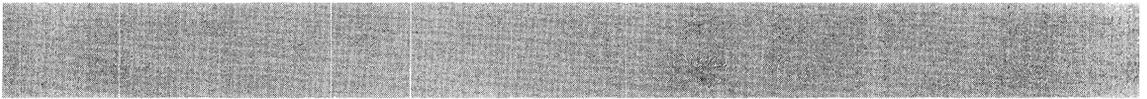


HOW TO USE DG/BLAST™





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Preface

Audience

This manual is written for users who need operating instructions for DG/BLAST™ Rev. 7 Asynchronous File Transfer software. It is assumed that the reader will link two computer systems via direct connection, standard dial-up, or dedicated phone lines.

Readers should be familiar with the type of asynchronous communication port(s) available on their systems, and should know whether the device has been identified to the host operating system during configuration. Users also should be familiar with the operating system of their local computer. If they plan to log onto the target system and work with its operating system, they should have an understanding of that operating system.

Organization

This manual is divided into eleven chapters and four appendices. A tear-out reference card is also included.

If DG/BLAST is not already installed on your system, read appendices A and B, and chapter 11, for information on DG/BLAST and modem installation. See your operating system user's guide for information on backing up your system. The reader should then read the remainder of the manual, beginning with chapter 1, for detailed instructions on starting the program, and a variety of DG/BLAST transfer capabilities.

Chapter 1: A general introduction to DG/BLAST is provided. The two major methods of transferring files (interactive and batch operation) and the two primary modes of operation (terminal and error-free modes) are covered.

Chapter 2: This chapter gets you going on DG/BLAST. Instructions on how to start DG/BLAST with a CLI command line are explained. Also provided is a step-by-step description of transferring a file in interactive operation.

Chapter 3: This chapter gives you troubleshooting information to help you manage DG/BLAST as it is executing. For example, instructions for restarting an interrupted file transfer and error handling are provided.

Chapter 4: The main menu is explained.

Chapter 5: Configuration management is discussed. Parameters set in the configuration management menu are explained, and instructions on how to change a configuration file also are provided.

Chapter 6: The file transfer options offered in terminal mode are discussed.

Chapter 7: File transfer options available in error-free mode are explained. Additional file transfer options are provided, such as transmitting part of a local file, updating remote files, and communication with different operating systems. An explanation of the DG/BLAST templates also is given.

Chapter 8: Instructions are provided for building error-free command files that may be used within a batch command file (for batch operation) or entered during error-free mode (for interactive operation).

Chapter 9: Instructions on how to build function strings are provided. Function strings, when used either in terminal mode or in a batch command file, can make file transfer more efficient and convenient.

Chapter 10: Once you have a sound understanding of the DG/BLAST menu structure and the various file transfer options available in the terminal and error-free modes, the explanation of the batch command file provided in this chapter can lead you to more convenient and faster (in user time) file transfers.

Chapter 11: Instructions on how to configure your modem into the DG/BLAST program are provided.

Appendix A: Helpful hints are provided for installing DG/BLAST onto your system. Instructions for self-testing your program are also given.

Appendix B: The RS-232 Interface and its part in the DG/BLAST modem installation are explained.

Appendix C: DG/RDOS and RDOS CLI error codes are provided.

Appendix D: AOS and AOS/VS error codes are provided.

Using this Guide

Whether you are a veteran user of communications programs, or a novice user, it is important that you read this guide in an order that would ensure you receive the full benefit of DG/BLAST's efficiency and convenience in file transfer. The following approach toward this guide is recommended:

1. DG/BLAST Installation: appendix A.
2. Modem Installation: chapter 11 and appendix B.
3. The remainder of the guide in the order of its chapters, 1-10.

Conventions Used

Throughout this manual, the computer from which you are sending or receiving files is referred to as the **local** computer. The computer that files are sent to or received from is considered the **target** computer.

Note that whenever the CTRL key is used with a following character (such as CTRL K for the attention key), you should press both keys at the same time. An easy way to do this is to press the CTRL key and to continue holding it down while you press the accompanying key.

Also, the carriage return key differs from system to system. Many systems, for example, use the CR (Carriage Return) key or the RETURN key. Others use a left arrow (←). In this guide, the NEW LINE key serves as the carriage return key.

Italics and Brackets

All the CLI command line switches and arguments explained in the following chapters are placed in brackets to show they are **optional**. As each switch is explained, you will find in most cases italicized characters are part of the switch. All italicized words are **optional** parts of the switch.

For example, the optional port switch *PORT*/P may be used on an AOS system. Because *PORT* is italicized, it is an optional component of the switch. Thus, if you wanted to specify an ALM port, the switch would be added to the CLI command line as follows:

```
BLAST ALM/P
```

See chapters 2 and 10 for more information on CLI command line switches and arguments.

Contents

1	Introduction	
	Interactive Operation	1-2
	Terminal Mode	1-3
	Error-Free Mode	1-5
	Batch Operation	1-7
2	Interactive Operation	
	Before Starting DG/BLAST	2-1
	Starting DG/BLAST	2-2
	MS-DOS CLI Command Line	2-3
	DG/RDOS and RDOS CLI command line format	2-5
	AOS and AOS/VS CLI Command Line	2-9
	Executing DG/BLAST Interactively	2-13
	Checking Your Configuration	2-14
	Logging Onto the Target Computer	2-16
	Transferring Files	2-20
	Logging Off	2-23
3	Managing DG/BLAST	
	The Attention Key	3-1
	The DG/BLAST Logon Code	3-2
	Terminating DG/BLAST with the Attention Key	3-2

Premature DG/BLAST Termination	3-3
Restarting an Interrupted File Transfer	3-3
Error Handling	3-3
Line Quality Reporting	3-4
File Transfer Progress Reports	3-4

4 The Main Menu

The Main Menu	4-2
The Main Menu Explained	4-3

5 Configuration Management

Creating Configuration Files	5-2
The Configuration Management Menu	5-2
The Configuration Data Parameters Explained	5-5

6 Terminal Mode

The Terminal Menu	6-2
The Terminal Menu Explained	6-3
Special Terminal Mode Functions	6-4

7 Error-Free Mode

The Options for Error-Free Mode Menu	7-2
The Options for Error-Free Mode Menu Explained	7-3
The Error-Free Communications Menu	7-4
The Error-Free Communications Menu Explained	7-5
Sample Error-Free File Communications	7-7
Transferring a Single File	7-7
Renaming Files in Transit	7-7
Sending a Message	7-8
Transmitting Part of a Local File	7-8
Updating Part of a Remote File	7-9
Combining Partial File Transfer Commands	7-9
Remote-to-Local Partial File Transfer	7-10
DG/BLAST Supported AOS Switches	7-10
Communication Between Different Operating Systems	7-11
Text File Conversion	7-11

Additional File Transfer Options	7-12
DG/BLAST Templates	7-12
Overwriting a File	7-13
8 The Error-Free Command File	
The Error-Free Command File	8-1
Building an Error-Free Command File	8-2
Sample Error-Free Command Files	8-3
9 Function Strings	
Building Function Strings	9-1
Sample Function Strings	9-3
10 Batch Operation	
The CLI Command Line Format for Batch Operation	10-2
Sample CLI Command Lines for Batch Operation	10-3
The Batch Command File	10-6
Building a Batch Command File	10-7
Sample Batch Command Files	10-9
11 MODEMS	
Modem Handling	11-1
Modem Control Strings	11-2
Sample Modem Control Strings	11-5
The Connection Control Language and Function Strings	11-6
If Auto-Dialing Fails	11-6
A Installing and Testing DG/BLAST	
Required Hardware/Software Environment	A-1
Communications Port Selection and Configuration	A-2
Wiring the Port	A-3
Testing DG/BLAST on Your System	A-3
Additional Installation and Self-Test Instructions	A-4
B The RS-232 Interface	
Wiring Modems with the RS-232 Interface	B-3
C DG/RDOS and RDOS CLI Error Codes	
D AOS and AOS/VS CLI Error Codes	

Illustrations

Figure

1.1	The Menu Tree	1-3
1.2	Unverified Terminal Mode Transfer	1-4
1.3	Verified Error-Free Mode Transfer	1-6

Introduction

1

DG/BLAST is a communications program that lets you transfer any type of data file easily and accurately, whether you are transmitting files to or from mainframe computers, minicomputers, or microcomputers. DG/BLAST is compatible with any target systems also running DG/BLAST. This makes it a flexible and powerful tool to create a sophisticated networking environment.

Apart from DG/BLAST's use of the latest sliding-window, pipeline protocol in a full-duplex and asynchronous environment, it is DG/BLAST's flexibility, efficiency, and reliability that separate it from other communications programs on the market. Once invoked, DG/BLAST acts as a program shell through which you can dial up a target computer, and your terminal becomes a terminal on the target system.

When you are logged onto the target computer, you are free to work on the system through the native CLI to perform various tasks, such as file maintenance duties. Having done all this, you are still within the DG/BLAST program shell. You may return to the DG/BLAST menu structure to transfer a file to or from the target system, or to send a message to the target computer. You are returned to the CLI of your local system only after you have logged off the target system, and have exited the DG/BLAST program operating on your local computer.

Thus, DG/BLAST saves you the time and energy of having to leave the communications program to access the target computer, perform the above operations, and once again invoke the program to transfer a file.

You control the sending and receiving of files from your local computer to the target computer in two ways:

- In **interactive operation** by invoking DG/BLAST with with a CLI command line that initiates the menu-driven program. Once in the program, you will interact with the menus to perform a file transfer.
- In **batch operation** by invoking DG/BLAST with the name of a batch command file included in the CLI command line. The batch command file automatically executes file transfer without your interacting with the program menus, or, if you desire, with only a partial interaction with the menus.

Interactive operation gives you the flexibility to alter the running of the program when unexpected circumstances arise during execution.

Batch operation, like interactive operation, is invoked with a single CLI command line. But unlike interactive operation, batch operation can eliminate all user interaction with the menu structure, and it is often a more convenient method of transferring files. Successful file transfers in batch operation, however, require that you have a thorough understanding of the DG/BLAST menu structure and transfer options.

Interactive Operation

Interactive operation of DG/BLAST is the simplest means of transferring a file from your local computer to the target system. You start DG/BLAST with a single command: **DGBLAST**, along with optional arguments and switches that are explained in chapter 2.

During the course of interactive operation, you will encounter five primary menus:

- Main Menu
- Terminal Menu
- Configuration Management Menu
- Options for Error-Free Mode
- Error-Free Communications Menu

These menus help steer you toward various file transfer options. The menus are inter-related, as illustrated in the following diagram:

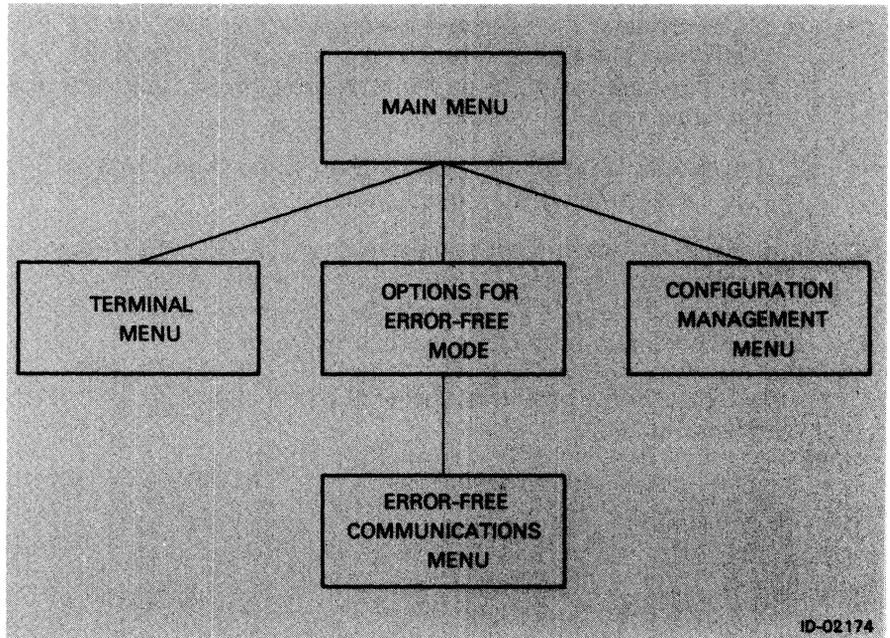


Figure 1-1 The Menu Tree

Interactive operation offers you two modes of transferring files:

- Terminal mode.
- Error-free mode.

Each mode transfers files quickly and efficiently; however, each is tailored for notably different transfer needs, as explained in the following sections.

Terminal Mode

Transferring files through terminal mode, selection U (UPLOAD TEXT FILE), is importantly different from transferring through error-free mode. Two key points should be stressed when transferring files in terminal mode:

- You can transfer a file **whether or not DG/BLAST is running** on the target system. The file is sent in a steady stream of data. No handshaking is performed between the two systems to confirm that the data is being properly received.

- If you transfer files through terminal mode, DG/BLAST does not verify that the files are received at the target computer. Because of this, poor modem lines and interrupted phone line communications can cause transfer malfunctions.

You should transfer files through terminal mode **only** if DG/BLAST is not available on the target system.

Conversely, error-free mode requires that DG/BLAST be operating on the target system. Unlike terminal mode, when you transfer files in error-free mode the transfer is guaranteed. Consequently, error-free mode is a preferable method of transfer.

The figure below provides a basic diagram of a file transferred through terminal mode:

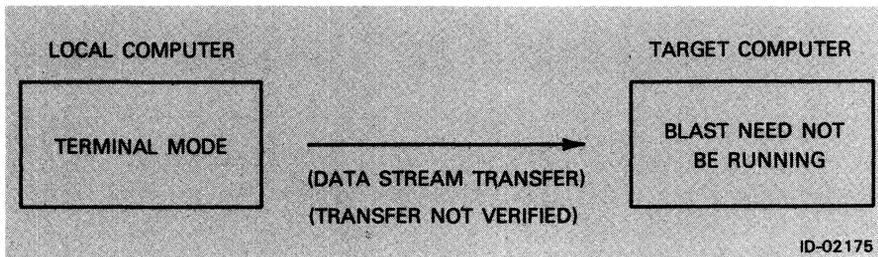


Figure 1-2 Unverified Terminal Mode Transfer

Terminal mode lets you perform a variety of communications functions, including:

1. Become a terminal on the target machine.
2. Send a string of control characters and text to the target system by issuing a single command, rather than having to type in all the characters manually. The function strings are listed in the configuration data. You may, for example, create a function string that logs your local terminal onto the target system, thus saving you time.
3. "Capture" and store to local disk any text information and dialogue transmitted from the target machine.
4. Turn off the capture function.
5. Upload a text file immediately from your local computer to the target system.

Terminal mode lets you log onto the target computer, access that computer's specific operating system, and perform CLI functions without ever leaving the DG/BLAST program shell. By selecting the U (UPLOAD TEXT FILE) option from the terminal menu, you may transfer a file to the target system.

While in terminal mode, you also might start DG/BLAST on the target system if it is not already running. Once DG/BLAST is running on the target machine, you could return to the main menu, select the error-free mode option, and transfer a file through error-free mode (see "Error-Free Mode").

The DG/BLAST terminal mode is not a terminal emulator per se, because it does not translate screen control characters. Rather, terminal mode acts as a "pass-thru" terminal that sends the local terminal's control characters to the target system, and that system's control characters back, with no translation of the codes. Because DG/BLAST can communicate with a wide range of computer systems, no specific terminal is emulated.

Be aware that, since DG/BLAST is not translating character codes returning from the target computer, your screen may occasionally display unusual data or none at all when you are communicating with a target machine having an operating system different from your own. For example, if your local terminal is operating under MSTM-DOS and the target system is under RDOS or AOS, the control characters sent from the target machine will probably effect an incorrect response from your MS-DOS terminal, as the RDOS or AOS codes will most likely be unrecognized by MS-DOS.

For further information on the file transfer options available in terminal mode, see chapter 6.

Error-Free Mode

Transferring files through error-free mode ensures that files are transmitted without error. You are notified if and when the reliability of the communications lines from the local computer to the target machine deteriorates enough to impair fault-free file transfer. The program continues to send blocks of data (hence, BLocked ASynchronous Transmission), and wait for an expected verification of data transmission from the target computer before sending another block of data. If file transfer is interrupted, your subsequent restarting of

DG/BLAST causes the program to resume file transfer at the point the interruption occurred. No data is lost.

The figure below provides a basic diagram of a file transferred through error-free mode:

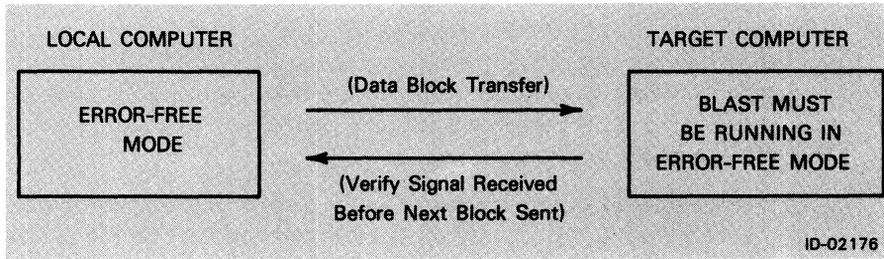


Figure 1-3 Verified Error-Free Mode Transfer

Error-free mode guarantees errorless file transfer. Because DG/BLAST operates in a full-duplex environment, you can perform simultaneous, bi-directional data transfer between the local and target computers. You can choose various data, text, and command information to be sent to and retrieved from the target machine.

You can perform a variety of file transfer functions in error-free mode, including:

1. Operate interactively with the program to send and receive files, and to send messages and CLI commands to the target system.
2. Perform a file transfer by invoking a previously created error-free command file.
3. Operate the local system as a "slave" to the remote site, thus allowing the remote computer to initiate and control file transfer. This function implicitly disallows your initiating a file transfer from the local computer.

