```
**********************************************************
*                                                        *
*                                                        *
*              USER'S MANUAL FOR                         *
*                                                        *
*              ReachOut                                  *
*                                                        *
*              Version 1.M16                             *
*                                                        *
*                                                        *
*         Special Version for Morrow Designs             *
*                                                        *
*                                                        *
*         FOR THE MORROW MODEM, MM300                    *
*                                                        *
*              (300 BAUD MODEL)                          *
*                                                        *
*    FOR MORROW MICRO-DECISION COMPUTERS ONLY            *
*                                                        *
*                                                        *
**********************************************************
```

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104 Knight Drive
San Rafael, California 94901
(415) 459-3212

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IMPORTANT WARRANTY INFORMATION

LIMITED WARRANTY

Morrow, Inc. warrants its products to be free from defects in workmanship and materials for the periods indicated below. This warranty is limited to the repair and replacement of parts only.

This warranty is void if, in the sole opinion of Morrow Inc., the product has been subject to abuse or misuse, or has been interconnected to other manufacturer's equipment for which compatibility has not been established in writing.

Circuit boards - Parts, including the printed circuit board, purchased as factory assemblies, are warranted for a period of ninety (90) days from the original invoice/purchase date.

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Should a buyer experience a defect in either workmanship or materials during the warranty period, any Morrow Authorized Service Center will replace or repair the product at its expense only if the product is promptly returned to the dealer or Service Center with dated proof of purchase.

Should factory repair be necessary, the Service Center shall contact Morrow Customer Service for a Return Materials Authorization (RMA) number

AUTHOR'S NOTE

I became interested in telephones when I was five. I took a
screwdriver to one to see what made it work. I first saw a
computer in the early 1950s. I have since been fascinated by
them, and especially the concept of transmitting intangible
intelligence, in the form of data and programs, over distances of
thousands of miles in a matter of minutes.

In 1980 I purchased my own computer and soon began using
telecommunications software that others had written. I was
frustrated by the confusing operational design of most of the
programs as well as the incomplete performance, poor error-
handling and other, equally-disturbing, inadequacies.

In April of 1981 I decided to write my own program: something
that I would enjoy using and would like to share with others.
The most primitive functions didn't take too long, but I "just
had to" add a refinement "here," and an additional feature
"there." It wasn't long until working on the program became an
obsession. It took 30 months to make it a product and get it
ready for this release. What you purchased is the result.

A great effort has been made to make the operation of ReachOut
logical, simple, and intelligently responsive to operator errors.
Prior to it being released as a major product, the program was
extensively tested by a small, but diligent, group of my friends
and associates: programmers, computer hobbyists, businessmen,
writers, and secretaries. They made valuable suggestions, and
the program now reflects a blending of most of them.

I want to thank some people who made contributions: Rob Barnaby,
Tom Bishop, Jim Fox, Frank Korzeniewski, Becca Thomas, and Jean
Yates for their suggestions and technical assistance, and Ward
Christensen who helped debug early versions, from over 2,100
miles away, over the phone, with the program having been sent to
him via his program, "MODEM."

My heartfelt thanks goes to my former housemates Dick Shaffer and
Marty Epstein, for their encouragement over the many, intense,
months of development, and also for the loans, so that I could
continue working without worrying about income. And I greatly
appreciate the endurance of my daughter, Marlayna, who often had
to wait for hours while I worked for "just five minutes more."

Although the program is powerful and, hopefully, a joy to use, I
doubt that it will ever be "done." New features are constantly
being discussed and added, and subtle refinements seem to always
find their way into the process. Accordingly, your suggestions
for improving the program are always welcome.

I hope that you will have as much pleasure using ReachOut as I
had writing it.

Sandy Gossman

END-USER AGREEMENT

Before using the program, you should read the End-user Licensing Agreement that comes with this manual. The Agreement specifies the conditions under which the program is to be used.

To insure compliance with the licensing agreement, certain features of the program will not operate when both computers are using a copy of the program made from the same distribution disk.

Please read, sign, and return the enclosed End-user Licensing Agreement Registration Form to Applied Computer Techniques. A self-addressed envelope has been provided for your convenience.

Returning the signed Registration Form will record you as a legal user of ReachOut and entitle you to technical support, updates, and other privileges provided to complying users. Using the program without having executed the Registration Form could subject you to legal consequences.

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TRADEMARK ACKNOWLEDGMENTS

Various trademarks are referred to in this manual. They are acknowledged at the rear of this manual, just before the Section entitled "Installation."

TABLE OF CONTENTS

BOLD TYPE indicates the sections you should certainly read and/or the ones expected to be of the most interest to you.

INSTALLATION INSTRUCTIONS MORROW MODEM MODEL MM300

We have designed the Morrow intelligent modem with ease of installation in mind. To insure proper installation, please follow these steps in order.

WARNING: WHENEVER INSTALLING OR REMOVING THE MM300, TURN OFF THE COMPUTER POWER. FAILURE TO DO SO WILL RESULT IN SERIOUS DAMAGE TO THE MODEM.
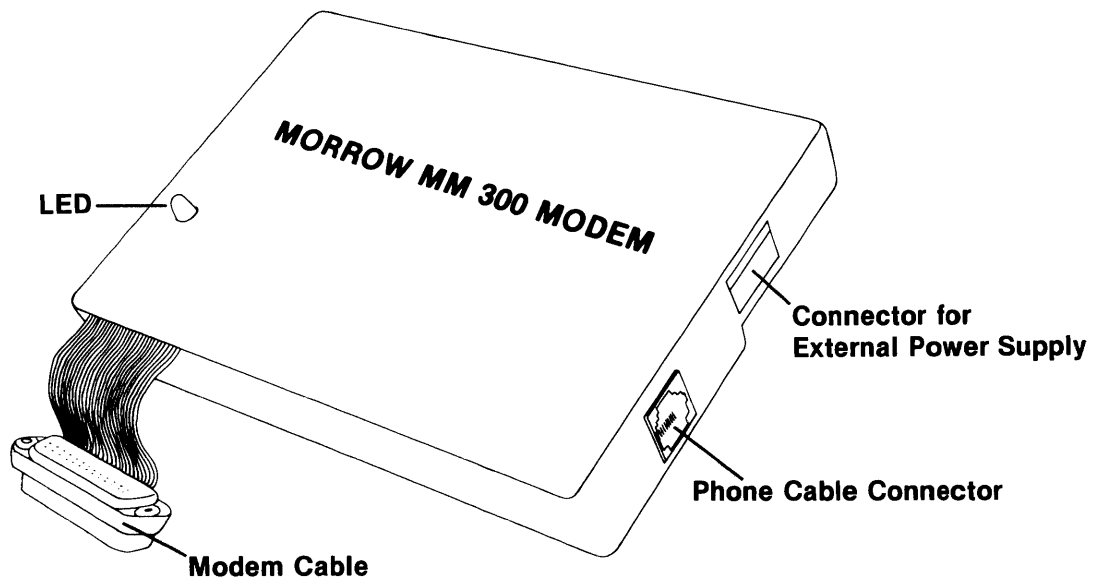
Figure 1: Morrow Model MM300 Intelligent Modem

FIRST TIME INSTALLATION

NOTE: The installation procedure is identical for all Morrow Micro Decision chassis styles. We have shown the Revision B chassis in our illustration.

1. Turn off the power to the computer, and face the rear of the unit.

2. Locate the port labeled PRINTER/MODEM, on the computer.

3. Position the MM300 as illustrated in Figure 2. Align the top of the MM300 with the top edge of the computer.

4. Peel off the white plastic strips on the rear of the MM300. This will expose the adhesive on the velcro.
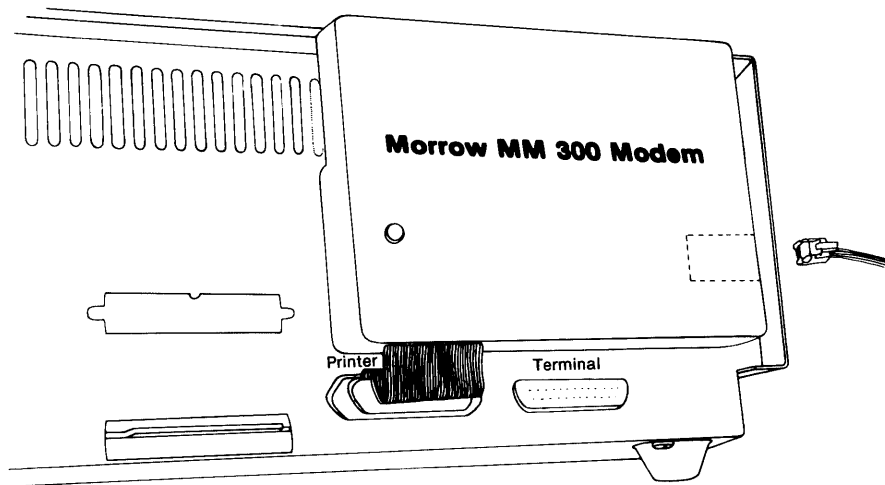
Figure 2: Typical MM300 Installation

5.   Press the MM300 against the back of the computer.

6.   Insert   the   modem cable connector into   the   computer   port
      labeled PRINTER/MODEM.

7.   Turn the computer power on. On most installations the yellow
      LED will light. If it does not, your MM300 requires an
      external power supply (revision 1 circuit boards). Contact
      your Morrow dealer and order part number MM300-PS.

      NOTE: Do not connect external power supply, if LED light
              comes on without it.

Your installation should look like the one illustrated in Figure 2.

EXTERNAL POWER SUPPLY CONNECTOR

If an external power supply is required for your installation
locate the connector under the knock-out illustrated in Figure 1.

To remove the knock-out, insert a small flat bladed screwdriver
into the slot and lift up. The rectangular plastic piece will
separate from the MM300 case, exposing the connector.

ii

PHONE LINE HOOK-UP

To connect the telephone cable, simply disconnect the modular (RJ11C) connector from your telephone, and insert it into the connector located on the right hand side of the MM300 (see Figure 2). If you do not have a modular phone connection, converter kits are available at most electronic hobby stores.

MODEM REMOVAL

1.   Turn off the computer power.

2.   Disconnect the modem cable from the Printer/Modem port and the telephone cable from the RJ11C connector.

3.   Carefully pull the unit away from the computer. One set of velcro strips should remain attached to the computer. The other set should remain on the MM300, ready for your next installation.

WARNING

This equipment generates and uses radio frequency energy and if not installed and used according to the instructions provided, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Part 15 of FCC rules. However, there is no guarantee that no interference will occur in a particular installation. If this equipment does cause interference with such equipment, the user is encouraged to try to correct the interference.

If necessary, the user should consult the dealer or an experienced radio/television technician for assistance. The following booklet prepared by the FCC may be helpful: "How To Identify and Resolve Radio-TV Interference Problems." It is available from the U.S. Government Printing Office, Washington, D.C. 20402. Stock #004-000-00345-4.

> This equipment has been certified to comply with the limits for a Class A computing device, pursuant to Part 15 of FCC rules. Only peripherals certified as Class A or B may be attached to the Morrow computer. Operation of non-certified peripherals is likely to cause interference in radio and TV reception.

The MM300 is designed to be directly connected to the telephone line via an RJ11C connector. As such, the user has certain responsibilities to the telephone company. Notification of connection and disconnection of the device, the FCC registration number, the ringer equivalence number, and the type of jack required for connection to the network must be provided to the telephone company. These numbers may be found on the bottom of the modem.

Do not connect the modem to party lines or coin-operated telephone lines.

If problems arise with the modem or telephone line, disconnect the modem immediately. If it is determined that the modem is defective, refer to the warranty information and the section "In Case of Difficulty" for further information.

Under certain circumstances, the telephone company may temporarily discontinue service and may make changes in facilities and services that affect the operation of the modem. The user shall be given adequate notice in writing so that uninterrupted service may be maintained.

WHAT IS REACHOUT?

ReachOut is a sophisticated telecommunications software package that comprehensively and conveniently controls the hardware environment so that two computers can communicate: either over telephone lines using modems, or without modems, with the two systems being directly connected. The computer using ReachOut can "appear" to be only a terminal to another computer (enabling you to interact as though the terminal was directly connected to the modem) or the capabilities of the computer can be fully utilized, so that pre-typed text can be quickly sent, screen images can be saved, and files can be transferred (transmitted or received) with assured accuracy. The computer using ReachOut must be operated with the CP/M$^{(R)}$ operating system; the other system can be any computer.

File transfers take place in an efficient manner, thus making this often tedious task an easy activity. Any type of file can be transferred: text files, data files, and programs in any form.

With a proliferation of non-compatible disk sizes and formats, the need to "download" and "upload" files between two dissimilar computers has, unfortunately, become commonplace. ReachOut has an unique "non-modem" mode especially for this purpose.

When both computers are using ReachOut, files can be easily transferred singly, or in groups. In batch mode, ReachOut provides a method of transfer whose sophistication is unmatched by any product of its type. The details of the ReachOut-to-ReachOut transfer process is described later in this literature.

Public data bases (like CompuServe, Knowledge Index, and The Source) can be easily accessed by, and used with, ReachOut. Using an auto-dial modem, ReachOut can automatically place the call and establish the connection. Then, in the terminal mode, all the features of the host can be used normally. Yet, the full facilities of the calling computer are retained, making all aspects of the communication convenient and efficient: the information seen on the screen, that would otherwise be lost, can be retained in a disk file; text typed before the call can be easily sent with only a few keystrokes.

Contained within ReachOut are all the file-management functions of the operating system that are necessary for normal use: the user never has to exit the program to perform operations such as displaying the file directory, renaming and deleting files, examining a file, and determining disk free-space.

The basic design precepts of ReachOut emphasize simplicity, feedback, and safe use. Thus, every effort has been made to insure that ReachOut functions as conveniently, as efficiently, as automatically, and as safely, as possible. All these characteristics work together to make ReachOut a joy to use. "Implementation," as well as power, is the hallmark of ReachOut.

Easy to Install

A menu-driven program enables installation of ReachOut without the user knowing technical information, and without patching.

Installation can be as easy as answering two questions:

1. What computer?
2. What terminal?

In addition to configuring the program to the hardware in the system for which it is being installed, the installation program allows the changing of values and flags that affect the operation of the program, including functional "logic."

Easy to Learn

Besides extensive, well-written, printed documentation over 150 pages in length, a built-in help system provides over 25 screens of text to guide the new user through the learning process.

There are two Help Levels: set to BEGINNER, help is given automatically; set to EXPERT, help is given selectively.

Easy to Use

With the exception of entering filenames, commands are entered with a single keystroke. Prompts are clear. Technical terms are avoided whenever possible. Most prompts and progress messages are displayed on a single line and are erased when they are no longer relevant. This Clean-Screen(TM) technique saves the operator from having to search for the most current prompt.

Efficiency

With the exception of entering file names, all commands and responses to questions require only a single keystroke. When "case" is unimportant, lower-case characters are converted to upper-case: the keyboard "shift" key can be ignored. The free-space on the current disk is shown each time a file is created.

Menu-driven function selection

Most functional choices that are available at any moment are presented as a list; you merely indicate -- by a single key-stroke -- what function is desired. Each ReachOut functional characteristic can be controlled separately, and changing any function can be made from within the program: there is no "command line" syntax to be memorized.

Input-Error Detection

All operator input is checked for errors: numbers when a letter
is required; attempting file operations on a drive that doesn't
exist; using file names of illegal length or containing illegal
characters. On error, the operator is immediately informed and
the nature of the error is explained.

Feedback

There is an instant response to all commands. Whenever the
program is performing an operation, there is a display that shows
the progress. When a file cannot be found, an error-message,
which contains the name of the file, is displayed.

Safe Use

Confirmation is required when a requested operation will cause a
condition from which there is no recovery; for example, erasing a
file or erasing the line-buffer.

Automatic Dialing

When an auto-dial modem is used, ReachOut permits dialing in
three ways:

    1. Manually;
    2. By entering the number from the keyboard;
    3. By selecting from a list of choices that come
       from a telephone directory file.

If the system being called doesn't answer, ReachOut automatically
takes care of waiting and re-dialing, re-trying as specified.

When re-dialing is necessary, you can choose both the number of
retries (1-9 or continuous), as well as the amount of time to
wait between each retry (no time, or 1-9 minutes).

When the other system answers, ReachOut will let you know with an
extended "beep" (6 seconds) sounding of the console bell.

Dialing is sophisticated. For example, a command to pause for an
intermediate dial-tone can be inserted in the dialing string.
When a "ring-back" system is called, ReachOut will automatically
execute the required dialing scenario. When used with multiple-
baud modems that are controlled by electronics that can change
baud rate under program control, the baud rate of the system
being called can be specified in the dialing instruction. At the
end of the call, ReachOut will automatically return the baud rate
of both the modem and the controlling hardware to the default rate.

Automatic Sign-on

ReachOut can automatically, and selectively, perform the sign-on requirements of the system being called by executing a "script" that is contained in the telephone directory file and associated with the telephone number. Thus, the tedious task of responding to the usual lengthy number of questions (system name, account number, password, menu choices, etc.) is entirely eliminated.

Scripts can be long enough to control the session well beyond entry: script commands include opening a logging file and (closing the file and) hanging-up when a specified string is transmitted by the host. Accordingly, directory choices can reflect the _function desired_ rather than merely what system to call. Making a script is straight-forward and easy: there are only five functional commands.

Logging Mode (data "capture")

A disk record of what is seen on the screen can be easily made. The resulting file can be used in the same manner as any other text file: it can be edited, printed, or even (re-)transmitted. Among the uses of this feature is after-the-call review of the use of another system. Incoming data is held in a "line-buffer" before being written to the disk. When the line-buffer gets full, disk-writes are automatic, without the loss of characters that may be received during the disk-write operation. Manual disk-write are possible at any time. Available disk space is the only factor that limits file length.

Flexible Transfers

ReachOut provides a means of transferring files between two systems, when the other system is not also using ReachOut or a program with which it is compatible, both with, and without, error-checking.

Without error-checking, pre-typed text can be sent just as if it was being typed from the keyboard, but at "modem speed," rather than at typing speed. Sending "Electronic mail" and using the domestic TELEX system is a good use of this mode.

If the other system is not compatible with ReachOut in an error-detection, error-correction, mode, it is possible to send a file with errors being detected, but not automatically corrected: the "echo" of each character from the other system is compared to what was sent. If there is a mismatch, you are alerted, and can choose between aborting the transfer or not.

Multiple Protocols

Competitive products have only a single "proprietary" file-
transfer routine that does error-checking. This limits you to
reliably transferring files only with another system, or person,
that uses the same program. Besides its file-transfer protocol,
ReachOut provides several other protocols. By doing this,
ReachOut can be used with literally thousands of systems.

File transfers with systems using the "Christensen Protocol" are
possible. This enables file transfers with all public-access
Remote CP/M systems and with persons using the "MODEM7" program.

Automatic modem control

ReachOut permits convenient operation when file transfers are
interspersed with conversation between system operators.

File Compression Utilities

ReachOut comes with two public-domain programs. One program
compresses a file so that the transfer of it is reduced by as
much as 40%. The other program restores the file to normal.

File Encryption Utility

ReachOut comes with a data-encryption utility. The contents of a
file can be "scrambled" before it is transmitted. It can only
be "unscrambled" by someone having the same program and knowing
the password. Multiple encryptions are possible: an encrypted
file can be encrypted to provide a second "layer" of security.

The Powerful ReachOut Protocol

When ReachOut is used by both systems, file transfers take place in the easiest and most sophisticated manner that is available in a program of this type.

Files can be sent either individually or as a batch. Sent individually, either operator can control the name the file will have on the receiving system. In batch mode, ReachOut permits defining a batch either "ambiguously" or by specifying a file in which is contained a simple list of files to be sent.

If a batch is specified by a list of file names contained in a file, a search is made for each file before the transfer begins. If any file is missing, an error message is displayed, the operator is given the option of aborting the start of the transfer and, in either case, filenames are written to a file. This file can be used as a guide to the needed files and, like the list of files too big to fit on the receiving system, the list of missing files can be later used to automatically control the re-transmission of these files.

If a transmission is in progress, and then aborted, the names of all files in the batch that weren't sent are written to a file.

The size of each file is sent ahead of the file. ReachOut tests the disk of the receiving system for adequate available space. If the file won't fit, an error message is displayed and the next file is processed. At the end of the transfer, the names of the files that were too large to send are listed on the screen and written to a disk file on both systems. This file can later be used to automatically control the re-transmission of these files.

The name of the file is also sent ahead of the file. If an incoming filename exists on the disk of the receiving system, the existing file is renamed (to .TMP). At the end of the transfer, the receiving operator is advised that renaming was required. Thus, the receiving party has the freedom of ultimately determining the filenames.

Additional features of the ReachOut protocol are:

1. A reliable error-detection-and-correction scheme: when an error is detected, the incorrect data is automatically re-transmitted until it is received correctly.

2. Transfer reports are displayed on BOTH systems. When a single file is sent, its name, size, time to transfer, and and how much of it has already been transferred is shown. Batch transfers include, in addition, the size of the batch, the time to transfer it, the time remaining at the start of each file, and the current file number.

3. The progress of the transfer is constantly updated.

ReachOut has four menus:

1. **The Dialing Menu**: primarily controls dialing functions.

2. **The Control Mode Menu**: controls the major modes of operation, and is considered to be the "main" menu.

3. **The Configuration Menu**: shows status, and permits changing, of the most operating characteristics of the program as it relates to logical operation, some file-transfer parameters, printer activity and, in most cases, operational characteristics of the modem.

4. **The Protocol Menu**: allows changing from one type of error-checking file-transfer protocol to another.

The relationship of the menus to each other is depicted below. The blunted arrows indicate how movement between menus is controlled and the commands required for each movement:


```
                         |---------|
                         | SIGNON  |
                         |---------|
                              |

                          ( RETURN )

                            \ | /
                    |----------------|
                    | DIALING  MENU  |
                    |----------------|
                        |        / \

                      ( C )    ( # )

                       \ /       |
         |------------------------------------------|
         |         C O N T R O L    M E N U         |
         |------------------------------------------|
            |           / \        |         / \

      ( RETURN )  ( RETURN )   ( P )    ( RETURN )

          \ /         |         \ /         |
       |----------------|    |--------------------|
       | CONFIGURATION  |    |     PROTOCOL       |
       |     MENU       |    |       MENU         |
       |----------------|    |--------------------|
```
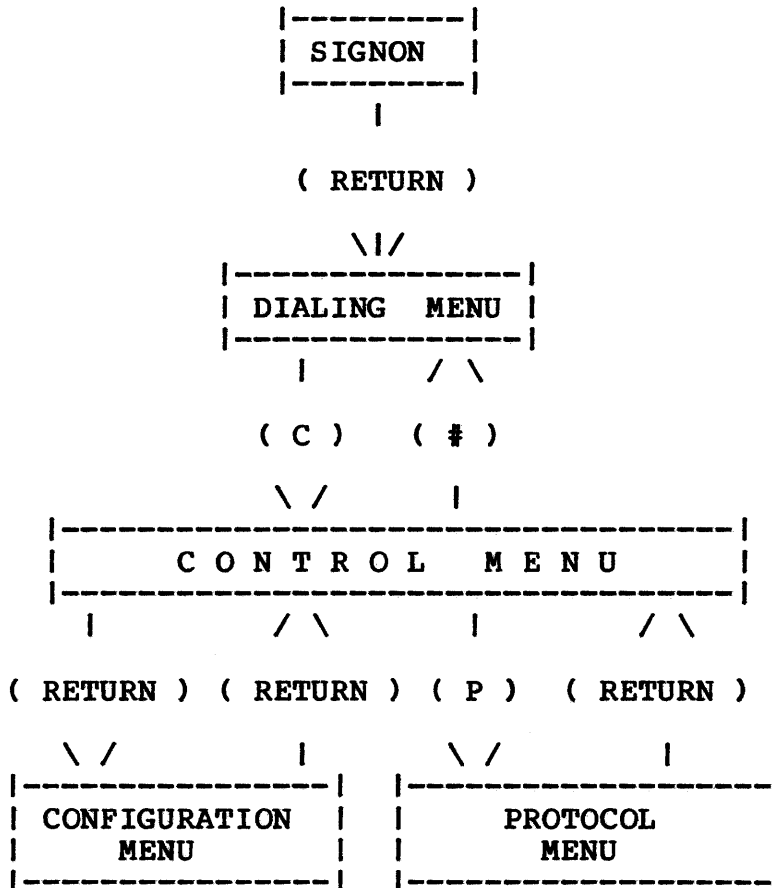
THE DIALING MENU:

Dialing Menu:

```
PRESS     IN ORDER TO
-----     -----------
  D       dial from directory
  K       dial from the keyboard
  L       re-dial the last number
  M       monitor after manual dial
  C       go to Control Mode Menu
  X       exit to operating system
```

THE CONTROL MODE MENU:

Control Mode Menu:

```
PRESS     IN ORDER TO
-----     -----------
  1       create a log
  2       rename a file
  3       delete a file
  4       examine a file
  5       log-in a disk
A -> x    display disk directory
  -       determine free disk space
  O       change from OFF-LINE
  P       change transfer protocol
  R       receive a file
  S       send a file
  T       enter Terminal Mode
  V       enter Direct-display Mode
  #       dial another number
(RET)     go to Configuration Menu
  X       exit to operating system
```

NOTE 1: x = a single letter, B through F, depending on the
disk drives in the system.

