Honeywell

SERIES 60 (LEVEL 64)
TERMINAL OPERATIONS

SUBJECT

> This Manual Describes the Terminal Operator Interface with the Communications
> Processing Facility Available with Series 60 Level 64 Systems

SPECIAL INSTRUCTIONS

> For users of Release 0400 this manual replaces Revision 0 dated June 1977.
> Because of extensive changes, change bars have not been used.

SOFTWARE SUPPORTED

> GCOS Software Release 0400

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This manual gives instructions on how to interface with the Series 60 Level 64 Communications Processing Facility.

The physical operation of a terminal is not described except where relevant to a discussion of operator interaction with the system. For the operating instructions and complete physical description of a supported device, consult the manufacturer.

Section I gives a glossary of telecommunications terms and describes the concept of a terminal as seen by Level 64. Section II lists the terminals supported and describes their general characteristics. Section III describes the procedures for establishing a connection between a terminal and an application. Section IV contains a complete description of tne set of commands available to the terminal operator through Level 64. Section V lists and describes the messages that can be sent from the system to the terminal.

Each section of this document is structured according to the heading hierarchy shown below. Each heading indicates the relative level of the text which follows it.

Level	Heading Format
1 (highest)	<u>ALL CAPITAL LETTERS, UNDERLINED</u>
2	<u>Initial Capital Letters, Underlined</u>
3	ALL CAPITAL LETTERS, NOT UNDERLINED
4	Initial Capital Letters, Not Underlined
5 (lowest)	ALL CAPITAL LETTERS FOLLOWED BY COLON: Text begins on same line.

The following notation conventions are used in this manual:

UPPERCASE The keyword item is coded exactly as shown.

lowercase Indicates a user-supplied parameter value.

[item] An item within square brackets is optional.

$\begin{Bmatrix} \underline{item1} \\ item2 \\ item3 \end{Bmatrix}$ A column of items within braces means that one value must be selected if the associated parameter is specified. If the parameter is not specified the underlined item is taken as the default value.

( ) Parentheses must be coded if they enclose more than one item.

... An ellipsis indicates that the preceding item may be repeated one or more times.

LEVEL 64 DOCUMENT LIST

Order Number	Title
AQ02	*Series 100 Program Mode Operator Guide*
AQ03	*Series 100 Conversion Guide*
AQ04	*Series 200/2000 Conversion Guide*
AQ05	*System 360/370 Conversion Guide*
AQ09	*System Management Guide*
AQ10	*Job Control Language (JCL) Reference Manual*
AQ11	*Job Control Language (JCL) User Guide*
AQ13	*System Operation Operator Guide*
AQ14	*System Operation Console Messages*
AQ18	*Operator Reference Manual*
AQ20	*Data Management Utilities Manual*
AQ21	*Series 200/2000 Program Mode User Guide*
AQ22	*Series 200/2000 Program Mode Operator Guide*
AQ26	*Series 100 File Translator*
AQ27	*Series 200/2000 File Translator*
AQ28	*Library Management Manual*
AQ40	*System 3 Conversion Guide*
AQ49	*Network Control Terminal Operation Manual*
AQ50	*Terminal Operations Manual*
AQ52	*Program Checkout Facility Manual*
AQ53	*Communications Processing Facility Manual*
AQ55	*TDS/64 Standard Processor Site Manual*
AQ56	*TDS/64 User Guide*
AQ57	*Standard Processor Programmer Reference Manual*
AQ59	*Unit Record Devices User Guide*
AQ63	*COBOL User Guide*
AQ60	*Interactive Operation Facility*
AQ64	*COBOL Language Reference Manual*
AQ65	*FORTRAN Language Reference Manual*
AQ66	*FORTRAN User Guide*
AQ67	*FORTRAN Mathematical Library*
AQ68	*RPG Language Reference Manual*
AQ69	*RPG User Guide*
AQ72	*Series 200/2000 COBOL to Level 64 COBOL Translator*
AQ73	*IBM COBOL Translator*
AQ82	*BFAS User Guide*
AQ83	*HFAS User Guide*
AQ84	*UFAS User Guide*
AQ85	*Sort/Merge Manual*
AQ86	*Catalog Management Manual*
AQ87	*Library Maintenance User Guide*
AQ88	*I-D-S/II User Guide, Volume 1*
AQ89	*I-D-S/II User Guide, Volume 2*
AQ90	*COBOL Reference Card*
AQ92	*Operator's Reference Card*
AQ93	*RPG Reference Card*
AQ94	*FORTRAN Reference Card*

TABLE OF CONTENTS

INTRODUCTION

The objective of telecommunications is to convey information between two points. Most often, the two points are a central computer and a remote device, capable of sending and receiving information.

NOTE: Although a remote device can have several connotations (e.g., terminal, station - see below in the glossary), the word terminal is all-inclusive as used in this manual.

Each end-point must have a driver. At the computer end, it is the software that provides control and direction; at the terminal end, the terminal operator contributes significantly to the control of the flow of the information to and from the terminal.

This manual provides a description of the role of the terminal operator in the Level 64 telecommunications environment. This manual is not meant to cover the various applications functions (discussed in the appropriate manual) but only the ways in which terminals can interact with the system.

The rest of this section is dedicated to various concepts to help the reader understand the terminology used.

BASIC TERMINAL NETWORK SUPPORT (BTNS)

BTNS is software provided to the user to support a communications network and forms the case of Level 64 communications. It is the main interface between applications and the terminals. BTNS has two main components:

- The Dispatcher: which supervises all physical I/O (input-output) operations over the communications lines. It is also responsible for message switching and line selection.

- The Site Controller: which is in overall charge of the communications network, and supervises the following activities:

- requesting dispatcher functions during message exchanges over the lines.

- establishing and disestablishing sessions (log-on, log-off).

- supervising the states of the physical units (terminals, lines, etc...).

- dynamic reconfiguration of the network.

- issuing various informative and error messages.