For more information on transferring files in error-free mode, refer to the file transfer procedures discussed in chapters 2 and 7.

Batch Operation

Batch operation is the counterpart to interactive operation. With batch operation, you can start DG/BLAST with a single CLI command line that will execute a file transfer, or a series of transfers. Batch operation saves you time and energy that would normally be spent interacting with the menu structure of interactive operation. The convenience of batch operation is due to the single CLI command line that includes the name of a batch command file and a series of optional switches. The batch command file then directs the specified file transfer(s).

Normally, the menus are flashed on the terminal screen as they are passed through by the batch command file during unattended file transfer. Batch mode gives you the option to have none of the operation displayed on the screen. You still are notified, however, of the progress of the transfer.

Batch operation requires that you have a sound understanding of DG/BLAST's menu structure, transfer options, and modes of operation (terminal and error-free). The sample file transfer in chapter 2 provides you with the fundamental background to interactive operation. Successful batch file transfer requires that you have such a background.

Batch Command File

In batch operation, all switches and arguments are optional in the CLI command line to invoke DG/BLAST, **except** the name of the batch command file. The batch command file is the crucial argument to the **DGBLAST** start-up command. The batch command file consists of menu options and command filenames that coordinate the transfer of individual files. Without a specified batch command file, DG/BLAST has no instructions to follow. An error message will invariably result, or DG/BLAST will be started in interactive operation with the program's main menu being displayed.

For more information on the CLI command line and the optional switches, refer to chapter 2, "Interactive Operation," and chapter 10, "Batch Operation."

Interactive Operation

2

This chapter explains how to transfer a file in interactive operation between two systems, which are either connected by “dedicated lines” (direct cable), or by a phone modem. You are notified where the procedures differ between the two methods of connection.

Understanding the DG/BLAST menus and the various functions offered will enable you to later perform more advanced batch file transfers by constructing batch command files and error-free command files. The following sections provide a general background for interactive file transfer. Later chapters describe in greater detail the various menus that comprise the DG/BLAST program.

Before Starting DG/BLAST

Before starting DG/BLAST in either interactive or batch operation, you should perform five fundamental steps:

1. Bring up your operating system. Refer to your operating system user’s guide for more information. Be certain you are acquainted with the operating system of the local computer.
2. Back up your DG/BLAST program diskette for protection against loss or damage. If your system does not have a hard disk from which to run the program, run DG/BLAST from your backup copy of the program and store the master diskette in a safe place. Refer to your operating system user’s guide for more information on backing up your system.

3. Install DG/BLAST onto your system's hard disk (if available). Refer to appendix A, "Installing DG/BLAST," the release notice accompanying the DG/BLAST software, and your operating system user's guide for explanation of this procedure.
4. Install a modem or other cabling equipment between your local computer and the target system(s). Refer to appendix B and your modem user's guide for more information.

Use the special DG/BLAST "connection control language" to configure your modem into the DG/BLAST program. The connection control language avoids the need for modem drivers. See chapter 11 for further explanation.

5. Test your program and system configuration. See appendix A.
6. Return here to begin execution of DG/BLAST.

Starting DG/BLAST

After you have performed the above procedures, you are ready to start DG/BLAST.

Start MS-DOS. Create a file called CONFIG.SYS. You can do this either with the command COPY or with the text editor EDLIN. Both utilities are described in Guide to MS-DOS. You must use a text editor if the file CONFIG.SYS already exists, and you are updating it. To use COPY, enter the following command:

```
COPY CON: CONFIG.SYS
```

and press the Return key. You may now enter text into the file. Type FILES=10 and press the Return key. Now press F6 followed by the Return key. Restart MS-DOS. Now MS-DOS is configured to support DG/BLAST.

Insert your backup copy of DG/BLAST into the primary diskette drive. If you have already loaded DG/BLAST onto a hard disk, move to the directory where DG/BLAST is located.

Use a CLI command line to start DG/BLAST.

The optional switches and arguments that may be contained in the CLI command line specify:

- File transfer in interactive or batch mode.
- The communications port used by the program.
- The secondary device code for IDEFed devices.
- The mux line number.
- The configuration management file.
- The batch command file.
- A file or device where log output is sent.

The CLI command line format differs slightly from one operating system to another. Refer to section below that is appropriate to your system.

MS-DOS CLI Command Line

The CLI command line format for MS-DOS systems is as follows:

DGBLAST [/N] [PORT/P] [CONFIG/C] [CMD/I] [LOG/O]

Explanation of the above switches and arguments is provided below:

/N Specifies a non-interactive operation. The menus are not displayed as they would be if you were in interactive operation.

NOTE: You need not use the /N switch to run in batch mode with a specified batch command file. However, if you do use the /N switch a batch command file **must** be specified.

PORT/P Specifies an optional communications port is to be used. The available communications port specifiers are as follows:

COM1:
COM2:
MDM1: (available only on DATA
GENERAL/One Personal System)

CONFIG/C Specifies the name of the configuration file, whose parameters are to be used during the current session. When you specify a configuration file other than the default file, it must already exist.

See chapter 5 for information on how to create and save configuration files.

CMD/I Specifies the name of the batch command file or device that is to control the session. The default is interactive operation.

The menu commands are read from the batch command file, and the status of the transfer is updated just as if the operator were entering the commands from the keyboard. The batch command file contains menu options that are ordered much as you would sequence them if you were keying in the transfer commands in interactive operation. The error-free command file(s), contained in the batch command file, supplies the transfer commands.

The operator is allowed to take over when the end of the batch command file is reached. Function strings in the batch command file can be used to auto-dial the target system, log onto that computer, perform the file transfer(s), and ultimately log off the target machine.

See chapter 10 for information on creating and using batch command files.

LOG/O Specifies a log output file or device. There is no default log file. If you wish to save the session dialogue, you must create a log file (such as **BLAST.LOG** on an MS-DOS system). If a specified log output file already exists, new log output is appended to it. You should use the /O switch with the name of the log file. For example, the CLI command line

DGBLAST BLAST.LOG/O

stores the session dialogue in log file **BLAST.LOG**.

Log output can be generated in both batch and interactive operation. **DG/BLAST** does not automatically delete your user-created log file when the session ends.

NOTE: Under MS-DOS, the **DG/BLAST** communications port is specified during the system configuration.

Sample MS-DOS CLI Command Lines

The following CLI command lines illustrate a simple startup command that begins DG/BLAST in interactive operation, and a more complex command line that specifies a variety of optional switches and arguments:

Example 1: DGBLAST

Mode	Interactive via the user's console.
Communications port	Default port: COM1 at 1200 baud.
Initial configuration parameters	Default internal parameters.
Command input	User console.
Log output	None.

Example 2: DGBLAST B:DALLAS/C GO/I NORM.LOG/O

Mode	Interactive via the user's console.
Communications port	Default port: COM1.
Initial configuration parameters	Configuration parameters taken from configuration file B:DALLAS.
Command input	Initial command input will be from the batch command file GO. When the end of the batch command file is reached, commands are read interactively from the user's console.
Log output	Disk file NORM.LOG.

DG/RDOS and RDOS CLI command line format

The CLI command line format for DG/RDOS and RDOS systems is as follows:

```
DGBLAST [/N] [/PORT] [LINE/L] [DEV/D] [BAUD/B] [CONFIG/C] [CMD/I]
[LOG/O]
```

Explanations of the above switches and arguments are provided below:

/N Specifies a non-interactive operation. The menus are not displayed as they would be if you were in interactive operation.

NOTE: *You need not use the /N switch to run in batch mode with a specified batch command file. However, if you do use the /N switch, a batch command file must be specified.*

/PORT Specifies an optional communications port is to be used. The available communications port specifiers are as follows:

/R = SYSGENed mux line (the default, and need not be specified).

/U = IDEFed or SYSGENed ULM line. If you include the /U switch, you must also specify the baud rate with the /B switch.

/A = IDEFed or SYSGENed ALM line. If you include the /A switch, you must also specify the clock number with the /B switch.

/M = IDEFed or SYSGENed USAM/ASLM line. If you use the /M switch, you must also specify the baud rate with the /B switch.

/Q = IDEFed or SYSGENed QTY line (DG type 4060 mux).

/S = IDEFed TTY1 line (device code 50/51).

/T = IDEFed or SYSGENed TCU/ALM line. If you use the /T switch, you must specify the clock number with the /B switch.

LINE/L Specifies the mux line number. The default is 0.

DEV/D Specifies the secondary device code for an IDEFed device (default = primary code). The legal values are as follows:

ULM = 44

ALM = 44

USAM/ASLM = 44

QTY = 70

TTY1 = 40

BAUD/B Specifies the baud rate for ULM or IDEFed USAM/ASLM devices. The default baud rate is 1200. The /B switch, for ALM or TCU/ALM devices, also specifies the clock number. The default clock is 0.

CONFIG/C Specifies the name of the configuration file, whose parameters are to be used during the current session. When you specify a configuration file other than the default file, it must already exist.

See chapter 5 for information on how to create and save configuration files.

CMD/I Specifies the name of the batch command file or device that is to control the session. The default is interactive operation.

The menu commands are read from the batch command file, and the status of the transfer is updated just as if the operator were entering the commands from the keyboard. The batch command file contains menu options that are ordered much as you would sequence them if you were keying in the transfer commands in interactive operation. The error-free command file(s), contained in the batch command file, supplies the transfer commands.

The operator is allowed to take over when the end of the batch command file is reached. Function strings in the batch command file can be used to auto-dial the target system, log onto that computer, perform the file transfer(s), and ultimately log off the target machine.

See chapter 10 for information on creating and using batch command files.

LOG/O Specifies a log output file or device. There is no default log file. If you wish to save the session dialogue, you must create a log file (such as BLAST.LG on an RDOS system). If a specified log output file already exists, new log output is appended to it. You should use the /O switch with the name of the log file. For example, the CLI command line

```
DGBLAST BLAST.LG/O
```

stores the session dialogue in log file BLAST.LG.

Log output can be generated in both batch and interactive operation. DG/BLAST does not automatically delete your user-created log file when the session ends.

Sample DG/RDOS and RDOS CLI Command Lines

The following CLI command lines illustrate a simple startup command that begins DG/BLAST in interactive operation, and a more complex command line that specifies a variety of optional switches and arguments.

Example 1: `DGBLAST`

Mode	Interactive via the user's console (background or foreground).
Communications port	System device QTY:0 at the SYSGENed baud rate.
Initial configuration parameters	Default internal parameters.
Command input	User console.
Log output	None.

Example 2: `DGBLAST/A 3/B STARTUP.CM/I BLAST.LG/O`

Mode	Interactive via the user's console (background or foreground). The batch command file controls only part of the entire file transfer.
Communications port	Line 0 of an IDEFed or SYSGENed ALM device at the clock 3 baud rate.
Initial configuration parameters	Default internal parameters.
Command input	Initial command input will be from the batch command file STARTUP.CM. When the end of the batch command file is reached, commands are read from interactively from the user's console.
Log output	Disk file BLAST.LG.

AOS and AOS/VS CLI Command Line

The CLI command line format for AOS or AOS/VS systems is as follows:

```
DGBLAST [/N] [PORT/P] [LINE/L] [DEV/D] [BAUD/B] [CONFIG/C] [CMD/I]
[LOG/O]
```

Explanations of the above switches and arguments are provided below:

/N Specifies a non-interactive operation. The menus are not displayed, as they would be in interactive operation.

NOTE: *You need not use the /N switch to run in batch mode with a specified batch command file. However, if you do use the /N switch, a batch command file must be specified.*

PORT/P Specifies an optional communications port is to be used. The available communications port specifiers are as follows:

@CONn = System console port n. The default is @CON2.
 @CONSOLE = User's console port.
 USAM = IDEFed USAM/ASLM device.
 ULM = IDEFed ULM device.
 ALM = IDEFed ALM device.
 QTY = IDEFed QTY line (DG type 4060 mux).
 TTY1 = IDEFed TTY1 line (device code 50/51).

LINE/L Specifies the mux line number. The default is 0.

DEV/D Specifies the secondary device code for the IDEFed device (default = primary code). The legal values are as follows:

ULM = 44
 ALM = 44
 USAM/ASLM = 44
 QTY = 70
 TTY1 = 40

BAUD/B Specifies the baud rate for IDEFed ULM or USAM/ASLM devices. The default baud rate is 1200. The /B switch, for ALM devices, also specifies the clock number. The default clock is 0.

CONFIG/C Specifies the name of the configuration file, whose parameters are to be used during the current session. When you specify a configuration file other than the default file, it must already exist.

See chapter 5 for information on how to create and save configuration management files.

CMD/I Specifies the name of the batch command file or device that is to control the session. The default is interactive operation.

The menu commands are read from the batch command file, and the status of the transfer is updated just as if the operator were entering the commands from the keyboard. The batch command file contains menu options that are ordered much as you would sequence them if you were keying in the transfer commands in interactive operation. The error-free command file(s), contained in the batch command file, supplies the transfer commands.

The operator is allowed to take over when the end of the batch command file is reached. Function strings in the batch command file can be used to auto-dial the target system, log onto that computer, perform the file transfer(s), and ultimately log off the target machine.

See chapter 10 for information on creating and using batch command files.

LOG/O Specifies a log output file or device. There is no default log file. If you wish to save the session dialogue, you must create a log file (such as BLAST.LOG on an AOS system). If a specified log output file already exists, new log output is appended to it. You should use the /O switch with the name of the log file. For example, the CLI command line

```
DGBLAST BLAST.LOG/O
```

stores the session dialogue in log file BLAST.LOG.

Log output can be generated in both batch and interactive operation. DG/BLAST does not automatically delete your user-created log file when the session ends.

NOTE: *In interactive mode, it is illegal to assign log output to @CONSOLE.*

Sample AOS and AOS/VS CLI Command Lines

The following CLI command lines illustrate a simple startup command that begins DG/BLAST in interactive operation, and a more complex command line that specifies a variety of optional switches and arguments.

Example 1: `DGBLAST`

Mode	Interactive via the user's console.
Communications port	@CON2 at the default baud rate.
Initial configuration parameters	Default internal parameters.
Command input	User console.
Log output	None.

Example 2: `DGBLAST/N @CONSOLE/P BULLETIN.CFG/C @NORM.CMD/I NORM.LOG/O`

This sample CLI command line might be used when transferring a file from a microcomputer workstation over the user's console port.

Mode	Non-interactive. Menu screens are not displayed on the console screen.
Communications port	User's console (@CONSOLE).
Initial configuration parameters	Configuration parameters taken from configuration file BULLETIN.CFG.
Command input	Command input is from batch command file @ NORM.CMD. This specific command file places DG/BLAST in error-free slave mode, and then terminates the program after a file transfer has been initiated and completed by the target system. See chapter 8 for more on error-free command files.
Log output	Disk file NORM.LOG.

To execute DG/BLAST in interactive operation, a batch command file normally is not specified in the CLI command line. You may, however, build the batch command file so it returns control to the console at some point in the operation. At that time, you may begin interactive operation. See chapter 10 for more on batch operation.

You also do not need to specify a configuration management file in the CLI command line if the default parameters in configuration file are appropriate to the session. See the "Checking Your Configuration" section later in this chapter.

However, depending on the configuration of your system, you may need to specify a particular device, baud rate, communications port, or mux line number if it is different from the default setting. You may also want to generate a log output file to be stored on disk, or you may send the log output to a device (such as a printer). In this case, you would need to use the log output switch (/O) to specify the file or device address.

The default settings for the optional CLI command line switches and arguments are as follows:

Switch	DG/RDOS & RDOS Systems	AOS & AOS/VS Systems	MS-DOS Systems
Mode	Interactive	Interactive	Interactive
Com Port	QTY:0 at SYSGENed baud rate	@CON2 at the SYSGENed baud rate	COM1 at default baud rate
Line no.	Mux line 0	Mux line 0	N/A
Initial Config.	Default internal parameters	Default internal parameters	Default internal parameters
Command input	User console	User console	User console
Log output	No default log file	No default log file	No default log file

The DATA GENERAL/One™ Internal Modem

For DATA GENERAL/One™ users, a communications port for an internal modem is available. The device code for this port is MDM1. To use the internal modem, simply include the MDM1:/P switch in the CLI command line when you start DG/BLAST on your system.

If you have an alternate external modem (such as the Hayes Smartmodem 1200) you might use the default port, which is normally COM1. However, be sure that in your DATA GENERAL/One setup procedures you have configured COM1 to be the default communications port. See your *DATA GENERAL/One Owner's Manual* for more information on the internal modem and port configuration.

Executing DG/BLAST Interactively

When you have started DG/BLAST for interactive operation, the main menu is displayed:

```

                                M A I N   M E N U
D - dial   T - terminal mode   C - change configuration   Q - quit program
A - answer E - error-free mode H - hang up

Enter desired option: _

----- LOCAL DISPLAY AREA -----

                                DG/BLAST
                                Rev 7.0
                                BLocked ASynchronous Transmission
                                (c) 1984 Communications Research Group, Inc.
```

Checking Your Configuration

Before starting communications, you first should make certain the preset parameters of the configuration data are compatible with those on the target computer. For example, the baud rate, parity, data bits, stop bits, and duplex parameters set in the configuration files on both machines must match. Enter option C, CHANGE CONFIGURATION, from the main menu. The Configuration Management Menu appears:

```

      C O N F I G U R A T I O N   M A N A G E M E N T   M E N U

C-change data  L-load config file  W-write config file  X-exit to main menu

      Enter desired option--

----- GLOBAL PARAMETERS -----
1. Baud rate-          2. Attention key-^K          3. Streamlined operation-NO
----- TELEPHONE PARAMETERS -----
4. Phone no-
5. Dial cmd-^X90ATDT^P^M^TCONNECT
6. Answ cmd-^TCONNECT
7. Disc cmd-^X10^W+ + ^W^WATH^M^TOK
----- ERROR-FREE PARAMETERS -----
8. Logon timeout(sec)-0  9. Connect timeout(sec)-120  10. Password-
----- TERMINAL PARAMETERS -----
11. Data bits-8          14. Duplex-FULL          17. Interchar delay(sec/10)-0
12. Stop bits-1         15. Auto line feed-NO   18. Send next line char-NONE
13. Parity-NONE         16. Wait for echo-NO    19. Send next line delay(sec)-0
20. String 1-
21. String 2-
22. String 3-
23. String 4-
24. String 5-

```

You are given the opportunity to:

C — CHANGE DATA

Change any of these current configuration entries.

