DNOS

Online Diagnostics and System Log Analysis Task User's Guide

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DNOS Software Manuals

This diagram shows the manuals supporting DNOS, arranged according to user type. Refer to the block identified by your user group and all blocks above that set to determine which manuals are most beneficial to your needs.

All DNOS Users:

DNOS Concepts and Facilities
2270501-9701

DNOS Operations Guide
2270502-9701

DNOS System Command Interpreter (SCI) Reference Manual
2270503-9701

DNOS Text Editor Reference Manual
2270504-9701

DNOS Messages and Codes Reference Manual
2270506-9701

DNOS Reference Handbook
2270505-9701

DNOS Master Index to Operating System Manuals
2270500-9701

High-Level Language Users:

COBOL Reference Manual
2270518-9701

DNOS COBOL Programmer's Guide
2270516-9701

DNOS Performance Package Documentation
2272109-9701

TI Pascal Reference Manual
2270519-9701

DNOS TI Pascal Programmer's Guide
2270517-9701

FORTRAN-78 Reference Manual
2268681-9701

DNOS FORTRAN-78 Programmer's Guide
2268680-9701

MATHSTAT-78 Programmer's Reference Manual
2268687-9701

FORTRAN-78 ISA Extensions Manual
2268696-9701

TI BASIC Reference Manual
2308769-9701

RPG II Programmer's Guide
939524-9701

Assembly Language Users:

990/99000 Assembly Language Reference Manual
2270509-9701

DNOS Assembly Language Programmer's Guide
2270508-9701

DNOS Link Editor Reference Manual
2270522-9701

DNOS Supervisor Call (SVC) Reference Manual
2270507-9701

Security Managers:

DNOS Security Manager's Guide
2308954-9701

Productivity Tools Users:

DNOS Sort/Merge User's Guide
2272060-9701

DNOS TIFORM Reference Manual
2276573-9701

DNOS Query-990 User's Guide
2276554-9701

DNOS Data Base Management System Programmer's Guide
2272058-9701

DNOS Data Base Administrator User's Guide
2272059-9701

Data Dictionary User's Guide
2276582-9701

DNOS TIPE Reference Manual
2308786-9701

DNOS TIPE Exercise Guide
2308787-9701

DNOS COBOL Program Generator User's Guide
2234375-9701

Communications Software Users:

DNOS DNCS/SNA User's Guide
2302663-9701

DNOS DNCS Operations Guide
2302662-9701

DNOS DNCS 914A User's Guide
2302664-9701

DNOS 3270 Interactive Communications Software (ICS) User's Guide
2302670-9701

DNOS 3780/2780 Emulator User's Guide
2270520-9701

DNOS DNCS System Generation Reference Manual
2302648-9701

DNOS DNCS X.25 Remote File Transfer (RFT) User's Guide
2302640-9701

DNOS Remote Terminal Subsystem (RTS) User's Guide
2302676-9701

Systems Programmers:

DNOS System Generation Reference Manual
2270511-9701

DNOS Systems Programmer's Guide
2270510-9701

DNOS Online Diagnostics and System Log Analysis Tasks User's Guide
2270532-9701

ROM Loader User's Guide
2270534-9701

Source Code Users:

DNOS System Design Document
2270512-9701

DNOS SCI and Utilities Design Document
2270513-9701

DNOS Software Manuals Summary

Concepts and Facilities
Presents an overview of DNOS with topics grouped by operating system functions. All new users (or evaluators) of DNOS should read this manual.

DNOS Operations Guide
Explains fundamental operations for a DNOS system. Includes detailed instructions on how to use each device supported by DNOS.

System Command Interpreter (SCI) Reference Manual
Describes how to use SCI in both interactive and batch jobs. Describes command procedures and gives a detailed presentation of all SCI commands in alphabetical order for easy reference.

Text Editor Reference Manual
Explains how to use the Text Editor on DNOS and describes each of the editing commands.

Messages and Codes Reference Manual
Lists the error messages, informative messages, and error codes reported by DNOS.

DNOS Reference Handbook
Provides a summary of commonly used information for quick reference.

Master Index to Operating System Manuals
Contains a composite index to topics in the DNOS operating system manuals.

Programmer's Guides and Reference Manuals for Languages
Contain information about the languages supported by DNOS. Each programmer's guide covers operating system information relevant to the use of that language on DNOS. Each reference manual covers details of the language itself, including language syntax and programming considerations.

Performance Package Documentation
Describes the enhanced capabilities that the DNOS Performance Package provides on the Model 990/12 Computer and Business System 800.

Link Editor Reference Manual
Describes how to use the Link Editor on DNOS to combine separately generated object modules to form a single linked output.

Supervisor Call (SVC) Reference Manual
Presents detailed information about each DNOS supervisor call and DNOS services.

DNOS System Generation Reference Manual
Explains how to generate a DNOS system for your particular configuration and environment.

User's Guides for Productivity Tools
Describe the features, functions, and use of each productivity tool supported by DNOS.

User's Guides for Communications Software
Describe the features, functions, and use of the communications software available for execution under DNOS.

Systems Programmer's Guide
Discusses the DNOS subsystems and how to modify the system for specific application environments.

Online Diagnostics and System Log Analysis Tasks User's Guide
Explains how to execute the online diagnostic tasks and the system log analysis task and how to interpret the results.

ROM Loader User's Guide
Explains how to load the operating system using the ROM loader and describes the error conditions.

DNOS Design Documents
Contain design information about the DNOS system, SCI, and the utilities.

DNOS Security Manager's Guide
Describes the file access security features available with DNOS.

Preface

This manual provides the information necessary to execute the Online Diagnostics and System Log Analysis Task for the Texas Instruments DNOS Operating System Release 1.2.0. It is written for all persons involved with system operation and contains the following:

- Step-by-step procedures for executing a diagnostic session
- Complete information on the commands, prompts, tests, and messages involved in executing the session
- Instructions for accessing online reference material supplied by the optional help and long-message-level features of Online Diagnostics
- Information to assist in interpreting the results of the tests

This manual contains the following sections and appendixes. Read Sections 1 through 3 before starting to execute a diagnostic session as described in Section 4.

Section

1 Introduction — Presents an overview of the Online Diagnostics and System Log Analysis Task programs.

2 Preparing for a Diagnostic Session — Provides preliminary information about selecting and preparing the resources for a diagnostic session.

3 Command Verbs — Presents detailed information about the controlling verbs, prompts, and responses.

4 Executing a Diagnostic Session — Provides step-by-step instructions for executing a typical disk diagnostic session.

5 Diagnostic Test Descriptions — Describes the tests that make up the diagnostic task for each device class.

6 System Log Analysis Task — Describes, in detail, how to generate and interpret the System Log Analysis Task reports.

Appendix

A Keycap Cross-Reference — Contains illustrations of keyboards and cross-references of key functions.

B LP810 Output — Presents output examples of all LP810 tests when executed with default options.

C LP2260 Output — Presents output examples of all LP2260 tests when executed with default options.

D LP600 Output — Presents output examples of all LP600 tests when executed with default options.

E ST820 Output — Presents output examples of all ST820 tests.

F LP840 Output — Presents output examples of all LP840 tests.

G CPTEST Output — Presents output examples of all CPTEST diagnostic (LP850) tests.

H Messages — Lists all messages generated by Online Diagnostics.

I Reference Tables — Presents tables and charts for quick reference.

In addition to the DNOS software manuals listed on the frontispiece (page iii), the following manuals provide further information about the devices tested by Online Diagnostics.

Title	Part Number
Model CD1400 Disk System Installation and Operation	2272081-9701
Model 990 Computer Model CD1400 Disk Controller Depot Maintenance Manual	2272082-9701
Model 990 Computer Model DS10 Cartridge Disk System Installation and Operation	946261-9701
Model 990 Computer Model DS25/DS50 Disk Systems Installation and Operation	946231-9701
Model 990 Computer Model DS31/DS32 Disc Systems Installation and Operation	945260-9701
Model DS80 Disk System Installation and Operation Manual	2302629-9701
Model 990 Computer Model DS200 Disk System Installation and Operation	949615-9701

Title	Part Number
Model DS300 Disk System Installation and Operation	2302631-9701
Model FD1000 Flexible Disk System Installation and Operation	2261886-9701
Model 990 Computer WD500 Mass Storage System Installation and Operation Manual	2302688-9701
Model 990 Computer WD800 Mass Storage System Installation and Operation	2306140-9701
Model 990 Computer Model 911 Video Display Terminal Installation and Operation	945423-9701
Model 931 Video Display Terminal Installation and Operation	2229228-9701
Model 990 Computer Model 940 Electronic Video Terminal (EVT) Installation and Operation Manual	2250368-9701
Model 990 Computer Model 940 Electronic Video Terminal Maintenance Manual	2207864-9701
Model 990 Computer Model 979A Magnetic Tape System Installation and Operation	946229-9701
Model MT1600 Magnetic Tape System Installation and Operation	2302642-9701
Model 990 Computer Model 810 Printer Installation and Operation	939460-9701
Model 990 Computer Model 820 KSR Data Terminal Installation and Operation	2250454-9701
Model 990 Computer Model 2230 and 2260 Line Printers Installation and Operation	946256-9701
Model 990 Computers Models LP300 and LP600 Line Printers Installation and Operation Manual	2250364-9701
Model 990 Computer Model 840 RO Printer Installation and Operation Manual	2302695-9701

Title	Part Number
Model 850 Printer User's Manual	2219890-0001
990 Family Communication Systems Field Reference Manual	2276579-9701

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1

Introduction

1.1 DEFINITION AND PURPOSE

The Online Diagnostics and System Log Analysis Task are system diagnostic utility programs that provide vital information about the performance of peripheral devices. The programs execute as application-level tasks under your operating system. Consequently, they do not usually interfere with daily production requirements.

When detailed fault isolation is necessary, the Model 990 Computer Unit Diagnostics provide both user and service personnel with information necessary to isolate and correct specific conditions. However, using the unit diagnostics requires that the computer system be shut down. This disrupts the daily production environment and, for most users, is an unscheduled and costly interruption of business.

The most efficient approach is use of the Online Diagnostics and System Log Analysis Task programs to evaluate the current frequency and severity of errors while normal system operation continues. This evaluation may provide you with advance warning of the need for unit diagnostics and service calls, enabling you to schedule them for time periods less disruptive to business.

1.2 DIAGNOSTIC STRUCTURE

The system diagnostics package consists of three major parts:

- Online Diagnostics Driver Task
- Device diagnostic tasks
- System Log Analysis Task

1.2.1 Online Diagnostics Driver Task

The System Command Interpreter (SCI) activates the Online Diagnostics Driver task. You can start the driver from any terminal device. From this terminal, called the control terminal, you enter the command verbs that control the driver and that select, start, terminate, and specify the options for the device diagnostic tasks.

NOTE

> In this manual, commands to the driver are referred to as *command verbs* or *verbs*, while the word *command* refers to SCI commands.

The driver performs the following functions:

- Activates, controls, and terminates device diagnostic tasks
- Processes requests from the device diagnostic tasks for services and messages
- Logs messages to the diagnostic history file

The diagnostic history file is a file or device in which the driver stores error and progress messages from the diagnostic tasks.

1.2.2 Device Diagnostic Tasks

The device diagnostic tasks are programs that exercise and test hardware devices. Each task is a group of procedures that test a specific type of device. The tasks are controlled and serviced by the diagnostic driver. Before executing a diagnostic task, you can either take default options for a priority level, an execution mode, and a termination mode, or you can select them to suit your specific requirements.

1.2.2.1 Priority Level. Each diagnostic task can execute at priority level 1, 2, or 3. The default value is 3, but you can select a higher priority level when you initiate the device diagnostic or use the Change Task Priority (CP) command verb.

1.2.2.2 Execution Mode. Diagnostic tasks can execute in one of two execution modes:

- Test
- Operation

All diagnostic tasks can operate in the test execution mode. This mode executes a predetermined group of tests for each device. After choosing the device, you can either execute all tests for that device or execute any one of the tests. Section 5 describes the individual tests for each device.

All diagnostic tasks other than disk and memory diagnostic tasks can operate in the operation execution mode. This mode performs one specific operation determined by a subopcode of the supervisor call (SVC) code for performing input/output (I/O) functions (I/O SVC code 00). Section 3 and Appendix I provide information about valid subopcodes and their execution.

NOTE

> You can change the execution mode within the diagnostic session, even if you have started a task, by using the command verb Change Execution Mode (CE).

1.2.2.3 Termination Mode. After you select the execution mode, the driver requests you to select a termination mode. You select a termination mode by specifying an action which must be completed before termination. The termination mode can be any one of the following:

- Execute continuously (terminates after you enter the Kill Diagnostic Task (KD) command verb)
- Terminate after a specified number of minutes
- Terminate after a specified number of errors occur
- Terminate after a specified number of passes through the tests or specific SVC operation codes occur

The default termination mode is one pass through the tests (when in test mode) or one specific operation (when in operation mode).

NOTE

You can change the termination mode within the diagnostic session, even if you have started a task, by using the command verb Change Termination Mode (CT).

When using Online Diagnostics, first start the driver, then select a device (diagnostic task). Then either accept the default options or select a priority level, an execution mode, and a termination mode. During the diagnostic session, you can change the priority level, the execution mode, or the termination mode with command verbs. The combination of priority level, execution modes, and length of running time (determined by the termination option) provides a flexible diagnostic session that you control.

Table 1-1 shows the hardware devices supported and the tests performed by the diagnostic tasks.

Table 1-1. Functions Performed by Diagnostic Tasks

Device	Class*	Tests
Disks: CD1400, DS10, DS25, DS31, DS50, DS80, DS200, DS300, FD1000, WD500, and WD800	DS	Read diagnostic cylinder, read diagnostic cylinder with head motion, read and write random pattern, and read and write specific pattern
		Read specified tracks, seek and verify all tracks, random seek, ID error status check, write/format/verify tracks, write/read/compare tracks, and comprehensive write/seek/read
Tapes: Magnetic Tape Drive Models 979, 979A and MT1600, and WD800 Cartridge Tape	MT	Basic read/write with rewind and backspace, forward creep, even/odd read and write, special movement and end-of-file (EOF), read/write full reel and check for end of tape, and write ring status/recording type
Line printers: LP2230/LP2260	LP or RP	Form length and feed, character set, ripple pattern buffer length, hammer alignment, and character burst
LP300/LP600		Same as above with addition of 8 lines per inch (lpi), solid black box, carriage return and underline, plot mode, elongated character, delete characters, graphic example plot, and TI logo plot
810 (LP or RP)		Form length and feed, character set, carriage return, tab to line, vertical tabs, tab to address, horizontal tabs, lpi, and characters per inch (cpi)
Model 840 RO with or without device forms control (DFC) option		Character set, ripple pattern, buffer, carriage return, form feed, tab to line, set/test vertical tabs, remote on/off, set/test horizontal tabs, cpi and lpi bell, left/right margins, top/bottom margins, and answerback memory
Model 850 (CPTEST)		Character set, ripple dump, buffer, jitter, jitter interval, center out, alternating left to right, alternating right to left, interplaced jitter, overstrike, alternating overstrike, random print, left to right inverted strike, right to left inverted strike, and black line
Keyboard devices: Model 820 KSR Date Terminal with DFC option	ST	Form length and feed, character set, ripple pattern, buffer length, character return, tab to line, set/test vertical tabs, tab to address, set/test horizontal tabs, lpi and cpi, bell test, and interactive keyboard
Model 911 Video Display Terminal		Ones and zeros, scroll, beeper, low intensity, high intensity, character generator, nonblinking/blinking cursor, and interactive keyboard

Table 1-1. Functions Performed by Diagnostic Tasks (Continued)

Device	Class*	Tests
Model 931 Video Display Terminal		Host-initiated self-tests, cursor, systems throughput, show graphics, show mask, communications, auxiliary port, video monitor, keyboard
Model 940 Electronic Video Terminal		Memory, beeper, intensity, scrolling, cursor, host-initiated self-test, and interactive keyboard
Memory	MM	Read/write and compare seven test patterns (cannot be done individually)

Note:

* The class types supported are as follows:

DS = disk devices
MT = magnetic tapes
LP = line printers
ST = keyboard devices
MM = memory

Figure 1-1 shows how you interact with the driver, the diagnostic tasks, and the diagnostic history file while at the control terminal.

1.2.3 System Log Analysis Task

The System Log Analysis Task provides information about the reliability of hardware devices and memory by analyzing and reporting on the system log files. The operating system maintains two system log files on which it writes descriptive records when certain errors and events occur. This recording of system activity occurs constantly when the operating system is active.

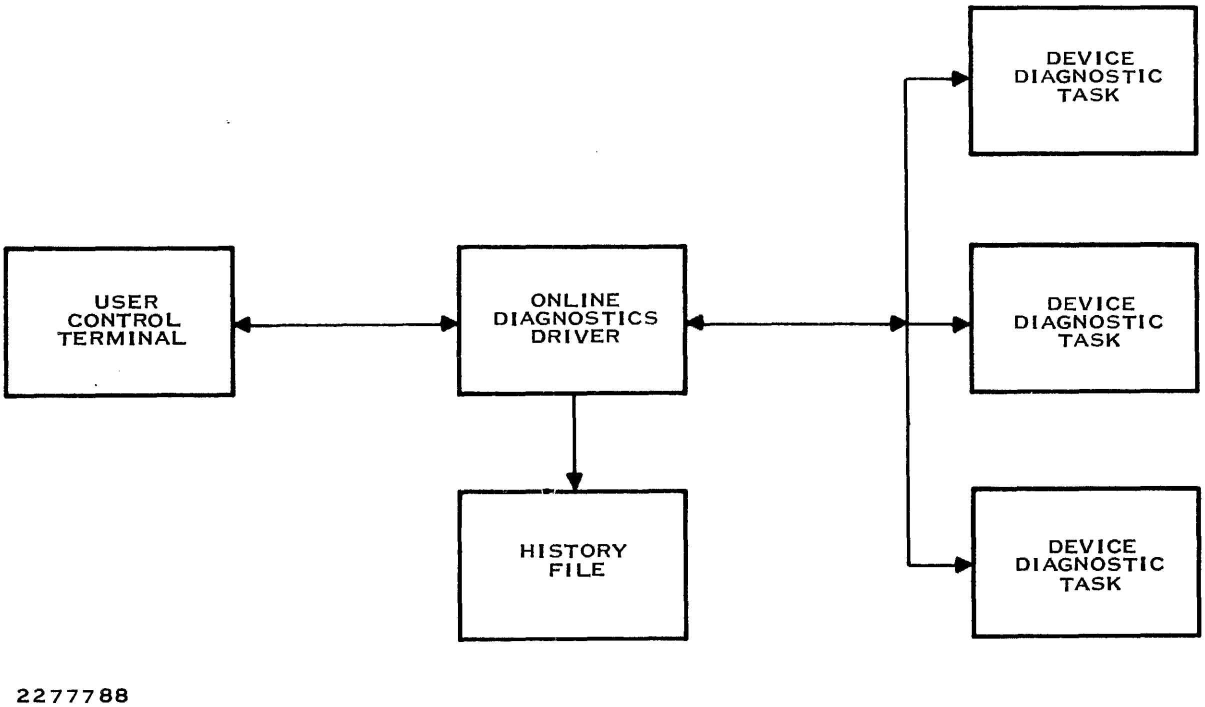

Figure 1-1. Diagnostics Block Diagram

When a system log file is full, the operating system calls the System Log Analysis Task. The task compresses the system log records and writes them to a file (.S$DML). From this file the System Log Analysis Task prepares one of three reports: the level one, level two, and level three reports. A brief description of the three System Log Analysis Task reports follows:

- The level one report provides a summary of system log activity. This report contains information that may point to errors or potential errors in devices or memory. The report supplies recommendations concerning the number of errors, the possibility of a hardware problem, and the need for preventive or scheduled maintenance.

- The level two report supplies the same information as the level one report along with a complete copy of each record that was logged to the system log file. The complete records provide additional details for those familiar with system hardware and software. The information in the level one report frequently indicates the need for a level two report.

- The level three report is a combination of the level one and level two reports. It contains a summary of each record in the system log and provides you with recommendations for devices that have received more than a minimum number of errors. It also includes complete copies of the system log records that include the errors.

You can choose to produce a report for all devices (using the default option), all devices in one class, or any specific device.

You can also execute the System Log Analysis Task at any time by performing the Execute System Log Analysis (XSLA) command. Section 6 provides more information on the operation and use of the System Log Analysis Task. Figure 1-2 shows a block diagram of its structure.

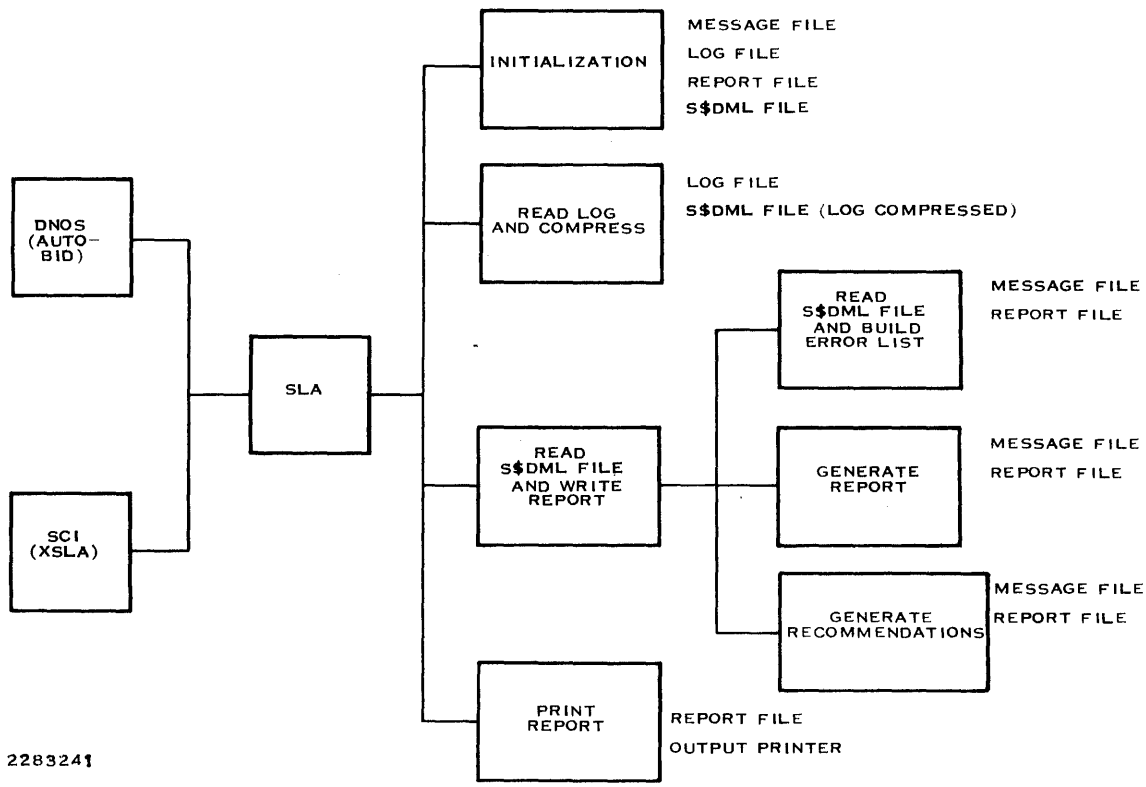

Figure 1-2. System Log Analysis Task Structure

2

Preparing for a Diagnostic Session

2.1 GENERAL INFORMATION

The options available and the ability to change them during a diagnostic session provide flexibility and variety to users of Online Diagnostics. To use the options effectively, you must make certain decisions before the diagnostic session actually begins. This section discusses topics that relate to these decisions:

- Which devices Online Diagnostics can test
- Choosing the control terminal
- Whether to use Online Diagnostics in a diagnostic session without an operator (using batch commands from an input file)
- What to expect when you are the operator in an interactive session
- How to use the reference material on devices, commands, prompts, modes, and tests

2.2 DEVICES TO BE TESTED

Table 1-1 lists the devices that Online Diagnostics can test. You can execute the diagnostic tasks on one device, on all available devices of one class, or on all available devices.

The devices you choose for testing are called *target devices*. A target device must be in a certain device state before the Online Diagnostics Driver can test it. The three possible device states are as follows:

- Online
- Diagnostic
- Offline

You must place all target devices in the diagnostic device state before testing. (The only tests that are exceptions to this rule are the nonextended disk tests and the extended read only disk tests.) Disks contain a separate file of test data that the operating system maintains; this file is available for testing when the disk is in the online device state. You should also return target devices from the diagnostic state to the online state after you have tested them.

Two commands, DIAG and ON, change the device states. You can use them as System Command Interpreter (SCI) commands before activating the Online Diagnostics Driver or as command verbs to the driver after the session starts. The SCI commands DIAG and ON were added to the SCI commands on your system during the installation of the Online Diagnostics and System Log Analysis Task package. The format is the same as that of all other SCI commands. You cannot execute these commands for devices that are in use, as in the case of terminal devices that are logged on to SCI. You can put devices that are offline state into online or diagnostic state only from SCI, not from the driver. To change the device state of a printer that has been assigned to the spooler, you must first reenter SCI, then perform a Modify Spooler Device (MSD) command, specifying Q (Queue) or D (Delete) in response to the SPOOLER MODE prompt. For more information on the MSD command, see the *DNOS System Command Interpreter (SCI) Reference Manual.*

You cannot execute the ON and DIAG commands for a disk volume installed in a disk drive. You must first unload the disk volume by using the Unload Volume (UV) command. For more information about the UV command, refer to the *DNOS Operations Guide*.

The formats of the DIAG and ON commands are as follows:

Online Diagnostics Driver	SCI
DIAG ENTER DEVICE NAME? ALL devicename, class, or default to ALL	[ ] DIAG PLACE DEVICE IN DIAGNOSTIC STATE DEVICE NAME: devicename
ON ENTER DEVICE NAME? ALL devicename, class, or default to ALL	[ ] ON PLACE DEVICE IN ONLINE STATE DEVICE NAME: devicename

where:

devicename — is a valid four-character device name. The first two characters are the device class, and the last two are the device number. For example, LP01 is the device name for line printer 01.

When using the SCI commands, the only valid response to the request for a device name is a specific four-character device name such as LP02, ST09, and so on.

When you are using the command verbs ON and DIAG during a diagnostic session, you can respond to the ENTER DEVICE NAME? prompt with a two-character device class (such as LP), a four-character device name (such as LP02), or accept the default (ALL). Section 3 provides details about changing device states during the diagnostic session.

2.3 CONTROL TERMINAL

You must select one terminal from which to initiate and execute the diagnostic session and to start the Online Diagnostics Driver task. This terminal is called the *control terminal.* Since the driver task is nonreplicatable, Online Diagnostics can operate from only one control terminal at a time. The control terminal can be a Texas Instruments 911, 931, 940, 820, or a *Silent 700** series terminal. Appendix A shows equivalent keys on the various control terminals.

You cannot test the control terminal with Online Diagnostics during the diagnostic session. For example, when ST02 is the control terminal, the diagnostic task for ST02 cannot start.

2.4 BATCH INPUT SESSION

The two types of diagnostic sessions available to you are the following:

- Interactive session
- Batch input session

The interactive diagnostic session requires input from an operator at a control terminal. In contrast, when a session requires an established pattern of options and tests, the driver can also operate from a previously prepared batch input file instead of requiring interactive input. The batch session differs from the interactive session only in the method of input and the need to prepare the input before the session starts. Once you create a batch input file, you can execute diagnostic sessions from the file.

A diagnostic session can also be partially batch and partially interactive. You can stop the batch processing at any time by inserting a Wait on Diagnostics (WD) command verb in the file in the desired sequence and then deleting the rest of the input file. You can then continue the session from the terminal.

2.4.1 Creating a Batch Input File

You can create a batch input file in either of two ways. The easiest method is to name a separate DNOS file in response to the COMMAND LOG FILE prompt for an interactive diagnostic session. During that session, execute all the command verbs you want to have in your batch input file. Then use a WD command verb to keep the driver monitoring the diagnostics message queue until the completion of the diagnostic tasks. When the tasks are completed, execute the Quit Online Diagnostics (QD) command verb. The file is now a complete batch input file for the Online Diagnostics Driver.

The second method of creating a batch input file is to create the entire file using the Text Editor. This method requires a thorough knowledge of the order of the prompts within the command verbs. The data begins in column one of the file, and you enter one response per line.

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The following example illustrates a batch input file.

EXAMPLE

```
XD          (Execute Diagnostics)
DS01        (Device--disk 01)
YES         (Select extended disk tests)
YES         (Accept all default options)
WD          (Wait on Diagnostics)
QD          (Quit Diagnostics)
```

For more information on creating a batch input file, see paragraph 3.6.2.

2.4.2 Using a Batch Input File

To use the batch input file, enter the name of the file in response to the COMMAND INPUT prompt in the Execute the Online Diagnostics Driver (XODD) command. If the entire session is to be batch input (that is, the batch input file contains a QD command verb), execute the session in background. If the session is to be partially interactive (that is, the batch input file does not contain a QD command verb), execute the session in foreground.

2.5 DIAGNOSTIC SESSION: WHAT TO EXPECT

You are ready to start the diagnostic session when you have:

- Selected and prepared the devices to be tested
- Selected a control terminal
- Decided whether to accept the default options or to select priority level, execution mode, and/or termination mode for each device diagnostic task
- Set up a batch input file (if you want to run a batch session)

The rest of this section explains how to activate Online Diagnostics and how to use the aids that are available online.

2.5.1 XODD — Execute the Online Diagnostics Driver Command

To activate the Online Diagnostics Driver, enter the XODD command at the control terminal. The following display includes the default file pathnames.

Prompts

```
DNOS ONLINE DIAGNOSTICS -  VERSION  X.X.X
         COMMAND INPUT: STxx
        MESSAGE OUTPUT: STxx
      COMMAND LOG FILE: volumename.S$ODIAG.CMD
          HISTORY FILE: volumename.S$ODIAG.HISTORY
            MODE (F,B): FOREGROUND
```

Prompt Responses

COMMAND INPUT
Enter the name of the file or class ST device (terminal) from which you enter your responses to the prompts of the diagnostic command verbs. The default is the name of the control terminal. Do not use the control terminal for COMMAND INPUT if you want to execute Online Diagnostics in background. Do not assign the same file for both this prompt and the COMMAND LOG FILE prompt. When you specify a device, enter your responses to the prompts at that device. When you specify a file, the driver reads the file as batch input.

MESSAGE OUTPUT
Enter the name of the file or device where the messages and prompts of the command verbs are displayed. The default is the name of the control terminal. Do not enter the control terminal in response to this prompt if you want to execute the diagnostics session in background.

COMMAND LOG FILE
Enter the name of the file where the driver stores your responses to the prompts of the command verbs. This file is a log of all the prompt responses in a diagnostic session and can be used for a batch input file in a later diagnostic session. The default pathname is volumename.S$ODIAG.CMD, but you can substitute any valid DNOS file pathname. The XODD command creates the file if it does not exist. Do not assign the same file for both this prompt and the COMMAND INPUT prompt.

HISTORY FILE
Enter the name of the file or device where the driver stores diagnostic error and progress messages from the diagnostic tasks. System errors do not always correspond to diagnostic errors, and the history file does not match the system log. For example, a device error that is correctable within the acceptable number of retries might cause a system log error, but not necessarily a history file error. The default pathname for the history file is volumename.S$ODIAG.HISTORY. You can substitute any valid DNOS device or file pathname. However, if you substitute a device, you cannot execute the default option of the Show Diagnostic Files (SF) command verb. In that case, when you enter the SF command verb and accept the default (history file) you receive the following message: SF COMMAND VERB INVALID WHEN DIAGNOSTIC HISTORY FILE NOT A DNOS FILE.

MODE (F,B)
Enter either F (foreground) or B (background). Foreground execution (the default) is recommended for interactive diagnostic sessions; background execution is recommended for batch input diagnostic sessions. Execute diagnostic sessions that are mixed (interactive and batch input) in foreground.

2.5.2 ENTER COMMAND VERB? Prompt

After you respond to all of the XODD prompts, the following messages are displayed at the control terminal:

```
DNOS ONLINE DIAGNOSTICS VERSION X.X.X BEGINNING EXECUTION.
AT ANY TIME, ENTER THE WORD 'HELP' FOR MORE INFORMATION.

ENTER COMMAND VERB?
```

The prompt ENTER COMMAND VERB? is referred to throughout this manual as the command prompt. When it is displayed, you can enter a command verb. You are now ready to start selecting the diagnostic tasks and specifying the options you want to execute. Read paragraph 2.6 to become familiar with the use of the help feature. Then turn to Section 3 to learn how to use the command verbs.

2.6 SOURCES OF INFORMATION ON DIAGNOSTIC OPTIONS

If you have installed the help feature, the following online aids are available to you:

- Long-message-level feature
- Help feature
- System device list (available to all users)
- Test tables (for test execution mode)
- Valid subopcode charts (for operation execution mode)

If you elected not to install the help feature in order to save disk space, you can locate most of the same information in Appendix I of this manual. The system device list is available to you whether or not you have installed the help feature.

2.6.1 Long Message Level Feature

The Online Diagnostics Driver communicates with you by displaying prompts and messages at the file or device specified in response to the MESSAGE OUTPUT prompt in the XODD command. Messages can be either short or long. The short message level displays only prompts. The long message level displays a list of all available command verbs, detailed explanations of each prompt, and the valid responses.

The driver starts the diagnostic session on the short message level. To change to the long level, enter the Change Message Level (CM) command verb as follows:

```
ENTER COMMAND VERB?
CM

ENTER MESSAGE LEVEL (SHORT, LONG)? LONG
```

Accept the default by pressing the Return key. To change back to the short message level, enter the CM command verb and respond to the prompt by entering SHORT.

The following example shows the short level display for the first prompt of the Execute Diagnostic Task (XD) command verb.

EXAMPLE

```
ENTER DEVICE NAME? ALL
```

The next example shows the long level display for the same prompt of the XD command verb.

EXAMPLE

```
YOU HAVE CHOSEN TO EXECUTE A DEVICE DIAGNOSTIC TASK. YOU CAN
SELECT ALL AVAILABLE DEVICES, ALL DEVICES OF ONE CLASS (SUCH
AS ALL DISKS), OR ANY ONE SPECIFIC DEVICE. ENTER YOUR
SELECTION AS FOLLOWS:

  ALL -- SELECTS ALL DEVICES AVAILABLE

  DS  -- SELECTS ALL TILINE DISK DEVICES AVAILABLE
  MT  -- SELECTS ALL MAG TAPE DEVICES AVAILABLE
  LP  -- SELECTS ALL PRINTER DEVICES AVAILABLE
  RP  -- SELECTS ALL REMOTE LP810 DEVICES AVAILABLE
  ST  -- SELECTS ALL TERMINAL DEVICES AVAILABLE

  REJECT -- RETURN TO COMMAND PROMPT
  COMPLETE DEVICE NAME (ST02, DS01) -- SELECTS THAT DEVICE

  ENTER DEVICE NAME? ALL
```

2.6.2 Help Feature

The Online Diagnostics help feature displays the long level message for the current prompt when you enter the word HELP. You may substitute H or ? for the word HELP. Entering the Display Long Message for Current Prompt (HELP) command verb while on the long message level has the effect of repeating the long message. The feature displays the long message only for the current prompt and has no effect on your message level status.

2.6.3 System Device List

The Show System Device List (SD) command verb allows you to display a table showing the state of all devices in your system. The SD command is available to all users of Online Diagnostics and has no additional prompts. For more information on the use of the SD command verb and an example of a typical device list, see paragraph 3.5.1.

2.6.4 Test Tables

Each device diagnostic task performs a prearranged series of tests or one specific test (if so requested). Section 5 contains a description of each test, arranged by test number under the device it tests. If you install the help feature of Online Diagnostics, a summary of the same information is available at your terminal in the form of a table listing the tests for each device. To view the table, enter HELP (or H) as a command verb when the ENTER DIAGNOSTIC TEST (INTEGER, ALL)? prompt appears on the screen. If you do not install the help feature, you can find the same test tables in Appendix I. You can display the table for each device by operating in the long message level, or by using the HELP command verb after selecting execution mode and before selecting the tests.

2.6.5 SVC Subopcode Charts

To execute a device diagnostic task in operation mode, you must select a valid I/O SVC subopcode. Appendix I contains a chart for each device that shows SVC operations, subopcodes, and validity codes indicating the response of the device to each subopcode. You can display the same table on your terminal screen by using the Show SVC Operation Codes (SO) command verb. See paragraph 3.5.4 for more information on the use of the SO command verb.

3

Command Verbs

3.1 INTRODUCTION

The Execute Online Diagnostics Driver (XODD) command transfers control from the System Command Interpreter (SCI) to the Online Diagnostics Driver. You then control the driver with command verbs. As soon as you have transferred control to the driver, you can display a screen that lists the command verbs alphabetically by using the help feature or by changing the message level to long. Figure 3-1 shows the screen display.

```
THE ONLINE DIAGNOSTICS DRIVER IS WAITING FOR A COMMAND VERB.
ENTER A COMMAND VERB FROM THE FOLLOWING LIST:

CE   - CHANGE EXECUTION MODE         SD   - SHOW SYSTEM DEVICE LIST
CH   - CLEAN HEADS ON FD1000 DSDD    SF   - SHOW DIAGNOSTIC FILES
CM   - CHANGE MESSAGE LEVEL          SMM  - SHOW MEMORY MAP
CP   - CHANGE TASK PRIORITY          SO   - SHOW SVC OPERATION CODES
CQ   - CHECK MESSAGE QUEUE           SP   - SHOW PROGRESS OF DIAGNOSTICS
CT   - CHANGE TERMINATION MODE       SSD  - SHOW SUPPORTED DEVICES
DIAG - CHANGE DEVICE STATE TO DIAG   WD   - WAIT ON DIAGNOSTICS
KD   - KILL DIAGNOSTIC TASK          XA   - EXECUTE ALL DIAGNOSTICS
LDC  - LIST DEVICE CONFIGURATION     XD   - EXECUTE DIAGNOSTIC TASK
ON   - CHANGE DEVICE STATE TO ON     XMEM - EXECUTE MEMORY TASK
QD   - QUIT ONLINE DIAGNOSTICS       XSLA - EXECUTE SYSTEM LOG ANALYZER

ENTER COMMAND VERB?
```

Figure 3-1. Screen Display of Command Verbs

In this manual, commands to the driver are referred to as *command verbs* or *verbs*, while the word *command* refers to SCI commands. This section provides all the information you need in order to use each command verb. It contains general information about all verbs as well as a discussion of each one separately. The paragraphs on each individual verb contain the following:

- The verb name and description
- The prompts displayed when you use a command verb
- The possible responses for each prompt, including the default response
- A description or example of the action resulting from execution of the command verb

Command verbs are divided into five functional groups corresponding to the order in which you use them. The five groups of command verbs and their functions are as follows:

- *Execute* — Start the tasks and select execution options
- *Change* — Alter the execution options of a diagnostic task while it executes
- *Show* — Display information about the diagnostic session
- *Terminate* — End the diagnostic tasks and end the diagnostic session
- *Miscellaneous* — Perform additional functions such as initiating the help feature

Table 3-1 lists the command verbs by group.

Table 3-1. Command Verbs

Verb	Description	Function
XA	Execute All Diagnostics	Execute
XD	Execute Diagnostic Task	
XMEM	Execute Memory Task	
XSLA	Execute System Log Analyzer	
CE	Change Execution Mode	Change
CM	Change Message Level	
CP	Change Task Priority	
CT	Change Termination Mode	
SD	Show System Device List	Show
SF(2)	Show Diagnostic Files	
SMM(2,3)	Show Memory Map	
SO	Show SVC Operation Codes	
SP(2,3)	Show Progress of Diagnostics	
SSD	Show Supported Devices	
KD	Kill Diagnostic Task	Terminate
WD	Wait on Diagnostics	
QD	Quit Online Diagnostics	
CH	Clean Heads on FD1000 DSDD	Miscellaneous
CQ	Check Message Queue	
ON	Change Device State to ON	
DIAG	Change Device State to DIAG	
LDC(2)	List Device Configuration	

Table 3-1. Command Verbs (Continued)

Verb	Description	Function
HELP(1)	Display Long Message for Current Prompt	
REJECT(1)	Return to Previous Prompt	

Notes:

[1] HELP and REJECT are not listed on the screen display as command verbs, but are included here since the driver responds to them as miscellaneous command verbs.

[2] SF, LDC, SMM, and SP are not valid verbs when used in a batch stream. Use them in the interactive mode only.

[3] SMM and SP are valid verbs only if your control terminal is a VDT type. You cannot use these verbs if your control terminal is a TTY type terminal (such as an 820 terminal).

3.2 USING COMMAND VERBS

To use the command verbs effectively, you need general information about their usage. Topics related to the use of command verbs, which are discussed in the following paragraphs, are as follows:

- Driver action
- Prompts and default responses
- Equivalence file
- Diagnostic message queue

3.2.1 Driver Action

The driver activates and controls the diagnostic tasks. After initializing the tasks, the driver assumes its normal state of processing requests for services and messages for the diagnostic tasks by monitoring the diagnostic message queue. Any request for service from the control terminal interrupts the normal activity of the driver and returns the driver to the terminal.

While at the control terminal, the driver responds to most command verbs by displaying prompts that ask for detailed information. When the prompts are displayed, the cursor also appears on the screen, indicating the field where you must enter your response. Whenever the cursor appears at the control terminal, the driver is inactive and cannot continue until you respond. This means that some diagnostic tasks may be unable to continue until the driver completes processing command verbs at the control terminal and returns to its normal state of monitoring the diagnostic message queue.

Before the driver can process your command verbs at the terminal, it must check your reponses to the prompts to be certain they are valid.

3.2.2 Prompts and Default Responses

Each prompt is displayed in the form of a question that can be followed by the default response to the question. In some cases, all valid responses to the prompt are also displayed in parentheses before the question mark. If the valid responses are not displayed and you need to know what they are, you can enter the HELP command verb (if you installed the help feature) or you can refer to the appropriate section of this manual (Section 3 for command verbs, Section 5 for individual tests, or Appendix I for reference tables).

The default response to the prompt always appears after the question mark. The following example shows the prompt that appears after you have entered the name or class of the device(s) to be tested. YES and NO are the possible responses; YES is the default.

EXAMPLE

```
USE DEFAULT OPTIONS (YES,NO)? YES
```

You can either accept the default (YES) by pressing the Return key or enter NO and then press the Return key.

3.2.3 Equivalence File

All command verb prompts have a range of valid responses. These responses correspond to numeric values in a preprogrammed table that the Online Diagnostics Driver uses. The first two columns of Table 3-2 show the contents of the preprogrammed table.

Table 3-2. Prompt Responses and Equivalents

Prompt Response	Numeric Value	Default Equivalents From .S$ODIAG.EQFILE
XA	1	
XD	2	
CE	3	
CP	4	
CT	5	
SD	7	
SF	8	
SO	9	
KD	12	
QD	13	
CM	14	
YES	15	Y
NO	16	N
ALL	17	
CQ	25	
ST	26	
DS	27	
MT	28	
LP	29	

Table 3-2. Prompt Responses and Equivalents (Continued)

Prompt Response	Numeric Value	Default Equivalents From .S$ODIAG.EQFILE
HELP	30	H and ?
REJECT	31	R
IGNORE	32	I
SHORT	37	
LONG	38	
STANDARD	39	
TEST	40	T
OPERATION	41	O
WD	49	QB
RP	50	
HISTORY	51	
ERRORS	52	ERR
LOG1	53	L1
LOG2	54	L2
SLARPT	55	
SP	56	
CONTINUE	57	C
ON	58	
DIAG	59	
XSLA	60	
XMEM	61	XM

The driver also uses a file, the equivalence file, that contains alternate responses assigned to the same numeric values. The equivalence file is a text file named volumename.S$ODIAG.EQFILE. You can edit this file to customize the alternate responses.

After you enter your response to a prompt, the driver searches the equivalence file for the characters you entered. If the characters are present, the driver uses the corresponding numeric value to perform the appropriate function.

If the characters are not present in the equivalence file, the driver searches the preprogrammed table for the characters. If the characters are in this table, the driver uses the corresponding numeric value to perform the appropriate function. If the characters are not present in the preprogrammed table or the equivalence file, the following error message is written to the file or device you specified in response to the MESSAGE OUTPUT prompt of the XODD command:

ILLEGAL INPUT! INPUT = xxxxxxxx

where:

xxxxxxxx are the characters you entered.

Because the driver searches the equivalence file first, you can customize your responses to command verb prompts without affecting the Online Diagnostics software.

To change the equivalence file, enter the characters of your customized response, starting in column 1. On the same line, enter the numeric value of the original response from Table 3-2, starting in column 9. For example, in Table 3-2 the numeric value of the original response OPERATION is 41. To save keystrokes, you can assign a shorter response (O) to the numeric value 41 by adding it to the equivalence table.

The following example shows an equivalence file (volumename.S$ODIAG.EQFILE) that allows you to enter Y instead of YES, N instead of NO, R instead of REJECT, and O instead of OPERATION.

EXAMPLE

```
Y       15
N       16
R       31
O       41
```

3.2.4 Diagnostic Message Queue

After the driver processes a command verb from the terminal, it checks the diagnostic message queue. This queue contains messages from the diagnostic tasks that request driver action. The driver processes the messages in the order in which they are entered into the queue until you call it back to the control terminal. While the driver is monitoring the message queue, the following message appears on the screen:

ONLINE DRIVER AVAILABLE — PRESS 'COMMAND' FOR NEXT COMMAND VERB

To return the driver to the control terminal, press the Command key and wait for the command prompt to appear.