MAM AND VCAM SUBSYSTEMS.

There are two subsystems used in Level 64 communications and these are used by the applications as access methods.

MAM (Message Access Method) is used only with MCS COBOL applications and provides the user with access to message queues on disk and in main memory.

VCAM (Virtual Communications Access Method) is used by the direct access applications (IOF, ROF and TDS), and permits direct communications between the application and the BTNS service job.

APPLICATIONS

Applications are user programs in the host computer's CPU (Central Processor Unit). Level 64 supports four types of applications.

MCS (Message Control System) COBOL applications interact with the terminal operator via queues (see below), and use the MAM subsystem to permit access to these queues. Due to the queue concept the operator is not in direct contact with the applications.

TDS (Transaction Driven Subsystem) applications are used for real time processing. TDS applications interact with the terminal operator via the VCAM subsystem.

IOF (Interactive Operator Facility) applications are service jobs which allow the terminal operator to run jobs on the host computer and to access the job outputs on the terminal. IOF interacts via the VCAM subsystem.

ROF (Remote Operations Facility) applications are service jobs whereby two linked computers can exchange data and messages. ROF uses the VCAM subsystem.

PROGRAM AND TERMINAL QUEUES

MCS COBOL applications use queues for inputting and outputting data,
these queues are accessed via MAM. The queue from which the program
receives data (input) is called the program queue and the queues to
which the program sends data (outputs) are called the terminal
queues.

The program queue receives messages from terminals which are
logged-on to the program queue. These messages are stored in the
order in which they were received; thus when the MCS program
accesses these messages it will handle them in the same order as
when they were received. Terminals can still send messages to a
program queue while the application is not active, providing the
queue is not disabled. A program queue can be enabled or disabled by
either the application or the network control operator.

The terminal queues are used to store messages from the application
to the terminals on a first in, first out basis. BTNS extracts these
messages and sends them to the destination terminal. Each terminal
using an MCS application must have a terminal queue defined at
network generation; the queue takes the same name as the terminal.

COMMUNICATIONS LINES

There are two types of lines used in communications point-to-point
and multipoint lines. Point-to-point lines connect a single terminal
to the computer, whereas multipoint lines can connect several
stations (clusters of terminals) to the computer. In the second case
the lines have to be controlled by polling and selecting to govern
the transmission and destinations of messages over the lines.

In either of the above cases the lines may be either switched or
non-switched. A non-switched line is permanently assigned to the
network and can be considered as part of it, a switched line,
however, has to have its presence established during the log-on
procedure as it is not permanently assigned to the network. (See
"Manual Log-on", section III).

NETWORK CONTROL TERMINAL

Control over the communications network - lines, terminals, queues -
is exercised by the network control operator. The network control
terminal is named when the network is generated; it can be any
terminal in the network or, by default, the system console. Network
generation is described in the "Communications Processing Facility"
manual.

COMMANDS AND ACTIONS

Operator actions are sometimes dependent on the type of application involved. Where appropriate, operator actions relevant to TDS are described. In other cases, the reader is referred to the "TDS Site Manual" for a description of operator actions specific to TDS.

Apart from handling log-on dialogs (see Section III), the site controller is also responsible for handling terminal operator commands. There are two types of command, standard and privileged. Privileged commands can only be entered from the network control terminal.(For more information on these commands refer to the Network Control Terminal Operations manual.) Standard commands are available to both the network control operator and the terminal operator, for whom this manual is intended (see Section IV).

TERMINAL STATES

After a terminal is turned on, it can be in one of the following states:

        -HELD

        -IDLE

        -LOGIN

        -LOGGED

        -ACTIVE

A terminal can be specified as HELD at network generation. There are privileged commands through which the network control operator can hold and release terminals; in fact, with these commands lines and queues can also be held and released. Some external events, such as terminal failure, can also cause a terminal to be held. A held terminal is out of use as far as the site controller is concerned and thus cannot access or be accessed by an application. The terminal operator cannot control the holding or releasing of the terminal.

A terminal is IDLE when it is not held and is also eligible to be logged-on to an application.

A terminal is LOGIN while it is in the process of logging-on, i.e., between being IDLE and LOGGED.

A terminal is LOGGED after the log-on procedure is successfully completed, but a session is not yet established with an application as the application has not yet issued an allocation request for the terminal.

A terminal is ACTIVE when it has established a session with an application.

TERMINAL CLASSIFICATIONS

An operator's actions often depend upon how his terminal is classified. Terminals can be classified as:

-Dedicated

-General-purpose

-Master or Slave

These classifications are described below.

Dedicated Terminal

A dedicated terminal can only be in session with a specified application. The terminal can be dedicated to an application either at network generation or by a privileged network control command (see note). A dedicated terminal can be logged-on to its application either automatically or manually (see Section III).

NOTE: The network control operator can change a dedicated terminal to a general-purpose terminal, or vice-versa, by use of the privileged command Modify Telecom Terminal(MTT).

General-purpose Terminal

A general-purpose terminal can be used for a session with any of the applications recognized by BTNS. The session is effective until terminated by operator or program request. Once this has happened the terminal is eligible to be logged-on to another application. A general-purpose terminal can be logged-on to an application either automatically or manually (see Section III).

Terminal as Master or Slave

A terminal cluster or multi-terminal station (such as a VIP7700) can be defined with one or several masters for the other units, or slaves, attached to the same station. For example, the keyboard/screen can be the master with the printer and cassette unit as slaves. The terminal unit is defined as master or slave at network generation.

The master/slave concept exists solely as a convenience for logging-on. When a master terminal logs-on to an application, either automatically or manually, all the slave terminals attached to the same station are logged-on at the same time; a slave terminal cannot log-on independently. In addition, if the master is a dedicated terminal, all its slaves are dedicated to the same application; a slave terminal cannot be dedicated independently of its master.

A master terminal in this sense is not to be mistaken for the network control terminal, which oversees all terminals, or for the master terminal designated to control a TDS session (see the "TDS Site Manual").