L — LOAD CONFIG FILE

Load a previously created configuration file that will overwrite the current configuration data.

W — WRITE CONFIG FILE

Write the newly created configuration to disk, where it will be saved for later use under a specified filename.

X — EXIT TO MAIN MENU

Accept the current configuration data settings and return to the main menu.

If you select option C, enter the number of the configuration parameter you wish to change. Then press NEW LINE. Once you have changed the entry setting, press NEW LINE to enter the change. You may save your new configuration data (if you change the default file) for later use by choosing option W, WRITE CONFIG FILE. If you do not save your new configuration data, the data is deleted after the current session, and the default parameters are reinstated.

NOTE If you make a mistake while changing a parameter, use the DELETE key to erase the incorrect values and press NEW LINE. The default parameter settings are reinstated.

For more information on changing the configuration data, see chapter 5.

NOTE The most common error in communications is not making the baud rate, parity, data bits, stop bits, and duplex parameters of the host machine identical to those of the target machine. If these parameters are not the same, communications are impossible. You might also make sure the phone number (if you are auto-dialing) is correct.

Logging Onto the Target Computer

Once you have verified that the DG/BLAST configuration of your local computer and that of the target system are compatible, you should make sure DG/BLAST is running on the target computer. Transferring files in error-free mode requires that DG/BLAST be running on both systems.

Either be certain that DG/BLAST has already been started on the target machine, or log onto the target computer to invoke DG/BLAST. In this section, it is assumed that DG/BLAST is not yet running on the target system.

To log onto the target computer, first return to the main menu. If you are using a phone modem, select option D, DIAL, to establish communication with the target computer. Be sure your configuration file contains the phone number to be dialed. If you are on a dedicated line, you are already connected to the target computer.

NOTE DG/BLAST must make two types of communication connections with the target computer:

- *Connection with the operating system of the target computer itself, so you may log onto the system.*
- *Connection with the DG/BLAST program after it has been started on the target computer.*

When communication with the target system is established, select from the main menu option T, TERMINAL MODE. The terminal menu appears:

T E R M I N A L M E N U

B - become a terminal Y - capture mode on U - upload text file
S - send string N - capture mode off X - exit to main menu

Enter desired option: _

----- LOCAL DISPLAY AREA -----

DG/BLAST

Rev 7.0

BLocked ASynchronous Transmission

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Terminal Mode

To log onto the target computer, choose selection B, BECOME A TERMINAL. The following message is displayed on the screen:

```
Capture mode ON/OFF  
Now entering terminal mode. . .
```

You are notified that terminal mode is in process. If the operating system on the target computer subsequently prompts you for a username and password, enter both. If you are not prompted, press NEW LINE to initiate the prompt. At this point, you have the option of transferring files in terminal mode, without DG/BLAST running on the target system. However, since error-free transfer is preferable, this exercise assumes DG/BLAST is available on the target computer.

After you enter a username and password, start DG/BLAST on the target machine by typing the appropriate CLI command line for that machine. Refer to the sections earlier in this chapter that explain the available CLI command lines.

To initiate a file transfer from the local computer, you should be aware of two important points:

1. If you want the target system to run DG/BLAST in interactive mode, the user of that system must ask to exit error-free mode before you, on the local system, are able to receive any files requested from the target system.
2. You may simply start up DG/BLAST on the target system in slave mode (as is done below). This allows the local system to control all file transfers. Putting the target system in slave mode, however, prevents the user on the target machine from interacting with the local system.

The CLI command line below includes a batch command file that starts up DG/BLAST on the target system (AOS) in slave mode:

```
DGBLAST/N @CONSOLE/P SLAVE__MODE/I BLAST__LOG/O
```

The /N switch starts DG/BLAST in non-interactive mode. The user's console (@CONSOLE/P) is specified as the communications port. The batch command file SLAVE_MODE contains menu commands that place the target computer in slave mode. The log output is stored in disk file BLAST_LOG. Once in slave mode, the target system is ready to receive or send files as directed by the local computer.

A sample batch command file called SLAVE_MODE is supplied in chapter 10, along with other information on creating batch command files.

NOTE To invoke DG/BLAST, the DG/BLAST program must be in your directory or searchlist on the target system. As with starting DG/BLAST on the local system, you also may need to use other optional switches or arguments to invoke a properly configured DG/BLAST program on the target computer.

Earlier versions of DG/BLAST differ in their start-up CLI command line formats. Some versions are configured so they are constantly running in slave mode. Be acquainted with the version of DG/BLAST with which you are communicating. This knowledge will make start-up procedures on the target computer much easier.

Once DG/BLAST is running on the target system, a row of p's (or 7's for earlier DG/BLAST versions) should appear across the screen to show DG/BLAST is running on the target computer. Press the attention key (CTRL K) twice. You are returned to DG/BLAST operating on your local computer and the terminal menu.

Enter option X to exit the terminal menu, and return to the main menu.

Transferring Files

Once you have invoked DG/BLAST on the target machine and pressed the attention key (CTRL K) twice, you are returned to the main menu of the program operating on your local system. You now are ready to initiate a file transfer. The following file transfer is done in error-free mode.

Error-Free Mode

Select from the main menu option E, ERROR-FREE MODE. The options for error-free mode menu appears:

```

      O P T I O N S   F O R   E R R O R - F R E E   M O D E

I - interactive local command input      S - slave mode
F - read local commands from a command file  X - exit to main menu

      Enter desired option:  _

----- LOCAL DISPLAY AREA -----

                                     DG/BLAST
                                     Rev 7.0
                                     BLocked ASynchronous Transmission
                                     (c) 1984 Communications Research Group, Inc.
```

Enter the number of the desired option. The simplest transfer method is option I, INTERACTIVE LOCAL COMMAND INPUT. DG/BLAST attempts to log onto the DG/BLAST program running on the target computer. You receive the following message:

```

      Waiting for log-on with remote system. . .
      . . .type the 'attention key' to abort. . .
```

When DG/BLAST establishes communication with its counterpart DG/BLAST program, which must already be running in slave mode on the target computer, the error-free communications menu appears:

```
ERROR - FREE COMMUNICATIONS MENU

S - send file      C - send console command  X - exit to main menu
G - get file      M - send message

Enter desired option: _

----- LOCAL DISPLAY AREA -----

----- REMOTE DISPLAY AREA -----

----- line quality ----- xfer pct complete ----- block count-----
SND= % / RCV= %      SND= % / RCV= %      SND= % / RCV= %
```

Enter the type of file transfer desired. You are prompted for the name of the file to be transferred to or from the target machine. Enter the filename, and press NEW LINE. DG/BLAST updates you on the status of the transfer in the LOCAL DISPLAY AREA and the REMOTE DISPLAY AREA.

The LINE QUALITY message at the bottom of the screen notifies you of line dependability. You are sent a message whenever the line quality is affected by a deterioration or improvement of 20% or more.

The XFER PCT COMPLETE message notifies you of the percentage of the text file that has been stored to disk. The BLOCK COUNT message, on the other hand, notifies you of the number of blocks of the file left yet to send or receive. There is always a lag from the time a file is received or sent, as reflected in the BLOCK COUNT, and when the XFER PCT COMPLETE message notifies you of the percentage transmitted to disk. This is because the data sent or received is placed in a memory buffer before it is sent to disk.

NOTE Depending on the length of the file, the transfer may take several minutes. Once you have entered the name of the file to be transmitted, **do not interrupt the program until you are notified that the transfer is completed**, or until there has been a timeout (see *CONNECT TIMEOUT* in chapter 5).

When you transfer files, keep in mind two major features offered by DG/BLAST:

1. DG/BLAST supports “wild card” templates to make large transfer tasks simpler and faster. The asterisk (*), question mark (?), and percent sign (%) have special meaning when used as part of the local file specifier. See chapter 7 for explanation of how these templates work.
2. When you transfer a file that already exists on the target machine, you normally would receive an error message FILE ALREADY EXISTS. You can avoid this error message by appending the switch /OVW to the destination filename. DG/BLAST then deletes and overwrites any existing file of that name on the target system. For example, if you enter DINGER/OVW as the destination filename, DG/BLAST stores the transferred file as file DINGER on the target system. Any file on the target system already having the identical filename is overwritten.

The /OVW switch saves you the time you otherwise would expend responding to the FILE ALREADY EXISTS message. If, however, the program suffers a sudden termination due to a timeout or line disruption, the /OVW switch causes DG/BLAST to restart the entire transfer again, beginning with the first file in the transfer sequence. This duplication could be time-consuming for long-distance calls.

When the transfer is complete, enter X. This disconnects communications with the DG/BLAST program operating on the target system. After all queued commands have been processed, you are returned to the main menu.

NOTE If you have logged onto the target system, exiting error-free mode does not log you off the target computer. You must return to terminal mode and log off before leaving the DG/BLAST program.

See chapter 7 for further explanation of additional transfer options available in interactive operation.

Logging Off

Select option X from the options for error-free communications menu. You can check to see that the file(s) was transferred by selecting from the main menu option T, TERMINAL MODE. From the terminal menu, select option B, BECOME A TERMINAL. Use the list command of that target computer's operating system to view the files contained in the target directory.

You can log off the target computer in the following steps:

1. Type BYE to log off the target machine. The log-off command may differ from one operating system to another.
2. Type the attention key (CTRL K) twice to return to the terminal menu on your local computer.
3. Select option X to return to the main menu.
4. If you are connected to the target computer by a phone modem, disconnect the communications by selecting option H, HANG UP. Depending on your modem and computer, you may need to physically disconnect communications.
5. Select option Q to exit DG/BLAST and return to the operating system of your local computer.

Managing DG/BLAST

3

This chapter provides information that will help you manage DG/BLAST during its operation, such as logon instructions and explanation of transfer termination processes.

The Attention Key

The attention key (CTRL K) interrupts functions or activities being performed. When you press the CTRL and K keys simultaneously, you are returned to the previous menu. You can change the default attention key (CTRL K) by entering the configuration management file (selection C, CHANGE CONFIGURATION, from the main menu) and defining a new key. The ability to interrupt operations, coupled with the option to return to previous menus, lets you supervise various operations while they are being performed.

If you are running on DG/RDOS or RDOS, or if the local computer is a DESKTOP GENERATION System, you will need to precede each control character sent to the target machine with an attention key. For example, to send the target computer the control characters CTRL C - CTRL A , enter:

```
CTRL K - C. . .CTRL K - A
```

You may also save yourself a few keystrokes on the above RDOS machine by using the EOL (End of Line) key, which sends a ^K code to the computer. If you type EOL - C. . .EOL - A , you would have the same results as above.

The DG/BLAST Logon Code

During error-free logon, DG/BLAST outputs a logon code through the serial port once every second. You can confirm this by attaching a terminal to the port. See appendix A for self-test instructions.

While sending a logon code, DG/BLAST also is listening on the serial port for an incoming **p** (or **7**). This signals connection to the target computer is established and that DG/BLAST is running and is ready for file transfer. DG/BLAST remains in logon mode indefinitely until the local system receives a **p** logon code from the target system. You can abort the logon process by entering the attention key (CTRL K).

It also is possible to limit the amount of time DG/BLAST will spend trying to log onto the target system. This is done by specifying a non-zero number of seconds in the LOGON TIMEOUT configuration field (see chapter 5).

Terminating DG/BLAST with the Attention Key

A file transfer can be terminated at any time by pressing CTRL K at your console. If DG/BLAST is in the process of communicating with a target system in the error-free mode (for example, during logon or the actual data communications phase), the program intercepts the attention key. An orderly shutdown is performed by DG/BLAST.

If, however, you type CTRL C - CTRL A, your operating system intercepts the termination command. If the DG/BLAST session is aborted at this point, DG/BLAST is not given an opportunity for an orderly shutdown of communications with the target system. As a result, some data may be lost in transfer, and you may be required to return to the CLI to restart DG/BLAST. For this reason, it is better to shut down using the attention key.

Premature DG/BLAST Termination

If the file transfer process terminates due to a communications time-out, or if DG/BLAST intercepts an attention key, the program performs an orderly shutdown. An orderly shutdown consists of the following steps:

1. All open files are closed. If DG/BLAST was receiving a file, the partial file is retained.
2. The temporary scratch file is deleted.
3. DG/BLAST waits until there is no more data being received on the communications port before returning you to the file transfer menu.
4. When the transfer is restarted, DG/BLAST returns to the first transfer command. If the command was to send a list of files, DG/BLAST tries to send the first file in the sequence. If that file already exists on the target system, DG/BLAST moves on to the next file to be transferred. This process continues until the program finds a file that does not yet exist in its entirety on the target system. DG/BLAST then resumes transfer at the point in the file where the interrupt earlier occurred.

Restarting an Interrupted File Transfer

A file transfer interrupted by a communications timeout or an abnormal termination is automatically continued from the point of interruption if you attempt to re-transmit the file. This saves you from having to restart the file transfer process from the beginning.

Error Handling

When DG/BLAST detects an error, it sends an error message to the screen. If the error occurs in your local computer, the message normally describes the error. If the error is detected in the target system, the error message reports the decimal value of the one-byte error code returned from the target system.

If the error is non-fatal to the program's operation (for example, a file transfer command contains an illegal filename), DG/BLAST discontinues processing that command and proceeds to the next command. However, if the error is fatal (for example, the disk, to which you are transferring a file, runs out of memory space) data transfer in that direction is terminated.

The most common errors during DG/BLAST operation are:

1. Incorrect configuration parameters that do not match the corresponding parameters on the target machine (for example, different baud rates, unmatched parity, etc.). Keep in mind that, to transfer a file in error-free mode, parity must be set at NONE, the data bits at 8 and the stop bits at 1.
2. Incorrect phone numbers of target machines.
3. An incorrect filename format to reference a file.
4. The depletion of disk space during file transfer.

Line Quality Reporting

Once you have initiated a file transfer, DG/BLAST measures the line quality and displays it at the bottom of the screen. (The telephone company actually uses two separate circuits for outgoing and incoming signals.) A line quality less than 100% means that circuit flaws have been detected. This requires re-transmission of some data blocks, and overall efficiency is lowered. Once a line quality report has been displayed, DG/BLAST does not update that report unless the line quality changes by 20% or more.

File Transfer Progress Reports

When you send or receive a large file, DG/BLAST periodically (about once every 10,240 bytes) outputs a log message that indicates the percentage of the file that has been transferred. As each message is reported, DG/BLAST also updates the disk directory information so that, in the event of a system malfunction, all file data received to the point are retained on disk.

The number of blocks received at the local computer is reported, as is the percentage of the file stored to disk. There is always a short lag between the time when the number of blocks received is reported and the percentage of the file sent to disk is given. This is because the data are initially stored in a temporary buffer before being transferred to disk.

The Main Menu

4

Normally you will transfer files by interacting with the menu-driven DG/BLAST program. After invoking DG/BLAST, you can perform a variety of operations from the main menu, including:

- Dial the target computer.
- Answer a call from the target computer.
- Enter terminal mode.
- Enter error-free mode.
- Hang up or disconnect modem communications with the target computer.
- Change the current configuration.

Many of the options from the main menu, when selected, display submenus that offer a variety of operations. When you execute DG/BLAST in interactive operation, you will interact with most of these menus to perform a file transfer. However, if you execute DG/BLAST in batch operation, you skip most (if not all) of these menus, depending on how you design the batch command file (see chapter 10).

The Main Menu

When you begin DG/BLAST in interactive operation, the main menu appears, displaying the available function options:

```

                                M A I N  M E N U

D - dial   T - terminal mode   C - change configuration   Q - quit program
A - answer E - error-free mode H - hang up

      Enter desired option: _

----- LOCAL DISPLAY AREA -----

-----

                                DG/BLAST
                                Rev 7.0
                                BLocked ASynchronous Transmission
                                (c) 1984 Communications Research Group, Inc.
```

The Main Menu Explained

The main menu selections are briefly explained below:

D — DIAL

The phone number to be dialed, an entry in the configuration management file, can be set with the CHANGE CONFIGURATION function, option C, described below.

The dialing action of the program is controlled by the DIAL command that is stored in the configuration data. The DIAL command must be written in the connection control language (see chapter 11), and can be changed through the configuration management menu.

NOTE: *This function assumes that you have an auto-dial modem, such as the Hayes Smartmodem 1200.*

For more information on configuration management functions, see chapter 5.

A — ANSWER

When the two computers are connected by phone and an auto-dial modem is used, dial out using the function option D for DIAL, or this second function if you are expecting a call from another computer. This function waits for a call to be received and answered. Then it returns you to the main menu.

The action taken by the program in answering is controlled by the ANSW command that is stored in the configuration data. The ANSW command must be written in the connection control language (see chapter 11), and can be changed through the configuration management menu.

To interrupt this function, press the attention key (CTRL K). This causes the program to return immediately to the main menu.

For more information on configuration management functions, see chapter 5.

T — TERMINAL MODE

When you select option T, the terminal menu is displayed. From the terminal menu, you can become a terminal on the target computer, log onto the target system, transmit text files (transfer unverified), or capture incoming text to disk (capture unverified).