CAUTION

When the driver is waiting for input at the terminal (the cursor is on the screen), diagnostic tasks with messages in the message queue waiting to be processed by the driver may be suspended. As long as the cursor stays on the screen, some of the diagnostic tasks may be unable to execute to completion. IF YOU MUST LEAVE THE TERMINAL UNATTENDED WHILE A DIAGNOSTIC SESSION IS IN PROGRESS, RETURN THE DRIVER TO ITS NORMAL STATE OF MONITORING THE MESSAGE QUEUE BY EXECUTING A CHECK MESSAGE QUEUE (CQ), A WAIT ON DIAGNOSTICS (WD), OR SHOW PROGRESS OF DIAGNOSTICS (SP) COMMAND VERB. See paragraph 3.5.5.

3.3 EXECUTE COMMAND VERBS

The group of execute command verbs consists of four verbs that initiate the diagnostic tasks and the System Log Analysis Task. The execute command verbs are as follows:

XA	Execute All Diagnostics
XD	Execute Diagnostic Task
XMEM	Execute Memory Task
XSLA	Execute System Log Analyzer

3.3.1 XA — Execute All Diagnostics

The XA command verb selects all devices configured on the system that are in the appropriate device state and starts executing diagnostic tasks for those devices. The default prompt responses are as follows:

```
Priority Level        = 3
Execution Mode        = TEST
Tests Selected        = ALL
Disk Write Tests      = NO
Interactive Tests     = NO
Paper Width           = 80
Timed Test Interval   = 1 SECOND
Termination Mode      = ONE PASS
```

You cannot choose other options when using the XA command verb. However, you can change the options of any diagnostic task while it is executing by using the Change Execution Mode (CE), Change Termination Mode (CT), and Change Task Priority (CP) command verbs. See paragraph 3.4.

To be selected by the XA command verb, disk devices (class DS) must be in the online device state, and all other devices must be in the diagnostic device state. Extended read disk tests 1 through 5 are executed by the XA command verb. You can place devices in the appropriate state by using the ON or DIAG commands from SCI (before the XODD command calls the Online Diagnostics Driver) or by using the ON or DIAG command verbs from the driver (before using the XA verb).

The format of the XA command verb is as follows:

```
ENTER COMMAND VERB?
XA
DEVICE xxxx IS SELECTED.
DEVICE xxxx HAS STARTED EXECUTION.
DEVICE xxxx IS SELECTED.
DEVICE xxxx HAS STARTED EXECUTION.
  .     .     .     .      .
  .     .     .     .      .
  .     .     .     .      .
DEVICE xxxx HAS STARTED EXECUTION.
```

The messages `DEVICE xxxx IS SELECTED` and `DEVICE xxxx HAS STARTED EXECUTION` appear for each device that the XA verb selects.

3.3.2 XD — Execute Diagnostic Task

The XD command verb starts the diagnostic task for one or more devices. You choose a target device and select the execution options by responding to the prompts of the XD command verb. If you choose more than one device, you must go through the prompts for each device.

You can customize the diagnostic task by selecting options that best suit your needs, or you can select the default options. You can alter your choice of options while the task is executing by using the CE, CT, and CP command verbs.

Before the XD command verb can start a diagnostic task, the target device must be in the appropriate device state. Disk devices (class DS) must be in the diagnostic state to run the extended write tests, or in the online state to run all other tests. Other devices must be in the diagnostic state.

Figure 3-2 shows an aggregate view of many of the prompts of the XD command verb in the order in which they appear. They do not all appear for any one device class. The prompts appear on the terminal screen one at a time; when a response is entered, the next one will appear. The indentation of prompts in the figure indicates subordination; they are not indented when they appear on your terminal screen. Study Figure 3-2 to familiarize yourself with the order and subordination of the prompts.

```
ENTER COMMAND VERB?
XD

ENTER DEVICE NAME? ALL

DEVICE xxxx IS SELECTED.

USE DEFAULT OPTIONS (YES, NO)? YES

  ENTER PRIORITY LEVEL (1, 2, 3)? 3

  CHANGE EXECUTION MODE (YES, NO)? NO

    ENTER NEW EXECUTION MODE (TEST, OPERATION)? TEST

      ENTER DIAGNOSTIC TEST (INTEGER, ALL)? ALL
```

Figure 3-2. XD Command Verb Prompts (Sheet 1 of 2)

```
      USE EXTENDED DEFAULT OPTIONS (YES, NO)? YES

      or

      EXECUTE INTERACTIVE TERMINAL TESTS (YES, NO)? NO
      ENTER TIMED TEST INTERVAL (0..59)? 1

      or

      EXECUTE LONG TAPE TESTS (YES, NO)? NO

      or

      ENTER PAPER WIDTH (80..136)? 80

      or

      ENTER SVC SUBOPCODE (HEX 0..0F)? 0B
      ENTER DATA BUFFER LENGTH (1..8192 BYTES)? 161
      ENTER NUMBER OF RECORDS TO SKIP (1..32767)? 1
      ENTER DATA PATTERN (HEX 0..0FFFF)? 03737

  CHANGE TERMINATION MODE (YES, NO)? NO
    EXECUTE CONTINUOUSLY (YES, NO)? NO
    ENTER NUMBER OF MINUTES FOR TASK EXECUTION (1..32767)? IGNORE
    ENTER MINIMUM NUMBER OF ERRORS FOR TERMINATION (1..32767)? IGNORE
    ENTER NUMBER OF PASSES OR SPECIFIC OPERATIONS (1..32767)? 1

DEVICE xxxx IS SELECTED.
```

(This prompt appears again if you select more than one device.)

```
USE DEFAULT OPTIONS (YES, NO)? YES

DEVICE xxxx HAS STARTED EXECUTION.
```

(The appropriate prompts for device xxxx appear until you enter all necessary responses.)

Figure 3-2. XD Command Verb Prompts (Sheet 2 of 2)

3.3.2.1 Device Name. The first prompt of the XD command verb is ENTER DEVICE NAME?. The device name you enter is the target device(s). The three valid responses are as follows:

- A full device name to specify one specific target device (example: LP02)
- A two-character device class to specify all devices in a class (example: LP)
- The word ALL, which is the default, to specify all devices configured on the system that Online Diagnostics supports

Each specified device *must be* in the appropriate device state for the diagnostic task to test that device. The diagnostic task starts by displaying the following acknowledgment message:

```
DEVICE xxxx IS SELECTED.
```

This message appears for one device at a time; the appropriate prompts of the XD verb for that device follow. You must respond to a series of prompts for each device that you want to test.

3.3.2.2 Default Options. The next prompt of the XD command verb asks whether or not you want to use all the default options. The possible responses appear in parentheses (YES, NO) and the default is YES. Some default options are valid only for certain device classes. The default options are as follows:

```
Priority Level        = 3
Execution Mode        = TEST
Tests Selected        = ALL
Interactive Tests     = NO
Paper Width           = 80
Timed Test Interval   = 1 SECOND
Termination Mode      = ONE PASS

USE DEFAULT OPTIONS (YES, NO)? YES
```

To select the default options, enter YES. This completes the XD command verb if you are testing only one device. If you are testing more than one device, you must respond to the default options prompt that appears after the acknowledgment message for each device.

If you enter NO, the prompts for the remaining options appear.

3.3.2.3 Task Priority Level. The first of the remaining options is priority levels 1, 2, or 3. The priority level helps the operating system allocate system resources to balance the workload and give special consideration to your most important tasks. Priority level 1 is the highest level, and those tasks assigned to level 1 have access to the majority of system resources. The default task priority is level 3.

Select the task priority by responding to the following prompt:

```
ENTER PRIORITY LEVEL (1, 2, 3)? 3
```

3.3.2.4 Execution Mode. The next prompt offers you the opportunity to change the execution mode. The prompt appears as follows:

```
CHANGE EXECUTION MODE (YES, NO)? NO
```

If you enter NO, the default option for test execution mode prevails, and the diagnostic task that you bid will run through one pass of all tests for each device. The prompt for termination mode appears after you enter NO.

If you want to specify the tests to be run, you must enter YES in response to this prompt. Then, a series of prompts for test and operation execution modes follows.

Test Execution Mode. For the diagnostic test execution mode, you must decide whether to execute one test or all of the tests. Each device has a different number of tests associated with its diagnostic task. Table 3-3 shows the test number ranges for each device. A test table summarizing test information appears at the control terminal when you are in the long message level or when you enter the HELP command verb (if you installed the help feature). If you did not install the help feature, you can find all of the test tables in Appendix I.

If you choose to execute all of the tests, you must respond to additional prompts for disk (DS), printer (LP or RP), magnetic tape (MT), and keyboard terminal (ST) devices. These additional prompts request information that the diagnostic task uses for each device.

Table 3-3. Test Numbers by Device Class

Device	Test Numbers
DS — ALL (nonextended)*	1 through 4
DS — ALL (extended read)	1 through 5
DS — ALL (extended write)	10 through 13
LP — 300/600	1 through 15
LP — 810	1 through 11
LP — 840	1 through 14
LP — 850 (CPTEST)	1 through 15
LP — 2230/2260	1 through 6
MT — 979A, MT1600	1 through 8
RP — 810	1 through 11
ST — 911	1 through 7
ST — 820	1 through 12
ST — 931	1 through 9
ST — 940	1 through 6

The following paragraphs describe the prompts that appear when you choose the test execution mode (enter your response to the ENTER NEW EXECUTION MODE (TEST, OPERATION)? prompt). Not all prompts appear for all tests. The first of these prompts appears on the screen as follows:

```
ENTER DIAGNOSTIC TEST (INTEGER, ALL)? ALL
```

You can choose to execute any one of the numbered tests by entering the test number. You can choose to execute all of the tests in numeric order by entering ALL.

When the target device is a disk, you must know if the disk is in the online or diagnostic state before specifying ALL. If the disk is in the online state and you select all of the tests, the diagnostic executes the nonextended disk tests or the extended read disk tests (depending on your response to the DO YOU WANT TO EXECUTE THE EXTENDED DISK TESTS (YES,NO)? prompt). If you select all the tests and the disk is in the diagnostic state, the diagnostic executes only the extended write tests.

Other disk prompts follow the test selection prompts. For more information on disk testing requirements, see Section 5.

When the target device is a keyboard terminal (class ST) and you select all of the tests, the following prompt is displayed:

```
EXECUTE INTERACTIVE TERMINAL TESTS (YES NO)? NO
```

The interactive tests require you to be present at the target device to respond to the test. After you enter either YES or NO, the following prompt is displayed:

```
ENTER SECONDS OF TIMED INTERVAL (0..59)? 1
```

The timed test interval is used for several items in the diagnostic tests for class ST devices. For further information, refer to the test descriptions in Section 5.

When the target device is a magnetic tape drive (class MT) and you choose to execute all of the tests, the following prompt appears:

```
EXECUTE THE LONG TAPE TESTS (YES, NO)? NO
```

You must decide whether to execute tape tests 6 through 8. Tests 6 and 7 take a long time to execute. Test 8 offers you the opportunity to put on or remove the write ring. For further details on magnetic tape tests 6 through 8, refer to the test descriptions in Section 5.

When the target device is a line printer (class LP) device or an 820 KSR (class ST), and you choose to execute all of the tests, the following prompt appears:

```
ENTER PAPER WIDTH (80..136)? 80
```

Enter the appropriate paper width (80 to 136) for the device being tested.

Operation Execution Mode. For the operation execution mode, the tasks exercise subopcodes of I/O SVC code >00. You must choose the particular I/O SVC subopcodes and, for certain Supervisor Calls (SVCs), you must select the data buffer length and ASCII data pattern. Only certain subopcodes are valid for each device class. You can display these subopcodes by entering the Show SVC Operation Codes (SO) command verb (see paragraph 3.5.4). The SVC subopcode tables are also available in Appendix I. Certain SVC subopcodes require special conditions or prerequisite actions on your part. For example, the Read ASCII operation for a 911 Video Display Terminal (VDT) requires your presence at the target 911 to press key(s) for each operation performed.

NOTE

The specific SVC operation execution mode is not valid for disk devices or memory devices.

A right angle bracket (>) preceding a value indicates a hexadecimal value.

The following paragraphs describe the prompts of the XD command verb that appear when you enter OPERATION as your new execution mode (as your response to the ENTER NEW EXECUTION MODE (TEST, OPERATION)? prompt). Not all prompts appear for all tests. The first of these prompts is as follows:

```
ENTER SVC SUBOPCODE (HEX 0..0F)? 0B
```

Enter the I/O SVC subopcode from the chart called to the screen with the SO command verb.

After you enter subopcode > 06, > 07, > 09, > 0A, > 0B, or > 0C, the following prompt appears:

```
ENTER DATA BUFFER LENGTH (1..xxxx BYTES)? xxxx
```

where:

xxxx is a decimal value dependent on the particular device class.

Enter the number of bytes to be allocated for the buffer that the subopcode uses. This prompt allows you to exercise varying buffer lengths and even/odd buffer lengths. For class LP and ST devices, the buffer is deblocked to 80 characters at output time.

If you enter subopcode > 06 or > 07, the following prompt appears:

```
ENTER NUMBER OF RECORDS TO SKIP (1..32767)? 1
```

This prompt allows you to space forward or backward a specific number of records (from 1 through 32,767). Enter the desired number of records.

If you enter subopcode > 0B or > 0C, the following prompt appears:

```
ENTER DATA PATTERN (HEX 0..0FFFF)? 03737
```

Enter the hexadecimal number that represents the two-character ASCII code you want to use as the data pattern. For example, the default value > 3737 is the hexadecimal representation of the ASCII 77, and > 4141 is the hexadecimal representation of the ASCII AA.

3.3.2.5 Termination Mode. The following paragraphs describe the prompts of the termination mode option. Not all prompts appear under all conditions. Refer to Figure 3-2 for subordination relationships between these prompts and the remainder of the XD verb prompts.

The first prompt concerning termination mode is as follows:

```
CHANGE TERMINATION MODE (YES, NO)? NO
```

If you enter NO, the diagnostic uses the default termination mode of one pass.

If you enter YES, the prompts for selecting the termination options appear.

The termination options are as follows:

- Execute continuously, until you enter a Kill Diagnostic (KD) or a Quit Online Diagnostics (QD) command verb (see paragraphs 3.6.1 and 3.6.3).
- Execute for a specified number of minutes.
- Execute until a specified minimum number of errors occur.
- Execute a specified number of passes through all of the tests, a specified test, or a specified number of operations.

The next prompt appears as follows:

```
EXECUTE CONTINUOUSLY (YES, NO)? NO
```

If you enter YES, the diagnostic task executes until you enter a KD or a QD command verb.

If you enter NO, the following prompt appears:

```
ENTER NUMBER OF MINUTES FOR TASK EXECUTION (1..32767)? IGNORE
```

If you enter a decimal number from 1 through 32,767, the task executes until the number of minutes you enter have elapsed. If you enter IGNORE, the Online Diagnostic Driver (ODD) does not select this termination option. The following prompt appears whenever you enter any valid response (including IGNORE):

```
ENTER MINIMUM NUMBER OF ERRORS FOR TERMINATION (1..32767)? IGNORE
```

If you enter a decimal number from 1 through 32,767, a counter is initialized, and the task executes until the number of errors counted equals the number you enter. If you enter IGNORE, the ODD does not select this termination option. The following prompt appears whenever you enter any valid response (including IGNORE):

```
ENTER NUMBER OF PASSES OR SPECIFIC OPERATIONS (1..32767)? 1
```

If you selected the test execution mode, the task executes until the number of passes through all of the tests is equal to the decimal number you enter. If you selected the operation execution mode, the task executes until the number of operations of the SVC subopcode executed is equal to the decimal number you enter. If you enter IGNORE, the ODD does not select this termination option.

3.3.3 XMEM — Execute Memory Task

The diagnostic memory task exercises the memory by writing a series of seven data patterns into memory, reading them from memory, and comparing the output to the input. The tests cannot be executed separately. The format of the XMEM command verb is as follows:

```
ENTER COMMAND VERB?
XMEM

ENTER NUMBER OF MEMORY TASKS: (1..XX)? 1
```

No other prompts appear for the XMEM command verb. Other execution options are not available.

If you want the memory task to exercise more than one area of the memory, you can specify the number of areas by entering a number other than 1 in response to the ENTER NUMBER OF MEMORY TESTS prompt. Each series of memory tests execute in a different area of memory. You can execute as many memory tasks simultaneously as the system resources permit. The diagnostic does not permit you to request more tests than the system resources can handle (see paragraph 5.7). To view the area of the memory being exercised, enter the Show Memory Map (SMM) command verb.

3.3.4 XSLA — Execute System Log Analyzer

The XSLA command verb initiates the System Log Analysis Task. For a complete explanation of the use of the XSLA verb, see paragraph 6.4.2.

3.4 CHANGE COMMAND VERBS

The change command verbs allow you to respecify the execution options of the XD command verb for a diagnostic task while it is executing, without stopping and restarting the task. When you enter a change command verb, the diagnostic task will stop and wait for you to complete respecifying the options. If you are operating for a specified number of minutes, the time you take in changing options will be included as part of the execution time before termination.

The prompts of the change command verbs are the same as, or similar to, the prompts of XD command verb. For this reason, details of responses to the change command verb prompts are not provided in the following paragraphs. For details of the responses, refer to the XD command verb description.

The change command verbs are as follows:

CE	Change Execution Mode
CM	Change Message Level
CP	Change Task Priority
CT	Change Termination Mode

3.4.1 CE — Change Execution Mode

The CE command verb modifies the execution mode of the diagnostic task after it begins execution. The prompts and default options of the CE command verb are as follows:

```
ENTER COMMAND VERB?
CE

ENTER DEVICE NAME? ALL

DEVICE xxxx IS SELECTED.
CHANGE TEST EXECUTION MODE (YES, NO)? NO

ENTER NEW EXECUTION MODE (TEST, OPERATION)? TEST

ENTER DIAGNOSTIC TEST (INTEGER, ALL)? ALL

USE EXTENDED DEFAULT OPTIONS (YES, NO)? YES
```

or

```
EXECUTE INTERACTIVE TERMINAL TESTS (YES, NO)? NO
```

or

```
EXECUTE THE LONG TAPE TESTS (YES, NO)? NO
ENTER TIMED TEST INTERVAL (0..59)? 1
```

or

```
ENTER PAPER WIDTH (80..136)? 80
```

or

```
ENTER SVC I/O OPERATION CODE (HEX 0..0F)? 0B
ENTER THE NUMBER OF RECORDS TO SKIP (1..32767)? 1
ENTER BUFFER LENGTH (1..8192 BYTES)? 161
ENTER DATA PATTERN (HEX 0..0FFFF)? 03737
```

3.4.2 CM — Change Message Level

The CM command verb changes the message level of the user/driver interface from the current level to the specified new level. The new level is in effect until you enter another CM command verb.

The user/driver interface message levels are long and short. The diagnostic session always begins on the short level, displaying only the command prompt. The long level displays charts and expanded explanations of the command prompts.

The prompts and default options of the CM command verb are as follows:

```
ENTER COMMAND VERB?
CM

ENTER MESSAGE LEVEL (SHORT, LONG)? LONG
```

3.4.3 CP — Change Task Priority

The CP command verb changes the priority of a diagnostic task while it is executing. The default priority is 3; you select it by pressing the Return key without entering any value. The priority change takes place at the first opportunity after the request is processed. You can use this command verb to speed up or slow down task execution.

Be careful when using the CP verb to change online diagnostic task priorities. The recommended procedure is to change *all* tasks of the same priority level. If selected tasks have different priority levels (DS01 = 1, DS02 = 2, ST03 = 3), a priority 3 task message could possibly block the message queue to the Online Diagnostics Driver (ODD) if the operating system rolls that message for long periods of time. This condition does not occur if all tasks are of the same priority level.

The prompts and default options of the CP command verb are as follows:

```
ENTER COMMAND VERB?
CP

ENTER DEVICE NAME? ALL
DEVICE xxxx IS SELECTED.

ENTER PRIORITY LEVEL (1, 2, 3)? 3
```

3.4.4 CT — Change Termination Mode

The CT command verb changes the termination mode of the diagnostic task while it is executing. The CT verb is accurate to within a minute, therefore, if you select a time value of eight minutes, the task will terminate within seven to nine minutes.

The prompts and default options of the CT command verb are as follows:

```
ENTER COMMAND VERB?
CT

ENTER DEVICE NAME? ALL

DEVICE xxxx IS SELECTED.
CHANGE TERMINATION MODE (YES, NO)? NO

EXECUTE CONTINUOUSLY (YES, NO)? NO
ENTER NUMBER OF MINUTES FOR TASK EXECUTION (1..32767)? IGNORE
ENTER MINIMUM NUMBER OF ERRORS FOR TERMINATION (1..32767)? IGNORE
ENTER NUMBER OF PASSES OR SPECIFIC OPERATIONS (1..32767)? 1
```

The prompts appear in the order shown. A positive response to the EXECUTE CONTINUOUSLY? prompt suppresses the following prompts. Any valid response (including IGNORE) to the other prompts causes the next one to be displayed.

3.5 SHOW COMMAND VERBS

The show command verbs display information at the control terminal. The verbs are as follows:

SD	Show System Device List
SF	Show Diagnostic Files
SMM	Show Memory Map
SO	Show SVC Operation Codes
SP	Show Progress of Diagnostics
SSD	Show Supported Devices

3.5.1 SD — Show System Device List

The SD command verb displays a list consisting of all the devices on your system that are supported by Online Diagnostics, the device state associated with them, and their availability for testing. The device list is not sorted. It appears in the same order as the devices are shown when you use the SCI command List Device Configuration (LDC) to display the state of the devices configured on your system. The SD command verb has no subordinate prompts.

In response to the SD command verb, the Online Diagnostics Driver displays the device state information in the format shown in the following example:

EXAMPLE

```
DEVICE   STATE         AVAILABLE FOR TEST
-----------------------------------------
DS02     ONLINE        YES
DS03     ONLINE        YES
LP01     ONLINE        NO
LP02     DIAGNOSTIC    YES
ST01     ONLINE        NO
ST02     OFFLINE       NO
ST03     DIAGNOSTIC    YES
DS01     OFFLINE       NO
```

To suspend the upward scrolling of the SD command verb display, press the Attention key on your terminal (see Appendix A for equivalent keys on control terminals). To resume scrolling, press the Attention key again.

3.5.2 SF — Show Diagnostic Files

Five diagnostic files are available to you when you use the SF command verb of the Online Diagnostics Driver. They are:

- HISTORY — Diagnostic history file. This is the default for the SF command verb. For information about the history file, see paragraph 2.5.1.

- ERRORS — Diagnostic error file. This file extracts error records from the history file and stores them in a file with volumename.S$ODIAG.ERRORS.

- LOG1 — System log file 1. See paragraphs 6.1 and 6.5 for information about the system log files.

- LOG2 — System log file 2.

- SLARPT — System Log Analysis Task report file. See paragraph 6.1.

The SF command verb displays a screen listing the choices available to you if you are in the long message level. It displays the following screen in the short message level.

```
ENTER COMMAND VERB?
SF

ENTER FILE NAME? HISTORY
```

The SF command verb is not valid in batch mode; however, messages are logged to the diagnostic history and error file. You can display them on a terminal by using the SF command in SCI. Pathnames are volumename.S$ODIAG.HISTORY and volumename.S$ODIAG.ERRORS if you accepted the default pathname when you executed the XODD command.

3.5.2.1 Diagnostic History File. If you accept the default to the ENTER FILE NAME? prompt, the diagnostic history file appears at the control terminal. The file shown is current to the time of the request, and you can manipulate the display with full DNOS show file functions. The following example shows entries in a diagnostic history file:

EXAMPLE

```
ODD  0001 I 08/24/83 08:36:36
     DNOS ONLINE DIAGNOSTICS VERSION 1.2.0 BEGINNING EXECUTION.
     AT ANY TIME, ENTER THE WORD 'HELP' FOR MORE INFORMATION.
ST03 5000 I 08/24/83 08:45:28
     DNOS ST911 DEVICE DIAGNOSTIC VERSION 1.2.0 STARTING EXECUTION: RUN ID=>FE.
ST03 5100 T 08/24/83 08:45:28
     TEST 1 - ONES AND ZEROS TEST BEGINNING.
ST03 5142 E 08/24/83 08:45:29
     MEMORY ERROR!  ZERO'S TEST PATTERN CHANGED.
ST03 5200 T 08/24/83 08:45:31
     TEST 2 - SCROLL TEST BEGINNING.
ST03 5300 T 08/24/83 08:45:34
     TEST 3 - BEEPER TEST BEGINNING.
ODD  0402 I 08/24/83 08:47:37
     DEVICE DIAGNOSTIC ST03 TERMINATED WITH     1 ERRORS,     1 PASSES.
ODD  000E I 08/24/83 08:48:30
     DNOS ONLINE DIAGNOSTICS COMPLETED EXECUTION.
```

3.5.2.2 Diagnostic Error File. If you enter the prompt response ERRORS, the following screen display appears:

```
ENTER DEVICE NAME? ALL
```

The diagnostic error file does not exist until you enter ERRORS in response to the ENTER FILE NAME? prompt. The SF verb then creates the file and copies appropriate entries from the history file into it. The following example shows entries in a diagnostic error file that are extracted from the entries in the example shown in paragraph 3.5.2.1:

EXAMPLE

```
ST03 5142 E 08/24/83 08:45:29
MEMORY ERROR!  ZERO'S TEST PATTERN CHANGED.
```

3.5.2.3 System Log Files 1 and 2. Entering LOG1 or LOG2 displays the entries in the system log file. The following example shows some typical entries in a DNOS system log file:

EXAMPLE

```
0919:0902      **** SCI - IV JEW025 AT ST07 INSTALLED DNODOBJ IN DS03
0919:0903 STAT DEV=DS03 RDS G=0006 B=0000 WRTS G=0000 B=0000 OTHER G=0000 B=0000
0919:0903      **** SCI - UV JEW025 AT ST07 UNLOADED DNODOBJ
0919:0959 MEMP BIT=00 ROW=0C CORRECT=Y BASE=0000 MEM=64KB TYPE=1 TPCS=FB10
0919:1035+DS05 ERR=1C JOB=0004 IID=17 BLOCK=0000 001C 0A02 C000 9014 0100
                S=00 L=02 ST09 RID=30
```

3.5.2.4 System Log Analysis Task Report File. When the System Log Analysis Task finishes processing system log records, it writes the report it produces to the System Log Analysis Report File. The reports are printed from that file. To see the file, enter SLARPT in response to the ENTER FILE NAME? prompt. The following example shows the beginning entries in a System Log Analysis Task report file:

EXAMPLE

```
          1     EB - DISK PACK CHANGE DETECTED
READS G=000044, B=000000 WRITES G=000000, B=000000 OTHER G=000255, B=000002
   RAL7 UNLOADED FORM DS04

MT01 FROM 09/17/83 AT 20:34 TO 09/17/83 AT 20:34

          4     45 - PARITY ERROR ENCOUNTERED ON MAGNETIC TAPE

MT02 FROM 09/17/83 AT 20:34 TO 09/17/83 AT 20:34

          1     43 - MAG TAPE UNIT IS OFFLINE
```

This example shows only a portion of one report file. See Section 6 for more information.

3.5.3 SMM — Show Memory Map

The SMM command verb performs the same function under the driver that the Show Memory Map (SMM) command prrforms under SCI. It displays the allocation of main memory to system and user tasks and estimates if more or less memory is needed for the operating system to handle these tasks. If any portion of memory is blank, that portion is currently not in use.

CAUTION

Do not leave the SMM display active if you activated it from the Online Diagnostic Driver (ODD). If you do, the SMM verb will disallow the processing of Online Diagnostics progress messages. Use the Show Progress (SP) verb as the normal means of viewing the progress of a diagnostic session.

For examples and a description of the fields of the SMM display, see the *DNOS Systems Programmer's Guide*.

3.5.4 SO — Show SVC Operation Codes

The SO command verb displays a chart of all the available I/O SVC subopcodes. You can use the SO command verb only under certain conditions during the execution of a diagnostic session. The three times when you can invoke the SO verb follow:

- When the ENTER COMMAND VERB? prompt appears on the screen
- When you have selected to operate the diagnostic session in the operation execution mode
- When you have changed the execution mode to operation by using the CE command verb

Each device class has a separate chart. Each chart contains the name of the operation, the subopcode, and a validity code for the device class. The legend at the bottom of the chart explains the validity codes. The disk and memory device classes have no operation chart because only the test execution mode is valid for them.

The SO command verb displays the following prompt:

```
ENTER DEVICE CLASS?
```

Enter a valid two-character device class: LP, MT, or ST.

Figure 3-3 shows the SO command verb display that appears if you enter LP as the device class. The display is valid for both class LP and RP devices. For other subopcode charts, see Appendix I.

```
*** ONLINE DIAGNOSTICS DEVICE SUBOPCODE CHART ***
             DEVICE CLASS: LP, RP

+---------------------------------+-------------------------------+
| OPERATION      CODE   VALIDITY  | OPERATION      CODE   VALIDITY |
|                                 |                                |
|  OPEN           00       R      |  UNUSED         08       E     |
|  CLOSE          01       R      |  READ ASCII     09       E     |
|  CLOSE/EOF      02       R      |  READ DIRECT    0A       E     |
|  OPEN/REWIND    03       R      |  WRITE ASCII    0B       R     |
|  CLOSE/UNLOAD   04       R      |  WRITE DIRECT   0C       E     |
|  READ STATUS    05       I      |  WRITE EOF      0D       R     |
|  FORWARD SPACE  06       I      |  REWIND         0E       R     |
|  BACK SPACE     07       I      |  UNLOAD         0F       I     |
+---------------------------------+-------------------------------+

FOR VALIDITY = R, DEVICE RESPONDS TO SUBOPCODE.
               I, DEVICE IGNORES SUBOPCODE.
               E, DEVICE RETURNS ERROR CODE.

ENTER THE LETTER 'C' TO CONTINUE
```

Figure 3-3. SO Command Verb Display

3.5.5 SP — Show Progress of Diagnostics

The SP command verb displays a dynamic picture of the diagnostic session as it runs. The Online Diagnostic Driver (ODD) enters each device that is being tested into the chart, logs the status of the tests as they proceed, and logs any errors encountered into the chart. The following example shows a picture of one instant in a diagnostic session:

EXAMPLE

```
+------------------------------------------------------------------+
|                                  |                                |
| DEVICE  TEST/OP  PASSES  ERRORS  | DEVICE  TEST/OP  PASSES  ERRORS |
+----------------------------------|--------------------------------+
|                                  |                                |
| DS03    3        1       0       |                                |
| LP02    3        0       0       |                                |
| ST07    2        0       0       |                                |
| DS05    11       0       4       |                                |
| DS01    2        0       0       |                                |
| DS02    1        0       8       |                                |
|                                  |                                |
|                                  |                                |
|                                  |                                |
|                                  |                                |
|                                  |                                |
--------------------------------------------------------------------
ONLINE DRIVER AVAILABLE -- PRESS 'COMMAND' FOR NEXT COMMAND VERB
```

3.5.6 SSD — Show Supported Devices

The SSD command verb displays a list of the devices that are supported by Online Diagnostics. Figure 3-4 shows the screen display that appears when you enter the SSD command verb.

```
ONLINE DIAGNOSTICS SUPPORT THE FOLLOWING TESTS:
NOTE:  THE ONLINE TEST MUST BE INSTALLED PRIOR TO EXECUTION.
TESTS       CLASS                   DEVICE

 DSnn       DISKS                    CD1400, DS10, DS25, DS31,
                                     DS50, DS80, DS200, DS300,
                                     FD1000, WD500, WD800

 MTnn       TAPES                    MT979A, MT1600,
                                     Cartridge Tape

 LPnn       LINE PRINTER             Printronix 300/600
                                     Data Products 2230/2260
                                     Omni Model 810, 850, or 840 RO with
                                                  or without DFC option
 RPnn       REMOTE PRINTER           Omni Model 810 (DNOS ONLY)

 STnn       KEYBOARD DEVICES         Model 820 KSR with DFC option
                                     Model 911, 931 Video Display Terminal
                                     Model 940 Electronic Video Terminal

 MMnn       MEMORY
 ENTER THE LETTER 'C' TO CONTINUE
```

Figure 3-4. SSD Command Verb Display

3.6 TERMINATE COMMAND VERBS

The terminate command verbs cause normal termination for the individual diagnostic task or the Online Diagnostics Driver. They are as follows:

KD	Kill Diagnostic Task
WD	Wait on Diagnostics
QD	Quit Online Diagnostics

3.6.1 KD — Kill Diagnostic Task

The KD command verb terminates diagnostic tasks, but does not affect the Online Diagnostics Driver (ODD). You can terminate one, several, or all diagnostic tasks with the KD command verb. If you have selected the execute continuously termination mode, you must either change the termination mode with a CT verb or terminate the task with the KD command verb.

You must enter the device name for the task you want to terminate. When you enter the full four-character device name (for example DS01), only the task for that device terminates. When you enter the two-character device class (for example DS), all tasks for devices of that class terminate. When you enter ALL, all diagnostic tasks are terminated.

The prompts and default options of the KD command verb are as follows:

```
ENTER COMMAND VERB?
KD

ENTER DEVICE NAME? ALL
```

The following messages appear for each diagnostic task:

```
DEVICE xxxx TERMINATION STARTED.

ONLINE DRIVER AVAILABLE PRESS 'COMMAND' FOR NEXT COMMAND VERB.

DEVICE DIAGNOSTIC xxxx TERMINATED WITH nnnnn ERRORS, nnnnn PASSES.
```

where:

xxxx is the device name of the diagnostic task.

nnnnn represent the appropriate decimal numbers.

3.6.2 WD — Wait on Diagnostics

Although the WD verb is listed as a termination verb, it actually suspends execution rather than terminating it. For this reason, you normally use the WD command verb only for a batch input file to suspend the reading of the file until the device diagnostic completes execution. (The batch input file is the file specified in response to the COMMAND INPUT prompt of the XODD command.) When the driver suspends reading of the batch file, the driver monitors the message queue, as if you entered a Check Message Queue (CQ) command verb. When the device diagnostic terminates, the driver reads the remainder of the batch input file. If the remainder of the file contains a QD command verb, the diagnostic session ends. If it contains another command verb, the driver reads the batch input file until the next WD command verb.

If there is no remainder of the file (the WD command verb is the last element of the file), you can continue the diagnostic session from the control terminal. This can be helpful when you need to execute batch diagnostics, but must return to interactive execution to view the diagnostics history file or show device status after the batch execution.

The WD command verb prevents the QD command verb from ending a batch diagnostic session before diagnostic task completion. The following example shows a batch input file that does not contain a WD command verb. When reading this file, the driver reads and executes the QD command verb after reading the other input, thus ending the diagnostic session immediately. The disk diagnostic tasks do not execute.

```
XD
DS
YES
QD
```

The following example shows one correct usage of the WD verb. The diagnostic session ends after all the diagnostics are complete.

EXAMPLE

```
XD
MT02
YES
XD
LP03
YES
XD
DS01
YES
WD
QD
```

The following example shows another correct usage of the WD command verb. In this example, several WD command verbs are in the batch input file. The diagnostic session ends after the diagnostic for LP01 is complete. This example does not allow multiple diagnostic tasks to execute concurrently. Using only one WD verb allows all tasks to execute concurrently and is the recommended method.

EXAMPLE

```
XD
DS01
YES
WD
XD
MT01
YES
XD
LP02
YES
WD
XD
LP01
YES
WD
QD
```

The following example shows another correct usage of the WD command verb. The WD command verb ends the batch execution, but the diagnostic session does not end because the file contains no QD command verb. The driver returns control to the control terminal for further input after the diagnostic task for DS01 is complete. This is an example of a diagnostic session that is both batch and interactive.

EXAMPLE

```
XD
DS01
YES
WD
```

3.6.3 QD — Quit Online Diagnostics

The QD command verb ends the diagnostic session, returning the control terminal to SCI. The target devices placed in the diagnostic device state remain in that state even though the diagnostic session is over. (Use the ON command to place these devices back in the online state.)

Usually, all diagnostic tasks terminate before you enter the QD command verb. Either they terminate according to specified termination mode options, or you terminate them with the KD command verb. However, when diagnostic tasks are still executing at the time you enter the QD command verb, the Online Diagnostics Driver terminates these tasks first before terminating itself. The driver cannot terminate interactive tasks awaiting I/O; therefore, it cannot terminate itself. The driver displays the following messages for each task it terminates:

```
DEVICE xxxx TERMINATION STARTED.

DEVICE xxxx TERMINATED WITH nnnnn ERRORS, nnnnn PASSES.
```

where:

xxxx is the device name of the target device.

nnnnn represent the appropriate decimal numbers.

When all the diagnostic tasks have been terminated, the driver displays the following message:

```
TOTAL NUMBER OF ERRORS REPORTED = nn:
```

When the cursor returns to the terminal screen, the QD verb has completed execution, and the driver is terminated.

NOTE

When you attempt to terminate the driver with a Quit Online Diagnostics (QD) command, and diagnostics are still awaiting I/O (such as with the interactive terminal tests), the driver will not terminate. In this situation, you have two possible ways of terminating the driver. One is to press any key on the target terminal awaiting I/O. The other is to identify all tasks that have not been killed by using the Show Task Status (STS) SCI command. Once you have identified these tasks, kill them with the Kill Task (KT) SCI command.

A synonym table overflow can replace the total number of errors message with the following message:

```
0500 PARAMETER DOES NOT EXIST
```

This is a system message which appears on the screen as soon as the driver terminates and displaces the errors message. You should delete unnecessary synonyms.

3.7 MISCELLANEOUS COMMAND VERBS

The miscellaneous command verbs perform additional functions to aid you during the diagnostic session. The verbs are:

CH	Clean Heads on FD1000 DSDD
CQ	Check Message Queue
ON	Change Device State to ON
DIAG	Change Device State to DIAG
LDC	List Device Configuration
HELP	Display Long Message for Current Prompt
REJECT	Return to Previous Prompt

3.7.1 CH — Clean Heads on FD1000 Floppy Drive

The CH verb can be executed only on an FD1000 disk drive in the diagnostic state when a special cleaning diskette has been inserted. Execution of the CH verb causes the heads to come in contact with the cleaning surface of the diskette for approximately 30 seconds.

The prompts and defaults of the CH verb are as follows:

```
ENTER COMMAND VERB?
CH

ENTER THE FD1000 DEVICE NAME TO BE CLEANED.

A HEAD CLEANING DISKETTE SHOULD BE IN THE DRIVE.
ARE YOU READY TO EXECUTE (YES, NO)? YES
```

3.7.2 CQ — Check Message Queue

The CQ command verb causes the Online Diagnostics Driver to monitor the diagnostic message queue for diagnostic tasks in need of service.

When a diagnostic task needs service, it places a message on the queue and may be suspended until the driver responds to the message. The driver, in its normal state, displays the following message on the control terminal and services the diagnostic tasks by monitoring the message queue:

```
ONLINE DRIVER AVAILABLE -- PRESS 'COMMAND' FOR NEXT COMMAND VERB
```

When you transfer control of the driver from monitoring the message queue to awaiting input from the control terminal by pressing the Command key, the cursor appears on the screen. As long as the cursor is on the screen, the driver is waiting for you to enter a response at the control terminal and cannot return to its normal state of servicing the diagnostic tasks. You can force the driver to return to the diagnostic message queue by entering the CQ command verb in response to the command prompt.

If you must leave the terminal while a diagnostic session is in progress, you can be sure that the driver is responding to any diagnostic tasks that need servicing by entering the CQ command verb. There are no additional prompts for the CQ command verb.

3.7.3 ON — Change Device State to ON

The ON command verb allows you to change the device state of any device from the diagnostic state to the online state. Change devices back to the online state after testing has completed. The prompts and default options of the ON verb are as follows:

```
ENTER COMMAND VERB?
  ON
ENTER DEVICE NAME? ALL
```

3.7.4 DIAG — Change Device State to DIAG

The DIAG verb allows you to place any device in the diagnostic state before testing it. You can use the command verb SD or LDC to check the current device state; then use the DIAG or ON verb to change a state as required. The prompts and default options of the DIAG verb are as follows:

```
ENTER COMMAND VERB?
DIAG (or ON)

ENTER DEVICE NAME? ALL
```

You can enter the four-character device name to change the state of an individual device, a two-character device class to change the state of all devices in that class, or the default option (ALL) to put all available devices into the diagnostic state or back into the online state. After you change the state of the devices, control is returned to the driver, and the following message appears:

```
ONLINE DRIVER AVAILABLE -- PRESS 'COMMAND' FOR NEXT COMMAND VERB
```

If the device is in use, the following message appears:

```
UNABLE TO PLACE xxxx IN DIAGNOSTIC STATE.
```

where:

xxxx is the device name of the target device.

3.7.5 LDC — List Device Configuration

The LDC command verb executes in the same way the List Device Configuration (LDC) SCI command executes. It displays a table of all devices configured on your system along with information about those devices. For an example of a device configuration table, see the *DNOS System Generation Reference Manual*.

3.7.6 HELP — Display Long Message for Current Prompt

The HELP command verb invokes the help feature that displays the long level message for the current prompt. You can enter HELP at any time during the diagnostic session. If you did not install the help feature at installation time, the same information can be found in Appendix I of this manual. For more information on the HELP feature, refer to Section 2.

3.7.7 REJECT — Return to Previous Prompt

The REJECT command verb causes the driver to reject a prompt and display the previous prompt in any series. It is valid at any time during the diagnostic session. To reject a series of prompts, use the REJECT (R) verb to reject each prompt individually until you arrive back at the prompt you want to retain.

4

Executing a Diagnostic Session

4.1 INTRODUCTION

This section provides an example of the execution of a diagnostic session on a disk drive. The example is designed specifically to:

- Serve as a prototype for any diagnostic session
- Show the order of prompts that the diagnostic driver displays when it initiates the disk diagnostic task

Here you find step-by-step instructions for initiating the diagnostic driver, selecting a diagnostic task, selecting all the options necessary to operate the disk diagnostic task, and interpreting the results when the diagnostic task terminates. If you are already familiar with Online Diagnostics, you may want to skip this section. However, it is the only place in the manual where all the prompts for both nonextended and extended disk tests are detailed.

If you have never executed a diagnostic session, the step-by-step instructions will assist you in the following ways:

- Using the manual
- Learning to select the options necessary to execute a diagnostic session
- Practicing the prompt responses for execution of disk tests
- Interpreting the results

4.2 PREPARING FOR THE SESSION

You have already installed the Online Diagnostics and Systems Log Analysis Task and verified the installation. To prepare for the diagnostic session, you need to establish some of its parameters before you initiate the diagnostics driver.

4.2.1 Selection of Target Device

You can execute Online Diagnostics and the System Log Analysis Task either as a routine maintenance operation or to investigate a problem in a particular device. For routine sessions, you may prefer to use a batch input file and background operation. For this example session, assume that a disk drive (DS02) or specific disk (volume name ORDERS) indicates a problem, and you want to execute Online Diagnostics for information. You prefer, if possible, not to interrupt daily operations.

4.2.2 Control Terminal

Select a control terminal. It must be one that is not needed for other purposes during the diagnostic session. Assume it is the terminal with device name ST01.

4.2.3 Device State

Since you want to run the tests without interrupting normal operations (both on the system as a whole, and on the target disk), you must test the disk while it is in the online state. You can run only the nonextended disk tests and the extended read only disk tests on a disk drive in the online state. If you decide the problem is the disk drive rather than the disk media, you can use a scratch disk to test the drive while it is in the diagnostic state with the extended write tests.

4.2.4 Tests to Run

Turn to Tables 11, 12, and 13 of Section 5 of this manual to find the list of tests that you can execute on disks. Following the table is more specific information on each of the three disk test categories and each individual disk test.

The driver does not allow you to execute all of the categories in the same session since the extended write disk tests destroy data on the disk they are testing. The prompts for the extended write disk tests appear only if the disk is in the diagnostic (DIAG) state. If you choose to execute these tests, no other options are offered to you. Execute the extended write disk tests only on a scratch disk, and do not attempt to install it with the Install Volume (IV) command.

Figure 4-1 shows the disk test decision map that you follow as you respond to the prompts displayed on the screen. The prompts for the extended write disk tests are not displayed if you execute your disk diagnostic task in the online (ON) state. In that case, you start selecting tests at the second decision box.

Section 4 explains how to execute each of the 3 disk test categories. All 3 categories execute on the premise that you want to perform all possible tests. You must execute each category of disk tests separately. To test the system disk or a disk drive with an installed volume in place, you execute one session with the nonextended disk tests and a second session with the extended read only disk tests. If you then want to test the drive further, you run a third diagnostic session using a scratch disk to execute the extended write disk tests.

Determine if the disk volume you want to test was initialized on one of these operating systems: DNOS Release 1.1.0 or later, or DX10 Release 3.3.0 or later. If it was, you can perform the nonextended disk tests and the extended read only disk tests. If it was not, you cannot test the disk with those tests. You can, however, test the disk drive with the extended write disk tests and a scratch disk.

4.2.5 Execution Mode

Since you are testing a disk, only the test execution mode is valid.

4.2.6 Default Options

You must accept the default options or select a priority level and a termination mode. (See paragraph 1.2.2.3.) The default priority level is 3, and the default termination mode is one pass through all tests.