THE CONFIGURATION MENU:

Configuration Menu:

```
PRESS     THE LETTER TO CHANGE THE SETTING
------------------------------------------------
  A       Character set is: ( STANDARD )
  C       Cntrl-Chars. are: ( EXECUTED )
  D       Delay for prompts is: ( LONG )
  E       Echo received chars. is: ( OFF )
  F       Filter when rapid-type is: ( ON )
  H       Help level is: ( BEGINNER )
  I       Line-feed insertion is: ( ON )
  M       Carrier tone is: ( ORIGINATE )
  O       X-ON/X-OFF pair is: ( ^R/^T )
  P       Set/strip parity bit is: ( OFF )
  S       Show free disk space is: ( ON )
  T       Terminal bell is: ( ON )
  X       X-ON/X-OFF handshake is: (OFF)
```

OR PRESS

 (RET)   to go to the Control Mode Menu

THE PROTOCOL MENU:

Protocol Menu for file transfer:

Current protocol is item (1)

```
PRESS     TO CHANGE THE PROTOCOL
-----     -------------------------
  1       ReachOut-to-ReachOut
  2       "Christensen" (CKSUM)
  3       CP/M User's Group (CRC)
  4       Echo-plex
```

OR PRESS

 (RET)   to go to the Control Mode Menu

HARDWARE REQUIREMENTS

DIRECT-CONNECTION

For "down-loading" and "up-loading" without modems, you merely need two machines that have a RS-232 port and a properly-wired cable to connect them together.

MODEMS

This version of ReachOut works only with the Morrow Modem, MM300.

TERMINALS

The program will work with any terminal, but some terminals can be "installed" with only one keystroke: when the terminal appears on the terminal menu. The terminals that are on the menu are:

     1) LEVEL 1: ADM-3A or "workalike"

     2) LEVEL 2: SOROC IQ-120 or "workalike"

     3) LEVEL 3: ADM-31 or "workalike" ("Morrow" terminals)

COMPUTERS

Any Morrow Micro-Decision. This version of ReachOut will NOT work with the Decision-I computer.

COPYING THE DISTRIBUTION DISK

WARNING !! WARNING !! WARNING !! WARNING !! WARNING !!

Don't use the distribution disk for anything except making a "working copy." Make additional copies from the working copy.

When you are done copying the original, configured disk, store it in a safe, clean, dry place, free from magnetic fields.

WARNING !! WARNING !! WARNING !! WARNING !! WARNING !!

****

After configuration, ReachOut will NOT operate until you have INSTALLED it by running the installation/modification program INSTMOD.COM. Later, INSTMOD can be used to change parameters.

For installation instructions, see the Section on INSTALLATION.

****

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THE FILES ON THE DISTRIBUTION DISK

The files are:

1. INSTMOD.COM   (The installation/modification program.)

2. REACHOUT.COM   (The main communication program.)

3. REACHOUT.MSG   (Help, menu, and error message text.)

4. TELENUMB.ERS   (A sample telephone directory.)

5. TESTING   (A multi-line, 19 sector, test file.)

6. SQUEEZ.COM   (Used to compress a file, to minimize
                         file-transfer time)

7. UNSQUEEZ.COM   (Used to convert a squeezed file back
                         to its original form)

8. ENCODE.COM   (Used to encoded a file for security)

9. DECODE.COM   (Used to decode an encoded file)

10. UNLOAD.COM   (Used to convert a binary [8-bit] file
                         to its a hex [7-bit] file.)

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HOW TO USE THIS MANUAL

For the most enjoyment and utility, READ THE MANUAL.

ReachOut has many features that make it especially easy to use. Without completely, and carefully, reading the manual you may never know about a feature and miss a lot of what you paid for.

You will get the most from the manual if you read it twice: first quickly "skim" it, then read it again, taking your time.

The manual is comprehensive: it explains all possible features. Not all modems can take advantage of some of the features of the program. By configuring the program (using INSTMOD.COM) certain "flags" are set that control the way the program interacts with the hardware in your system. By keeping in mind what equipment will be used with the program while reading the manual, you will know what portions of the manual do not pertain to you.

The manual is organized this way:

First, there is a discussion of some basic operational rules of programs in general, and this program in particular.

Next, the menus and their relationship to each other, is briefly discussed. Then, each menu is presented alone, with a detailed discussion of each function in the order it appears on the menu.

The section on dialing is divided into two parts:

    DIALING: BASIC OPERATION and DIALING: ADVANCED FEATURES

Instructions on making a dialing directory and creating signon scripts are in separate sections; see the Table of Contents.

INSTALLATION INFORMATION is at the end of the manual, after the Glossary and Index and past the tab or sheet of colored paper.

Use the TABLE OF CONTENTS to get a feeling of organization.

Use the INDEX to look-up specific points in the future.

Use the GLOSSARY to define terms you don't understand.

This manual assumes that the reader has at least a basic understanding of computer fundamentals and the CP/M operating system, and adheres to standard, accepted, practices of responsible hardware and software management.

One more thing: there is nothing that you can accidently do with the program that will damage either the disk or your equipment. Things may not work properly, but no harm will be done.

So, relax, and explore.

CONVENTIONS USED IN THIS MANUAL

There are conventions used in the manual that are important:

1. Keyboard characters are represented by a parenthesis on either side, to represent a key: (A), (X), etc.

   Note: The (RETURN) key on some keyboards will say ENTER.

   Note: The Escape key is sometimes labeled (ESC).

2. Control characters are shown with a leading "caret." For example, CONTROL-A is shown as ^A. A control character is sort of a third "case." Think of an alphabetic character as being lower-case, upper-case, and control. A control character is "activated" by pressing the (CONTROL) key and, while holding it down, pressing the key of the desired character.

3. PRESS means to press a single key.

4. KEY pertains to a control-character.

5. ENTER means that you press a series of keys to indicate information, and then end the series by pressing the (RETURN) key.

6. TYPE means to enter a command by pressing a series of keys, but withOUT ending the series by pressing the (RETURN) key.

7. PRESS, KEY, TYPE, and ENTER are collectively called INPUT.

8. Text in bold type (like this), in the context of a program function or message, means that it is something displayed by the program.

9. Text that is underlined (like this) means that it is something input by you.

10. Bold type text is used to either title the start of a Section or to indicate a new topic within a Section:

    a) Bold text that is centered indicates the start of a Section.

    b) Bold text that starts in the left-most margin indicates the start of a new topic within the Section.

11. Underlined text is used to emphasize a word, phrase, or sentence.

GENERAL NOTES

This Section provides an overview of some important operational considerations -- functions and rules -- of the program, and some general information that either didn't seem to properly fit anywhere else, or is something you really should know about from the start (especially if you are going to use the program without reading the entire manual!). If there is a term you don't understand look in the Glossary for the definition.

1. When two systems are communicating, one of the systems must be in ORIGINATE mode (the mode in which the ORIGINATE tone is sent) and the other must be in ANSWER mode. Typically, ORIGINATE is used by the system originating the call and ANSWER is used by the system receiving the call.

   Most host systems allow you to change the carrier tone from one mode to the other. The reason for permitting the change is that inverting the ORIGINATE/ANSWER assignment often will salvage a poor telephone connection (you will know that the connection is marginal when you see something other than what you type when in Communication Mode, or experience data errors when transferring a file with error-checking).

   If your modem permits changing the carrier tone by the position of a switch, then ReachOut will not know, nor be able to control, the setting. If your modem permits changing the carrier tone by a software command, you can change the tone from the Configuration Menu. Instruct the other system to "flip" carrier tones, and then you flip yours. Remember, before communication can resume, the two systems must be in opposite modes.

2. CP/M filename conventions are used. Ambiguous names are permitted when performing a disk-directory function or defining a batch of files for transfer when using the ReachOut-to-ReachOut protocol.

3. When entering file names for a file operation (creating, deleting, etc.) you can specify a drive. A drive is specified by entering a drive letter, followed by a colon, before the file name. Without a drive being specified, the file operation will be attempted on the current drive.

4. ReachOut will not permit you to do anything that is "destructive" unless you confirm the command; operations such as deleting a file requires confirmation.

5. Data "words" can be either 7 or 8 bits in length. It
   takes 7 bits to form a printable (ASCII) character,
   but 8 bits to properly transfer some text files (for
   example, those produced by WordStar) and ALL programs
   in executable (.COM file) form.

   ReachOut sets the data word length to 8-bits and makes
   no provision for it to be changed. Set to 8 bits,
   ReachOut and your hardware can accommodate either word
   length. The ability to change the word length would
   make the operation of the program unnecessarily
   complicated and provide an opportunity for the user to
   cause operational errors.

6. Data words can have either 1 or 2 stop bits between
   them. ReachOut sets the hardware for 1 stop bit. This
   setting will work without any problem regardless of the
   number of stop bits being sent by, or needed by, the
   other system to which you are connected. Using 1 stop
   bit also increases the transmission speed by 10% over
   using two stops bits, with eight-bit data words.

                    ----------oOo----------

   At the end of the communication session, and just
   before ReachOut exits to the operating system, the
   electronics associated with the PRINTER/MODEM port is
   re-set, ready for a printer.

                    ----------oOo----------

7. When transferring a file with error-checking both
   systems must be compatible. If both systems are using
   ReachOut each system should be set to the ReachOut-to-
   ReachOut protocol. The protocol is checked and changed
   from the Protocol Menu.

8. When exiting the program (returning to CP/M), the modem
   will be disconnected automatically: if it is on-line,
   it will be taken off-line. This insures immediate
   availability of the telephone line for normal use, and
   poses no problem since ReachOut contains all necessary
   functions of the operating system.

ABORTING PROGRAM FUNCTIONS

The (ESC) key is used extensively throughout the program to abort functions or the set-up prior to a function.

Pressing the (ESC) key will ABORT:

1. the remaining display time of the signon

2. a call while waiting for a dial tone

3. a call while dialing is in progress

4. a call while waiting for an answer

5. a call while waiting before a re-dial

6. a long sounding of the terminal bell

7. the display of remaining help screens

8. the display of a file (EXAMINE function)

9. the display of a disk directory

10. the set-up before transferring a file

11. the transfer of a file

```
----------oOo----------
```

(ESC) is also used to cancel file functions, in two ways:

1. Before any portion of a file name has been entered, by pressing (ESC) in response to a file-function question.

2. When a file name has been partially entered, by pressing (ESC), followed by pressing (RETURN).

```
----------oOo----------
```

When a series of questions is being asked, and you have passed the first question, pressing the (ESC) key will return you to the previous question.

GETTING HELP FROM THE PROGRAM

In addition to this manual, operational assistance is provided from within the program. Help is provided in one of two ways:

1. When the Help Level is set to BEGINNER, and it seems like help may be required, explanatory text is automatically displayed. (Example: before viewing the directory of the files on the disk, there is a message that explains how to stop and start the display.)

2. Selectively, by inputting a question-mark at a menu, or in response to a file-function question.

----------oOo---------

The program is distributed with the Help Level set to "BEGINNER." When you no longer need the automatic help, the Help Level can be temporarily changed to EXPERT from the Configuration Menu of the program each time is used or, on a (semi-)permanent basis, by using the installation/modification program (INSTMOD).

----------oOo---------

When viewing a series of help screens, you can bypass the remaining screens by pressing (ESC) in response to the prompt "To continue, press (RETURN)."

The help text is located in a file called REACHOUT.MSG. This file also contains the text of error messages and some menus. The file must be on the current drive, drive A (the "boot" disk), or on a third drive, the identity of which can, and must, be specified specified during installation.

Each time the program is run, a search for the REACHOUT.MSG file is made. If it can't be found on the current drive, drive A, or a third drive, if specified, a comprehensive error-message is displayed and you will be told exactly what to do.

SUGGESTED DISK MANAGEMENT

Most systems have two drives (drive A and drive B). If your
system has at least two drives you have the choice of having
ReachOut and its associated files on each disk or only on one.

When you have more than one drive, what seems like the easiest
way to use ReachOut is to have the files REACHOUT.COM,
REACHOUT.MSG and, if you will be making calls by selecting
numbers from the telephone directory, also the file TELENUMB.ERS,
on a "working disk" (a "programs disk" that has an operating
system recorded on the system tracks on it) and put this disk
into drive A.

With this method of use, disks that go in drive B (or any drive
other than drive A) are those disks that will be used for:

    1. Storing logging files;

    2. Files that are going to be received;

    3. Files that are going to be sent.

To use ReachOut as described above:

    1. Boot the system.

    2. "Move to" drive B by typing

        A> <u>B:(RETURN)</u>

    3. Load ReachOut from drive A by typing:

        B> <u>A:REACHOUT (RETURN)</u>

In this way you can change the disk in drive B as needed (for
the reasons listed above) by merely logging-in the replacement
disk (function 5 on the Control Mode Menu). The ReachOut files
need to be only on drive A.

If your system has only one drive:

    1. Start with a system disk that has REACHOUT.COM and the
       other needed ReachOut files (REACHOUT.MSG and, if you
       will be making calls by selecting numbers from the
       telephone directory, TELENUMB.ERS) on it.

    2. When ReachOut is running you can change disks,
       logging-in the new disk (function 5 on the Control Mode
       Menu), <u>as long as the replacement disk has the file</u>
       <u>REACHOUT.MSG on it</u>.

AMBIGUOUS FILE NAMES

An important part of using ReachOut involves the use of ambiguous file names: when looking at a disk directory and defining a group of files to be transmitted.

Although the "rules" for ambiguous names are the same as used in CP/M (for the DIR, ERA, STAT commands, and when using PIP), you may not be familiar with them.

An ambiguous name is a way of defining a group of files by something that is common to all the names in the group. The "something-in-common" can be:

     1. They all start with the same character.
     2. They all have a common character in a particular position.
     3. They all have an equal number of characters in the name.

An ambiguous name is specified by defining "wildcards." A wildcard means that any character is acceptable in a particular position. There are two characters used to define wildcards. They are:

     1. The symbol ?
     2. The symbol *

The ? indicates a wildcard only in the position of the ?.

A * indicates wildcards in two ways:

     1. If it is located to the left of the "dot": from the character position in which it is located to the character position in front of the dot.

     2. If it is located to the right of the "dot," from the character position in which it is located to the third character position to the right of the dot.

Both symbols are employed by using them as part of a file name, instead of a character or group of characters.

Examples of the use of ambiguous names are:

   T*.*   means all files starting with the letter T.

   TEST.*   means all files having a primary name of TEST.

   TEST*.*   means all files having a primary name starting with TEST.

   T??.TXT   means all files starting with the letter T, having a primary name no longer than three characters, and a secondary name of TXT.

   .   means all files on the disk.

A toggle is a "software switch". Like a switch, you turn it "off" and "on." A toggle is the means by which an operating mode is changed.

ReachOut contains many "toggles." For example, changing the Help Level from BEGINNER to the Help Level of EXPERT is accomplished by changing a toggle. Another example is changing from using the STANDARD character set to using the ALTERNATE character set.

The way you turn a toggle off and on is by pressing a single key that corresponds to a line on a menu of toggles.

When a toggle is switched (changed), the entire menu is re-displayed, showing the new status by having different text on the appropriate line. A subsequent, and identical, command will change the operating status and the menu text back to what it was.

For example, as distributed, the line of the Configuration Menu that describes the status of the Help Level looks like this:

      H   Help level is: (BEGINNER)

What is conveyed is that the program is currently set at the BEGINNER level, and that by pressing the key (H) the mode will be changed to the EXPERT level.

After the (H) key is pressed, the text changes to

      H   Help level is: (EXPERT)

Then, by pressing the key (H) the mode is changed back to the BEGINNER level and the text says

      H   Help level is: (BEGINNER)

          ****

THE DEFAULT SETTING OF MOST TOGGLES CAN BE CHANGED USING INSTMOD.

If you normally operate the program with a toggle set to a value other than that on the distribution diskette, you can avoid having to change the setting of the toggle each time the program is run by using INSTMOD.COM to change the setting of the toggle semi-permanently. Answer the first question of INSTMOD so as to go directly to the toggles section.

          ****

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THE MENUS AND THEIR RELATIONSHIP

The program has four menus:

1. **The Dialing Menu**: primarily controls dialing functions.

2. **The Control Mode Menu**: controls the major modes of operation, and is considered to be the "main" menu.

3. **The Configuration Menu**: permits you to change the operating characteristics of the modem, or the program as it relates to the modem and other equipment in your system.

4. **The Protocol Menu**: allows you to change from one type¥ of error-checking protocol to another.

The relationship of the menus to each other is depicted below. The arrows indicate how you move from one menu to the others and the commands between each box tell what keys to press:

```
                    |----------|
                    | SIGNON   |
                    |----------|
                         |

                    ( RETURN )

                       \ | /
              |------------------|
              | DIALING   MENU   |
              |------------------|
                   |        / \

                  ( C )    ( # )

                   \  /       |
    |------------------------------------------|
    |        C O N T R O L     M E N U         |
    |------------------------------------------|
        |         / | \       |        / | \

    ( RETURN ) ( RETURN ) ( P )    ( RETURN )

        \ | /        |        \ | /        |
    |------------------|     |------------------------|
    | CONFIGURATION    |     |       PROTOCOL         |
    |     MENU         |     |        MENU            |
    |------------------|     |------------------------|
```
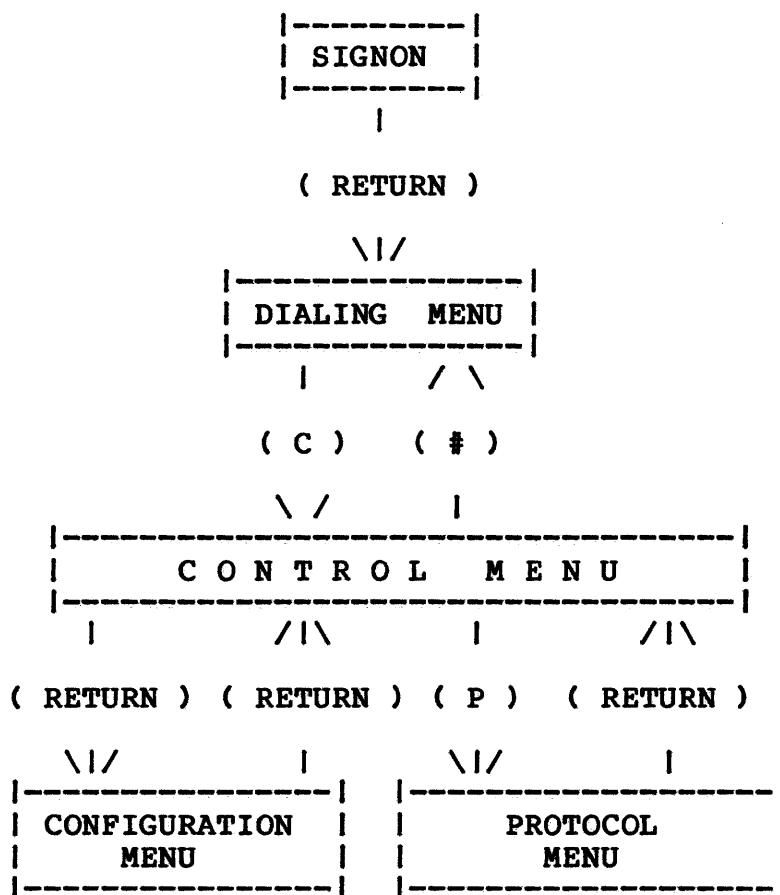
THE SIGNON

The first display of the program is called the signon. It contains a substantial amount of information about the program and the equipment configuration for which it has been installed.

The signon looks like this:

>> ReachOut <<

Version 1.M16A

Applied Computer Techniques
San Rafael, California 94901

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Configured for a
MORROW MODEM, MODEL MM300
controlled by a
MORROW MICRO-DECISION (REV.2)

SET TO 300 BAUD

Lear Siegler ADM-20 Terminal

22K of line-buffer available

NOTE: The line-buffer size (the 22K) will vary with different versions of the program.

The signon is shown for a few seconds, and the program proceeds to the next display.

If the program is configured with the Help Level set to BEGINNER level (as it is distributed) there will be a message following that explains how to access the help system:

For help, press (?) at
any menu, or as an answer
to any file-function question.

Press (RETURN) to continue.

After you read the message about getting help, press (RETURN) and the program will continue.

THE DIALING MENU

Dialing is accomplished from the Dialing Menu. In addition, the
Dialing Menu is used to access other parts of the program when
the program when the call was placed manually, or when you want
to access the Control Mode Menu without making a call.

The Dialing Menu appears on the screen like this:

Dialing menu:

PRESS	IN ORDER TO
D	dial from directory
K	dial from the keyboard
L	re-dial the last number
M	monitor after manual dial
C	go to Control Mode Menu
X	exit to operating system

DIALING: BASIC OPERATION

DIALING FROM THE KEYBOARD

A phone number can be entered from the keyboard. To enter a
number from the keyboard, press (K) while at the Dialing Menu.

ReachOut will respond with:

ENTER NUMBER TO DIAL:

The numbers alone can be entered, but symbols can be included.
For example, 4151234567 will work, but (415) 123-4567 will also.

After the number to be dialed is entered the number is displayed
for confirmation. If the number is confirmed, the dialing begins:

THE NUMBER TO BE DIALED IS: 415 123-4567

which is displayed for a brief period, then erased.

If number is not confirmed, the program re-displays the Dialing Menu.

Dialing progress is shown in one of two ways:

1. With modems that pulse-dial only, by showing one
   digit at a time, as it is dialed:

   DIALING... 415 (etc.)

2. With modems that can "intelligently" dial, the progress
   message is in two parts:

   DIALING IN PROGRESS...

When dialing is completed the following message is displayed:

   DIALING COMPLETED, AWAITING ANSWER... ##

where ## is a number, starting at 20 (the default value), and
decreasing by one number approximately once each second.

--------oOo--------

If the modem detects that the line is busy, the count-down
will be interrupted by a message that says the line is busy
and the count-down will be terminated.

--------oOo--------

ENTRY TO THE COMMUNICATION MODE

When a connection has been established with the other system
the program indicates that the two systems are in contact with
each other by displaying:

   CALL ANSWERED, ENTERING COMMUNICATION MODE...

for a few seconds, and then entering the Communication Mode.
(The Communication Mode permits communication with the other
system by typing from the keyboard.)

If NO answer-tone is detected during the count-down period, the
following message is displayed:

   ++ NO ANSWER; MODEM IS OFF-LINE ++

MINIMUM DIGITS REQUIRED

You cannot dial a number when it contains less digits than were specified as the minimum amount when the program was installed.

The purpose of this requirement is to prevent unintentionally calling an invalid number -- one that contains less digits than a complete phone number. This avoids the count-down process while waiting for the other system to answer, and the re-dial questions that are displayed when there is no answer.

Telephone numbers that contain less digits than the minimum required can be dialed by adding to the digit string as many of the symbol #s as are required to make the total of the digits and the #s equal to the minimum quantity; that is, a # is considered as a digit when the digits are counted.