NOTE: For any of the above classifications (except slave) the terminal may also be controlled; this is specified at network generation where the terminal description contains the CONTROL option. A controlled terminal has a slightly different log-on procedure where certain information has to be supplied before a session can be established. See log-on procedures in Section III.

SECTION II

TERMINALS SUPPORTED AND THEIR CHARACTERISTICS

Level 64 supports a variety of terminal types. This section groups
these terminals and briefly describes some of their functional and
operational characteristics. The reader is referred to documentation
supplied by the manufacturer for information regarding the design
and operation of a specific device.

TERMINAL GROUPS SUPPORTED BY LEVEL 64 TELECOMMUNICATIONS

Terminals supported by Level 64 are divided into four groups.
Terminals within a group are compatible with each other.
Compatibility is linked to line procedure, hence each terminal group
has its own line procedure. The terminal groups and the types of
communications lines to which they can be attached are listed below.

Group 1 - Teletype and related devices (TTY Line Procedure)

        VIP 7100/7200
        TTY 33/35/37/38   line only
        TWU 1001/1003/1005
        TN300/1200

Group 3 - VIP (VIP Line Procedure)

        VIP 765/775/785   point-to-point
        VIP 7700/7760/7700R
        TWU 1901   or multipoint
                                     line

Group 4 - BSC (BSC Line Procedure)

        HL 61   point-to-point
        HL 62
        HL 64   line only
        HL 66

NOTE: Because of special considerations, the site controller cannot
      communicate with a BTT 7300 or with an HL61,62,64 or 66. Thus,
      information in this manual regarding the log-on procedure,
      operator commands, and messages received at the terminal, does
      not pertain to these devices.

MESSAGE TERMINATING CHARACTERS

Each terminal group has a specific way of denoting the end of a
message being sent from the terminal.
For teletype-group terminals, message terminating characters are
entered directly by the terminal operator, who depresses the
appropriate key. Depending on the device and what has been defined
to the system, the terminating key can be: CR (Carriage Return), LF
(Line Feed), NL (New Line), CAN (Cancel), or SUB (Substitute).

NOTE: A default time delay of 2 minutes is allowed between
      characters being entered. If time elapses before the next
      character is entered, the end-of-message is forced. This value
      can be modified at network generation with the TOLEN parameter
      of the LINE command. It can also be modified by the Network
      Control Operator by the Modify Telecom Line (MTL) command.

For VIP-group terminals, the ETX and EOT (end-of-transmission)
characters denote message termination. For certain devices of this
group, these characters are affixed automatically when the Transmit
key is depressed. Other devices of the group are equipped with ETX
and EOT keys (consult the device manual).

For BSC-group terminals, message termination is a programming
consideration.

ERASING FUNCTIONS

The operator must have some means of rectifying incorrectly entered information. The means vary depending on the group and the device.

Teletype-group terminals are not buffered; i.e., entered characters are sent immediately over the line to the central computer. If an erroneous character or line is entered, the terminal operator must request that the previous character can be erased by entering a backslash (/). The previous line can be erased by entering the @ symbol followed by CR. These functions must be specified for the terminal at network generation (ERCAP parameter in the LINE command).

NOTE: The operator must be wary of one instance: if the last character of a message is the @ symbol and the CR character is the message terminating character, the last line entered is inadvertently erased.

VIP-group terminals are buffered; therefore, all editing and erasing functions can be performed locally before entering a transmission request (consult the device manual for available editing functions).

For BSC-group terminals, editing functions are under program control.

ERROR DETECTION AND MESSAGE RETRIES

BTNS software and IURP or URP firmware monitor communications activity and detect errors. When the error is a hardware problem, the affected terminal and line, if applicable, are closed automatically. When the problem is corrected the terminal, and possibly the line, must be released by the network control operator and a new session must also be established before activity between the terminal and the application can be resumed.

When there is an error in transmission (parity error over the line or a loss of characters due to line interference), attempts to complete the transmission successfully are repeated automatically as necessary according to the number of retries called for at network generation. If the number specified is exhausted without having completed a successful transmission, the terminal and line are automatically held; before activity can be resumed the terminal and line must be released by the network control operator.

Error Detection and Operator Intervention

When a page overflow condition occurs on a VIP 7700 terminal, the ERROR light illuminates to notify the operator. This condition can be the result of a program error (the message is too long), or an operator error (failure to clear the screen). The terminal is flagged as busy by BTNS so that no further output attempts are made to the terminal. Operations can resume only after the operator: (1) clears the screen (as described in the device manual) and (2) sends the command RDY (see Section IV).

The message being sent when the overflow occurred is sent again. If the condition is the result of message length, there is a recurrence. The operator can dynamically alter the length through the Modify Terminal Edit (MTE) command (see Section IV).

LINE AND MESSAGE LENGTHS

The maximum line length of a terminal is a hardware characteristic as is the maximum message length. Values, up to the maximum, can be specified for the line and message lengths of each terminal at network generation; there is however a maximum message length that can be used on a Level 64 network, this is 2,442 characters (including control characters). The terminal operator has the ability to alter the values of message and line length through use of the Modify Terminal Editing (MTE) command (see Section IV).

The following list shows the maximum line and message lengths for the various terminals, however the relevant hardware manual should be consulted as some terminals are supplied with more than one screen size.

Terminal	Maximum line Length	Maximum Message Length
HL61,62,64,66.	*	2048
TN300 & TN1200	118	120
TTU8124 & TTU8126	132	256
TTU8221	132	1920
TTY33 – TTY38	72	120
VIP765 & VIP775	46	960
VIP785	92	1920
VIP7100 & VIP7200	80	120
VIP7700, VIP7760 & 7700R	80	1920

* = not applicable

NOTE : Terminals using the VIP line procedure automatically start a new line when necessary; line length for terminals using the BSC line procedure is under program control.

SECTION III

LOG-ON AND LOG-OFF PROCEDURES

A connection must be established between a terminal and an
application before a session can take place. This section describes
how a session is established and terminated by a terminal operator.