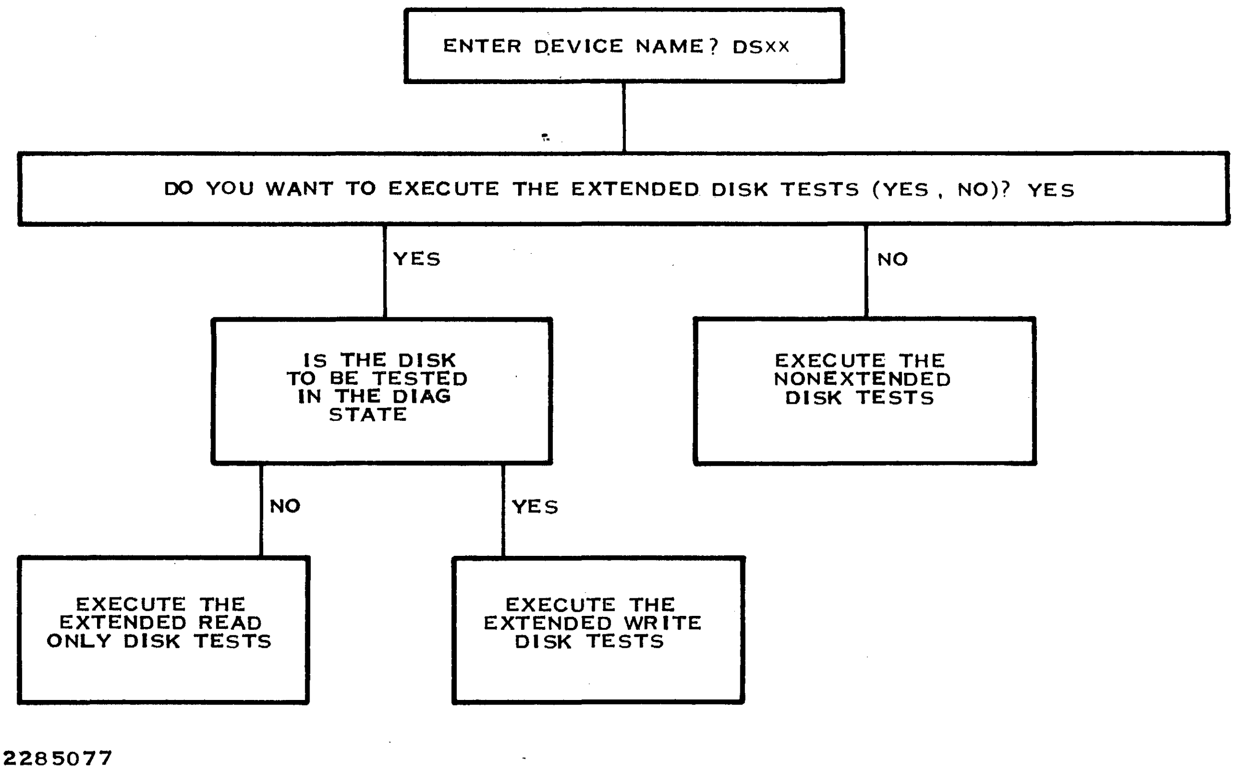

Figure 4-1. Disk Test Decision Map

4.2.7 Batch Mode

You can record the commands and prompt responses that you enter during the session by assigning a pathname to a file in order to retain the commands. This allows you to run the same diagnostic session again in batch mode and in background. Assign volumename.DSKBATCH to this file, which is the command log file (specified in the XODD command).

4.3 EXECUTING THE SESSION

You now know that you want to execute an interactive session that includes all three disk test categories and that has the following parameters:

- Target device — DS02
- Device state — ON for the nonextended disk tests and the extended read only disk tests, DIAG for the extended write disk tests
- Control terminal — ST01
- Tests — nonextended disk tests and extended read only disk tests when disk drive is in the ON state, extended write disk tests when disk drive is in the DIAG state

- Termination mode — one pass through all tests (default)
- Priority level — 3 (default)
- Command log file — volumename.DSKBATCH (batch input file)

NOTE

For the first part of the session, you will execute the nonextended disk tests and the extended read only disk tests, since both groups of tests require the target disk to be installed (by the IV command) and in the online (ON) state.

In the second and final part of the session, you will execute the extended write disk tests. At that time you will perform an Unload Volume (UV) command and then change the target disk to the diagnostic (DIAG) state.

You are now ready to execute your diagnostic session by using the following instructions. All instructions are numbered and the terminal's responses are preceded by an arrow (→). The word *enter* is used to indicate the action of typing in the response to a prompt and pressing the Return key.

4.3.1 Performing the Nonextended and the Extended Read Only Disk Tests

The following instructions describe how to execute the nonextended and the extended read only disk tests.

1. Turn on the terminal.

2. Log on.

   → The DNOS System x.x.x menu screen appears. The cursor is in the lower left-hand corner of the screen following the SCI command prompt ([ ]), indicating that SCI is bid.

3. Enter the Execute the Online Diagnostics Driver (XODD) command.

   → The Online Diagnostics Driver displays the following:

```
DNOS ONLINE DIAGNOSTICS - VERSION  x.x.x
          COMMAND INPUT:  STxx
         MESSAGE OUTPUT:  STxx
       COMMAND LOG FILE:  volumename.S$ODIAG.CMD
           HISTORY FILE:  volumename.S$ODIAG.HISTORY
             MODE (F,B):  FOREGROUND
```

4. Enter the prompt responses as follows:

```
   COMMAND INPUT: ST01 (or accept default)
   MESSAGE INPUT: ST01 (or accept default)
COMMAND LOG FILE: volumename.DSKBATCH
    HISTORY FILE: (accept default)
      MODE (F,B): (accept default)
```

→ The following message appears on the control terminal:

```
DNOS ONLINE DIAGNOSTICS VERSION X.X.X BEGINNING EXECUTION.

AT ANY TIME, ENTER THE WORD 'HELP' FOR MORE INFORMATION.

ENTER COMMAND VERB?
```

5. Since this is the first disk diagnostic session to be executed on your system, change the message level from short to long by entering the Change Message Level (CM) command verb. You can change the level only if you have installed the help feature.

```
ENTER COMMAND VERB?
CM
```

→ The following display appears on the screen:

```
ENTER MESSAGE LEVEL (SHORT, LONG)? LONG
```

6. Accept the default (the long message level).

→ The following display appears on the screen:

```
ONLINE DRIVER AVAILABLE -- PRESS COMMAND FOR NEXT COMMAND VERB
```

7. The driver is checking the diagnostic message queue to see if it contains any messages to be processed. To call the driver back to the control terminal, press the Command key.

   → The following display appears on the screen:

```
THE ONLINE DIAGNOSTICS DRIVER IS WAITING FOR A COMMAND VERB.
ENTER A COMMAND VERB FROM THE FOLLOWING LIST:

CE   - CHANGE EXECUTION MODE          SD   - SHOW SYSTEM DEVICE LIST
CH   - CLEAN HEADS ON FD1000 DSDD     SF   - SHOW DIAGNOSTIC FILES
CM   - CHANGE MESSAGE LEVEL           SMM  - SHOW MEMORY MAP
CP   - CHANGE TASK PRIORITY           SO   - SHOW SVC OPERATION CODES
CQ   - CHECK MESSAGE QUEUE            SP   - SHOW PROGRESS OF DIAGNOSTICS
CT   - CHANGE TERMINATION MODE        SSD  - SHOW SUPPORTED DEVICES
DIAG - CHANGE DEVICE STATE TO DIAG    WD   - WAIT ON DIAGNOSTICS
KD   - KILL DIAGNOSTIC TASK           XA   - EXECUTE ALL DIAGNOSTICS
LDC  - LIST DEVICE CONFIGURATION      XD   - EXECUTE DIAGNOSTIC TASK
ON   - CHANGE DEVICE STATE TO ON      XMEM - EXECUTE MEMORY TASK
QD   - QUIT ONLINE DIAGNOSTICS        XSLA - EXECUTION SYSTEM LOG ANALYZER

ENTER COMMAND VERB?
```

8. Since you want the driver to initiate only the diagnostic task for a disk drive, not all of the tasks, enter XD, the Execute Diagnostic Task command verb.

   → The following message and prompt appear on the screen:

```
YOU HAVE CHOSEN TO EXECUTE A DIAGNOSTIC TASK. YOU CAN SELECT ALL
AVAILABLE DEVICES, ALL DEVICES OF ONE CLASS (SUCH AS ALL DISKS),
OR ANY ONE SPECIFIC DEVICE. ENTER YOUR SELECTION AS FOLLOWS:

ALL - SELECTS ALL DEVICES AVAILABLE

DS  - SELECTS ALL TILINE DISK DEVICES AVAILABLE
MT  - SELECTS ALL MAG TAPE DEVICES AVAILABLE
LP  - SELECTS ALL PRINTER DEVICES AVAILABLE
RP  - SELECTS ALL REMOTE LP810 DEVICES AVAILABLE
ST  - SELECTS ALL TERMINAL DEVICES AVAILABLE

      REJECT -- RETURN TO COMMAND PROMPT
COMPLETE DEVICE NAME (ST02, DS01) - SELECTS THAT DEVICE

ENTER DEVICE NAME? ALL
```

9. Enter the device name DS02.

   → A message appears stating that device DS02 has been selected. Device DS02 is being readied for testing.

   → The following message is displayed, asking if you want the nonextended or extended disk tests.

```
DO YOU WANT TO EXECUTE THE EXTENDED DISK TESTS (YES, NO)? YES
```

   → Since you earlier left the target disk in the ON state, you can only execute either the nonextended disk tests or the extended read only disk tests. For this first part of the session, you want to execute the nonextended disk tests. Enter NO.

   → The following screen is displayed, asking if you want to operate your session with all of the default options.

```
THE DEFAULT OPTIONS ARE:
  PRIORITY LEVEL       = 3
  TESTS SELECTED (1-4) = ALL
  TERMINATION MODE     = 1 PASS

TO SELECT THESE DEFAULT OPTIONS, ENTER YES.
TO SELECT OTHER OPTIONS, ENTER NO.
TO RETURN TO THE COMMAND PROMPT, ENTER 'R' FOR REJECT.

USE DEFAULT OPTIONS (YES, NO)? YES
```

10. Even though you want to use the default options, enter NO in order to see the options available when executing the nonextended disk tests.

   → The following screen display appears:

```
CHOOSE A NEW PRIORITY FOR THIS TASK.  THE DIAGNOSTIC WILL MAKE
THIS PRIORITY CHANGE WHEN THE TASK IS GIVEN CPU TIME SLICES.

ENTER PRIORITY LEVEL (1, 2, 3)?  3
```

11. Accept the default unless you want to assign a priority level higher than 3.

   → The next display appears as follows:

```
THE FOLLOWING TESTS ARE PERFORMED BY THE DISK DIAGNOSTIC TASK:

NOTE:  AN INITIALIZED AND INSTALLED DISK VOLUME MUST BE USED TO
       EXECUTE THE FOLLOWING TESTS.

TEST  1 - READ DIAGNOSTIC CYLINDER TEST: READ/COMPARE OF S$DIAG FILE.
TEST  2 - READ DIAGNOSTIC CYLINDER WITH HEAD MOTION: S$DIAG AND VCATALOG.
TEST  3 - READ/WRITE RANDOM PATTERN TEST: WRITE/READ OF FILE S$ODDWRT.
TEST  4 - READ/WRITE PATTERNS TEST: WRITE/READ SET PATTERNS OF S$ODDWRT.

ENTER DIAGNOSTIC TEST ( INTEGER,ALL )? ALL
```

12. Again, accept the default.

    → The termination mode message and prompt appear as follows:

```
THE TERMINATION MODES ARE:
 1. EXECUTE CONTINUOUSLY (TASK DOES NOT TERMINATE UNTIL YOU ENTER
    A 'KD' COMMAND VERB)
 2. TERMINATE AFTER A SPECIFIED NUMBER OF MINUTES
 3. TERMINATE AFTER A SPECIFIED NUMBER OF ERRORS
 4. TERMINATE AFTER A MAXIMUM NUMBER OF PASSES THROUGH THE TESTS
    OR MAXIMUM NUMBER OF SPECIFIC OPERATION CODES (SVC).
 TO ALTER THE TERMINATION MODE, ENTER YES. TO CONTINUE, ENTER NO.

 CHANGE TERMINATION MODE (YES, NO)? NO
```

13. Since some of the disk tests take a long time to complete, you may want to change the termination mode when executing a disk diagnostic session. Enter YES.

    → The following screen displays appear successively:

```
THE 'EXECUTE CONTINUOUSLY' TERMINATION MODE CAUSES THE TASK
TO EXECUTE UNTIL YOU ENTER A KD COMMAND VERB.

ENTER 'YES' TO SELECT THIS TERMINATION MODE.
ENTER 'NO' TO CONTINUE.

EXECUTE CONTINUOUSLY (YES, NO)? NO
```

NOTE

If you select continuous execution, be sure to terminate the task with a Kill Diagnostic Task (KD) command verb and the driver with a Quit Online Diagnostics (QD) command verb when the session has run as long as you want.

```
IF YOU WANT THE DEVICE DIAGNOSTIC TASK TO EXECUTE FOR A NUMBER
OF MINUTES LESS THAN OR EQUAL TO 32767, ENTER THE NUMBER.
IF NOT,  ENTER THE WORD  'IGNORE'.  THE TASK TERMINATES WHEN
THE TIME IS UP. IF THE NUMBER OF MINUTES IS MORE THAN  32767,
ENTER  'R' FOR REJECT AND SELECT THE 'EXECUTE CONTINUOUSLY'
TERMINATION MODE.

ENTER NUMBER OF MINUTES FOR TASK EXECUTION (1..32767)? IGNORE

IF YOU WANT THE TASK TO STOP WHEN A MINIMUM NUMBER OF ERRORS
HAVE OCCURRED, ENTER THE NUMBER. IF NOT, ENTER 'IGNORE'.

ENTER MINIMUM NUMBER OF ERRORS FOR TERMINATION (1..32767)? IGNORE
```

```
IF YOU SELECTED THE TEST EXECUTION MODE,  ENTER  THE  MAXIMUM
NUMBER OF PASSES THROUGH THE  TESTS.   IF  YOU  SELECTED  THE
SPECIFIC SVC OPERATION  EXECUTION  MODE,  ENTER  THE  MAXIMUM
NUMBER OF TIMES TO REPEAT THAT SVC SUBOPCODE. THE DIAGNOSTIC
TASK ENDS WHEN THE NUMBER YOU ENTER IS REACHED.

ENTER NUMBER OF PASSES OR SPECIFIC OPERATIONS (1..32767)? 1
```

14. Accept the default in each case. The default termination is one pass through all the tests. For many sessions, however, you may want to respond YES to the prompt for continuous operation and stop the test at your discretion with a KD command verb.

    → The diagnostics driver now has all the information it needs to start the disk diagnostic task. When the task starts, the driver returns the command prompt (step 6) to the screen.

    The driver is monitoring the diagnostic message queue and can be called back to the terminal with the Command key. If you want to leave the terminal while the tests are executing, be sure that the command prompt is on the screen. It is displayed after execution of either the CQ or SP command verbs. When the task terminates, the following prompt appears:

    DEVICE DIAGNOSTIC XXXX TERMINATED WITH X ERRORS, X PASSES

15. If you want to ensure the task is operating as desired, execute the Show Progress (SP) command verb.

    → A chart appears, showing which tests are operating and the number of errors found. The chart is a dynamic picture that changes as the tests are executed. Paragraph 3.5.5 shows an example of a typical progress chart.

    For the nonextended tests, the SP chart displays a total of four tests as they begin operation. After that, the chart goes blank, indicating that the nonextended tests have completed executing. When that happens, press the Command key. The command verb menu appears with the prompt:

    ENTER COMMAND VERB?

16. During the execution of the disk tests, all diagnostic error and progress messages from the diagnostic task are stored by the driver in the diagnostic history file. To view the history file, enter the Show Diagnostic File (SF) verb.

    → The SF command verb message and prompt appear:

```
YOU HAVE CHOSEN TO DISPLAY A DIAGNOSTIC FILE. ENTER THE NAME OF
THE FILE YOU WISH TO SHOW.
VALID FILES ARE:
  ERRORS    - ONLINE DIAGNOSTIC ERROR FILE
  HISTORY   - ONLINE DIAGNOSTIC HISTORY FILE
  LOG1      - SYSTEM LOG FILE 1
  LOG2      - SYSTEM LOG FILE 2
  SLARPT    - SYSTEM LOG ANALYSIS REPORT FILE

WHILE IN SF MODE, ALL KEYS RESPOND THE SAME AS A SCI SHOW FILE.

ENTER FILE NAME? HISTORY
```

17. Accept the default for the SF command verb prompt. The diagnostic history file is displayed. You can find an example of a history file from a disk diagnostic session in paragraph 3.5.2.1.

    The error messages are extracted from the history file and stored in the diagnostic error file. If you want to see only errors, you can view the error file as indicated in paragraph 3.5.2.2. When you have finished looking at the files, press the Command key to return to the command verb menu.

18. You are now ready to perform the extended read only disk tests. To do so, enter XD, the Execute Diagnostic Task command verb.

    → The following message and prompt appear on the screen:

```
YOU HAVE CHOSEN TO EXECUTE A DIAGNOSTIC TASK. YOU CAN SELECT ALL
AVAILABLE DEVICES, ALL DEVICES OF ONE CLASS (SUCH AS ALL DISKS),
OR ANY ONE SPECIFIC DEVICE. ENTER YOUR SELECTION AS FOLLOWS:

  ALL - SELECTS ALL DEVICES AVAILABLE

  DS  - SELECTS ALL TILINE DISK DEVICES AVAILABLE
  MT  - SELECTS ALL MAG TAPE DEVICES AVAILABLE
  LP  - SELECTS ALL PRINTER DEVICES AVAILABLE
  RP  - SELECTS ALL REMOTE LP810 DEVICES AVAILABLE
  ST  - SELECTS ALL TERMINAL DEVICES AVAILABLE

        REJECT -- RETURN TO COMMAND PROMPT
  COMPLETE DEVICE NAME (ST02, DS01) - SELECTS THAT DEVICE

ENTER DEVICE NAME? ALL
```

19. Enter the device name DS02.

    → A message appears stating that device DS02 has been selected. Device DS02 is being readied for testing.

    → The following message is displayed asking you if you want the nonextended or extended disk tests.

```
DO YOU WANT TO EXECUTE THE EXTENDED DISK TESTS (YES, NO)? YES
```

20. The target disk is still in the ON state, so you can execute either the nonextended disk tests or the extended read only disk tests. You now want to execute the extended read only disk tests, so accept the default value YES.

    → The following screen is displayed asking you if you want to operate your session with all of the default options.

```
THE DEFAULT OPTIONS ARE:
  PRIORITY LEVEL        = 3
  TESTS SELECTED (1-5)  = ALL
  TERMINATION MODE      = 1 PASS

TO SELECT THESE DEFAULT OPTIONS, ENTER YES.
TO SELECT OTHER OPTIONS, ENTER NO.
TO RETURN TO THE COMMAND PROMPT, ENTER 'R' FOR REJECT.

USE DEFAULT OPTIONS (YES, NO)? YES
```

21. Again, you will use the same values listed as the default options. However, to view the available options for the extended read only disk tests, enter NO.

    → The following screen display appears:

```
CHOOSE A NEW PRIORITY FOR THIS TASK.  THE DIAGNOSTIC WILL MAKE
THIS PRIORITY CHANGE WHEN THE TASK IS GIVEN CPU TIME SLICES.

ENTER PRIORITY LEVEL (1, 2, 3)?  3
```

22. Accept the default unless you want to assign a priority level higher than 3.

    → The next display appears as follows:

```
THE FOLLOWING READ TESTS ARE PERFORMED BY THE EXTENDED DISK TASK.

TEST  1 - READ SPECIFIED TRACKS TESTS: FULL TRACK READ WITH CRC CHECK.
TEST  2 - CONSECUTIVE SECTOR SEEKS TEST.
TEST  3 - JITTER SEEK/READ TEST.
TEST  4 - RANDOM SEEK - SEEKS TO RANDOM GENERATED
          TRACK ADDRESSES.
TEST  5 - CRESCENDO SEEK - COMPREHENSIVE TRACK TO
          TRACK SEEK.

ENTER DISK DIAGNOSTIC TEST ( INTEGER,ALL )? ALL
```

23. Again, accept the default.

    → The next prompt to appear is:

```
DEFAULT VALUES FOR THE EXTENDED ''READ ONLY'' TESTS:
  STROBE OFFSETS = NONE
  HEAD OFFSETS   = NONE
  DEFAULT TRACKS = ALL

USE EXTENDED DEFAULT OPTIONS (YES, NO)? YES
```

    To see the explanation of the default values, enter NO. The following messages then appear:

```
TRIDENT AND CD1400 DISKS HAVE ADDITIONAL HARDWARE FEATURES THAT
ALLOW THE DATA STROBE TO BE ADVANCED (EARLY) OR RETARDED (LATE).
THIS IS USED WITH THE READ DATA AND UNFORMATTED READ COMMANDS
TO ATTEMPT TO RECOVER DATA THAT YIELDS ERRORS WHEN READ WITH A
NOMINAL STROBE SETTING.

ENTER STROBES  ( EARLY, LATE, NORMAL )? NORMAL

TRIDENT AND CD1400 DISKS HAVE ADDITIONAL HARDWARE FEATURES THAT
ALLOW OFFSETS IN THE DISK DRIVE HEADS. OFFSET FORWARD MEANS THE
DISK DRIVE HEAD IS OFFSET TOWARD THE SPINDLE. THE PURPOSE OF
THIS IS TO FACILITATE THE RECOVERY OF MARGINAL DATA.

ENTER HEAD OFFSET ( FORWARD, REVERSE, NONE )? NONE
```

```
  THE FOLLOWING TABLE CONTAINS INFORMATION ABOUT DISK HEADS:

DISK TYPE                HEAD RANGE | DISK TYPE              HEAD RANGE
------------------------------------|----------------------------------
FD1000                   0 -  1     |  CD1400 (32mb FIXED)       0
DS31                     0 -  1     |  CD1400 (64mb FIXED)     0 - 2
DS10                     0 -  1     |  CD1400 (96mb FIXED)     0 - 4
DS25                     0 -  4     |  WD500  (FLOPPY)         0 - 1
DS50                     0 -  4     |  WD500  (FIXED)          0 - 3
DS80                     0 -  4     |  WD800  (2 PLATTERS)     0 - 2
DS200                    0 - 18     |  WD800  (4 PLATTERS)     0 - 6
DS300                    0 - 18     |
CD1400 (32mb REMOVABLE)    0        |

ENTER STARTING HEAD ( 0..MAX )? 0

  THE FOLLOWING TABLE CONTAINS INFORMATION ABOUT DISK HEADS:

DISK TYPE                HEAD RANGE | DISK TYPE              HEAD RANGE
------------------------------------|----------------------------------
FD1000                   0 -  1     |  CD1400 (32mb FIXED)       0
DS31                     0 -  1     |  CD1400 (64mb FIXED)     0 - 2
DS10                     0 -  1     |  CD1400 (96mb FIXED)     0 - 4
DS25                     0 -  4     |  WD500  (FLOPPY)         0 - 1
DS50                     0 -  4     |  WD500  (FIXED)          0 - 3
DS80                     0 -  4     |  WD800  (2 PLATTERS)     0 - 2
DS200                    0 - 18     |  WD800  (4 PLATTERS)     0 - 6
DS300                    0 - 18     |
CD1400 (32mb REMOVABLE)    0        |

ENTER ENDING HEAD ( 0..MAX )? 0

  THE FOLLOWING TABLE CONTAINS INFORMATION ABOUT DISK CYLINDERS:

DISK TYPE            CYLINDER RANGE | DISK TYPE            CYLINDER RANGE
------------------------------------|------------------------------------
FD1000                  0 -  76     | CD1400 (32mb FIXED)      0 - 820
DS31                    0 - 202     | CD1400 (64mb FIXED)      0 - 820
DS10                    0 - 407     | CD1400 (96mb FIXED)      0 - 820
DS25                    0 - 407     | WD500  (FLOPPY)          0 -  76
DS50                    0 - 814     | WD500  (FIXED))          0 - 149
DS80                    0 - 802     | WD800  (2 PLATTERS)      0 - 650
DS200                   0 - 814     | WD800  (4 PLATTERS)      0 - 650
DS300                   0 - 802     |
CD1400 (32mb REMOVABLE) 0 - 820     |

ENTER STARTING CYLINDER ( 0..MAX )? 0
```

```
   THE FOLLOWING TABLE CONTAINS INFORMATION ABOUT DISK CYLINDERS:

DISK TYPE              CYLINDER RANGE | DISK TYPE             CYLINDER RANGE
--------------------------------------|-------------------------------------
FD1000                    0 -  76     | CD1400 (32mb FIXED)      0 - 820
DS31                      0 - 202     | CD1400 (64mb FIXED)      0 - 820
DS10                      0 - 407     | CD1400 (96mb FIXED)      0 - 820
DS25                      0 - 407     | WD500  (FLOPPY)          0 -  76
DS50                      0 - 814     | WD500  (FIXED))          0 - 149
DS80                      0 - 802     | WD800  (2 PLATTERS)      0 - 650
DS200                     0 - 814     | WD800  (4 PLATTERS)      0 - 650
DS300                     0 - 802     |
CD1400 (32mb REMOVABLE)   0 - 820     |

ENTER ENDING CYLINDER ( 0..MAX )? 0
```

24. After you specify the ending cylinder, a prompt display appears on the screen, asking if you want to change the termination mode.

→ The termination mode message and prompt appear as follows:

```
THE TERMINATION MODES ARE:
 1. EXECUTE CONTINUOUSLY (TASK DOES NOT TERMINATE UNTIL YOU ENTER
    A 'KD' COMMAND VERB)
 2. TERMINATE AFTER A SPECIFIED NUMBER OF MINUTES
 3. TERMINATE AFTER A SPECIFIED NUMBER OF ERRORS
 4. TERMINATE AFTER A MAXIMUM NUMBER OF PASSES THROUGH THE TESTS
    OR MAXIMUM NUMBER OF SPECIFIC OPERATION CODES (SVC).
 TO ALTER THE TERMINATION MODE, ENTER YES. TO CONTINUE, ENTER NO.

 CHANGE TERMINATION MODE (YES, NO)? NO
```

25. Since some of the disk tests take a long time to complete, you may want to change the termination mode when executing a disk diagnostic session. Enter YES.

→ The following screen displays appear successively:

```
THE 'EXECUTE CONTINUOUSLY' TERMINATION MODE CAUSES THE TASK
TO EXECUTE UNTIL YOU ENTER A KD COMMAND VERB.

ENTER 'YES' TO SELECT THIS TERMINATION MODE.
ENTER 'NO' TO CONTINUE.

EXECUTE CONTINUOUSLY (YES, NO)? NO
```

NOTE

If you select continuous execution, be sure to terminate the task with a Terminate Diagnostic Task (KD) command verb and the driver with a Quit Online Diagnostics (QD) command verb when the session has run as long as you want.

```
IF YOU WANT THE DEVICE DIAGNOSTIC TASK TO EXECUTE
FOR A NUMBER OF MINUTES LESS THAN OR EQUAL TO 32767,
ENTER THE NUMBER.  IF NOT, ENTER THE WORD  'IGNORE'.
THE TASK TERMINATES  WHEN  THE  TIME IS  UP.  IF THE
NUMBER OF MINUTES IS MORE THAN 32767,  ENTER 'R' FOR
REJECT  AND  SELECT  THE  'EXECUTE  CONTINUOUSLY'
TERMINATION MODE.

ENTER NUMBER OF MINUTES FOR TASK EXECUTION (1..32767)? IGNORE

IF YOU WANT THE TASK TO STOP WHEN A MINIMUM NUMBER OF ERRORS
HAVE OCCURRED, ENTER THE NUMBER. IF NOT, ENTER 'IGNORE'.

ENTER MINIMUM NUMBER OF ERRORS FOR TERMINATION (1..32767)? IGNORE

IF YOU SELECTED THE TEST EXECUTION MODE,  ENTER  THE  MAXIMUM
NUMBER OF PASSES THROUGH THE  TESTS.   IF  YOU  SELECTED  THE
SPECIFIC SVC OPERATION  EXECUTION  MODE,  ENTER  THE  MAXIMUM
NUMBER OF TIMES TO REPEAT THAT SVC SUBOPCODE. THE DIAGNOSTIC
TASK ENDS WHEN THE NUMBER YOU ENTER IS REACHED.

ENTER NUMBER OF PASSES OR SPECIFIC OPERATIONS (1..32767)? 1
```

26. Accept the default in each case. The default termination is one pass through all the tests. For many sessions, however, you may want to respond YES to the prompt for continuous operation and stop the test at your discretion with a KD command verb.

    → The diagnostics driver now has all the information it needs to start the disk diagnostic task. When the task starts, the driver returns the command prompt (step 6) to the screen.

    The driver is monitoring the diagnostic message queue and can be called back to the terminal with the Command key. If you want to leave the terminal while the tests are executing, be sure that this message is on the screen. It is displayed after execution of the CQ, SP or WD command verbs.

27. If you want to be sure the task is operating as desired, execute the Show Progress of Diagnostic (SP) command verb.

    → A chart appears, showing which tests are operating and the the number of errors found. The chart is a dynamic picture that changes as the tests are executed. Paragraph 3.5.5 shows an example of a typical chart.

    For the extended read only disk tests, the SP chart displays a total of five tests as they begin operation. After that, the chart goes blank, indicating that the nonextended tests have completed executing. When that happens, press the Command key. The command verb menu appears with the prompt:

    ```
    ENTER COMMAND VERB?
    ```

28. During the execution of the disk tests, all diagnostic error and progress messages from the diagnostic task are stored by the driver in the diagnostic history file. To view the history file, enter the Show File (SF) verb.

    → The SF command verb message and prompt appear:

```
YOU HAVE CHOSEN TO DISPLAY A DIAGNOSTIC FILE. ENTER THE NAME OF
THE FILE YOU WISH TO SHOW.
VALID FILES ARE:
  ERRORS  - ONLINE DIAGNOSTIC ERROR FILE
  HISTORY - ONLINE DIAGNOSTIC HISTORY FILE
  LOG1    - SYSTEM LOG FILE 1
  LOG2    - SYSTEM LOG FILE 2
  SLARPT  - SYSTEM LOG ANALYSIS REPORT FILE

WHILE IN SF MODE, ALL KEYS RESPOND THE SAME AS A SCI SHOW FILE.

ENTER FILE NAME? HISTORY
```

29. Accept the default for the SF command verb prompt. The diagnostic history file is displayed. You can find an example of a history file from a disk diagnostic session in paragraph 3.5.2.1.

    The error messages are extracted from the history file and stored in the diagnostic error file. If you want to see only errors, you can view the error file as indicated in paragraph 3.5.2.2.

    Since both the diagnostic history and error files are erased the next time you initiate the driver, you may want to make a permanent copy of the history file.

    You can copy the diagnostic history or error file in either one of two ways:

    - Use the Copy Concatenate (CC) command to copy the file to a permanent file.
    - Use the Print File (PF) command to print a copy of the file contents.

    You cannot do either of these procedures while the diagnostic session is in operation. You must first end it with a QD command verb.

30. If you are sure the tests have completed execution, terminate the driver with the QD verb.

→ The following screen display appears:

```
DEVICE xxxx TERMINATION STARTED.

DEVICE xxxx TERMINATED WITH nnnnn ERRORS, nnnnn PASSES.

DNOS ONLINE DIAGNOSTICS COMPLETED EXECUTION.

TOTAL NUMBER OF ERRORS REPORTED = nn:
```

where:

xxxx is the device name of each target device.

nnnnn represent the appropriate decimal numbers.

31. When the last message and the cursor appear on the screen, the driver has terminated. Press the Return key.

→ The SCI menu and cursor position will be displayed.

32. Copy the diagnostic history file and/or error file if desired. Use the following pathnames:
    - volumename.S$ODIAG.HISTORY
    - volumename.S$ODIAG.ERRORS

4.3.2 Performing the Extended Write Disk Tests

If you suspect that the trouble is in the disk drive itself, execute the extended write disk tests on the same disk drive with a scratch disk in it. For this demonstration session, enter a UV command and remove the disk that you have just tested. Place a scratch disk in disk drive DS02. Do not perform an IV command. Tests 10 through 13 are designed to run on a volume that is not installed.

Follow steps 1 through 4 in the previous example (paragraph 4.3) to log on and to activate the Online Diagnostics Driver. For the following example, all prompts are displayed as they would be without the long message format. Remember that if you have a question at any point during the diagnostic session, you can enter H, ?, or HELP and press the Return key to obtain the same information for the currently displayed prompt as you can see with the long message format.

Once the command verb prompt is displayed, verify that the disk drive is in the DIAG state. Proceed to step 1 to check the device state as follows:

1. The command prompt is on the screen display. Execute the Show System Device List (SD) command verb.

   → The following is an example of the device state information that appears:

   ```
   DEVICE   STATE        AVAILABLE FOR TEST
   ----------------------------------------

   DS01     ONLINE       YES
   DS02     ONLINE       YES
   DS03     OFFLINE      NO
   LP01     OFFLINE      NO
   ST01     ONLINE       NO
   (etc.)
   ```

2. In this example, disk drive DS02 is available for testing because it is in the online state. To execute the extended write tests, however, it must be in the diagnostic state. To change the device state, first return to the command prompt by pressing the Command key. Then execute the Change Device State to DIAG (DIAG) command verb. Remember that you cannot change a device from the offline state to the diagnostic state while the driver is activated. If the device is offline, you must place it in the online (ON) or diagnostic (DIAG) state before the diagnostic session starts.

   → The following prompt is displayed:

   ```
   ENTER DEVICE NAME? ALL
   ```

3. Enter DS02.

   → The following display appears on the screen:

   ```
   DEVICE DS02 IS SELECTED.
   ONLINE DRIVER AVAILABLE -- PRESS 'COMMAND' FOR NEXT COMMAND VERB
   ```

4. Press the Command key. The ENTER COMMAND VERB? prompt appears. Since you want the driver to initiate only the diagnostic task for a disk drive, not all of the tasks, enter XD, the Execute Diagnostic Task command verb.

   → The following prompt appears on the screen:

   ```
   ENTER DEVICE NAME? ALL
   ```

5. Enter the device name DS02.

   → A message stating that device DS02 has been selected appears. Device DS02 is being readied for testing.

   → The following message is displayed asking you if you want the nonextended or extended disk tests.

```
DO YOU WANT TO EXECUTE THE EXTENDED DISK TESTS (YES, NO)? YES
```

   → Since the target disk is now in the DIAG state, you can only execute the extended write disk tests. Accept the default value. Since DS02 is now in the DIAG state, the following prompts appear:

```
** THE DISK WRITE TESTS HAVE BEEN SELECTED!!!
** ALL DISK DATA MAY BE DESTROYED!!
   DO YOU WISH TO CONTINUE (YES, NO)? NO
```

6. Enter YES.

   → The next extended write disk test prompt appears:

```
**** WARNING *** WARNING *** WARNING *** WARNING *** WARNING ****
THE EXTENDED WRITE TESTS WILL DESTROY ALL DATA AREAS ON THE DISK!
ARE YOU SURE YOU WANT TO EXECUTE THESE TESTS (YES, NO)? NO
```

7. Enter YES.

   → The following screen is displayed asking if you want to operate your session with all of the default options.

```
USE DEFAULT OPTIONS (YES, NO)? YES
```

8. Even though you want to use the default options, enter NO in order to see the options available when executing the extended write disk tests.

   → The following screen display appears:

```
ENTER PRIORITY LEVEL (1, 2, 3)?  3
```

9. Accept the default unless you want to assign a priority level higher than 3.

   → The next display appears as follows:

```
ENTER DISK DIAGNOSTIC TEST ( INTEGER, ALL )? ALL
```

10. To see what tests are available as extended write tests, enter H or HELP.

   → The next display appears as follows:

```
THE FOLLOWING WRITE TESTS ARE PERFORMED BY THE EXTENDED DISK TASK.

NOTE: USE SCRATCH MEDIA AND THE DISK IN DIAGNOSTIC STATE TO
      EXECUTE THE FOLLOWING TESTS.

TEST  10 - COMMAND VERIFICATION/ID ERROR CHECK
TEST  11 - FORMAT DISK/TRACKS
TEST  12 - WRITE/READ/COMPARE TRACKS
TEST  13 - COMPREHENSIVE WRITE/SEEK/READ

ENTER DISK DIAGNOSTIC TEST ( INTEGER,ALL )? ALL
```

11. Enter either 10, 11, 12, or 13, or press the Return key to accept the default.

   → The next prompt appears as follows:

```
DO YOU WISH TO DESTROY THE SYSTEM BAD TRACK MAP (YES, NO)? NO
```

   Accept the default value of NO.

   → The next display appears as follows:

```
USE EXTENDED DEFAULT OPTIONS (YES, NO)? YES
```

   Enter NO to see the default values.

   → The following prompts for the individual tests are displayed successively if you enter NO:

```
ENTER WRITE DATA PATTERN (0..0FF HEX)? 0DB67

ENTER STARTING HEAD (0..MAX)? 0

ENTER ENDING HEAD (0..MAX)? 0

ENTER STARTING CYLINDER (0..MAX)? 0

ENTER ENDING CYLINDER (0..MAX)? 0
```

12. Accept the defaults for format verification, and the data pattern. Enter strobes, offset, and beginning and ending heads and cylinders. You can enter values for heads and cylinders, or accept the default values of zero.

   → The screen display appears asking if you wish to change the termination mode.

13. Accept defaults for termination mode as in steps 24 to 26 in the preceding diagnostic session.

    → The diagnostic driver now has all the information it needs to start the extended write disk diagnostic task. When the task has been started, the driver returns the command prompt to the terminal.

14. Monitor the files to observe messages, enter the QD command verb, and copy the diagnostic history and/or error files if you want, as explained in steps 30 to 32 in the previous example.

15. Return disk drive DS02 to the online state using the SCI ON command.

5

Diagnostic Test Descriptions

5.1 GENERAL INFORMATION

Each diagnostic task executes a series of tests for a device class. When devices within a class vary in operating characteristics, the tests performed on those devices must also vary. Since some device models require custom designed tests, the diagnostic task for that device class must be able to distinguish each model and select the program module to execute the appropriate tests. For disks, tapes, and memory, when you specify device class at the beginning of the diagnostic session, the diagnostic task will execute the same tests on every model that is configured on the system. For line printers and terminals, however, when you specify class alone, the diagnostic task will execute different tests on different models, or more than one diagnostic task will be executed.

This section contains information on every test executed by every diagnostic task. The device classes are treated in the order listed in Table 5-1. Within each class, individual models are listed when the tests that exercise them are custom designed. The tests are listed in the order in which they run when all tests are executed.

Table 5-1. Device Class Order

Paragraph	Device Class	Class Mnemonic
5.2	Line printers	LP or RP
	Keyboard devices:	
5.3	820 KSR terminal	ST
5.4	Video terminals	ST
5.5	Disks	DS
5.6	Magnetic tapes	MT
5.7	Memory	MM

The paragraphs dealing with each device class include the following information:

- A table for each device or device class showing the test name, the test number, and other necessary information
- A description of each test that runs on that device or device class
- Information on interpreting the results of each test

5.2 LINE PRINTERS

The diagnostic task for all line printers provides hard-copy results that you must evaluate. Monitoring the control terminal during the execution of line printer tests can only tell you whether the tests are running. Errors show up on the paper output produced by the printer during the task execution. Different tests are performed on different line printer models. Appendixes B, C, D, F, and G show examples of hard-copy output for each test exercised by the diagnostic task for each line printer model.

The following models of line printers are supported by Online Diagnostics and the System Log Analysis Task:

- LP810
- LP840
- LP850 (CPTESTS)
- LP2230/LP2260
- LP300/LP600

If you enter the device class mnemonic (LP) when you start the diagnostic session, all of the line printer models in the diagnostic state on your system are selected for testing. You must be sure that all of the printers you want tested, and only those, are in the diagnostic state. If other printers are also in the diagnostic state, you must specify each printer you want tested separately.

NOTE

Be sure that the spooler is off before putting any printers into the diagnostic state.

5.2.1 LP810 — 810 Line Printer

The LP810 diagnostic task executes 11 noninteractive tests for a Model 810 printer classified as either an LP (Line Printer) or RP (Remote Printer) device. Table 5-2 lists the tests of the LP810 diagnostic.

Table 5-2. LP810 Tests

Test Number	Test Name
1	Form Length and Feed
2	Character Set
3	Ripple Pattern
4	Buffer Length
5	Carriage Return
6	Tab to Line
7	Set and Test Vertical Tabs
8	Tab to Address
9	Set and Test Horizontal Tabs
10	Lines and Characters per Inch
11	Bell

To begin the LP810 diagnostic, enter the name of the target printer in response to the ENTER DEVICE NAME? prompt of the Execute Diagnostic Task (XD) command verb, as follows:

```
ENTER DEVICE NAME? ALL
LPxx
```

or

```
ENTER DEVICE NAME? ALL
RPxx
```

where:

LP, RP identify the line printer diagnostic task.

xx is the device number of the particular 810 to be tested.

5.2.1.1 Test 1 — Form Length and Feed. Test 1 checks for accuracy in form length and feed. The forms in the printer must be properly aligned to the top of the form before Test 1 begins. Test 1 performs the following:

1. The form length is set to 33 lines, followed by a form feed.
2. The message THIS LINE IS AT THE CENTER OF THE FORM is printed.
3. The form length is set to 99 lines, followed by a form feed.
4. The message THIS LINE IS AT THE TOP OF THE FORM is printed.
5. The form length is set to 64 lines, followed by a form feed.
6. The message THIS LINE IS AT THE BOTTOM OF THE FORM is printed.
7. The form length is set to 66 lines, followed by a form feed.
8. The message THIS LINE IS AT THE TOP OF THE FORM is printed.

Check the positions of the printed messages to ensure they are correct.

5.2.1.2 Test 2 — Character Set. Test 2 prints all of the characters in the LP810 character set in a block format as shown in Figure 5-1.

These block letters represent the dot-matrix structure of the LP810 output. The dot-matrix structure is shown in the *Model 990 Computer Model 810 Line Printer Installation and Operation* manual.

In Figure 5-1, each letter that makes up a block letter represents one dot. Compare the structure of the block letters to the structure of the individual letters making up the block letter. The dot-matrix structure of the individual letter A also has two dots across the top and three dots across the center. The large block letter A has two characters across the top and three characters across the center. Since the comparison is correct, the character A is printing correctly.

```
   A A       B B B B       C C C     D D D D
  A   A       B      B   C       C    D      D
 A     A      B      B   C            D      D
A       A     B  B B     C            D      D
A A A A A     B      B   C            D      D
A       A     B      B   C       C    D      D
A       A    B B B B       C C C     D D D D
```

Figure 5-1. LP810 Character Set Test Example

5.2.1.3 Test 3 — Ripple Pattern. Test 3 prints 94 lines of a ripple pattern of all available non-graphic characters, as shown in Figure 5-2. Since each character appears in each print position at least once, you can examine the output for problems such as characters not printing in certain positions. The width of the ripple pattern is determined by the response to the ENTER PAPER WIDTH prompt of the XD command verb.

5.2.1.4 Test 4 — Buffer Length. To determine the maximum buffer length, Test 4 uses the paper width you specified in the XD command verb. The buffer length test prints the character string PRINTER*BUFFER*TEST, beginning with only the first two characters. Each successive line increases by two characters until the maximum buffer length is reached. Then the test reverses and prints from the maximum buffer length back to the first two characters.

5.2.1.5 Test 5 — Carriage Return. Test 5 prints a sentence with every other character missing, followed by a carriage return to the same line. Then, the same sentence is printed again with the opposite characters missing, followed by another carriage return. The full sentence THIS LINE IS PRINTED IN TWO PASSES is the result.

```
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnop
"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopq
#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqr
$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrs
%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrst
&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstu
'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuv
()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvw
)*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwx
*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxy
+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz
,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{
-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|
./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}
/0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~
0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!
123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"
23456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#
3456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$
456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%
56789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&
6789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'
789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'(
89:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()
9:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*
:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+
;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,
<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-
```

Figure 5-2. Ripple Pattern Test Output

5.2.1.6 Test 6 — Tab to Line. Test 6 prints the following message:

```
THIS TEXT SHOULD BE AT LINE x
```

This message prints on the following lines:

2, 3, 5, 9, 17, 33, 49, 57, 61, 63, 64

The variable x is the line number where the message is printed. For example, the first line printed by the test is as follows:

```
THIS TEXT SHOULD BE AT LINE 2
```

When the forms are properly aligned in the LP810, the line numbers should be correct.

5.2.1.7 Test 7 — Set and Test Vertical Tabs. Test 7 sets the vertical tab stops as follows:

2, 3, 5, 9, 17, 33, 49, 57, 61, 63, 64

The test causes the printer to tab to each of these stops. After each tab stop, the following message is printed:

```
THIS TEXT SHOULD BE AT LINE x
```

The variable x is the tab stop number where the message is printed. For example, the test tabs to vertical tab stop 2, and prints the following message:

```
THIS TEXT SHOULD BE AT LINE 2
```

5.2.1.8 Test 8 — Tab to Address. Test 8 prints lines of reference numbers that identify the horizontal columns of the paper. The test sets addresses and prints an up arrow (↑) at each address.

The test prints the following message:

```
ARROWS SHOULD BE IN FOLLOWING COLUMNS:
```

The test prints a list of the addresses below this message. You must verify that the arrows are in the correct columns.

5.2.1.9 Test 9 — Set and Test Horizontal Tabs. Test 9 prints lines of reference numbers that identify the columns of the paper. The test sets horizontal tab stops and prints an up arrow at each tab stop.