Again, the operation of these functions depends on the preset parameters of your configuration file. Use the CHANGE CONFIGURATION function (option C of the main menu) to be sure the specified baud rate, phone number, and other system parameters of your computer and the host machine match.

When you transmit text files to the target system, DG/BLAST utilizes the X-ON/X-OFF flow control protocol. This gives you access to standard time-sharing services, etc. offered by the host machine. This minimizes loss of data during transmission.

DG/BLAST terminal mode makes no effort to make your computer emulate another specific terminal or model, but acts as a “pass-thru” terminal that can communicate with any target computer under the shell of the DG/BLAST program, despite hardware differences between the local and target systems.

See chapter 6 for a display of the terminal menu and explanation of all the available terminal functions.

E — ERROR-FREE MODE

When you select this option from the main menu, a subordinate menu appears. You can select a simple interactive file transfer by choosing option I and interacting with the following menu that is displayed.

You may also specify an error-free command file to direct the execution of the file transfer (option F). This second option gives you partial unattended operation. It is also more convenient than option I, since it offers no interactive prompting; however, it does require the user to be knowledgeable of the program’s file transfer capabilities.

The error-free command file contains various commands that direct the file transfer program during execution. An error-free command file can send files to or receive files from the target system. An error-free command file might also send messages to the target machine. Other command files might include CLI

commands to be executed at the target system after file transfer is completed. The format of the error-free command file is identical to the format used under earlier versions of DGBLAST. Do not confuse the error-free command file with the batch command file (see chapter 10).

You could also choose to have your local computer serve as a "slave" to the remote system. This allows the target computer to initiate all file transfers in either direction.

See chapter 7 for a display of the error-free mode menus and explanation of all the file transfer options available.

C — CHANGE CONFIGURATION

When you select this function, the current configuration data is displayed in the configuration management menu. All preset functions and logon string entries are also shown.

This subordinate menu lets you modify the current data, or override the current data by entering the name of a previously created configuration file. If you create a new configuration file, you are given the chance to save the file. This makes for greater convenience later if your file transfer needs require you to constantly change your configuration data.

NOTE: *To transfer a file in error-free mode, parity must be set at NONE, stop bits set at 1, and the data bits set to 8.*

See chapter 5 for more information on editing your configuration data file.

H — HANG UP

This function causes the modem to hang up a call. The action taken by the program in hanging up is controlled by the DISC command that is stored in the configuration data. The DISC command must be written in the connection control language (see chapter 11), and can be changed through the configuration management menu.

Performing this function is critical before terminating your file transfer session, especially with long-distance calls.

Q — QUIT PROGRAM

When you choose option Q from the main menu, the DG/BLAST program is terminated and you are returned to the operating system CLI.

For a description of the function options available from the main menu, refer to the appropriate following chapters.

Configuration Management

5

For DG/BLAST to operate properly, its configuration parameters must accommodate both the local and target computers. Before accessing the target computer for file transfer, make sure the configuration parameters of both DG/BLAST programs working on the two computers are compatible (baud rate, parity, data bits, stop bits, duplex, etc.).

Configuration parameters control the operation of the program once DG/BLAST has been started. By altering the present configuration, you can change the baud rate, the phone number of the target computer that can be automatically dialed, the identification of the attention key, etc. The default parameters can be changed during each execution of DG/BLAST, or you can create configuration files with various parameter settings. These configuration files can be invoked and used according to your file transfer needs at a particular session.

You can specially tailor DG/BLAST to specific requirements of your system and your file transfer needs by creating your own configuration file(s). This chapter explains the need for configuration files with various parameter settings, and the procedure for building these files to accommodate the varying configuration characteristics of different target computers.

Creating Configuration Files

Users of DG/BLAST often want to access a number of different computer systems, both in terminal and in error-free mode. Consequently, they recognize the need for establishing configuration files that have a variety of hardware and software parameters that make their system compatible with these different machines.

To view the preset configuration data file, select from the main menu option C, CHANGE CONFIGURATION. If the configuration data is not appropriate for your particular communications environment, you may create new configuration management files by changing the data parameters.

The Configuration Management Menu

The CHANGE CONFIGURATION option makes the customized alteration of current and the creation of new configuration files easy. When you access the CHANGE CONFIGURATION function from the main menu, the following screen appears:

```

      C O N F I G U R A T I O N   M A N A G E M E N T   M E N U

C-change data  L-load config file  W-write config file  X-exit to main menu

      Enter desired option_

----- GLOBAL PARAMETERS -----
1. Baud rate-          2. Attention key-^K      3. Streamlined operation-NO
----- TELEPHONE PARAMETERS -----
4. Phone no-
5. Dial cmd-^X90ATDT^P^M^TCONNECT
6. Answ cmd-^TCONNECT
7. Disc cmd-^X10^W+ + ^W^WATH^M^TOK
----- ERROR-FREE PARAMETERS -----
8. Logon timeout(sec)-0  9. Connect timeout(sec)-120  10. Password-
----- TERMINAL PARAMETERS -----
11. Data bits-8        14. Duplex-FULL          17. Interchar delay(sec/10)-0
12. Stop bits-1       15. Auto line feed-NO   18. Send next line char-NONE
13. Parity-NONE       16. Wait for echo-NO    19. Send next line delay(sec)-0
20. String 1-
21. String 2-
22. String 3-
23. String 4-
24. String 5-

```

The first three data entries, BAUD RATE, ATTENTION KEY, and STREAMLINED OPERATION are global parameters and apply to the DG/BLAST program in general. The next four entries—PHONE NO, DIAL CMD, ANSW CMD, and DISC CMD—are telephone parameters. The error-free parameters include LOGON TIMEOUT, CONNECT TIMEOUT, and PASSWORD. The remainder of the configuration management menu consists of terminal parameters.

The menu shows the default values for several parameters. In some communications environments, this default configuration is sufficient. If this is the case for your communications requirements, you need not make any changes in the data. However, if the target system's DG/BLAST program has a different baud rate in its configuration, change the baud rate accordingly in your configuration. This also is true for the other parameters.

You are prompted for a menu selection at the top of the screen. Your options are:

Option C — CHANGE DATA

When you enter option C, CHANGE DATA, you can change individual data parameters. After entering C, you are prompted for the number of the parameter to be changed. Press NEW LINE after entering the parameter number.

You then are prompted to enter the new value. Enter the new value and press NEW LINE. Answer 0 when you are satisfied with the new configuration data. Then enter X to return to the main menu.

For some versions of DG/BLAST, certain configuration entries cannot be accessed. For example, under RDOS and AOS it is not possible to modify the baud rate, parity, and other communication port settings. DG/BLAST gives an error message if you try to change these fields.

NOTE: *If you make a mistake while changing a parameter, use the DELETE key to erase the incorrect values and press NEW LINE. The default parameter settings are reinstated.*

Option L — LOAD CONFIG FILE

When you enter option L, LOAD CONFIG FILE, you are prompted for the name of the configuration file to be loaded. If you wish to load a configuration file that you have already created in an earlier session, enter the name of the configuration file.

Then press X to return to the main menu. From the main menu you can initiate a file transfer with option E, ERROR-FREE MODE.

Option W — WRITE CONFIG FILE

When you enter W, you are given the chance to save the configuration data you have just created with the C option. When you are prompted for a name for the new configuration file, enter a filename that is easily recognizable for later use. You might use filenames such as DALLAS.CFG or DALLAS.CF, and so on.

If you make changes in the configuration data and do not save it, the program does not record the altered data for future use. However, by saving the new configuration data, you can accumulate a variety of files that can be recalled later for communications directed toward different target machines.

When you edit configuration data, you can load a previously created configuration file for that particular session by entering the name of the configuration file. DG/BLAST will run with the specified configuration data until the session is terminated and you are returned to your operating system.

Option X — EXIT TO MAIN MENU

When you enter option X, EXIT TO MAIN MENU, you are returned to the main menu. From there, you may select option E, ERROR-FREE MODE, to initiate file transfer procedures.

The Configuration Data Parameters Explained

For an explanation of the configuration parameters, refer to the numbered parameters below:

Global Parameters

1. BAUD RATE

The baud rate is the speed at which data is transmitted from one system to another. The baud rate of your local system (and modem) must match the baud rate of the target system (and its modem).

You should set the baud at valid rates: 110, 300, 1200, 2400, 4800, 9600, and 19200. The default baud rate is 1200. Be aware of the maximum baud your specific system can accept. An error in coordinating baud rates can cause the loss of information being transferred and a system failure.

2. ATTENTION KEY

The default attention key is CTRL K (^K). The attention key interrupts program activity. DG/BLAST continually looks for the attention key followed by a valid direction character (see section 6.3 for information on direction characters). When CTRL K is entered, DG/BLAST performs the task prescribed by the direction character.

You may change the attention key by selecting option C and making the modification through the configuration management menu.

3. STREAMLINED OPERATION

If this parameter is set to YES, DG/BLAST operation is streamlined. In particular, the terminal and error-free menus are not displayed. When you request terminal mode from the main menu, the local system immediately becomes a terminal on the target computer. When you request error-free mode from the main menu in streamlined operation, DG/BLAST displays the error-free communications menu.

Skipping the initial submenus of terminal and error-free modes speeds your interactive file transfer.

Telephone Parameters

4. PHONE NO

The phone number you enter here is used by your local system to connect by modem with the target computer. The telephone dialing function of the main menu executes the call.

You can enter up to 66 characters into this entry.

5. DIAL CMD

The dial command is a control string written in connection control language. It directs the program to perform a series of dialing functions. A standard dial command, for example, might set a timeout period for 90 seconds, send the dial command to dial the phone number listed in the PHONE NO entry, and then instruct the program to wait for a connect signal from the target computer before responding with an answer signal and preceding with file transfer.

The following dial command string directs such a sequence to the Hayes Smartmodem:

```
^X90ATDT^P^M^TCONNECT
```

This particular modem command is preset in the configuration file, but, like the other modem command strings, it can be changed.

For more information on the connection control language, see chapter 11.

6. ANSW CMD

The answer command string, like the dial command, is written in the connection control language. The answer command string instructs the program to answer the call from the target computer.

The following answer command, for example, is for the Hayes Smartmodem, and it instructs the program to wait for a "CONNECT" message from the modem.

```
^TCONNECT
```

This particular command is preset in the configuration file, but, like the other modem command strings, it may be changed. The

default setting for the program to wait for the connect signal is 0 (infinite).

For more information on the connection control language, see chapter 11.

7. DISC CMD

The disconnect command is a control string that instructs the program how to end modem communications with the target computer. The DISC CMD is executed from the HANG UP option from the main menu. Like the dial and answer commands, the disconnect command is created with the connection control language.

The following disconnect command is for the Hayes Smartmodem:

```
^X10^W+++^W^WATH^M^TOK
```

This particular modem command is preset in the configuration file, but, like the other modem command strings, it can be changed.

The default setting for the program to wait for further transfer instructions, after it has established modem communications with the target computer, is 10 seconds.

For more information on the connect control language, see chapter 11.

Error-Free Parameters

8. LOGON TIMEOUT

This entry specifies the number of seconds DG/BLAST will try, in error-free mode, to log onto the target system. If the program is unable to log onto the target machine within this allotted time, you are returned to the main menu. Thus, a timeout has occurred.

The default value is 0. This means there is no logon timeout, and that DG/BLAST will continue trying to log onto the target system indefinitely until you interrupt the logon attempts with the attention key.

9. CONNECT TIMEOUT

A connect timeout is the period after logon has occurred during which DG/BLAST waits for valid data or commands. This entry specifies the number of seconds the program will wait for such data before returning you to the main menu.

Timeouts can happen for three reasons:

- Line quality is very poor, thus disrupting the modem connection.
- Line communication has been broken.
- No user commands have been entered for too long a time at either end of the line.

The default connect timeout is 120 seconds. An entry of 0 means DG/BLAST will never timeout, no matter how long it must wait for valid data or commands from the target system.

10. PASSWORD

If this field is not blank, a remote site must send to the local system a command with the form "PASSWORD=NNNNN", where NNNNN is an arbitrary text string matching the password field, before the local system will send any files, or process received CLI commands.

The default setting is blank.

Terminal Parameters

11. DATA BITS

This entry instructs terminal mode to communicate with the target system, using either eight or seven data bits per character (or byte) of data.

The default value is 8.

12. STOP BITS

This entry sets the number of bits designated to mark the end of each byte of data in asynchronous operation.

The default setting is 1.

13. PARITY

While in terminal mode, the host system dictates the parity setting you should choose for this entry. The options are EVEN, ODD, or NONE.

The default setting is NONE.

14. DUPLEX

The host system dictates whether you should be half-duplex or full-duplex. The options are HALF and FULL.

The default setting is FULL—that is, the target system echoes back each character as it is received. This is also called “echo plex.”

15. AUTO LINE FEED

Some host systems send text and responses to a terminal with only a carriage return to terminate the end of a line. Therefore, to properly display received text from the target system on your screen, you may opt to insert an automatic line-feed character after each carriage return received.

The options are YES and NO. A YES entry inserts a line-feed character after each carriage return only on the screen for display purposes. If you accidentally select this option, your output may appear double-spaced. The default is NO.

The following parameters apply only to text file uploading in terminal mode:

16. WAIT FOR ECHO

This entry causes your computer to wait after each character is sent. When the local computer receives an echoed character from the target system, it sends another character. This parameter setting is useful when you are transmitting files in terminal mode where file transfer is not verified.

The options are YES and NO. Entering YES directs the program to wait for echo confirmation from the host computer. This ensures that your text is being properly received and avoids loss of data.

The default setting is NO.

17. INTERCHAR DELAY

This entry directs the local computer to delay a specified number of 10ths of a second between the transfer of text characters.

The valid range is 0 to 255. The default value is 0.

18. SEND NEXT LINE CHAR

This entry configures the target computer to receive one line of data, to provide confirmation to the local computer that the line was received, and to prompt for another line of data. This process continues until the entire file is transferred.

Enter the character the host computer will send to prompt your local computer for another line. The options are any valid character, a control character, or NONE.

The default setting is NONE.

19. SEND NEXT LINE DELAY

This entry directs the program to delay a specified number of seconds between each line sent to the host computer. This delay can be in addition to, or instead of, the delay invoked by the SEND NEXT LINE CHAR function.

The valid range is 0 to 255. The default value is 0.

20-24 STRING 1-5

Five function strings can be created to perform a variety of CLI operations. You may designate a function string to instruct the program to log onto the target computer. Another string may start DG/BLAST up on the target machine. A third string may be created to log off you the target system. All function strings are written in connection control language.

NOTE: Only *^P*, *^H* and *^C* of the connection control language cannot be used in a function string.

Chapter 9 provides more information on creating function strings.

Terminal Mode

6

The DG/BLAST terminal mode allows your local computer to appear as a terminal to any target computer, such as a mainframe host or a remote-terminal system.

Once logged onto the target system, your local computer acts as a terminal, allowing you to perform whatever file management functions you wish. While in terminal mode, you might start DG/BLAST (if it is not already running) on the target machine, then begin transferring data files while still in terminal mode, or from error-free mode.

DG/BLAST's terminal mode is a "pass-thru" terminal program that enables your terminal to communicate with any target system regardless of the hardware differences between the two systems. No terminal emulation per se is performed, since no control characters are translated.

In terminal mode, you can:

- Become a terminal on the target computer.
- Send a function string to the target computer.
- Upload a text file.
- Turn the capture of transmitted text on and off.
- Save captured text in a memory buffer within your computer.

Transferring files through terminal mode, selection U (UPLOADING TEXT FILE), is importantly different from transferring through error-free mode. Two key points should be stressed when transferring files in terminal mode:

- You can transfer a file **whether or not DG/BLAST is running** on the target system. The file is sent in a steady stream of data. No handshaking (other than X-ON/X-OFF flow control) is performed between the two systems to confirm that the data is being properly received.
- If you transfer files through terminal mode, DG/BLAST does not verify that the files are received at the target computer. Because of this, poor modem lines and interrupted phone line communications can cause transfer malfunctions.

You should transfer files through terminal mode **only** if DG/BLAST is not available on the target machine.

The Terminal Menu

When you select from the main menu option T, TERMINAL MODE, the following submenu appears:

```

                T E R M I N A L   M E N U

B - become a terminal   Y - capture mode on   U - upload text file
S - send string        N - capture mode off   X - exit to main menu

Enter desired option: _

----- LOCAL DISPLAY AREA -----

                                     DG/BLAST
                                     Rev 7.0
                                     Blocked ASynchronous Transmission
                                     (c) 1984 Communications Research Group, Inc.
```

The Terminal Menu Explained

The options offered in the terminal menu include the following functions:

B — BECOME A TERMINAL

When you select this option, your computer becomes a terminal to the target system. While in terminal mode, you can log onto the target computer and start DG/BLAST (if the program is not already running on the target system).

You may interrupt this function by pressing the attention key (CTRL K) twice. You are then returned to the terminal menu. See chapter 2 for information on start-up procedures for interactive operation.

S — SEND STRING

The configuration file has entries for 5 function strings that can be automatically executed from terminal mode via an operator command, or from a batch command file issued from a CLI command line in batch operation.

Function strings can make use of the connection control language, and can perform a variety of tasks. You might build a function string that, when issued from terminal mode with the S option, will automatically log you onto the target system by providing the required username and password. Function strings might also be built to start DG/BLAST on the target computer, or to log you off the system.

When you are prompted for the function string, enter the number of the function string stored in the configuration file.

See chapter 9 for more explanation of function strings.

Y — CAPTURE MODE ON

You can capture data transmitted to your computer from the target machine by choosing this option. The program regards your computer as a terminal, and all incoming data are written to your screen and into a memory buffer within your computer.

When you select Y, to turn capture ON, you are asked for the name of the file into which the captured text is to be stored.

Invalid characters are filtered and discarded. Those retained include the valid printable ASCII character set, plus special control codes: ^G, ^H, ^I, ^J, ^K, ^L, and ^M.