You may need to pad the dialing string in this way when a "within-the-company" system ("Centrex," PBX) is used because, typically, "within-the-company" numbers use less digits than the numbers used when dialing "outside."

"SECOND" DIAL TONES

If a wait is required for a "second dial tone" -- because of the delay that occurs before an "outside line" is connected, or when making a call using an "alternative long-distance system" such as Sprint or MCI -- a "D" (must be a capital letter) can be included as part of the number -- either in the directory or entered from the keyboard -- at the point where the pause is required.

AUTOMATIC RE-DIALING

When there is no answer on the initial try, re-dialing options for the current call are displayed.

RE-DIAL LAST NUMBER? Y)es; N)o; A)nother C)ontrol mode

If you want to re-dial, you are asked for the number of attempts:

HOW MANY MORE ATTEMPTS? (1-9 or C)ontinuous)

After you indicate the number of attempts, the following prompt is displayed:

HOW LONG BETWEEN TRIES? (0, or 1-9 minutes)

No delay, indicated by pressing (0), will cause the number to be re-dialed as soon as possible after waiting a minimal time (about five seconds) for the line to clear and a dial tone to be re-established. Other delays are in one minute increments.

After you indicate the amount of time between each attempt redialing begins.

If a delay before re-dialing is desired, the following message is displayed:

WAITING BEFORE REDIALING... ##

represents numbers between 60 and 0, counting down. The time between each number is determined by the overall time: if the wait before each retry is one minute, then there is 1 second between each number; if the wait before each retry is five minutes, then the time between each number is five seconds.

If there is no answer after the specified number of retries, the following progress message is displayed:

NO CARRIER AFTER SPECIFIED NUMBER OF RE-TRIES...

and, after a short pause, the retry prompt is again displayed:

RE-DIAL LAST NUMBER? Y)es; N)o; A)nother; C)ontrol Mode:

"ALERT" SIGNAL AFTER DIALING

When connection to the other system is made on the first attempt, the terminal bell will sound for a short period (unless it has been turned off from the Configuration Menu or during the program installation process).

When connection to the other system is made as a result of a re-dial, the bell is sounded for a longer time (about 6 seconds).

Thus, while the program is in the re-dialing mode, the system can be left unattended; you have only to listen for the extended tone, which will summon you when the system is ready for input.

EARLY TERMINATION OF THE ALERT SIGNAL

When the terminal bell is sounded for a long time and you want to by-pass the balance of the signal, press (ESC) or the space-bar.

****

There are special commands that can be added to the dialing string. The commands and their use are discussed in the Section entitled "DIALING: ADVANCED FEATURES."

****

DIALING MANUALLY

Dial the number using your telephone in the normal manner.
Listen for the carrier (the high-pitched tone) from the other
computer. When you hear the carrier, while at the Dialing Menu,
press (M); the program will automatically enter the
Communication Mode when the modem senses the carrier.

From this point, the response of the program is the same as if
the modem had dialed, except that it is NOT possible to execute a
signon script when manually dialing calls.

ADDITIONAL COMMANDS FROM THE DIALING MENU

These are the commands remaining on the Dialing Menu that have
not been discussed:

RE-DIALING THE LAST NUMBER CALLED

After a call is completed, the same number can be re-dialed by
pressing (L) while at the Dialing Menu.

If a sign-on script was used during the previous call, it will be
used again. If the number has a sign-on script associated with
it but the script was cancelled prior to the previous call, the
cancellation will remain in effect when the number is re-dialed.

If the script was cancelled for the previous call but you want
the script to be active for the re-dial, then you must re-display
the telephone directory and make the choice in the usual way.

----------oOo----------

ACCESSING THE CONTROL MODE MENU

The Control Mode Menu is accessed by pressing (RETURN).

EXITING TO THE OPERATING SYSTEM

To exit ReachOut and go to the operating system, press (X).

DIALING: ADVANCED FEATURES

There are commands that can be added to the dialing string.
These commands may provide more convenient operation of the
dialing sequence when making a particular call rather than
accomplishing a special requirement manually.

The dialing commands are:

                  D = wait for second dial tone
                  R = execute ring-back scheme

The commands can be included as part of the number either when
entering a number from the keyboard or by being included in the
telephone directory.

MORE THAN ONE DIAL TONE

If you must first dial a number to get an "outside line" before
dialing the number you wish to call, ReachOut can control the
dialing sequence so that a pause will occur at the proper time.
You will also need to wait for an additional dial tone when using
an "alternative long-distance system" such as Sprint or MCI.

A capital letter "D" included at the proper place in the dialing
string will cause a delay before the remaining portion of the
number is dialed.

The messages displayed when this command is used is described
under the heading **"SECOND" DIAL TONES** six pages before this page.

RING-BACK SYSTEMS

Sometimes a computer will share a telephone line with people.
For example, a computer system acting as a bulletin-board might
be located in a private home that is serviced by only a single
phone line. The computer monitors the phone line through an
auto-answer modem, and the bulletin board software monitors the
rings and determines if control of the computer should be given
to the caller. The way you access the computer, rather than talk
to the people, is to call, ring once, hang-up, and immediately
call again. Usually, the second ring is valid only when it
follows the first ring by no more than 40 seconds.

ReachOut makes satisfying the requirement easy. By placing a
capital "R" after a telephone number the ring once/hang-up/re-
dial scheme will be executed automatically: the first time the
number is dialed the program will wait just long enough for one
ring and then cause the modem to hang-up. It will then re-dial.
After the re-dial, the line will be monitored as usual for an
answer. Progress messages reflect the dialing progress.

DIALING FROM THE TELEPHONE DIRECTORY

A number can be dialed by selecting from a list of choices in a
telephone number directory that is contained in a file called
"TELENUMB.ERS." The directory file is created by the user with a
text-editing or word-processing program. The specifics of how to
make your own directory is explained later in the manual, in the
Section entitled "MAKING A TELEPHONE NUMBER DIRECTORY."

USING THE TELEPHONE NUMBER DIRECTORY

The telephone number directory contains the numbers from which a
dialing choice is made, and the user-chosen label that identifies
each one. The file must be on a disk located in one of three
places: on the logged-in (current) disk, on the A: drive
(commonly called the "boot disk" or "system disk") and, if the
program is installed appropriately, on the one other drive that
was specified for "associated files".

If you want to examine the choices in the telephone number
directory, or dial a number listed there, press (D) while at
the Dialing Menu. The telephone number directory file will be
read-in and displayed.

The sample telephone directory, when displayed, looks like this:

THESE ARE THE DIRECTORY CHOICES:

*=SCRIPT: KEY (^I) TO IGNORE

A=	TELENUMBER LABEL A	B=	TELENUMBER LABEL B
C=*	TELENUMBER LABEL C	D=	TELENUMBER LABEL D
E=*	TELENUMBER LABEL E	F=	TELENUMBER LABEL F
G=	TELENUMBER LABEL G	H=	TELENUMBER LABEL H
I=	TELENUMBER LABEL I	J=	TELENUMBER LABEL J
K=	TELENUMBER LABEL K	L=	TELENUMBER LABEL L
M=	TELENUMBER LABEL M	V=	OUTSIDE LINE
W=	RING-BACK TEST	X=	OUTSIDE & SPRINT
Y=	TELENUMBER LABEL Y	Z=	ALL POSSIBLE TST

NUMBER TO DIAL?

Some of the choices demonstrate either a program feature or error
message. The * indicates which choices have a signon script
associated with them. More about that later.

Make your choice by pressing the letter that corresponds to the
choice. The number is dialed immediately, and automatically,
after the choice is made.

CANCELLING SIGN-ON SCRIPTS

As noted above, when the telephone directory is displayed,
ReachOut determines which numbers, if any, have a signon script
associated with them. However, having a signon script available
does not man that it needs to be executed. Execution of the
sign-on scripts can be temporarily cancelled.

To temporarily cancel the sign-on script of the next number to be
dialed, key (^I) while at the telephone directory.

The program will respond with

     ++ NEXT SIGN-ON SCRIPT WILL BE IGNORED ++

SCRIPT STATUS WHEN RE-DIAL LAST NUMBER

When the Dialing Menu is displayed, the status of the sign-on
script remains the same as it was for the last call, if there was
a call made since the Dialing Menu was last displayed. However,
when the Telephone Number Directory is displayed, the sign-on
script function is made active.

So, if you are re-dialing the last number called, and choose to
do it from the Dialing Menu, rather than the Telephone Number
Directory, the re-dial will be made _exactly_ the same way as the
previous call. If the re-dial attempt is to treat the signon
script differently, you must display the Telephone Number
Directory so that the script function will be set accordingly.

THE COMMUNICATION MODES EXPLAINED

There are two communication modes:

    1. Terminal Mode (full-duplex);

    2. Direct-display Mode (half-duplex).

Each mode can be entered in three possible ways:

    1. Automatically (equipment permitting) when the carrier
       of the other system is detected after dialing;

    2. When a Logging File is created;

    3. From the Control Mode Menu:

        A) By pressing (T) for Terminal Mode
        B) By pressing (V) for Direct-display Mode

NOTE: Which mode is entered, in both case 1 and 2 above, is
      dependent on how the program was "installed." The
      default is Terminal Mode. What mode to use at a given
      time depends on the requirements of the system on the
      "other-end." As a general rule, you will probably be
      using Terminal Mode almost exclusively, but can easily
      switch from one mode to the other.

TERMINAL (FULL-DUPLEX) MODE

The Terminal Mode is used when you are connected to a system that
can echo (return) the characters that you type. Most systems you
will call do this. This is a very functional way of operating,
because what you see on your screen has "traveled" to the other
system and back to you. Thus, you are able to constantly monitor
if what you type is getting to the other system accurately.

If you are connected to a system that does NOT echo, and are in
Terminal Mode, you won't see anything on your screen when you
press keys. If this seems the case, switch to Direct-display
mode by keying ^A and again press some keys. If you now see your
keystrokes note that it is Direct-display mode that should be
used for that system.

DIRECT-DISPLAY (HALF-DUPLEX) MODE

The Direct-display Mode is used when the system to which you are
connected does not have the ability to echo (return) the
characters that you type. This mode is used mostly in those
instances when the "other end" consists of only a terminal
connected to the modem or to someone also using ReachOut who does
NOT have the Echo Option turned ON.

There is a menu of Communication Mode commands displayed each time either of the two communication modes are entered:

```
^A = go to alternate Communication Mode
^B = send a "break" to the other system
^E = erase the line-buffer
^L = turn logging mode OFF / ON
^W = write line-buffer to disk and stay
^X = go to the Control Mode Menu
```

The commands are explained in detail later in various sections of the manual.

GETTING "SYNCHRONIZED"

When calling another system there are usually steps that you must take so that it can get "synchronized" with your system (e.g. the baud rate of your system must be determined).

The most common sequence used to inform the other system that you "are there" is to repeatedly press (RETURN) until the host system responds. (NOTE: Some host systems require repeatedly sending a ^C instead.) While you're doing this, the other system is determining the transmission rate of your system, attempting to "link-up" with it.

When the other system has determined your transmission rate, it will display some sort of signon message, or ask a question, or display a menu, or any combination of these things. It should be easy for you to know what to do from there.

NOTE: With some systems you will have only about ten seconds in which to tell the other system that you "are there" (the fact that the other system answered the call isn't enough). In such a case, if you do NOT press the required key, or at least some key, within the allotted time the other system will hang up.

THE CONTROL MODE MENU

The Control Mode Menu is considered to be the main menu of the program. With the exception of controlling the ON-LINE/OFF-LINE status of a direct-connect modem, it is the "place" from where you activate a program function that does NOT have to do with either hardware or the setting of program toggles. Thus, it is the most frequently-used menu, and the one that is displayed after most operations.

Control Mode Menu:

PRESS	IN ORDER TO
1	create a log
2	rename a file
3	delete a file
4	examine a file
5	log-in a disk
A -> x	display disk directory
-	determine free disk space
O	change from OFF-LINE
P	change transfer protocol
R	receive a file
S	send a file
T	enter Terminal Mode
V	enter Direct-display Mode
#	dial another number
(RET)	go to Configuration Menu
X	exit to operating system

NOTE 1: x = a single letter, B through F, depending on the number, and logical names, of the disk drives in the system.

NOTE 2: The text "change from OFF-LINE" will become "change from ON-LINE" when (O) is pressed.

----------oOo----------

On the several pages following each option shown on the Control Mode menu will be explained.

----------oOo----------

CREATING A LOGGING FILE

A permanent record of EVERY character displayed on the screen can be made by creating a LOGGING FILE. The resulting file can be used in exactly the same manner as a file you prepared yourself: it can be edited, printed, or re-transmitted.

Among the uses of Logging Mode is the review of use of a program or other facility on another computer system, and the retention of data, reports, and messages displayed on the screen. Logging Mode is used for saving electronic mail, since the "mail" is not sent as a file, but is displayed on the screen as a message.

A logging file is created by pressing (1) while at the Control Mode menu.

The factor that limits the amount of data you can save to disk is the free-space on the disk and NOT the length of the line-buffer. ReachOut will report the amount of available space on the disk in the current drive whenever a Logging File is created:

DRIVE X HAS ###K BYTES FREE

    X = the drive letter   ### = the number of bytes

After the amount of free-space is displayed, you will be prompted for the file name. If the file exists, you will be asked if you want to over-write, or examine it:

EXISTS: OVER-WRITE? Y)es, N)o, E)xamine

If you choose to examine it, you will be shown a maximum of three sectors. If there is nothing in the file (it is on the disk in name only) you will be told that there is nothing in the file:

++ THERE IS NOTHING IN THE FILE ++.

After a filename is entered and processed, the program will go to one of the two Communication Modes. Which mode depends on the way the program was installed. The default setting (as comes on the distribution diskette) is Terminal Mode). Whatever is received will be periodically written to the current disk unless you specified a drive when entering the file name (by preceeding it with the letter of the drive, followed by a colon.

There are four types of data NOT written to the disk:

    1. Nulls sent by the other system.

    2. The control character that makes the terminal bell sound.

    3. The control characters ^Q and ^S.

    4. Typing errors corrected by back-spacing and typing over them.

NOTE: Whether the high-order bit is stripped from each
      character prior to being placed in the line-buffer is
      dependent on the setting of the Parity-processing
      toggle. The setting of this toggle is determined by
      examining the Configuration Menu.

THE LINE-BUFFER

When in Logging Mode, characters both received and transmitted
are stored in a portion of the computer's memory not used by the
ReachOut program or by the operating system before being written
to the disk. Memory used for this type of temporary storage is
called a "buffer" and in this case, and in this manual, it is
called the "line-buffer." When the line-buffer gets full, disk
writes occur automatically. When a break-out request is keyed,
the contents of the line-buffer that has been yet been written to
the disk is saved to the file and the file is closed.

When a disk-write occurs automatically, the characters "coming
down the line" are NOT lost: before the disk write, a "stop"
command is sent to the other system and any characters arriving
before the other system responds to the stop command are stored.
When the disk write is completed, the stored characters are
processed in the usual way, and a "start" command is sent to the
other system and normal transmission is resumed.

ReachOut automatically determines the maximum amount of memory
space that is available for use as the line-buffer and displays
it as part of the signon.

The time to fill the line-buffer, and thus the time to the first
disk-write, is determined as follows:

        For each "K" of space in the line-buffer, it will take
        approximately 36 seconds to transfer "1 K worth" of data
        when operating at 300 baud. Thus, in a system with a line-
        buffer size of 22K, it would take 13.2 minutes to fill it

The times in the example assume <u>continuous transmission</u> . In
reality, it probably will take significantly longer.

"LOGGING-ACTIVE" FLAG

While in the Logging Mode, and with Logging being active, you
will be constantly reminded by the symbol pair L) being displayed
on the left-most portion of each line.

TEMPORARILY SUSPENDING LOGGING

Logging activity can be temporarily suspended while remaining in
Logging Mode. You would want to do this if there is "something

coming" that you don't want to log, or if you wish to change the
configuration of the equipment or the program without first
writing to the disk and closing the file.

To suspend the Logging Mode, key ^L

When logging is not active, the symbol pair L) is not displayed.

RE-ACTIVATING LOGGING

When you have suspended Logging Mode and wish to activate it
again, key ^L

When logging is made active, the symbol pair is again displayed.

EXITING THE LOGGING MODE

You exit the Logging Mode when you no longer want to save to disk
what you are seeing on the screen.

There are two ways to exit the Logging Mode:

        1. Exiting and going to the Control Menu;

        2. Exiting and remaining in Communication Mode.

The two ways are explained in detail:

EXITING THE LOGGING MODE TO SAVE THE LINE-BUFFER
AND STOP COMMUNICATING OR TO MAKE ANOTHER LOGGING FILE:

To exit the Logging Mode and go to the Control Menu, key ^X (or
some other "break-out" character you specified). You will be
asked to confirm the exit request by the display of the prompt

        Confirm exit with 2nd ^X or (RETURN)

If keying the break-out character was a mistake, press (RETURN)
to stay in the Communication Mode.

If the first break-out character is confirmed, any data that has
not yet been written to the disk will be saved to the disk and
the Control Mode Menu will be displayed.

If you want to start another logging file, then press (1) and
enter the name of the file. After the file is created, the
program will automatically enter the Communication Mode.

EXITING THE LOGGING MODE AND CONTINUE COMMUNICATING:

If you want to save the contents of the line-buffer but do NOT

want to continue logging under a new file name, then key ⌃W.

The same as when you key the break-out character, you will be asked to confirm the exit request.

HOW TO DETERMINE IF YOU ARE IN THE LOGGING MODE

When you are in Logging Mode, and the mode in active, the symbol pair "L)" appears at the far left of the line the cursor is on.

When you are in Logging Mode, but the mode is INactive, then the symbol pair "L)" is not displayed on the current line.

If symbol pairs "L)" appear above the current line, then it is an indication that you are in Logging Mode but the mode is INactive.

If an action is attempted that is inappropriate unless you are in Logging Mode, the error message

      ++ NOT IN LOGGING MODE ++

will be displayed.

<div align="center">

ERASING THE LINE-BUFFER

</div>

When in the Logging Mode, there is NO REQUIREMENT to save data that has been displayed, but not yet been written to the disk. That is, the contents of the line-buffer can be erased before any of the data has been written to the disk.

You can erase the line-buffer by keying ⌃E while in the Logging Mode. A prompt will ask you to confirm the command.

If the ⌃E is confirmed the line-buffer will be erased. The space then available is the same as if you just started to log or a disk write just occurred. If the ⌃E is not confirmed, the program will continue as though there had been no interruption.

Any characters "coming-down-the-line" from the other system during the re-setting process are NOT lost. A technique similar to the one employed when there is an automatic disk-write is employed when the pointer is being re-set.

The erasing feature enables you to enter the Logging Mode knowing that you don't want to save to disk any preliminary commands and responses leading-in to what you did want to save. Just erase the line-buffer JUST BEFORE what you want to save is transmitted.

OTHER USES OF LOGGING MODE

The Logging Mode can be used to do minor "word-processing."
There are two reasons why you might need to do word-processing
while using ReachOut:

1. To make a list of files to transmit in batch mode.

2. To pre-type electronic mail before placing a call.

There are two reasons why you might want to use the Logging Mode
instead of an actual word-processing program,

1. Convenience. This is especially true if the disk
   storage capability of your system is such that ReachOut
   and a word-processing program could not both fit on the
   same disk, and you were using your system in a way that
   required them to both be on the same disk: both on the
   "system disk."

2. Necessity. You might not have a word-processing program.

3. Maintaining the communication connection while
   preparing a list of files to send vua batch mode.

To use the Logging Mode as a word-processor:

1. Create a file by pressing (1) while at the Control menu.

2. After the file is created, if ReachOut does NOT go into
   the Terminal Mode, than key ^A while in the Terminal Mode.

3. Type as needed, including correcting mistakes by keying
   ^H to back-up one character space.

4. When done typing, save what you typed by keying ^X (the
   break-out character) and confirm it with a second one.

5. Continue as required.

NOTE: When the Logging Mode is used to prepare a list of
      files to send in batch mode the characters that you
      type will be sent through the modem to the other system.
      This won't cause any problem if you make sure that the
      other system is in a state where receiving the
      characters will not cause it to do anything undesirable.

RENAMING A FILE
(Same as CP/M "REN" command.)

To rename a file, press (2) while at the Control Mode Menu.

The program will ask

NAME OF FILE TO RENAME?

After the file name has been entered, a search will be made for it on the current disk, or another disk if you specified another disk by preceding the file name with a drive letter and a colon.

If the file IS found, the program will ask

NEW FILE NAME?

If the file is NOT found, the program will say

++ CAN'T FIND THE FILE "dr:filename.filetype" ++

The file may not have been found merely because you mis-typed the name. Thus, by displaying the name you typed, you will know if you made a typing error. Note that the drive letter is also shown. Perhaps you typed the name correctly, but the file isn't on the drive you are logged-into or the one you specified before the filename. In that case, when the file-function question is asked again, precede the file name with the letter of the drive the file is on, followed by a colon.

After displaying the error message for a brief period, the error message will be erased and the "NAME OF FILE TO RENAME" prompt will again be displayed.

When the correct name is entered and the file is found, the prompt

NEW FILE NAME?

is displayed.

When the new file name is entered, the progress message

RENAMING FILE

is displayed and, after a moment,

UPDATING DISK DIRECTORY

will be displayed.

When the rename function has been executed, the program returns to the Control Mode Menu input mode.

DELETING A FILE
(Same as CP/M "ERA" command.)

To delete a file, press (3) while at the Control Mode Menu.

The program will ask

NAME OF FILE TO DELETE?

After the file name has been entered, the program will look for it on the disk. If the file IS found, the program will ask

CONFIRM DELETE FILE "dr:filename.filetype" (Y/N) ?

When you press (Y), the progress message

DELETING FILE

is displayed and, after a moment,

UPDATING DISK DIRECTORY

will be displayed.

When the delete function has been executed, the program returns to await Control Mode Menu input.

----------oOo----------

If you press (N) in response to the confirmation question, the message

++ FUNCTION CANCELLED ++

is displayed and, after a brief period, the message is erased and the program returns to await Control Mode Menu input.

If the file is NOT found, the program will say

++ CAN'T FIND THE FILE "dr:filename.filetype" ++

The file may not have been found merely because you mis-typed the name. Thus, by displaying the name you typed, you will know if you made a typing error. Note that the drive letter is also shown. Perhaps you typed the name correctly, but the file isn't on the drive you are logged-into or the one you specified before the filename. In that case, when the file-function question is asked again, precede the file name with the letter of the drive the file is on, followed by a colon.

After displaying the error message for a brief period, the message will be erased and the "NAME OF FILE TO DELETE" prompt will again be displayed.

EXAMINING A FILE
(Same as CP/M "TYPE" command.)

You can examine a disk file by using the Examine function.

The Examine function is activated in two ways.

1. By pressing (4) while at the Control Mode Menu. In this mode, the entire file can be examined. To pause while the file is being displayed, key ^S. To re-start the display, key ^S again. To abort the function before the end of the file is reached, press (ESC).

2. When an attempt is made to create a file whose name already exists on the disk, you will be prompted with

   FILE EXISTS: OVER-WRITE? Y)es N)o E)xamine

   Pressing (E) will cause about "one screenfull" of the file to be displayed (the number of lines of the screen, less a few lines to allow space for the prompt that follows). This way, you can quickly determine the general content of a file, so that you can decide if you want to erase it, rename it, or use a different name for the incoming file.

In either mode, if the file contains nothing, a message will tell you that there is nothing in the file.

LOGGING-IN A DISK
(Same as CP/M "^C" command.)

Whenever a disk is physically changed, or you "move" from one disk to another, the affected drive must be "logged-in." Logging-in a disk provides the operating system with essential information about the disk: what files are present, how much space they occupy, and where on the disk they are located.

To log-in a disk, press (5) while at the Control Mode Menu, followed by pressing the key that corresponds to the letter-name of the drive containing the disk to be logged-in.

If the disk is successfully logged-in, the message

   DISK IN DRIVE X: HAS BEEN LOGGED-IN

will appear, where X is the letter of the drive.

A drive name letter not specified in the installation procedure will cause the error message **++ ILLEGAL DRIVE SPECIFIED ++** to be displayed.

