

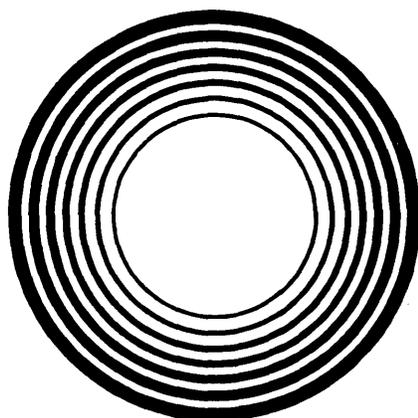
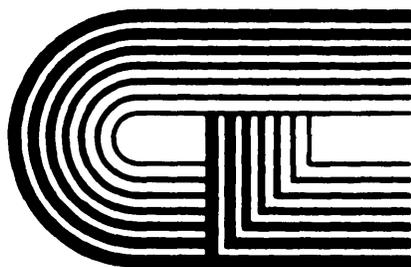
COMMUNI- CATIONS REFERENCE MANUAL

OPERATING SYSTEM SOFTWARE

MAKES MICROS RUN LIKE MINIS

From
PHASE ONE SYSTEMS, INC.

OAKLAND, CALIFORNIA



COMMUNI- CATIONS REFERENCE MANUAL

Second Edition

Documentation by: C. P. Williams
Software by: Timothy S. Williams

OPERATING SYSTEM SOFTWARE

MAKES MICROS RUN LIKE MINIS

From
PHASE ONE SYSTEMS, INC.

OAKLAND, CALIFORNIA

7700 Edgewater Drive, Suite 830
Oakland, California 94621
Telephone (415) 562-8085
TWX 910-366-7139

Second edition, First printing: March 1980

PROPRIETARY NOTICE

The software described in this manual is a proprietary product developed by Timothy S. Williams and distributed by Phase One Systems, Inc., Oakland, California. The product is furnished to the user under a license for use on a single computer system and may be copied (with inclusion of the copyright notice) only in accordance with the terms of the license.

Copyright (C) 1980 by Phase One Systems, Inc.

Previous editions copyright 1978, 1979, and 1980 by Phase One Systems, Inc. All rights reserved. Except for use in a review, the reproduction or utilization of this work in any form or by any electronic, mechanical, or other means, now known or hereafter invented, including xerography, photocopying, and recording, and in any information storage and retrieval system is forbidden without the written permission of the publisher.

Z80 is a registered trademark of Zilog, Incorporated.

P R E F A C E

This manual describes the OASIS communications programs and provides the detailed information necessary to use these programs.

This manual, named COMM, like all OASIS documentation manuals, has the manual name and revision number in the lower, inside corner of each page of the body of the manual. In most chapters of the manual the last primary subject being discussed on a page will be identified in the lower outside corner of the page.

Referenced or Related Material

The following manuals provide information describing other programs that may be required for the use of the communications programs:

OASIS System Reference Manual

OASIS Text Editor Reference Manual

OASIS EXEC Language Reference Manual

TABLE OF CONTENTS

Section	Page
CHAPTER 1 INTRODUCTION	1
CHAPTER 2 RECEIVE COMMAND	2
CHAPTER 3 SEND COMMANDD	3
CHAPTER 4 TERMINAL COMMAND	5
APPENDIX A SEND/RECEIVE PROTOCALL	8

CHAPTER 1

INTRODUCTION

The OASIS operating system includes three programs designed for inter-system communications.

Two of the communications programs are designed to be used to transfer files between two OASIS operating systems. These programs, SEND and RECEIVE, are the logical complements of each other, and have the capability of transmitting and receiving any data or program file that the OASIS operating system supports.

The third communications program, TERMINAL, provides the capability of using the OASIS system and its console as a terminal to another computer system. This program also has the capability of transmitting or receiving sequential format files using the data base of the OASIS system.

CHAPTER 2

RECEIVE COMMAND

The RECEIVE command provides an easy means of receiving files from another OASIS system. The format of the command is:

RECEIVE [<file-name> [<file-type>] <fd> [(COMMn())]

Where:

file-name Indicates the file name to be given to the file received. When this field is omitted the name of the file sent will be used.

file-type Indicates the file type to be given to the file received. When this field is omitted the type of the file sent will be used.

fd Indicates the disk to be used to save the file received. This field is required.