When you are within 255 characters of filling the buffer, DG/BLAST automatically transmits a CTRL S character to the host computer that causes it to stop transmitting. The program then saves the buffered data on disk, sends a CTRL Q to the host computer to cause it to resume transmitting, and begins filling the buffer once again.

You may press the attention key (CTRL K) twice to return to the terminal menu. DG/BLAST continues to capture text when you again become a terminal.

N — CAPTURE MODE OFF

This option instructs DG/BLAST not to save incoming data that might later be stored in memory within your computer. Any partial buffer left over from an earlier capture-ON session is appended to the capture file previously created.

U — UPLOAD TEXT FILE

By choosing this function, you can transfer a text file to the host system as though the text were being keyed in directly from your terminal. When you select option U, you are prompted for the name of the text file to be sent.

After the entire file has been transmitted, the program continues to regard your computer system as a terminal to the host computer.

X — EXIT TO MAIN MENU

This selection returns you to the main menu.

Special Terminal Mode Functions

While in terminal mode (having already selected from the terminal menu option B, BECOME A TERMINAL and logged onto the target computer), you can perform several functions without having to return to the terminal menu. To enter these functions, press the attention key (CTRL K), then a single direction character.

One function you may wish to perform is to send a control code, like CTRL C, to the target computer. If you attempt to do this directly from DG/BLAST running under RDOS, the local RDOS system will intercept the CTRL C. DG/BLAST provides an answer to this dilemma. If the direction character following the attention key is a letter (A-Z), DG/BLAST transmits the equivalent control code to the target system. For example, the attention key followed by the letter A sends a CTRL A.

The direction characters are:

K EXIT TO THE PREVIOUS MENU (CTRL K CTRL K) The current transfer activity is terminated, and you are returned to the previous menu where you can choose another function to be executed.

NOTE: *For this operation to work, you must already have set up the attention character in the configuration data file.*

N TRANSMIT FUNCTIONS TO REMOTE SYSTEM (CTRL K1, CTRL K2,etc.)

This operation sends function strings to the remote computer. Enter the attention key, followed by the appropriate number (N being 1 through 5) of the function string in the configuration file.

See chapter 9 for more information on function strings.

Error-Free Mode

7

Normally you will transfer files in error-free mode. The error-free communications menu is accessed through the main menu, option E. While in error-free mode, you can:

- Send and receive files interactively with error-free transfer.
- Access and execute an error-free command file to achieve an easy and convenient file transfer.
- Operate as a slave system to the target site.
- Send CLI commands to the target computer.
- Send messages to the target computer.

This chapter explains the menus and file transfer functions available in error-free mode. Advanced procedures for changing filenames during transfer, transferring partial files, updating remote files, etc. are also given.

The Options for Error-Free Mode Menu

When you select from the main menu option E, ERROR-FREE MODE, the following menu is displayed:

```

      O P T I O N S   F O R   E R R O R - F R E E   M O D E

I - interactive local command input      S - slave mode
F - read local commands from a command file  X - exit to main menu

      Enter desired option: _

----- LOCAL DISPLAY AREA -----

-----

                                     DG/BLAST
                                     Rev 7.0
                                     BLocked ASynchronous Transmission
                                     (c) 1984 Communications Research Group, Inc.
```

Once you have selected the desired file transfer procedure, DG/BLAST attempts to log onto the remote computer's DG/BLAST program. You are notified when the communications have been established. DG/BLAST is then ready to accept file transfer commands.

The Options for Error-Free Mode Menu Explained

The three file transfer options are described below:

I — INTERACTIVE LOCAL COMMAND INPUT

You normally will choose this option when sending files, messages and requests from your local computer. When you select option I, DG/BLAST attempts to log onto the DG/BLAST program operating on the target system. After communications have been established, a submenu, the error-free communications menu, is displayed. The file transfer options available in the error-free communications menu are explained later in this chapter (see "The Error-Free Communications Menu").

F — READ LOCAL COMMANDS FROM A COMMAND FILE

When you choose this option, the program skips the interactive prompting and menus. It instead asks you for the name of an error-free command file to be executed. Once you have specified a command file, the program attempts to log-on in error-free mode with the target system. It then automatically accesses and executes the error-free command file named. You are not prompted here for specific file transfer commands.

Once the program has executed the commands in the error-free command file, you return to the main menu. See chapter 8 for information on how to build an error-free command file.

NOTE: *When a DG/BLAST menu option cannot be completed, (for example, you asked DG/BLAST to auto-dial but there was no phone number in the configuration file), the program will not produce an error message, but simply continue to the next instruction. Also be aware that the time needed to transfer a file depends on the size of the file. Once the transfer has begun, any unneeded keystrokes will only interrupt, slow, and, at times, abort the file transfer.*

If there is no command file entry in the configuration file, or if there is no file of that name on the current disk, the program displays an error message and returns you to the main menu.

The F selection requires that you have significant experience with

DG/BLAST and knowledge of the file transfer command format. Without this experience, successful file transfer is unlikely. For further information on the DG/BLAST menu structure and file transfer options, see chapters 2 and 10.

S — SLAVE MODE

This option differs from the previous options, in that it does not prompt for the name of the file to be transferred, or the name of an error-free command file. Rather, after communication with the DG/BLAST program operating on the target system has been established, the program waits for transfer instructions from the remote site. The program allows files and messages to be sent from the remote computer to the local system, and any requested files be sent to the remote machine. All transfer must be initiated from the remote computer.

X — EXIT TO MAIN MENU

This selection returns to you the main menu.

The Error-Free Communications Menu

The simplest method of transferring files is in interactive mode, using option I, INTERACTIVE LOCAL COMMAND INPUT, from the options for error-free mode menu. When you select option I, the error-free communications menu appears:

```

ERROR - FREE COMMUNICATIONS MENU

S - send file      C - send console command  X - exit to main menu
G - get file      M - send message

Enter desired option: _

----- LOCAL DISPLAY AREA -----
----- REMOTE DISPLAY AREA -----

----- line quality ----- xfer pct complete ----- block count-----
SND= % / RCV= %          SND= % / RCV= %          SND= % / RCV= %

```

The Error-Free Communications Menu Explained

When the error-free communications menu is displayed, you are prompted for a file transfer selection.

S — SEND FILE

When you enter this selection, the program asks for the name of a file to be sent to the target system.

G — GET FILE

When you enter this selection, the program asks for the name of the file to be received from the target system. The received file is stored on your disk in the current directory.

C — SEND CONSOLE COMMAND

Selection C lets you send CLI commands to the target machine. All CLI commands sent to the target computer are not executed immediately, but are saved in a CLI file on the target system. They can be executed automatically on the target system at the discretion of the user after DG/BLAST is terminated.

The name of the CLI command file on DG/RDOS and RDOS systems where the CLI commands are stored is BLASTCMD.MC. The command filename on AOS and AOS/VS systems is BLASTCMD.CLI. The command filename on MS-DOS systems is BLASTCMD.BAT.

M — SEND MESSAGE

Selection M instructs DG/BLAST to send a message to the target computer. You are prompted for the text of the message to be sent.

X — EXIT TO MAIN MENU

Selection X terminates communications with the target computer and returns you to the main menu.

A later section, "Sample Error-Free File Communications" gives more explanation of these selections.

NOTE File transfer requests and CLI commands sent by your computer are processed by the remote computer only after all local commands have been completed at the remote machine. Each site must execute its own commands before executing the requests of the remote site.

During file transfer, all messages you might send to or receive from the target computer are displayed on the screen. The status indicators at the bottom portion of the screen also keep you updated on the progress of the transfer.

Local Display Area

The central scrolling region, LOCAL DISPLAY AREA, is available at all times to display messages you may generate at your local computer. The central scrolling region is always retained from one screen to another, as the menus occupy only the top third of the screen. Lines that appear in this area are also sent to the log output stream.

Remote Display Area

While in error-free mode, a lower scrolling region, REMOTE DISPLAY AREA, displays messages generated by the remote system. After you exit error-free mode, any text in this region continues to be displayed in the lower scrolling region. Lines that appear in this area are also sent to the log output stream, where they are indented four spaces so they may be distinguished from the local log output. The following example illustrates the indentation used to distinguish remote output messages from local output messages:

```
    SNDING FILE2.DAT
    RCVING FOROTS.LIB
    RCV COMPLETED
    SND COMPLETED
```

Line Quality and Status Messages

The LINE QUALITY message at the bottom of the screen notifies you of line dependability. You are sent a message whenever the line quality is affected by a deterioration or improvement of 20% or more. Line quality does not reflect the integrity of the data transmitted. Error-free mode guarantees errorless file transfer.

Additional messages at the bottom of the screen update you on the status of the transfer. The XFER PCT COMPLETE message notifies you of the percentage of the text file that has been stored to disk. The BLOCK COUNT message, on the other hand, notifies you of the number of blocks of the file left to send or receive. There is always a lag from the time a file is received or sent, as reflected in the BLOCK COUNT, and when the XFER PCT COMPLETE message notifies you of the percentage transmitted to disk. This is because the data sent or received is placed in a memory buffer before it is sent to disk.

Sample Error-Free File Communications

This section provides various examples of file transfers performed in error-free mode. The sample transfers range from the most simple (such as transferring a single file to a target computer), to more sophisticated transfers (such as transmitting and updating parts of files).

Transferring a Single File

When you choose selection S (SEND FILE) or G (GET FILE) from the error-free communications menu, you are prompted for the name of the file to be transferred. For example, to transfer file EXETER.DAT to the target computer, where it is stored under the same name, respond to the FILENAME: prompt by typing:

```
EXETER.DAT
```

You may instruct the program to receive the file by selecting option G, GET FILE, and entering the same filename.

Renaming Files in Transit

You have the option of renaming files in transit. You may also access disks other than the target disk you are currently logged onto. The following command, for example, transfers local file REPORT.TXT on disk C to the target computer (under MS-DOS), where it is stored on disk A under the the name REPORT.SAV.

```
C:REPORT.TXT A:REPORT.SAV
```

NOTE *A space is required to separate the two parts of the command.*

If you wish to retrieve a file from the other computer, your command should have the following format:

```
COCOANUT.BAS MYDINNER.BAS
```

The above command transfers file COCOANUT.BAS from the local computer to the target computer, where it is stored under the new name MYDINNER.BAS. As noted earlier, DG/BLAST on the target computer will not execute commands sent to it in this way until it had executed all of its own local commands, unless it is in slave mode.

Sending a Message

If you want to send a message to the target computer, select option M, SEND MESSAGE, from the above menu. When you are prompted, enter your message. For example:

```
ENTER MESSAGE:  HOW'S THE WEATHER IN TOLEDO?
```

Transmitting Part of a Local File

To transfer parts of files, specify the address of the first byte to be transferred, and the number of consecutive bytes to be transferred. This information must be appended to the filename in a special format:

```
[Filename1]/M,N [Filename2]
```

The original filename (Filename1) is followed by the address of the first byte to be transferred (M), then the number of bytes (N). The part of original file to be transferred is given a new filename on the host computer (Filename2). Keep in mind that the address of the first byte in a file is 0, the next address is 1, and so on.

For example, from the main menu, select option E, ERROR-FREE MODE, then option I, INTERACTIVE LOCAL COMMAND INPUT. To send a file enter S, SEND FILE. The DG/BLAST command

```
CAKE.DAT/5,3 SLICE.DAT
```

creates a file in the target computer named SLICE.DAT that consists of the 6th, 7th, and 8th bytes of the local file CAKE.DAT.

NOTE *Restrictions on filenames and their extensions differ from one operating system to another.*

Updating Part of a Remote File

You can also update, or overwrite, part of an existing file in the target computer with the contents of a local file. First specify the starting byte address of the destination file where data updating is to begin. This address information must be appended to the filename in a special format:

```
[Filename1] [Filename2]/M
```

In this example, the local file (Filename1) is inserted into the file located on the target computer (Filename2) starting at the specified byte address (M). Keep in mind that the address of the first byte in a file is 0, the next address is 1, and so on.

For example, from the main menu, select option E, ERROR-FREE MODE, then option I, INTERACTIVE LOCAL COMMAND INPUT. To send a file, select option S, SEND FILE. The DG/BLAST command

```
SALAD.DAT DINNER.DAT/9
```

instructs the program to insert the local file SALAD.DAT (consisting of 128 bytes of data) into remote file DINNER.DAT starting at byte address 9. This causes bytes 10 through 137 of DINNER.DAT to be replaced with the text of SALAD.DAT.

Combining Partial File Transfer Commands

The partial file transfer capabilities explained in the preceding two sections can be combined in one to save you time, if both functions need to be performed. This function requires a special format:

```
[Filename1]/M,N [Filename2]/M
```

Part of local file (Filename1) is inserted into the remote file (Filename2) starting at the specified byte address (M).

For example, select from the main menu select option E, ERROR-FREE MODE, then option I, INTERACTIVE LOCAL COMMAND INPUT. To send a file, enter S, SEND FILE. The DG/BLAST command

```
PATCH.BIN/0,5 PROG.COM/0
```

replaces the first five bytes in remote file PROG.COM with the first five bytes in local file PATCH.BIN.

Remote-to-Local Partial File Transfer

You can perform remote-to-local partial file transfer very much like a local-to-remote transfer. This function also requires a special format:

[Filename1]/M,N [Filename2]

A local file (Filename2) is created by transferring part of a remote file (Filename1) into that file. The section of the remote file to be transferred is determined by the specified beginning byte address (M) followed by the number of bytes after that address to be transferred.

For example from the main menu select option E, ERROR-FREE MODE, then option I, INTERACTIVE LOCAL COMMAND INPUT. To get a file, enter G, GET FILE. The DG/BLAST command

TESTDAT.BIN/512,128 RECORDS5.DAT

creates a local file RECORDS5.DAT that contains the fifth 128-byte record in remote file TESTDAT.BIN.

DG/BLAST Supported AOS Switches

DG/BLAST supports a number of AOS AND AOS/VIS switches that may be appended to target filenames. They are:

Switch	Description
/T=TXT	Text file.
/T=UDF	User data file.
/T=UPF	User profile file.
/T=STS	Symbol table file.
/T=LOG	Log file.
/T=PRG	Program file.
/T=OVL	Overlay file.
/T=MCC	Fortran output files.
/T=FCC	
/T=OCC	
/E=n	Element size specified for requested disk blocks. The n represents a decimal number.

For more explanation of these switches, consult your AOS reference guide.

Communication Between Different Operating Systems

DG/BLAST can also transfer files to a computer system with whom you do not share the same operating system. When you are transferring files to or receiving files from such a system, use the filename-space-filename format that has been explained throughout this chapter.

When you use this command format, only that part of the command preceding the space is processed by the local system. Only the second part of the command, that part following the space, is processed by the target system. In this way, a single command can reference a file in two non-compatible, file-naming systems.

For example, the file transfer command

```
B:DATA8.BIN @DPHO:DATA8:BN/T=UDF/E=15
```

sends a file from an MS-DOS system to an AOS system. The first part of the command contains a file reference specific to MS-DOS. The second part contains file references specific to AOS. If you are unsure of the device and file references specific to the target computer, refer to the user's manual of the target computer's operating system.

Text File Conversion

Normally, DG/BLAST is not concerned with file contents. Each file is considered a string of bytes transmitted from one system to another. DG/BLAST, however, supports a standard format for exchanging text files. When DG/BLAST is implemented, the text files written in the format of their native operating system (MS-DOS, RDOS, AOS, etc.) are converted to or from DG/BLAST's standard format during file exchange.

Under DG/BLAST's standard format, each line of text consists of a string of ASCII characters. Each line is terminated by a carriage return code, and the end-of-file determination is based on file size, rather than on a special end-of-file code.

The native MS-DOS text format, on the other hand, includes a CTRL-Z code as an end-of-file mark. By appending /T=TXT to a filename, DG/BLAST converts that MS-DOS file to or from the standard DG/BLAST text format during file transfer. Most versions of DG/BLAST for other operating systems also understand the /T=TXT convention, as well as the other standard DG/BLAST text format conventions.

For example, the command

```
FREIDA.BAS/T=TXT FREIDA.SR/T=TXT
```

transfers text file FREIDA.BAS in the standard DG/BLAST format to a target system, where it is converted to that system's (AOS or MS-DOS) native text format for storage. The command

```
BOBO.SR/T=TXT BOBO.BAS/T=TXT
```

transfers text file BOBO in standard DG/BLAST format, while running under a different operating system, to an MS-DOS system, where it is converted to MS-DOS format for storage.

NOTE The text file format of some operating systems (such as Data General's RDOS) is the same as the standard DG/BLAST format. Therefore, it is not necessary to append the /T=TXT extension to the filename on their half of the transfer command.

Keep in mind that it is the operator's responsibility to put transfer commands in the proper format for different operating systems.

Additional File Transfer Options

This section explains additional options in the error-free mode that would prove helpful in more advanced transfer operations.

DG/BLAST Templates

DG/BLAST supports "wild card" templates to make large transfer tasks simpler and faster. The asterisk (*), question mark (?), and percent sign (%) have special meaning when used as part of the local file specifier. The templates are explained below:

- The asterisk (*) template matches any **series of characters** before and after it, or until the next asterisk, including 0.
- The question mark (?) template matches any **single character**.

- The percent sign (%), when used as a remote file specifier, is replaced by the **entire string for the local file specifier**.

A sample directory on the local system (under RDOS) might include the following files:

```
JOE.SR      JOHN.SR      JIM.SR      JANE.SR
JOE.AS      JOHN.AS      JIM.AS      JANE.AS
```

The following wild card commands would expand as shown:

Wild Card Command	File Transfer Commands Issued
J*.SR	JOE.SR, JOHN.SR, JIM.SR, JANE.SR
JOE.?S	JOE.AS
J??SR	JOE.SR, JIM.SR
JOE.* B:%	B:JOE.SR, B:JOE.SR
JOE.S?/T=TXT XX%/T=TXT	JOE.SR/T=TXT XXJOE.SR

As is evident, the percent sign wild card can be used to rename the file on the remote system, and to append different combinations of file transfer switches.