The test prints the following message:

```
ARROWS SHOULD BE IN FOLLOWING COLUMNS:
```

The test prints a list of the tab stops below this message. You must verify that the arrows are in the correct columns.

5.2.1.10 Test 10 — Lines and Characters per Inch. Test 10 prints the following:

1. 8 lines of 10 characters at 8 lines per inch (lpi) and 10 characters per inch (cpi)
2. 6 lines of 10 characters at 6 lpi and 10 cpi
3. 8 lines of 17 characters at 8 lpi and 16.5 cpi
4. 6 lines of 17 characters at 6 lpi and 16.5 cpi

The message BLOCK IS x CHRS/INCH AND n LINES/INCH is printed before each output group. For example, 8 lines of 10 characters printed at 8 lpi and 10 cpi appear as a square after the following message:

```
BLOCK IS 10 CHRS/INCH AND 8 LINES/INCH
```

You must verify that the output is approximately one inch square to determine that it is correct.

5.2.1.11 Test 11 — Bell. Test 11 sounds the printer alarm for three seconds and prints the following message:

```
PRINTER BELL SHOULD SOUND FOR 3 SECONDS
```

5.2.2 LP840 — 840 Receive-Only Printer

The diagnostic task that tests the Model 840 Receive-Only (RO) Printer executes 4 tests on the basic 840 with no options and 14 tests on the 840 with the device forms control (DFC) option.

Table 5-3 lists the 14 tests that execute on the LP840 with the DFC option. The first four of the tests can execute on the LP840 without the DFC option. Test 14 is interactive and requires input at the target terminal.

Table 5-3. LP840 Tests

Test Number	Test Name
1	Character Set
2	Ripple Pattern
3	Buffer Length
4	Carriage Return
5	Form Length and Feed
6	Tab to Line
7	Set and Test Vertical Tabs
8	Remote On/Off
9	Set and Test Horizontal Tabs
10	Lines and Characters per Inch
11	Bell
12	Left and Right Margins
13	Top and Bottom Margins
14	Answerback Memory

To begin the LP840 diagnostic task, enter the name of the target printer in response to the ENTER DEVICE NAME? prompt of the XD command verb, as follows:

```
ENTER DEVICE NAME?  ALL
LPxx
```

where:

LP identifies the line printer diagnostic task.

xx is the device number of the particular 840 to be tested.

The following message and prompt appear on the screen:

```
THE DEVICE/FORMS CONTROL OPTION NEEDS TO BE INSTALLED
IN ORDER TO EXECUTE TEST NUMBERS 5 THRU 14.  FOR MORE
DETAILS SEE THE TEST DESCRIPTIONS IN THE USER'S GUIDE
AND THE LP840 INSTALLATION AND OPERATIONS MANUAL.

IS THE DEVICE/FORMS CONTROL OPTION INSTALLED (YES,NO)? NO
```

Your response to the prompt determines whether the diagnostic task can execute Tests 1 through 4 or 1 through 14.

5.2.2.1 Test 1 — Character Set. Test 1 prints all of the characters in the LP840 character set in a block format, as shown in Figure 5-1 for the LP810 character set. These block letters represent the dot-matrix structure of the LP840 output.

In Figure 5-1, each letter that makes up a block letter represents one dot. Compare the structure of the block letters to the structure of the individual letters making up the block letter. The dot-matrix structure of the individual letter A has two dots across the top and three dots across the center. The large block letter A also has two characters across the top and three characters across the center. Since the comparison is correct, the character A is printing correctly.

5.2.2.2 Test 2 — Ripple Pattern. Test 2 prints 94 lines of a ripple pattern of all available non-graphic characters, as shown in Figure 5-2 for the LP810. Since each character appears in each print position at least once, you can examine the output to verify that the 840 RO printer can print all characters in all columns. The width of the ripple pattern is determined by the response to the ENTER PAPER WIDTH prompt of the XD command verb.

5.2.2.3 Test 3 — Buffer Length. To determine the maximum buffer length, Test 3 uses the paper width you specified in the XD command verb. The buffer length test prints the character string PRINTER*BUFFER*TEST, beginning with only the first two characters. Each successive line increases by two characters until the maximum buffer length is reached. Then, the test reverses and prints from the maximum buffer length back to the first two characters.

5.2.2.4 Test 4 — Carriage Return. Test 4 prints a sentence with every other character missing, followed by a carriage return to the same line. Then, the same sentence is printed again with the opposite characters missing, followed by another carriage return. The full sentence THIS LINE IS PRINTED IN TWO PASSES is the result.

5.2.2.5 Test 5 — Form Length and Feed: Test 5 checks for accuracy in form length and feed. The forms in the printer must be properly aligned to the top of the form before Test 5 begins. Test 5 performs the following:

1. The form length is set to 33 lines, followed by a form feed.
2. The message THIS LINE IS AT THE CENTER OF THE FORM is printed.
3. The form length is set to 99 lines, followed by a form feed.
4. The message THIS LINE IS AT THE TOP OF THE FORM is printed.
5. The form length is set to 64 lines, followed by a form feed.
6. The message THIS LINE IS AT THE BOTTOM OF THE FORM is printed.
7. The form length is set to 66 lines, followed by a form feed.
8. The message THIS LINE IS AT THE TOP OF THE FORM is printed.

Check the positions of the printed messages to ensure they are correct.

5.2.2.6 Test 6 — Tab to Line. Test 6 prints the following message:

```
THIS TEXT SHOULD BE AT LINE x
```

This message prints on the following lines:

2, 3, 5, 9, 17, 33, 49, 57, 61, 63, 64

The variable x is the line number where the message is printed. For example, the first line printed by the test is as follows:

```
THIS TEXT SHOULD BE AT LINE 2
```

When the forms are properly aligned in the LP810, the line numbers should be correct.

5.2.2.7 Test 7 — Set and Test Vertical Tabs. Test 7 sets the vertical tab stops as follows:

2, 3, 5, 9, 17, 33, 49, 57, 61, 63, 64

The test causes the printer to tab to each of these stops. After each tab stop, the following message is printed:

```
THIS TEXT SHOULD BE AT LINE x
```

The variable x is the tab stop number where the message is printed. For example, the test tabs to vertical tab stop 2, and prints the following message:

```
THIS TEXT SHOULD BE AT LINE 2
```

5.2.2.8 Test 8 — Remote On/Off. Test 8 issues the printer-off command to the 840 RO and then sends it three messages to print. The task then issues the printer-on command and gives the printer three more messages to print. If the remote on and off feature is operating correctly, the following lines will be printed:

```
THIS MESSAGE SHOULD APPEAR ONLY 3 TIMES.
THIS MESSAGE SHOULD APPEAR ONLY 3 TIMES.
THIS MESSAGE SHOULD APPEAR ONLY 3 TIMES.
```

An invalid printout may indicate a faulty DFC ROM or ROM interface.

5.2.2.9 Test 9 — Set and Test Horizontal Tabs. Test 9 prints lines of reference numbers that identify the columns of the paper. The test sets horizontal tab stops and prints an up arrow at each tab stop. It then prints the following message:

```
ARROWS SHOULD BE IN FOLLOWING COLUMNS:
```

The test prints a list of the tab stops below this message. You must verify that the arrows are in the correct columns.

5.2.2.10 Test 10 — Lines and Characters per Inch. Test 10 prints the following:

1. 8 lines of 10 characters at 8 lpi and 10 cpi.
2. 6 lines of 10 characters at 6 lpi and 10 cpi.
3. 8 lines of 17 characters at 8 lpi and 16.5 cpi.
4. 6 lines of 17 characters at 6 lpi and 16.5 cpi.

The message BLOCK IS x CHRS/INCH AND n LINES/INCH is printed before each output group. For example, 8 lines of 10 characters printed at 8 lpi and 10 cpi appear as a square after the following message:

```
BLOCK IS 10 CHRS/INCH AND 8 LINES/INCH
```

You must verify that the output is approximately one inch square to determine that it is correct.

5.2.2.11 Test 11 — Bell. Test 11 sounds the printer alarm for three seconds and prints the following message:

```
PRINTER BELL SHOULD SOUND FOR 3 SECONDS
```

5.2.2.12 Test 12 — Left and Right Margins. Test 12 exercises the terminal's ability to modify the left and right margins. A row of column numbers is printed across the top of a page. The left and right margins are set to 10 and 50, respectively. Lines of Xs are printed. For every set of lines, the margins are increased by 10. The first set of lines of Xs are printed between columns 10 and 50, the next set between columns 20 and 60, and the next set between columns 30 and 70. An invalid printout may indicate a faulty DFC ROM or ROM interface.

5.2.2.13 Test 13 — Top and Bottom Margins. Test 13 exercises the terminal's ability to modify the top and bottom margins. The task sets the form length to 33, the top and left margins to 10, and the bottom and right margins to 20. It prints Xs, producing 121 Xs in an 11-by-11 array.

The last X printed causes a form feed to line 43. If the bottom margin has been set correctly, no change will take place. The task then increases the bottom margin to 30, and prints Xs again. This time the array will be 11-by-21 and will contain 231 Xs. The task then resets the margins to normal settings. An invalid printout may indicate a faulty DFC ROM or ROM interface.

5.2.2.14 Test 14 — Answerback Memory. Test 14 is an interactive test which requires input from the target terminal. You should preprogram the answerback memory with up to 32 characters. For information on programming the ABM, see the *Model 990 Computer Model 840 RO Printer Installation and Operation Manual.* When Test 14 executes, the answerback memory contents are read and printed. For the LP840 to print the output of the answerback memory test, configuration codes 72 and 82 must be set; check at your terminal before the test starts to ensure that these codes are set.

5.2.3 CPTEST — Model 850 Printer

CPTEST is a diagnostic task comprised of 15 tests for verifying the correct operation of the Model 850 Printer. Table 5-4 lists the 15 tests that execute on the LP850.

NOTE

CPTEST can also be executed on the model 810 Printer, using the option LP850.

Table 5-4. CPTEST Tests

Test Number	Test Name
1	Character Set Test
2	Ripple Dump Test
3	Buffer Test
4	Jitter Test
5	Jitter Interval Test
6	Center Out Test
7	Alternating Left to Right Test
8	Alternating Right to Left Test
9	Interplaced Jitter Test
10	Overstrike Test
11	Alternating Overstrike Test
12	Random Print Test
13	Left to Right Inverted Strike Test
14	Right to Left Inverted Strike Test
15	Black Line Test

To begin the CPTEST diagnostic task, enter the name of the target printer in response to the ENTER DEVICE NAME? prompt of the XD command verb, as follows:

ENTER DEVICE NAME? ALL
LPxx

where:

LP identifies the line printer diagnostic task.

xx is the device number of the particular 850 to be tested.

5.2.3.1 Test 1 — Character Set. Test 1 prints a row of each non-graphic character available to the 850 printer as shown in Figure 5-3.

5.2.3.2 Test 2 — Ripple Dump Test. Test 2 prints 94 lines of a ripple pattern of all available nongraphic characters, as shown in Figure 5-4. Since each character appears in each print position at least once, you can examine the output for problems such as characters not printing in certain positions. The width of the ripple pattern is determined by the response to the ENTER PAPER WIDTH prompt of the XD command verb.

5.2.3.3 Test 3 — Buffer Test. Test 3 begins by printing a single character on a line, and then increasing the number of characters printed on each succeeding line by one until reaching the paper width you specified in the XD command verb. At this point, the test decrements by one the number of characters printed on each succeeding line until only one character is printed.

NOTE

Tests 4 through 14 require you to select a character to be printed by answering the prompt:

SELECT CHARACTER TO BE PRINTED:

Enter the character that you desire *twice*, since certain single character entries (H for HELP, R for REJECT) are interpreted as control characters by the ODD.

All CPTEST examples are explained in terms of 80 column wide paper. The tests actually use a column width based on your response to the ENTER PAPER WIDTH prompt of the XD command verb (80 through 132).

```
TEST 1 - CHARACTER SET TEST

!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""""

################################################################################
$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$
%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
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''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''''

((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((((
))))))))))))))))))))))))))))))))))))))))))))))))))))))))))))))))))))))))))))))))
********************************************************************************
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,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
--------------------------------------------------------------------------------

................................................................................
////////////////////////////////////////////////////////////////////////////////
```

Figure 5-3. CPTEST Character Set Test Example

```
TEST 2 - RIPPLE TEST

!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghi
"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghij
#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijk
$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijkl
%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklm
&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmn
'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmno
()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnop
)*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopq
*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqr
+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrs
,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrst
-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstu
./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuv
/0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvw
0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwx
123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxy
23456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz
3456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{
456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|
56789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}
```

Figure 5-4. Ripple Dump Test Output

5.2.3.4 Test 4 — Jitter Test. Test 4, the jitter test, prints a character on the far left (column one) and then prints a character in the far right column (column 80). Then the test increments the far left column number by one and prints a character in that column (column two would be next). Then the test decrements the far right column number and prints a character in that column (column 79). This alternating pattern is continued until characters have been printed in the two center columns, 40 and 41.

5.2.3.5 Test 5 — Jitter Interval Test. The jitter interval test first examines the line width for your 850 printer. It then divides that numeric value (80, 132, and so on) by 20, and determines the integer value of the quotient. For example, if the line width for your 850 printer is 132, the test divides 132 by 20, obtaining 6 as the integer value of the quotient. If the line width of your printer is 80, the quotient would be 4. The test then divides the line to be printed into a number of segments equivalent to the integer value of the quotient from the first portion of the test. Finally, the jitter interval test performs a jitter test on each segment, one at a time.

5.2.3.6 Test 6 — Center Out Test. This test performs a reverse function to the jitter test. The test first prints a character in the centermost column of the left hand half of the printer paper (column 40). It then prints a character in the centermost column of the right hand half of the printer paper (column 41). At this point, the center out test alternates between decrementing the left hand column numbers and printing a character and incrementing the right hand column numbers and printing a character. The test prints characters in columns according to this pattern:

40, 41, 39, 42, 38, 43, 37, 44, . . .

This process continues until a character is printed in column 80.

5.2.3.7 Test 7 — Alternating Left to Right Test. In a manner similar to the immediately previous tests, Test 7 prints a preselected character in an alternating left to right pattern. The test first prints a character in the column 1. Next it prints a character in the first column of the right hand half of the printer paper (column 41). At this point, the center out test alternates between incrementing the left hand column numbers and printing a character and incrementing the right hand column numbers and printing a character. The test prints characters in columns according to this pattern:

1, 41, 2, 42, 3, 43, 4, 44, . . .

This process continues until a character is printed in column 80.

5.2.3.8 Test 8 — Alternating Right to Left Test. Test 8 is the reverse of Test 7. The alternating right to left test prints a preselected character in an alternating right to left pattern, beginning with column 80. Next it prints a character in the last column of the left hand half of the printer paper (column 40). Having established this pattern, the test alternates between decrementing the right hand column numbers and printing a character and decrementing the left hand column numbers and printing a character. The test prints characters in columns according to this pattern:

80, 40, 79, 39, 78, 38, 77, 37, . . .

This process continues until a character is printed in column 41.

5.2.3.9 Test 9 — Interplaced Jitter Test. Test 9 is a variation of the jitter test. The interplaced jitter test prints whatever character you select in the far left column (column one) and then prints the character in the far right column (column 80). Next, the test increments the far left column number by two and prints the selected character in that column (column three would be next). Then the test decrements the far right column number by two and prints the selected character in that column (column 78). This alternating pattern is continued until the selected character is printed in column 40. At this time, the test begins its second half. Using the same character you previously selected, the test prints the same pattern, beginning with column 2 and continuing until it prints the selected character in column 41. Therefore, the test prints characters in columns according to this pattern:

1, 80, 3, 78, 5, 76, . . . 40, 2, 79, 4, 77, 6, 75 . . . 41

5.2.3.10 Test 10 — Overstrike Test. The overstrike test prints the character H in every column, from column one through column 80, in order. After a carriage return, the test repeats itself, overstriking the previously printed H's.

5.2.3.11 Test 11 — Alternating Overstrike Test. The alternating overstrike test prints an H character in column one, skips to column 40, and prints an H character there. After incrementing column one, the test prints an H character in that column (column two). Next, the test increments column 40 and prints an H character in that column (column 41). The test repeats this left to right pattern until it prints an H character in column 80; then it repeats the entire pattern a second time, overstriking the previously printed line. This completes the first half of Test 11.

The second half of the test issues a line feed and then repeats the first half of the test, alternating from right to left this time. To do this, the test prints an H character in column 80, then column 39, column 79, column 38, and so on until it prints the H character in column 1. This procedure is then repeated, overstriking the previously printed line in the same right to left pattern from column one through column 80. After a carriage return, the test repeats itself, overstriking the previously printed H's.

5.2.3.12 Test 12 — Random Print Test. The random print test prints a full line of characters. However, it prints these characters in random order.

5.2.3.13 Test 13 — Left to Right Inverted Strike Test. The left to right inverted strike test prints a character in column one, and after incrementing this position by two, prints a character in column three. The test then decrements its column position by one and prints a character in column two. At this point the test establishes a pattern of incrementing the column position by three, printing a character, and then decrementing the column position by one, and printing another character. Therefore, the test prints characters in columns according to this pattern:

1, 3, 2, 5, 4, 7, 6, 9 . . . 74, 77, 76, 79, 78, 80

5.2.3.14 Test 14 — Right to Left Inverted Strike Test. Test 14 is the inverse of the previous test. The right to left inverted strike test prints a character in column 80, and after decrementing this position by two, prints a character in column 78. The test then increments its column position by one and prints a character in column 79. At this point the test establishes a pattern of decrementing the column position by three, printing a character, and then incrementing the column position by one, and printing a character. Therefore, the test prints characters in columns according to this pattern:

80, 78, 79, 76, 77, 74, 75, 72 . . . 7, 4, 5, 2, 3, 1

5.2.3.15 Test 15 — Black Line Test. The black line test overstrikes each cursor position several times for one line length, producing a solid black line across the width of the printer paper. In effect, it tests the wires on the printhead.

5.2.4 LP2230/LP2260 — 2230/2260 Line Printers

The diagnostic task that tests the Models 2230 and 2260 Line Printers executes six noninteractive tests. Table 5-5 lists the tests of the LP2230/LP2260 diagnostic task.

Table 5-5. LP2230/LP2260 Tests

Test Number	Test Name
1	Form Length and Feed
2	Character Set
3	Ripple Pattern
4	Buffer Length
5	Hammer Alignment
6	Character Burst

To begin the LP2230/LP2260 diagnostic task, enter the name of the target printer in response to the ENTER DEVICE NAME? prompt of the XD command verb, as follows:

```
ENTER DEVICE NAME?  ALL
LPxx
```

where:

LP identifies the line printer diagnostic task.

xx is the device number of the particular 2230 or 2260 to be tested.

5.2.4.1 Test 1 — Form Length and Feed. Test 1 checks for accuracy in the form feed function of the LP2230/LP2260. Test 1 executes two form feeds and prints the message THIS LINE IS AT THE TOP OF FORM on the first line of each page. You must check this output for accuracy.

5.2.4.2 Test 2 — Character Set. Test 2 prints all of the characters in the 2230/2260 character set in a block format similar to that shown in Figure 5-1 of the LP810 test descriptions. Because the 2230/2260 is not a dot-matrix printer, the block characters do not represent the internal structure of the characters, and Test 2 functions only as an exercise.

5.2.4.3 Test 3 — Ripple Pattern. Test 3 prints 64 lines of a ripple pattern of the characters represented by the ASCII codes >21 through >5F.

NOTE

A right angle bracket (>) preceding a value indicates a hexadecimal value.

Since each character appears in each print position at least once, you can examine the output for problems such as characters that do not print in certain positions. The width of the ripple pattern depends on the paper width you specified in the XD command verb. See Figure 5-2 for an example similar to the output of Test 3 for the LP2260.

5.2.4.4 Test 4 — Buffer Length. To determine the maximum buffer length, Test 4 uses the paper width you specified in the XD command verb. The test prints the character string PRINTER*BUFFER*TEST, beginning with only the first two characters. Each successive line increases by two characters until the maximum buffer length is reached. Then, the test reverses and prints from the maximum buffer length back to the first two characters.

5.2.4.5 Test 5 — Hammer Alignment. Test 5 enables you to isolate defective or misaligned hammers. Test 5 prints a line of hammer and hammer-bank reference numbers, followed by 18 lines of a character and another line of hammer and hammer-bank reference numbers. The first 18 lines of characters contain H, the next 18 lines contain /E, and the last 18 lines contain the hyphen (-). You can identify the malfunctioning hammer by examining the output and locating the hammer and hammer-bank numbers for the characters that do not print correctly.

5.2.4.6 Test 6 — Character Burst. Test 6 prints a full line of each available character on the 2230/2260 line printer, beginning with the exclamation point (!) and ending with the left arrow (←). You can examine the output to ensure that all characters on a line are printing accurately.

5.2.5 LP300/LP600 — 300/600 Line Printers

The diagnostic task that tests and exercises the Model 300 Line Printer and the Model 600 Line Printer executes 15 noninteractive tests. Table 5-6 lists the tests of the LP300/LP600 diagnostic.

Table 5-6. LP300/LP600 Tests

Test Number	Test Name
1	Form Length and Feed
2	Character Set
3	Ripple Pattern
4	Buffer Length
5	Hammer Alignment
6	Eight Lines per Inch
7	Character Burst
8	Solid Black Box
9	Carriage Return and Underline
10	Plot Mode
11	Elongated Characters
12	Delete Characters
13	Electronic Vertical Format Unit
14	Graphic Example Plot
15	TI Logo Plot

To begin the LP300/LP600 diagnostic, enter the name of the target printer in response to the ENTER DEVICE NAME? prompt of the XD command verb, as follows:

```
ENTER DEVICE NAME?  ALL
LPxx
```

where:

LP identifies the line printer diagnostic task.

xx is the device number of the particular 300 or 600 to be tested.

5.2.5.1 Test 1 — Form Length and Feed. Test 1 checks for accuracy in the form feed function of the LP300/LP600. The forms in the printer must be properly aligned to the top of the form before Test 1 begins. Test 1 executes two form feeds and prints the message THIS LINE IS AT THE TOP OF FORM on the first line of each page. You must check this output for accuracy.

5.2.5.2 Test 2 — Character Set. Test 2 prints all of the characters in the 300/600 character set in a block format. The small characters that make up the large character represent the dot matrix of the actual character. (See Figure 5-2, LP810 Test 2.)

5.2.5.3 Test 3 — Ripple Pattern. Test 3 prints 94 lines of a ripple pattern using ASCII codes >21 through >7E. The output of the LP300/LP600 Test 3 is similar to the ripple pattern shown in Figure 5-2 for LP810. Appendix D shows the ripple pattern for an LP600.

Since each character appears in each print position at least once, you can examine the output for problems such as characters not printing in certain positions. The width of the ripple pattern depends on the paper width you specified in the XD command verb.

5.2.5.4 Test 4 — Buffer Length. To determine the maximum buffer length (either 80 or 150 characters), Test 4 uses the paper width you specified in the XD command verb. The test prints the character string PRINTER*BUFFER*TEST, beginning with only the first two characters. Each successive line increases by two characters until the maximum buffer length is reached. Then, the test reverses and prints from the maximum buffer length back to the first two characters.

5.2.5.5 Test 5 — Hammer Alignment. Test 5 enables you to isolate defective or misaligned hammers. It prints a line of hammer and hammer-bank reference numbers, followed by 55 (or 58) lines of a character and another line of hammer and hammer-bank reference numbers. The first 55 lines of characters contain H, the next 58 lines contain E, and the last 58 lines contain the hyphen. You can identify the malfunctioning hammer by examining the output and locating the hammer and hammer-bank numbers for the characters that do not print correctly.

5.2.5.6 Test 6 — Eight Lines per Inch. Test 6 checks the electronic control of the feature of the LP300/LP600 that allows those printers to print eight lines per inch.

5.2.5.7 Test 7 — Character Burst. Test 7 prints a full line of each available character on the LP300/LP600. You can examine the output to ensure that all characters on a line are printing accurately.

5.2.5.8 Test 8 — Solid Black Box. Test 8 prints a three-inch, single-density solid black box using the plot mode of the LP600. (See T8600 in Appendix D.)

5.2.5.9 Test 9 — Carriage Return and Underline. Test 9 repeatedly prints the message *THIS LINE SHOULD BE UNDERLINED* across the full width of the page. It then executes a carriage return and again prints the underlined message. This sequence is repeated until five complete underlined sentences, spanning the width of the page, are printed.

5.2.5.10 Test 10 — Plot Mode. To test the plot mode of the LP300/LP600, Test 10 prints the following across the page: a screen of alternating dots, a solid horizontal line of single-density plot, a solid line of double-density plot, and two rows of alternating vertical lines. (See Appendix D.) The LP300 does not have double-density capability and prints series of double-spaced lines instead of the double-density plot.

5.2.5.11 Test 11 — Elongated Characters. Test 11 causes data placed in the data stream to be printed in elongated characters.

5.2.5.12 Test 12 — Delete Characters. Test 12 checks the delete option of the LP300/LP600. The following sentence is stored in the buffer and the delete option is turned on for the characters in spaces 30 through 45:

```
15 BLANK SPACES SHOULD FOLLOW--ERROR-ERROR--15 BLANK SPACES SHOULD PRECEDE THIS
```

If your delete option is operating correctly, the following sentence appears on your hard-copy test results:

```
15 BLANK SPACES SHOULD FOLLOW                15 BLANK SPACES SHOULD PRECEDE THIS
```

5.2.5.13 Test 13 — Electronic Vertical Format Unit. Test 13 exercises the 14 electronic vertical format unit (EVFU) channels and the paper-slewing operation of LP300/LP600 printers. It causes lines of text (identifying the line number) to be printed by setting appropriate channel numbers for both slewing and vertical tabs. If the line number in the text corresponds to the actual line number of the hard-copy page, the EVFU is operating correctly.

5.2.5.14 Test 14 — Graphic Example Plot. Test 14 exercises the plot mode by producing a graphic representation of r*cos(theta) and r*sin(theta).

5.2.5.15 Test 15 — TI Logo Plot. Test 15 exercises the plot mode by producing a graphic representation of the TI logo.

5.3 KEYBOARD DEVICES: 820 KSR TERMINAL

The ST820 diagnostic task tests only the Model 820 Keyboard Send/Receive (KSR) Terminal devices that have the device/forms control (DFC) option. For more information about the DFC, refer to the *Model 990 Computer Model 820 KSR Data Terminal Installation and Operation* manual.

5.3.1 Introduction

The ST820 diagnostic is composed of 11 noninteractive tests and 1 interactive test. The tests produce hard-copy results that you must evaluate. Examples of the results of all 12 tests are shown in Appendix E. The interactive keyboard test (Test 12) will not execute unless you are present at the target terminal to respond to the prompts. Interactive tests must be asked for specifically. Do not take the default prompts. Monitoring the control terminal during the ST820 tests does not provide meaningful information about the test results. Table 5-7 lists the tests of the ST820 diagnostic.

Table 5-7. ST820 Tests

Test Number	Test Name
1	Form Length and Feed
2	Character Set
3	Ripple Pattern
4	Buffer Length
5	Carriage Return
6	Tab to Line
7	Set and Test Vertical Tabs
8	Tab to Address
9	Set and Test Horizontal Tabs
10	Lines and Characters per Inch
11	Bell
12	Interactive Keyboard

To begin the ST820 diagnostic, enter the name of the target 820 terminal in response to the ENTER DEVICE NAME? prompt of the XD command verb, as follows:

```
ENTER DEVICE NAME? ALL
STxx
```

where:

ST identifies the terminal diagnostic task.

xx is the device number of the particular 820 to be tested.

5.3.2 Test Descriptions

The following paragraphs describe the ST820 diagnostic tests in detail. Tests 1 through 11 are noninteractive. Test 12 is interactive and requires your presence at the target terminal.

5.3.2.1 Test 1 — Form Length and Feed. Test 1 checks for accuracy in form length and feed. The forms in the printer must be properly aligned to the top of the form before Test 1 begins. Test 1 performs the following:

1. The form length is set to 30 lines, followed by a form feed.
2. The message THIS LINE IS AT THE CENTER OF THE FORM is printed.
3. The form length is set to 34 lines, followed by a form feed.
4. The message THIS LINE IS AT THE TOP OF THE FORM is printed.
5. The form length is set to 64 lines, followed by a form feed.
6. The message THIS LINE IS AT THE BOTTOM OF THE FORM is printed.
7. The form length is set to 66 lines, followed by a form feed.
8. The message THIS LINE IS AT THE TOP OF THE FORM is printed.

Check the positions of the printed messages ensure they are correct.

5.3.2.2 Test 2 — Character Set. Test 2 prints all of the characters in the 820 KSR character set in a block format similar to that shown in Figure 5-1 of the LP810 test descriptions.

The block letters represent the dot-matrix structure of the 820 KSR printed output. The dot-matrix structure is shown in the *Model 990 Computer Model 820 KSR Data Terminal Installation and Operation* manual. Compare the dot-matrix structure of the Test 2 output with that shown in the manual.

5.3.2.3 Test 3 — Ripple Pattern. Test 3 prints 94 lines of a ripple pattern consisting of all available nongraphic characters, similar to Figure 5-1 of the LP810 diagnostic. Since each character appears in each print position at least once, you can examine the output for problems such as characters not printing in certain positions. The width of the ripple pattern depends on the paper width you specified in the XD command verb.

5.3.2.4 Test 4 — Buffer Length. To determine the maximum buffer length, Test 4 uses the paper width you specified in the XD command verb. The test prints the character string PRINTER*BUFFER*TEST, beginning with only the first two characters. Each successive line increases by two characters until the maximum buffer length is reached. Then, the test reverses and prints from the maximum buffer length back to the first two characters.

5.3.2.5 Test 5 — Carriage Return. Test 5 prints a sentence with every other character missing, followed by a carriage return to the same line. Then the same sentence is printed again with the opposite characters missing, followed by another carriage return. The full sentence THIS LINE IS PRINTED IN TWO PASSES is the result.

5.3.2.6 Test 6 — Tab to Line. Test 6 prints the following message:

```
THIS TEXT SHOULD BE AT LINE x
```

This message prints on the following lines:

2, 3, 5, 9, 17, 33, 49, 57, 61, 63, 64

The variable x is the line number where the message is printed. For example, the first line printed by the test is as follows:

```
THIS TEXT SHOULD BE AT LINE 2
```

When the forms are properly aligned in the ST820, the line numbers should be correct.

5.3.2.7 Test 7 — Set and Test Vertical Tabs. Test 7 sets the vertical tab stops as follows:

2, 3, 5, 9, 17, 33, 49, 57, 61, 63, 64

The test causes the printer to tab to each of these stops. After each tab stop, the following message is printed:

```
THIS TEXT SHOULD BE AT LINE x
```

The variable x is the tab stop number where the message is printed. For example, the test tabs to vertical tab stop 2, and prints the following message:

```
THIS TEXT SHOULD BE AT LINE 2
```

5.3.2.8 Test 8 — Tab to Address. Test 8 prints lines of reference numbers that identify the horizontal columns of the paper. The test sets addresses and prints an up arrow (↑) at each address. The test prints the following message:

```
ARROWS SHOULD BE IN FOLLOWING COLUMNS:
```

The test prints a list of the addresses below this message. You must verify that the arrows are in the correct columns.

5.3.2.9 Test 9 — Set and Test Horizontal Tabs. Test 9 prints lines of reference numbers that identify the columns of the paper. The test sets horizontal tab stops and prints an up arrow at each tab stop. It then prints the following message:

```
ARROWS SHOULD BE IN FOLLOWING COLUMNS:
```

The test prints a list of the tab stops below this message. You must verify that the arrows are in the correct columns.

5.3.2.10 Test 10 — Lines and Characters per Inch. Test 10 prints the following:

1. 6 lines of 10 characters at 6 lpi and 10 cpi
2. 6 lines of 5 characters at 6 lpi and 5 cpi
3. 6 lines of 17 characters at 6 lpi and 16.5 cpi
4. 6 lines of 8 characters at 6 lpi and 8.25 cpi
5. 3 lines of 10 characters at 3 lpi and 10 cpi
6. 3 lines of 5 characters at 3 lpi and 5 cpi
7. 3 lines of 17 characters at 3 lpi and 16.5 cpi
8. 3 lines of 8 characters at 3 lpi and 8.25 cpi
9. 8 lines of 10 characters at 8 lpi and 10 cpi
10. 8 lines of 5 characters at 8 lpi and 5 cpi
11. 8 lines of 17 characters at 8 lpi and 16.5 cpi
12. 8 lines of 8 characters at 8 lpi and 8.25 cpi
13. 4 lines of 10 characters at 4 lpi and 10 cpi
14. 4 lines of 5 characters at 4 lpi and 5 cpi
15. 4 lines of 17 characters at 4 lpi and 16.5 cpi
16. 4 lines of 8 characters at 4 lpi and 8.25 cpi

The message BLOCK IS x CHRS/INCH AND n LINES/INCH is printed before each output group. For example, 6 lines of 10 characters printed at 6 lpi and 10 cpi appear as a square after the following message:

```
BLOCK IS 10 CHRS/INCH AND 6 LINES/INCH
```

You must verify that the output is approximately one inch square to determine that it is correct.

5.3.2.11 Test 11 — Bell. Test 11 sounds the terminal alarm for three seconds and prints the following message:

```
PRINTER BELL SHOULD SOUND FOR 3 SECONDS
```

5.3.2.12 Test 12 — Interactive Keyboard. Test 12 is an interactive test and uses the test interval timer. You must go to the target terminal and enter the information requested by the screen instructions. The test compares the character read from the keyboard (the entered value) to the character requested by the test (the expected value). When the entered and expected values do not match, an error condition is recognized. The error is noted at the target terminal, and an error message is written to the diagnostic history file.

Test 12 has five categories with several parts for each category. The five categories of Test 12 are as follows:

NOTE

The following list refers to key names as they appear on the actual key cap. No generic key names are used in this list.

Category	Description
1	ASCII KEYS, UPPER CASE LOCK, NO SHIFT The UPPER CASE LOCK key must be in the lower, or locked, position. Do not press the SHIFT key during this category.
2	ASCII KEYS, NO UPPER CASE LOCK, NO SHIFT The UPPER CASE LOCK key must be in the upper, or unlocked, position. Do not press the SHIFT key during this category.
3	ASCII KEYS, NO UPPER CASE LOCK, SHIFT The UPPER CASE LOCK key must be in the upper, or unlocked, position. You must continuously press one SHIFT key throughout this category. The recommended method is to press the SHIFT keys alternately.
4	CTRL KEY COMBINATIONS Category 4 tests certain keys with the CTRL key pressed. You must press the CTRL key throughout this category.
5	FUNCTION KEYS Category 5 tests the function keys Tab, Return, and Line Feed, and also tests the space bar.

Examples of results of all categories of Test 12 are shown in Appendix E. Test 12 prints two columns of information, KEY and CODE. The KEY column names the key you are to press (the expected value), and the CODE column displays the ASCII value of that key (the entered value). When the entered value does not match the expected value, the message *** ERROR *** is written next to the CODE column.

5.4 KEYBOARD DEVICES: VIDEO TERMINALS

The diagnostic task for keyboard devices supports the following four terminal devices:

- 911 video display terminal (VDT)
- 931 VDT
- 940 electronic video terminal (EVT)
- 820 KSR terminal (nonvideo keyboard device — See Paragraph 5.3)

When you initiate the keyboard device diagnostic task by entering ST after the ENTER DEVICE NAME? prompt, all 911 VDTs, 931 VDTs, 940 EVTs, and 820 KSR terminals that are configured on your system and in the diagnostic state are tested. You must ensure that all the terminals you want to test, and only those, are in the diagnostic state. Since most of the tests performed on 820 KSR devices are printer tests, they are described separately in paragraph 5.3 and are not included here.

The ST911, ST931, and ST940 diagnostic tests produce observable results on the target terminal that you must evaluate. Some tests are interactive and require you to respond to prompts at the target terminal. Unless you enter responses at the appropriate time during the tests, the task cannot continue. Monitoring the control terminal during the tests does not provide meaningful information about the test results. You must be at the target terminal to interpret the results.

5.4.1 ST911 — 911 VDT

The ST911 diagnostic exercises the screen and keyboard on the Model 911 Video Display Terminal. It is composed of seven tests, of which five are noninteractive and two are interactive. (Target Terminals do not need to be logged on to have diagnostics run on them.) Table 5-8 lists the tests of the ST911 diagnostic task.

Table 5-8. ST911 Tests

Test Number	Test Name
1	Ones and Zeros
2	Scroll
3	Beeper
4	Intensity
5	Character Generator
6	Nonblinking/Blinking Cursor (Interactive)
7	Interactive Keyboard

To begin the ST911 diagnostic task, enter the name of the target 911 VDT in response to the ENTER DEVICE NAME? prompt of the XD command verb, as follows:

```
ENTER DEVICE NAME? ALL
STxx
```

where:

ST identifies the terminal diagnostic task.

xx is the device number of the particular 911 to be tested.

You can enter a particular device or accept the default (ALL). Messages and prompts appear as follows:

```
DEVICE STxx HAS BEEN SELECTED.

USE DEFAULT OPTIONS (YES/NO)? YES
```

If you want to execute the interactive tests, you must not select the default options. Change the prompt response to NO. The following prompts appear:

```
ENTER PRIORITY LEVEL (1,2,3)? 3

CHANGE TEST EXECUTION MODE (YES/NO)? NO
```

Accept the default for priority level. If you want to select the interactive tests, answer YES to the CHANGE EXECUTION MODE? prompt and accept the default for the following prompt:

```
ENTER NEW EXECUTION MODE (TEST, OPERATION)? TEST

ENTER DIAGNOSTIC TEST (INTEGER, ALL)? ALL
```

If you specify an interactive test (Test 6 or 7), it will start to execute. You must go to the target terminal and respond. If you accept the default (ALL), the following prompt will appear:

```
EXECUTE INTERACTIVE TERMINAL TESTS (YES, NO)? NO
```

To execute Tests 6 and 7 you must answer YES to this prompt. The next prompt to appear is:

```
ENTER TIMED TEST INTERVAL (0 - 59)? 0
```

Your response to this prompt determines the length of time Test 3 operates. Next, you are asked to respond to termination mode prompts. When the information is complete and the task starts execution, go to the target terminal to monitor the tests and respond to the interactive test.

5.4.1.1 Test 1 — Ones and Zeros. Test 1 exercises the controller memory. It begins by writing ones (> FFFF) to the first 960 controller memory locations. This appears on the screen as blanks. Next, the task writes zeros (> 0000) to the bottom half of the controller memory. This appears on the screen as lines of dashes. The test reads all 1920 locations, checking for a match with what is written. Any mismatch is recognized as an error condition.

The writing process is repeated with the output locations reversed (that is, >0000 written to the top half of the controller memory and >FFFF written to the bottom half). The data is read and checked for a match with what is written. Any mismatch is recognized as an error condition.

Test 1 appears on the screen as a group of lines of dashes. The lines appear alternately on the bottom and top halves of the 911 screen.

5.4.1.2 Test 2 — Scroll. Test 2 also exercises the controller memory and uses the test interval timer. It writes one line containing the 26 characters of the English alphabet, A through Z, in uppercase, followed by 54 blanks. This line is always displayed at the bottom of the screen, then moves upward (scrolls) so that the bottommost line of the screen is blank. The pattern is written and the line scrolled until the first line written is at the top of the screen (the uppermost line). The task reads the uppermost line of the screen, checking for a match with what is written. Any mismatch is recognized as an error. The interval timer is started at the time of the first read. For example, when the response to the ENTER TIMED TEST INTERVAL? prompt of the XD command verb is zero, the first read is performed and the test ends. When the response is other than zero, the read, compare, and scroll cycle continues for the specified number of seconds.

Test 2 appears on the screen as the letters A through Z, in the left part of the screen, continuously moving from the bottom of the screen to the top. The test momentarily stops this continuous scrolling when waiting for display of an error message on the control terminal.

5.4.1.3 Test 3 — Beeper. Test 3 uses the test interval timer. It sounds the audible alarm for the number of seconds you specified in response to the timed test interval prompt of the XD command verb. When the response is zero seconds, the beeper sounds for the shortest possible time. When the response is other than zero, the beeper sounds for the specified number of seconds. The message BEEPER SHOULD BE SOUNDING appears on the screen.

5.4.1.4 Test 4 — Intensity. Test 4 exercises the ability of the 911 to write and refresh in one intensity or the other. To check the high and low intensity display, the test uses an adaptation of the ripple pattern of the LP810 diagnostic. (See Figure 5-2.) The test displays, from left to right, lines of all available nongraphic characters. Each line starts and ends with a different character.

First, the test writes the pattern in low intensity, displaying the message PATTERN SHOULD BE IN LOW INTENSITY at the top of the screen. When the screen is filled, the test holds the low intensity display for a specified number of seconds. Then, the test changes the display to high intensity, holding the display for the same number of seconds and displaying the message PATTERN SHOULD BE IN HIGH INTENSITY at the top of the screen.

5.4.1.5 Test 5 — Character Generator. Test 5 uses the test interval timer and exercises the character generator of the 911 VDT controller board. This test is noninteractive because it can execute to completion without your intervention. However, it does not recognize error conditions; therefore you must evaluate the displays at the target device. When you cannot be present to evaluate the displays, Test 5 provides no information and has value only as a device exercise.

Test 5 displays characters on the 911 VDT screen as combinations of small lit or unlit dots, called pixels. The test displays the characters of the 911 VDT character set in an expanded format, representing the pixels of each character. For further information about pixels and the 911 VDT character display, refer to the *Model 990 Computer Model 911 Video Display Terminal Installation and Operation* manual.

Each character is displayed as a block character inside a box of smaller characters, all in low intensity. The block character is made of cursor boxes. For example, the character A is displayed as a large A made of blocks (double cursors) surrounded by smaller As to make a square. The block character A represents the pixels that are lighted during 911 VDT character display. The smaller characters making up the box represent pixels that are not lighted during 911 VDT character display.

The pixel characters are displayed from left to right across the center of the screen. When the right side of the screen is reached, the leftmost pixel character is overwritten with a new pixel character. This process continues from left to right until all characters have been displayed. The speed of this process depends on the timed test interval you specified in the XD command verb. The number of seconds you specified determines the length of the pause between the display of each character.

You can detect errors in Test 5 only by careful observation. The following conditions indicate errors:

- Small characters appear as a different character than the block character.
- A block character consists of something other than cursor boxes.
- Small characters appear in high intensity.

5.4.1.6 Test 6 — Nonblinking/Blinking Cursor. Test 6 exercises the ability of the 911 VDT to display a continuously nonblinking or blinking cursor. The test is interactive; therefore you must respond at the target terminal. The test starts with the cursor not blinking. The message CURSOR SHOULD NOT BE BLINKING, PRESS RETURN TO CONTINUE is displayed at the top of the screen. The nonblinking cursor is displayed below this message. When you press the Return key, the nonblinking cursor is no longer displayed, and the blinking cursor part of the test begins.

The message CURSOR SHOULD BE BLINKING, PRESS RETURN TO CONTINUE is displayed at the top of the screen. A blinking cursor is displayed below this message. When you press the Return key, the blinking cursor is no longer displayed and the test ends.

5.4.1.7 Test 7 — Interactive Keyboard. Test 7 is an interactive test and uses the test interval timer. You must go to the target terminal and enter the information requested by the screen instructions. The test compares the character read from the keyboard (the entered value) to the character requested by the test (the expected value). When the entered and expected values do not match, an error condition is recognized. The error is noted at the target terminal, and an error message is displayed at the control terminal.

Test 7 has five categories with several screen displays for each category. When all the characters that you enter appear on the screen, the screen display remains for the number of seconds you specified in response to the timed test interval prompt of the XD command verb. Then the next screen is displayed. The five categories of Test 7 are as follows:

NOTE

> The following list refers to key names as they appear on the actual key cap. No generic key names are used in this list.

Category	Description
1	ASCII KEYS, UPPER CASE LOCK, NO SHIFT The UPPER CASE LOCK key must be in the lower, or locked, position. Do not press the SHIFT key during this category.
2	ASCII KEYS, NO UPPER CASE LOCK, NO SHIFT The UPPER CASE LOCK key must be in the upper, or unlocked, position. Do not press the SHIFT key during this category.
3	ASCII KEYS, NO UPPER CASE LOCK, SHIFT The UPPER CASE LOCK key must be in the upper, or unlocked position. You must continuously press a SHIFT key throughout this category. The recommended method is to press both SHIFT keys alternately.
4	CONTROL KEY COMBINATIONS Category 4 tests certain keys with the CONTROL key pressed. You must press the CONTROL key throughout this category. Note that the hyphen key is not used in this category.
5	FUNCTION AND EDIT KEYS Category 5 tests the function keys (F1 through F8) and edit keys (TAB, SKIP, INS CHAR, and so on).

Figure 5-5 illustrates a typical keyboard test screen as described in the following paragraphs.