LOG-ON CONSIDERATIONS

Logging-on is only possible if all the physical and logical
resources that are required are available. This means that:

1. The line to which the terminal is connected is
    initialized and is not held.

2. If the terminal is connected via a station then the
    station must be initialized and must not be held.

3. The terminal itself is eligible for connection, i.e., in
    the IDLE state.

4. The supporting software and the intended application or
    program queue are active.

The initial states of the physical units can be specified at network
generation, and at the startup of communications (i.e. the
introduction of a BTNS service job) the site controller tries to
implement the specified network state. At the end of startup a list
of all the units that could not be put into the specified states is
displayed on the network control terminal. The site control operator
can dynamically alter the network configuration by use of privileged
commands.

A TDS direct access application must signal its presence to the site
controller if it is to be considered active. It must then issue
allocation requests for terminals, otherwise log-on requests for the
TDS will be denied or enqueued. This is to say that an "M-START" TDS
command must have been issued by the TDS master terminal.

IOF and ROF applications are started automatically by the site
controller when the appropriate log-on procedure has been
successful.

To log-on to an MCS COBOL application the program or terminal queue
must be enabled (not held), otherwise the log-on request will either
be denied or enqueued. A queue (program or terminal) can be
specified as enabled or disabled at network generation. During a
communications session, queues can be enabled or disabled by either
the application program or the network control operator. If only the
program queue is enabled the terminal can only be used for one way
input; if only the terminal queue is enabled the terminal can be
used only for one way output.

There are other considerations that affect logging-on:

1. Whether the terminal has automatic or manual log-on
    procedures (specified at network generation).

2. Whether or not the terminal has been dedicated to a
    specific application (can be specified at network
    generation).

3. Whether or not the terminal is under control (specified
    at network generation).

Automatic Log-on

A terminal can be defined as AUTO at network generation. This is
normally used for receive-only or master terminals. No operator
intervention is required for session establishment as the site
controller handles the log-on procedure and also enters a session
record automatically.

Provided neitner the terminal or its line are held, the site
controller is able to initiate log-on procedures as soon as the
physical path to the terminal is established.

- General purpose terminals are logged-on as soon as the
  physical path between the site controller and the terminal
  is established.

- Controlled terminals are logged-on for general purpose,
  providing there is account time available. The user
  identification is assumed to be the terminal
  identification.

- Dedicated terminals are logged-on as soon as their
  application is active.

At this stage if the procedure has been successful the following message is displayed:

    CC33 terminal-name LOGGED

The terminal is now logged and is awaiting an allocation request from an application before it is considered active.

Manual Log-on

If the AUTO parameter was not used in a terminals description at network generation the operator must issue a request to log-on. Depending on the line and terminal type there are three ways to request to log-on, providing the terminal and line are not held.

1. If the terminal is attached to a switched line, the operator must dial the ring indicator. When the site controller detects the ring indicator it will then start the log-on dialog (see below).

2. If the terminal is equipped with a break key (and is not on a switched line), the operator depresses this key, which causes the site controller to begin the log-on dialog (see below).

3. If there is no break key, the operator must simulate the break signal by issuing the BRK command (see Section IV); this will then cause the site controller to begin the log-on dialog.

NOTE : When a session is established, a break signal is no longer significant except as an interrupt signal when specifically defined for that purpose at network generation.

Log-on of a Dedicated Terminal

A terminal can be dedicated to a specific application at network generation and the network control operator can also declare a terminal as dedicated by use of a privileged command. If automatic log-on is in effect, the session is established as described under Automatic Log-on above. If the terminal is described as manual then the operator must follow the procedure shown under Manual Log-on. Note that dedicated terminals can also be controlled.

Log-on of a Controlled Terminal

If a terminal is described as controlled at network generation the
operator must provide additional information during a manual log-on
(see below). This information takes the form of user
identification, project name, billing name and password which is
associated to an account. The account will have been allocated an
amount of time during which it can be connected to the computer, if
there is no time credited to the account then the log-on request
will be denied, this is also true if any of the other information
required is incorrect. Automatic log-on has already been described
above. Note that controlled terminals can also be dedicated.

LOG-ON DIALOG

Messages issued by the site controller are preceded by a four
character identifier, sometimes preceded by an asterisk (*) which
indicates that operator action is expected or required. The meanings
of the messages are described in Section IV.

Given that the operator has already conveyed a log-on request to the
site controller, the following message(s) can be displayed asking
for log-on information.

*   CCOO $\left[ID,\right]\left[APPL\ ?\right]$ (i)

*   CCOI $\left[ID,\right]$ USER/PROJECT/BILLING$\left[\$PASSWORD\right]\left[,APPL\right]$?   (ii)

*   CCO2   PASSWORD ?   (iii)

     (i) This question is asked for general purpose and dedicated
          terminals without the control option. If the terminal is
          not on a switched line the ID (terminal identifier) is
          not asked for. If the terminal is dedicated the APPL
          (application) is not asked for. Thus if both the
          preceding conditions apply, no message is displayed.

    (ii) This question is asked for controlled terminals whether
          they are dedicated or not. As for (i) above ID and APPL
          may not be asked for, but USER is mandatory; for some
          sites PROJECT and BILLING (account name) are generated
          automatically from the user identifier, however if they
          are not, then they have to be supplied. For some sites
          the user identifier is associated with a list of
          applications that may be used; if the terminal is not
          dedicated and the APPL field is not completed, then the
          application is assumed to be the first application in
          the list associated with the user. If PASSWORD is not
          asked for it will be requested in question CCO2.

(111) This question is asked only after question CC01 when
PASSWORD was not shown. This is for reasons of site
security when this password is to be kept secret. There
are two mechanisms for this: either the password is not
printed when the operator enters it, or it is overwritten
with other characters so that it is illegible.

The operator should enter the required information after each
question.