Overwriting a File

When you transfer a file that already exists on the target machine, you normally would receive an error message **FILE ALREADY EXISTS**. You can avoid this error message by appending the switch **/OVW** to the destination filename. **DG/BLAST** then deletes and overwrites any existing file of that name on the target system.

For example, if you enter **DINGER/OVW** as the destination filename, **DG/BLAST** stores the transferred file as file **DINGER** on the target system. Any file on the target system already having the identical filename is overwritten. The **/OVW** switch saves you the time you otherwise would expend responding to the **FILE ALREADY EXISTS** message.

The Error-Free Command File

8

The error-free command file is a text file containing transfer commands that can be invoked in two ways:

- 1) In batch operation: by including it in the batch command file. See chapter 10.
- 2) In interactive operation: by selecting option F, read local command from a command file, from the options for error-free mode menu. See chapter 7.

This chapter explains the uses of the error-free command file, and how it is created.

The Error-Free Command File

The error-free command file specifies one or more files to be sent to or received from the target computer. You may also send messages and CLI commands to the target system with the error-free command file. The purpose of the error-free command file is to make a regularly performed transfer task simpler. You may place the name of the error-free command file within the batch command file. This would allow you to perform any number of file transfer and management functions in batch operation.

You also can place the file transfer commands, messages and CLI commands into a single file, whose name can be entered during interactive operation. Do this by entering error free mode and selecting

option F, READ LOCAL COMMANDS FROM A COMMAND FILE, from the options for error-free mode menu.

NOTE The error-free command file in DG/BLAST Rev. 7.0 is identical in format to Rev. 4.0.

Building an Error-Free Command File

The error-free command file is a text file created with any standard text editor. Each command in the command file should occupy one line, and may contain up to 60 characters. There are three types of commands available in the error-free command file that simplify execution of file transfer:

- A **CLI command**, designated by an exclamation point (!) preceding the command sent to the target system.

The command must be valid to the operating system on that computer. For example, the command !XEQ MASM/L=LFILE MAINPROG SUBR1 SUBR2 executes the Macroassembler on an AOS or AOS/VS system.

- A **message command**, designated by a semicolon (;) preceding the message.

For example, the command ;HELLO, DREW, HOW ARE YOU? transmits the message to the target system, where it is displayed on the screen.

- A **file transfer command**, designated by no punctuation mark preceding files to be sent.

A plus sign (+) precedes files to be received from the target system.

For example, the transfer command MYPROG1 MYPROG2 sends a file MYPROG1 to the target system and stores it there under the new name MYPROG2. The command +MYPROG2 MYPROG3 receives file MYPROG2 from the target system and stores it under the filename MYPROG3 on the local computer.

Sample Error-Free Command Files

As with the batch command file, you will find many ways of adapting the error-free command file to your personal needs. For example, you can send an updated business report back to your company's home computer (running on AOS) by accessing the options for error-free communications menu and selecting option F. When you are prompted for the name of the error-free command file, enter:

```
DAILY.REP
```

The DAILY.REP error-free command file might look something like this:

```
;GOOD MORNING. JENNINGS HERE. DAILY REPORT BEING SENT.  
DAILY1 DAILY.JENNINGS  
+NEWS  
!BYE
```

This error-free command file sends a greeting to the target computer. The file DAILY1 is then renamed DAILY.JENNINGS and stored in the target computer's memory. The file NEWS is requested from the target computer, and Jennings is logged off the target system.

By entering a single filename, Jennings is able to bypass the error-free communications menu and the remote functions menu. Without an error-free command file, a notable number of keystrokes and a sizeable amount of time would have been required to make the same relatively simple sequence of transfers.

You might use an error-free command file to send and receive several text files. Such a command file might consist of the following commands:

```
+TEXT1  
+TEXT2  
TEXT3  
TEXT4
```

For information on more advanced transfer command syntax, see chapter 7.

Function Strings

9

Function strings are lines of control characters that can perform CLI operations on the target computer, such as logging onto that computer, starting DG/BLAST, and then logging off. Such strings, when invoked during a session, improve operation speed and user ease.

You can send function strings in three ways:

1. Interactively: from the terminal menu: option S, SEND STRING.
2. In batch operation: the function string being included in the batch command file.
3. In terminal mode: using CTRL Kn (n being the number of the function string).

In each of these cases, the string is retrieved from the configuration file where it is stored in one of the five entries.

Building Function Strings

Function strings can be constructed of two types of control characters:

1. Control characters from the connection control language.
2. The standard ASCII characters.

In addition to any legal ASCII characters, you may also use most of the control characters from the connection control language (see chapter 11). A function string cannot exceed 60 characters in length. The available control characters you may use from the connection control language are explained below:

^D Set delay between characters. After each character is sent, the user can set a time delay. The next 2 characters after the ^D are interpreted as the new delay time. The delay is specified in 10ths of a second. For example, ^D05 sets the delay to 1/2 second.

^E Turn on echo mode. This causes the routine to wait for each character sent to be echoed back.

The default setting is off (no echo).

^N Turn off echo mode. Use this code to disable the wait for character echo. It is the opposite of ^E.

^K Send control code. This code allows the user to send control codes that are defined as reserved codes in the connection control language (D,E,P,T,W,X,K). The character following the ^K is sent as a control code. For example, ^KE would send a CTRL E.

^T Get trap character(s). The character(s) following ^T is used as the trap character(s). Incoming data are monitored, and compared against the trap character(s). All other characters are ignored. If the character(s) is not received within the timeout period, an error is returned. The trap string is terminated by another ^T or the end of a command string.

NOTE: *All characters preceded by a circumflex (^) that are within the trap string are treated as control characters. No command codes are interpreted.*

^W Wait. This code causes a one-second delay to be inserted into the execution of the command string.

^X Set timeout. Use this code to set a timeout period when you are waiting for an expected response (such as a specified trap sequence or character) before continuing string processing.

Normally the response is a trap sequence or character. The two characters following ^X are interpreted as the new timeout period. The timeout period is specified in whole seconds. For example, ^X30 is 30 seconds.

The default timeout for DIAL CMD is 90 seconds. The DISC CMD default timeout is 10 seconds. The ANSW CMD default timeout is 0 (no timeout is taken).

NOTES *The circumflex (^) used here refers to the actual circumflex key on your keyboard (SHIFT 6). DG/BLAST considers any character following the circumflex as a control character. When you enter the control characters in either the configuration file, or in a function string, you would use the circumflex sign (^). The circumflex symbol, used in a function string to denote a control character in a control string, should not be confused with the CTRL key on your keyboard that sends control characters directly to the operating system.*

A circumflex code (^) can be sent by preceding it with another circumflex. For example, ^^ sends one ^.

Note that the ^P function, available for modem control, is not available in a function string when transferring files from terminal mode.

Sample Function Strings

The following function strings, when invoked, log the program onto the target computer, start DG/BLAST up on the target machine, and then log the program off the target system:

```
^M^TUSERNAME:^TPETER^M^TPASSWORD:^TJANUS^M
```

Program waits for AOS USERNAME prompt, then sends required username, PETER. JANUS sent as password. User logged onto target system.

```
^WDGBLAST/N @CONSOLE/P SLAVE__MODE/I SAVEIT/0^M
```

DG/BLAST CLI command line starts DG/BLAST on target system. Batch command file SLAVE__MODE places target system in slave mode. File transfer commands controlled by local computer.

```
^WBYE^M
```

User PETER logged off target system after completion of transfer, as directed by batch command file SLAVE__MODE.

Notice that the ^T control character derives from the connection control language, while the ^M character is the standard ASCII control character for a carriage return.

Earlier versions of DG/BLAST will require different CLI command line formats to start DG/BLAST on the target system. If you are communicating with a version other than DG/BLAST Rev. 7.0, consult that version's user's guide for information on how to start DG/BLAST in slave mode.

Refer to chapter 5 for explanation of function strings in the configuration parameters. Refer to chapter 10 for a description of how functions strings might be used in a batch command file to speed file transfer.

Batch Operation 10

By using batch operation, you can decrease or eliminate the time normally spent interacting with the DG/BLAST menu structure. As with starting DG/BLAST in interactive operation, you can invoke the program in batch operation with a single CLI command line. But unlike interactive operation, the batch CLI command line can include a series of optional switches and arguments that will control the **entire** communications process.

The key to batch operation is the **batch command file**. The batch command file is a text file that controls the transfer session. Other switches and arguments, besides the name of the batch command file, may also be included in the CLI command line for the execution of special file transfers, as explained in chapter 2.

The batch command file can give you **entirely unattended** operation—from dialing and logging onto the target computer, starting DG/BLAST on the target system, executing file transfer, and logging off the target machine. The batch command file also can give you **partially unattended** operation, depending on how much of the session you design the batch command file to control. You may have the batch command file stop at any point in the program to allow you to resume control of the session and to interact with the menus.

NOTE *If you start DG/BLAST with only the `DGBLAST` command without specifying a batch command file, the program begins interactive operation, and the main menu is displayed. From that point, the program would operate in interactive mode.*

The following sections explain the batch command file, and the optional switches and arguments that can be used in the CLI command line to execute DG/BLAST in batch operation.

The CLI Command Line Format for Batch Operation

To begin DG/BLAST in batch operation, the DGBLAST command may be followed by five basic types of switches or arguments:

- Non-interactive operation. This switch is optional. When used, no menus are displayed on the screen during batch operation. If the switch **is** used, a batch command filename must also be included in the CLI command line.
- Device switches. These switches specify a device, mux line number, baud rate, or communications port. All these switches are optional, and should be used only if your system configuration differs from the DG/BLAST default configuration.
- Configuration filename. This argument is optional.
- Batch command filename. This argument is **required** for batch operation.
- Log output argument. If you decide to generate log output (recommended in batch operation), use this optional switch. Note that DG/BLAST does **not** automatically create a log file. If you want a log file, you must create it, and use the /O switch with the filename in the CLI command line.

To operate in batch mode, you need add **only** the name of the batch command file, that is to control the session, to the DGBLAST command. If desired, you may use the default values of all the remaining switches and arguments.

However, if you do choose to use a system configuration different from the default, you must include the needed switches and arguments to notify the program of the new configuration. See chapter 2 for explanation of all these switches and arguments, and the default configuration.

Sample CLI Command Lines for Batch Operation

The CLI command line format differs slightly from one operating system to another. Refer to the following section that is appropriate to your operating system.

*NOTE As mentioned in the preface, all the CLI command line switches and arguments explained in the following sections are placed in brackets to show they are **optional**. As each switch is explained, you will find in most cases italicized characters are part of the switch. All italicized words are **optional** parts of the switch.*

For example, the optional port switch *PORT/P* may be used on an AOS system. Because *PORT* is italicized, it is an optional component of the switch. Thus, if you wanted to specify an ALM port, the switch would be added to the CLI command line as follows:

```
DGBLAST ALM/P
```

MS-DOS CLI Command Line

The CLI command line format for MS-DOS systems is as follows:

```
DGBLAST [/N] [PORT/P] [CONFIG/C] [CMD/I] [LOG/O]
```

Sample CLI command lines for batch operation are provided below:

Example 1: DGBLAST B:MADRID/C GO/I ALICANTE/O

Mode	Interactive via the user's console.
Communications port	Default port: COM1.
Initial configuration parameters	Configuration parameters taken from configuration management file B:MADRID.
Command input	Initial command input will be from the batch command file GO. When the end of the batch command file is reached, commands are read from interactively from the user's console.
Log output	Disk file ALICANTE.

Example 2: `DGBLAST/N UPDATE.J12/I LOG.J12/O`

Mode	Non-interactive. Because of the /N switch, the menus are not displayed on the console screen. The batch command file controls the entire file transfer.
Communications port	Default port: COM1 at 1200 baud.
Initial configuration parameters	Default internal parameters.
Command input	Batch command file UPDATE.J12 controls the entire transfer session.
Log output	Disk file LOG.J12.

DG/RDOS and RDOS CLI Command Line

The CLI command line format for DG/RDOS and RDOS systems is as follows:

```
DGBLAST [/N] [/PORT] [LINE/L] [DEV/D] [BAUD/B] [CONFIG/C] [CMD/I]
[LOG/O]
```

Sample CLI command lines for batch operation are provided below:

Example 1: `DGBLAST/A 3/B LEGAL.CF/C STARTUP.CM/I`

Mode	Interactive via the user's console (background or foreground). The batch command file controls only part of the entire file transfer.
Communications port	Line 0 of an IDEFed or SYSGENed ALM device at the clock 3 baud rate.
Initial configuration parameters	Configuration parameters taken from configuration file LEGAL.CF.
Command input	Initial command input will be from the batch command file STARTUP.CM. When the end of the batch command file is reached, commands are read from interactively from the user's console.
Log output	None.

Example 2: DGBLAST/N/U 2/L 2400/B HQ.CF/C WEEKLY.CM/I \$LPT/O

Mode	Non-interactive. Because of the /N switch, the menus are not displayed on the console screen. The batch command file controls the entire file transfer.
Communications port	Line 2 of an IDEFed or SYSGENed ULM device at 2400 baud.
Initial configuration parameters	Configuration parameters taken from configuration management file HQ.CF.
Command input	Batch command file WEEKLY.CM controls the entire file transfer.
Log output	Line printer.

AOS and AOS/VS CLI Command Line

The CLI command line format for AOS and AOS/VS systems is as follows:

```
DGBLAST [/N] [PORT/P] [LINE/L] [DEV/D] [BAUD/B] [CONFIG/C] [CMD/I]
[LOG/O]
```

Sample CLI command lines for batch operation are provided below:

Example 1: DGBLAST/N @CONSOLE/P STARTIT/I SAVEIT/O

This sample CLI command line might be used when transferring a file from a microcomputer workstation over the user's console port.

Mode	Non-interactive. Menu screens are not displayed on the console screen to avoid interference with protocol.
Communications port	User's console.
Initial configuration parameters	Default internal parameters.
Command input	The batch command file STARTIT (stored on disk) controls the transfer session. The batch command file should contain the command to start DG/BLAST in error-free slave mode. The local system, then, would wait for transfer commands sent from the target computer.
Log output	Disk file SAVEIT.

Example 2:	DGBLAST/N TTY1/D=40 @INPUT/I @OUTPUT/O
Mode	Non-interactive.
Communications port	Device TTY1 at secondary device code of 40/41.
Initial configuration parameters	Default internal parameters.
Command input	Batch command file @INPUT controls the entire transfer session.
Log output	Disk file @OUTPUT.

The Batch Command File

First it is important that the batch command file be distinguished from the error-free command file.

The batch command file can control the entire communications session, including terminal mode functions, such as logging onto the target computer, starting DG/BLAST on that machine, and so on. You also can designate the batch command file to perform only partial unattended operation, by having it return control to the console for interactive input once it has transferred all the specified files.

The error-free command file, on the other hand, applies only to error-free operation. As a component of the batch command file, it specifies text files to be sent to or received from the target computer. It may also send a message and a CLI command (must be valid to the target operating system) to the target system. The error-free command file does not have the wide range of coordinating capabilities as does the batch command file.

However, the error-free command file is slightly more versatile than the batch command file. Where as the batch command file can be used only in the CLI command line, error-free command file can be used in both batch and interactive operation:

- Batch operation: Included in the batch command file named in the CLI command line.

- **Interactive operation:** In error-free mode where file transfer is executed from a specified error-free command file, option F, read local commands from a command file, of the options for error-free mode menu.

NOTE Error-free command files of DG/BLAST Rev. 7.0 are compatible with those of earlier DG/BLAST versions, such as Rev. 4.0.

Building a Batch Command File

A batch command file is a text file that may be created with a standard text editor. Each command should occupy one line and may contain up to 60 characters. The syntax of the commands is simple. You merely map the course the program is to follow by including the name of the desired menu option. You can build the batch command file so that it controls the entire communications process—from dialing the target computer to logging off. You do this by including function strings and error-free command filenames in the batch command file. Function strings and error-free command files are explained later in this chapter, and in chapters 9 and 8 respectively.

The first command in the batch command file might be to dial the target computer:

DIAL

DG/BLAST reads the first letter in each command line. Since DG/BLAST opens with the main menu, the above command instructs the program to dial the phone number. The phone number should already have been entered into the PHONE NO entry in the configuration data. The configuration filename should also be included in the DG/BLAST CLI command line with the name of the batch command file. After the target machine has been dialed and communications have been established, the program returns to the main menu, as it would if you were interacting with DG/BLAST in attended operation.

The next command

TERMINAL MODE

directs the program to access the terminal communications menu. If you want to invoke a function string that you had previously created in the configuration management file, the next command would be

SEND STRING

Follow this command with the number of the string to be accessed on the next line. You have a choice of 1-5 strings. Each string may instruct the program to perform transfer functions that would normally have required attended operation— such as logging onto the target computer, starting DG/BLAST on the target system, and possibly logging off on the target computer.

To invoke an error-free command file, which might contain instructions to transfer a file or send CLI commands to the target computer, include the command

ERROR-FREE COMMUNICATIONS

on the next line in the batch command file. This accesses the options for error-free communications menu. On the next line of the batch command file, enter the command

FILE

for option F of the menu, SEND LOCAL COMMANDS FROM A COMMAND FILE. On the following line enter the name of the error-free command file. DG/BLAST finds the error-free command file in your directory and executes the file's instructions. If you are sending files, be certain they are correctly named and addressed. You may use full pathnames. If you are receiving files, the files should be available on the target computer where you logged on.