DISPLAYING A DISK DIRECTORY
(Same as CP/M "DIR" command.)

You can display a list of the files contained on a disk in any
drive in the system in three ways:

1. At the Control Mode Menu: press the key that
corresponds to the name of the drive which contains
the disk whose file names you want to list.

2. Current disk: when in a file-function mode (when a file-
related question, like "NAME OF FILE TO CREATE," is being
displayed), by pressing (RETURN).

3. Other than the current disk: when in a file-function
mode, by pressing the key that corresponds to the drive
containing the disk whose directory you want to view,
then a colon (:), and then (RETURN).

STOPPING/STARTING THE DIRECTORY DISPLAY

If the disk directory is too long to fit on your screen you can
temporarily stop the writing of the display by keying ^S.

To restart the display, key ^S again.

After you read the directory, pressing (RETURN) will clear the
screen and restore the question that you were just being asked.

If you want to abort the display, press (ESC).

After leaving the directory function, the program will return
to "where you were" when the directory mode was entered; that is,
the Control Mode Menu or a file-function question.

DETERMINING FREE DISK SPACE

The term "free disk space" refers to the space available on a
disk for the storage of new data.

To determine the available space on the disks that have been
logged-in, press (-) while at the Control Mode Menu.

The free space will be displayed like this:

    A: ### K BYTES FREE   B: ### K BYTES FREE

and, after a brief period, the display is erased and the program
returns to the Control Mode Menu and awaits input.

CONTROLLING ON-LINE/OFF-LINE STATUS

NOTE: This feature applies only if the program is installed for an auto-dial modem.

You can control the modem being on-line or off-line from the keyboard via the Control Mode Menu.

The text of the menu on the line starting with the letter "O" indicates the current status of the modem.

Pressing the (O) key will change the modem from the current state to the opposite state.

When the modem is used to dial a number, or when the call is made manually and the modem used to monitor the line for a carrier, and a carrier is detected, the modem will always be on-line the first time you see the Control Mode Menu. After that, whether or not the modem is on-line depends on you taking the modem off-line from the Control Mode Menu or your answer to questions prior to a file transfer.

Sometime you may be talking to a person on the telephone and during the conversation decide that you want to transfer a file. Both modems must, of course, be on-line before the transfer can begin. Getting the modem(s) on-line could be handled as a function separate from whether you are going to be sending or receiving: you could control the modem manually, from the Control Mode Menu, returning to set-up to transfer a file, but ReachOut makes keeping track of the "line-status" of the modem care-free. Just enter the SEND or RECEIVE mode, and the modem will placed on-line automatically. Using this automatic mode, when the questions that are asked prior to transferring a file are displayed, the question about hanging-up at the end of the transfer will NOT be asked. At the end of the transfer, because it was put on-line automatically, the modem will be taken off-line automatically. This feature keeps the carrier tones off the line so that you can talk between transfers without manually controlling the modem.

NOTE: You still must manually control whether your modem will "be originate" or "be answer." This is done from the Configuration Menu and needs to be done only once.

CHANGING FILE-TRANSFER PROTOCOLS

Determining the current file-transfer protocol and changing the protocol is done from the Protocol Menu. The Protocol Menu is accessed from the Control Mode Menu by pressing (P).

In addition to its own transfer protocol that uses a 16-bit CRC, ReachOut is compatible with the file-transfer error-detection-and-correction protocols of public-domain programs ("MODEM7" and its companion programs using either the "Christensen" protocol or the CP/M Users Group CRC) and some commercial programs.

The Protocol Menu looks like this:

Protocol Menu for file transfer:

Current protocol is item (1)

PRESS	TO CHANGE THE PROTOCOL
1	ReachOut-to-ReachOut
2	Christensen (CKSUM)
3	CP/M User's Group (CRC)
4	Echo-plex

OR PRESS

(RET)   to go to the Control Mode Menu

The current protocol is shown within the parenthesis. If it does not show the protocol you want, press the key corresponding to the protocol you do want and the status will be updated.

IN ORDER FOR TWO COPIES OF THE PROGRAM TO WORK TOGETHER, THE PROTOCOL OF EACH MUST BE SET TO THE SAME CHOICE.

For the most accurate and convenient transfers, select protocol 1.

TRANSFERRING FILES

FILE TYPE COMPATIBILITY

All files (data, text, and programs in executable form) can be transferred in the "ReachOut-to-ReachOut" file transfer mode, or between your system and a system using a program listed on the Protocol Menu or using the Christensen "MODEM" protocol.

WORDSTAR FILES

WordStar files (created using the WordStar document mode only) are different than files produced by most other word-processing programs. This could affect sending such a file to a "7-bit system." An example of a 7-bit system is CompuServe, The Source, or most private main-frame type of time-sharing systems.

Although the ASCII character set defines all the characters on the typewriter keyboard (and then some) using only 7 bits, WordStar uses the 8th bit (the high-order bit) to contain special information about some of the characters: to differentiate between spaces and carriage-returns typed by the user and those that WordStar put in the file itself.

When the eight bits are received by a 7-bit system, the 8th bit is ignored and, although the fundamental character information of the file is retained, the WordStar-information is lost. Thus, if you are sending a WordStar document to someone who will be editing and/or printing the file using WordStar "through" a third-party computer in the form of "electronic mail" the file should be processed before it is sent so as to convert it to a form that can be transferred without loss of this information. The receiving party can then re-process the file and restore it to its original form.

----------oOo----------

A WordStar file is converted and restored like this:

To convert the file to 7-bit (Intel hex) format use the UNLOAD program included on the distribution disk. You type

> UNLOAD filename.filetype
> (The output filename is filename.HEX)

The receiving party can convert the file to 8-bit form using the LOAD program that comes with CP/M. They type

> LOAD filename.filetype
> (The output filename is filename.COM, and must be renamed manually.)

NOTE: The size of a file processed with UNLOAD is almost three times the size of the pre-processed file.

WITH WHOM CAN YOU TRANSFER FILES?

RECEIVING

1. From any system that you can communicate with using a simple terminal connected directly to a modem. Examples are CompuServe, The Source, the ITT TELEX system (300 baud nodes) or a mainframe system that "talks ASCII" (not BI-SYNC or SDLC). Communication with such a system is limited to transfers without error-checking. Data is "captured" using the Logging Mode.

2. Another system using ReachOut, with error-checking.

3. Another system, with an operator in attendance, using the CP/M User's Group program MODEM7 or an earlier version.

4. A "Remote CP/M" system, with NO operator in attendance, using the program XMODEM that is on such systems.

5. Another system, with an operator in attendance, using the

Details of transferring with various systems is discussed later.

SENDING

1. To any system that you can communicate with using a simple terminal connected directly to a modem. Examples are CompuServe, The Source, the ITT TELEX system (300 baud node) or a mainframe system that "talks ASCII" (not BI-SYNC or SDLC). Communication with such a system is limited to transfers without error-checking, or error-checking using the Echo-plex mode of operation. Transfers are limited to DATA files (no 8-bit object code). A file is sent using the Rapid-typing Mode of ReachOut.

2. Another system using ReachOut, with error-checking.

3. Another system, with an operator in attendance, using the CP/M User's Group program MODEM7 or an earlier version.

4. A "Remote CP/M" system, with NO operator in attendance, using the program XMODEM that is on such systems.

THE TWO TRANSFER MODES

A file can be transferred in two modes:

> 1. WithOUT error-checking;
>
> 2. WITH error-checking.

WITHOUT ERROR-CHECKING

RECEIVING

A file is received withOUT error-checking in instances where the computer system to which you are connected does not have an error-checking routine that is among the choices provided by ReachOut but whose "file dumps" can be under your control.

This mode is activated by pressing (R) while at the Control Mode Menu, and answering the question WITH ERROR-CHECKING? (Y/N) by pressing (N).

SENDING

When a file is sent withOUT error-checking, what is sent "down the wire" is, in effect, no different than if you typed the same information at a steady rate equal to the speed of the modem -- 30 characters per second -- rather than at your typing speed. A file sent this way is merely "dumped" to the modem, the same as if the modem was a printer, and in the context of ReachOut this type of transfer is called "Rapid-typing."

When a file is transferred in this way nothing is done, by either system, to determine if it was received accurately. So, if there is a line disturbance during the transfer (possible causes: a "Call-Waiting" tone on either phone, a weak carrier, or someone picking up an extension telephone at either end and attempting to dial) the data could get "garbled," and if so, the data processed by the receiving system would contain errors.

A file would be sent this way (withOUT error-checking) in instances where the receiver has only a terminal connected to their modem, the computer system to which you are connected is set-up to handle only data sent from a terminal connected to a modem, or the system does not work with any of the error-checking routines that is among the choices provided by ReachOut. This mode is especially handy when leaving messages on an "electronic mail" system: text typed prior to making the phone call is sent.

This mode is activated by pressing (S) while at the Control Mode Menu, and answering the question WITH ERROR-CHECKING? (Y/N) by pressing (N).
WITH ERROR-CHECKING

RECEIVING

When a file is received WITH error-checking, the integrity of the
data received is assured. This is because as each sector is
received it is processed through a mathematical formula and the
result is compared to the same processing done by the sending
system. After the software controlling the receiving system has
determined whether the data was received correctly is sends an
"OK" or "NOT OK" signal to the sending system. If there was an
error, the segment containing the error will be re-transmitted.
Thus, if the line is disturbed such that a data error results, the
program will detect the error and ask the sending system to re-
transmit the bad data segment.

The specifics of this "hand-shaking" can vary. Accordingly,
ReachOut supports more than one error-checking scheme. In use,
two things must be true: THE PROTOCOL SELECTED MUST BE
COMPATIBLE WITH THE OTHER SYSTEM and the protocol-mode of
transfer must be "activated."

What protocol ("hand-shaking" rules) is in effect depends on the
protocol that is selected as current, from the Protocol Menu.

In the receiving mode, a transfer with protocol is activated by
pressing (R) while at the Control Mode Menu, and answering the
question WITH ERROR-CHECKING? (Y/N) by pressing (Y).

SENDING

When a file is transmitted WITH error-checking, the integrity of
the data received is assured. This is because as each sector is
sent, it is processed through a mathematical formula and the
result is sent to the receiving system. The receiving system
processes the data through the same formula, compares the
results it got with that of the sending system, and sends an "OK"
or "NOT OK" signal to the sending system. If the signal is "OK"
the next data segment (sector) is sent. If there is a mis-match,
the data segment is re-transmitted. Thus, if the line is
disturbed such that a data error results, the program will detect
the error and re-transmit the segment containing the bad
information until it is received without error.

The specifics of this "hand-shaking" can vary. Accordingly,
ReachOut supports more than one error-checking scheme. In use,
two things must be true: THE PROTOCOL SELECTED MUST BE
COMPATIBLE WITH THE OTHER SYSTEM and the protocol-mode of
transfer must be "activated."

In the sending mode, a transfer with protocol is activated by
pressing (S) while at the Control Mode Menu, and answering the
question WITH ERROR-CHECKING? (Y/N) by pressing (Y).

TYPES OF ERROR-CHECKING PROTOCOLS

ReachOut supports a variety of error-checking protocols.

The types of error-checking possible with ReachOut are:

1. Echo-plex   (least accurate, universal, but slow)
2. Checksum comparison (reliable, and very common)
3. CRC comparison   (most accurate, but not common)

ECHO-PLEX

Sometimes you may want to insure that the other system has received information correctly, but the other system is not using ReachOut, or any compatible program. A special feature of ReachOut provides a method of determining if data has been accurately transmitted to any system that can echo the characters received by it.

Using this scheme, ReachOut waits for the receiving system to echo each character sent before the next one is sent. Only when the echoed character matches the one that was sent does ReachOut send the next character.

If a mismatch occurs, file transfer is suspended. The operator is given the choice of ignoring the error and sending the next character, sending the same character again, or aborting the transmission.

The Echo-plex error-checking mode is intended for ASCII files only, and NOT binary files (i.e.,".COM" files). However, text files CAN be sent and the echoed character checked against the character sent. (This is because only the first 7 bits are checked: the high-order bit is ignored; WordStar files are OK.)

There are some very specific conditions under which the echoed character is NOT checked: some systems respond to the receipt of a carriage-return by sending a carriage-return AND a line-feed. So, when a carriage return is sent (by you) ReachOut will test the first character echoed, but NOT the one that follows it.

Using the Echo-plex mode of error-checking does have a "trade-off": the transfer time is doubled.

The Echo-plex protocol is activated through the Protocol Menu. The Protocol Menu is displayed by pressing (P) while at the Control Mode Menu. The Echo-plex protocol is protocol 3.

CHECKSUM COMPARISON

The checksum file-transfer protocol processes the characters of
each sector (which contains 128 characters) "through" a simple
mathematical formula: starting with 0, the ASCII value of each
character is added to the value of the character preceding it.
When a sector has been transmitted, the sending system sends the
receiving system the result of the mathematical processing.
The receiving system compares this value to the value it got when
it calculated the checksum using the same formula. If the value
is the same, the receiving system tells the sending system that
the sector was received accurately, and the sending systems sends
the next sector. If the values are not the same, the receiving
system tells the sending system that an error has occurred and
the sector is sent again.

The checksum error-detecting method is used by all the
telecommunication programs available through the CP/M User's
Group and the commercial programs that are compatible with them.

CRC COMPARISON

The CRC ("Cyclic Redundancy Check") method of error-detection is
the most reliable, with a "reliability factor" exceeding 99.99%.

Using this method, the data is processed through a complex
mathematical formula -- on a sector-by-sector basis -- by both
the sending and receiving system. CRC checking is an improvement
over a simple checksum, because the more complex numerical
manipulation virtually eliminates the possibility of error. In
fact, the same sort of scheme is used internally in the computer
when writing to the disk.

CRC error-detecting is used by the ReachOut protocol, some other
commercial programs, and as one of the two protocols of the
somewhat recently upgraded telecommunication programs circulated
by the CP/M Users Group.

File-transfers, in any error-checking protocol mode, are made by
using the (R) and (S) options of the Control Mode Menu then,
in response to the question

WITH ERROR CHECKING? (Y/N)

by pressing (Y).

----------oOo----------

ReachOut-to-ReachOut protocol
uses the CRC method of error-checking.

----------oOo----------

DETERMINING THE ERROR-CHECKING PROTOCOL

ReachOut supports more than one error-checking scheme. The various protocols are selected from the choices found at the Protocol Menu.

To determine or change a protocol, go to the Protocol Menu by pressing (P) while at the Control Mode Menu:

Protocol Menu for file transfer:

Current protocol is item (1)

PRESS	TO CHANGE THE PROTOCOL
1	ReachOut-to-ReachOut
2	Christensen (CKSUM)
3	CP/M User's Group (CRC)
4	Echo-plex

OR PRESS

(RET)	to go to the Control Mode Menu

Determine the current protocol, change it if necessary, and return to the Control Mode Menu by pressing (RETURN).

File-transfers, in any error-checking protocol mode, are made by using the (R) and (S) options of the Control Mode Menu then, in response to the question

WITH ERROR CHECKING? (Y/N)

by pressing (Y).

THE PROTOCOL SELECTED MUST BE COMPATIBLE WITH THE OTHER SYSTEM.

THE REACHOUT-TO-REACHOUT PROTOCOL

Transferring files with ReachOut is the most automatic when both systems are using it, and data integrity is assured.

When both systems are using ReachOut, and both systems are set to the ReachOut-to-ReachOut file-transfer protocol, there is substantially more than the usual amount of "hand-shaking" between the systems. This enables the following:

1. Files can be sent individually, with the estimate of transfer time being displayed on both systems. The name of the received file is determined by the receiving operator.

2. Files can be sent as a batch. A batch can be specified ambiguously or by a list of file names contained in a file.

   The size of the batch, an estimate of the time to transfer the batch, the number that the current file is of the batch, and an estimate of the time it will take to send the current file is displayed on both systems. The names of the received files is determined by sending system: a received file will have the same name as it has on the sending system.

3. Files can be sent in a "hybrid" mode: with the receiving system in Batch Mode, the operator of the sending system can send files as a manually-controlled series. Before each file is sent, the operator of the sending system is asked if the current file is the last one. When it is not, the receiving system will "recycle" after the current file is received so that it can receive another file.

   To the receiving system, it seems like a batch transfer, except that the information normally displayed with an actual batch transfer is <u>not</u> displayed on either system (size of batch, transfer time of the batch, the number of files in the batch, the number the current file is in the batch). The size of the current file, and the estimate of its transfer time, is still displayed. In addition, the number the current file is in the series is displayed. When the current file has been identified as the last one in the series by the sending operator, the transfer will automatically terminate after it is received.

   Since, once it "gets going," the transfer takes place unattended, the names under which the files will be received is controlled by the sending system, the same as in batch mode.

   This "series mode" of operation is useful when files from different disks are being sent: while the receiving system is attempting to tell the sending system to start transferring the next file, the sending operator can quickly log-in a new disk, re-enter the single-file/series mode, and send the next file.

EXAMPLE OF "BATCH REPORT"

An example of the screen displayed, on the receiving system, when a batch is being transferred, at 300 baud, and the first file has just recently started to be transferred, looks like this:

ReachOut-to-Reachout protocol   > IN BATCH MODE <
------------------------------   --------------

OVERALL BATCH SIZE IS 67.7 K

REMAINING >BATCH< TRANSFER TIME:
 -- INCLUDING CURRENT FILE --

    61 MINS.: 5 SECS.

TOTAL FILES IN BATCH: 5

THIS FILE IS NUMBER   1

CURRENT FILE: "B:REACHOUT.COM"

FILE SIZE: 218 SECTORS

ESTIMATED FILE TRANSFER TIME:

    24 MINUTES.: 31 SECS.

    RECEIVING SECTOR #   5

With each successive file transfer, the value under the heading

    REMAINING >BATCH< TRANSFER TIME:
     -- INCLUDING CURRENT FILE --

is reduced by the amount of time taken by the previous file.

Thus, in the example, when file # 2 begins to be sent, the remaining time for the batch would be 36 MINS.: 34 SECS.

You can determine how much time remains, considering the portion of the current file already sent, you merely note the needed information from the screen and do a simple mental subtraction.

Example:

If the time for the remaining portion of the batch is 30 minutes, and the entire current file will take 10 minutes, but you can tell by comparing the current sector to the number of sectors in the current file that one-half of the current file has already been sent, then the time remaining would be 25 minutes.

TRANSFER-MODE COMPATABILITY CHECK

When using the ReachOut-to-ReachOut file-transfer protocol, there is an automatic check of the compatibility of the transfer mode between the sending and receiving system. The test is made by the receiving system. If the transfer modes (single-file, manual-series-of-files; batch) are different, the receiving system will automatically change to the proper protocol.

The "rules" of the compatibility check are:

a) When the receiver is in single-file mode, and so is the sender, the transfer proceeds without event;

b) When the receiver is in batch mode and the sender is Also in batch mode, the transfer proceeds without event;

c) When the receiver is in single-file mode, and the sender is in batch mode, the receiver is changed into batch mode, and the file just created will be deleted;

d) When the receiver is in batch mode, and the sender is in single-file mode and sending only one file, the receiver is changed into single-file mode and the receive mode will terminate after the file is sent; Batch information is not displayed.

e) When the receiver is in batch mode, and the sender is in single-file mode and sending more than one file, the receiver is changed into single-file mode and stays in that mode until the sender has sent the last file. Batch information is not displayed.

In the instance of items c, d, and e, error and progress messages are displayed as appropriate. Since "switch-over" messages are displayed only once, it is a good idea to watch the terminal screen until the transfer of the content of the first file begins (when the sector numbers start counting-up).

DISK-SPACE CHECK

In any mode of the **ReachOut-to-ReachOut** protocol, the size of the
current file is sent before the file itself. The receiving disk
is tested to determine if there is enough space to hold the file.
If the disk will NOT hold the file, an error message is displayed
on both systems and the file is not sent. At the end of the
transfer, a list of files that "didn't make it" is displayed, on
both systems. In addition, a list of the same files are written
to a file. The file is called TOOBIG.LST. It can be used

1. To review for general information, just to remind you
   what files were not sent (using the Examine function);

2. To print-out a paper copy (using the operating system or
   a word-processing program);

3. To control the re-transmission of the files. This is the
   main purpose of creating the file: once the disk on the
   receiving system has been replaced with one that has
   enough space, the operator of the sending system using
   the file TOOBIG.LST to define the batch.

DUPLICATE-NAME CHECK

Each incoming file name is checked for duplication on the
receiving disk. If the name exists, the name of the file on the
disk is changed: the file type (the three character positions
after the "dot") is changed to **TMP**. When this occurs, an error
message is displayed on the receiving system. When the transfer
is complete, the operator of the receiving system is shown an
appropriate message and has full control over how the file pairs
(temporary name and incoming name) will be named.

There are presently more that 200 privately operated, public-access microcomputer systems around the country. The software that runs these systems originated from the CP/M User's Group, and was authored by Ward Christensen, and friends, in 1979.

Some systems have a "mail" capability. Using this facility you can access useful information about specific subjects and also leave questions that might be answered by someone hundreds of miles away. Some systems provide a seemingly endless supply of public-domain (free) software. Some systems have both features. With these systems you can have a lot of fun, learn something, and also obtain a wealth of software, all at the maximum price of a phone call.

Although "mail" messages are transferred by simply displaying them on the screen -- thus enabling you to "capture" them by using the Logging Mode of ReachOut -- software, and other individual files, are transmitted using an error-correcting method so as to insure the accuracy of transfer.

There are two telecommunications programs available from the CP/M Users Group. The programs are called MODEM or XMODEM, and various versions have version numbers attached to their name: MODEM75.COM is MODEM, version 7.5. MODEM is the program that is used by someone calling a remote CP/M System. XMODEM is the program on the remote system that is run by the caller to transfer a file. When both systems have an operator in attendance both systems will use MODEM.

The original programs contain a error-detection-and-correction protocol devised by Mr. Christensen and, accordingly, it is generally referred to as the "Christensen protocol." As part of an error-checking-and-detection scheme, the Christensen protocol passes from the sending system to the receiving system the current sector number, the "complement" of the sector number, the data contained in the sector, and a check-value of the data.

The checksum protocol is not 100% reliable. As an illustration, assume that a file contains alphabetical data. If a particular sector contained an A and a Z, and line noise caused the A to be changed to a Z and the Z to be changed to an A, the checksum would be the same, and would erroneously imply that the current sector was received accurately.

In 1981 a CRC error-detecting scheme was incorporated into the program. This protocol known as the "CP/M Users Group CRC." Those versions that are also CRC-capable indicate so when the program is being used. When a calling party requests CRC transfer from XMODEM, a special code is sent (as the signal to start transmitting) that will automatically switch a CRC-capable version XMODEM to the CRC mode. Otherwise, the Christensen protocol will be in effect.

COMPATIBILTY WITH OTHER PROGRAMS

Compatibilty with other commercial programs is possible under the following modes of operation:

1. Some programs support the Christensen protocol ("MODEM7," etc.). If you want to transfer a file to one of these systems, use protocol 2 of ReachOut.

2. A) When receiving, use the Logging Mode of ReachOut and the "file dump" mode of the other program, if it has such a mode.

   B) When sending, use the NON-error-checking mode of ReachOut ("rapid-typing" and the "data capture" mode of the other program, if it has such a mode.

FILE COMPRESSION

ReachOut comes with two public domain programs that are provided
free of charge. The two files are SQUEEZ.COM and UNSQUEEZ.COM.
They are used together to minimize file-transfer time.

SQUEEZ is used to compress a file which is transmitted, and
reduces the size of programs in executable form (binary files)
approximately 10% and a text or data file approximately 40%.

SQUEEZ processes files by their normal name, and produces a
second file having the same name, except that the second
character of the file type is replaced by the letter Q:

        LETTER1.DOC will result in the file LETTER1.DQC

UNSQUEEZ is used by the receiving party to convert the squeezed
file back to its original form.

UNSQUEEZ processes files by the name given them by SQUEEZ, and
produces a second file having the same name as the original:

        LETTER1.DQC will result in the file LETTER1.DOC

When the expansion is complete, you may delete the squeezed file.