If any of the responses are unacceptable the log-on request is
denied and the following message is displayed:

CC04 LOGON DENIED reasons

NOTE : This message does not necessarily mean an error in the
response, the reasons may show that there is no time credited
to an account, the application is not active or is already
supporting the maximum number of terminals (see messages in
Section V).

If all the responses have been acceptable but:

- no application has been specified (for non-dedicated
terminals)
or
- the terminal does not have an enabled terminal queue (MAM
applications)
or
- the application (TDS subsystem) has not yet issued an
allocation request for the terminal

then the terminal is in the LOGGED state and is waiting to be
activated. This is indicated by the following message:

CC33 terminal-name LOGGED

The terminal will be activated:

- in VCAM mode - to the first TDS application that requests
it, if the terminal is dedicated then only
to that application.

- in MAM mode - when the associated terminal queue is
enabled.

When a session is established the following message is displayed:

hh.mm terminal-name ACTIVATED FOR application ON mm.dd.yy

- If the application is shown, the terminal is in session in either two way alternate (TWA), or one way input (OWI) mode with one of the following applications:

    - a program queue (OWI) for MCS COBOL

    - a program and a terminal queue for MCS COBOL

    - IOF

    - ROF

    - TDS

- If the application is not shown, the terminal is in session in one way output (OWO) mode with its associated terminal queue. To be in this mode the operator must not fill the APPL field during log-on; a dedicated terminal cannot be used in this mode.

SESSION TERMINATION

A session can be terminated for any of the following reasons:

- use of the DIS command by the terminal operator (logging-off)

- network control operator intervention

- program (application) request

- external factors (i.e. hardware failure)

When a session is terminated, a general purpose terminal is eligible to log-on to another application.

For switched point-to-point lines, when the DIS command is used with the HOLD option, the terminal is logged-off from the application but the line is not disconnected: also if there is no activity over the line for a specified time period the line is disconnected and the session is terminated.

NOTE: IOF and TDS applications have a separate command for logging-off; it is - BYE for TDS and - QUIT for IOF: the DIS command should not be used with either of these applications (see the relevant manuals for IOF and TDS).

SECTION IV

OPERATOR COMMANDS

The terminal operator is provided with a set of eight commands.
These commands and their functions are described in this section.

The following is a list of the commands and a brief description of
their functions, each command is dealt with in detail on the
following pages.It should be noted that applications have their own
commands and that the commands in this section relate only to BTNS
functions. For this reason they relate more to MCS usage than VCAM
based applications.

Command	Function
Break (BRK)	Simulates the function of the BREAK key for terminals that do not have this feature.
Broadcast Telecom(BT)	Sends a message to other terminals, network control terminal or system console.
Disconnect (DIS)	Logs-off, i.e. causes the session to terminate.
Display Telecom (DT)	Displays the state of the terminal or its queue.
Halt Message (HM)	Suspends the delivery of messages to the terminal (if connected to a program queue).
Modify Terminal Edit (MTE)	Modifies the way in which the terminal formats data.
Ready (RDY)	Used after a page or message overflow to indicate that the terminal is ready to resume activity.

Resume Message (RM)   Resumes the delivery of messages to
                                       the terminal after an HM has been
                                       used.

NOTE: The following rule applies to all commands.

Each message must be preceded by a break qualifier (three
characters) that indicates to the site controller that the entry is
a command. The break qualifier can be specified at network
generation; if it is not, the following default value is used - $*$.
The default value ($*$) is shown in all the following commands; if
however your site has its own break qualifier this should be
substituted when any commands are used.

Where "Possible site controller replies" are shown on the following
pages these should be referred to Section V for interpretation.

Where a delta (Δ) is shown in a command this indicates that a space
is mandatory in this position for correct command format.

Break (BRK) Command

Function:

Sends a break signal to the site controller or an application.

Format:

$*$BRK

Meaning:

If the terminal is IDLE then a log-on dialog is initiated.
If the terminal is connected to an application (VCAM subsystem or program queue) for which the BREAK parameter was specified at network generation, the break signal is sent to the application or the queue, otherwise it is ignored.

In addition, for VIP type terminals the BRK command also executes the function of the RDY command. Thus the BRK will have the effect of RDY+BRK.

Possible site controller replies:

*   CC01   [ID,] [APPL]

*   CC02   [ID,]   USER/PROJECT/ACCOUNT [$PASSWORD] [,APPL]

Broadcast Telecom (BT) Command

Function:

Sends a message to the specified terminal.

Format:

$*$BT Δ terminal-name Δ message-text

Meaning:

The message is sent to the terminal specified. if OPER is used for terminal-name the message is sent to the network control terminal, if MAIN is used the message is sent to the system console.

The message text must not exceed 128 characters including spaces, otherwise the message will be truncated. The message must begin with a non-alphabetic character or a word of more than 4 characters.

The destination terminal must be active, not subject to a HM command and must not be a slave.

Possible site controller replies:

CC03   BT   { COMPLETED
                      INVALID STATUS
                      INVALID NAME
                      UNAUTHORIZED COMMAND

Disconnect (DIS) Command

Function:

Terminates a session between the terminal and application, i.e. log-off.

Format:

$$\$*\$DIS \left[\Delta \left\{ \begin{array}{l} HOLD \\ STRONG \end{array} \right\} \right]$$

Meaning:

The session is terminated and the terminal is returned to the IDLE state. If it was specified at network generation (defined with the BREAK option), direct access applications (VCAM subsystems) and program queues are informed of the disconnection.

The HOLD parameter is only used for terminals that have a point-to-point switched line, the use of this option ensures that the line is not disabled so that it can log-on to another application without dialing the ring indicator; all the operator has to do is press the break key or issue a break (BRK) command.

The STRONG parameter is only used for terminals that have a multipoint switched line, the use of this option ensures that the line is disabled. If the option is not used then only the issuing terminal is disconnected.

Possible site controller replies:

    hh.mm terminal-name   DEACTIVATED BY USER

Display Telecom (DT) Command

Function:

Provides the terminal operator with information about the terminal or a queue.