COMMn Indicates the logical device name to be used for the communication link. When this option is not specified the COMM1 device will be used.

Specifying only the receiving disk indicates that the files received are to have the same file name and file type as the source file description. (The SEND command always transmits the file description of the file being sent.)

RECEIVE Examples:

```
>RECEIVE DATA FILE A
Waiting for Sending Station
```

```
Receiving DATA.FILE:A
```

```
Segment 1
```

```
End of File Received
```

```
End of Transmission
```

```
>RECEIVE A
Waiting for Sending Station
```

```
Receiving TEST.DATA:A
```

```
Segment 23
```

```
End of File Received
```

```
Receiving TEST1.FILE:A
```

```
Segment 92
```

```
End of File Received
```

```
End of Transmission
```

```
>
```

CHAPTER 3

SEND COMMAND

The SEND command provides an easy means of transmitting a file from one OASIS system to another. The format of the command is:

SEND <file-desc> [(<option>...)]

Where:

file-desc Indicates the file to be sent. Wildcards are not permitted.

SEND Options:

NOEOT Indicates that the End of Transmission character is not to be transmitted to the receiving system at the end of the file transmission. This option is convenient when several files are to be transmitted because the receiving system will not disconnect at the end of each file.

COMMn Indicates the logical device name to be used for the communication link. When this option is not specified the COMM1 device will be used.

SEND Examples:

```
>SEND TEST FILE S  
Waiting for Receiving Station
```

Segment 1

End of File

```
>SEND TEST DATA A (NOEOT
```

```
Waiting for Receiving Station
```

Segment 23

End of File

```
>SEND TEST1 FILE A
```

Segment 92

End of File

```
>
```


CHAPTER 4

TERMINAL COMMAND

The TERMINAL command provides a means of using the system (and its console) as a terminal to another, possibly foreign, system. The format of the command is:

TERMINAL [(<option>...)]

Terminal Options:

COMMn Indicates the logical device name to be used for the communication link. When this option is not specified the COMM1 device will be used.

AUTOLF Indicates that a LF is to be displayed after receipt and display of a CR. This option may be changed by a menu function.

HALFDUP Indicates that the host system expects the terminal to be in half duplex mode. This option may be changed by a menu function.

In the default FULL DUPLEX operation every character typed is transmitted to the host system but not displayed. In this mode it is assumed that the host system "echos" back to you each character that it receives.

In the optional HALF DUPLEX operational mode every character typed or sent to the host system will be displayed just as if it had been "echoed" by the host system. This mode is useful when are using the options RDRON, RDROFF, PCHON, or PCHOFF because you can type the character desired and it will be as if the host system had sent it.

RUB nn Indicates that the host interprets the character, whose value is nn, as the RUBOUT character. The default value for the RUBOUT character is 127.

ESC nn Indicates that the host system interprets the character, whose value is nn, as the escape character. The default value for the escape character is 27.

CTL Indicates that all control characters (values less than 32 or greater than 127) are to be displayed in their graphic equivalents. This option may be changed by a menu function.

NULL Indicates that the TERMINAL program is to ignore all null or filler characters. This option may be changed by a menu function.

PCHON nn Indicates that the host system uses the character whose value is nn to turn the punch device on. When this character is received from the host system (and a receive file has been defined) the TERMINAL command will "turn on" the punch, i.e., subsequent characters will be written to the receive file.

PCHOFF nn Indicates that the host system uses the character whose value is nn to turn the punch device off. When this character is received by the TERMINAL command (and a receive file has been defined) the characters previously received since the PCHON character will be physically written to the receive file. Until this character is received the characters are only saved in memory.

It is not necessary to specify a PCHOFF character. When no PCHOFF

COMMUNICATIONS REFERENCE MANUAL

character is specified the entire file sent by the host will be saved in memory. Upon receipt of an end-of-file mark (character value 26 = CONTROL/Z) the TERMINAL command will write its buffer to the file and close it. For small files this method is the most efficient.