Each of the programs are used by typing the program name, pressing
the space-bar, typing the name of the file to be processed, and
pressing (RETURN), like this:

        SQUEEZ dr:filename.filetype   to compress a file

        UNSQUEEZ dr:filename.filetype   to expand a file

The drive name is optional; if not specified, the file is
assumed to be on the current drive.

              ---------oOo---------

     File compression and restoration can NOT be used unless
     both systems have access to the required programs. So,
     you would NOT use SQUEEZ to process a file that was being
     sent to a public data base like CompuServe or The Source.

              ---------oOo---------

Both "SQUEEZE" and "UNSQUEEZ" were written by

                    Richard Greenlaw
                    251 Colony Ct.
                    Gahanna, Ohio 43230

FILE ENCRYPTION

ReachOut comes with a pair of programs that should be useful when security is a concern to you. Used together, they will encode a file using a password and decode the file when the same password is used. The programs are in the public domain and are provided free of charge. Both programs were written by Ward Christensen. The programs are identical and were originally called "SCRAMBLE." We have provided two copies of the same program under different names because it makes using them much easier to understand.

The two files are ENCODE.COM and DECODE.COM.

ENCODE is used by the sending party to encode a file using a password. The encoded file is sent and decoded by the receiving party who knows the password.

DECODE is used by the receiving party to decode a file using the same password that was used by the sending party.

Each program is used by typing the program name, pressing the space-bar, typing the name of the file to be processed, and pressing (RETURN). The password must be eight characters in length, made up of characters permissible in a file name. For the best scrambling result, no character in the password should appear more than twice.

The sending party does this:

ENCODE dr:filename.filetype password   to encode a file.

The receiving party does this:

DECODE dr:filename.filetype password   to decode a file.

The drive name is optional; if not specified, the file is assumed to be on the current drive.

For further security, file processing can be nested; that is, a file can be encoded more than once, using a different password each time. When it is decoded, the same number of decoding passes are required, using the same passwords as when they were encoded, but IN REVERSE ORDER:

For example:

The sending party encodes with PSWRD123, then again with PSWRD456.

The receiving party decodes with PSWRD456, then again with PSWRD123.

Both programs process the files "in place." That is; there is NO "output" file. Accordingly, if there is a problem with the disk that occurs during the process the file you started with will be ruined. To prevent this, **always work with a copy.**

RECEIVING A FILE

RECEIVING A SINGLE FILE WITH ERROR-CHECKING

OVERVIEW

The best way to transfer a file is to use an "error-detection and error-correction" protocol. To transfer a file using a protocol technique the criteria is only that the other system is either using ReachOut or a program compatible with ReachOut. ReachOut supports more that one protocol, and the protocols that are supported are listed on the Protocol Menu.

The following is an overview of the transfer process. The details of each transfer mode follows this brief explanation.

<u>If both systems are using ReachOut,</u>
<u>the ReachOut-to-ReachOut protocol is preferred.</u>

1. The file-transfer protocol must be set correctly.

2. While at the Control Mode Menu, press (R), and respond to the question

   WITH ERROR-CHECKING? (Y/N)

   by pressing (Y).

3. Respond to the prompt "NAME OF FILE TO RECEIVE?" by typing the name you want give to the received file.

4. If the filename already exists on the disk, the prompt

   FILE EXISTS: OVER-WRITE? Y)es N)o E)xamine

   will be displayed.

   Pressing (E) will display of about "one-screenful" of the file, followed by the "Press (RETURN) to continue" message is displayed. This way, you can quickly determine the general content of a file, so that you can decide if you want to erase it, rename it, or use a different name for the incoming file.

   If the file contains nothing, a message will tell you that there is nothing in the file.

5. Information such as file name, file size, and estimate of transfer time is displayed during the transfer, as well as the sector number currently being sent.

6. At the end of the transfer, the file will be closed, and you will be in either the Communication Mode or the Control Menu.

RECEIVING A SINGLE FILE: REACHOUT-TO-REACHOUT

COMMAND SEQUENCE

To receive A SINGLE FILE from another system using ReachOut:

1. Both systems must be set to Protocol 1.

   The Protocol Menu is accessed from the Control Mode Menu, by pressing (P). The active protocol is shown at the right of the second line of the Protocol Menu screen. If the protocol is already set to protocol 1, press (RETURN). Otherwise, press (1) and then press (RETURN).

2. Enter the receive mode by pressing (R) while at the Control Mode Menu.

3. Respond to the question

   WITH ERROR-CHECKING? (Y/N)

   by pressing (Y).

4. Respond to the "NAME OF FILE TO RECEIVE (ERROR-CHECK)?" by entering the name you want the file to be called, and pressing (RETURN).

5. When the transfer begins, the size of the incoming file and the estimate of the transfer time is displayed.

6. At the end of the transfer, you will be returned to the Control Mode Menu.

RECEIVING A GROUP OF FILES: REACHOUT-TO-REACHOUT

The best way to exchange a group of files with a system that is
also using ReachOut is to use the ReachOut-to-ReachOut protocol
in Batch Mode. If the other system is NOT also using ReachOut,
the files must be sent individually.

To transfer a group of files as a batch, in the normal way, both
systems must be in the batch mode. Do the following:

> NOTE: <u>There are two pages of instruction</u>:
>
> A. For the operator of the receiving system. (R#)
> B. For the operator of the sending system.   (S#)

THE RECEIVING SYSTEM DOES THIS:

R1. Make sure that the protocol is set to Protocol 1.

R2. While at the Control Mode Menu, press (R)

R3. Respond to the question

   WITH ERROR-CHECKING? (Y/N)

   by pressing (Y).

R4. Respond to the prompt "NAME OF FILE TO RECEIVE?" by keying ^B

R5. The program will enter the Batch-Receive mode.

   a. As each file is being transferred the screen will
      show the overall batch size, an estimate of the
      time to transfer the remaining portion of the
      batch, the total files in the batch, the number of
      the current file, the file name, the file size,
      and the approximate time for the transfer of the
      current file.

   b. If an incoming file has the same name as one
      already on the disk, the name of the file on
      the disk will be changed: the file type (the
      three character positions after the "dot") is
      changed to TMP.

   c. The name of any file that was too big to fit on
      the receiving disk will be listed at the end of the
      transfer and also written to a file TOOBIG.LST.

R6. At the end of the transfer, any messages regarding
   problems encountered during the transfer will be displayed.

THE SENDING SYSTEM DOES THIS:

S1. Make sure that the protocol is set to Protocol 1.

S2. While at the Control Mode Menu, press (S)

S3. Respond to the question

WITH ERROR-CHECKING? (Y/N)

by pressing (Y).

S4. Respond to the prompt "NAME OF FILE TO SEND?" by keying ^B

S5. Define the batch.

The batch is defined in one of two ways:

1. By entering an ambiguous name "mask."

2. By entering the name of a file in which there is
   contained a list of filenames to be sent.
   (FOR THE RULES OF THE FILES SEE THE NEXT PAGE)

S6. The batch is processed before the transfer begins:

1. If a file containing a list was specified:

   A) The list is checked for proper formatting;
      an error message will report any problems.

   B) If a file can't be found, an error message
      will be displayed and all missing files will
      be listed.

2. The number of files in the batch, and their size, is
   determined.

S7. As each file is being transferred the screen will show the
overall batch size, an estimate of the time to transfer the
remaining portion of the batch, the total files in the
batch, the number of the current file, the file name, the
file size, and the approximate time for the transfer of the
current file.

If a file is too big to fit on the disk of the receiving
system, an error message will be displayed and, at the end
of the transfer, the name will be written to a file called
TOOBIG.LST.

S8. At the end of the transfer, any messages regarding problems
encountered during the transfer will be displayed.

RECEIVING A FILE FROM A RCP/M SYSTEM

There are many systems in the country (over 200 at this writing) that enable the exchange of public-domain software. The systems are known as Remote CP/M Systems (RCP/M). Some systems operate in conjunction with a Remote Bulletin Board Systems (RBBS), a system for the leaving and retrieval of messages, both public and private. The systems are unattended and often are computers at businesses not used during the evening, nights, and weekends, or computers at home that are not used during the business day.

Software available on these systems is contributed by various people throughout the country who write a program they consider worthy of sharing with the rest of the hobbyist community. Their software is submitted to the national headquarters of the CP/M User's Group to be included on disks that are regularly released. A disk contains many programs and sells for nominal fee. However, after their "official" release, and often before, many programs find their way onto the RCP/M systems and can be received for the cost of the telephone call.

Public-domain software, or other files, can be received by you "running" the program called XMODEM that is on the RCP/M system.

To receive a file from one of these systems do the following:

1. Make sure that ReachOut is set for Protocol 2.

2. After contacting the system, enter the "CP/M portion" (if the system is a RBBS system with a RCP/M system facility).

3. Get the other system ready to send a file. Type

   <u>XMODEM</u> <u>S</u> <u>dr:filename.filetype</u>

   The drive name is optional; if no drive is specified, the file is assumed to be on the current drive.

4. If you typed the command correctly, the other system will send the message:

   FILE IS OPEN - READY TO RECEIVE

5. Go to the Control Mode Menu by keying the "break-out" character (as the program is distributed, it is ^X).

6. Prepare to receive a file by pressing (R).

7. Specify that you want to receive using an error-checking protocol by answering the question

   WITH ERROR-CHECKING? (Y/N)

   by pressing (Y).

8. The program will respond with

   DRIVE X: HAS ### BYTES FREE

   which will be displayed for a few seconds, and be followed by

   NAME OF FILE TO RECEIVE? (ERROR-CHECK)

9. Enter the name you want to call the file you will be
   receiving. If the file exists on the current disk, you will
   be asked if you want to over-write it (this has the same
   effect as erasing it.)

10. When the file has been opened, a message will be displayed:

    FILE HAS BEEN CREATED

    If the filename already exists on the disk, the prompt

    FILE EXISTS: OVER-WRITE? Y)es N)o E)xamine

    will be displayed.

11. Another question will be asked:

    Hang-up when transfer completed?

    If the program is long and you might not be present when the
    transfer is completed, press (Y). At the conclusion of
    the transfer, a BYE command will be sent, thus assuring that
    the system will be available to another user at the earliest
    possible time, rather than have it hang up due to
    inactivity: usually about two minutes.

    Otherwise, press (N) so that you can continue to use the
    host system, or properly sign-off

****

NOTE: If you change your mind, pressing (ESC) will return
      you to the Control Mode Menu.

****

12. The screen will clear and the following message is
    displayed:

    AWAITING RECEIPT OF SECTOR # 1

    After a few seconds, for the two systems to "synchronize,"
    the transfer will begin. The number of the sector will
    increase by 1 until the total number of sectors in the file
    is reached. A sector will be sent approximately every 4.5
    seconds.

If a sector is received containing an error, the sending
system will be informed by your system, and the sector will
be re-transmitted automatically. You will know if this
happens because an error message will appear over the
current-sector message.

13. When the transfer is completed, the message

```
*****************************************
*                                       *
*           TRANSFER COMPLETE           *
*                                       *
*****************************************
```

is displayed, along with a modem status message:

++ MODEM HAS BEEN DISCONNECTED ++ or **++ MODEM IS STILL ON-LINE ++**

14. Press (RETURN), and continue in the normal manner.

RECEIVING A FILE WITHOUT ERROR-CHECKING

There are two methods by which you can receive a data file without error-checking.

The first method is to get into the Logging Mode and then command the other system to "list" (type), or otherwise send, a file. Using this technique, your file will contain everything you saw on the screen, including your command to the host to list the file. Anything else appearing on the screen before you give the command to write the contents of the line-buffer to the disk will also become part of the file. Later, using a text editor, you can delete the portions of the logging file that are not needed. The specifics of this technique are:

1. Create a logging file.

2. From the Communication Mode, type whatever command is required to prepare a file to be sent to you.

3. Receive the file, reading it as it is transmitted if you wish. When the transmission is complete, cause the contents of the line-buffer to be written to the disk, while remaining in Communication Mode, by keying ^W

NOTE: Sometimes you may get a little more than the file because the sending computer added a message at the conclusion of the file, before you could write the data in memory to the disk. Edit the file as needed.

NOTE: If you have "seen enough" before the file has ben completely listed, just key whatever command is needed to abort the listing by the other system (try ^C, or ^K).

The second method is to receive a file under the control of the other system, with the other system controlling when the contents of the line-buffer is written to the disk. The technique is:

1. If necessary, exit the Communication Mode and get to the Control Mode Menu.

2. Press (R), and answer the question

   WITH ERROR-CHECKING? (Y/N)

   by pressing (N).

3. Enter the name you want to call the file.

4. When in the Communication Mode, type the required command to get the other system to list the desired file.

5. The line-buffer will fill, and disk-writes will occur as necessary until the entire file has been received. The file will be closed and the mode terminated when any one of the following occurs:

    a) An "end-of-file" (EOF=1A hex=^Z) is received;

    b) An "end of transfer" (EOT=4 hex=^D is received;

    c) An X-OFF character (either ^S or ^T) is received;

    d) A break-out character is keyed from the console.

NOTE: You can NOT properly receive certain files in this manner; in particular, all files that contain information in 8-bit form. These files include those that end in .COM, .INT, .REL, .OBJ, and document files produced by WordStar. Files of these types can be reliably received only when using an error-checking protocol.

NOTE: "Source code" of a program (it's source code if you can read the file just like text) can be safely received without error-checking; "safe" only in that if during transmission a portion of the file gets garbled you can either assume what corrections to make or could examine (without receipt) the file on the other end, identify exactly what portion was modified during transmission, and make the changes manually on your end.

---------oOo---------

Understand, "99%" of the time" a file can be received accurately without error-checking. But, in those instances where error-checking can be utilized, it is best to use it. There is always that feeling of "peace-of-mind" knowing that what has just been received, was received perfectly.

If your telephone service includes the "call-waiting" feature, and someone tries to call you when you are receiving a file, the data will undoubtedly get garbled. If someone dials (or "tones") a number from an extention phone during the transfer, the data will get garbled for sure, and if they merely pick-up the phone at at critical instant, the data being transferred at that moment might get garbled.

---------oOo---------

SENDING A FILE

SENDING A FILE WITH ERROR-CHECKING

The best way to transfer a file is to use an "error-detection-and-correction" protocol. To transfer a file using this technique the criteria is only that the other system is compatible with ReachOut. ReachOut supports more that one transfer protocol, and the protocols that are supported are listed on the Protocol Menu.

> If both systems are using ReachOut,
> the ReachOut-to-ReachOut protocol is preferred.

SENDING A SINGLE FILE WITH ERROR-CHECKING

OVERVIEW

The following is an overview of the transfer process. The details of each transfer mode follows this brief explanation.

1. The file-transfer protocol must be set correctly: if both systems are using ReachOut, then both systems should be set to Protocol 1, otherwise the system using ReachOut should be set to the protocol that is compatible to the protocol of the other system.

2. While at the Control Mode Menu, press (S), and respond to the question

    WITH ERROR-CHECKING? (Y/N)

    by pressing (Y).

3. Respond to the prompt "NAME OF FILE TO SEND? " by typing the name of the file you want to send.

4. Information such as file name, file size, and estimate of transfer time is displayed during the transfer, as well as the sector number currently being sent.

5. At the end of the transfer, ReachOut will enter either the Communication Mode or the Control Menu, depending on the protocol chosen, the state of the program when the transfer was initiated, and the way questions were answered prior to the transfer starting.

SENDING FILES USING REACHOUT-TO-REACHOUT PROTOCOL

When transferring files between two systems that are each using ReachOut, the best transfer method is to use the ReachOut-to-ReachOut protocol.

COMMAND SEQUENCE

To send a file to another system using ReachOut:

1. The file-transfer protocol on each system must be set to the ReachOut-to-ReachOut protocol, Protocol 1.

2. While at the Control Mode Menu, press (S).

3. Answer the question

   WITH ERROR-CHECKING? (Y/N)

   by pressing (Y).

4. Respond to the "NAME OF FILE TO SEND (ERROR-CHECK)?" question in one of three ways:

   a. If a single file is going to be sent, and the operator of the receiving system is in the single-file mode, just enter the name of the file and press (RETURN).

   b. If a single file is going to be sent, and the operator of the receiving system is in Batch Mode, (also) enter the name of the file and press (RETURN).

   c. If a group of files is going to be sent, and the operator of the receiving system is in Batch Mode, enter the Batch Mode by keying ^B

      The batch is defined in one of two ways:

      1. By entering an ambiguous name "mask."

      2. By entering the name of a file in which there is contained a list of filenames to be sent.

(The rules for the ReachOut batch file is two pages ahead.)

5. The batch definition will be processed. If the batch was defined by a list of files, a search of the current drive will be made to determine that all the files are present. If any files are not found, an error message will be displayed and, after the final file is processed, you will be asked if you want to continue without the missing files. In either case, the names of the missing files will be written into a file called MISSING.LST.

6. After ReachOut has prepared to send the batch, a "Batch Report" will be displayed. The information in the report is:

   a) The size of the batch;

   b) The transfer time for the batch;

   c) The number of files in the batch;

   d) The number the current file is in the batch;

   e) The name of the current file;

   f) The size of the current file;

   g) The time to transfer the current file;

   h) The current sector being processed (displayed when the actual transfer of the file begins).

7. When the signal to start the transfer is received from the other system, the transfer will begin. The first thing that is sent is the information contained in the Batch Report. When it is received, the receiving system will display the same Batch Report as the sending system.

8. As each file is sent, the Batch Report, on BOTH systems, is updated to reflect the new status. The time for transferring the batch is what the time was when the previous file began, less the time taken to transfer it.

9. If a file is too big to fit on the disk of the receiving system, an error message will be displayed, the file is skipped, and the next file is processed. The name of a file that is too big to fit will later be written to a file called TOOBIG.LST, to be used to define the batch when another attempt is made to transfer the file (when the disk of the receiving system is changed so as to have enough space.)

10. At the end of the transfer, any messages regarding problems encountered during the transfer will be displayed.

THE REACHOUT BATCH FILE

The file used to define a batch is made with a word-processing program, or while using the Logging Mode of ReachOut.

The rules for the file are:

1. Type the name of each file, with the dot (that separates the "filename" from the "filetype") included if required, and press (RETURN) after each name.

   Example:

   ```
   FILENAME.ABC  ( RETURN ) <----- press the key
   FILENAME.123  ( RETURN ) <----- press the key
   FILENAME.456  ( RETURN ) <----- press the key
   LETTER.1      ( RETURN ) <----- press the key
   INVORDER.FRI  ( RETURN ) <----- press the key
   CUSTLIST      ( RETURN ) <----- press the key
   ```

2. The letters can be either lower or upper case.

3. <u>Drive designations are NOT allowed: all files must be on the current disk, and so the file containing the list of names must be on the same disk as the files themselves.</u>

4. Blank lines are not allowed. That is, don't press the (RETURN) key two times in a row.

-------oOo--------

When the file is used, ReachOut will process the file to determine if it contains any errors. But, still, be careful when making the file as an error will cause a frustrating delay later.

-------oOo--------

SENDING A FILE TO A "CP/M USER'S GROUP" SYSTEM

There are many systems in the country (over 200 at this writing) that enable the exchange of public-domain software. The systems are known as Remote CP/M Systems (RCP/M). Some systems operate in conjunction with a Remote Bulletin Board Systems (RBBS), a system for the leaving and retrieval of messages, both public and private. The systems are unattended and often are computers at businesses not used during the evening, nights, and weekends, or computers at home that are not used during the business day.

There are two reasons why you might want to send a file to one of these systems:

1. To share a program you have written or modified;

2. To use the system as a "third-party" "store-and-forward" depository.

SHARING A PROGRAM

Perhaps you have written a program you would like to share with the hobbyist community. The standard way of submitting software is to send it to the national headquarters of the CP/M Users Group to be included on disks that are regularly released. Putting it on one of these systems is a good way to get it into circulation quickly.

If you provide source code, name the file with a filetype to appropriately identify it (.ASM, .BAS, etc.). If you are offering executable code only, name the file "filename.OBJ" before you send it as these systems can't transmit files named "filename.COM." In either case, your submission should have complete and clear documentation. The file containing the documentation should be called "filename.DOC."

Documentation should begin by indicating the purpose of the program and an description of the equipment on which it will work. A statement including your name, address, (phone number optional) and a statement indicating that the program is being put into the public-domain by you is appropriate and may be included as part of the program signon in addition to being in the documentation and source code.

THIRD-PARTY DEPOSITORY

This is useful if you want to exchange a file with someone but you cannot "get together" at a convenient time. You leave the file on the public system; they will get it later.

Files can be sent by you "running" the program called XMODEM that is on those systems that support the file-transfer capability.

To send a file to one of these public systems, do the following:

1. Make sure the file-transfer protocol is set to Protocol 2.

2. Contact the system and answer the initial signon questions.

3. Answer further questions and/or respond to menus such that you enter the CP/M portion of the system.

4. Get the other system ready to receive. Do this by typing

   XMODEM R filename.filetype (RETURN)

5. If the file name you specified is not already on the other system's disk, the following message, or one similar to it, will be sent by the other system:

   FILE OPEN, READY TO RECEIVE

6. Get to the Control Mode Menu by keying `X (or another "break-out" character specified by using INSTMOD.)

7. From the Control Modem Menu, press (S).

8. Answer the question

   WITH ERROR-CHECKING? (Y/N)

   by pressing (Y).

9. Answer the prompt

   NAME OF FILE TO SEND? (ERROR-CHECKED)

   by entering the file name. Unless the filename is preceeded by a drive name and a colon, the current drive is assumed.

   NAME OF FILE TO SEND? (ERROR-CHECKED)   dr:filename.filetype

   The drive name is optional; if not specified, the file is assumed to be on the current drive.

10. A search for the file will be made. If it is found, and if you are using an auto-dial modem, the question

    Hang-up when transfer completed?

    will be asked.

    If the program is long and you might not be present when the transfer is completed, press (Y). This will cause the text **BYE (RETURN)** to be sent at the conclusion of the transfer.

This causes the program "BYE.COM" to be run on the other
system. BYE causes the host's modem to hang-up and the
host's system to re-set making the system available to
another caller as soon as possible. Otherwise, the system
would hang-up and re-set after a period of inactivity
(usually about two minutes).

If you want to continue using the host system at the end of
the transfer, press (N).

11. Assuming that the file named is found, the progress message

CURRENT FILE: "dr:filename.filetype"

FILE SIZE: 123 SECTORS

ESTIMATED FILE TRANSFER TIME:

   y MINS.: z SECS.

Waiting for signal to start sending... ##

where ## is a number that starts at 60 and counts down to 0
at the rate of approximately one digit per second.

---------oOo---------

If you change your mind about an answer, pressing (ESC) will
return you to the previous question or abort the function.

---------oOo---------

12. When the other system sends the "go-ahead," the screen will
clear and display the additional text:

SENDING SECTOR # 1

The sector number will increase by 1 until the total number
of sectors in the file is reached. A sector will be sent
approximately every 6.75 seconds. The time are greater than
when "rapid-typing" because there is more than data being
sent between the two systems and also because of error-
checking and other routines being executed at both ends.

If a sector is received with an error, the other system will
inform yours and it will be re-transmitted automatically.
You will know if this happens because an error message will
be displayed. Recovery from an error is automatic. If ten
errors are encountered, you will have a change to abort the
transfer. Errors are usually caused by a poor connection.

Each system will have disk activity every sixteen sectors, so there is a slight pause when the end of each 16-sector block is reached.

It is normal for the message

OTHER SYSTEM IS INACTIVE: OCCURRENCE #

> (Where x is a number that starts
> at 1 and increases by 1 to a
> maximum of 10.)

to be displayed before the first sector is actually transferred. If a "timeout" error occurs during the transfer, you will see the same message again.

-----------oOo---------

If the other system does not send a signal to "start sending" in time (maybe you forgot to tell it to get ready to receive), the program will display

++ Signal to start sending not received ++

To continue, press (RETURN)

Pressing (RETURN) will abort the sending mode and take you to the Terminal Mode.

-----------oOo---------

17. When the transfer is completed, the message

```
*************************************
*                                   *
*         TRANSFER COMPLETE         *
*                                   *
*************************************
```

is displayed, along with a modem status message:

++ MODEM HAS BEEN DISCONNECTED ++ or **++ MODEM IS STILL ON-LINE ++**

depending on how you answered the "Hang-up after transfer?" question that was asked before the transfer began.