Format:

$*$DT $\left[\Delta \begin{Bmatrix} \text{STRONG} \\ \text{QUEUE} \\ \text{program-queue-name} \end{Bmatrix}\right]$

Meaning:

The following information concerning the terminal is provided: the terminal's name, state and current session.

If the STRONG option is used the following information is also provided: the current data formats used, the input/output capability, alternate states (if present), statistical information and the current state of the terminal queue with the number of messages it contains (if applicable).

If the QUEUE option is used, information is given for the terminal queue but not for the terminal. The following information is given for the queue: its state, the number of messages it contains, and the percentage of queue space used.

If a program queue name is specified, the following information concerning the queue is supplied: the queue name, its state, number of messages it contains, and the percentage of queue space used.

Possible site controller replies:

The following messages can be displayed: CC08,CC09,CC10 and CC15.

Halt Message (HM) Command

Function:

Suspends the delivery of messages to the terminal.

Format:

$*$HM

Meaning:

The terminal is incapable of receiving any messages until the RM command is used.

Possible site controller replies:

```
CCO3      HM    ⎰ MEANINGLESS ⎱
                ⎨ COMPLETED   ⎬
                ⎱ RETRY LATER ⎰
```

Modify Terminal Editing (MTE)

Function:

Modifies the presentation and format of data received and transmitted by the terminal when it is connected to a program queue.

Format:

$$\$*\$MTE \quad \left[\begin{Bmatrix} BLOCK \\ NBLOCK \end{Bmatrix} \right] \left[\begin{Bmatrix} line\text{-}length \\ * \end{Bmatrix} \right. \begin{Bmatrix} block\text{-}size \\ * \end{Bmatrix} \begin{Bmatrix} INORM \\ IMARK \\ INEDT \end{Bmatrix} \left. \begin{bmatrix} ONORM \\ ONEDT \end{bmatrix} \right]$$

Meaning:

This command can only be used if the terminal is not in session with an application.

BLOCK - indicates that message blocking should be used.

NBLOCK - indicates that message blocking should not be used.

line-length - an integer value (range 4 to 1000) that specifies the maximum number of characters (including spaces) that will constitute a line. If the present value is to be used this is indicated by an asterisk (*).

block-size - an integer value that specifies the maximum number of lines per message (block). If the present value is to be used this is indicated by an asterisk (*). This value multiplied by the line length gives the maximum message length that can be received or transmitted by the terminal. If the maximum message length is exceeded the message will be truncated; see the table in the previous section.

INORM - specifies normal input; message headers and trailers (if any) are deleted, all control characters are deleted, all other characters are shown unaltered, including standard mark, the repeat function is performed.

INEDT - specifies unedited input; all characters are shown unaltered.

IMARK - specifies input mark; all hexadecimal control characters are translated into standard marks, all other characters are shown unaltered, the repeat function is performed.

4-08

ONORM - specifies normal output: message headers and trailers
are provided by the system (except for VIP type
terminals where the text must be preceded by certain
characters) where needed, control characters are
translated into the appropriate code, standard marks
are translated into hexadecimal, other characters are
transmitted without alteration, the repeat function
is performed.

ONEDT - specifies unedited output: all characters (including
control characters) are transmitted without
alteration, message trailers are provided by the
system if required, for VIP type terminals the user
can precede the message with a header if required.

Possible site controller replies:

CC22   MTE   INV./MEANINGLESS PARAM.:[BLOCK] [NBLOCK] [LENGTH]

CC03   MTE $\left\{\begin{array}{l} \text{INVALID NAME} \\ \text{INVALID COMMAND} \\ \text{COMPLETED} \\ \text{INVALID SYNTAX} \\ \text{INVALID STATUS} \end{array}\right\}$

NOTE: This command should be used with caution as the wrong data
formats could cause the MCS application to abort. In general
this command should only be used when the operator has been
instructed to do so.

Ready (RDY) Command

Function:

Corrects a "busy" condition on a VIP type terminal.

Format:

$$\$*\$RDY\left[\Delta STRONG\right]$$

Meaning:

After a page overflow on a VIP type terminal the terminal is considered as being "busy". This command informs the application that the condition has been rectified. If the STRONG option is used the message that caused the overflow is cancelled, otherwise the message is retried and will possibly cause a recurrence of the "busy" condition.

Possible site controller replies:

None.

Resume Message (RM) Command

Function:

Resumes the delivery of one or more messages to the terminal, normally only used after an HM command has been used.

Format:

$*$RM$\left[\Delta\text{ALL}\right]$

Meaning:

If the ALL option is used, the delivery of messages is resumed. If however the option is not used, only one message will be allowed before a halt message state is resumed. Note that after an HM command, entering an asterisk (*) will have the same effect as $*$RM and will allow just one message to be delivered at one time. This is of use when the operator wishes to deal with only one message at a time.

Possible site controller replies:

$$\text{CC03} \quad \text{RM} \quad \left\{ \begin{array}{l} \text{COMPLETED} \\ \text{MEANINGLESS} \end{array} \right\}$$

SECTION V

TERMINAL MESSAGES

Terminal messages can be divided into two general types: those which are entered by the terminal operator (Input Messages) and those received by the terminal from or via the site controller (Output Messages).

INPUT MESSAGES

An input message can be one of the following:

- A reply to a site controller message (i.e. the responses in a log-on dialog).

- An operator command (see Section IV).

- A data message (to an application, these are user defined).

Whatever the type, the operator enters a message according to a specified format, the message must then be terminated with the appropriate characters and transmission requested (see Section II).

OUTPUT MESSAGES

An output message can be one of the following:

- A message sent from another terminal (see Section IV).

- A message sent by the application (user defined).

- A message from the site controller:

    - that does not require a reply

    - that requires a reply (as indicated by a preceding asterisk (*).