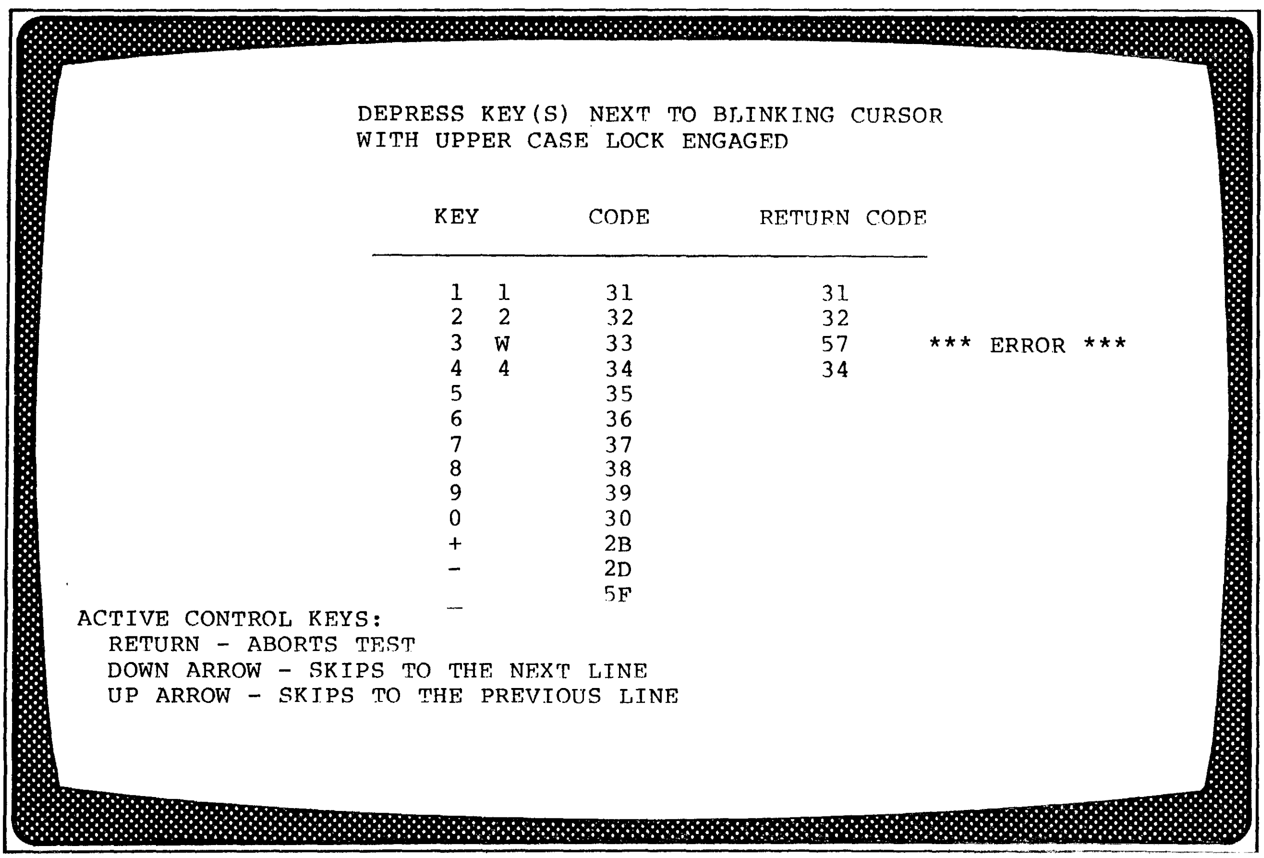

Figure 5-5. ST911 Test 7 Screen Format

The instructions for the category are displayed at the top center of the screen. Beneath the instructions are columns of information. From left to right, the columns are as follows:

1. Expected key (KEY)

2. Flashing cursor and entered key

3. Expected ASCII value (CODE)

4. Entered ASCII value (RETURN CODE)

5. Error

Column 1 is a list of the keys you must press. The flashing cursor in column 2 indicates which of those keys is expected next. The key that you press is displayed, and the flashing cursor automatically moves to indicate the next key to press. You can move the flashing cursor up and down. Therefore, you can single out a key you want to test repeatedly and skip over keys you do not want to test.

The expected ASCII value of each of the keys, or the CODE, is displayed in column 3. The entered ASCII value, or RETURN CODE, is displayed in column 4. When the entered value does not match the expected value, the message *** ERROR *** is displayed in column 5. Figure 5-5, the user pressed the W instead of the 3. Columns 1 and 2 show the expected 3 and the entered W. Columns 3 and 4 show the ASCII values of the 3 and the W, respectively. Column 5 notes the error.

The lower left corner of the screen contains descriptions of special keys that control the movement of the cursor during this test. With the exception of the Repeat key, which is always available, the keys that are available to control the cursor vary throughout the test. The descriptions in the lower left corner of the screen change as available keys change.

5.4.2 ST931 — 931 VDT

The ST931 diagnostic exercises the Model 931 Video Display Terminal with nine tests, two of which are interactive. Table 5-9 lists the tests of the 931 VDT diagnostic.

Table 5-9. ST931 Tests

Test Number	Test Name
1	Communications
2	RAM/ROM Host Initiated Self Tests
3	Cursor
4	Throughput
5	Show Graphics
6	Show Mask
7	Video Monitor
8	Auxiliary Port (Interactive)
9	Keyboard (Interactive)

To begin the ST931 diagnostic task, enter the name of the target 931 VDT in response to the ENTER DEVICE NAME? prompt of the XD command verb, as follows:

```
ENTER DEVICE NAME? ALL
STxx
```

where:

ST identifies the terminal diagnostic task.

xx is the device number of the particular 931 to be tested.

You can enter a specific device or accept the default (ALL). Messages and prompts appear as follows:

```
DEVICE STxx HAS BEEN SELECTED.

USE DEFAULT OPTIONS (YES/NO)? YES
```

If you want to execute the interactive tests, you must not select the default options. Change the prompt response to NO. The following prompts appear:

```
ENTER PRIORITY LEVEL (1,2,3)? 3

CHANGE EXECUTION MODE (YES/NO)? NO
```

Accept the default for priority level. If you want to select the interactive tests, answer YES to the CHANGE EXECUTION MODE? prompt and accept the default for the following prompt:

```
ENTER NEW EXECUTION MODE (TEST, OPERATION)? TEST

ENTER DIAGNOSTIC TEST (INTEGER, ALL)? ALL
```

If you specify an interactive test (Test 8 or 9), it will start to execute. You must go to the target terminal and respond. If you accept the default (ALL), the following prompt will appear:

```
DO YOU WANT TO EXECUTE THE INTERACTIVE TERMINAL TESTS (YES, NO)? NO
```

To execute Tests 8 and 9 you must answer YES to this prompt. The next prompt to appear is:

```
ENTER TIMED TEST INTERVAL (0 - 59)? 0
```

Your response to this prompt determines the length of time that Tests 5 and 6 operate. Next, you are asked to respond to termination mode prompts. When the information is complete and the task starts execution, go to the target terminal to monitor the tests and respond to the interactive tests.

The following paragraphs describe the ST931 tests. Two of the tests are interactive; that is, they issue prompts, and require further input from you once they have started.

5.4.2.1 Test 1 — Communications. Test 1 checks the communications interface between the computer and the target terminal. First it transmits and receives a string of characters in a data loopback. Next it compares the received string with the transmitted string for errors, issues a Report Terminal ID command to verify that the target terminal is a 931. And finally, it checks for parity errors.

5.4.2.2 Test 2 — RAM/ROM Host Initiated Self Tests. Test 2 issues separate commands to the target 931 terminal that execute a Cyclical Redundancy Character (CRC) check on the Read Only Memory (ROM) and then the Random Access Memory (RAM) in that terminal.

One of the following messages appear when the test completes:

```
931 ROM N:VERSION W, REVISION X, TI P/N YYYYYYY YYYY: ZZZZZZ CRC.
```

where:

W	is the version number.
X	is the revision letter.
YYYYYYY YYYY	is the ROM part number.
ZZZZZZ	is either PASSED or FAILED.

The 931 ROM message appears one time for each program ROM that is installed (up to four ROMs can be installed).

5.4.2.3 Test 3 — Cursor. Test 3 tests the terminal's ability to perform cursor functions. The test clears the terminal screen and moves the cursor to the home position. First, the cursor moves from left to right across the screen to verify its ability to address every column while the row address remains constant. Then the cursor moves from right to left, back to the home position while verifying column addressability again. In the next portion of the test, test 3 holds the column address constant and increases the row address to its limit, and then decreases the row address to row 0. Finally test 3 performs a cursor wrap subtest that verifies the cursor wrap function at the four corners of the screen.

5.4.2.4 Test 4 — Throughput. Test 4 verifies that the 931 VDT is able to accept a full screen of characters without pacing. (Pacing occurs when the 931 VDT is busy and a signal is issued to not send any data until the 931 VDT is not busy.) Test 4 also verifies that the 931 pacing works properly. The following steps are performed:

1. A barber pole of 1920 characters is written to the 931 VDT screen.
2. The data received on the screen is then verified using the Read to Address command, reading back the characters one at a time.
3. A series of scrolling commands is then issued to verify that the ready/busy hardware works correctly.

5.4.2.5 Test 5 — Show Graphics. Test 5 uses the test interval timer. After clearing the 931 screen, the test displays all available block graphics characters. They appear in the following three groups:

- Vertical graphics characters (displayed from smallest to largest character from left to right)
- Horizontal graphics characters
- Miscellaneous graphic characters

The test displays the characters roughly in the shape of a square in the center of the screen for the number of seconds you specified in response to the timed test interval prompt of the XD command verb.

5.4.2.6 Test 6 — Show Mask. Test 6 also uses the test interval timer. After clearing the 931 screen, Test 6 fills it with individual characters (the letter O), which remain displayed for the number of seconds you specified in response to the timed test interval prompt of the XD command verb.

5.4.2.7 Test 7 — Video Monitor. Test 7 also uses the test interval timer. The video monitor test allows you to judge the quality of the video monitor on the target terminal and verify certain video hardware. It performs the following functions:

1. Initializes the target terminal's screen and locks the keyboard.
2. Verifies that the 931 VDT hardware is able to extend the graphics character >36 across the horizontal character cell boundaries. The screen is painted with horizontal lines.
3. Verifies that the 931 VDT hardware is able to extend the graphics character >29 across the vertical character cell boundaries. The screen is painted with vertical lines.
4. Verifies character cell extension in both horizontal and vertical directions. The screen is then painted with graphics character >38 to display a crosshatch.
5. Verifies the character generator ROMs and allows for measurement of monitor specifications. The screen is then painted with a barber pole pattern. The character attributes are then changed to reverse video.
6. Verifies the cursor hardware features by positioning the cursor in the center of a blank screen.
7. Checks the hardware's ability to make the cursor blink.
8. Checks the hardware's ability to turn the cursor off.
9. Checks the hardware's ability to display all character attributes. Refer to the *Model 931 VDT General Description Manual* for a description of this display.
10. Erases the screen and restores the status line.

5.4.2.8 Test 8 — Auxiliary Port (Interactive). Test 8 first clears the target terminal's screen and verifies that the auxiliary port is online and not busy. If the port is ready, a formfeed is issued. Otherwise, an error message appears.

Next the test writes the following text, first to the 931 screen and then to the auxiliary port.

```
THE QUICK BROWN FOX JUMPED OVER THE LAZY DOGS BACK-- XX
```

where:

XX represents the line number.

The test sends 24 lines of data to the 931 terminal and printer. A formfeed is then issued to dump the printer's buffer. When the test completes, check the printer output for errors.

NOTE

Test 8 tests the auxiliary port by using the line printer. It is not a line printer test.

5.4.2.9 Test 9 — Keyboard (Interactive). Test 9 verifies that the 931 keyboard is generating the correct raw ASCII keycodes that the 931 processes internally. This test can be used on all international keyboards. Refer to the *Model 931 VDT General Description Manual* for more information.

Test 9 provides a visual display of the main keyboard and then the keypads of the keyboard. When you press any key, the corresponding keycap in the display is filled in. If you press a key more than once, a key count is displayed on the screen in the corresponding keycap. You can press the keycaps in any order. The maximum value of the key count is > FF.

The mode keys (CTRL, ALT, SHIFT, and CAPLOCK) are displayed and updated whenever a mode change occurs. Test 9 keeps a separate count for each key pressed per mode.

NOTE

Mode shifts and key count updates cause a brief locking of the keyboard. This is to prevent a character from being received when test 9 is unable to read the keystroke.

The assumed initial state of the keyboard is with the CAPS LOCK key off. When changing modes do not press two mode keys simultaneously, because test 9 will generate a test warning message.

When you use the alternate keyboard mode (ALT), local 931 functions (on/offline, display brightness, and so on) take precedence and do not generate internal ASCII keycodes.

CAUTION

If you press the ALT 4 key (on/offline function) during the keyboard test, the diagnostic reports an error indicating that the terminal is offline, and then terminates. You must cycle the power to the 931 once this happens in order to insure proper operation when you return the unit to the online state.

Refer to the *Model 931 VDT General Description Manual* for the location and functions of the ALT function keys.

5.4.3 ST940 — 940 EVT

The ST940 diagnostic task exercises the Model 940 Electronic Video Terminal with six tests, one of which is interactive.

Table 5-10 lists the tests of the 940 EVT diagnostic.

Table 5-10. ST940 Tests

Test Number	Test Name
1	Memory
2	Beeper
3	Intensity
4	Scrolling
5	Cursor
6	Interactive Keyboard

To begin the ST940 diagnostic task, enter the name of the target 940 EVT in response to the ENTER DEVICE NAME? prompt of the XD command verb, as follows:

```
ENTER DEVICE NAME? ALL
STxx
```

where:

ST identifies the terminal diagnostic task.

xx is the device number of the particular 940 to be tested.

You can enter a specific device or accept the default (ALL). Messages and prompts are displayed in the same sequence as they are for the 911 VDT. If you wish to execute the interactive keyboard test, you must follow the sequence detailed in paragraph 5.4.3.

The following paragraphs describe the ST940 tests. Tests 1 through 5 are noninteractive. Test 6 is interactive, requiring you to respond at the target terminal.

5.4.3.1 Test 1 — Memory. Test 1 exercises the controller memory. It begins by writing ones (>3030) to the first 960 controller memory locations. This appears on the screen as blanks. Next, the task writes zeros (>0000) to the bottom half of the controller memory. This appears on the screen as lines of dashes. The test then reads the data and checks for matches with what is written. Any mismatch is recognized as an error condition and an error message is written to the diagnostic history file.

The writing process is repeated with the output locations reversed. The data is read and checked. Any mismatches are indicated as errors in the diagnostic history file.

Test 1 appears on the screen as a group of lines of dashes. The lines appear alternately on the bottom and top halves of the 940 screen.

5.4.3.2 Test 2 — Beeper. Test 2 turns off the cursor and sounds the beeper for a specified number of seconds. The test uses the test interval timer to sound the audible alarm for the number of seconds you specified in response to the timed test interval prompt of the XD command verb. When the response is zero seconds, the beeper sounds for the shortest possible time. When the response is other than zero, the beeper sounds for the specified number of seconds. The message BEEPER SHOULD BE SOUNDING appears on the screen.

5.4.3.3 Test 3 — Intensity. Test 3 displays a ripple pattern at low intensity for a specified number of seconds, then at high intensity for the same number of seconds. To check the high and low intensity display, the test uses the ripple pattern of the LP810 diagnostic. (See Figure 5-2.) The test displays, from left to right, lines of all available nongraphic characters. Each line starts and ends with a different character.

First, the test writes the pattern in low intensity, displaying the message PATTERN SHOULD BE IN LOW INTENSITY at the top of the screen. When the screen is filled, the test holds the low intensity display for a specified number of seconds. Then, the test changes the display to a high intensity, holding the display for the same number of seconds and displaying the message PATTERN SHOULD BE IN HIGH INTENSITY at the top of the screen.

5.4.3.4 Test 4 — Scrolling. Test 4 exercises the terminal's ability to perform scrolling functions. It writes a line containing the 26 characters of the alphabet, A through Z, in uppercase, followed by 54 blanks on each line. This line is repeated until each row contains the pattern. The test turns on the smooth scrolling; the screen scrolls up 10 lines and down 10 lines. The test checks the pattern for accuracy.

5.4.3.5 Test 5 — Cursor. Test 5 tests the terminal's ability to perform cursor functions. The test clears the terminal screen and moves the cursor to the home position. First, the cursor moves across the screen to verify its ability to address every column while the row address remains constant. Next, the column address remains constant while the cursor accesses every row. Then, the test places the terminal in 132-character mode and repeats the same process. Finally, the test returns the terminal to 80-character mode and positions the cursor in every corner for approximately two seconds. This tests the terminal's ability to respond to the Set Cursor Address command.

5.4.3.6 Test 6 — Interactive Keyboard. Test 6 is an interactive test that checks the ability of the keyboard to send the proper ASCII code in response to the pressing of a specific key. The test checks the following keys:

NOTE

Items in all capitals in the following list refer to key names as they appear on the actual key cap.

Keyboard: UPPERCASE
lowercase
SHIFT key
CTRL key
CTRL/SHIFT keys
Numeric key pad
Cursor key pad
Cursor key pad shift
Erase, insert, delete, and PRINT keys
Erase, insert, delete, and PRINT keys with SHIFT key

You must go to the target terminal and enter the information requested by the screen instructions. The test compares the character requested by the test (the expected value) to the character read from the terminal (the entered value). When the entered and expected values do not match, an error condition is recognized. The display on the target terminal is the same as that illustrated in Figure 5-3 for Test 7 on the 911 terminal.

5.5 DISKS

The disk diagnostic task exercises and tests all models of class DS devices. (It does not test single-density flexible diskettes, which are class DK devices.) The task writes a record of each controller error, software or hardware retry, and error correction from the error correction circuitry (ECC)* in the diagnostic history file (volumename.S$ODIAG.HISTORY). If you want a permanent record of the messages in the diagnostic history file, after executing the task you must print the records in the file or copy them to another file.

* The controller used with the models CD1400, DS80, and DS300 disk drives provides auto detection and correction (ECC) of certain data error patterns. For more information on the ECC logic operation, refer to the *Model 990 Computer Model CD1400 Disk Controller Depot Maintenance Manual*, the *Model 990 Computer Model DS80 Disk System Installation and Operation Manual*, or the *Model 990 Computer Model DS300 Disk System Installation and Operation.*

5.5.1 Introduction

Disk tests are separated into the following categories:

- Nonextended disk tests — Tests 1 through 4
- Extended read only disk tests — Tests 1 through 5
- Extended write disk tests — Tests 10 through 13

NOTE

The nonextended and the extended disk tests both start with test 1. This is possible since both groups of tests are completely separate tasks that are independently bid by the Online Diagnostic Driver (ODD). Tests 6 through 9 are reserved for future extended read test expansion.

5.5.1.1 Nonextended Disk Tests. Table 5-11 lists the nonextended disk tests and the information you need to execute the tests. Be sure to perform an Install Volume (IV) command on the disk before executing the nonextended disk tests.

Table 5-11. Nonextended Disk Tests (File I/O Only)

Test Number	Test Name	Diag. Cyl. Used	Device State	Volume Status
1	Read/Compare Diagnostic Cylinder	Yes	ON	IV
2	Read/Compare Diagnostic Cylinder with Head Motion	Yes	ON	IV
3	Write and Read Random Pattern	Yes	ON	IV
4	Write and Read Test Patterns	No	ON	IV

Tests 1 and 2 of the nonextended disk tests (file I/O only) are read only tests that use the diagnostic cylinder. The diagnostic cylinder is the innermost cylinder on all disks that have been initialized under DNOS Release 1.0.0 or later, or DX10 Release 3.3.0 or later. It contains special diagnostic data in a file named volumename.S$DIAG. Disk packs that have not been initialized under DX10 Release 3.3.0 (or later) or DNOS Release 1.0.0 (or later) do not contain the diagnostic cylinder and cannot be tested with nonextended disk tests 1 or 2. This same restriction can also apply to FD1000 floppy disks. If, while performing the Initialize New Volume (INV) command on the floppy disk, someone specified YES to the USED AS A SYSTEM DISK? prompt, the floppy disk does not contain the diagnostic cylinder and cannot be tested with nonextended disk tests 1 or 2.

Tests 3 and 4 of the nonextended disk tests are read/write tests that create an output file on the target disk. The file is two cylinders in length and is named volumename.S$ODDWRT. It is erased after Test 4 is executed.

5.5.1.2 Extended Read Only Disk Tests. Table 5-12 lists the extended read only disk tests and the information you need to execute the tests. None of the extended read tests use the diagnostic cylinder. Be sure to perform an IV command on the disk before executing the extended read only disk tests.

Table 5-12. Extended Read Only Disk Tests (Direct Disk I/O)

Test Number	Test Name	Diag Cyl. Used	Device State	Volume Status
1	Read Specified Tracks	No	ON	IV
2	Consecutive Sector Read	No	ON	IV
3	Jitter Seek/Read (With random head selection)	No	ON	IV
4	Random Seek/Read	No	ON	IV
5	Crescendo Seek/Read (Seek and verify all tracks)	No	ON	IV

The extended read only tests perform direct track addressing (direct disk I/O). Target disks for these tests must be in the online device state. When the target disk is in the online device state, other users and tasks can access the disk while the diagnostic task is executing. This creates a usage environment with activity and stress equal to or greater than that of a normal production workload.

5.5.1.3 Extended Write Disk Tests. Table 5-13 lists the extended write disk tests and the information you need to execute the tests. These tests can only be performed on unloaded volumes that are in the diagnostic (DIAG) state.

Table 5-13. Extended Write Disk Tests

Test Number	Test Name	Diag. Cyl. Used	Device State	Volume Status
10	Command Verification/ID Error Check	No	DIAG	UV
11	Format/Verify Tracks	No	DIAG	UV
12	Write/Read/Compare Tracks	No	DIAG	UV
13	Comprehensive Write/Seek/Read	No	DIAG	UV

Tests 10 through 13 are the extended write tests. Target disks for these tests must be scratch disks in the diagnostic device state. Be sure not to perform an IV command on the disk before putting it in the diagnostic state; if it has been installed, be sure to unload it with a UV command before you issue a DIAG command or command verb. The driver displays the prompt for the extended write disk tests when it initiates the disk diagnostic task only when the target disk is in the diagnostic state.

WARNING

Tests 10 through 13 will destroy data on the target disk. Therefore, you must execute these tests only on scratch disks. Once these tests are performed on the target disk, you must perform an IDS command on the disk before reusing it.

You can perform the extended write disk tests even on disk packs that have not been initialized under DX10 Release 3.3.0 (or later) or DNOS Release 1.0.0 (or later). Such disk packs can be used as scratch disks for the extended write disk tests, but remember that data on the surfaces being tested will be destroyed.

To begin the disk diagnostic task, enter the name of the target disk in response to the ENTER DEVICE NAME? prompt of the XD command verb, as follows:

```
ENTER DEVICE NAME? ALL
DSxx
```

where:

DS identifies the disk device class.

xx is the device number of the particular disk to be tested.

To select all disks on the system that are in either the online or the diagnostic state, enter only the device class DS. The driver responds with additional prompts, providing you with options for categories of tests and requesting additional information for some of the tests. All of the prompts and prompt responses for executing disk diagnostics are described in Section 4.

5.5.2 Test Descriptions — Nonextended Disk Tests

The following paragraphs describe the nonextended disk tests in detail.

5.5.2.1 Test 1 — Read/Compare Diagnostic Cylinder. Test 1 sequentially reads the diagnostic cylinder and checks the data for accuracy. The front panel lights can indicate disk activity, and the beginning messages of the test are written to the diagnostic history file along with error messages. There are no other visible effects of this test.

5.5.2.2 Test 2 — Read/Compare Diagnostic Cylinder With Head Motion. Test 2 reads records from the diagnostic cylinder, located on the innermost cylinder of the disk, and then moves the read/write heads to the outermost cylinder of the disk. Test 2 checks the data for accuracy. The read-move-read-move cycle is repeated throughout the test. The purpose of this cycle is to force the read/write heads to move rapidly from the inside to the outside of the disk between read operations.

The front panel lights can indicate disk activity, and beginning messages of the test are written to the history file along with error messages. In most cases, the target disk drive visibly vibrates or shakes during this test. Also, noise levels may increase due to the large volume of disk activity.

5.5.2.3 Test 3 — Write and Read Random Pattern. Test 3 writes the diagnostic cylinder data to the diagnostic write file (volumename.S$ODDWRT). The test reads the data, checks it for accuracy, and records mismatches in the diagnostic history file. The diagnostic write file is left on the disk so that you can examine it; however, the next test (Test 4) erases the diagnostic write file at its completion.

5.5.2.4 Test 4 — Write and Read Test Patterns. Test 4 fills the diagnostic write file with hexadecimal patterns of data. Then, the test reads the file, record by record, and compares it to what is written. Any mismatch is recognized as an error condition. The test fills the file again with the next pattern and continues to fill and read the file until all the patterns are used. Test 4 then deletes the diagnostic write file.

The first hexadecimal data pattern is generated as follows: the first record contains >01; each successive record contains a value that is >101 greater than the previous value, until the value meets or exceeds >FFFF. Data patterns 2 through 6 are as follows:

Pattern	Data
2	>0000
3	>5555
4	>AAAA
5	>FFFF
6	>DB67

5.5.3 Test Descriptions — Extended Read Only Disk Tests

The following paragraphs describe the disk device diagnostic tests in detail.

5.5.3.1 Test 1 — Read Specified Tracks. If you do not accept the default options for Test 1 of the extended read only disk tests, you must specify the following:

- Starting and ending heads and cylinders
- Early, late, or no strobes
- Forward, reverse, or no offset

For more information about strobes and offsets for a particular disk drive, you must consult the appropriate disk drive installation and operation manual listed in the Preface.

The task executes a Read Data command and transfers a full track of data from the specified starting head and cylinder through the specified ending head and cylinder to memory for each track specified. If defaults are accepted, all tracks are tested. The test checks to ensure that no error bits are turned on in either the controller status word (TILINE Peripheral Control Space (TPCS) word 7), or the disk status word (TPCS word 0) after each track is read and records any error conditions in the diagnostic history file.

If the selected drive has early/late strobe and head-offset capabilities, and you select the driver prompt that enables them, the test reads each track using the combination of strobes and/or offsets as entered. The test does not report errors that occur on tracks that the operating system has mapped as bad (catalogued in track 0, sector 1). Only the status of uncatalogued tracks is reported to the history file. To view the error report, use the Show File (SF) command verb and accept the default option.

5.5.3.2 Test 2 — Consecutive Sector Read. Test 2 runs only in a default mode (no prompting for heads, cylinders, and so on). With a Read Data command, the task alternately reads a sector from track 0 and then a sector from the maximum numbered track. Then, after incrementing the sector address, the task repeats this action. This process continues until the last sector in both track 0 and the maximum numbered track have been read. Early/late strobe and head-offset capabilities are not used in Test 2. Errors are reported as described in Test 1 of the extended read only disk tests.

5.5.3.3 Test 3 — Jitter Seek (With Random Head Selection). Test 3 executes only in a default mode, and executes a series of Seek commands, selecting the head through the use of a random number generator. Beginning with the center cylinder of the disk, Test 3 seeks toward the outermost cylinder and then the innermost cylinder of the disk. Then the test increments the inner cylinder and decrements the outer cylinder used in the last Seek command and performs two more seeks. This process continues until the outer cylinder equals zero and the inner cylinder equals the maximum numbered cylinder for the disk. Test 3 runs only in the default mode and does not use any early/late strobe and head-offset capabilities. Errors are reported as described in Test 1 of the extended read only disk tests.

5.5.3.4 Test 4 — Random Seek. When you select Test 4, the driver displays the following prompt on the screen:

```
ENTER NUMBER OF RANDOM SEEKS (1....32767)? 1000
```

When you have entered the designated number of seeks or accepted the default, Test 4 issues a Seek command using a random number generator to select the track address. Errors are reported as described in Test 1 of the extended read only disk tests.

5.5.3.5 Test 5 — Crescendo Seek (Seek and Verify All Tracks). Test 5 executes a Seek command from each track to every other track, starting with the values entered for starting head and cylinder, and ending with the values entered for ending head and cylinder. The track addressing algorithm is implemented by use of a starting track counter (STC) and a track address register (TAR). Initially both the STC and the TAR are set to the track addressed by the entered starting head and starting cylinder values. The first seek is made to the track addressed by the TAR. The second seek is made to the track addressed by the STC. The TAR is then incremented by one and the two-seek sequence is repeated. This sequence continues until the TAR reaches the track addressed by the ending head and cylinder values entered from prompts. At this point, the STC is incremented by one, the TAR is set equal to the STC, and seeking resumes. This entire sequence continues until the STC reaches the track addressed by the entered ending head and ending cylinder values. Note that after the seek to TAR, a seek is always made back to the STC; the STC is not incremented until the TAR reaches maximum and the test does not finish until the STC reaches maximum.

CAUTION

Test 5 can easily take several hours to complete if a large number of tracks are specified.

If you specify defaults for this test, only one pass is made through all tracks of the selected drive. This means that the test completes when the TAR reaches maximum the first time and terminates before the STC is incremented. Errors are reported as described in Test 1 of the extended read only disk tests.

5.5.4 Test Descriptions — Extended Write Disk Tests

The following paragraphs describe the extended write disk tests in detail.

NOTE

Prior to executing any of the extended write disk tests, an Initialize Disk Surface (IDS) command should have been performed on the selected disk in order for the disk tests to avoid any bad tracks.

5.5.4.1 Test 10 — Command Verification/ID Error Check. Test 10 checks the proper execution of the Write Unformatted disk command, and the controller's ability to detect an ID error. You should be aware that the test forces an ID error, and that ID error is reported to the system log. This is an expected error, and should not be regarded as a failure.

Test 10 performs the following sequence of steps:

1. Executes a Write Format command to format a track and write one sector of data.
2. Executes a Read Unformatted command to recover the ID words, the data, and the CRC.
3. Alters one of the ID words.
4. Executes a Write Unformatted command to rewrite the ID words, the data, and the CRC.
5. Issues a Read Data command in an attempt to recover the original information. The controller-calculated CRC and the actual CRC should now be different.
6. Checks to ensure that the ID error bit is set in controller status.
7. Executes a Write Unformatted command to write the correct ID words.
8. Executes a Read Data command to ensure that the header has been corrected. An ID error should not occur.

NOTE

You cannot run this test on FD1000, WD500, or WD800 disks because the controllers do not support the functions necessary to modify and/or recover header ID words. If you respond ALL to the ENTER DIAGNOSTIC TEST? prompt when testing the disks listed, only the prompts for 11 and 12 will appear.

5.5.4.2 Test 11 — Format/Verify Tracks. Test 11 formats tracks using the Write Format command. Available tracks are formatted to one sector per record, beginning with the starting head and cylinder (which you specify) and ending with the ending head and cylinder (which you also specify). Test 11 verifies each track by executing a Read Unformatted command after each available Write Format command, and comparing the actual header words with the expected values. If defaults are accepted, all tracks are formatted.

NOTE

Available tracks are all tracks specified, except those reserved for the bad track map, and those mapped by the system as being bad.

5.5.4.3 Test 12 — Write/Read/Compare Tracks. Test 12 writes a full track of data beginning with the starting head and cylinder, which you specify, and ending with the ending head and cylinder. After writing each track, the test reads the track and compares it bit for bit. Mismatches are recorded as errors, and the number of errors found are recorded in the history file.

5.5.4.4 Test 13 — Comprehensive Write/Seek/Read. Test 13 performs the following functions to test a target disk:

- Write and read all tracks sequentially
- Perform all seek lengths

In performing these functions, Test 13 concentrates its operations on the cylinders that present worst-case bit crowding (inner cylinders) and those cylinders most likely to contain servo crosstalk (outer cylinders). In these two critical zones, the test provides random track selection.

While sequentially writing and reading full tracks from cylinder 0 through the maximum numbered cylinder, the test performs the following steps:

1. Performs a Read command to read one sector of the maximum numbered cylinder for the selected head
2. Writes a randomly selected track within a zone of cylinders from 0 through 49 (zone 1)
3. Reads a randomly selected track within a zone of cylinders from 49 to the maximum numbered cylinder (zone 2)
4. Reads the track written in step number 2

Once Test 13 performs the preceding steps, it repeats them again. However, on this second pass, steps 2 and 3 exchange cylinder zones; that is, in step 2 the test writes a randomly selected track within zone 2, and in step 3, the test reads a randomly selected track from zone 1.

5.6 MAGNETIC TAPES

The MT979 diagnostic task tests the 979, 979A, MT1600 Magnetic Tape Units or the WD800 cartridge tape unit. It exercises the tape drive functions of rewind, read, write, detect end-of-file (EOF), backspace single and multiple records, and forward space single and multiple records. It also tests the ability to correctly handle requests for erroneous record lengths. The test writes errors to the diagnostic history file.

5.6.1 MT979 — Models 979, 979A, and MT1600 Magnetic Tape Units

The MT979 diagnostic task is composed of eight tests that are classified as either short or long. Tests 1 through 5 are short tests and are the default selection. Tests 6, 7, and 8 are the long tests: 6 and 7 because they take a long time to execute; 8 because it provides you with an additional option for executing with or without the write ring. When you select the MT979 diagnostic task, a second prompt will ask you whether you want to execute the long tests. If you select the long tests, you need to also decide whether you want to execute Test 8 with or without the write ring. Table 5-14 lists the tests of the MT979 diagnostic.

Table 5-14. MT979 Tests

Test Number	Test Name
1	Basic Read/Write Test With Rewind.
2	Basic Read/Write Test With Backspace.
3	Forward Creep Test.
4	Even/Odd Record Length Write and Read Test.
5	Special Movement and End-of-File.
6	Write Full Reel of Tape, Check for EOT.
7	Read Full Rell of Tape, Check for EOT.
8	Write Ring and Recording Density Check.

The target tape drive must be in the diagnostic device state. You must mount a tape on the target tape drive. For more information about tape mounting, refer to the installation and operation manual for your particular tape drive.

To begin the MT979 diagnostic, enter the name of the target tape drive in response to the ENTER DEVICE NAME? prompt of the XD command verb, as follows:

```
ENTER DEVICE NAME? ALL
MTxx
```

where:

MT identifies the MT979 diagnostic task.

xx is the device number of the particular tape drive to be tested.

To select all tape drives that are in the diagnostic state, enter only the device class MT.

The diagnostic has both long and short duration tests. The short tests are the default selection tests (tests 1 through 5). If you only want to execute tests 1 through 5, answer the USE DEFAULT OPTIONS prompt with YES. However, if you want to execute all tests (including tests 5 through 8, be aware that the long tape tests (test 6 through 8) have excessive execution times, and that test 8 may require installing or removing the write ring. To perform all tests, answer each of the prompts that follow as shown in the right angle brackets beneath them.

```
USE DEFAULT OPTIONS (YES, NO)? YES
<NO>

ENTER PRIORITY LEVEL (1,2,3)? 3
<either 1, 2, or 3>

CHANGE TEST EXECUTION MODE (YES, NO)? NO
<YES>

ENTER NEW EXECUTION MODE (TEST, OPERATION)? TEST
<TEST>

ENTER DIAGNOSTIC TEST (INTEGER, ALL)? ALL
<ALL>

EXECUTE THE LONG TAPE TESTS (YES, NO)? NO
<YES>
```

5.6.2 Test Descriptions

The following paragraphs describe the MT diagnostic tests in detail.

5.6.2.1 Test 1 — Basic Read/Write With Rewind. Test 1 exercises the target tape drive by repeatedly performing the following steps:

1. Rewinds the tape.

2. Writes a record that is 256 characters long.

3. Rewinds the tape. The tape should now be positioned at the beginning of the record written in step 2.

4. Reads the 256-character record.

5. Compares the data in the record read in step 4 with the record written in step 2. Any discrepancy is recognized as an error condition.

5.6.2.2 Test 2 — Basic Read/Write With Backspace. Test 2 exercises the target tape drive by repeatedly performing the following steps:

1. Writes a record that is 256 characters long.

2. Backspaces the tape one record. The tape should now be positioned at the beginning of the record written in step 1.

3. Reads the 256-character record.

4. Compares the data in the record read in step 3 with the record written in step 1. Any discrepancy is recognized as an error condition.

5.6.2.3 Test 3 — Forward Creep. Test 3 exercises the target tape drive by repeatedly performing the following steps:

1. Writes two records that are each 256 characters long.

2. Backspaces one record. The tape should now be positioned at the beginning of the second record.

3. Reads the 256-character record.

4. Compares the data in the record read in step 3 with the record written in step 1. Any discrepancy is recognized as an error condition.

5. The test is performed 100 times.

The pattern is as follows: write, write, backspace, and read. The first record written is not read, the second is, the third is not, and so on. Alternate records are read back and compared. Any comparison error indicates a forward tape creep.

5.6.2.4 Test 4 — Even/Odd Write and Read. Test 4 exercises the target tape drive by repeatedly performing the following steps:

1. Rewinds the tape.
2. Writes 20 records in the following record lengths: 16, 17, 32, 33, 64, 65, 128, 129, 512, 513, 1024, 1025, 2048, 2049, 3096, 3097, 4096, 4097, 8191, and 8192.
3. Rewinds the tape.
4. Reads back the 20 records, one at a time.
5. Compares each record with the corresponding record written in step 2. Any discrepancy is recognized as an error condition.

For this test, the input and output buffers are separate buffers. Data comparison consists of logical comparisons, character by character, between the separate buffers.

5.6.2.5 Test 5 — Special Movement and End-of-File. Test 5 exercises the target tape drive by repeatedly performing the following steps:

1. Writes an EOF marker on the tape.
2. Writes 16 records in the following record lengths: 31, 32, 63, 64, 79, 80, 127, 128, 511, 512, 1023, 1024, 2047, 2048, 4095, and 4096.
3. Writes another EOF marker on the tape.
4. Backspaces one record. The tape should now be positioned at the EOF marker. Checks for the EOF marker.
5. Attempts to read an 80-character record. Checks for the EOF marker.
6. Backspaces one record. Checks for the EOF marker.
7. Forward spaces one record. The tape should now be positioned after the EOF marker. Checks for the EOF marker.
8. Backspaces one record. Checks for the EOF marker.
9. Backspaces 17 records. The tape should now be positioned at the first EOF marker, written in step 1.
10. Attempts a read for a record length of 1024 bytes. This read should result in an EOF condition.
11. Checks for an EOF condition.
12. Forward spaces five records. The tape should now be positioned at the 80-character record.

13. Attempts to read a record length of 2047 bytes.
14. Checks to see that the character length read was actually 80 bytes.
15. Compares those 80 bytes with the record written in step 2. Any discrepancy is recognized as an error.
16. Forward spaces nine records. The tape should now be positioned at the 4096-character record.
17. Reads the 4096-character record.
18. Compares the data of this record with the record written in step 2. Any discrepancy is recognized as an error condition.
19. Backspaces 3 records.
20. Reads the 2048-character record.
21. Compares the data of this record with the record written in step 2. Any discrepancy is recognized as an error condition.

For this test, the input and output buffers are separate buffers. Data comparison consists of logical comparisons, character by character, between the separate buffers.

5.6.2.6 Test 6 — Write Full Reel and Check for End-of-Tape. Test 6 writes a full reel of records and checks for an end-of-tape (EOT) condition. The records are 19,200 characters in length. Because Test 6 writes a full reel of tape, it can execute for long periods of time. This test is classified as long and must be selected by entering YES when the long tape test prompt appears on the screen. Accepting the default will exclude it from the tape tests you select.

The output tape from Test 6 is used as input for Test 7. A suggested use of Tests 6 and 7 is to alternate tape drives for both of the tests. This provides a drive-to-drive compatibility measurement that is useful in isolating the source of certain malfunctions.

5.6.2.7 Test 7 — Read Full Reel and Check for End-of-Tape. Test 7 reads the records on the tape from Test 6 and compares them with what should have been written. Any discrepancy is recognized as an error condition. The test also checks for the EOT condition. The input tape must be the tape created in Test 6. Because Test 7 reads a full reel of tape, it can execute for long periods of time. This test is classified as long and must be selected by entering YES when the long tape test prompt appears on the screen. Accepting the default will exclude it from the tape tests you select.

A suggested use of Tests 6 and 7 is to alternate tape drives for both of the tests. This provides a drive-to-drive compatibility measurement that is useful in isolating the source of certain malfunctions.

5.6.2.8 Test 8 — Write Ring Status/Recording Type. Test 8 checks the write ring status bit, the device state, and recording type status bits. It displays the write ring status at the control terminal. You can leave the ring on or off for this test. This test is classified as long to allow removal or insertion of the write ring before execution of the test. It must be selected by entering YES when the long tape test prompt appears on the screen. Accepting the default will exclude it from the tape tests you select.

The test writes the device state of the target tape drive to the history file. When the drive is in a LOAD condition (READY light on), the drive should be in the online device state. When the drive is in a RESET condition (READY light off), the drive should be in the offline device state.

The recording type is displayed at the control terminal. The recording types are as follows:

- Phase-encoded (PE) recording, 1600 bits per inch (bpi)
- Nonreturn-to-zero inverted (NRZI), 800 bpi

5.7 MEMORY EXERCISER TEST

The memory exerciser test first fills a 14,000-character buffer in memory with a specific character pattern. Then, the test reads the data and compares the actual value with the expected value. If the test finds a discrepancy, it writes an error message to the diagnostic history file. The test reads the next specified pattern into the memory buffer and repeats the process until it executes all seven patterns.

NOTE

> The XMEM diagnostic has a governor that does not allow you to enter more memory tasks than the system can accommodate at one time. The governor determines the maximum number of memory tasks according to the size of your system's memory. The prompt ENTER NUMBER OF MEMORY TASKS? (1..X) shows the maximum number of tasks (X) that you are allowed to enter. If you enter a larger value than X, the diagnostic returns an error, and reprompts you for another value.

Table 5-15 shows the seven patterns.

Table 5-15. Memory Exerciser Test Data Patterns

Data Pattern
1010
0000
5555
AAAA
FFFF
I – INDEX (Incrementing Pattern)
I – INVERSE (Decrementing Pattern)

6

System Log Analysis Task

6.1 GENERAL INFORMATION

The System Log Analysis Task provides you with information about the reliability of the hardware devices and memory on your system by analyzing and reporting on the system log files. The DNOS Release 1.2 Operating System maintains two system log files. In these files it stores information about errors along with messages generated by hardware operations, input/output (I/O) operations, tasks, and user programs. This recording of system activity occurs at all times when the operating system is active.

There are many types of system log records. However, the System Log Analysis Task analyzes and reports only on the following record types:

- Device error
- Memory parity error
- Cache memory error
- Device statistics
- Disk volume install and unload

You can find descriptions of the records processed by the System Log Analysis Task in paragraph 6.5.

The System Log Analysis Task maintains three additional files that must be on the system disk. They are the following:

- volumename.S$DML — File to which compressed system logs are concatenated. This is a circular file which keeps the records until they are overwritten by new records, or deleted by the Execute System Log Analyzer Purge (XSLAP) command.
- volumename.S$SLARPT — File to which the analysis reports are written.
- volumename.S$SLAMSG — File containing a list of messages used in the System Log Analysis Task reports. Each message is assigned a hexadecimal number. Most of the numbers and messages correspond to the supervisor call (SVC) error codes in the *DNOS Messages and Codes Reference Manual.*

NOTE

In the preceding list, volumename is the name of the system disk and is optional in building and accessing system files. Hereafter the three files will be referred to as .S$DML, .S$SLARPT, and .S$SLAMSG.

6.2 METHOD OF OPERATION

The System Log Analysis Task compresses, sorts, and analyzes the system log files. Each time the task is activated, it compresses the records on the system log file which is currently active and concatenates them onto the .S$DML file. This file is limited in size to 30 records and, when it is full, newly compressed records are written over previously compressed records. After compressing the records, the task retrieves an appropriate message for each record from the .S$SLAMSG file. The retrieved messages are sorted as follows:

1. Alphabetically by class of the device in question:
   a. Devices are arranged numerically within each class.
   b. Memory messages are placed at the end.
2. Numerically by message number: when a volume unload or install occurs, the message number order starts over.

Each error message is then matched up with its record from the compressed record file; the new records, sorted and formatted into the requested level report, are stored in the System Log Analysis report file, volumename.S$SLARPT. From that file you can print the report. A report of any of the three levels can be generated for:

- All devices (the default option)
- All devices in one class
- Any specific device

The level one report provides a summary of system log activity containing information that may point to errors (or developing errors) in devices or memory. Recommendations concerning the number of errors, the possibility of a hardware problem, and the need for corrective or scheduled maintenance are also supplied.

The level two report supplies the same information as the level one report with the addition of a copy of each record that was logged to the system log file. The complete records provide detail to those familiar with system hardware and software. The information in the level one report frequently indicates the need for a level two report.

The level three report is a combination of the levels one and two reports. It provides you with a summary of system log activity and recommendations for devices that have received more than a minimum number of errors. It also includes complete copies of the system log records that contain the errors.

Typical level one, two, and three reports are presented at the end of this section. (See Figure 6-3, Figure 6-4, and Figure 6-5.)

6.3 RELATIONSHIP TO ONLINE DIAGNOSTICS

Online Diagnostics provoke certain system error conditions and events. The operating system is active when Online Diagnostics are executed, and it writes records of these provoked system errors and events to the system log files. No distinction is made between those system log records resulting from usual system activity and those resulting from Online Diagnostics. Therefore, no distinction is made on the System Log Analysis Task reports.

Online Diagnostics have error messages identifying specific diagnostic test failures. These messages are listed in Appendix H. They are not part of the system log and are not included in the System Log Analysis Task reports. While they may coincide with system log errors under some conditions, this is not always true, as in the case of correctable device errors. Such errors cause a system log record, but cause neither a diagnostic error message nor a history file record.

When you are executing Online Diagnostics, you may want to produce a Systems Log Analysis Task report. You can call the task from an Online Diagnostics session with the Execute System Log Analyzer (XSLA) command verb.