18. Press (RETURN) to resume normal operation.

SENDING A FILE USING ECHO-PLEX

Sometimes you may want to insure that a system to which you send data has received the information correctly, but the other system is not using ReachOut or any compatible program. If the other system can echo each character it receives, a special feature of ReachOut provides a method of determining if data has been accurately received.

ReachOut waits for the receiving system to echo each character before the next character is sent. Only if the echoed character matches the one that was sent does ReachOut continue.

If a mismatch occurs, the file transfer is suspended. The operator is given the choice of ignoring the error and sending the next character, sending the same character again, or aborting the transmission.

----------oOo----------

The Echo-plex mode is intended for ASCII files only, and NOT binary files (i.e.,".COM," ".INT," etc. files). However, WordStar (or WordStar-like) files CAN be sent and the echoed character checked against the character sent. (This is because only the first 7 bits are checked: the high-order bit is ignored.)

----------oOo----------

There are some conditions under which the echoed character is NOT checked: most systems respond to the receipt of a carriage-return by returning (echoing) a carriage-return AND a line-feed. So, when a carriage return is sent by your system, ReachOut will NOT wait for and, therefore, will not test, the echoed character or the line-feed expected to follow it.

----------oOo----------

Using the Echo-plex mode of error-checking has a "trade-off": the transfer time is doubled.

----------oOo----------

SENDING THE FILE:

To send a file using the Echo-plex error-checking method, execute the following steps:

1. Make sure the file-transfer protocol is set to protocol 4.

2. Enter the file-sending mode, by pressing (S).

3. Answer the question

   WITH ERROR-CHECKING? (Y/N)

   by pressing (Y).

4. Answer the prompt

   NAME OF FILE TO SEND? (ERROR-CHECKED)

   by entering the file name. Unless the filename is preceeded by a drive name and a colon, the current drive is assumed.

5. A search for the file will be made. If found, the prompt

   View file characters during transfer?

   will be displayed.

   If you want to see the text as it is sent, press (Y).

   If you do NOT want to see the text as it is sent (perhaps for security reasons) and, instead, only want to watch the progress of the transfer via a graphic display, press (N).

6. **If** the modem is on-line, the question

   Hang-up when transfer completed?

   will be asked.

   If the host system does NOT require a command at the end of the file and/or you don't want to continue communication after the file has been transferred, or you will not be present at the end of the transfer and you wish to terminate the call when the transfer is completed, press (Y).

   If the host system DOES require a command at the end of the file transfer to close the file (on the other end), or if you want to continue to communicate with the other system after the file has been transferred, press (N).

7. When you answer the "hang-up" question, the screen clears and the following prompt is displayed:

   IF NEEDED, TYPE A
   "OPEN (PREPARE TO RECEIVE) FILE" COMMAND
   OR JUST PRESS (RETURN) TO START TRANSFER

   To NOT send, or to ABORT, press (ESC)

   If you have NOT yet sent the command to open the file on the host system, and one is required, type the command, ending by pressing (RETURN). If no command is required, just press (RETURN).

8. The screen will clear and the message

   CURRENT FILE: "dr:filename"

   FILE SIZE: xxx SECTORS

   ESTIMATED FILE TRANSFER TIME:

        y MINS.: z SECS.

   LOADING FILE...

   is displayed, and after a brief period,

   PREPARING TO SEND...

   will over-write the previous message.

9. Then, the file will begin to be sent.

10. If you chose to view the file, you will see the characters
    as they are echoed, rather than as they are sent.

    If you chose to NOT view the file as it is sent, you will
    see the "security" display:

        DATA BEING SENT:

    CURRENT SECTOR IS # 1

11. If an error is encountered (the character echoed does NOT
    match the character sent), the following will be displayed:

            ++ TRANSFER ERROR ++

           MIS-MATCH BETWEEN CHARACTER
            SENT AND CHARACTER ECHOED

PRESS	IN ORDER TO
A	abort the transfer
N	send next character
R	re-send last character

         ----------oOo---------

    Note that there is a 50% chance that there is an error in
    the received file; that is, there is just as much chance
    that the character you sent got changed "on the way" to the
    host as it did while being echoed back, and if it did get
    changed on the way, an erroneous character was received.

         ----------oOo---------

12. Respond to the MIS-MATCH MENU as desired.

13. When the transfer is completed, the message

```
*******************************************
*                                         *
*            TRANSFER COMPLETE            *
*                                         *
*******************************************


*******************************************
*  IF NEEDED, SEND A COMMAND TO CLOSE  *
*       THE FILE ON THE OTHER SYSTEM      *
*******************************************
```

is displayed, along with a modem status message:

++ MODEM HAS BEEN DISCONNECTED ++ or **++ MODEM IS STILL ON-LINE ++**

depending on how you answered the "Hang-up after transfer?"
question that was asked before the transfer began.

14. Press (RETURN) to resume normal operation.

SENDING A FILE WITHOUT ERROR-CHECKING

This mode is referred to as "rapid-typing" because the file is sent to the modem at the baud-rate speed instead of your typing speed. It is sometimes called, generically, an "ASCII dump."

Rapid-typing is typically used when sending a file to a system that has no error-checking ability, or for the transmission of "electronic- mail" that you have previously typed in order to reduce connect-time charges.

To RAPID-TYPE a file, do the following:

1. While at the Control Mode Menu, press (S).

2. Answer the question

   WITH ERROR-CHECKING? (Y/N)

   by pressing (N).

3. Answer the prompt

   NAME OF FILE TO SEND? ("RAPID-TYPE")

   by entering the file name. Unless the filename is preceeded by a drive name and a colon, the current drive is assumed.

   ----------oOo----------

   If the file is on the current disk, the next procedural prompt will be displayed. If the file is NOT on the disk, an error message will be displayed, along with the name you typed. If you think you may not be spelling the name correctly, and want to look at a list of files of a similar name on a disk, you can enter the directory mode by pressing (RETURN), rather than entering another file name, and enter an ambiguous "mask" that will assist you in determining the name of the file you need. To see the directory of a drive other than the current drive, enter the letter name of the drive (A, B, etc.), followed by a colon, then (RETURN). Then, enter an ambiguous "mask" that will assist you in determining the name of the file you need.

   ----------oOo----------

4. A search is made of the file. When it is found, the prompt

   View file characters during transfer?

   is displayed.

   If you want to view the data as it is being sent, press (Y)

If you do NOT want to view the characters, perhaps for
security reasons, press (N). If you choose this option,
you will see a progress message as each sector is sent.

5. Next, the question

    Delay after each line? (Y/N)

    will be displayed.

    Answering (Y) will cause a delay of approximately 1/2
    second after each line-feed is sent. This delay allows for
    the time that some systems take, when receiving electronic-
    mail, to be ready for the sending of a new line of text.
    Since these systems are expecting input at a rate no faster
    than typing speed, they will lose characters unless this
    delay is inserted.

    To determine if the delay is needed for a particular system,
    press (N) and see if the text is transmitted properly by
    sending yourself some test text. (The file "TESTING"
    included on the distribution disk is good for this test.)

6. **If** the modem is on-line, the question

    Hang-up when transfer completed?

    will be asked.

    If the host system does NOT require a command at the end of
    the file and/or you don't want to continue communication
    after the file has been transferred, or you will not be
    present at the end of the transfer and you wish to terminate
    the call when the transfer is completed, press (Y).

    If the host system DOES require a command at the end of the
    file transfer to close the file (on the other end), or if
    you want to continue to communicate with the other system
    after the file has been transferred, press (N).

7. When you answer the "hang-up" question, the screen clears
    and the following prompt is displayed:

    IF NEEDED, TYPE A
    "OPEN (PREPARE TO RECEIVE) FILE" COMMAND
    OR JUST PRESS (RETURN) TO START TRANSFER

    To NOT send, or to ABORT, press (ESC)

    If you have NOT yet sent the command to open the file on the
    host system, and one is required, type the command, ending
    by pressing (RETURN). If no command is required, just
    press (RETURN).

8. The screen will clear and the message

   CURRENT FILE: "dr:filename"

   FILE SIZE: xxx SECTORS

   ESTIMATED FILE TRANSFER TIME:

   y MINS.:   z SECS.

   LOADING FILE...

   is displayed, and after a brief period,

   PREPARING TO SEND...

   will over-write it.

9. If you chose to view the file as it is transferred, you will
   see the characters as they are sent.

   If you chose to NOT view the file as it is sent, you will
   see the "security" display:

   DATA BEING SENT:

   CURRENT SECTOR IS #   1

10. At the conclusion of the transfer, the terminal bell will
    sound and <u>ONE</u> of the following messges will be displayed,
    <u>but not sent</u>.

         If you indicated to NOT hang-up after the transfer:

         ```
         ************************************************
         *        FILE HAS BEEN "RAPID-TYPED"        *
         *  IF NEEDED, SEND A COMMAND TO CLOSE   *
         *      THE FILE ON THE OTHER SYSTEM        *
         ************************************************
         ```

    Send what is necessary to close the file. (CLOSE, SAVE, etc.)

         If you indicated TO hang-up after the transfer:

         ```
         ************************************************
         *                                              *
         *        TRANSFER COMPLETE              *
         *                                              *
         ************************************************
         ```

              ++ MODEM HAS BEEN DISCONNECTED ++

              To continue, press (RETURN)

    Pressing (RETURN) takes you to the Control Mode Menu.

ACCESSING THE COMMUNICATION MODES

Communication Mode is the program state that permits commun-
ication with the other system through typing from the keyboard.

There are two communication modes:

>   1. Terminal Mode;
>
>   2. Direct-display Mode.

ENTERING TERMINAL (FULL-DUPLEX) MODE

In Terminal Mode (full-duplex), what you see on the screen is
what you have typed AFTER it has been received by the other
system and echoed back to you.

Terminal Mode can be entered by pressing (T) while at the
Control Mode Menu. If the modem is NOT on line when you enter
Terminal Mode the modem will go on-line automatically.

While in the Terminal Mode, you can go to the Direct-display
Mode, and back again, by keying ^A (Alternate Comm. Mode).

----------oOo----------

When an auto-dial modem is being used, and a call is made, when
the other system answers ReachOut will automatically enter the
Terminal Mode (unless modified by using INSTMOD to be the Direct-
display Mode that is automatically entered).

----------oOo----------

ENTERING DIRECT-DISPLAY (HALF-DUPLEX) MODE

In Direct-display Mode (half-duplex), what you see on the screen
is what you have typed BEFORE it is sent to the other system.

Direct-display Mode can be entered by pressing (V) while at the
Control Mode Menu. If the modem is NOT on line when you enter
Direct-display Mode the modem will go on-line automatically.

While in the Direct-display Mode, you can go to the Terminal
Mode, and back again, by keying ^A (Alternate Comm. Mode)

COMMUNICATION MODE COMMANDS

The commands that are available from within either of the two communications modes, and their function and purpose, are:

```
^A = go to alternate Communication Mode
^B = send a "break" to the other system
^E = erase the line-buffer
^L = turn logging mode OFF / ON
^W = write line-buffer to disk and stay
^X = go to the Control Mode Menu
```

^A   Takes you to the alternate Communication Mode: if you are in Terminal Mode, it will take you to Direct-display Mode, and visa-versa.

^B   Will cause a "break" (continuous space for one character cycle) to be sent to the other system. It is used to abort functions (like a file listing) on some systems. On other systems, it will have no effect or may cause the other system to terminate the connection.

^E   Lets you "erase" the line-buffer. You might use this command to prevent menus and your responses to them from being part of the logging file.

^L   This command controls a toggle that will let you temporarily suspend logging when in the Logging Mode. By using this command you can prevent something from being written to the disk even though something "on either side" of it" WILL be written to the disk. Among the advantages: eliminate the need for editing and preserve precious disk space. When you turn-off the Logging Mode, the absence of the "L)" reminds you that you are not logging. To make logging active, key ^L again.

^W   Enables you to write the contents of the line-buffer to disk and remain in the Communication Mode. Use this command while logging, when you have seen everything you want to save on disk.

^X   This command is known as the "break-out" command. It lets you "break-out" of Communications Mode, and enter the Control Mode Menu. If you are logging, and logging is active, you will have to confirm the exit.

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DIALING ANOTHER NUMBER

This section is applicable only when an auto-dial modem is used.

Once a communication session is completed and you want to contact another system, you can access the Dialing Menu, from the Control Mode Menu, pressing (#).

Before the Dialing Menu is displayed, the progress message

WAITING FOR LINE TO CLEAR

may be displayed.

Whether this progress message is displayed depends on how long you have waited at the Control Mode Menu before pressing (#). If the time passed equals or exceeds the time specified as the time needed to wait for the "first" dial tone, then the prompt will not be displayed. (NOTE: Some modems take a little longer to respond than others.)

ACCESSING THE CONFIGURATION MENU

The Configuration Menu is accessed by pressing (RETURN) while at the Control Mode Menu.

EXITING TO THE OPERATING SYSTEM

To exit ReachOut and go to the operating system, press (X) while at the Control Mode Menu.

The modem will be taken off-line (hung-up) automatically.

NOTE: The Morrow Micro-Decision computer has an RS-232 connector that is used for either a modem OR a printer, but not both at the same time. ReachOut will set the parameters of the common port appropriate to a printer (baud rate, word length, parity) the same as the operating system does when the system is powered-up or the RESET button is pushed. When this is done, a message will be displayed:

MODEM/PRINTER PORT HAS BEEN SET FOR A PRINTER

This page intentionally left blank.

Configuration Menu:

PRESS	THE LETTER TO CHANGE THE SETTING
A	Character set is: (STANDARD)
C	Cntrl-Chars. are: (EXECUTED)
D	Delay for messages is: (LONG)
E	Echo received char. is: (OFF)
F	Filter when rapid-type is: (ON)
H	Help level is: (BEGINNER)
I	Line-feed insertion is: (ON)
M	Carrier tone is: (ORIGINATE)
O	X-ON/X-OFF pair is: (^R/^T)
P	Set/strip parity bit is: (OFF)
S	Show free disk space is: (ON)
T	Terminal bell is: (ON)
X	X-ON/X-OFF handshake is: (OFF)

OR PRESS

(RET)   to go to the Control Mode Menu

The setting of the toggles is dependent upon the way the toggles
have been set when using INSTMOD.

ALTERNATE CHARACTERS

You may find that there are characters required by another system that your terminal doesn't support; that is, there are no keys on your terminal labeled with the desired symbols. For example, systems using the UNIX operating system require symbols as part of commands that are not provided by some inexpensive keyboards. An example is the "back-slash" character (\ ).

ReachOut provides a means to translate a character that you don't otherwise need into one that you do need. Internal to the program is a "table" that enables you to specify what character you want substituted for another. You can specify up to five substitutions. Changing the values in the table is accomplished by using the installation/modification program (INSTMOD.COM).

The Alternate character set is turned on and off by pressing (A) while at the Configuration Menu. The pertinent text, as it appears when the program is set to "Alternate Characters OFF" (as it is on the distribution disk) is:

> A   Character set is: (STANDARD)

> which, when (A) is pressed, changes to

> A   Character set is: (ALTERNATE)

> and when (A) is again pressed, it changes back again.

The alternate character function can be demonstrated as follows:

1. While in the Direct-display Mode press the keys marked 1 through 5. Note that what is shown on the screen is the same as the label of the key.

2. Exit the Direct-display Mode by keying ^X (or other "break-out" character specified by using INSTMOD).

3. Enter the Configuration Menu by pressing (RETURN).

4. Change the STANDARD/ALTERNATE toggle by pressing (A)

5. Return to the Control Mode Menu by pressing (RETURN).

6. Re-enter the Direct-display Mode and again press the keys 1 through 5. Note that what is shown are the upper case letters "A" through "E," with "A" being sent when you press "1"; a "B" being sent when you press "2," etc. This reflects the values appearing in the translation table as the program is distributed.

7. Change back to the normal configuration and repeat.

DISPLAYING CONTROL CHARACTERS

Besides sending characters that you can read, the system to which you are connected sends characters that control such things as line-feeds, carriage returns and the sounding of the "bell" on your terminal. These characters (which are a part of a group called "control characters") are normally EXECUTED, rather than displayed. There are instances, however, when you may want to see a display that represents the control characters instead of executing them: such as testing for apparent system malfunction.

When this toggle is set "on," all control characters received will be displayed with a leading caret (^) followed by the letter: thus, a CONTROL-C would be displayed as ^C.

The "Display Control Characters" function can be toggled on and off by pressing (C) while at the Configuration Menu. The pertinent text, and the response to input, is:

     C   Cntrl-chars. are: (EXECUTED)

which, when (C) is pressed, changes to

     C   Cntrl-chars. are: (DISPLAYED)

and when (C) is again pressed, it changes back again.

CHANGING THE DELAY OF TEMPORARY MESSAGES

Some of the progress and error messages within ReachOut
are displayed only temporarily. That is, they are displayed for
a short time and then erased. The purpose of this type of
display is to prevent the screen display from rolling the text up
as each new line is added. Unlike the common practice, where
text rolling is accepted, this technique is not distracting and
makes using the program for long periods less tiring.

There are two distinct periods of time that the temporary prompts
are displayed before being erased. They are referred to as SHORT
and LONG. The program comes configured for the delay to be LONG.
After you become familiar with the program you may find the LONG
time to be somewhat irritating, and want to change it from LONG
to SHORT.

The duration of the temporary message delay can be changed from
LONG to SHORT by pressing (D) while at the Configuration Menu.
The pertinent text, and its changes in response to input, is:

    D   Delay for messages is: (LONG)

which, when (D) is pressed, changes to

    D   Delay for messages is: (SHORT)

and when (D) is again pressed, it changes back again.

ECHOING RECEIVED CHARACTERS

When you use your computer normally, what you see on the screen
of your terminal when you type is each keystroke AFTER it has
gone into your computer, has been processed by the operating
system in your computer, and has been "echoed" to the screen.
This assures you that what you typed got to the computer intact.
Each character is handled in the same way, except a carriage-
return. When you press the (RETURN) key, your computer adds a
line-feed, otherwise the cursor would move to the left only, and
not also to the next line.

When you call a host system and communicate with it in while in
Terminal Mode, the same sort of echoing takes place: what you
see on the screen when you type is each keystroke AFTER it has
gone into your computer, has been sent to the host via the modem,
and has been echoed back to you by the host. When you press the
(RETURN) key, the host adds the line-feed. (You may have
noticed when communicating with a system located several hundred
miles from you and/or with many users on the system at the same
time as you, that there is a short delay between the instant you
press a key and when the character is displayed.)

There are occasions when it is necessary, or just desirable, for
your system to echo what it receives. An example would be when
someone on the "other-end" has only a terminal and modem. If
they are operating in "full-duplex" mode, they won't see anything
on their screen directly as it is typed. With your system
providing an echo, they will be assured that what they type was
received by you without error.

NOTE: The echo feature works only when you are in the Direct-
      display Mode.

The "Echo Received Characters" function can be turned on and off
by pressing (E) while at the Configuration Menu. The pertinent
text, as it appears when the program is set to the default of the
distribution disk, is:

            E   Echo received char. is (OFF)

        which, when (E) is pressed, changes to

            E   Echo received char. is: (ON)

        and when (E) is again pressed, it changes back again.

FILTERING TEXT WHEN RAPID-TYPING

When sending a file withOUT error-checking (e.g., "rapid-typing")
you may NOT want the file to be sent exactly as it is.

Control characters inserted in a file by word-processing programs
can have an undesireable effect on systems that are not expecting
them. For example, a ^S used by WordStar to indicate the
beginning and end of text that is to be underlined when printed
might "hang" an unsuspecting system using X-ON/X-OFF protocol.

Another possibility is that the recipient of a rapid-typed file
may not have a word-processing program, or at least not the same
one as was used to create the file.   Thus, the file may be
examined on the console screen or be printed directly from the
operating system, (the CP/M "TYPE" command, with an optional ^P
added to turn-on the printer). In such a case, when "non-
standard" control-characters (other than carriage-returns, tabs,
and line-feeds) are encountered, strange things may happen to the
display and/or printed copy. (Try TYPING or printing a .COM file.)
To prevent problems of the sort noted, ReachOut provides the
filter feature: it causes certain characters to be ignored when a
file is rapid-typed.

When the filter toggle is ON, whatever characters are present in
the "filter table" are skipped-over. The filter table is located
in the parameter area of ReachOut and is examined and changed
using INSTMOD. There can be as many as ten characters in the
table. As ReachOut is distributed, there are five characters in
the table. They are

<center>^B,^D,^S,^T,^X</center>

The "Filter Characters" function can be toggled on and off by
pressing (F) while at the Configuration Menu. The pertinent
text, and the response to input, is:

      F   Filter when rapid-typing is: (ON)

   which, when (F) is pressed, changes to

      F   Filter when rapid-typing is: (OFF)

   and when (F) is again pressed, it changes back again.

NOTE: The filter toggle is normally set to ON. This, generally,
      allows you to rapid-type a file without causing difficulties
      on the receiving end. When it is important that the file
      be sent intact, turn-off the filter toggle.

      When sending a file that will be printed using a word-
      processor -- presumedly the same one as you used to create the
      file -- the transfer should occur in an error-checking mode.

CHANGING THE HELP LEVEL

There are two levels of help: BEGINNER and EXPERT. In the BEGINNER mode, guiding text is displayed when it is thought you might need it. In the EXPERT mode, help text is displayed only when requested by pressing (?) while a menu is displayed, or in response to a file-function question (making a log, etc.).

The Help Level is changed by pressing (H) while at the Configuration Menu. The pertinent text, and its change in response, is:

     H   Help level is (BEGINNER)

which, when (H) is pressed, changes to

     H   Help level is: (EXPERT)

and when (H) is again pressed, it changes back again.

LINE-FEED INSERTION

When you are NOT using ReachOut, and using your system in the usual way, each time you press the (RETURN) key on your terminal, the cursor moves to the first column of the NEXT line. It does this in response to a carriage-return character, and a line-feed character. What is sent to the computer when you press (RETURN) is the carriage-return character only. The line-feed is added by the computer.

When you are using ReachOut, and are in the Direct-display Mode, what you see on the screen as you type is a display of what is actually coming from your keyboard. So, when the (RETURN) key is pressed, the cursor will execute a carriage-return command ONLY, moving to the extreme left, but NOT to the next line. In most cases, this isn't good enough; the line-feed character must be added by ReachOut. The "Line-Feed Insertion" function is what controls the addition of the line-feed.

The rules:

A. When ON, and you press the (RETURN) key, a line-feed is added after the carriage-return, locally, so that the cursor on your screen moves properly.

B. When ON and the Echo Received Characters option is ALSO ON, receipt of a carriage-return will cause the display of both a carriage-return and a line-feed, the echoing of the carriage-return, and the sending of a line-feed to the other system."

The "Line-feed Insertion" function can be turned on and off by pressing (I) while at the Configuration Menu. The pertinent text, as it appears when the program is set to the default of the distribution disk, is:

           I   Line-feed insertion is: (ON)

         which, when (I) is pressed, changes to

           I   Line-feed insertion is: (OFF)

         and when (I) is again pressed, it changes back again.

CHANGING THE CARRIER TONE (ANSWER/ORIGINATE MODE)

To understand this section it is important that you know some
basic information:

A modem changes the data coming from your computer to a form that
can be sent down the telephone line: a rapidly-warbling tone.
So that the modem on each end ("you" on one end; "them" on the
other), can differentiate between "who's sending what," there are
two different basic tones. They are called ORIGINATE and ANSWER.

ORIGINATE is the mode in which calling-parties operate.

ANSWER is the mode in which the "host" system (the system being
called) operates.

**The two systems MUST be operating in opposite modes: one must be
in ORIGINATE mode and the other must be in ANSWER mode.**

This scheme permits simultaneous transmission in both directions.
This mode of operation is called "FULL-DUPLEX," and makes it
possible for a caller to abort a function of the host -- such as
the printing of a report -- usually by sending a "break,"
pressing (ESC), or keying a ^C or a ^P.