When receiving large files (files too large to be saved in their entirety in memory) the PCHOFF character should be specified. The host system should place this character at the end of each logical record (or group of logical records) and wait a sufficient period of time for the TERMINAL command to write the records to the receive file. This period of time is primarily dependant upon the access speed of the device holding the file.

RDRON nn Indicates that the host system uses the character whose value is nn to turn the reader device on. When the TERMINAL command receives this character (and a send file has been defined) the file will be sent to the host system.

RDROFF nn Indicates that the host system uses the character whose value is nn to turn the reader device off. When this character is received by the TERMINAL command (and a send file has been defined and is currently in the process of being sent) the transmission of the file will be suspended until another RDRON character is received.

BEEHIVE Indicates that the host system is programmed with the expectation of having a BEEHIVE 100 connected as the terminal device. This option may be changed by a menu function.

ADDS Indicates that the host system is programmed with the expectation of having an ADDS 580 connected as the terminal device. This option may be changed by a menu function.

ADM3A Indicates that the host system is programmed with the expectation of having an ADM3A connected as the terminal device. This option may be changed by a menu function.

SOROC Indicates that the host system is programmed with the expectation of having a SOROC IQ connected as the terminal device. This option may be changed by a menu function.

HAZEL Indicates that the host system is programmed with the expectation of having a HAZELTINE 1500 connected as the terminal device. This option may be changed by a menu function.

VDM Indicates that the host system is programmed with the expectation of having a Polymorphic type VDM connected as the terminal device. This option may be changed by a menu function.

The TERMINAL command transmits and receives all data to/from the host system via the logical device named COMM1. If the COMM1 device is not attached when the TERMINAL command is executed an error message is displayed and the command is exited.

The receive and send files mentioned above may be defined external to the TERMINAL command or from within the command by using a menu function. To define the files externally use the ASSIGN command. Channel 1 should be assigned to the send file; channel 2 should be assigned to the receive file.

Only sequential format files are allowed as the send or receive files.

When the TERMINAL command is executed its menu is displayed:

OASIS Terminal Emulator - version n.n

Modes: Duplex=F Autolf=N Ctl=N Null=N Class=0

Receive file = (ON= ,OFF=)
Send file = (ON= ,OFF=)

- 1 - Assign receive file
- 2 - Assign send file
- 3 - Define translate table
- 4 - Change Modes
- 5 - Begin Emulation
- 6 - Quit (return to OASIS)

Enter function:

APPENDIX A

SEND/RECEIVE PROTOCOL

The SEND and RECEIVE commands are designed to work together, transferring a file from one OASIS system to another OASIS system. However, this is not always the case -- frequently a user needs to send or receive a file from a foreign operating system. To do this he would have to write his own programs at each end of the communications link or he can merely write the complementary program of the OASIS SEND/RECEIVE program on the foreign system. The following protocol information is provided to assist the user in this task.

1. The SEND/RECEIVE communication is a master/slave relationship with message records transmitted between sender and receiver. The sender is the master of the communications link.
2. The master sends the following three types of message records to the slave:
 - (a) ENQ Haven't received any acknowledge for awhile.
 - (b) STX,msg,ETX,lrcc,RUB Text record.
 - (c) EOT End of transmission--disconnect.
3. The slave sends the following four types of message records to the master:
 - (a) NAK Negative acknowledge - didn't receive properly.
 - (b) ENQ Enquire - haven't received anything for awhile.
 - (c) DLE,'0' Acknowledge 0 - received okay.
 - (d) DLE,'1' Acknowledge 1 - received okay.

The slave alternates the acknowledge 0 and the acknowledge 1 to give the master an indication of whether the slave is acknowledging the same record as sent (prevents the loss of an odd number of consecutive records).

If the master receives the wrong acknowledge (i.e., receives DLE,'1' when DLE,'0' expected) the master will send an ENQ record. This will be repeated up to five times and, if the response is still wrong the master will disconnect.

4. Text messages include a Longitudinal Redundancy Check Code (LRCC) which is the eight bit sum of all characters transmitted in the record, including all control characters. The sum is logically ORed with COH and transmitted at the end of the message as indicated above.
5. Text messages contain, as the first character of the message, a letter indicating the action to be taken by the slave:

Letter	Type	Action
O	OPEN	Message is an OASIS directory entry (32 bytes).
W	WRITE	Message is a file record.
C	CLOSE	Message indicates end of file.