6.4 INITIALIZING THE SYSTEM LOG ANALYSIS TASK

The System Log Analysis Task is activated in one of two ways:

- Automatically
- With the Execute System Log Analyzer (XSLA) Command
  (either from SCI or the driver)

6.4.1 Automatic Activation

When you initialize your system logs with the Initialize System Log (ISL) command, the System Log Analysis Task identification (ID) is assigned. When a log file is filled, the system calls the task which processes the records in that file. The ISL command displays the following prompts:

```
[] ISL
INITIALIZE SYSTEM LOG
             ATTENTION DEVICE: pathname
               LOGGING DEVICE: pathname
      MODIFY FILE PROCESSING?: NO
              RECREATE FILES?: NO
```

Refer to the *DNOS System Command Interpreter (SCI) Reference Manual* for specific information on proper responses to the ISL prompts. For automatic activation, however, you must respond YES to the MODIFY FILE PROCESSING? prompt. As soon as you have done so, the next two prompts appear:

```
INITIALIZE SYSTEM LOG
 SYSTEM LOG PROCESSOR TASK ID: 000
   USER LOG PROCESSOR TASK ID: 000
```

Enter 051 as your response to the SYSTEM LOG PROCESSOR TASK ID prompt, and accept the default value for the next prompt.

In order to have the System Log Analysis Task Report printed while in the automatic mode, you must perform a Modify Spooler Device (MSD) command.

The prompts for the MSD command appear as follows:

```
MODIFY SPOOLER DEVICE
             DEVICE NAME: LPxx
  SPOOLER MODE (E,S,Q,D): SHARED
                    FORM: STANDARD
   CHANGE CLASS NAME(S)?: NO
```

Enter the name of the device on which you want to print the System Log Analysis Task report. Accept the default values for the next two prompts. For the CHANGE CLASS NAME(S)? prompt, you must specify YES; after which the last of the series of MSD prompts appears:

```
ENTER CLASS NAME CHANGE
       CLASS NAME(S):
```

Enter SLARPT in response to the ENTER CLASS NAME CHANGE prompt. You have now completed the necessary modifications to enable volumename.S$SLARPT to be printed while executing in the automatic mode.

6.4.2 Initialization with the XSLA Command

You can enter the XSLA command as either an SCI command or as a diagnostics driver command verb during a diagnostic session. The command bids the System Log Analysis Task. It then compresses the current log file regardless of whether it is full, concatenates it onto .S$DML, and reports on the entire contents of that file (including the previously compressed log files).

The format of the XSLA command executed from SCI is as follows:

```
[ ] XSLA

EXECUTE LOG ANALYSIS REPORT - VERSION 1.2.0
                LEVEL(1,2,3): 1
ANALYSIS OUTPUT PRINTER(0-9): 0
            SPECIFIC DEVICE: ALL
```

The format of the XSLA command verb executed from the driver is as follows:

```
ENTER COMMAND VERB?
XSLA

ENTER DEVICE NAME FOR SLA? ALL

ENTER SLA MESSAGE LEVEL (1,2,3)? 1

ENTER OUTPUT PRINTER (0=.S$SLARPT ONLY, 1..9=PRINTER NUMBER)? 0

SYSTEM LOG ANALYSIS TASK HAS BEGUN EXECUTION.
```

LEVEL refers to the level number (1, 2, or 3) of the System Log Analysis Task report. The prompts allow you to print the report, or you can call it to the screen with the Show Diagnostic Files (SF) command verb using the file .S$SLARPT.

6.5 PURGE RECORDS IN .S$DML FILE — XSLAP COMMAND

The Purge Records in .S$DML File (XSLAP) command purges existing data from the System Log Analysis master log file (.S$DML) when hardware problems have been corrected and the existing error data must be eliminated. XSLAP executes only from SCI (not from Online Diagnostics).

The format of the XSLAP command is as follows:

```
 [ ] XSLAP

PURGE RECORDS IN .S$DML FILE - VERSION 1.2.0
         STARTING DATE (MMDD):
           ENDING DATE (MMDD):
                  DEVICE NAME:
```

The STARTING DATE and ENDING DATE prompts require a four-digit input, two for month (MM) and two for the date (DD). The DEVICE NAME prompt requires one of the following:

- A device class (DS, LP, ST, and so on)
- A specific device (DS04, LP01, ST17, and so on)
- ALL (All devices) All records between the starting and ending dates will be purged for the device(s) you specify in response to the DEVICE NAME prompt. If you leave the DEVICE NAME prompt blank, XSLAP purges the records for all devices between the starting and ending dates.

6.6 SYSTEM LOG RECORDS

The system log consists of system log messages on a pair of mandatory disk files (.S$LOG1 and .S$LOG2), and optionally on a dedicated output device. There are many types of messages. You can find examples and field descriptions of all types of system log records in the *DNOS Messages and Codes Reference Manual.*

Figure 6-1 shows the types of records processed by the System Log Analysis Task. Figure 6-2 shows examples of actual system log records and tells you which ones are processed by the System Log Analysis Task.

All records contain the date and time of occurrence of the recorded event as the first two fields of the record. The date is expressed as a 4-digit combination; the first 2 digits representing the month, and the last 2 digits representing the day. The time is expressed on the basis of the 24-hour clock. A plus sign (+) before the third field indicates that the record has more than one line. Each type of system log record analyzed by the task is described in the following paragraphs.

6.6.1 Device Error Records

Two types of device errors produce messages for the system log; one is software-generated, the other is hardware-generated.

RECORD TYPE	MESSAGE TYPE
1	DEVICE ERROR MESSAGES
1a	SOFTWARE ERRORS
1b	HARDWARE ERRORS
2	MEMORY PARITY ERROR MESSAGES
3	CACHE MEMORY ERROR MESSAGES
4	DEVICE STATISTICS
5	DISK VOLUME LOAD AND UNLOAD MESSAGES

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Figure 6-1. System Log Messages Processed by SLA

```
-------------------------------------------------------------------------------------
|                                                                                   |
|Type                            System Log Records                                 |
|-----------------------------------------------------------------------------------|
|   |                                                                               |
|   |              27                                                               |
| 1b|0917:1959+DS04 ERR=18 JOB=0003 IID=06  A=F0F0 0700 0100 0000 0006 4AF8 0400 9001|
|   |                S=00 L=01 ST09 RID=21  B=FFFF 0700 0100 0000 0006 4AF8 0400 1000|
|   |               ****   1 LOG MESSAGE(S) LOST                                    |
|   |0917:2000      SYSTEM LOG ANALYZER HAS STARTED PROCESSING                      |
|   |0917:2000      SYSTEM LOG ANALYZER HAS FINISHED PROCESSING                     |
|   |0917:2001 TASK ERR=10 JOB=0003 IID=07 RID=1F ST09 WP=3446 PC=28D8 ST=21CF      |
|   |0100:0000      **** SYSTEM IPL OCCURRED                                        |
|   |0917:2203      **** DATE AND TIME INITIALIZED                                  |
|   |0917:2203      **** INITIALIZE SYSTEM LOG COMMAND PROCESSED                    |
| 5 |0919:0902      **** SCI - IV JEW025 AT ST07 INSTALLED DNODOBJ IN DS03          |
| 4 |0919:0903 STAT DEV=DS03 RDS G=0006 B=0000 WRTS G=0000 B=0000 OTHER G=0000 B=0000|
| 5 |0919:0903      **** SCI - UV JEW025 AT ST07 UNLOADED DNODOBJ                   |
| 2 |0919:0959 MEMP BIT=00 ROW=0C CORRECT=Y BASE=00000 MEM=64KB TYPE=1 TPCS=FB10    |
| 1a|0919:1035+DS05 ERR=1C JOB=0004 IID=17 BLOCK= 0000 001C 0A02 C000 9014 0100     |
|   |                S=00 L=02 ST09 RID=30                                          |
| 1b|0922:2104+MT01 ERR=45 JOB=0002 IID=35  A=0000 0000 2847 0000 0000 BB70 8609 8A20|
|   |                S=01 L=03 ST09 RID=32  B=0000 0000 0000 0000 2580 5160 8609 1000|
| 1b|0923:1329+LP02 ERR=06 JOB=0003 IID=59  A=59EC                                  |
|   |                F=00 L=02 STXX RID=1D  B=59FC                                  |
|   |0926:1113      **** QUEUE SERVER BID ERROR, JOB=0000 IID=00 LUNO=00 ERR=06     |
| 3 |0926:1225 MEMC BANK=A PARITY: A=G, B=G BASE=1F000 MEM=64KB EVEN=Y TPCS=FB10    |
| 5 |0926:1434      **** SCI - IV JEW025 AT ST04 INSTALLED RAL7 IN DS03             |
|___|_______________________________________________________________________________|
```

Figure 6-2. Typical System Log Records

6.6.1.1 Software-Generated Device Error Records. The device service routine (DSR) generates software error records. The example that follows shows a software-generated device error.

EXAMPLE

```
0919:1035+DS05 ERR=1C JOB=0004 IID=17 BLOCK= 0000 001C 0A02 C000 9014 0100
                S=00 L=02 ST09 RID=30
```

The fields of the device software error record are as follows:

Field	Description
ERR	Type of error shown in hexadecimal, occurring when I/O SVC > 00 is issued
JOB	Job ID of the job in which the task in error was running, shown in hexadecimal
IID	Installed task ID, shown in hexadecimal
BLOCK	The first six words of the SVC block in error, shown in hexadecimal
S, F	Number of controller retries, shown in decimal. When S, operation successfully completed. When F, operation failed.
L	Logical Unit Number (LUNO) assigned for this I/O request, shown in hexadecimal
STxx	Station requesting I/O services
RID	Task run ID, shown in hexadecimal

6.6.1.2 Hardware-Generated Device Error Records. Device hardware error records are the result of hardware failures or error conditions. In the following example, a magnetic tape parity error is encountered, indicating that the data on the tape is faulty.

EXAMPLE

```
0922:2104+MT01 ERR=45 JOB=0002 IID=35  A=0000 0000 2074 0000 0000 A8B0 8609 8A20
               S=01  L=03  ST09 RID=32  B=0000 0000 0000 0000 2580 2BE0 8609 1000
```

The fields of the device hardware error record are as follows:

Field	Description
ERR	Error code for I/O SVC > 00, shown in hexadecimal.
JOB	Job ID of the job in which the task in error was running, shown in hexadecimal
IID	Installed task ID, shown in hexadecimal.
S, F	Number of controller retries, shown in decimal. When S, operation successfully completed. When F, operation failed.
L	LUNO assigned for this I/O request, shown in hexadecimal.
STxx	Station requesting I/O services.
RID	Task run ID, shown in hexadecimal.
A	State of controller after the operation. For TILINE* devices, state is shown as eight words. For communications register unit (CRU) devices, state is shown as one word. Value shown is hexadecimal.
B	State of controller before the operation. Always valid for TILINE devices. May contain one word for CRU devices. Value shown is hexadecimal.

6.6.2 Memory Parity Error Records

Parity errors in four types of memory produce messages that are logged to the system log and are processed by the System Log Analysis Task. The four types are:

- Normal memory (type = 0)
- Cache memory (type = 1)
- Correction control chip (type = 2)
- Double word controller (type = 3)

Each of the four types can be correctable or noncorrectable. The CORRECT field in the message tells whether the error has been corrected. Noncorrectable errors cause a level 2 interrupt to occur. If the error occurs in a system task, the system crashes. If the error occurs in a user task, the task is killed. For noncorrectable errors, the BIT and ROW fields shown in the log message are not valid. The following example shows a correctable type 1 memory error record.

*TILINE is a trademark of Texas Instruments Incorporated.

EXAMPLE

```
0926:1554 MEMP BIT=00 ROW=0C CORRECT=Y BASE=00000 MEM=64KB TYPE=1 TPCS=FB10
```

The fields of the memory error record are as follows:

Field	Description
BIT	The number of the failing bit, shown in hexadecimal. Bits >0 through >0F represent memory data, bits >10 through >15 represent error correcting circuit (ECC) bits. Not valid for noncorrectable errors.
ROW	The row of memory chips in which the error occurred, shown in hexadecimal. The value is within the range >0 through >03F. Each row has 32K bytes of memory.
CORRECT	The letter Y indicates a correctable error. The letter N indicates a noncorrectable error.
BASE	Starting physical memory address of the memory on the controller board, shown in hexadecimal.
MEM	Number of kilobytes (KB) of memory on the controller board, shown in decimal (type 1).
TYPE	Memory type: 0 = normal memory, 1 = cache memory, 2 = correction control chip, 3 = double word controller. Cache memory errors produce an additional record.
TPCS	TILINE Peripheral Control Space address, shown in hexadecimal. The controller interrogates the memory through this address.

6.6.3 Cache Memory Error Records

If the controller is a cache controller, errors can be in the cache. The format of the cache memory error is shown in the following example.

EXAMPLE

```
1204:0555 MEMC BANK=A PARITY: A=B, B=G BASE=1F000 MEM=64KB EVEN=Y TPCS=FB10
```

The fields of the cache memory error record are as follows:

Field	Description
BANK	The memory bank (A or B) where the error occurred.
PARITY	Status of parity bit in the bank. For example, PARITY: A = G indicates that the parity in bank A is good. Values for banks A or B are G for good and B for bad.
BASE	Starting physical memory address of the memory on the controller board, shown in hexadecimal.
MEM	Number of kilobytes (KB) of memory on the controller board, shown in decimal.
EVEN	Y indicates that the error occurred on an even-address word boundary. N indicates that the error occurred on an odd-address word boundary.
TPCS	TILINE Peripheral Control Space address, shown in hexadecimal. The controller interrogates the memory through this address.

6.6.4 Device Statistics Records

The device service routines (DSRs) generate log records that summarize statistics of device use. Three pairs of counters are kept for all devices: a Good (successful) and a Bad (failed) pair each for reads, writes, and other events. The statistics record is written when the number in any of these counters exceeds >7FFF. Additionally, statistics records for disk devices are written when a disk volume is unloaded. The example that follows shows a device statistics record.

EXAMPLE

```
0919:0903 STAT DEV=DS03 RDS G=0006 B=0000 WRTS G=0000 B=0000 OTHER G=0000 B=0000
```

The fields of the statistics record are as follows (all values are hexadecimal):

Field	Description
DEV	Device name.
RDS	Number of read operations performed. The number of successful reads is listed in the G= field, the number of unsuccessful reads in the B= field.
WRITES	Number of write operations performed. The number of successful writes is listed in the G= field, the number of unsuccessful writes in the B= field.
OTHER	Number of other operations performed. The number of successful other operations is listed in the G= field, the number of unsuccessful other operations in the B= field.

6.6.5 Disk Volume Install and Unload Records

Whenever a disk volume is installed or unloaded, a record of the event is written to the system log file. The example that follows shows disk volume install and unload records.

EXAMPLE

```
0919:0902       **** SCI - IV JEW025 AT ST07 INSTALLED DNODOBJ IN DS03
0919:0903       **** SCI - UV JEW025 AT ST07 UNLOADED DNODOBJ
```

Information included in the volume install and unload record is as follows:

```
Volume install: userid AT stationid INSTALLED volumename IN devicename
Volume unload: userid AT stationid UNLOADED volumename
```

6.7 SYSTEM LOG ANALYSIS TASK REPORTS

Each of the three System Log Analysis Task reports contain two parts as follows:

- A summary of the log records accumulated for each device
- Recommendations that are based on the number and type of errors found

The summary includes the DNOS error code and the corresponding message for each accumulation. The level two and three reports also reproduce the actual records. You can find more information about the error codes and messages in the *DNOS Messages and Codes Reference Manual.*

The recommendations may indicate to you the possibility of a hardware problem and/or the need for corrective maintenance. However, the statistical analysis upon which the recommendations are based does not always apply in individual cases. You need to apply your careful analysis of the reports and their implications for your particular system and devices. Also, some of the errors may be simple operational errors (device unplugged or offline) or media errors (faulty tape or disk pack). Such errors are included in the count that the task uses to produce the recommendations but have no implications for hardware problems.

The following paragraphs describe the three System Log Analysis Task reports.

6.7.1 Level One Report

The level one report is the short form report designed for the system operator and data center manager. The report consists of two parts: summaries of records and recommendations.

The first part of the report summarizes system log record information for each device. The following examples show the development of the summary of the log records for several disk drives (similar to the level one report shown in Figure 6-3). The summaries are arranged in the following order:

1. Alphabetically by device class as shown in the following:

   ```
   DS
   ```

2. Numerically by unique device number. The date/time of the first and last record is included at this level. For example:

   ```
   DS01 FROM 09/08/83 AT 09:44 TO 09/09/83 AT 15:11
   ```

3. By ascending hexadecimal numbers of I/O SVC error codes. Records are accumulated at this point and number of errors, code, and meaning of the code are presented in the report, as shown in the following:

   ```
   DS01 FROM 09/08/83 AT 09:44 TO 09/09/83 AT 15:11

                 3    00 - I/O ERROR
                 1    1D - SEEK INCOMPLETE
   ```

4. Disk records are further divided by disk installs and unloads, so that accumulations of errors for each error code are made for each disk volume as well as each unique number device. Before each unload, a statistic record is included. An example of a statistic record and disk install and unload records follows:

```
DSKPROCD INSTALLED ON DS03
      12    18 - DISK UNIT IS OFFLINE
READS G=000161, B=000000 WRITES G=000000, B=000000 OTHER G=00006B, B=000000
DSKPROCD UNLOADED FROM DS03
```

The second part of the report presents recommendations for consideration. They are arranged by device class and number in the same way as the summaries in the first part of the report, as shown in the following:

EXAMPLE

```
DS04 HAS RECEIVED ONE OR MORE ERRORS WHICH HAD UNSUCCESSFUL RETRIES.
     THE PRESENCE OF THESE ERRORS MAY INDICATE A NEED FOR CORRECTIVE
     MAINTENANCE.
```

When the system log records are analyzed, memory is treated as a device class. The order of appearance of device classes is alphabetical, other than MEMP amd MEMC which come at the end of the listing.

Devices that have not generated log records are not included in the reports.

Figure 6-3 is an example of a level one report for all devices. The title at the top of the report states that this is a level one report. Devices summarized in the report that have generated log messages are DS03, DS04, MT01, MT02, and ST13.

You can interpret the errors summarized in this report by consulting the *DNOS Messages and Codes Reference Manual* for information about the error codes and messages. You can also produce a level two or three report to show the actual log records that produced the summaries in the level one report.

6.7.2 Level Two Report

The level two report is the long form report designed for those persons familiar with system hardware and software and for system maintenance personnel. This report presents summarized system log information and also shows each complete record from which the summary was compiled. The records are sorted in the same order as the level one report: device class, device number, date, and ascending hexadecimal error number. As with the level one report, entries appear only for those devices or device classes for which error records exist on the system log files.

Figure 6-4 is an example of a level two report for one specific device. The title at the top of the report states that this is a level two report for disk drive DS04. The dates and times given in the second line are the date and time of the first record to the last record for DS04 on the system log. During this time period, twelve error records have been logged to the system log file. The number of times the error has occurred, the error code, the error message, the system log records and a recommendation are included in the report.

```
09/19/83                                                       15:11:49

              SYSTEM LOG ANALYSIS REPORT 1.2.0 -- LEVEL ONE

DS03 FROM 09/16/83 AT 11:46 TO 09/19/83 AT 13:48

          7    1D - SEEK INCOMPLETE
          2    EB - DISK PACK CHANGE DETECTED
READS G=0000E7, B=000001 WRITES G=00009B, B=000000 OTHER G=0000D2, B=000000

   DSKPROCD INSTALLED ON DS03
         12    18 - DISK UNIT IS OFFLINE
READS G=000161, B=000000 WRITES G=000000, B=000000 OTHER G=00006B, B=000000
   DSKPROCD UNLOADED FROM DS03

DS04 FROM 09/16/83 AT 11:45 TO 09/19/83 AT 13:08

          1    EB - DISK PACK CHANGE DETECTED
READS G=000044, B=000000 WRITES G=000000, B=000000 OTHER G=000255, B=000002
   RAL7 UNLOADED FROM DS04

MT01 FROM 09/17/83 AT 20:34 TO 09/17/83 AT 20:34

          4    45 - PARITY ERROR ENCOUNTERED ON MAGNETIC TAPE

MT02 FROM 09/17/83 AT 20:34 TO 09/17/83 AT 20:34

          1    43 - MAG TAPE UNIT IS OFFLINE

ST13 FROM 09/16/83 AT 12:15 TO 09/19/83 AT 11:47

         19    07 - DEVICE ERROR

THE FOLLOWING RECOMMENDATIONS MAY BE CONSIDERED:

  DS03 HAS RECEIVED MORE THAN SIX ERRORS  THAT MAY REQUIRE ANALYSIS TO
       DETERMINE IF A HARDWARE  PROBLEM EXISTS  AND WHETHER PREVENTIVE
       MAINTENANCE SHOULD POSSIBLY BE SCHEDULED.

  ST13 HAS RECEIVED MORE  THAN TWELVE ERRORS THAT ARE OPERATIONAL TYPE
       ERRORS THAT MAY BE USUALLY IGNORED.  THE ERRORS MAY BE ANALYZED
       TO DETERMINE IF A HARDWARE PROBLEM REALLY EXISTS.

              END OF REQUESTED SYSTEM LOG ANALYSIS REPORT
```

Figure 6-3. Level One Report

6.7.3 Level Three Report

The level three report is a combination of the level one and two reports. The format of the first part of the report is identical to the format of the first part of the level one report. In the second part of the report, each recommendation is followed by complete system log records for those errors which were involved in producing the recommendations. When the recommendation is informative and does not indicate errors, the complete record is omitted.

```
09/19/83                                                          15:19:52

  SYSTEM LOG ANALYSIS REPORT 1.2.0 ON DEVICE DS04 -- LEVEL TWO

DS04 FROM 09/16/83 AT 11:45 TO 09/19/83 AT 13:08

          1     EB - DISK PACK CHANGE DETECTED
0916:1145+DS04 ERR=EB JOB=0016 IID=17  A=00F0 0000 0000 0000 0006 4AF8 0400 9000
                S=00 L=02 ST08 RID=2D  B=0001 8000 0000 0000 0002 4B0E 0400 1000
READS G=000044, B=000000 WRITES G=000000, B=000000 OTHER G=000255, B=000002
   RAL7 UNLOADED FROM DS04

          3     11 - ID WORD ERROR DURING DISK TRANSFER
0916:1203+DS04 ERR=11 JOB=0011 IID=06  A=00F0 0200 0101 0000 0120 2188 0406 9010
                S=00 L=01 ST09 RID=76  B=FFFF 0200 0101 0000 0120 2188 0406 1000
0916:1203+DS04 ERR=11 JOB=0011 IID=06  A=00F0 0200 0101 0000 0120 2188 0406 9010
                S=00 L=01 ST09 RID=76  B=FFFF 0200 0101 0000 0120 2188 0406 1000
0916:1203+DS04 ERR=11 JOB=0011 IID=06  A=00F0 0200 0101 0000 0120 2188 0406 9010
                S=00 L=01 ST09 RID=76  B=FFFF 0200 0101 0000 0120 2188 0406 1000
          1     1C - ILLEGAL DISK ADDRESS
0916:1517+DS04 ERR=1C JOB=0011 IID=17 BLOCK= 0000 001C 0A02 C000 9014 0100
                S=00 L=02 ST09 RID=93
          1     1E - DATA ERROR IN HEADER OR DELETED SECTOR READ ON FLOPPY
0916:1203+DS04 ERR=1E JOB=0011 IID=06  A=00F0 0100 0100 0001 0120 2188 0406 9050
                S=00 L=01 ST09 RID=76  B=FFFF 0100 0100 0001 0120 2188 0406 1000
          1     EB - DISK PACK CHANGE DETECTED
0917:1339+DS04 ERR=EB JOB=0000 IID=06 BLOCK= 0000 00EB 0B00 C000 9006 0100
                S=00 L=00 STXX RID=19
READS G=000410, B=000000 WRITES G=000366, B=000000 OTHER G=000005, B=000001
   DNODOBJ UNLOADED FROM DS04

READS G=0006FD, B=000000 WRITES G=000000, B=000000 OTHER G=000001, B=000000

   DNODOBJ INSTALLED ON DS04
          1     06 - I/O HAS BEEN ABORTED OR I/O OPERATION HAS TIMED OUT
0919:0903+DS04 ERR=06 JOB=0007 IID=56  A=0648 0648 0648 0648 0648 0648 0648 0648
                S=00 L=01 ST04 RID=04  B=0001 C100 0100 0001 0120 42B6 0408 1000
          2     11 - ID WORD ERROR DURING DISK TRANSFER
0919:0901+DS04 ERR=11 JOB=0007 IID=56  A=00F0 0200 0100 0000 0100 208C 0408 9010
                S=00 L=01 ST04 RID=04  B=FFFF 0200 0100 0000 0100 208C 0408 1000
0919:0901+DS04 ERR=11 JOB=0007 IID=56  A=00F0 8000 0000 0000 0002 4B0E 0400 9010
                S=06 L=01 ST04 RID=04  B=FFFF 8000 0000 0000 0002 4B0E 0400 1000

THE FOLLOWING RECOMMENDATIONS MAY BE CONSIDERED:

  DS04 HAS RECEIVED MORE THAN SIX ERRORS  THAT MAY REQUIRE ANALYSIS TO
       DETERMINE IF A HARDWARE  PROBLEM EXISTS  AND WHETHER PREVENTIVE
       MAINTENANCE SHOULD POSSIBLY BE SCHEDULED.

             END OF REQUESTED SYSTEM LOG ANALYSIS REPORT
```

Figure 6-4. Level Two Report

Figure 6-5 shows a typical level three report for all devices that have accumulated log records. The devices are disk unit DS03 and terminal ST13. Recommendations are given for both. Since the recommendation for ST13 is an informative message rather than a recommendation, the log records producing the message are not reproduced. Complete log records for DS03 are printed after the recommendation.

```
09/19/83                                                    15:28:05

              SYSTEM LOG ANALYSIS REPORT 1.2.0 -- LEVEL THREE

DS03 FROM 09/16/83 AT 11:46 TO 09/19/83 AT 13:48

          7    1D - SEEK INCOMPLETE
READS G=0000E7, B=000001 WRITES G=00009B, B=000000 OTHER G=0000D2, B=000000

ST13 FROM 09/16/83 AT 12:15 TO 09/19/83 AT 11:47

         19    07 - DEVICE ERROR

THE FOLLOWING RECOMMENDATIONS MAY BE CONSIDERED:

  -------------------------------------------------------------------
  DS03 HAS RECEIVED MORE THAN SIX ERRORS  THAT MAY REQUIRE ANALYSIS TO
       DETERMINE IF A HARDWARE  PROBLEM EXISTS  AND WHETHER PREVENTIVE
       MAINTENANCE SHOULD POSSIBLY BE SCHEDULED.
0916:1208+DS03 ERR=1D JOB=0011 IID=06  A=04F0 0200 0100 FFE8 0120 FBC8 0804 9001
               S=00 L=01 ST09 RID=79  B=FFFF 0200 0100 FFE8 0120 FBC8 0804 1000
0916:1208+DS03 ERR=1D JOB=0011 IID=06  A=04F0 0200 0100 FFE8 0120 FBC8 0804 9001
               S=00 L=01 ST09 RID=79  B=FFFF 0200 0100 FFE8 0120 FBC8 0804 1000
0916:1208+DS03 ERR=1D JOB=0011 IID=06  A=04F0 0200 0100 FFE8 0120 FBC8 0804 9001
               S=00 L=01 ST09 RID=79  B=FFFF 0200 0100 FFE8 0120 FBC8 0804 1000
0916:1208+DS03 ERR=1D JOB=0011 IID=06  A=04F0 0200 0100 FFE8 0120 FBC8 0804 9001
               S=00 L=01 ST09 RID=79  B=FFFF 0200 0100 FFE8 0120 FBC8 0804 1000
0916:1208+DS03 ERR=1D JOB=0011 IID=06  A=04F0 0200 0100 FFE8 0120 FBC8 0804 9001
               S=00 L=01 ST09 RID=79  B=FFFF 0200 0100 FFE8 0120 FBC8 0804 1000
0916:1208+DS03 ERR=1D JOB=0011 IID=06  A=04F0 0200 0100 FFE8 0120 FBC8 0804 9001
               S=00 L=01 ST09 RID=79  B=FFFF 0200 0100 FFE8 0120 FBC8 0804 1000
0916:1208+DS03 ERR=1D JOB=0011 IID=06  A=04F0 0200 0100 FFE3 0EA0 FBC8 0804 9001
               S=00 L=01 ST09 RID=79  B=FFFF 0200 0100 FFE3 0EA0 FBC8 0804 1000

  -------------------------------------------------------------------
  ST13 HAS RECEIVED MORE  THAN TWELVE ERRORS THAT ARE OPERATIONAL TYPE
       ERRORS THAT MAY BE USUALLY IGNORED.  THE ERRORS MAY BE ANALYZED
       TO DETERMINE IF A HARDWARE PROBLEM REALLY EXISTS.

              END OF REQUESTED SYSTEM LOG ANALYSIS REPORT
```

Figure 6-5. Level Three Report

Appendix A

Keycap Cross-Reference

Generic keycap names that apply to all terminals are used for keys on keyboards throughout this manual. This appendix contains specific keyboard information to help you identify individual keys on any supported terminal. For instance, every terminal has an Attention key, but not all Attention keys look alike or have the same position on the keyboard. You can use the terminal information in this appendix to find the Attention key on any terminal.

The terminals supported are the 931 VDT, 911 VDT, 915 VDT, 940 EVT, the Business System terminal, and hard-copy terminals (including teleprinter devices). The 820 KSR has been used as a typical hard-copy terminal. The 915 VDT keyboard information is the same as that for the 911 VDT except where noted in the tables.

Appendix A contains three tables and keyboard drawings of the supported terminals.

Table A-1 lists the generic keycap names alphabetically and provides illustrations of the corresponding keycaps on each of the currently supported keyboards. When you need to press two keys to obtain a function, both keys are shown in the table. For example, on the 940 EVT the Attention key function is activated by pressing and holding down the Shift key while pressing the key labeled PREV FORM NEXT. Table A-1 shows the generic keycap name as Attention, and a corresponding illustration shows a key labeled SHIFT above a key named PREV FORM NEXT.

Function keys, such as F1, F2, and so on, are considered to be already generic and do not need further definition. However, a function key becomes generic when it does not appear on a certain keyboard but has an alternate key sequence. For that reason, the function keys are included in the table.

Multiple key sequences and simultaneous keystrokes can also be described in generic keycap names that are applicable to all terminals. For example, you use a multiple key sequence and simultaneous keystrokes with the log-on function. You log on by *pressing the Attention key, then holding down the Shift key while you press the exclamation (!) key.* The same information in a table appears as *Attention/(Shift)!*.

Table A-2 shows some frequently used multiple key sequences.

Table A-3 lists the generic names for 911 keycap designations used in previous manuals. You can use this table to translate existing documentation into generic keycap documentation.

Figures A-1 through A-5 show diagrams of the 911 VDT, 915 VDT, 940 EVT, 931 VDT, and Business System terminal, respectively. Figure A-6 shows a diagram of the 820 KSR.

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Table A-1. Generic Keycap Names

Generic Name	911 VDT	940 EVT	931 VDT	Business System Terminal	820[1] KSR
Alternate Mode	None	ALT	ALT	ALT	None
Attention[2]		SHIFT PREV FORM NEXT			CTRL S
Back Tab	None	SHIFT TAB	SHIFT ⇧ TAB	None	CTRL T
Command[2]		PREV FORM NEXT	CMD		CTRL X
Control	CONTROL	CTRL	CTRL	CTRL	CTRL
Delete Character	DEL CHAR	LINE DEL CHAR	DEL CHAR	DEL CHAR	None
Enter		SEND	ENTER	ENTER	CTRL Y
Erase Field	ERASE FIELD	EOS ERASE EOF	ERASE FIELD	ERASE FIELD	CTRL] [

Notes:

[1]The 820 KSR terminal has been used as a typical hard-copy terminal with the TPD Device Service Routine (DSR). Keys on other TPD devices may be missing or have different functions.

[2]On a 915 VDT the Command Key has the label F9 and the Attention Key has the label F10.

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Table A-1. Generic Keycap Names (Continued)

Generic Name	911 VDT	940 EVT	931 VDT	Business System Terminal	820[1] KSR
Erase Input	ERASE INPUT	ALL ERASE INPUT	ERASE INPUT	ERASE INPUT	CTRL N
Exit	ESC	PREV PAGE NEXT	SHIFT ⇧ ESC	SHIFT ESC	ESC
Forward Tab	SHIFT TAB SKIP	TAB	TAB	SHIFT TAB SKIP	CTRL I
F1	F1	F1	F1	F1	CTRL A
F2	F2	F2	F2	F2	CTRL B
F3	F3	F3	F3	F3	CTRL C
F4	F4	F4	F4	F4	CTRL D

Notes:

[1]The 820 KSR terminal has been used as a typical hard-copy terminal with the TPD Device Service Routine (DSR). Keys on other TPD devices may be missing or have different functions.

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Table A-1. Generic Keycap Names (Continued)

Generic Name	911 VDT	940 EVT	931 VDT	Business System Terminal	820[1] KSR
F5	F5	F5	F5	F5	CTRL E
F6	F6	F6	F6	F6	CTRL F
F7	F7	F7	F7	F7	CTRL V
F8	F8	F8	F8	F8	CTRL W
F9	CONTROL ! 1	F9	F9	SHIFT F1	CTRL] [
F10	CONTROL @ 2	F10	F10	SHIFT F2	CTRL Z

Notes:

[1]The 820 KSR terminal has been used as a typical hard-copy terminal with the TPD Device Service Routine (DSR). Keys on other TPD devices may be missing or have different functions.

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Table A-1. Generic Keycap Names (Continued)

Generic Name	911 VDT	940 EVT	931 VDT	Business System Terminal	820[1] KSR
F11	CONTROL $ 4	F11	F11	SHIFT F3	CTRL ¦ \
F12	CONTROL % 5	F12	F12	SHIFT F4	CTRL } {
F13	CONTROL ^ 6	SHIFT F1	SHIFT ⇧ F1	SHIFT F5	CTRL + =
F14	CONTROL & 7	SHIFT F2	SHIFT ⇧ F2	SHIFT F6	CTRL — –
Home	HOME	HOME	HOME	HOME	CTRL L
Initialize Input		SHIFT LINE INS CHAR			CTRL O

Notes:

[1]The 820 KSR terminal has been used as a typical hard-copy terminal with the TPD Device Service Routine (DSR). Keys on other TPD devices may be missing or have different functions.

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Table A-1. Generic Keycap Names (Continued)

Generic Name	911 VDT	940 EVT	931 VDT	Business System Terminal	820[1] KSR
Insert Character	INS CHAR	LINE INS CHAR	INS CHAR	INS CHAR	None
Next Character	→ or SHIFT CHAR	→	►	→	None
Next Field	SHIFT FIELD	LINE FEED	SHIFT⇧ FIELD	SHIFT FIELD	None
Next Line	↓	↓	▼	↓	CTRL J or LINE FEED
Previous Character	← or CHAR	←	◄	←	None
Previous Field	FIELD	SHIFT SKIP	FIELD	FIELD	None

Notes:
[1]The 820 KSR terminal has been used as a typical hard-copy terminal with the TPD Device Service Routine (DSR). Keys on other TPD devices may be missing or have different functions.

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Table A-1. Generic Keycap Names (Continued)

Generic Name	911 VDT	940 EVT	931 VDT	Business System Terminal	820[1] KSR
Previous Line	↑	↑	▲	↑	CTRL U
Print	PRINT	PRINT	PRINT	PRINT	None
Repeat	REPEAT	See Note 3	See Note 3	See Note 3	None
Return	[redacted]	[redacted]	RETURN	[redacted]	[redacted]
Shift	SHIFT	SHIFT	SHIFT ⇧	SHIFT	SHIFT
Skip	TAB SKIP	← SKIP →	SKIP	TAB SKIP	None
Uppercase Lock	UPPER CASE LOCK	UPPER CASE	CAPS LOCK	UPPER CASE LOCK	UPPER CASE

Notes:

[1]The 820 KSR terminal has been used as a typical hard-copy terminal with the TPD Device Service Routine (DSR). Keys on other TPD devices may be missing or have different functions.

[3]The keyboard is typamatic, and no repeat key is needed.

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Table A-2. Frequently Used Key Sequences

Function	Key Sequence
Log-on	Attention/(Shift)!
Hard-break	Attention/(Control)x
Hold	Attention
Resume	Any key

Table A-3. 911 Keycap Name Equivalents

911 Phrase	Generic Name
Blank gray	Initialize Input
Blank orange	Attention
Down arrow	Next Line
Escape	Exit
Left arrow	Previous Character
Right arrow	Next Character
Up arrow	Previous Line

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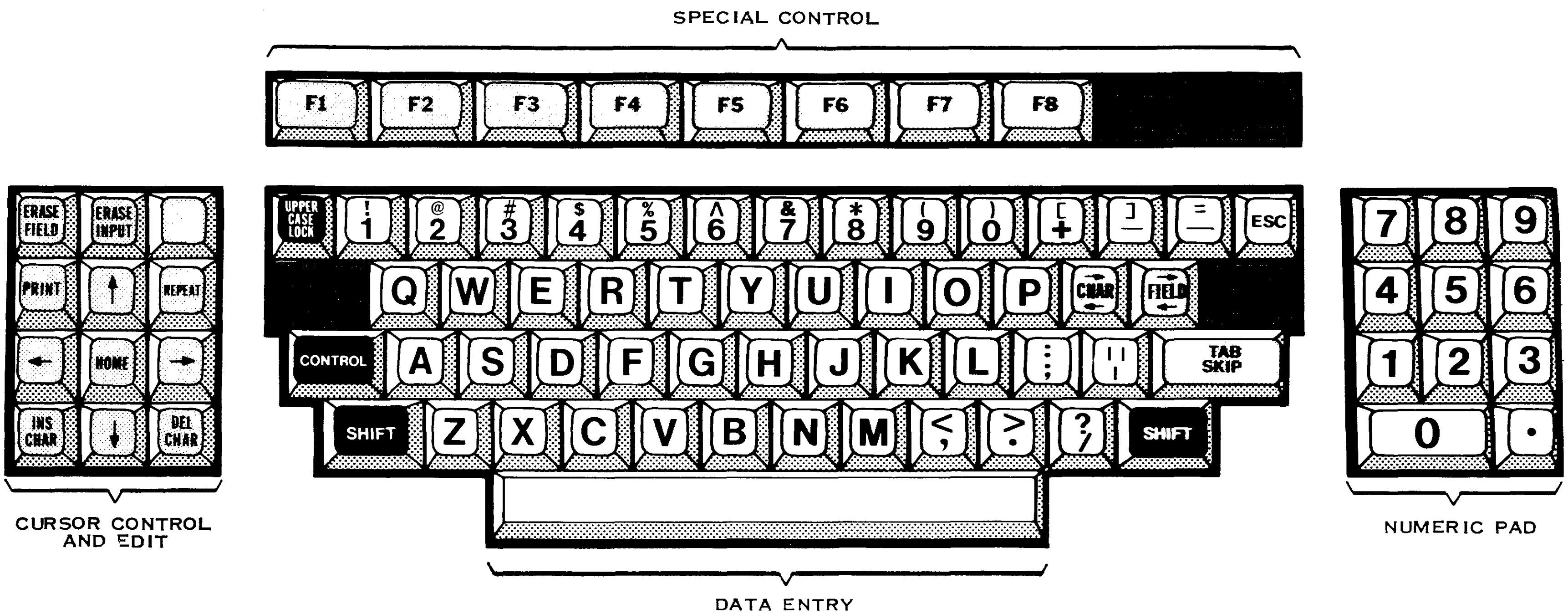

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Figure A-1. 911 VDT Standard Keyboard Layout

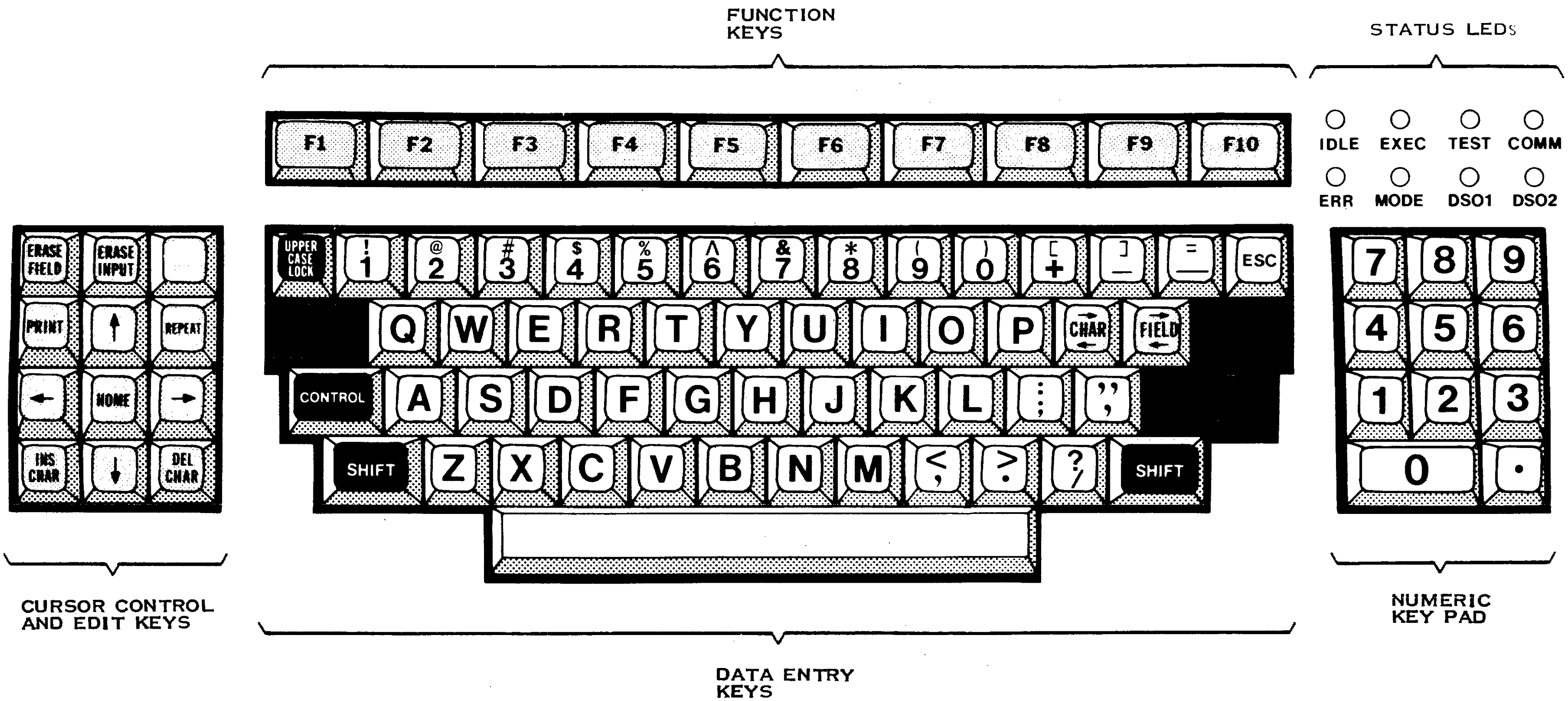

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Figure A-2. 915 VDT Standard Keyboard Layout

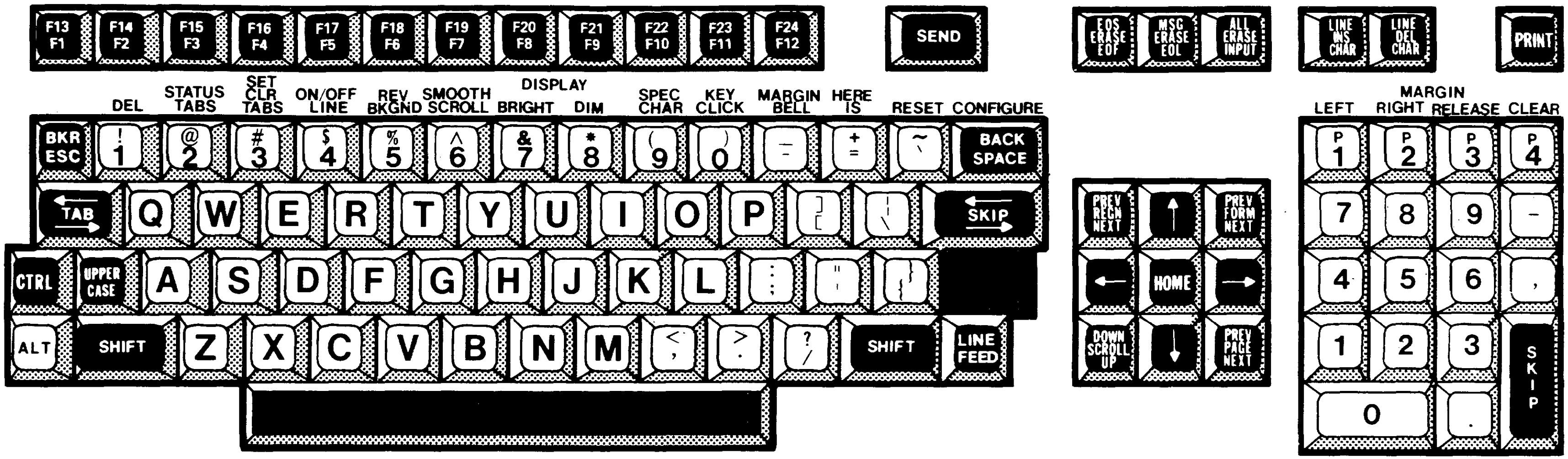

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Figure A-3. 940 EVT Standard Keyboard Layout