In contrast, in the "HALF-DUPLEX" mode, only one station can
transmit at a time: each system must complete its transmission --
whether it be a sentence or a file -- before the other system can
transmit. The half-duplex mode of operation is not very common
anymore, and is primarily used, of necessity, when the transfer
rate of the data (the baud rate) is of a speed such that the
somewhat limited ability of standard telephone lines prevents
simultaneous, bi-directional use (usually 2400+ baud systems).

Most systems allow you to "flip" from one carrier tone to the
other. The reason for having this facility is so that changing
the carrier tone can be done in an attempt to correct for a
borderline line condition. Just remember, if you command the
host system to change from one carrier tone to the other, you
must also flip your carrier mode to continue communication.

You can change between the ORIGINATE and ANSWER carrier modes by
pressing (M) while at the Configuration Menu. The pertinent
text, as it appears when the program is set to the default of the
distribution disk, is:

        M   Carrier tone is: (ORIGINATE)

     which, when (M) is pressed, changes to

        M   Carrier tone is: (ANSWER)

     and when (M) is again pressed, it changes back again.

PROCESSING OF HIGH-ORDER (PARITY) BIT

Internally, computers define operating instructions and the value
of variables with a scheme of stringed-together parts, called
"bits." A bit is the most-basic digital entity and is, at any
instant, either "on" (1) or "off" (0). The bits are evaluated in
groups of eight. However, the ASCII system (a standard that
defines the bit patterns [values] of 128 characters, most of
which correspond to keyboard keys) uses only 7-bits.
Accordingly, the 8th bit can be used for another purpose.

The purpose for which the 8th bit (commonly called the "high-
order" bit) is used when dealing with ASCII characters is for a
scheme by which a test of accuracy of the character of which the
bit is part can be made, with a "50-50" chance of detecting an
error; not perfect, but better than nothing. The system is
called "parity testing," and the 8th bit, when used for this
purpose, is called the "parity bit."

When using parity testing, as data is being processed just prior
to being sent "down the line," the first seven bits are evaluated
to determine the number of them that are "on." The 8th bit is
made high or low according to how many of the seven bits are on.

As each character is received, the receiving system processes the
character in the same manner. If the parity bit is not what it
should be, the discrepancy is called a PARITY ERROR and the
sending system is so informed. The response of the sending
system varies on the particular system: it may abort the
transmission or merely send the character again. The parity-
checking character protocol will work only if both systems are
using it, and only if both systems have compatible responses to
an error. If only one system is using the parity error-detection
scheme, the transfer of data between the two is impossible.

Because of the present-day ability of standard "voice" telephone
lines, virtually all of the systems you are likely to contact do
NOT use the parity method of error-detection. However, when the
parity system is NOT used, the parity bit has to have some value,
and what that value is has not been standardized. Therefore,
ReachOut is compatible with both possibilities.

----------oOo----------

MORE ON NEXT PAGE

----------oOo----------

The two ways that the parity bit is processed by ReachOut are:

1. Processing OFF:

   nothing is done, either when sending or receiving.

2. Processing ON:

   when sending, the high-order bit is set to 1;
   when receiving, the high-order bit is made 0 (stripped).

In neither case is the parity bit processed in the "textbook" manner.

The way in which the parity bit is processed can be changed by pressing (P) while at the Configuration Menu. The pertinent text, as it appears when the program is set to the default of the distribution disk, is:

       P   Set/strip parity is: (OFF)

   which, when (P) is pressed, changes to

       P   Set/strip parity is: (ON)

   and when (P) is again pressed, it changes back again.

IT IS EXTREMELY IMPORTANT THAT WHEN YOU ARE TRANSFERRING A
PROGRAM (A .COM file), OR ANY OTHER BINARY FILE, THAT THE PARITY-
SETTING FUNCTION IS OFF.

OTHERWISE, THE COMMANDS IN THE PROGRAM WILL BE DISTORTED AND THE
PROGRAM WILL NOT WORK PROPERLY.

SHOWING FREE DISK SPACE

ReachOut helps you manage disk by showing you the space
remaining whenever you enter either the Create a Logging File or
the Receive a File modes. Monitoring the space remaining on a
disk can save you the disappointment of having a write error
after considerable time -- and in most cases, money -- has been
spent receiving most, but not all, of a file, or most, but not
all of the data when in Logging Mode.

However, if you feel confident that you have enough space for a
communication session, you can temporarily turn-off this feature
by pressing (S) while at the Configuration Menu. The pertinent
text, as it appears when the program is set to the default of the
distribution disk, is:

        S   Show free disk space is: (ON)

        which, when (S) is pressed, changes to

        S   Show free disk space is: (OFF)

        and when (S) is again pressed, it changes back again.

CONTROLLING THE TERMINAL BELL

Most terminals have a "bell." (It really is a small speaker that puts out a tone.) The terminal bell is used by ReachOut to alert the operator to input errors, to signal when a connection is made upon automatic re-dialing, to summon the operator when it is time to enter the next file name when a series of files are being sent in "mock" batch mode when using the ReachOut-to-ReachOut protocol, and at the end of a file transfer.

The majority of the time, the bell is sounded for only a second or so. However, there are three instances when the tone is of longer duration (about 6 seconds):

    a) When a carrier is detected on the second attempt, or later: on a re-dial;

    b) When it is time to enter the next file name when a series of files are being sent in "mock" batch mode when using the ReachOut-to-ReachOut protocol, or at the end of a file transfer.

    c) At the end of a file transfer.

When the bell is sounding for an extended period, you can by-pass the remaining sound by pressing (ESC) or the (SPACE) bar.

While the bell is useful, and is used extensively by ReachOut, it can become annoying if bells generally bother you, or if there is someone nearby.

The terminal bell can be turned off and on by pressing (T) while at the Configuration Menu. The text of the pertinent menu entry, as it appears when the program is set to the default of the distribution disk, and its response when the toggle setting is changed, is:

        T   Terminal bell is: (ON)

      which, when (T) is pressed, changes to

        T   Terminal bell is: (OFF)

      and when (T) is again pressed, it changes back again.

            ----------oOo----------
When the bell is turned off, the long delay is by-passed automatically; that is, there will NOT be 6 seconds of silence before you can proceed.

            ----------oOo----------

CHANGING THE X-ON/X-OFF PAIR

There is a transfer protocol in which the sending system controls when the receiving system begins to log data to a disk, and when the file is closed at the end of a transmission. The protocol is called "X-ON/X-OFF." It involves a pair of characters and, just as you might expect, one of the characters is called X-ON and the other is called X-OFF.

For historical and other reasons, there are actually two pairs. One pair is ^Q/^S, the other is ^R/^T. ReachOut allows you to choose between the two.

The default value is the ^Q/^S combination. You can change the pair of values that are being used by pressing (O) while at the Configuration Menu. The pertinent text, and its response, is:

    O   X-ON/X-OFF pair is: (^Q/^S)

which, when (O) is pressed, changes to

    O   X-ON/X-OFF pair is: (^R/^T)

and when (O) is again pressed, it changes back again.

----------oOo----------

To enable (turn-on) the X-ON/X-OFF "hand-shake" select it from the Protocol Menu. The Protocol Menu is accessed by pressing (P) while at the Configuration menu.

----------oOo----------

X-ON/X-OFF is NOT really a protocol as defined and used in this manual, in that it has nothing to do with error-checking. What X-ON/X-OFF does is start the receipt of a file and stop the receipt of a file, if the receiving system requires the X-ON/X-OFF "hand-shake."

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MAKING THE TELEPHONE NUMBER DIRECTORY

----------oOo----------

<u>This section is applicable only when an auto-dial modem is used.</u>

----------oOo----------

Dialing can be done automatically from a list of telephone numbers that are in a file. The file is made by using a word-processing program. Dialing by using the telephone number directory is the easiest way of dialing, and using it allows you to use a powerful, and convenient, feature: the sign-on script.

The following is an explanation of making a telephone directory, and creating a script used to control a system sign-on sequence.

NAME

The file is called TELENUMB.ERS. When the (D) option is selected from the Dialing Menu, the program will look for the file "TELENUMB.ERS" on both the current disk and the boot disk (drive A). If it can't find the file an error message will be displayed. Instructions on what to do will also be displayed.

METHOD OF CONSTRUCTION

You can make or change the telephone number directory with any text editor, such as Select, Spellbinder, or WordStar.

An easy way to make your directory is to over-write a copy of the sample directory supplied on the distribution diskette. After loading the copy into your text-editor, set-up your text editor so that what you type is written-over the existing characters (INSERT OFF with WordStar). Using this method, characters in the sample directory are deleted by replacing them with a space.

Even though the layout of the directory is somewhat critical, there are routines inside ReachOut that will detect most errors, and there is no mistake that you can make that will damage your disk or your equipment. Just adhere to the rules on the pages that follow, and in particular, use the sample directory as a guide. You should have no problem.

SAMPLE TELEPHONE DIRECTORY

The sample directory is constructed to demonstrate not only
features of the program, but also some of the error conditions.

The sample telephone directory file (TELENUMB.ERS) is displayed
on the screen as:

A=	TELENUMBER LABEL A	B=	TELENUMBER LABEL B
C=	TELENUMBER LABEL C	D=	TELENUMBER LABEL D
E=*	TELENUMBER LABEL E	F=	TELENUMBER LABEL F
G=	TELENUMBER LABEL G	H=	TELENUMBER LABEL H
I=	TELENUMBER LABEL I	J=	TELENUMBER LABEL J
K=*	TELENUMBER LABEL K	L=	TELENUMBER LABEL L
M=	TELENUMBER LABEL M	V=	OUTSIDE LINE
W=	RING-BACK TEST	X=	OUTSIDE & SPRINT
Y=	TELENUMBER LABEL Y	Z=	ALL POSSIBLE TST

The symbol * after some of the choice letters denotes those
numbers that have a sign-on script associated with them. The
symbol is put on the screen automatically after the program
determines which choices have associated sign-on scripts.

ACTUAL TELEPHONE DIRECTORY FILE

The actual telephone number directory file looks like this:

A=	TELENUMBER LABEL A:	555-1111
B=	TELENUMBER LABEL B:	312-555-2222
C=	TELENUMBER LABEL C:	312-555-3333
D=	TELENUMBER LABEL D:	703-555-4444
E=	TELENUMBER LABEL E:	555-5555
F=	TELENUMBER LABEL F:	213-555-6666
G=	TELENUMBER LABEL G:	313-555-7777
H=	TELENUMBER LABEL H:	201-555-8888
I=	TELENUMBER LABEL I:	805-555-9999
J=	TELENUMBER LABEL J:	555-0000
K=	TELENUMBER LABEL K:	555-1111
L=	TELENUMBER LABEL L:	408-555-2222
M=	TELENUMBER LABEL M:	714-555-3333
V=	OUTSIDE .LINE:	9D-555-5555
W=	RING-BACK TEST	555-6666R
X=	OUTSIDE & SPRINT:	9D-123-4567D-111-222-415-555-7777
Y=	TELENUMBER LABEL Y:	555-8888
Z=	ALL POSSIBLE TST:	99D-123-4567D-111-222-415-555-9999R

$ <--- END OF DIRECTORY CHOICES (the $ must be here)

E= ^Cw:77770,101cw:FREE-DEMOce
K= cw?0w?Yw2!^Kw?JOEcw?BLOWcw2?Ccw4>w:cw>DIR1"DISK.B"cw>sBYEch"again"ne

ELEMENTS IN THE PHONE NUMBER STRING

This is an all-inclusive example of a hypothetical entry in the
telephone number directory.

```
T= NUMBER LABEL  :9D-123-4567D-111-222-415-555-1212R
^       delimiter-^              ^-wait for Sprint dial tone
|                       ^^---wait for outside-line dial tone
|- choice               |--- GET OUTSIDE LINE
                              ^###-###^###-###-####
              ^ start        sprint  ultimate
                local        account t. numb.
                Sprint       number (a/c-prefix-suffix)
                access
                number                          ^    a "RING-BACK" SYSTEM
```

An explanation of the significance of each characters is:

1. The "T" is the symbolic label of the directory choice.

2. "NUMBER LABEL" is the verbose description of the
   directory choice.

3. The symbol ":" delimits the label from the number and
   is >>> required <<<.

4. A "D" in a number string instructs the program to wait
   for an additional dial tone. The wait may be needed
   in commercial environments where a number must be
   dialed to "get an 'outside line'."

   An additional "dial tone" is also needed when using
   either Sprint or MCI, as there must be a wait for the
   Sprint or MCI to answer.

5. A capital letter "R" at the end of the number indicates
   that the system being called is a "ring-back" system.

RULES OF THE TELEPHONE NUMBER DIRECTORY

1. The number of choices is limited to 26, and <u>must be letters</u>.

2. Each choice must be a CAPITAL letter. It must be followed by an equal sign (=), which is followed by TWO spaces.

3. The choices do NOT have to be in alphabetical order.

4. Successive letters are NOT required.

5. The length of the telephone number label (whose number it is) is limited to 18 characters.

6. The identifying label must be followed by a colon (:).

7. The length of the number is not critical and spaces or other characters used to separate parts of the number are allowed.

8. An entry must be followed by a carriage-return/line-feed combination.

9. Commands following the digits must be CAPITAL letters:

    D = "wait for second dial tone" (d won't work)

    R = "ring-back system"   (r won't work)

10. There can be no spaces after the last character of a phone number string. (NOTE: With WordStar, a carriage return and line-feed combination seem like a single space.)

11. The telephone number portion of the directory must end with a dollar-sign symbol ($). The symbol goes between the end of the telephone numbers and before the sign-on scripts. If there are no signon scripts, then it just goes after the telephone numbers.

SIGN-ON SCRIPTS

----------oOo----------

<u>This section is applicable only when an auto-dial modem is used.</u>

----------oOo----------

PURPOSE AND LOCATION

One of the most powerful features of ReachOut is the ability to
use a script to automatically execute a sign-on sequence when
calling another computer, thus eliminating the usual tedium of
signing-in to most system.

Scripts are part of the telephone directory, and can > NOT < be
entered from the keyboard as part of keying-in a number to dial.

MAKING A SIGN-ON SCRIPT

Sign-on scripts are located inside the TELENUMB.ERS file. the
sample TELENUMB.ERS file contains some examples of scripts used
to control the sign-on sequence. Using them as examples, and
from the detailed explanation of one of them (choice C), you
should have no difficulty making scripts that fill your needs.

INDICATING THE START OF THE SIGN-ON SCRIPTS

ReachOut must know where in the TELENUMB.ERS file the telephone
number choices end and the signon scripts start. The point of
separation is indicated by a symbol $ between the end of the last
telephone number and the start of the first script.

SIZE OF "SCRIPT"

Scripts can be up to 80 characters long, not including the "e"
that ends it.

MULTIPLE SCRIPTS

If you want more than one script for particular number, just make
multiple entries of the same telephone number in the directory,
have a different letter choice and number label for each, and
have a different script for each entry.

"HIDING" A SCRIPT

To temporarily "hide" a script from the program, identify it with
a lower-case letter, instead of an upper-case letter.

ELIMINATING THE EFFECT OF A SCRIPT

Once a signon script is in the telephone directory you are not
forced to use it. The script can be "cancelled" by keying ^I
before choosing the telephone number. The script will be ignored
for the first attempt, and any re-dial attempts, of that same
number prior to any other number being called.

RESPONSE TIME OF OTHER SYSTEM

Scripts are executed independent of the time it takes the host
system to respond to a command. Therefore, using the same script
on different occasions may exhibit a different "rhythm."

BAUD RATE CONSIDERATIONS

Many systems that you may call will operate at more than one baud
rate. The host system "figures out" the baud rate of the calling
computer by the characteristics of the first few characters you
send it, which are usually carriage-returns -- pressing the
(RETURN) key -- or, on some systems, keying ^C.

When "getting synchronized" with the host system, the number of
times that (RETURN) is pressed -- or in some cases, it is ^C
that you send first -- before the "host" system responds is a
function of the baud rate in effect for that phone call. When
the other system answers, it determines your baud rate, starting
at the lowest speed. Each time it fails to match your rate, it
tries for the next higher speed. Thus, the higher the baud rate,
the more times (RETURN) must be pressed. The sign-on script,
therefore, must start-out with the minimum number of carriage
returns being sent before the system will respond to the rest of
the script.

For example, with a host system that tests for "common" baud
rates using the Bell 103 standard (75, 110, 300) and a caller
using their modem at 300 baud, the sequence would require 3 ^Cs:

              1st ^C says "not 75 baud."

              2nd ^C says "not 110 baud."

              3rd ^C says "IS 300 baud."

              ----------oOo----------

   MOST SYSTEMS WILL REQUIRE ONLY A SINGLE "SYNC" CHARACTER.

              ----------oOo----------

AUTOMATIC DISPLAY OF SIGN-ON SCRIPT "FLAGS"

When the directory is read-in from the disk, ReachOut will determine what entries have a sign-on script associated with them, and will mark those choices that do with a * symbol. The mark is placed just after the = sign and before the start of the label.

Example:

```
A=   TELENUMBER LABEL A        B=   TELENUMBER LABEL B
C=   TELENUMBER LABEL C        D=   TELENUMBER LABEL D
E=*  TELENUMBER LABEL E        F=   TELENUMBER LABEL F
G=   TELENUMBER LABEL G        H=   TELENUMBER LABEL H
I=   TELENUMBER LABEL I        J=   TELENUMBER LABEL J
K=*  TELENUMBER LABEL K        L=   TELENUMBER LABEL L
M=   TELENUMBER LABEL M        V=   OUTSIDE LINE
W=   RING-BACK TEST            X=   OUTSIDE & SPRINT
Y=   BAD BAUD ERROR            Z=   ALL POSSIBLE TST
```


Choices E and K have sign-on scripts associated with them.

SCRIPT COMMANDS

1.   c = SEND A CARRIAGE RETURN

2.   w = WAIT FOR... (THE FOLLOWING CHARACTER)
              If waiting for something other than
              the next (1st) occurance of a character, a
              digit -- between 2 and 9 -- can be put
              between the **w** and the character for which
              you are waiting to designate the occurence.
              A number 1 has the same effect as no number.

3.   ^ = <u>IF WAITING</u>: CHARACTER TO WAIT FOR IS A CONTROL CHARACTER,
              AND <u>WHICH</u> CONTROL CHARACTER FOLLOWS THIS SYMBOL

              <u>IF SENDING</u>: CHARACTER TO SEND IS A CONTROL CHARACTER,
              AND <u>WHICH</u> CONTROL CHARACTER FOLLOWS THIS SYMBOL

              To make your "reading" of a script easy, follow
              the symbol ^ with a CAPITAL letter, although
              ReachOut will correctly interpret it either way.

4.   b = SOUND THE CONSOLE BELL: ONCE

5.   n = SOUND THE CONSOLE BELL: 6 SECONDS, MAXIMUM (*)
              (*) To abort, press the (ESC) key.

6.   p = SHORT PAUSE : 1 SECOND

7.   l = OPEN LOGGING FILE AND START LOGGING
              The command is followed by a file name, enclosed
              between quotes, that, when the l is encountered,
              will cause a file to be created and logging to
              immediately begin. Before the call, the disk is
              checked to determine if the file already exists;
              if it does, you can enter another name.

8.   s = SAVE WHAT HAVE BEEN LOGGING (CLOSE LOGGING FILE)
              Use to save what has been logged before the
              system "log-off" command is sent, otherwise the
              log-off command will be part of the logging file.
              If you do NOT use this command, the file will
              automatically be closed when the either the script
              command h or e is processed.

9.   h = HANG-UP FOLLOWING STRING
              The command is followed by a string, enclosed
              between quotes, that, when sent by the host system,
              will cause ReachOut to hang-up your modem.
              As in the **w** command, a digit can follow to designate
              which occurence of the string hang-up should occur.
              A number 1 has the same effect as no number.

10.   e = END OF SCRIPT

EXAMPLES OF A SIGN-ON SCRIPT

EXAMPLE 1:

You are calling CompuServe, using a public account number and password to access the Demonstration Area.

What follows is what would appear on your screen after the call is answered. Remember, what the host displays is in **BOLD** type; what you type is in underlined type; (RETURN) means you pressed the (RETURN) key.

    USER ID:77770,101 (RETURN)

    Password:FREE-DEMO (RETURN)

The script would look like this:

         E= ^Cw:77770,101cw:FREE-DEMOce

The explanation of the script:

```
E -------> What number choice with which the script is associated
= -------> Defines the letter as a choice
  -------> the place for the * to go that says there is a script
^ -------> Send a control-...
C -------> ...C
w -------> Wait for the following character, before proceeding
: -------> This is the character that you're waiting for
          Send...
7 -------> 1st number of the account number
7 -------> 2nd number of the account number
7 -------> 3rd number of the account number
7 -------> 4th number of the account number
0 -------> 5th number of the account number
, -------> Separates 1st part and 2nd part of account number
1 -------> 1st number of the 2nd portion of account number
0 -------> 2nd number of the 2nd portion of account number
1 -------> 3rd number of the 2nd portion of account number
w -------> Wait for the following character, before proceeding
: -------> This is the character that you're waiting for
          Send...
F -------> 1st character of the password
R -------> 2nd character of the password
E -------> 3rd character of the password
E -------> 4th character of the password
- -------> 5th character of the password
D -------> 6th character of the password
E -------> 7th character of the password
M -------> 8th character of the password
O -------> 9th character of the password
c -------> send a carriage-return
e -------> end of the script
```

EXAMPLE 2:

A public system is called. The system has the facility of both a RBBS and RCP/M. The questions about the caller's hardware are answered, the caller is identified, a check for waiting mail is made, and the caller chooses to enter the RCP/M portion of the system where drive B is accessed, and a listing of the files contained on it displayed. The screen would look like this:

HOW MANY NULLS DO YOU NEED? 0
CAN YOUR TERMINAL DISPLAY LOWER CASE? Y

        Welcome to the Happy Dan's Computer System!
            Type ^K to abort bulletins.

Now for the bulletins! ^K

Please Wait...

What is your FIRST name ? JOE (RETURN)
What is your LAST name ? BLOW (RETURN)
Checking user file..

Logging JOE BLOW to disk...
Active # of msg's 78.
You are caller # 6605
Next msg # will be 116

No messages are waiting.

Function (B,E,R,S,K,G,W,C,U,P,X,Q (or '?' if not known)?C (RETURN)
Please remember to type BYE before hanging up the phone.

To re-enter RBBS, type:
A>RBBS P

For info on software exchange, type:
A>TYPE THIS-SYS.DOC

For general info, type:
A>HELP

Entering CP/M...