After invoking an error-free command file to perform file transfer, you might log off the target computer by using another function string:

SEND STRING

2

Disconnect the modem lines by entering

HANG UP

Terminate the DG/BLAST program on the local computer by entering

Q

Keep in mind that a special configuration file will be needed to perform this advanced file transfer process. See chapter 5, "Configuration Management," for more information. If you fail to include the name of the special configuration file with the batch command filename when starting up DG/BLAST, the file transfer fails and you are given an error message.

Sample Batch Command Files

Once you understand the DG/BLAST menu structure and transfer options, you can create batch command files for a variety of file transfer needs.

Starting DG/BLAST in Slave Mode

If you wanted to start up DG/BLAST (Rev. 7.0) on a target computer running AOS, you might build a batch command file called `SLAVE_MODE` that would place the program operating on the target system in slave mode. This would allow DG/BLAST operating on the local system to control the entire communication session.

The CLI command line

```
DGBLAST/N @CONSOLE/P SLAVE_MODE/I BLAST_LOG/O
```

starts DG/BLAST on the AOS target system in non-interactive operation with the `/N` switch. Batch command file `SLAVE_MODE` places the system in slave mode, and all log output is written to disk file `BLAST_LOG`. The console is used as the communications port (`@CONSOLE/P`). If the DG/BLAST program operating on the target system is not a Rev. 7.0 version, consult that version's user's guide for instructions on starting DG/BLAST in slave mode.

The batch command file `SLAVE_MODE` might contain the following commands:

Command	Action Taken
<code>ERROR-FREE MODE</code>	Access error-free mode from the main menu.
<code>SLAVE</code>	Invoke slave mode from the error-free communications menu.
<code>X</code>	Return to main menu once transfer is completed.
<code>Q</code>	Quit the program. Terminate program.

See chapter 2 for more on starting DG/BLAST on target systems.

Complete Unattended Batch Operation

You also may build a batch command file that lets you perform file transfers in complete unattended operation.

For example, the following batch command file, @AVILA, includes several function strings and error-free command files to handle the entire file transfer—from dialing the target machine (running AOS), to terminating the DG/BLAST program on the local computer. A configuration file you might have already created (LISBON.CFG) would need to contain the function strings that are invoked in the course of the batch command file. The CLI command line to invoke DG/BLAST in this instance would consist of at least the following components:

```
DGBLAST/N LISBON.CFG/C @AVILA/I LISBON.LOG/O
```

With the non-interactive switch (/N) included in the DGBLAST command, no menus are displayed on the screen. You are, however, notified that the log output is recorded in log file LISBON.LOG, and when the file transfer is finished. The batch command file, @AVILA, might consist of the following commands:

Command	Action Taken
DIAL	Target system dialed.
TERMINAL MODE	Terminal menu accessed.
SEND STRING 1	First function string invoked. Function string 1 logs user onto target system.
SEND STRING 2	Second function string invoked. Function string 2 starts DG/BLAST on target system.
X	Exit terminal menu.
ERROR-FREE MODE	Error-free mode accessed.
FILE PARIS	Invoke error-free command file. Error-free command file PARIS controls file transfer.
X	Exit error-free mode.
TERMINAL MODE	Access terminal mode.
SEND STRING 3	Third function string invoked. Function string 3 logs user off target system.
X	Exit terminal mode.
Q	Quit program.

The Function String

The three function strings used above to log onto the target computer, start DG/BLAST on that system, and then log off the target machine, should be in configuration file LISBON.CFG. Special control characters, embedded in the function string, are used to communicate with the target system.

The content of the three strings found in configuration file LISBON.CFG, referenced by the batch command file @AVILA, is as follows:

```
String 1  ^M^TUSERNAME:^TPETER^M^TPASSWORD:^TJANUS^M
String 2  ^WDGBLAST/N LISBON.CFG/C @SLAVE__MODE/I LISBON.LOG/O^M
String 3  ^WBYE^M
```

The above strings are explained in further detail in chapter 9.

The Error-Free Command File

The error-free command file PARIS specified in the sample batch command file might instruct DG/BLAST to send any number of files to and from the target system, and to send messages and CLI commands to the target machine. It might, for example, consist of the following commands:

```
;HELLO. FILE BEING SENT
FILE1
;DO YOU HAVE A FILE FOR ME?
+FILE2
```

The file ER.FREE1 instructs the program to send the message: HELLO. FILE BEING SENT. A local file, FILE1, is sent to the target computer. A second message is then transmitted: DO YOU HAVE A FILE FOR ME? A remote file, FILE2, is then received from the target computer. The error-free command file, like the batch command file and function strings, provides notable convenience and flexibility in your file transfer needs.

For more information on how to build error-free command files, see chapter 8.

Partial Batch Operation

The above sample batch command file gives you complete unattended operation in batch mode once the CLI command line has started DG/BLAST.

You, however, may create a batch command file that terminates at a specified point in the program so you may interact with the menus. For example, the batch command file SEGOVIA contains option commands and function strings that perform the following functions:

- Dial the target computer operating under AOS.
- Log the user onto the target system.
- Start DG/BLAST in slave mode on the target machine.
- Move through the menu structure until stopping at the options for error-free communications menu. There it chooses option I, INTERACTIVE LOCAL COMMAND INPUT, and waits for you to interactively enter the name of the text file to be transferred.

For this file transfer, you might use the same configuration file in the earlier CLI command line—LISBON.CFG. The CLI command line format for this partial batch transfer might be as follows:

```
DGBLAST LISBON.CFG/C SEGOVIA/I
```

The batch command file SEGOVIA would consist of the following commands:

Command	Action Taken
DIAL	Target system dialed.
TERMINAL MODE	Terminal menu accessed.
SEND STRING	First function string invoked.
1	Function string 1 logs user onto target system.
SEND STRING	Second function string invoked.
2	Function string 2 starts DG/BLAST on target system.
X	Exit terminal menu.
ERROR-FREE MODE	Error-free mode accessed.
INTERACTIVE	Interactive local input is selected, and control is given to the user.

After error-free logon has been accomplished, you are prompted for the name of the file to be transferred. After the transfer, you may terminate the program in the normal interactive fashion.

This chapter provides some background information on modems and their use in DG/BLAST operation. Modem-specific drivers are not used in the operation of the DG/BLAST program. Instead, the **connection control language** serves as an interface between the program and the modem in setting the telephone parameters, which are entered into the configuration data. The connection control language is crucial in building two types of control strings within the configuration data:

1. Modem control strings: DIAL CMD, ANSW CMD, and DISC CMD
2. Function strings 1-5

For more information on the hardware installation of your specific modem, see your operating system and modem user's manual.

Modem Handling

The connection control language consists of control characters that have been developed to give you direct control over the the following communications functions:

1. Send character strings to modem (for Hayes-style auto-dial modems).
2. Control DTR lead (not implemented under RDOS and AOS).
3. Wait for specifiable text string to be returned by modem.

4. Wait for DCD lead to be asserted by modem (not implemented under RDOS and AOS).
5. Set timeouts on modem text string or DCD lead response.

The connection control language allows commands to be written that can handle most popular standard and auto-dial modems, in either RS-232 or text string control mode. (Because a consistent hardware and software interface to the RS-232 control leads often is not available, the text string control offered by the connection control language is the preferred mode.)

The configuration data include fields for a telephone number and three strings to be supplied in the connection control language: dial (DIAL CMD), wait for incoming call and answer (ANSW CMD), and hang up or disconnect (DISC CMD). The execution of each of these three strings can be invoked from the main menu or a batch command file. DG/BLAST supplies default modem control strings for the Hayes Smartmodem and Hayes-compatible modems.

See chapter 10 for more information on the batch command file, and chapter 5 for explanation of the configuration data.

Modem Control Strings

Modem control strings direct the operation of all the modem functions: dialing, waiting, answering, and hanging up. By entering new modem control strings or modifying current strings in the configuration data file, you can define the desired modem functions. Normally a modem control string consists of text and control characters of the connection control language.

Connection Control Language

There are three control strings for each modem type (dial string, answer string, and hang-up string). Each string may contain up to 60 characters, including embedded control codes of the connection control language. The control codes consist of a circumflex (^), followed by a letter that designates the function to be performed.

The connection control language functions for modem control are as follows:

^C Wait for carrier detect (CD) lead to be asserted.

NOTE: *The ^C function is not usable in a function string from terminal mode.*

^D Set delay between characters. After each character is sent to the modem, the user can set a time delay. The next 2 characters after the ^D are interpreted as the new delay time. The delay is specified in 10ths of a second. For example, ^D05 sets the delay to 1/2 second.

^E Turn on echo mode. Echo mode causes the routine to wait for each character sent to the modem to be echoed back.

The default setting is off (no echo).

^H Drop the data terminal ready (DTR) lead.

NOTE: *The ^H function is not usable in a function string from terminal mode.*

^N Turn off echo mode. Use this code to disable the wait for character echo from the modem. It is the opposite of ^E.

^P Send phone number string. When this code is encountered, the phone number specified in the configuration data is substituted in its place and sent to the modem.

The default waiting period for an answer at the target site is 60 seconds.

NOTE: *The ^P function is not usable in a function string from terminal mode.*

^K Send control code. This code allows the user to send control codes that are defined as reserved codes in the connection control language (D,E,P,T,W,X,K). The character following the ^K is sent as a control code. For example, ^KE would send a CTRL E.

- ^T Get trap character(s). The character(s) following ^T are used as the trap character(s). Incoming data are monitored, and compared against the trap character(s). All other characters are ignored. If the character(s) is not received within the timeout period, an error is returned. The trap string is terminated by another ^T or the end of a command string.

NOTE: *All characters preceded by a circumflex (^) that are within the trap string are treated as control characters. No command codes are interpreted.*

- ^W Wait. This code causes a one-second delay to be inserted into the execution of the command string.
- ^X Set timeout. Use this code to set a timeout period in a specific modem control string or function string, so the program will wait for an expected response (such as a trap sequence) from the modem before continuing file transfer.

Normally the response is a trap sequence or character. The two characters following ^X are interpreted as the new timeout period. The timeout period is specified in whole seconds. For example, ^X30 is 30 seconds.

The default timeout for DIAL CMD is 90 seconds. The DISC CMD default timeout is 10 seconds. The ANSW CMD default timeout is 0 (no timeout is taken).

NOTES *The computer considers any character following the circumflex (^) as a control character. When you enter the control characters in either the configuration file, or in a function string, you would use the circumflex sign (^). The circumflex symbol used here should not be confused with the CTRL key on your keyboard that sends control characters directly to your operating system.*

A circumflex code (^) can be sent to the modem by preceding it with another circumflex. For example, ^^ sends one ^ to the modem.

Sample Modem Control Strings

The PHONE NO entry in the configuration management file does not require a control string, only the phone number of the target computer. For example, your setting for this entry should appear as follows, except for the change in phone number:

```
PHONE NO -5551212
```

NOTE Long-distance calls will require the necessary 1 prefix and the area code. Do not include parentheses or dashes.

The DIAL CMD entry requires a modem control string. The following control string auto-dials a Hayes Smartmodem:

```
Set timeout period to 90 seconds
|   Send dial command to modem
| |   Send phone number (from configuration data file)
| | |   Send a carriage return
| | | |   Wait (trap) for the letters "CONNECT"
| | | | |
^X90ATDT^P^M^TCONNECT
```

The ANSW CMD control string for a Hayes Smartmodem might consist of the following commands:

```
Wait (trap) for the letters "CONNECT"
|
^TCONNECT
```

The DISC CMD control string for a Hayes might be:

```
Set timeout to 10 seconds
|   Wait 1 second before reading rest of command string
| |   Three plus signs put the Hayes in command mode
| | |   Wait 1 second
| | | |   Wait 1 second
| | | | |   Send disconnect command to modem
| | | | | |   Send a carriage return
| | | | | | |   Wait (trap) for letters "OK"
| | | | | | | |
^X10^W+++^W^WATH^M^TOK
```

For more information on how these modem control strings are entered into the configuration management file, see chapter 5.

The Connection Control Language and Function Strings

In addition to building modem control strings, the connection control language can be used to create function strings that, like the modem parameters, are located in the configuration data. Function strings can perform CLI operations on the target computer, such as logging onto that computer, starting DG/BLAST, and then logging off.

Refer to chapter 9 for information on creating function strings.

If Auto-Dialing Fails

If your DG/BLAST program is unable to connect with the target computer, despite your having entered into the configuration management file a phone number and DIAL CMD control string, a few fundamental steps should be followed to isolate the source of the problem:

1. Make certain you have specified the correct configuration file in the CLI command line. Whether you are in interactive or batch operation, be sure the current configuration file contains the appropriate modem command strings.
2. Make sure the correct baud rate is specified in the configuration file. The baud rate of the local computer must be identical to that of the modem and target machine.
3. Verify the phone number. Also be sure no invalid characters are imbedded in the number.
4. Check the syntax of the control strings present in the configuration file. Illegal control string syntax will cause communication failure.

Some modems may require resetting (power off, then on) before the auto-dial functions will operate properly. To test a modem, enter terminal mode, and follow the instructions supplied with the modem to perform the auto-dial function. Also see appendix A for information to self-test your modem.

NOTE *Make sure you include a hang-up command in the DISC CMD within the configuration file (if you are in batch operation). Then make sure you choose option H, HANG UP, of the main menu after file transfer to terminate modem connection. This precaution is crucial in long-distance communication.*

Installing and Testing DG/BLAST

A

The following steps explain how to install and begin running DG/BLAST on your system.

Required Hardware/Software Environment

You should first confirm that DG/BLAST is compatible with your hardware and software environment. Requirements for running DG/BLAST on your system include:

1. The DG/BLAST program loaded and operating on your system
2. At least 64K bytes of memory for DG/RDOS, RDOS, AOS and AOS/VS systems. MS-DOS systems require 256K bytes.
3. A serial asynchronous port for communicating with the target system.
4. An asynchronous, full-duplex modem (for example, the Hayes Smartmodem 1200), unless the two computers are hard-wired.

Communications Port Selection and Configuration

On a stand-alone microcomputer running MS-DOS (such as the DATA GENERAL/One), DG/BLAST uses the COM1 port. Configuration of this port is totally controlled by the DG/BLAST software, so no user action is required. If you are operating a DATA GENERAL/One, refer to your Owner's Manual for information on configuring your communications port with the Setup program.

Under DG/RDOS, RDOS, AOS and AOS/VS, the communications port selection is more involved. Under these operating systems, DG/BLAST cannot directly change the communications port configuration. Therefore, a single configuration must be pre-selected and used throughout the communication session. The configuration chosen should be the one required by DG/BLAST for error-free communications. This configuration is as follows:

- 8 data bits
- 1 stop bit
- No parity
- No software flow control
- Baud rate to match modem and target system

There are three ways of pre-selecting these parameters:

1. For some Data General interfaces, such as the TTY and 4060, the configuration is controlled by jumpers and wires on the interface board.
2. For non-SYSGENed ALM's, ULM's, and USAM/ASLM's, the user can specify the baud rate in the CLI command line used to start DG/BLAST. The other parameters are forced to the above values.
3. For SYSGENed multiplexors, the parameters listed above must be specified when the system is SYSGENed. Under DG/RDOS and RDOS, this requires editing and re-assembly of the file ALMSPEED.SR.

Under AOS, an additional step is required. Before running DG/BLAST, the characteristics of the port to be used for communications must be set so that flow control is disabled. In particular, characteristics OFC and IFC must be OFF. Also, if the communications port is different from the console port, the communications port must be disabled from EXEC control.

Wiring the Port

You should prepare a cable to connect the serial port to either A) a modem (if the target computer is to be accessed by phone), or B) directly to the target computer.

DG/BLAST requires that the cable have only two circuits: one to transmit data, and the other to receive data. However, if your port is RS-232 compatible, you may need to locally “jumper” certain “hand-shaking” signals (signals that confirm communications linkage), such as DCD (Data Carrier Detect), CTS (Clear To Send), DSR (Data Set Ready), DTR (Data Terminal Ready), etc.

NOTE If your cable is connected directly to the target computer, the cable should be criss-crossed so your transmit data pin connects with the target computer's receive data pin, and vice versa.

Testing DG/BLAST on Your System

You should have already physically connected your remote system with the target computer, either by modem or by direct cable. If possible, connect your terminal to the communications port. Some systems (such as DESKTOP GENERATION Systems operating under DG/RDOS or RDOS) allow you to configure your system to loopback mode so DG/BLAST on the local computer will communicate with itself.

Place the working DG/BLAST diskette into your primary diskette drive. Start up DG/BLAST in interactive operation, by entering:

DGBLAST

The main menu appears on the screen. Select option T, TERMINAL MODE. From the terminal menu, select option B, BECOME TERMINAL. You now should be able to communicate with the terminal through the communications port.

Press the attention key (CTRL K) twice to interrupt the terminal operation and return to the terminal menu.

Select option X from the terminal menu. You are returned to the main menu. Enter selection E, ERROR-FREE MODE. Select option I of the options for error-free mode to use the most simplified transfer process.

Within seconds, a string of p's should appear across the terminal screen. This indicates that DG/BLAST is operating successfully through your communications port. If the string of p's does not appear, your connection is faulty. Check to see that your port is configured properly and that it is the correct port. You may also verify that your configuration data entries are correct.

Additional Installation and Self-Test Instructions

These installation and self-test instructions in no way cover all the requirements demanded by varying hardware and software environments. To receive thorough and accurate installation and self-test procedures specific to your environment, be certain to check at least two primary sources:

- Your operating system user's manual.
- The release notice accompanying your software.

The RS-232 Interface

B

The RS-232 standard defines 25 signals for connecting a modem to a terminal. Three of these are transmitted data, received data, and ground. Most of the other 23 signals are "hand-shake" signals, such as the signal on pin 20 (Data Terminal Ready) that announces the terminal is powered up and operational.