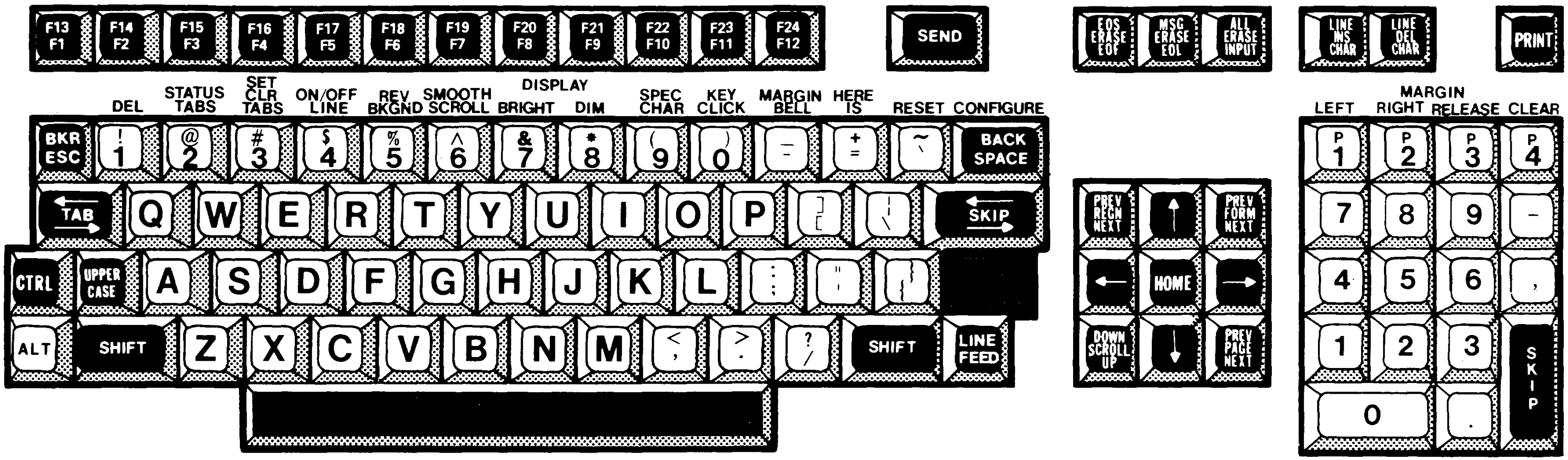

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Figure A-3. 940 EVT Standard Keyboard Layout

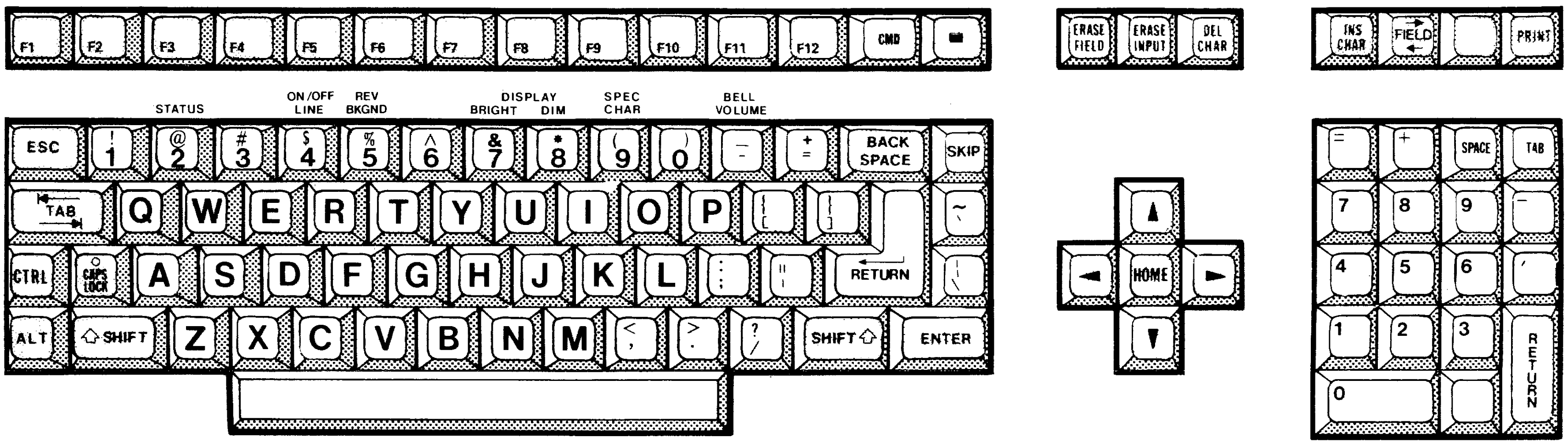

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Figure A-4. 931 VDT Standard Keyboard Layout

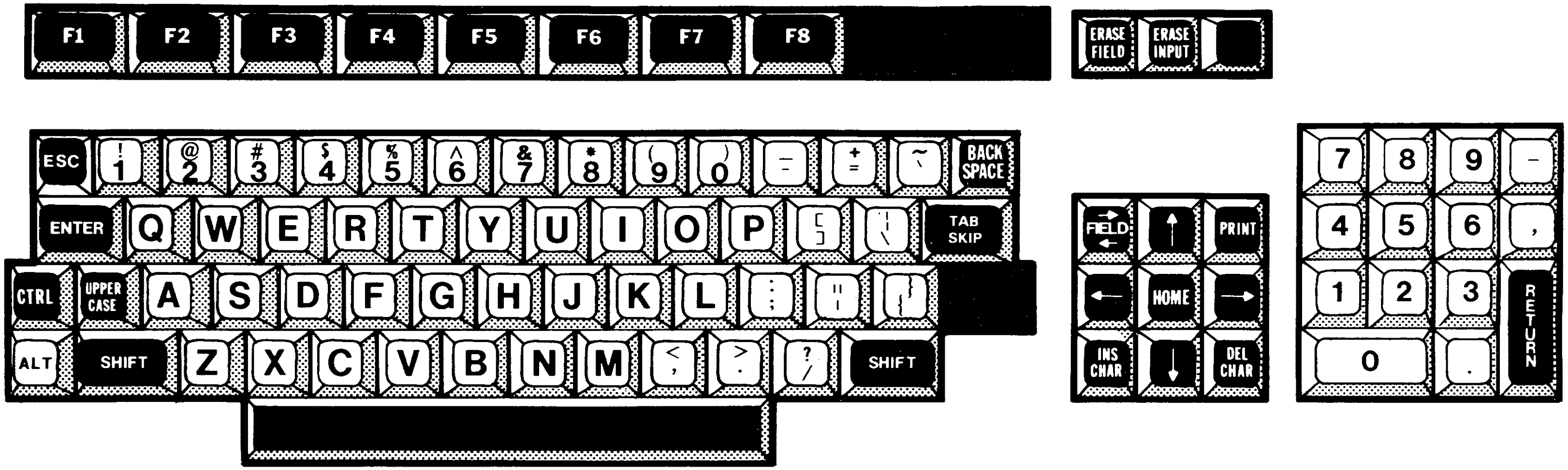

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Figure A-5. Business System Terminal Standard Keyboard Layout

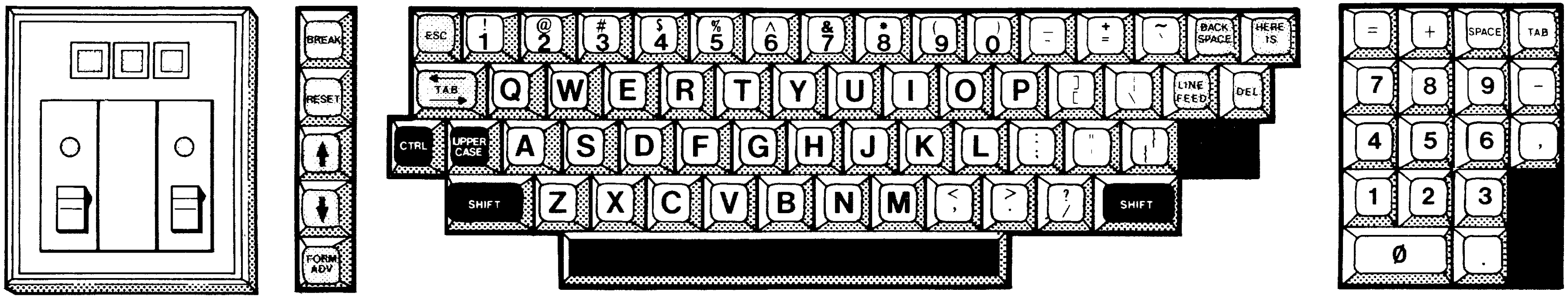

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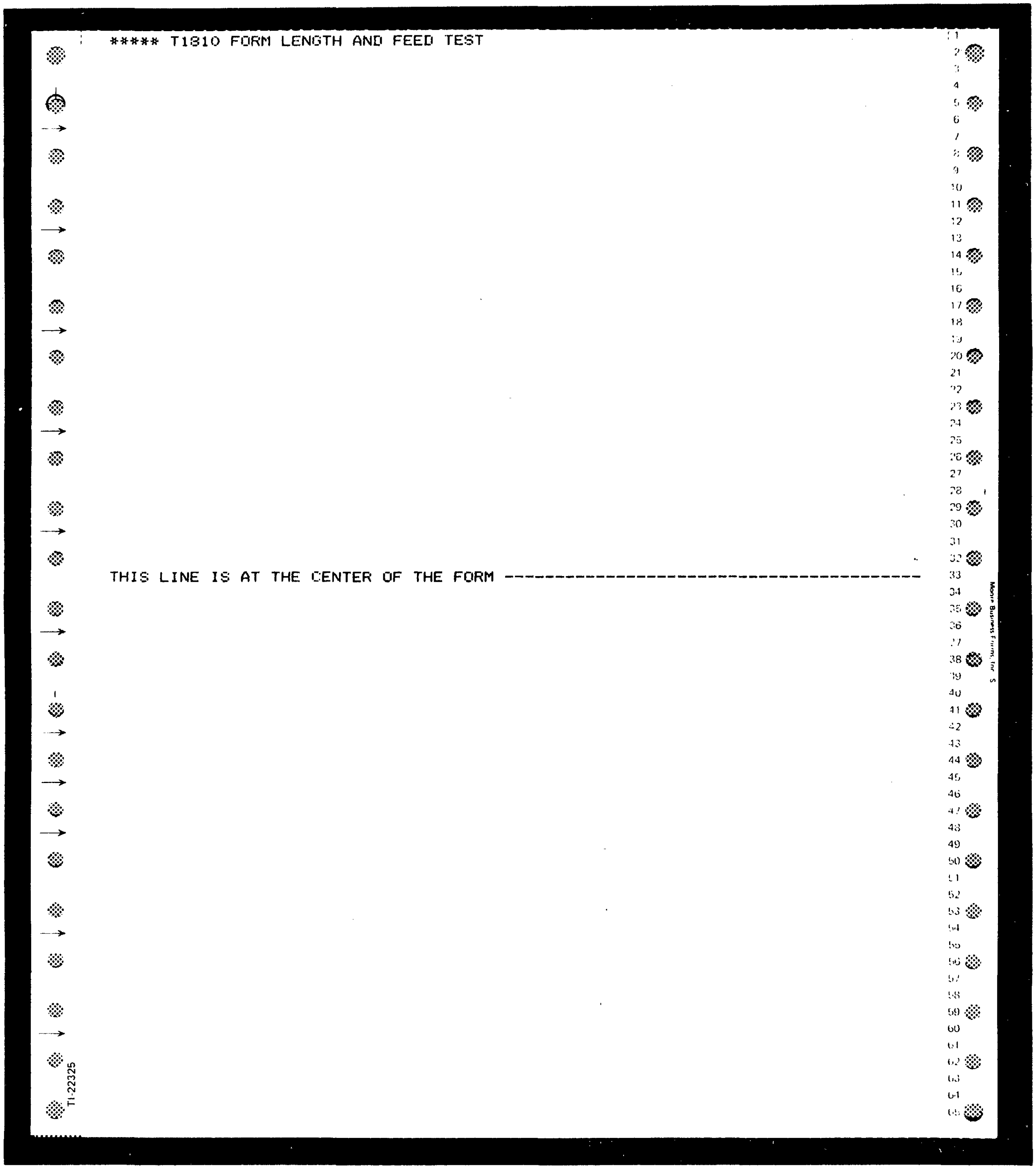
Figure A-6. 820 KSR Standard Keyboard Layout

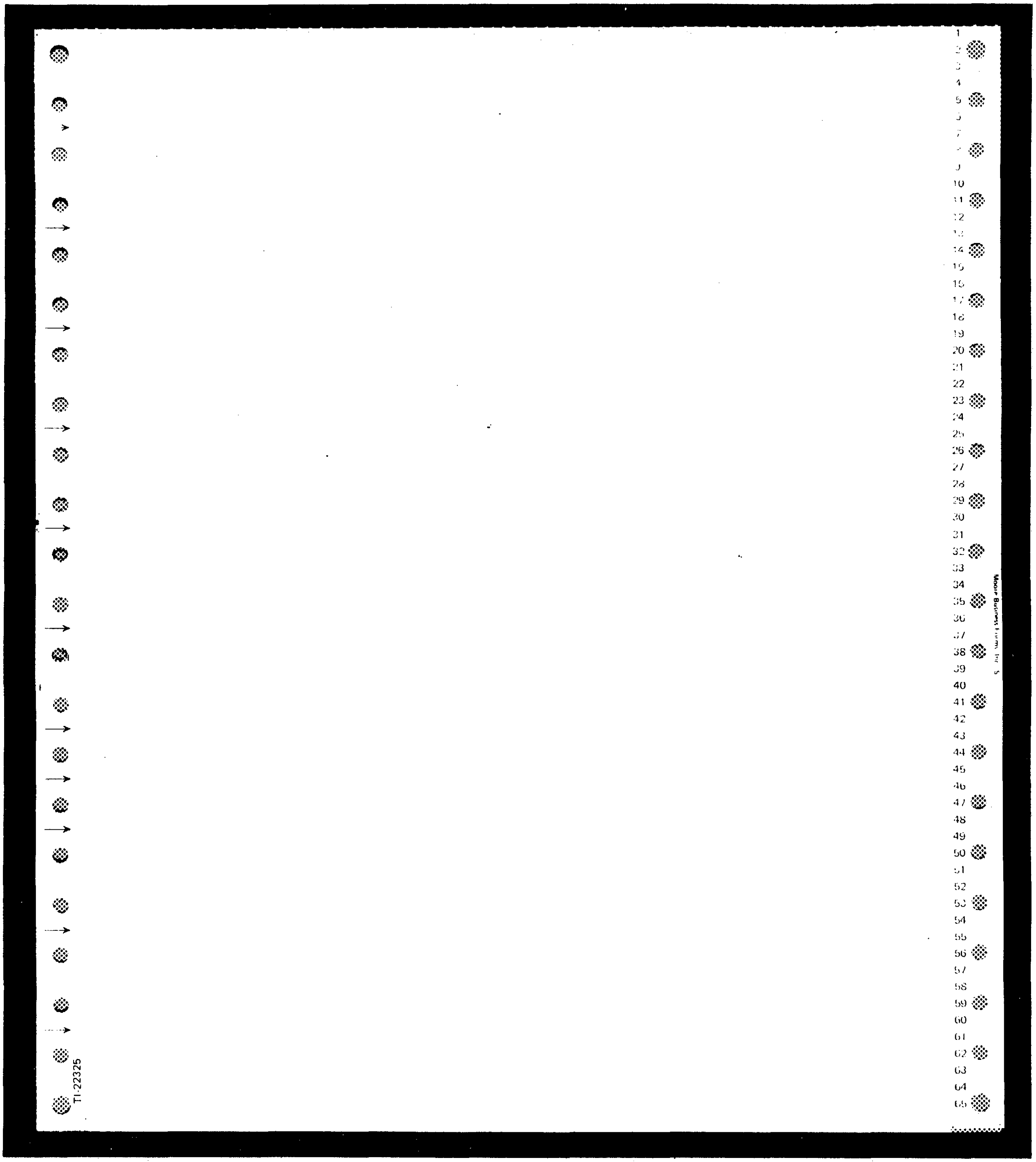
Appendix B

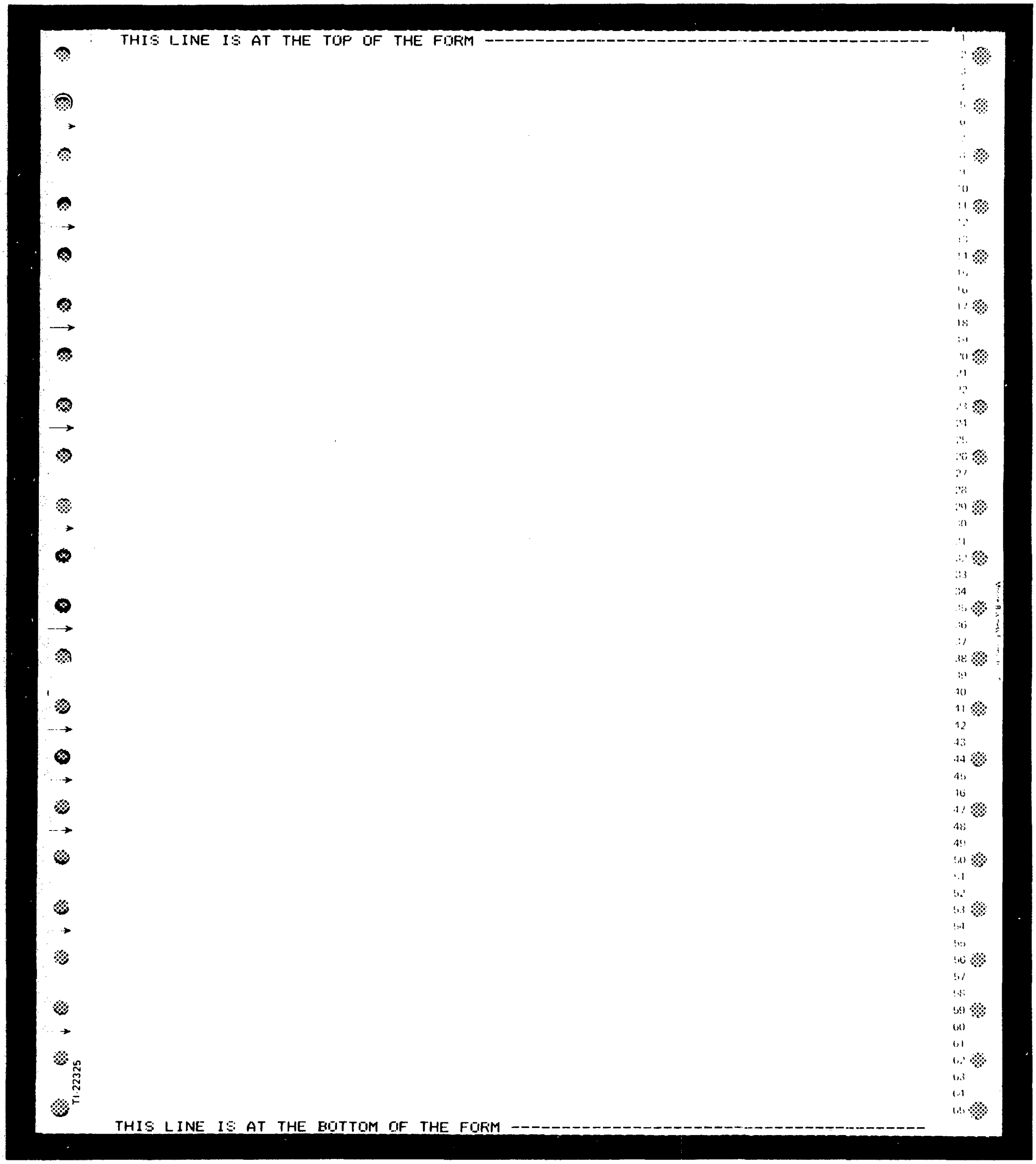
LP810 Output

The following pages are examples of the output of the LP810 tests when executed with the default options. You can use these examples for comparison with the output you receive.


```
***** T1810 FORM LENGTH AND FEED TEST

THIS LINE IS AT THE CENTER OF THE FORM ----------------------------------------
```
TI-22325

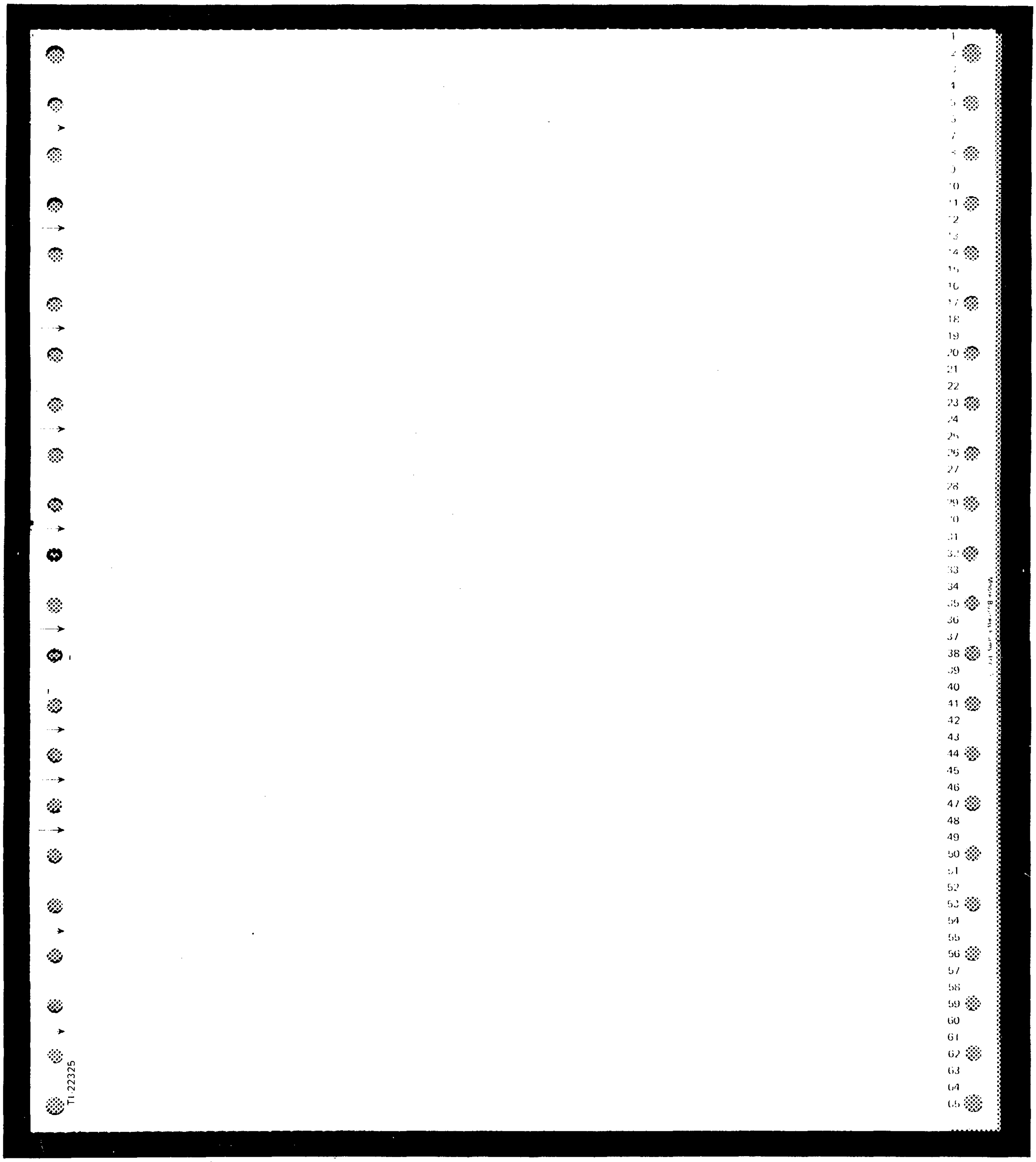

TI-22325

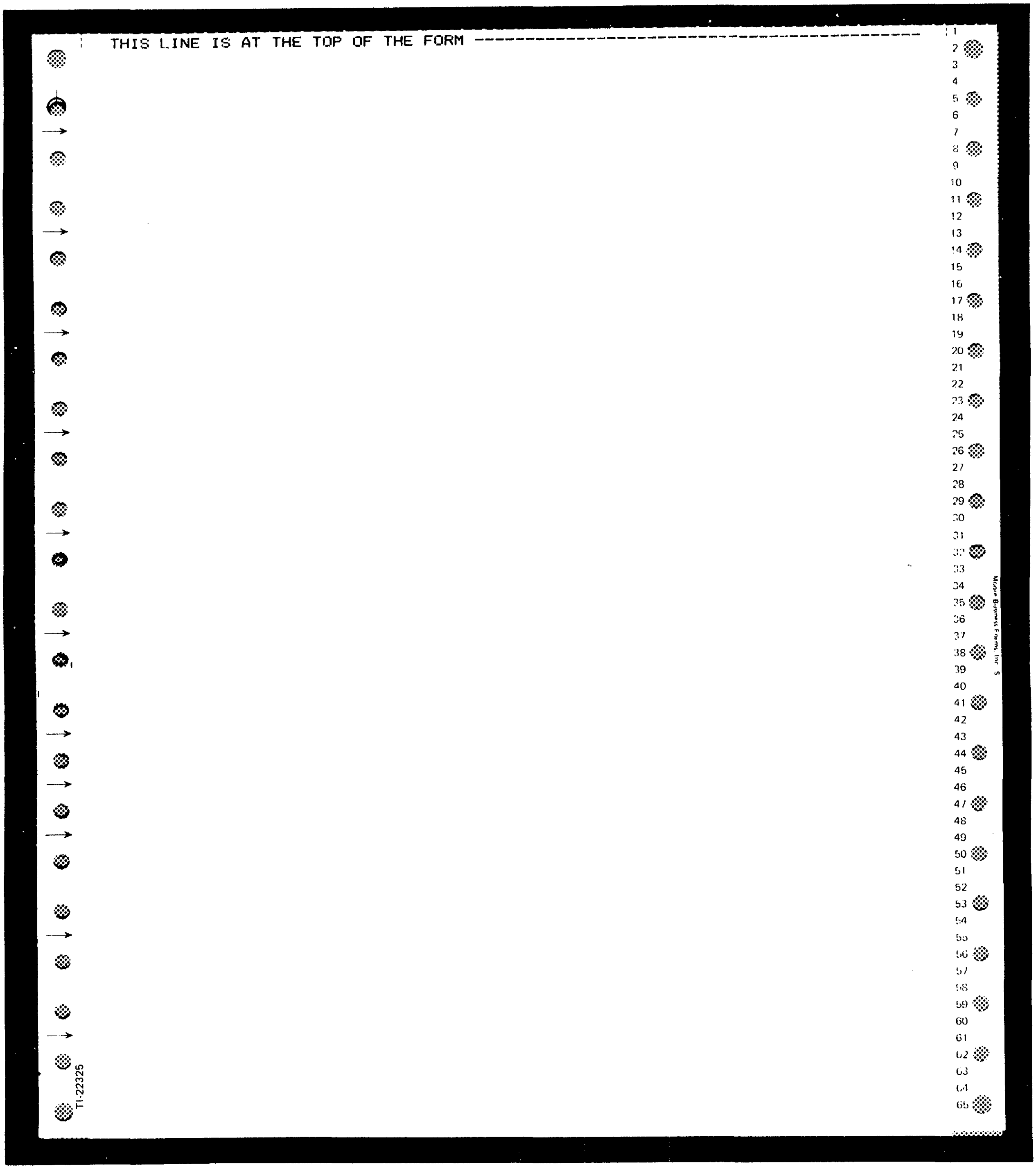


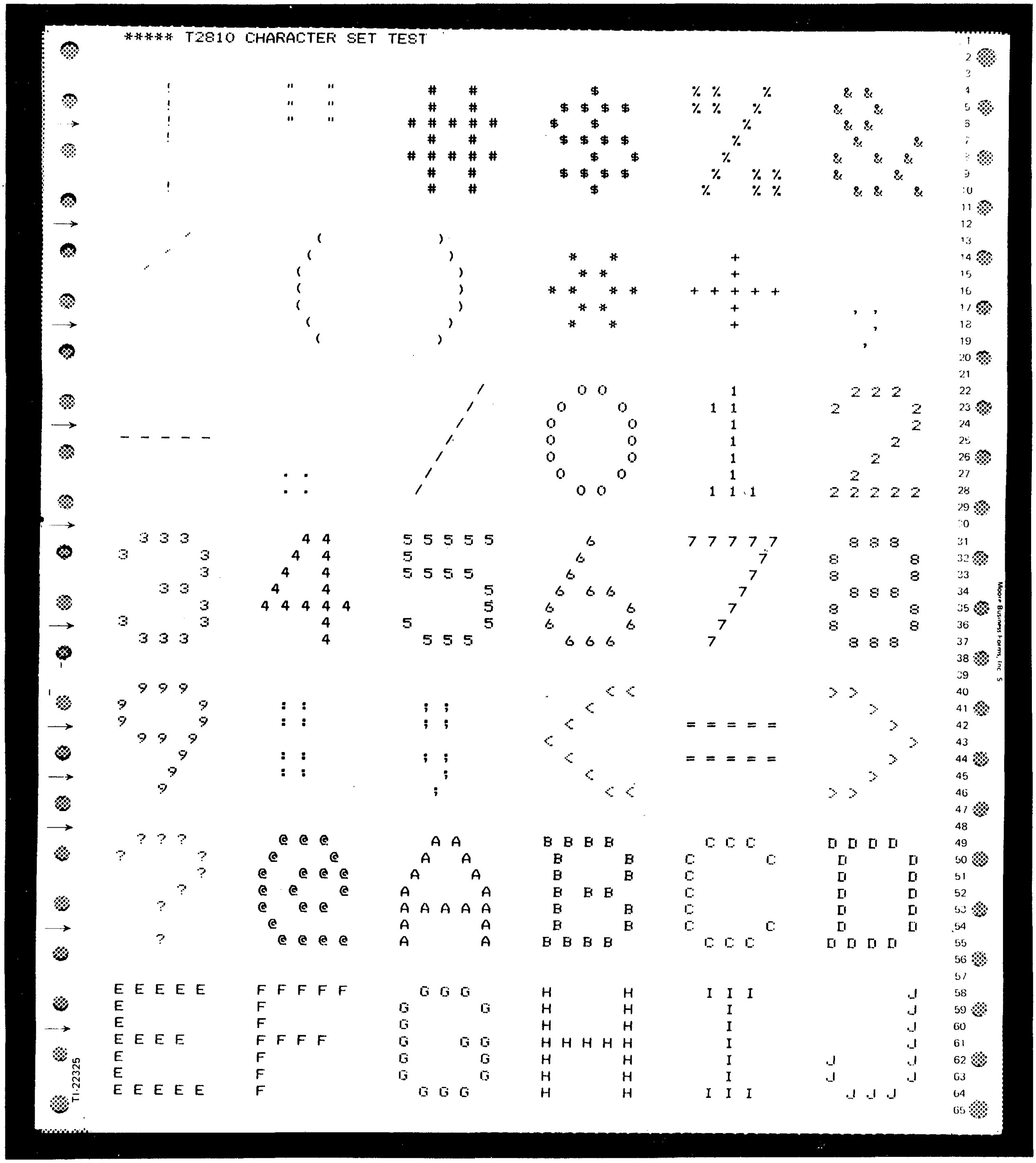
THIS LINE IS AT THE TOP OF THE FORM --

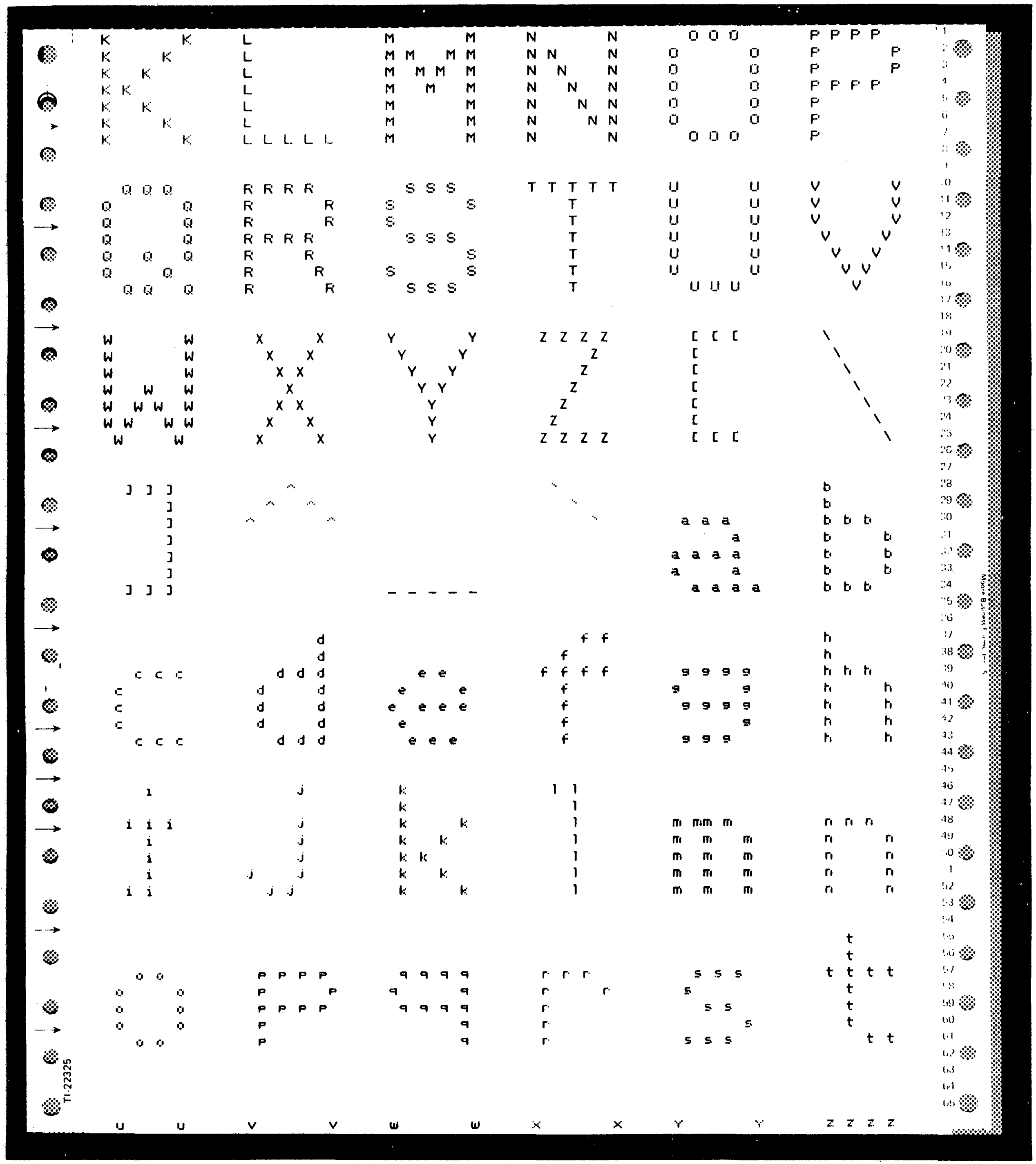
THIS LINE IS AT THE BOTTOM OF THE FORM ---

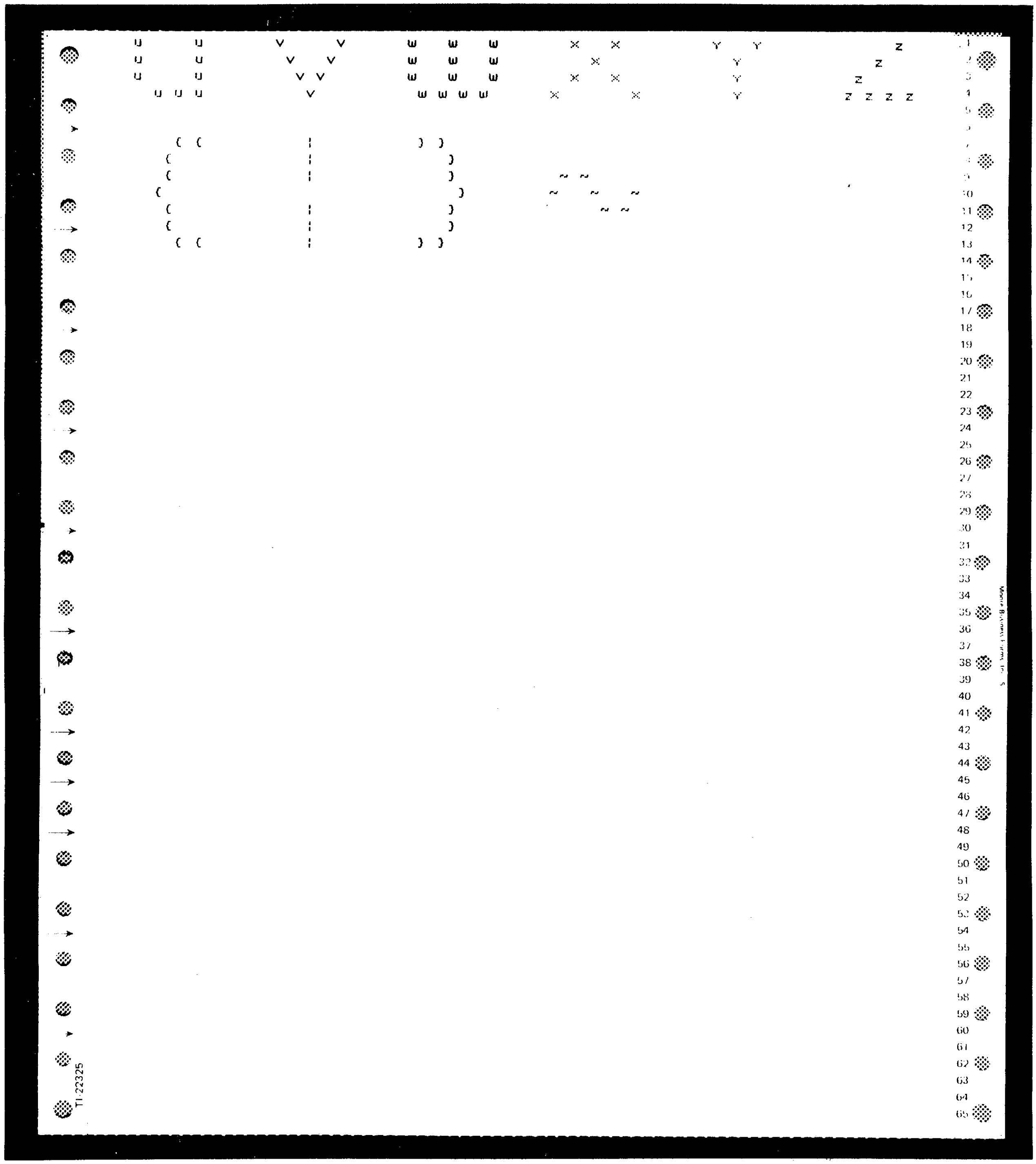
TI-22325


TI-22325


THIS LINE IS AT THE TOP OF THE FORM --
TI-22325


***** T2810 CHARACTER SET TEST
TI-22325


TI-22325


TI-22325

```
***** T3810 RIPPLE TEST

!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnop
"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopq
#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqr
$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrs
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*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxy
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9:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*
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^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNO
_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOP
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TI-22325

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}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmn
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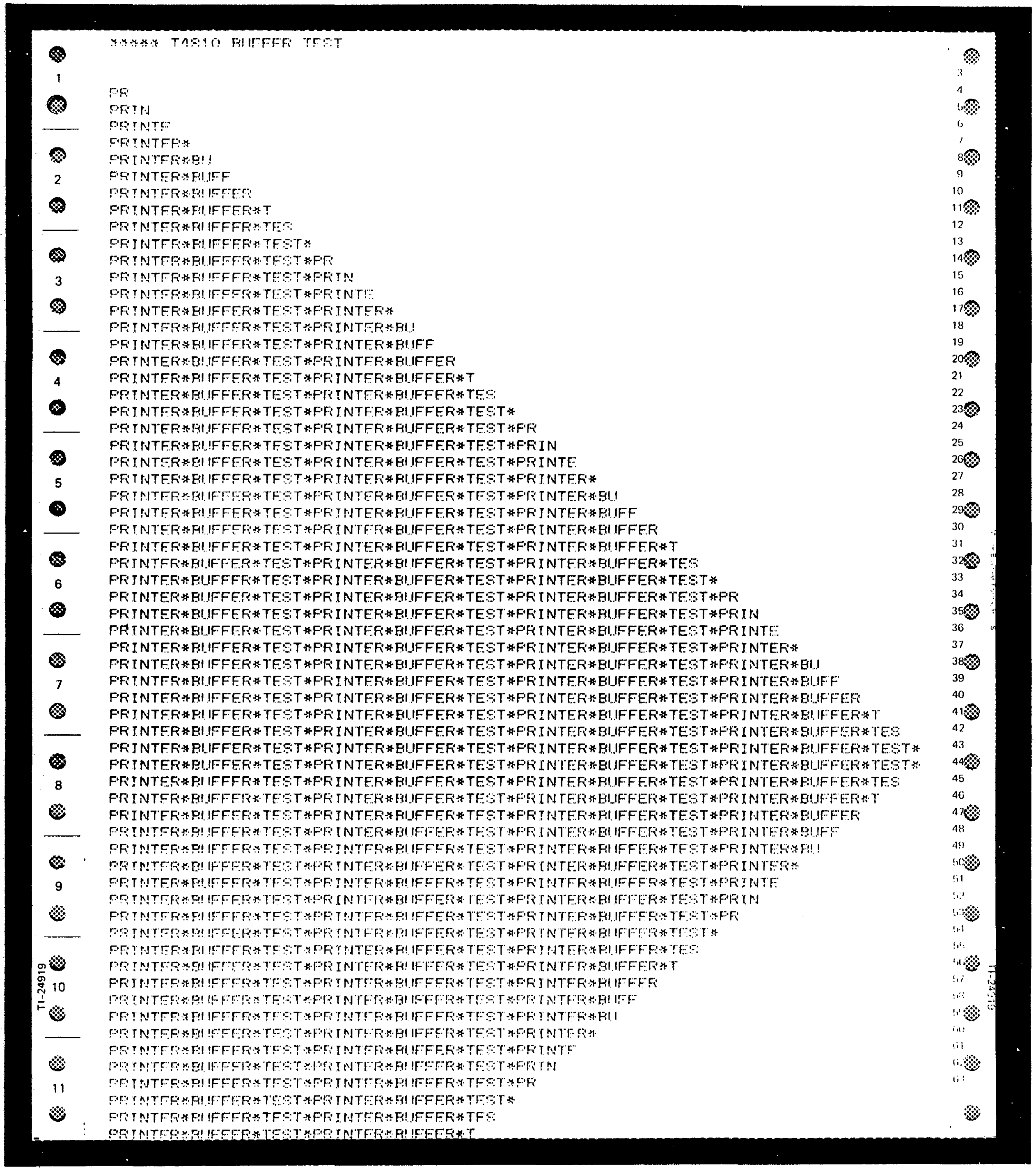
TI-22325