A>B: (RETURN)

B>DIR (RETURN)

```
ANGLECAL.COM  38k | ATTMDM  .OBJ  18k | BANNER  .ASM  10k | BBSC     .IBR  54k
BBSCDEF .H     6k | CDOSCPM .DQC   2k | CDOSCPM .OBJ   2k | CDOSCPM .ZQ0  14k
CMD185  .DOC  12k | CMD185  .OBJ   8k | DE-LBR  .OBJ   8k | DEMOUNT .PAS   8k
       Drive B, user 0 contains 526K in 35 files with 64K free
```

B>BYE (RETURN)
Good-bye, call again

To automatically control what is shown on the previous page and,
in addition, save the listing of the files contained on drive B
of the system, and then sign-off and hang-up, the script would
look like this:

K= cw?0w?Yw2!^Kw?JOEcw?BLOWcw2?Ccw4>w:cw>DIR1"DISK.B"cw>sBYEch"again"ne

The explanation of the script:

```
K -------> Tells what number choice the script is associated with
= -------> Defines the letter as a choice
c -------> Send a carriage return for baud rate determination
           (only one needed, but could be more on some systems)
w -------> Wait for the following character, before proceeding
? -------> The character that you're waiting for
           (This is the last character when asking for number
           of nulls to send between lines of text.)
0 -------> This is the answer: 0
           (Since only one keystroke is expected, there is no
           need for a carriage-return.)
w -------> Wait for the following character, before proceeding
? -------> This is the character that you're waiting for
           (This is the last character when asking if caller's
           terminal can display lower-case characters.)
Y -------> This is the answer: YES
           (Only one keystroke expected, so no carriage-return.)
           We don't want to see the bulletins.  A ^K will abort
           them.  We want to abort as soon as possible: just
           before the bulletins start.  An exclamation point
           ( ! ) is the last character before the bulletins
           start, but there was one before it, at the end of
           the welcoming message, so we want to send the ^K
           after the second exclamation point.
w -------> Wait for the...
2 -------> second occurrence of...
! -------> ...an exclamation point...
           ...and then send a...
^ -------> ...CONTROL...
K -------> ...K
w -------> Wait for the...
? -------> ...last character of the prompt asking for the...
           ...caller's first name
           Send...
J -------> ...the first letter of the caller's first name...
O -------> ...the second letter of the caller's first name...
E -------> ...the third letter of the caller's first name...
c -------> ...and a carriage return (to end the first name).
w -------> Wait for the...
? -------> ...last character of the prompt asking for the...
           ...caller's last name
           Send...
B -------> ...the first letter of the caller's last name...
L -------> ...the second letter of the caller's last name...
O -------> ...the third letter of the caller's last name...
```

```
W -------> ...the forth letter of the caller's last name...
c -------> ...and a carriage return (to end the last name)
w -------> Wait for the...
2 -------> ...second...
? -------> ...question mark...
          (So we can say that we want to go to the CP/M portion
          of the system.)
C -------> ..a C...
c -------> ...and a carriage return.
          (The text of the explanation about the CP/M and how to
          return to the RBBS portion of the system contains
          some brackets ( > ).  We are waiting for the
          bracket after the text, the funcional one; that
          is, the "CP/M ready" prompt.  There are 3 in the
          text, so we are waiting for the 4th one.)
w -------> Wait for...
)4 ------> ... the forth...
> -------> ...bracket.
          ...and then send...
B -------> then send a B...
: -------> ....a colon...
c -------> ...and a carriage return.
w -------> Wait for...
> -------> ...a bracket.
D -------> Send this letter...
I -------> ...and this letter...
R -------> ...and this letter...
l -------> Open a logging file...
" -------> Called...
D -------> F
I -------> I
S -------> L
K -------> E
. -------> .("dot")
B -------> B
" -------> Denotes end of the file name
c -------> Send a carriage return (To start the listing of files.)
w -------> Wait for...
> -------> ...a bracket (It means the directory listing is done.)
s -------> Save what has been logged
          (Sign off now.)
B -------> 1st character of sign-off command
Y -------> 2nd character of sign-off command
E -------> 3rd character of sign-off command
c -------> Carriage-return to terminate it
h -------> Hang-up...
" -------> ....When you see the string...
a -------> a
g -------> g
a -------> a
i -------> i
n -------> n
" -------> End of the string on which to hang-up.
n -------> Tell operator that the script is done.
e -------> End of the script.
```

ERROR MESSAGES

A significant portion of the ReachOut program is dedicated to the detection and reporting of errors. While the general rule is to have error messages that are comprehensive and, therefore, self-explanatory and clear, there are some conditions that will be encountered so rarely (if ever) that a verbose message would occupy more space in either the memory of the computer or the file REACHOUT.MSG than it is worth. In those cases, only an error number is displayed.

The explanation of the numbered error messages is:

ERROR 1: The program is being used with a disassembler. Your user license prohibits operation with a disassembler.

ERROR 2: The version of CP/M is incorrect; it must be version 2.0 or later.

ERROR 3: The REACHOUT.MSG file was accessed, for help text, or text for another reason, but there is no index entry for the "key character" specified in the code. This indicates that the REACHOUT.MSG file has been damaged. Record over the file on the disk that contains the .MSG file that is being used, using a copy of the file on another disk as the source. If the file is not on another disk, then use the file on the distribution disk as the source. If there still is a problem, then there is the possibility of an error internal to the program. In such a case, call us.

ERROR 4: NOT USED

ERROR 5: NOT USED

ERROR 6: NOT USED

ERROR 7: NOT USED

ERROR 8: NOT USED

ERROR 9: NOT USED

ERROR A: CALL THE TECHNICAL SERVICE DEPARTMENT (EMANGORP)

ERROR B: CALL THE TECHNICAL SERVICE DEPARTMENT (RODNEV)

ERROR C: CALL THE TECHNICAL SERVICE DEPARTMENT (REBMUNLAIRES)

ERROR D: CALL THE TECHNICAL SERVICE DEPARTMENT (EGASSEMLAICEPS)

ERROR E: CALL THE TECHNICAL SERVICE DEPARTMENT (SREBMUNLAIRESLPUD)

CONTROL CHARACTER FUNCTIONS

Control characters are like a third "case." That is, there is
lower-case, upper case, and control. When control characters are
generated from the keyboard they are keyed by pressing the
(CONTROL) key and the lettered key at the same time.

The meaning of some control characters used by ReachOut
are part of the ASCII standard, others are specific to ReachOut.

The control-characters on the following list have characteristics
noted as follows:

1. The control-characters that are part of the ASCII
   definition are identified by the notation (ASCII).

2. The control-characters that are unique to ReachOut are
   identified by the notation (RO).

3. The control-characters generated from the keyboard by
   the operator are identified by the notation (KB).

4. The control-characters generated automatically are
   identified by the notation (AUTO).

CONTROL-CHARACTER LIST

Control-A (^A) (01 hex): used to switch between one Communication Mode and the other; from Terminal Mode to Direct-connect Mode, or from Direct-connect Mode to Terminal Mode. (RO) (KB)

Control-B (^B) (02 hex): keyed in either the Terminal or Direct-display modes will send a "break" signal to the host. A break is used by some host systems to abort a function in progress. (If the RS-232 chip controlling the modem is not able to generate a break, of the modem does not have a command to send a beak, or the modem will not pass a break generated by the RS-232 chip controlling the modem, a series of 10, 7F hex's, in rapid succession, are sent at the current baud rate. This seems to have the same effect as a break on some systems). (RO) (KB)

Control-E (^E) (05 hex): default command to erase the line-buffer pointer. That is, when you don't want to have the current contents of the line-buffer written to the disk, key ^E (RO) (KB)

Control-G (^G) (7 hex): is a bell character. When transmitted by the host, it makes the terminal bell of the calling system sound. You can make the bell of the other system sound, when in Communication Mode, by keying ^G (ASCII) (KB) (AUTO)

Control-L (^L) (0C hex): used when in the Logging Mode to make logging switch between active and inactive. (RO) (KB)

Control-Q (^Q) (11 hex): restarts the transmission after a ^S; automatically sent by ReachOut after a disk-write when in Logging Mode. Can also be sent by the operator to re-start a listing from the host, when a ^S has been sent to suspend the listing. It is also used to re-start the display of a disk directory and when examining a (ASCII) (AUTO) (KB)

Control-S (^S) (13 hex): temporarily stops transmission from the host system; automatically sent by ReachOut when the line-buffer gets full , just before the disk-write. Can also be sent by the operator to suspend a listing from the host. (ASCII) (AUTO) (KB)

Control-W (^W) (17 hex): used while in Logging Mode to save the content of the line-buffer to disk, and remain in Communication Mode. (RO) (KB)

Control-X (^X) (18 hex): default to break-out of Communication Mode. That is, when you are in either the Direct-display or Terminal Mode, and want to go to the Control Mode Menu. (RO) (KB)

Control-Z (^Z) (1A hex): in a file indicates the end of the file; inserted and used by the CP/M operating system. (AUTO)

UPDATES

ReachOut may never be "done." It is periodically updated to reflect new features and other improvements.

Registered ReachOut users have the opportunity to refinement updates (1.M1x to 1.M1y) for $15.00. Updates from one release to another (1.M1x to 2.00x) cost $35.00. The price includes handling and shipping and either a new manual or additional manual pages.

All orders must comply with the following:

    a. The distribution diskette must be included.

    b. Payment, by check or money order, must accompany the order.

    c. California residents must add 6% for sales tax.

Allow three weeks for receipt, processing, and delivery.

BUG REPORTS

We are devoted to having a bug-free program.

Although the product was extensively tested before its initial release, and all new features are well-exercised by an active group of sophisticated users before being released to the general public, there is always the chance that something will slip by. Accordingly, it is our policy to reward the first registered owner who informs us of a reproducible malfunction with a free update containing the "dead bug."

If you find a problem with the program, write or call; a letter is preferred. If you write, please be sure to include your address. We would also appreciate both your day and evening telephone numbers in case we need further information.

Describe, or be prepared to describe, the condition in the most exact terms possible, including the hardware being used, the baud rate, and other relevant information. If the problem is evident in more than one condition, be sure and describe them all.

<div align="center">

Applied Computer Techniques
(address on front of manual)
(or call San Rafael Information)
San Rafael, CA 94901
(415) 459-3212

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GLOSSARY

The glossary is provided primarily to enhance your understanding of telecommunications, with a little bit of information about the CP/M operating system and the ReachOut program thrown in.

Acoustic modem -- A modem that is connected to the telephone system using a sound, rather than an electrical, connection. The "connection" is made by going through the mouthpiece and earpiece of a telephone handset and a "microphone" and "speaker" on the modem. Sort of the "opposite" of a direct-connect modem.

Ambiguous (file name) - A way of specifying a "template" used to describe something common to the names of files in a group of files; Includes using at least one "wildcard.".

ASCII -- American Standard Code for Information Interchange. The 7-bit code in which all the letters of the typewriter keyboard -- and other characters as well -- are represented.

Asynchronous transmission -- Transmission in which the time interval between transmitted characters may be of unequal length. Transmission is controlled by start and stop bits which frame (indicate the start and end of) each character.

Baud -- A measure of data-transfer speed, equal to the number of discreet conditions per second (i.e., the bits per second).

Bit -- The smallest unit of information in the binary system of notation. A bit is either "high" (has the value "1") or "low" (has the value "0"). ReachOut is written for computers that use bytes comprised of 8 bits.

Boot -- When a computer is first used after having had the power to it off, it must load information from a disk, or from a chip inside itself) into the portion of memory that controls basic operations. Getting this "spark of life" into the memory of the machine is called "booting," and is usually accomplished by pressing a button labeled "RESET."

Block -- A group of characters transmitted as a unit, over which a coding procedure is usually applied for synchronization and/or error control purposes.

Buffer -- A storage area, in memory, for temporarily "holding" data. Commonly used to compensate for differences in the rate of data flow from one device to the other. ReachOut uses the line-buffer to hold data before it is written to the disk.

Byte -- The second smallest element manipulated by the computer, and is comprised of bits, and processed as a unit: 8 bits, in an "8-bit computer." A character or numerical value is represented by a byte. In the ASCII system, a character is 7 bits long, and the 8th bit has no meaning. This 8th bit is known as the "high-order" or "parity" bit.

Carrier -- The tone sent "down" the telephone line that enables two computers to communicate. The carrier is varied by the sending equipment and the variations are decoded by the receiving equipment to recover the information being sent to it.

.COM -- A CP/M "command" file. It is a program, ready to run. To run it, all you do is type the name to the left of the dot and press (RETURN).

CRC -- Cyclic Redundancy Check. A method of confirming the accuracy of data by processing the data "through" a mathematical formula and comparing it to another value.

Control-character -- A "third case" letter (not upper-case, not lower-case). Used to control various computer functions. A control-character is input by holding-down the (CONTROL) key and, at the same time, pressing another key.

Current drive -- The disk drive you are "working from" or are "logged-onto." When in CP/M, you can tell what is the current drive by looking at the screen. The letter to the left of the symbol ">" is the current drive. For example, if you see B> the current drive is drive B. When in CP/M, you change to another drive by entering the drive letter, followed by a colon, and then by pressing (RETURN), whenever you see the > system prompt symbol. When using ReachOut, you "move to" a drive by pressing (5) while at the Control Mode Menu, and then pressing the key that corresponds to the logical name of the drive to which you want to move.

Data set -- Another name for a modem.

Default -- A value, or condition, that will be used by the program, if another value, or condition, is not specified. Example: the program comes assuming that you have two floppy drives; so, the default value for the number of drives is two.

Direct-connect -- A method of connecting the electronics of a modem to a telephone line without using the telephone handset. An acoustically-coupled modem is, by definition, NOT a direct-connect modem.

Distribution diskette -- The (ORIGINAL) program disk as it comes from the supplier, before it is configured, installed, or copied.

Dot -- In a file name, the period that separates the first part of the name (the primary name) from the second part of the name (the secondary name).

Filename -- That portion of the name of a file to the left of the "dot." Sometimes referred to as the "primary name."

Filetype -- That portion of the name of a file to the right of the "dot." Sometimes referred to as the "secondary name."

Flag -- A specific "cell" in the computer's memory used to track the status of a function by indicating if the function is "true" or "false."

Free-space -- That space on a disk which is not being used and is available for the storage of additional data (as files).

Full-duplex -- A circuit, or scheme, designed for transmission in both directions, simultaneously.

Half-duplex -- A circuit, or scheme, designed for transmission in either direction, but not in both directions simultaneously.

High-order bit -- The "leftmost" bit of an 8-bit "word." The ASCII system (which defines the binary values for 128 characters, most of which are on the terminal keyboard) uses only 7-bits and the 8th bit is not used; accordingly, it can be used for another purpose, if desired.

Host -- A computer/modem system that controls answering a ringing line and the system after the ring is answered.

Mark -- The presence of a signal.

Menu -- A menu is a list of functional choices that are presented on the screen. Generally speaking, to enable a function, you press the key of the number or letter that corresponds to the desired choice.

Message -- Text displayed by the program that tells the operator the status of an operation; is different than a prompt.

Mode -- The operational status of a program or piece of hardware.

Modem -- The acronym for MOdulator/DEModulator. An electronic device that converts digital data into audible tone variations (that are then sent over a telephone line), or decodes tone variations and converts them (back into) digital data.

Null -- A value of 0 (nothing); it is different than the character "0". A series of nulls is sometimes sent by host systems to waste time so that a printer (and sometimes a terminal) can perform a carriage-return operation; otherwise, data sent before the equipment was ready for it, might be lost. A null will not cause a display of a character on either a printer or a terminal.

Off-line -- As applies to a modem connected to a telephone line, when it IS electrically, rather than physically, connected to the phone line. The same as "on-hook." The opposite of on-line.

On-line -- As applies to a modem connected to a telephone line, when it is NOT connected electrically to the phone line, although it might be connected physically. The same as "off-hook." The opposite of off-line.

Parity -- A method of "flagging" a character with a certain condition (either "high" or "low") as a method to test if it was received correctly. In the ASCII system (a seven-position string of "off"s and "on"s, which, through various combinations, represent the 128 characters on the terminal keyboard, and then some.) the parity bit is the high-order bit: an 8th bit. If an even number of the seven bits are "on," then the eighth bit should be "true." If an odd number of the seven bits are "on," then the eighth bit should be "true." Since the ASCII character set is defined by seven bits, the condition of the parity bit (either high or low) has no effect on the value of the character.

Prompt -- Text displayed by the program when input from the operator is required (the question, when a question is being asked); is different than a message.

Progress message -- Words displayed by the program that inform the operator of the progress of an event or of the response to a command.

Protocol -- A formal set of rules governing the format, timing, and error-correction control to facilitate data exchange between two computer systems. As applied to transferring a file, is the rules about "Who does what, when." so that meaningful error-detection and recovery "hand-shaking" can take place.

Sector -- The basic "block" of information on a disk. On a standard, single-density, 8" disk, each sector contains 128 bytes (characters) of information, and there are 26 sectors per track.

Set -- making a bit "high" (a binary 1). Usually associated with the high-order bit.

Simplex (Mode) -- Operation of a channel in one direction only, with no capability of reversing.

Strip -- To make a bit "low" (a binary 0). Is usually performed on the high-order bit to make sure it is low, so as not to interfere with the display, or other processing, of an ASCII character (i.e., some terminals will cause the display to change from bright to dim, or from dim to bright, if the high-order bit is high.

Space -- The absence of a signal.

Start bit(s) -- In asynchronous transmission, the bit which synchronizes the receiver to the receiving data, done at each received character. The start bit is always a space.

Stop bit(s) -- In asynchronous transmission, the bit(s) which terminates the character frame (the bit following the 7th bit in a 7-bit word). A stop bit is always a mark.

Synchronous transmission -- Transmission in which the data characters and bits are transmitted at a fixed rate with the transmitter and receiver synchronized.

Support -- When a program works with a particular piece of equipment, or has a particular feature, it is said to support that equipment or feature.

Toggle -- A switch, not unlike a light-switch, that "turns-on" or "turns-off" a program function. With the exception of the ON-LINE/OFF-LINE toggle (direct-connect modems only) at the Control Mode menu, and the single toggle at the Protocol Menu, all the program toggles are accessible through the Configuration Menu.

USART -- The acronym for Universal Synchronous/Asynchronous Receiver/Transmitter. An integrated circuit that controls the modem port on some systems.

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INSTALLATION

THE REASON

In order to operate properly, ReachOut must "know" what equipment
it is being used with. The installation program (called INSTMOD.COM)
is used to configure ReachOut to the hardware environment. In
addition, INSTMOD enables the examination and changing of many of
the program's "switches" (toggles) so as to make the program
"start-out" in a configuration different than the way it was set
on the distribution disk.

For example, the program comes with the Help Level set to
BEGINNER. As you become more familiar with the program you will
probably want to change the Help Level to EXPERT. Although you
can change from BEGINNER to EXPERT from within the program, it is
inconvenient to do so each time the program is used. By using
the INSTMOD program, you can change ReachOut so that the Help
Level will be at EXPERT when the program is run, eliminating the
need to manually change it each time the program is used.

THE PROCESS

The function of the installation/modification program is to read
information from the file REACHOUT.COM and display each unit of
information separately: identifying it, explaining its purpose,
showing the present value, and asking if it is to be changed.

If you want to change a value, you indicate that you do and the
value is changed, either immediately and automatically (in the
case of a toggle) by you choosing a new value from a list, or by
entering the new value.

When all the values have been displayed, and are as you want
them, the information is written into the REACHOUT.COM file, thus
making the changes a semi-permanent part of that copy of ReachOut.
Later, you can review the values and change them again. That is,
you can change the information as often and as much as you like.

----------oOo----------

NOTE: There is nothing that you can do while using the
installation program that would permanently change, or
damage, the copy of the main program (REACHOUT.COM).

----------oOo----------

**ReachOut will not initially operate until you have seen all the
installation questions and, at the end of them, pressed (W) to
write to the disk. Writing to the disk is required even if none
of the "factory-set" values are changed.**

----------oOo----------

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USING THE INSTALLATION/MODIFICATION PROGRAM

The installation/modification program is called "INSTMOD.COM."
It is self-documenting and is used like this:

1. INSTMOD.COM and REACHOUT.COM must be on the same disk.
   The disk should have copies of the two files made from
   the distribution disk. The distribution disk should
   N E V E R be used when using INSTMOD.

2. If the drive containing the disk with the two programs
   on it is other than drive A, "move to" the drive
   containing the programs by typing the letter of the
   drive the disk is in (B, C, etc.) followed by a colon
   (:) and then pressing (RETURN).

3. Type INSTMOD and press (RETURN).

4. After some disk activity, you will see INSTMOD's signon.

5. Press (RETURN). After having agreed to comply with
   the End-Users Agreement and read the reminder about
   registering your program, there is, again, some disk
   activity as the information from the file REACHOUT.COM
   is read into memory.

6. There is an option to allow going directly to the
   section that changes toggles or variables. Since no
   modem, computer, or terminal has been chosen yet,
   answer this question by pressing (N).

7. Next, read the "first time message." It explains that
   the entire set of questions must be reviewed the first
   time the installation program is used (on a particular
   copy of ReachOut), but that later selected portions of
   the "toggles and variables" section can be by-passed by
   pressing (ESC). When you have read the instructions,
   press (RETURN).

8. The computer, and terminal are then chosen

9. The questions about variable values and toggles are then
   asked. Each question includes an explanation of the
   value, what it represents, and/or what is the usual
   value. What entries are relevant, and the value of
   each, is dependent on the specific configuration of the
   program (the modem selected or the modem for which the
   program was pre-configured by the dealer or, if
   purchased directly, by A.C.T.

10. The usual method is:

   a. If you want to keep a value as it is, pressing
      (RETURN) will leave the value unchanged and move
      on to the next question.

   b. If you want to change a value, answer yes to the
      "CHANGE IT?" question, by pressing (Y).

      * If the alternate choice is limited to
         the opposite of the present value only
         (ON/OFF, YES/NO, etc.), then answering
         (Y) is all that is required.

      * If a series of choice are available,
         selection is made from a menu, by
         pressing a single key;

      * If a literal value is required, it is
         entered by pressing the key that
         corresponds to that value.

      * If the value is a hex value, it is input
         by two keystrokes, followed by pressing
         (RETURN).

      After the new value is displayed, you will again
      be asked if you want to change it. If the value
      is now the way you want it, press (RETURN), and
      proceed to the next question.

   c. This process is repeated until all the values
      have been examined.

   d. At the end of the series of questions, the
      information must be written to the disk. This is
      done by pressing (W)

MULTIPLE VERSIONS

You may want to install ReachOut in more than one way, to be used
with different equipment, different equipment settings, or by
different operators. In such a case, install ReachOut for each
configuration then use PIP to make a copy of the just-installed
version under a name that is suitable. HINT: you may want to
start each name with RO (ie., ROMOREV1.COM, ROMOREV2.COM).

DEFAULT VALUES

The following is a list of ALL POSSIBLE things that can be
changed using the installation/modification program (INSTMOD).
It is a complete list and represents the aggregate of all
configurations of the program. That is, **there is NO choice of
modem and supporting equipment that will cause the display of, or
can change, all the values.** The values that are relevant to your
installation depends upon the modem that is being used.

----------oOo----------

Type of phone line (pulse/Touch-Tone):   Touch-Tone

The minimum number of digits in a phone number: 7

Time to wait for dial-tone: 3 secs.

Number of seconds to wait for call to be answered   20 secs.

Drives in the system: A B

What drive to check for associated files
(the Telephone directory and/or help text)
other than on the current drive and boot disk: BOOT DISK/A ONLY

Delay before timed messages are erased (short/long):   LONG

Help level (beginner/expert):   BEGINNER

Filter for text (on/off)   OFF

Characters to be filtered: ^B,^D,^S,^T,^X

Carrier tone (originate/answer):   ORIGINATE

X-ON/X-OFF pair (^Q/^S or ^R/^T):   ^Q/^S

Set/strip the (high-order) parity bit? (yes/no):   NO

Terminal bell (on/off):   ON

X-ON/X-OFF handshake (on/off):   OFF

Type of keyboard feedback
(when in Communication Mode):   TERMINAL MODE
Terminal Mode = (full-duplex)
Direct-display Mode = (half-duplex):

Where to go when logging file is closed:
(Control Menu or Communication Mode):   CONTROL MODE MENU

File transfer protocol:

    1. ReachOut-to-ReachOut
    2. Christensen (CKSUM)
    3. CP/M User's Group (CRC)
    4. Echo-plex

"Break-out" character: ^X

Control Character to erase the line-buffer   ^E

Use standard or alternate characters: STANDARD

Value of 1st character to test: 1
Character to send if is true: A

Value of 2nd character to test: 2
Character to send if is true: B

Value of 3rd character to test: 3
Character to send if is true: C

Value of 4th character to test: 4
Character to send if is true: D

Value of 5th character to test: 5
Character to send if is true: E

IN CASE OF DIFFICULTY

As we all know, sometimes things don't function the way that they should. This is true both when something is used for the first time or when it has been working for some time. Recognizing this, this Section is provided for your guidance. Don't be offended by the simplicity of some of the suggestions:

1. Is the connecting cable between the computer and modem in place and fitted tightly?

2. Is it a proper connecting cable, with the two data pins in the correct orientation, and with all the pins needed to be "high" (logically) at the computer end, or modem end, of the cable actually being high?

3. If you have a REV.1 machine, is the power supply connected to the modem?

4. Sometimes, the modem can get "confused" inside. Try turning off the modem, and then turning it back on.

   If you do this, be sure and load ReachOut again as the modem requires initialization codes from ReachOut and the effect of the commands are lost when the modem is turned-off.

5. Is ReachOut installed for the COMPUTER that you are using?

6. Is the modem in the proper carrier mode?

7. Try erasing ReachOut on your working disk and then use PIP to make a fresh copy from the distribution disk. (Watch it! Do NOT copy to the distribution disk).

8. Contact your dealer.