The majority of RS-232 ports require only a few of the hand-shake signals. Some RS-232 ports require only the two data signals. The following table describes the important signals. All signals, except for ground, are directional (for example, the Data Terminal Ready signal goes directly from the terminal to the modem). Keep in mind that signals are named in reference to the terminal (for example, Transmitted Data means data going from the terminal to the modem). Also, a signal is considered "true" = "high" = "on" = "asserted" when the output side is presenting a voltage of +3 or greater to the input side.

Pin#	Signal Name	Description
2	Transmitted Data (TD)	Data going from terminal to modem.
3	Received Data (RD)	Data going from modem to terminal.
4	Request to Send (RTS)	Signal sent by terminal asking to send data.
5	Clear to Send (CTS)	Signal asserted by modem to indicate to terminal that it may send data to modem. Some terminal ports will not transmit data on pin 2, unless there is a positive input on pin 5.
6	Data Set Ready (DSR)	Signal asserted by modem to indicate to terminal that modem is powered up and operational. Some terminal ports will not receive data on pin 3, unless there is a positive input on pin 6 and/or pin 8 (see pin 8 below).
7	Signal Ground (SG)	Electrical ground.
8	Data Carrier Detect (DCD)	Signal asserted by modem to indicate to terminal that modem is detecting a carrier signal from remote modem (i.e., a phone connection has been established). Some terminal ports will not receive data on pin 3, unless there is a positive input on pin 8 and/or pin 6 (see pin 6 above).
20	Data Terminal Ready (DTR)	Signal asserted by terminal to indicate to modem that terminal is powered up and operational. Some modems will not operate, unless there is a positive input from pin 20.

Wiring Modems with the RS-232 Interface

Before using the RS-232 port for DG/BLAST communications, determine if the port is a modem or terminal port. If the manufacturer intended the port for attaching terminals, it will have modem characteristics: pin 2 is the data input, pin 3 is the data output, and pins 5, 6, and 8 are probably set at positive voltage to simulate the CTS, DSR, and DCD signals. If the manufacturer intended the port for attaching modems, it will have terminal characteristics: pin 2 is the data output, pin 3 is the data input, and pin 20 is set high to simulate the DTR signal.

You are now ready to wire your modem(s). The simplest cable configuration consists of the transmit data wire, the receive data wire, and the ground. The ground wire should go from your pin 7 to pin 7 of the target device, whether it is a modem or a local computer. When you are wiring the data lines, your output data line must be connected to the input data pin on the target device, and the receive data line must be connected to the output data pin on the target device.

For example, if your port is functioning as a terminal and you are transmitting through a modem, your pin 2 should be connected to the modem's pin 2. Your pin 3 should be connected to the modem's pin 3.

However, if your port is functioning as a modem, your pin 2 should be wired to the modem's pin 3. Your pin 3 should be wired to the modem's pin 2.

Finally, if your port is functioning as a terminal and you are transmitting to a local computer whose port is also functioning as a terminal, connect your pin 2 to the target computer's pin 3. Connect your pin 3 to that computer's pin 2.

NOTE At 9600 baud, an RS-232 interface can transmit only 100 feet without a modem. However, at lower baud rates it can operate over much greater distances.

To wire the hand-shake inputs required for port operation, you might use a shortcut. Rather than receiving a hand-shake input from the corresponding output pin on the other device, use a hand-shake output pin on the same port to provide the needed positive voltage. For example, connecting pin 4 to pin 5 (CTS to RTS), and connecting pins 6 (DSR), 8 (DCD), and 20 (DTR), will usually provide all the needed hand-shaking inputs.

DG/RDOS and RDOS CLI Error Codes

C

*Unknown
Codes*

9

43

Code (Octal)	Explanation
1	Illegal filename
3	Illegal command for device
6	End of file
7	File read protected
10	File write protected
11	File already exists
12	File does not exist
27	Out of disk space
30	File read error
36	Device not in system
45	Device already in system
46	Not enough free contiguous disk blocks
51	Attempt to open too many devices or directories
52	Illegal directory specifier
53	Unknown directory specifier
57	Link depth exceeded
60	File is in use

64	File position error
66	Directory device not initialized
77	Error detected in SYS.DR
101	Device timeout
102	Link not allowed
121	Disk format error
122	Disk has invalid bad block table
123	Insufficient space in bad block pool (core)

AOS and AOS/VS CLI Error Codes

D

Code (Octal)	Explanation
1	;Illegal system command
2	;Channel not open
3	;Channel already open
4	;Shared I/O req not map slot aligned
5	;Insufficient memory available
6	;Illegal starting address
7	;Illegal overlay number
10	;Illegal time argument
11	;No task control block available
12	;Signal to address already in use
13	;Error in QTASK request
14	;Task I.D. error
15	;Data channel map full
16	;System call parameter address error
17	;Task not found for abort
20	;Insufficient room buffer
21	;File space exhausted

22	;User stack fault
23	;Directory does not exist
24	;Illegal filename character
25	;File does not exist
26	;Filename already exists
27	;Non-directory argument in pathname
30	;End of file
31	;Directory delete error
32	;Write access denied
33	;Read access denied
34	;Append and/or write access denied
35	;No channels available
36	;Release of non-active shared slot
37	;Illegal priority
40	;Illegal max size on process create
41	;Illegal process type
42	;Console device specification error
43	;Swap file space exhausted
44	;Device already in system
45	;Illegal device code
46	;Error on shared partition set
47	;Error on remap call
50	;Illegal ghost gate call
51	;Number of processes exceeds 64
52	;IPC message exceeds buffer length
53	;Invalid port number
54	;No matching send
55	;No outstanding receive
56	;Illegal origin port

57	;Illegal destination port
60	;Invalid shared library reference
61	;Illegal record length specified (=0)
62	;Attempt to release console device
63	;Device already in use
64	;Attempt to release unassigned device
65	;Attempt to close unopened channel or device
66	;I/O terminated by close
67	;Line too long
70	;Parity error
71	;Resident process tried to push (EXEC)
72	;Not a directory
73	;Shared I/O request not to shared area
74	;Attempt to create max number of sons
75	;File read error
76	;Device timeout
77	;Wrong type I/O for open type
100	;Filename too long
101	;Positioning before beginning of file
102	;Caller not privileged for this action
103	;Simultaneous requests on same channel
104	;Illegal file type
105	;Insufficient room in directory
106	;Illegal open
107	;Attempt to access process not in hierarchy
110	;Attempt to block unblockable process
111	;Invalid system call parameter
112	;Attempt to start multiple ghosts
113	;Channel in use

114	;Insufficient contiguous disk blocks
115	;Stack overflow
116	;Inconsistent bit map data
117	;Illegal block size for device
120	;Attempt to XMT illegal message
121	;Physical unit failure
122	;Physical write block
123	;Physical unit offline
124	;Illegal open option for file type
125	;Too many or too few device names
126	;Disk and file system rev numbers don't match
127	;Inconsistent dib data
130	;Inconsistent LD
131	;Incomplete LD
132	;Illegal device name type
133	;Error in process ust definition
134	;LD is use, cannot release
135	;Searchlist resolution error
136	;Cannot get IPC data from father
137	;Illegal library number given
140	;Illegal record format
141	;Too many or too few arguments to PMGR
142	;Illegal ?GTIMES parameter
143	;Illegal CLI message
144	;Message receive disabled
145	;Not a console device
146	;Attempt to exceed max index level
147	;Illegal channel
150	;No receiver waiting

151	;Short receive request
152	;Transmitter inoperative
153	;Illegal username
154	;Illegal link number
155	;Disk positioning error
156	;MSG text longer than specified
157	;Short transmission
160	;Error on Histogram init/delete
161	;Illegal retry value
162	;Assign error—already your device
163	;Magnetic tape req past logical end of tape
164	;Stack too small (?task)
165	;Too many tasks requested (?task)
166	;Spooler open retry count exceeded
167	;Illegal ACL
170	;?STMAP buffer invalid or write protected
171	;IPC file not opened by another process
172	;FPU hardware not installed
173	;Illegal process name
174	;Process name already in use
175	;Disconnect error (modem controller)
176	;Nonblocking process request error
177	;System not installed
200	;Max directory tree depth exceeded
201	;Releasing out-of-use overlay
202	;Resource deadlock
203	;File is open, can't exclusively open
204	;File is exclusively open, can't open
205	;Init privilege denied

206	;Multiple ?IMSG calls to same dct
207	;Illegal link
210	;Illegal dump format
211	;EXEC not available (mount, etc)
212	;EXEC request function unknown
213	;Only EXEC's sons can do that
214	;Refused by operator
215	;Volume not mounted
216	;Illegal switch value (65K decimal)
217	;Input file does not exist
220	;Output file does not exist
221	;List file does not exist
222	;Data file does not exist
223	;Recursive generic file open failure
225	;User data area does not exist
226	;Illegal device type from AOSGEN
227	;AOS restart of system call
230	;Probably fatal hardware runtime error
233	;User data area already exists
237	;Control point directory max size exceeded
240	;SYS or boot disk not part of master LD
241	;Universal system, you can't do that
242	;Execute access denied
243	;Can't init LD, run fixup on it
244	;File access denied
245	;Directory access denied
246	;Attempt to define > 1 special process
247	;No special process is defined

- 250 ;Attempt to issue MCA request with direct I/O in progress
- 251 ;Attempt to issue MCA direct I/O with outstanding requests
- 252 ;Last task was killed
- 253 ;Resource load or release failure
- 254 ;Zero length filename specified

Index

A

Answering phone, ANSW
command 5-6
Attention key 3-1, 5-5
AUTO LINE FEED, see Line feed

B

Batch command file 1-7, 10-1
building of 10-7
command line switch 10-5
defined 10-6
examples of 10-8
Batch operation 1-6, 10-1
batch command file 10-1
CLI command line 10-2
partial batch operation 10-11
sample CLI command lines 10-3,
10-10
Bits
data, see Data bits
stop, see Stop bits

C

Capture
OFF 6-4

ON 6-3
Character echo setting 5-9
CLI command line
batch operation 10-4, 10-5
baud rate specified 2-8, 2-11
clock specified 2-8, 2-11
for AOS and AOS/VS 2-8, 10-5
for batch operation 10-3
for DG/RDOS and RDOS 2-5, 10-4
for MS-DOS 2-3, 10-3
log file switch 2-8
sample AOS and AOS/VS CLI
command lines 2-11
sample DG/RDOS and RDOS CLI
command lines 2-8
sample MS-DOS command lines 2-5
CLI error codes
for AOS and AOS/VS D-1
for DG/RDOS and RDOS C-1
Configuration management 5-1
building configuration files 5-1
defined 5-1
menu 5-2
menu options 5-3
parameters explained 5-4
Configuration management file 2-14
changing of 4-5
command line switch 2-8

Configuration management menu 5-2
Connection control language 11-1,
11-3
 function strings 9-2
Console interrupt 3-2

D

Data bits, setting of 5-8
Dialing 4-3
 DIAL command 5-6
 troubleshooting 11-6
Disconnect phone, DISC command 5-7
Duplex, setting of 5-9

E

Error handling 3-3
Error-free command file 10-6
 building of 8-2
 defined 8-1
 examples of 8-2, 10-11
Error-free mode 1-5, 4-4, 7-1
 error-free command file 4-4
 error-free communications
 menu 2-20
 options 7-1
 options menu 2-20, 7-2
 transfer examples 7-7
 transfer options 7-1

F

Function strings 5-10, 6-3, 9-1, 10-10,
11-5
 building of 9-1
 examples of 9-3

H

Hanging up 4-5

I

Installation of DG/BLAST A-1

communications port A-1
port wiring A-3
 required hardware/software A-1
 testing of A-3
Interactive operation 1-2, 2-1
 CLI command line 2-3
 getting started 2-1
 logging off 2-22
 logging onto target system 2-16
 logon 3-1
Intercharacter delay 5-9

L

Line character sent 5-10
Line delay sent 5-10
Line feed, AUTO LINE FEED
 setting 5-9
Line quality 2-21, 3-4, 7-6
 progress reports 3-4
Local display area 7-6
Log file, command line switch 2-8
Logon 3-1
 Interactive operation 3-1
 timeout 5-7
Logon code 3-1

M

Main menu 2-13, 4-1
 options 4-1
Menus
 configuration management
 menu 2-14, 5-2
 error-free communications
 menu 2-20, 7-4
 main menu 2-13, 4-2
 menu tree 1-3
 options for error-free mode
 menu 2-20, 7-2
terminal menu 2-16, 6-2
Modem
 answering 4-3
 dialing 4-3
 hanging up 4-5

Modems 11-1
 connection control language 11-3
 control strings 11-2
 DATA GENERAL/One internal
modem 2-13
 handling of 11-1
 sample control strings 11-4
 wiring of B-2

restarting transfer 3-3
Testing DG/BLAST A-3
Timeout
 connect 5-7
 logon 5-7

O

Options for error-free mode menu 7-2

P

Parity, setting of 5-8
Password 5-8
Phone number, configuration file
parameter 5-6

R

Remote display area 7-6
RS-232 Interface B-1
 pin description B-1
 wiring modems B-2

S

Self-test, testing DG/BLAST A-3
Stop bits, setting of 5-8
Streamlined operation 5-5

T

Terminal menu 2-16, 6-2
Terminal mode 1-3, 4-3
 defined 6-1
 options 6-1
 special mode functions 6-4
 terminal menu 6-2
Termination
 premature 3-2

ERROR-FREE COMMAND FILE FORMAT

Command	Function
Exclamation point (!)	Precedes a CLI command
Semicolon (;)	Precedes a message
Plus sign (+)	Precedes name of file to be received
Filename	File to be sent

Sample error-free command file:

```

DOD MORNING. JENNINGS HERE. DAILY REPORT BEING SENT.
DAILY DAILY. JENNINGS
NEWS
/E
  
```

FUNCTION STRING FORMAT

Control Codes	Functions
^C	Wait for carrier detect lead.
^D	Set delay between characters.
^E	Turn on echo mode.
^H	Drop DTR lead.
^N	Turn off echo mode.
^P	Send phone number string.
^X	Send control code.
^T	Get trap character(s).
^W	Wait. One second delay.
^X	Set timeout in seconds.

All legal ASCII control characters.

Sample function strings:

```

^M^TUSERNAME:^TPETER^M^TPASSWORD:^TJANUS^M
Send logon string to target machine

^WBLAST/N @CONSOLE/P SLAVE__MODE/I SAVE/0^M
Start BLAST on AOS target machine

^M^BYE^M
Log off target machine
  
```

DG/BLAST™

REFERENCE CARD

CLI COMMAND LINE FORMAT

For AOS and RDOS systems:

DGBLAST [/N] [PORT/P] [LINE/L] [DEV/D]
[BAUD/B] [CONFIG/C] [CMD/I] [LOG/O]

The CLI command line switches and arguments are defined below:

/N = Non-interactive operation.
Menus not displayed.
PORT/P = Optional communication ports:

RDOS Systems:

/R = SYSGENed mux line
/U = IDEFed or SYSGENed ULM line
/A = IDEFed or SYSGENed ALM line
/M = IDEFed or SYSGENed USAM/ ASLM line
/Q = IDEFed or SYSGENed QTY line
/S = IDEFed or TTY1 line
/T = IDEFed or SYSGENed TCU/ ALM line

AOS Systems:

@CONn/P = System console port n
@CONSOLE/P = Console port
USAM/P = IDEFed USAM/ASLM device
ULM/P = IDEFed ULM device
ALM/P = IDEFed ALM device
QTY/P = IDEFed QTY line
TTY1/P = IDEFed TTY1 line

LINE/L = Mux line number.
DEV/D = Secondary device code.
BAUD/B = Baud rate for ULM or USAM/ASLM devices.
CONFIG/C = Name of the configuration file.
CMD/I = Name of the batch command file.
LOG/O = Log output file or device.

For MS-DOS Systems:

DGBLAST [/N] [PORT/P] [CONFIG/C] [CMD/I]
[LOG/O]

BATCH COMMAND FILE FORMAT

Batch command file may include:

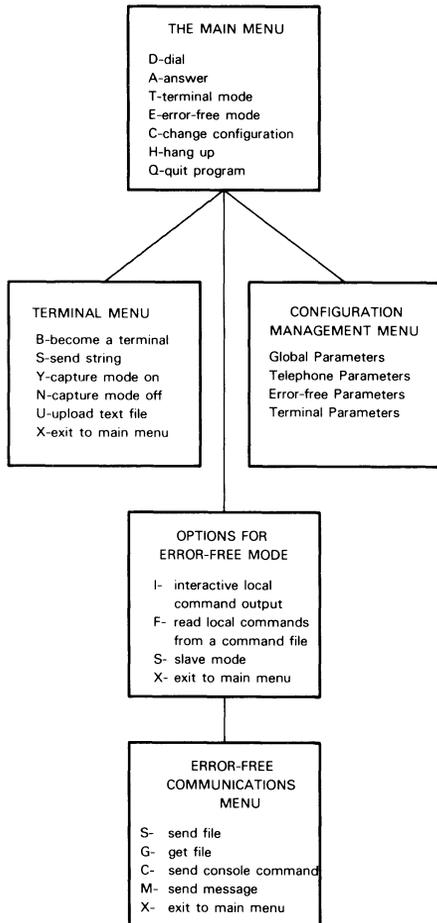
- Menu option commands
- Function strings
- Error-free command files

Sample batch command file:

Command	Action Taken
DIAL	Dial target system.
TERMINAL MODE	Access terminal mode.
SEND STRING	Invoke function string 1.
1	First function string logs v onto target system.
SEND STRING	Invoke function string 2.
2	Second function string sta DG/BLAST on target syst
X	Exit terminal mode.
ERROR-FREE MODE	Access error-free mode.
FILE	Invoke error-free comman file.
<Error-free command filename>	Enter error-free command filename.
X	Exit error-free mode.

[Unattended operation halted at main menu for interactive command input.]

THE MENU TREE



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