Site Controller Messages

The remainder of this section is devoted to site controller
messages, their format, meaning and any required actions. As
previously stated, if a message is preceded by an asterisk (*), it
indicates that an operator reply is expected. This reply must be
made before activity can be resumed.

Messages can be preceded by either a time stamp (hh.mm) or a key
CCnn); time stamp messages are listed first in alphabetic order,
those with a key are listed in ascending order of the numeric part
of the key.

       hh.mm term-name message-text

Meaning: the message is the result of the use of a BT command on the
        terminal shown; if term-name is OPER the message is from
        the network control operator, if it is MAIN it is from the
        system operator.

Action: respond to the message if required, otherwise none.

       hh.mm term-name ACTIVATED [FOR appl-name] ON mm.dd.yy

Meaning: the terminal is now in active session with the application
        shown, if no application is shown the session is with the
        terminal's terminal queue (echo mode via MCS).

Action: the terminal can now be used.

       hh.mm term-name DEACTIVATED BY $\left\{\begin{array}{l}\text{USER}\\\text{OPERATOR}\\\text{SYSTEM}\\\text{APPL}\end{array}\right\}$

Meaning: the current session has been terminated by:

      - APPL = application
      - SYSTEM = the communications system
      - OPERATOR = the network control operator
      - USER = the terminal operator (use of the DIS command).

Action: none.

* CC00 ID ?

Meaning: log-on dialog request to a non-controlled dedicated
        terminal on a switched line.

Action: enter the terminal's identifier (up to 4 alphanumeric
        characters, the first character must be alphabetic).

*   CC00 [ID,] APPL ?

Meaning: log-on dialog request to a non-controlled general purpose
          terminal. If ID is shown the terminal is on a switched
          line.

Action: enter the terminal identifier (if required) and the
          application identifier. Each field can be up to 4
          alphanumeric characters, for each field the first character
          must be alphabetic.

*   CC01 [ID,] USER/PROJECT/BILLING[$PASSWORD][,APPL] ?

Meaning: log-on dialog request to a controlled terminal: If ID is
          shown, the terminal is on a switched line; this is a
          request for the terminal identifier. PROJECT is a request
          for the project name and BILLING is a request for the
          billing name; these two requests may not need a reply as
          this information can be generated from the user identifier
          which is requested by USER; this request must be answered.
          $PASSWORD, if shown, is a request for the password
          associated with the terminal and the application to be
          used; if this field is not shown, question CC02 will be
          asked when CC01 has been answered to. APPL is a request for
          the application name and indicates that the terminal is
          general purpose; if this field is not shown, this indicates
          that the terminal is dedicated.

Action: reply with the requested information. The fields should be
          separated with the same characters as in the question
          (i.e., - / - $), and be supplied in the same order. The ID
          and APPL fields can be up to 4 alphanumeric characters but
          both fields must begin with an alphabetic character. The
          other fields can be up to 8 alphanumeric characters in
          length.

*   CC02 PASSWORD ?[XXXXXXXX]

Meaning: request for the password associated with the terminal and
          the application. This question is only asked after question
          CC01 (where this field was not shown), and is for reasons
          of site security. On some terminals the operator reply is
          not physically printed and on others the reply field is
          masked with other characters (XXXXXXXX) so that the
          password cannot be read by another person. This case only
          applies to terminals with a hard copy.

Action: reply with the correct password. The reply can be up to 8
          alphanumeric characters.

```
                                  ⎧ COMPLETED              ⎫  (i)
                                  ⎪ INVALID COMMAND        ⎪  (ii)
                                  ⎪ INVALID NAME           ⎪  (iii)
                                  ⎪ INVALID STATUS         ⎪  (iv)
    CC03  command-name            ⎨ INVALID SYNTAX         ⎬  (v)
                                  ⎪ MEANINGLESS            ⎪  (vi)
                                  ⎪ RETRY LATER            ⎪  (vii)
                                  ⎪ UNAUTHORIZED COMMAND   ⎪  (viii)
                                  ⎩ QUEUE SEND ERROR RC =  ⎭  (ix)
                               xxxxxxxx -- yyyyyyy,nnnnnn
```

Meaning: site controller response to the use of the command shown and indicates that:

    (i) The command has been successfully completed.

    (ii) An invalid command was entered.

    (iii) The main object name in the command is wrong (i.e. the terminal name in a BT command).

    (iv) The destination of a BT command is inactive.

    (v) The wrong syntax was used for the command.

    (vi) The command is meaningless (i.e. entering an HM command while the terminal is still subject to a previous HM command).

    (vii) The command cannot be accepted as a previous command has not yet been completed.

    (viii) The terminal operator has entered a privileged command.

    (ix) An error has been detected while trying to transmit a message to a queue.

Action:

    (i) None.

    (ii) Verify the command syntax and re-enter the command.

    (iii) Verify the main object name (using DT command) and re-enter the command.

    (iv) Re-enter the command when the destination is able to receive.

    (v) As for (ii).

    (vi) None.

    (vii) Re-enter the command later, after the current command has been completed.

    (viii) None.

    (ix) Verify that the error is not due to a queue overflow (use DT command). If it is, retry later when the queue is not full otherwise inform the Field Engineers.

CC04 LOGON DENIED $\left\{\begin{array}{l} \text{appl-name INACTIVE} \\ \text{user-id ALREADY LOGGED} \\ \text{password NOT CREDITED} \\ \left\{\begin{array}{l} \text{user-id} \\ \text{password} \\ \text{account-name} \\ \text{project-name} \\ \text{appl-name} \end{array}\right\} \text{INVALID} \\ \text{appl-name NOT AUTHORIZED} \\ \text{appl-name TRY LATER} \\ \text{appl-name UNAVAILABLE} \\ \text{appl-name CONTROL MANDATORY} \end{array}\right\}$

(i)
(ii)
(iii)

(iv)

(v)
(vi)
(vii)
(viii)

Meaning: the site controller has denied a log-on request for the following reasons:

(i)   The application requested is not active or the program queue is disabled.
(ii) Someone with the same user identifier is already logged, user identifiers should be unique.
(iii) The account associated with the password has no time credited to it.
(iv) The indicated log-on parameter is incorrect.
(v)   The remote end user is not authorized to use the requested application.
(vi) The site controller has been unable to start an application such as IOF or ROF.
(vii) The site controller has been unable to establish a session with an application, this could be because the maximum number of sessions permissible for that application have already been established.
(viii) The log-on request was to an application for which control is mandatory, this option has not been specified for the terminal at network generation (i.e. the terminal must be controlled and have the correct password).