6. Messages are sent in transparent mode. This means that the message text may contain embedded control characters. Control characters that are not to be treated as text are always preceded by the DLE character (Device Link Escape -- decimal value 16). (Note: if a DLE character is to be included as part of the text then it is preceded with another DLE. Therefore, the sequence of characters A,B,DLE,SO,C will be sent as A,B,DLE,DLE,SO,C.)

APPENDIX A: SEND/RECEIVE PROTOCOL

7. Message characters are always transmitted as seven bit ASCII characters. Message characters that, upon receipt, are to have their eighth bit turned on will be surrounded by SI and SO. For example, the sequence of characters 81H,0FEH,8FH,23H will be transmitted as: DLE,SI,01H,7EH,0FH,DLE,SO,23H.
8. Message text may have repetitive character compression. When the master recognizes that the text contains four or more consecutive repetitions of a character the characters will be compressed as follows: <character>,VT,<count>. As an example, six consecutive spaces will be transmitted as: SP,DLE,VT,DLE,06H. (The commas are not transmitted, they are only separators for this documentation; the 06H indicates the character whose value is 6 hexadecimal.)
9. Because many systems, including OASIS, perform special action upon receipt of the ESC character (decimal value 27) messages that are to contain the ESC character will convert it to a CAN character. This translation applies to the count of a character compression.
10. The RUB character, when received outside of a framed message, is ignored.

COMMUNICATIONS REFERENCE MANUAL

SEND/RECEIVE Example

The following file, named TEST.SEND:A, is sent:

This is record one.

This is the second record.

And, finally, this is the last record.

```
=====
SEND:      ENQ
RECEIVE:   DLE,30H
SEND:      DLE,STX,4FH,04H,54H,45H,53H,54H,20H,20H,20H,20H,53H,45H,4EH,44H,20H,
           20H,20H,20H,03H,00H,01H,00H,DLE,SI ,00H,DLE,SO ,00H,26H,00H,43H,DLE,
           SI ,CAN,DLE,SO ,00H,00H,00H,DLE,SI ,00H,DLE,SO ,00H,DLE,ETX,5EH
RECEIVE:   DLE,31H
SEND:      DLE,STX,57H,54H,68H,69H,73H,20H,69H,73H,20H,72H,65H,63H,6FH,72H,64H,
           20H,6FH,6EH,65H,2EH,0DH,54H,68H,69H,73H,20H,69H,73H,20H,74H,68H,65H,
           20H,73H,65H,63H,6FH,6EH,64H,20H,72H,65H,63H,6FH,72H,64H,2EH,0DH,41H,
           6EH,64H,2CH,20H,66H,69H,6EH,61H,6CH,6CH,79H,2CH,20H,74H,68H,69H,73H,
           20H,69H,73H,20H,74H,68H,65H,20H,6CH,61H,73H,74H,20H,72H,65H,63H,6FH,
           72H,64H,2EH,0DH,SUB,DLE,VT ,7EH,DLE,VT ,29H,00H,00H,DLE,ETX,4BH
RECEIVE:   DLE,30H
SEND:      DLE,STX,43H,DLE,ETX,68H
RECEIVE:   DLE,31H
SEND:      DLE,EOT
=====
```

Reader's Comments

Name _____ Date ___/___/___
Organization _____
Street _____
City _____ State ___ Zip _____

Name of manual: _____

Did you find errors in this manual? If so, specify with page number.

Did you find this manual understandable, usable, and well-organized?
Please make suggestions for improvement.

Is there sufficient documentation on associated system programs required for use of
the software described in this manual? If not, what material is missing and where
should it be placed?

Indicate the type of user/reader that you most nearly represent:

- Assembly language programmer
- Higher-level language programmer (BASIC, FORTRAN, etc.)
- Occasional programmer (experienced)
- User with little programming experience
- Student programmer
- Non-programmer interested in computer concepts and capabilities
- Data entry operator

Mail to: OASIS Documentation
Phase One Systems, Inc.
7700 Edgewater Drive #830
Oakland, CA 94621