetype	-voice grade
comments	-output -15 to 0dbm adjustable

3M VRC II

speed	-4 or 6 min./page
coupling	-acoustic or daa
modulation	-fm
linetype	-voice grade
comments	-output 0dbm adjustable

Graphic Sciences dex 120

speed	-2 min./page
coupling	-integrated acoustic coupler
modulation	-fm
linetype	-voice grade
comments	-uses reverse channel

Graphic Sciences dex 180

speed	-3 or 6 min./page
coupling	-integrated acoustic coupler
modulation	-fm
linetype	-voice grade
comments	-uses reverse channel

Graphic Sciences dex 181

speed	-3 or 6 min./page
coupling	-daa
modulation	-fm
linetype	-voice grade
comments	-uses reverse channel

Graphic Sciences	dex 182	
	speed	-3 or 6 min./page
	coupling	-automatic daa
	modulation	-fm
	linetype	-voice grade
	comments	-uses reverse channel
Graphic Sciences	dex 4100	
	speed	-2 to 12 min./page
	coupling	-daa
	modulation	-fm
	linetype	-voice grade
	comments	-
Graphic Sciences	dex 700	
	speed	-2 to 6 min./page
	coupling	-integrated acoustic coupler
	modulation	-am/fm
	linetype	-voice grade
	comments	-uses reverse channel
Graphic Sciences	dex I	
	speed	-6 min./page
	coupling	-integrated acoustic coupler
	modulation	-fm
	linetype	-voice grade
	comments	-uses reverse channel
Graphic Sciences	dex IX	
	speed	-4 min./page
	coupling	-integrated acoustic coupler
	modulation	-fm
	linetype	-voice grade
	comments	-uses reverse channel
Graphic Sciences	dex VI	
	speed	-6 min./page
	coupling	-daa
	modulation	-fm
	linetype	-voice grade
	comments	-uses reverse channel
Graphic Sciences	dex VII	
	speed	-6 min./page
	coupling	-automatic daa
	modulation	-fm
	linetype	-voice grade
	comments	-uses reverse channel

Infolink Electrowriter

speed	-na
coupling	-daa
modulation	-fm
linetype	-voice grade
comments	-transmits handwriting

Infolink Scanatron

speed	-3 min./page
coupling	-daa
modulation	-fsk/fm
linetype	-voice grade
comments	-

Cambridge Instrument 3038

linetype	-voice grade
coupling	-internal daa
frequencies	-1075,1935,2365 Hz
comments	-internal auto dialer

Hewlett Packard 1517A

linetype	-voice grade
coupling	-internal daa
frequencies	-1075,1935,2365 Hz
comments	-internal auto dialer