Action:
(i)   Inform network control operator.
(ii) As for (i).
(iii) Inform the site administrator.
(iv) Log-on again using the correct parameters.
(v)   Inform the network control operator or the site administrator.
(vi) Try logging-on again later, if the message is persistent inform the Field Engineers.
(vii) Try logging-on again later, if message is repeated inform the network control operator.
(viii) Inform the network control operator. A new network generation is needed to specify the terminal with the necessary control option for this application.

CC08   term-name   ACTIVE $\left[\text{FOR}\quad \left\{\begin{array}{l}\text{appl-name}\\\text{queue-name}\end{array}\right\}\right]\left[\text{/TEMP}\right]\left[\text{US:user-id}\right]$ (i)

CC08   term-name $\left\{\begin{array}{l}\text{HELD}\\\text{IDLE}\end{array}\right\}$ASG TO $\left\{\begin{array}{l}\text{appl-name}\\\text{queue-name}\end{array}\right\}$ (ii)

CC08   term-name $\left\{\begin{array}{l}\text{LOGGED}\\\text{LOGGING}\end{array}\right\}$ON $\left\{\begin{array}{l}\text{appl-name}\\\text{queue-name}\end{array}\right\}\left[\text{US:user-id}\right]$ (iii)

Meaning: these messages are a response to a DT command without the
STRONG or queue name options. One of the three messages is
displayed depending upon which state the terminal is in.

(i) The terminal is active and in session with:
   - an application or a program queue (only if the
     first optional field is present)
   or
   - with its terminal queue (only if the third
     optional field is present) in which case the
     user identifier is shown.

       NOTE: the first and third optional fields
             are mutually exclusive.

       If the "/TEMP" field is shown the terminal
       is only temporarily assigned to the
       application or queue.

(ii) The terminal is dedicated (ASG TO) the
     application or program or terminal queue shown.

     The terminal is either in the IDLE state or in
     the HELD state, in which case it is subject to a
     HT command.

(iii) The terminal is either LOGGED or is LOGIN on to:
   - an application or a program queue (only if the
     first optional field is present)
   or
   - its terminal queue (only if the second
     optional field is shown), in which case the
     user identifier is shown.

     NOTE: The two optional fields in this message
           are mutually exclusive.

Action: in all three cases none.

$$\text{CCO9} \begin{Bmatrix} \text{BLOCK} \\ \text{NBLOCK} \end{Bmatrix} \text{n1/n2} \quad \text{IN} = \begin{Bmatrix} * \\ M \\ N \\ U \end{Bmatrix} \text{OU} = \begin{Bmatrix} * \\ N \\ U \end{Bmatrix} [\text{HM}] \; [\text{IH}] \left[\text{ALT} \begin{Bmatrix} \text{ON} \\ \text{OFF} \end{Bmatrix} \text{queue-name} \right]$$

Meaning: this message is a response to a DT STRONG command.

BLOCK - indicates that messages are blocked and the n1/n2 field is meaningful.

NBLOCK - indicates that the messages are unblocked and therefore the n1/n2 field is meaningless.

n1/n2 - indicates the blocking factor, n1 is the maximum line length and n2 is the maximum number of lines per message (block): these two factors multiplied together will give the current maximum message size.

IN = - this field indicates the mode of input, M = mark mode, N = normal mode, U = unedited mode, an asterisk (*) indicates that the field is meaningless as the terminal is being used for output only.

OU = - this field indicates the mode of output, N = normal, U = unedited, and an asterisk (*) indicates that the field is meaningless as the terminal is being used for input only.

HM - if this field is present it indicates a HM command is in force, the terminal cannot receive any messages (output suspended).

IH - if this field is present it indicates that the terminal cannot send any messages (input suspended).

ALT - this field is only present if the network control operator has used an MTT command on the terminal or its terminal queue and the command is still in force. This privileged command allows a terminal to use another terminal's terminal queue; the terminal whose queue is being used (by another terminal) can only operate in input mode.
If ALT ON is shown, this indicates that the terminal is using the terminal queue shown (another terminal's queue).
If ALT OFF is shown, this indicates that the terminal is using the terminal queue shown (this terminal's queue).

Action: none.

CC10 $\begin{Bmatrix} OQ \\ queue\text{-}name \end{Bmatrix}$ [HELD] n1 MSG(S) n2 % OF FREE SPACE

Meaning: this message is a response to a DT command where a queue
name was specified, or if OQ (output queue) is shown it is
a response to a DT STRONG or DT QUEUE command and is
referring to the terminal's queue.

If HELD is shown it means that the queue is disabled.

n1 - is the number of messages in the queue.

n2 - is the percentage of free space in the queue.

Action: none.

CC19 term-name [NOT] ON STAND BY IN

Meaning: this message is displayed when an MCS COBOL program enables
or disables its program queue. The message is only sent to
a terminal which is in session with the queue.

If NOT is shown the queue is enabled, otherwise the queue
is disabled.

Action: none.

CC22 MTE INV./MEANINGLESS PARAM.: [BLOCK] [NBLOCK] [LENGTH]

Meaning: response to an MTE command where an invalid or meaningless
parameter has been supplied. The parameters in question are
shown.

Action: validate the parameters to be used and re-enter the command.

CC33 term-name LOGGED

Meaning: this message indicates that the terminal has been
successfully logged but is waiting for an application to
issue an allocation request for the terminal.

Action: none.

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