```
***** T4810 BUFFER TEST

PR
PRIN
PRINTE
PRINTER*
PRINTER*BU
PRINTER*BUFF
PRINTER*BUFFER
PRINTER*BUFFER*T
PRINTER*BUFFER*TES
PRINTER*BUFFER*TEST*
PRINTER*BUFFER*TEST*PR
PRINTER*BUFFER*TEST*PRIN
PRINTER*BUFFER*TEST*PRINTE
PRINTER*BUFFER*TEST*PRINTER*
PRINTER*BUFFER*TEST*PRINTER*BU
PRINTER*BUFFER*TEST*PRINTER*BUFF
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PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PR
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRIN
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTE
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*
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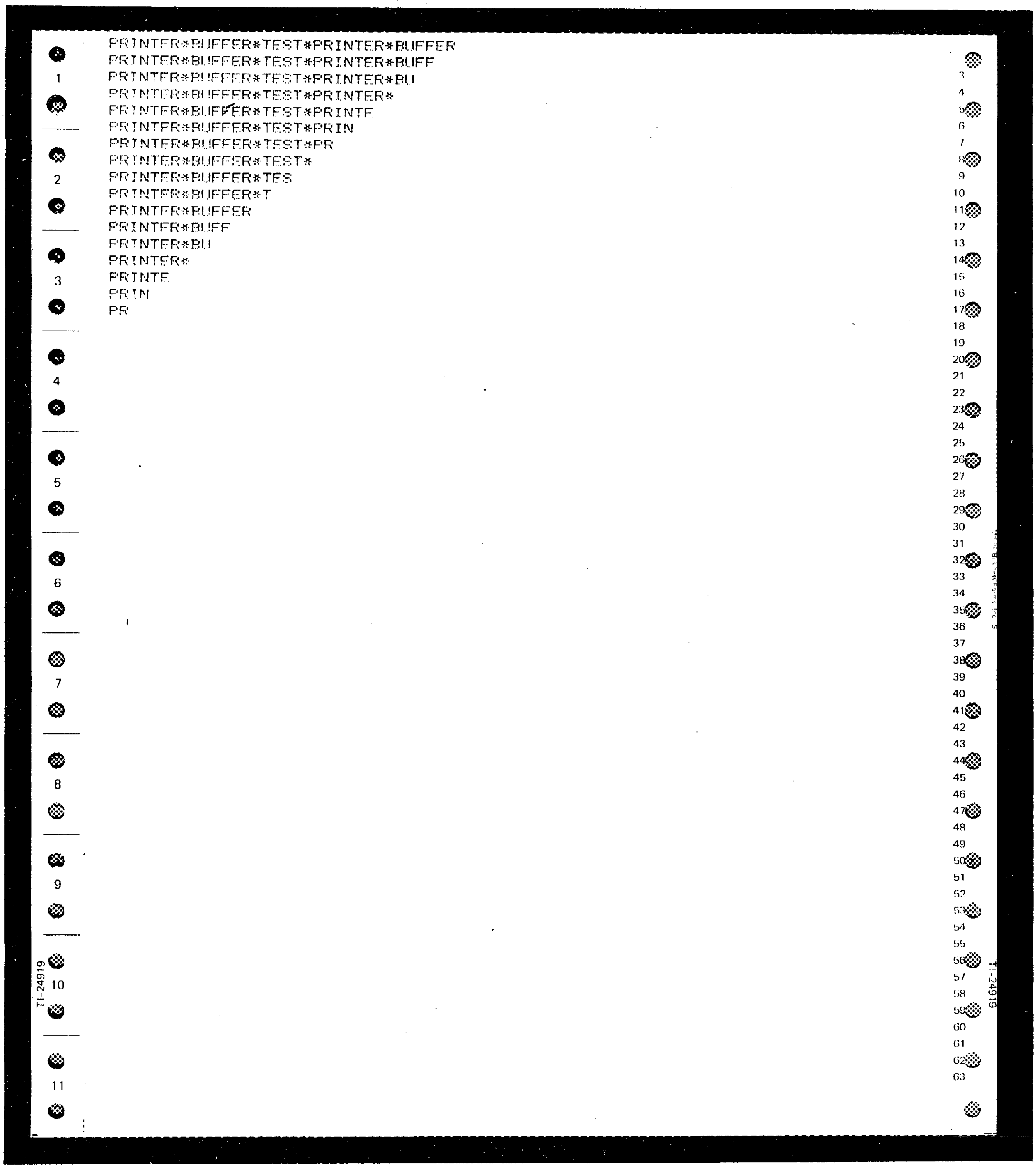
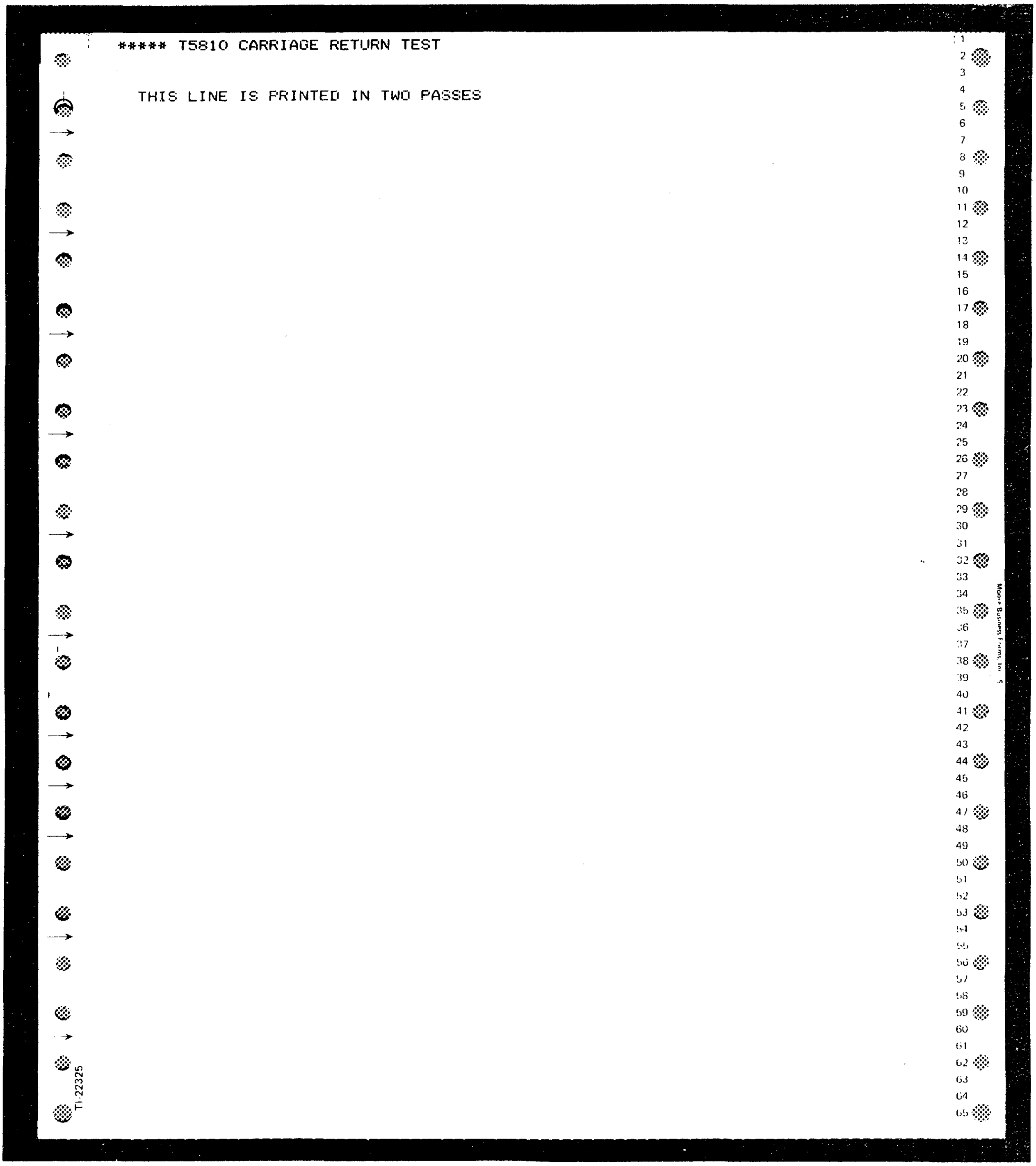
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRIN
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTE
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BU
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFF
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*T
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TES
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TES
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*T
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFF
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BU
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTE
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRIN
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PR
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TES
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*T
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFF
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BU
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTE
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRIN
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PR
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TES
PRINTER*BUFFER*TEST*PRINTER*BUFFER*T
```

TI-24919



```
PRINTER*BUFFER*TEST*PRINTER*BUFFER
PRINTER*BUFFER*TEST*PRINTER*BUFF
PRINTER*BUFFER*TEST*PRINTER*BU
PRINTER*BUFFER*TEST*PRINTER*
PRINTER*BUFFER*TEST*PRINTE
PRINTER*BUFFER*TEST*PRIN
PRINTER*BUFFER*TEST*PR
PRINTER*BUFFER*TEST*
PRINTER*BUFFER*TES
PRINTER*BUFFER*T
PRINTER*BUFFER
PRINTER*BUFF
PRINTER*BU
PRINTER*
PRINTE
PRIN
PR
```

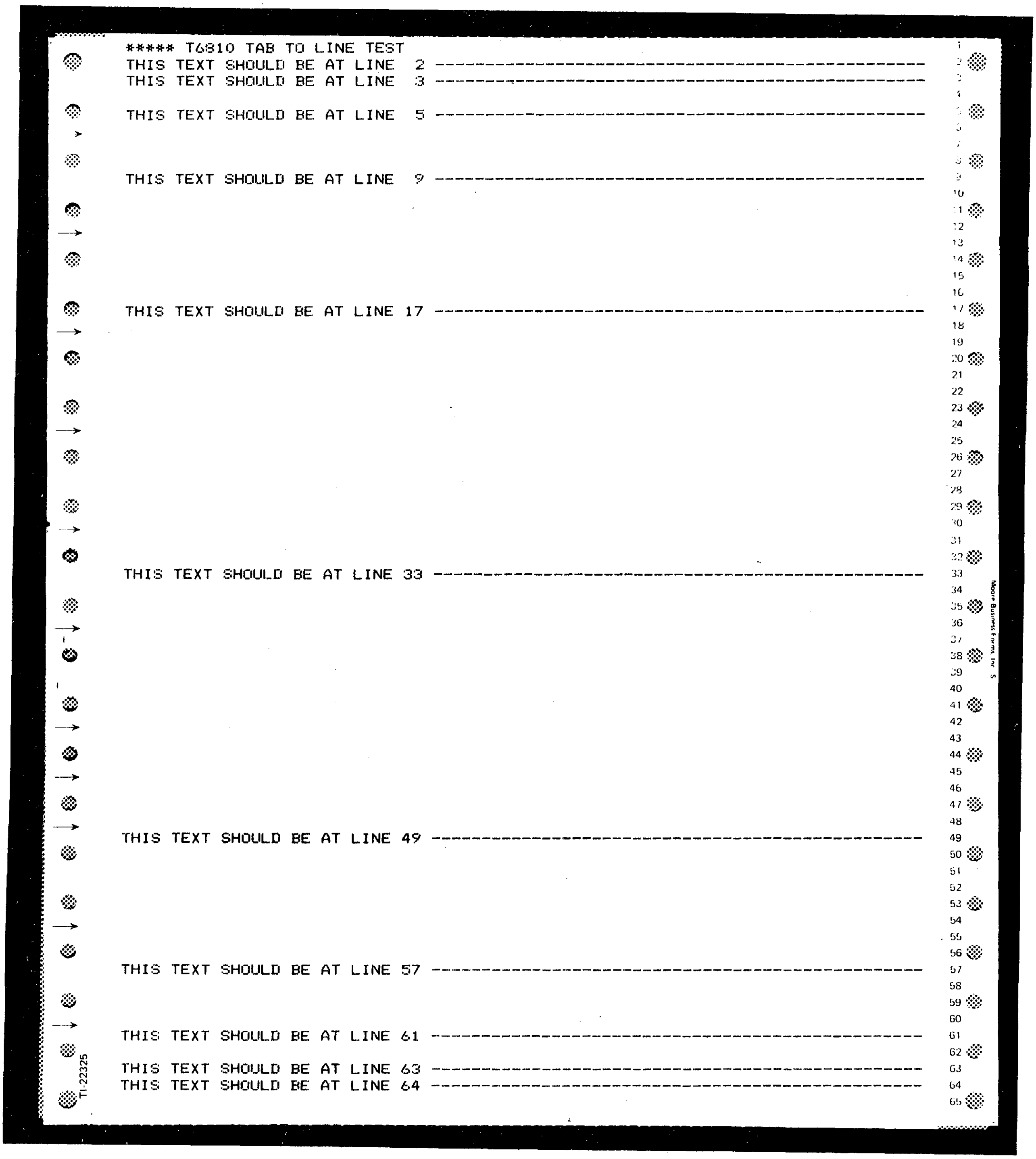
TI-24919



```
***** T5810 CARRIAGE RETURN TEST

  THIS LINE IS PRINTED IN TWO PASSES
```

TI-22325



```
***** T6810 TAB TO LINE TEST
THIS TEXT SHOULD BE AT LINE  2 ---------------------------------------------------
THIS TEXT SHOULD BE AT LINE  3 ---------------------------------------------------

THIS TEXT SHOULD BE AT LINE  5 ---------------------------------------------------



THIS TEXT SHOULD BE AT LINE  9 ---------------------------------------------------







THIS TEXT SHOULD BE AT LINE 17 ---------------------------------------------------















THIS TEXT SHOULD BE AT LINE 33 ---------------------------------------------------















THIS TEXT SHOULD BE AT LINE 49 ---------------------------------------------------







THIS TEXT SHOULD BE AT LINE 57 ---------------------------------------------------



THIS TEXT SHOULD BE AT LINE 61 ---------------------------------------------------

THIS TEXT SHOULD BE AT LINE 63 ---------------------------------------------------
THIS TEXT SHOULD BE AT LINE 64 ---------------------------------------------------
```

TI-22325

```
***** T7810 SET/TEST VERTICAL TABS TEST
THIS TEXT SHOULD BE AT LINE  2 -------------------------------------------------
THIS TEXT SHOULD BE AT LINE  3 -------------------------------------------------

THIS TEXT SHOULD BE AT LINE  5 -------------------------------------------------



THIS TEXT SHOULD BE AT LINE  9 -------------------------------------------------







THIS TEXT SHOULD BE AT LINE 17 -------------------------------------------------















THIS TEXT SHOULD BE AT LINE 33 -------------------------------------------------















THIS TEXT SHOULD BE AT LINE 49 -------------------------------------------------







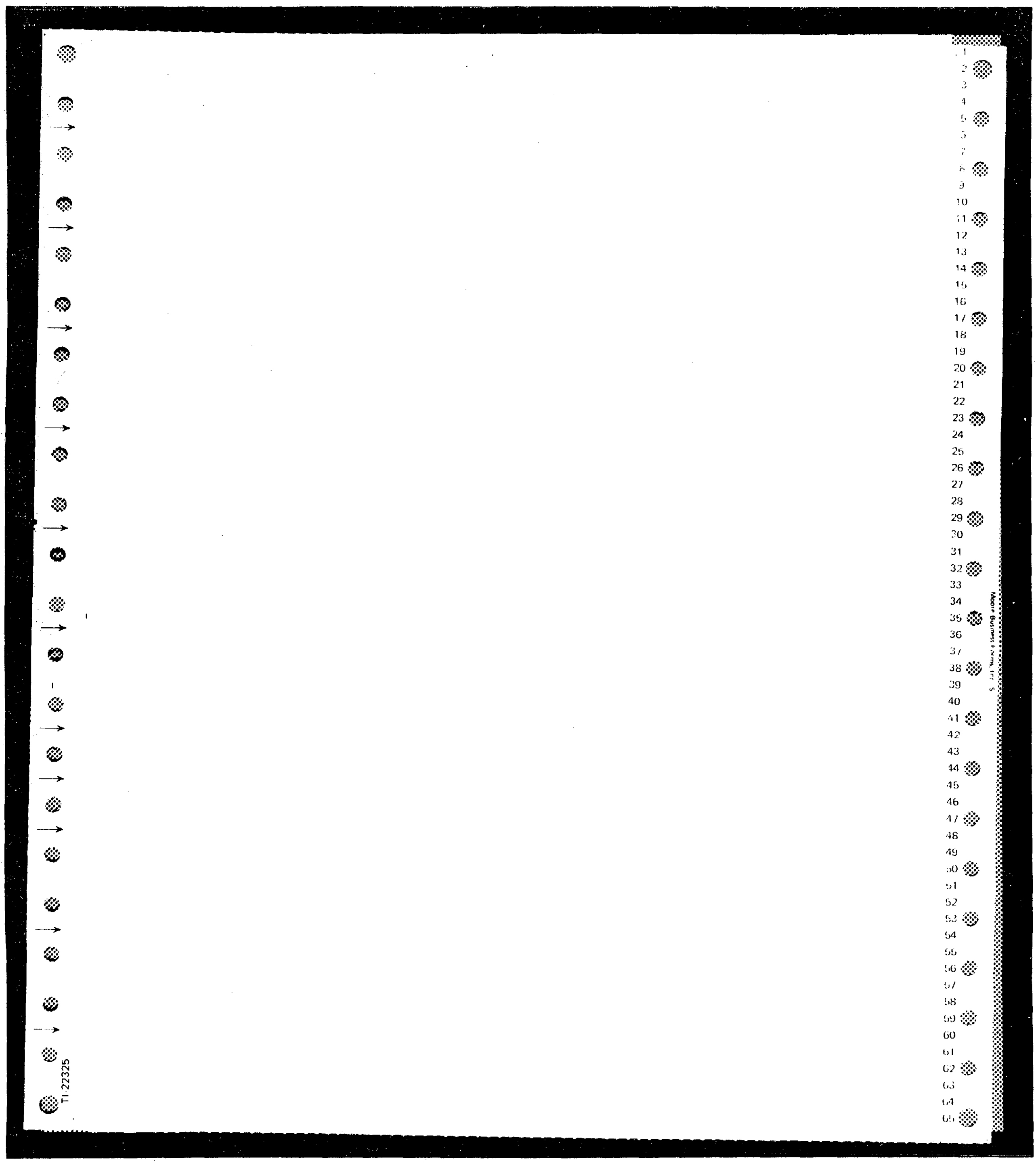
THIS TEXT SHOULD BE AT LINE 57 -------------------------------------------------

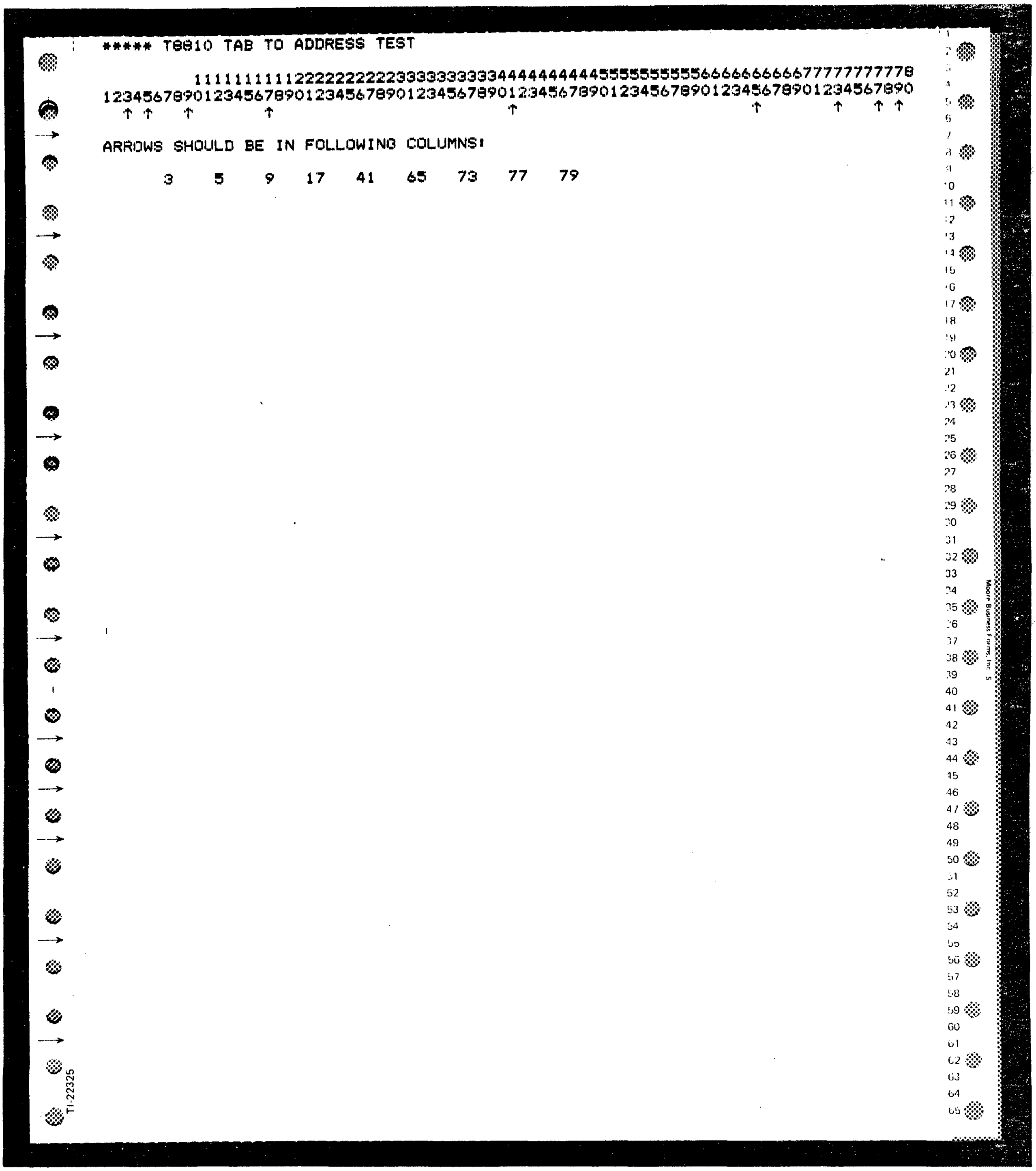


THIS TEXT SHOULD BE AT LINE 61 -------------------------------------------------

THIS TEXT SHOULD BE AT LINE 63 -------------------------------------------------
THIS TEXT SHOULD BE AT LINE 64 -------------------------------------------------
```

TI-22325


TI-22325



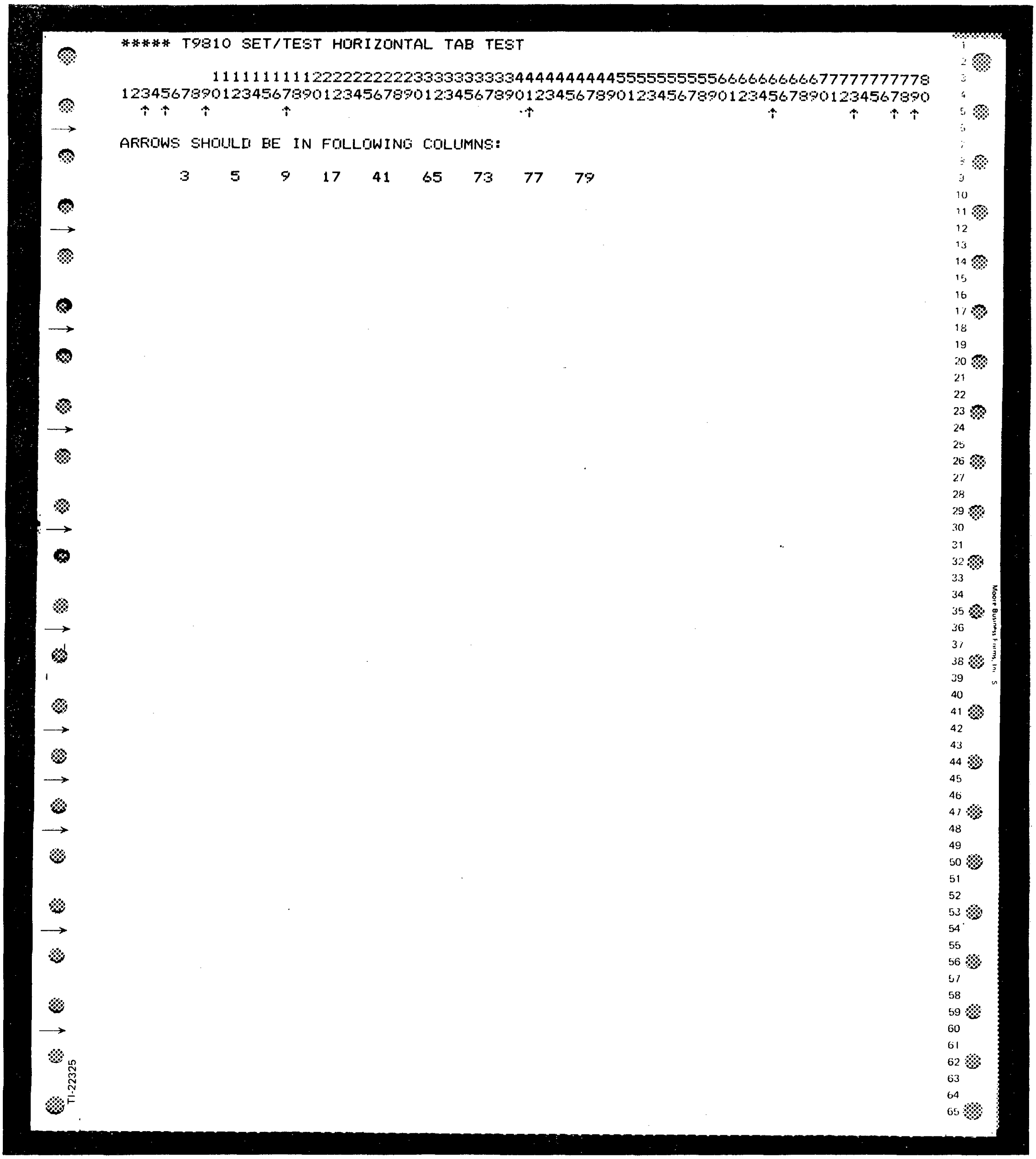
```
***** T8810 TAB TO ADDRESS TEST

         1111111111222222222233333333334444444444555555555566666666667777777778
12345678901234567890123456789012345678901234567890123456789012345678901234567890
  ↑ ↑   ↑       ↑                       ↑                       ↑       ↑   ↑ ↑

ARROWS SHOULD BE IN FOLLOWING COLUMNS:

      3    5    9   17   41   65   73   77   79
```

TI-22325



```
***** T9810 SET/TEST HORIZONTAL TAB TEST

         11111111112222222222333333333344444444445555555555666666666677777777778
12345678901234567890123456789012345678901234567890123456789012345678901234567890
  ↑ ↑   ↑       ↑                       ↑                       ↑       ↑   ↑ ↑

ARROWS SHOULD BE IN FOLLOWING COLUMNS:

      3    5    9   17   41   65   73   77   79
```

TI-22325

```
***** TA810 LINES AND CHARS/INCH TEST

BLOCK IS 10 CHRS/INCH AND 8 LINES/INCH
                                  XXXXXXXXXX
                                  XXXXXXXXXX
                                  XXXXXXXXXX
                                  XXXXXXXXXX
                                  XXXXXXXXXX
                                  XXXXXXXXXX
                                  XXXXXXXXXX
                                  XXXXXXXXXX

BLOCK IS 10 CHRS/INCH AND 6 LINES/INCH

                                  XXXXXXXXXX
                                  XXXXXXXXXX
                                  XXXXXXXXXX
                                  XXXXXXXXXX
                                  XXXXXXXXXX
                                  XXXXXXXXXX

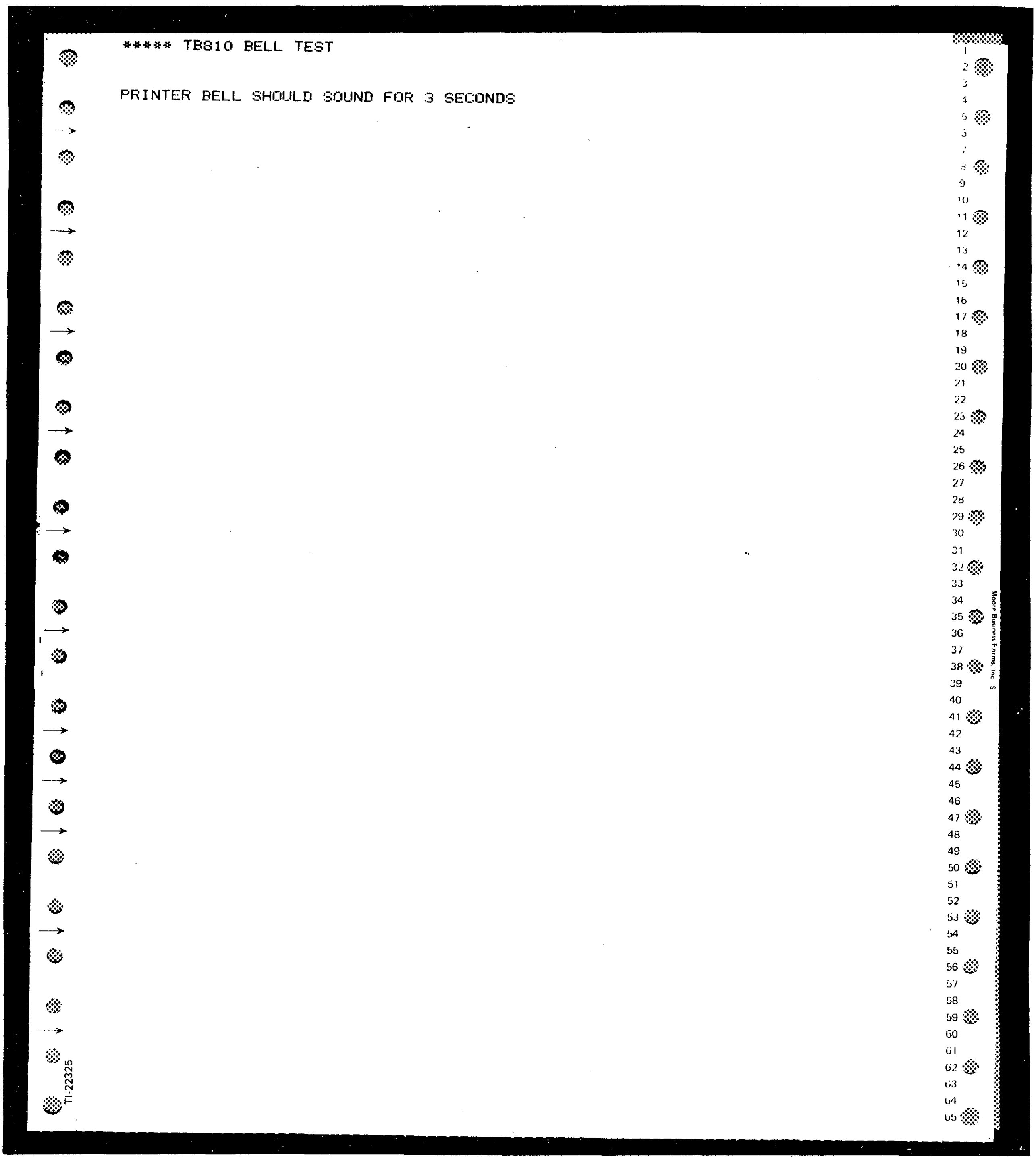

BLOCK IS 16.5 CHRS/INCH AND 8 LINES/INCH
                    XXXXXXXXXXXXXXXXX
                    XXXXXXXXXXXXXXXXX
                    XXXXXXXXXXXXXXXXX
                    XXXXXXXXXXXXXXXXX
                    XXXXXXXXXXXXXXXXX
                    XXXXXXXXXXXXXXXXX
                    XXXXXXXXXXXXXXXXX
                    XXXXXXXXXXXXXXXXX

BLOCK IS 16.5 CHRS/INCH AND 6 LINES/INCH

                    XXXXXXXXXXXXXXXXX
                    XXXXXXXXXXXXXXXXX
                    XXXXXXXXXXXXXXXXX
                    XXXXXXXXXXXXXXXXX
                    XXXXXXXXXXXXXXXXX
                    XXXXXXXXXXXXXXXXX
```

Moore Business Forms, Inc

TI-22325



```
***** TB810 BELL TEST

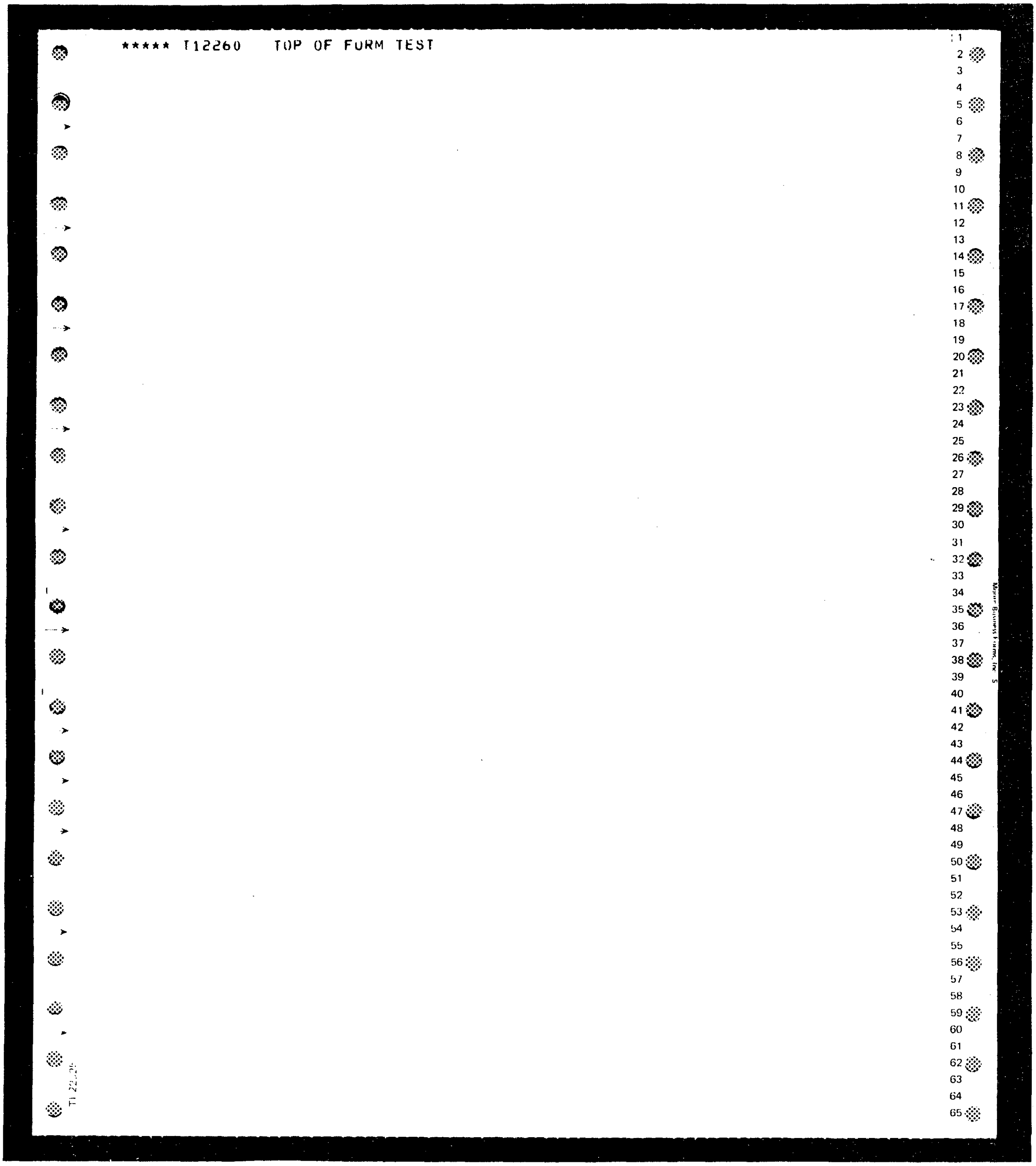
PRINTER BELL SHOULD SOUND FOR 3 SECONDS
```

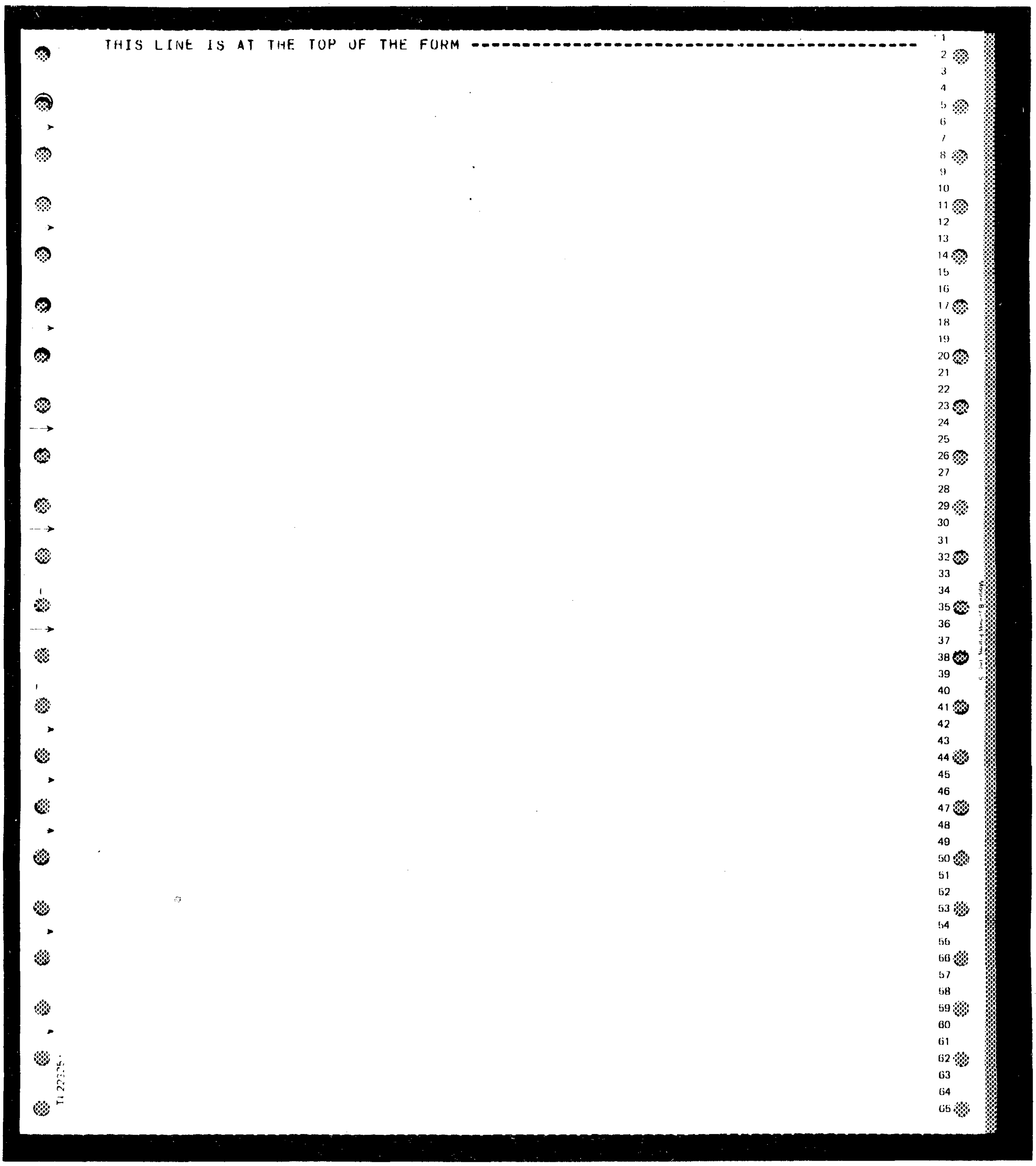
TI-22325

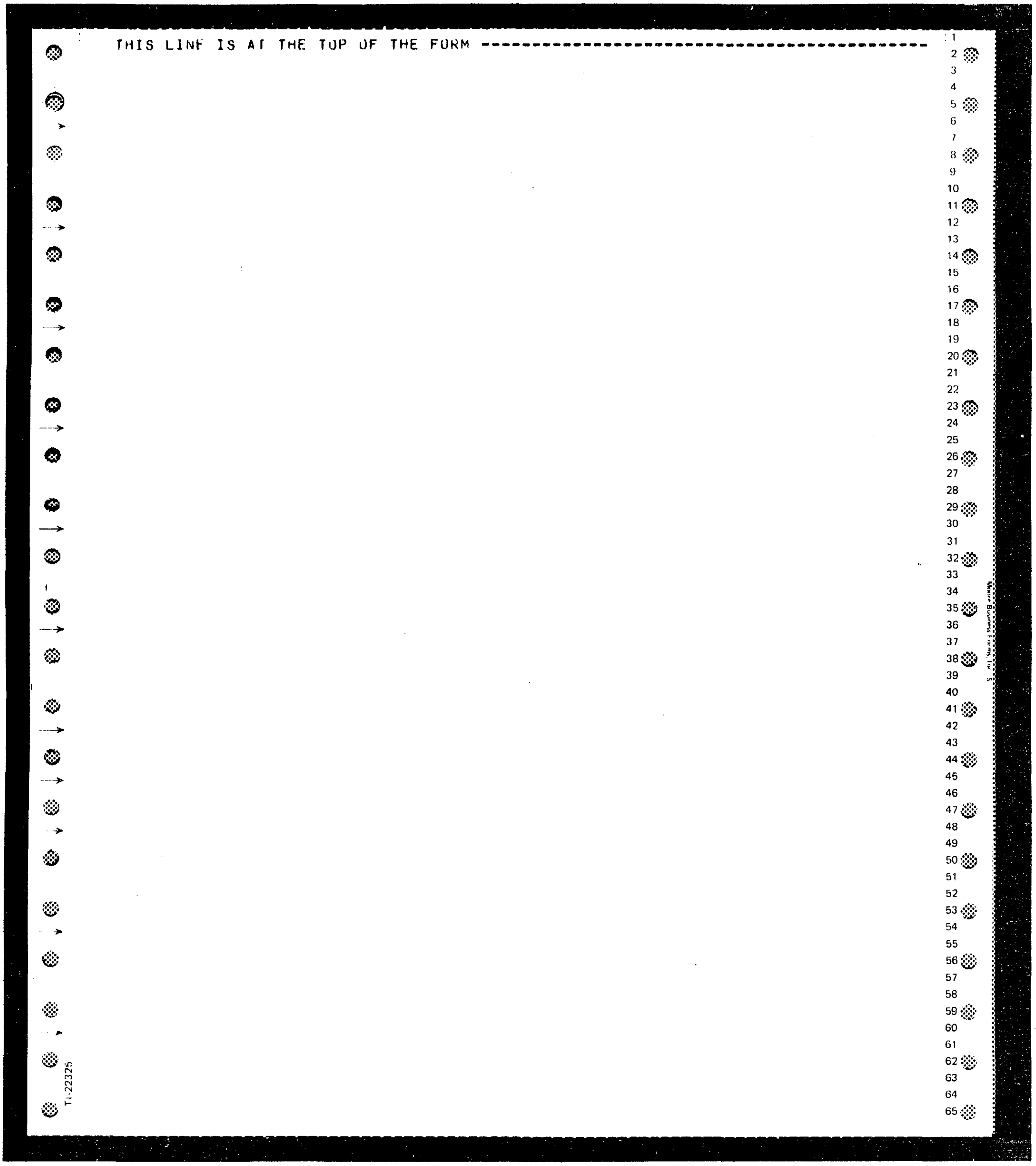
Appendix C

LP2260 Output

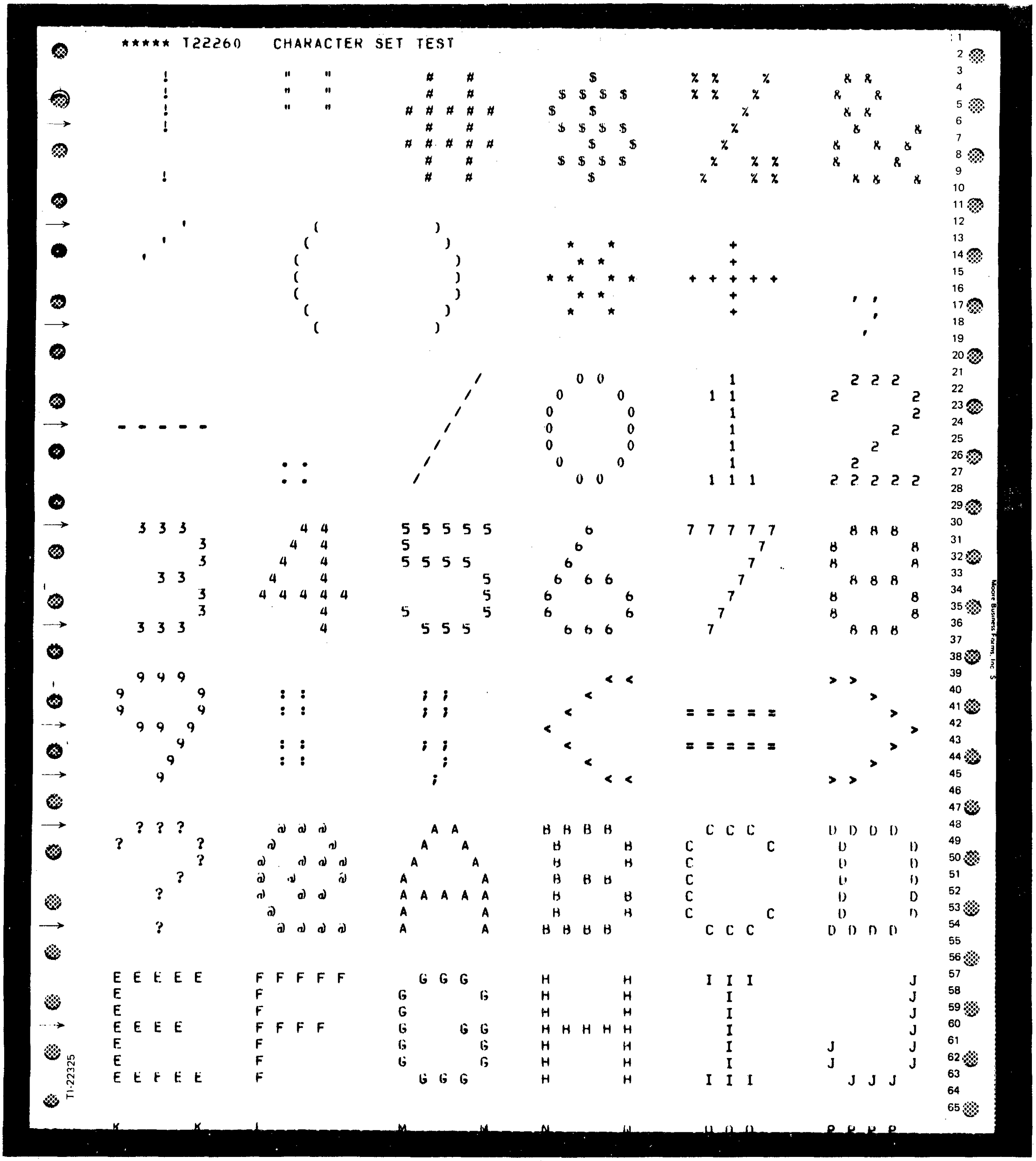
The following pages are examples of the output of the LP2260 tests when executed with the default options. You can use these examples for comparison with the output you receive from both the LP2260 and LP2230.

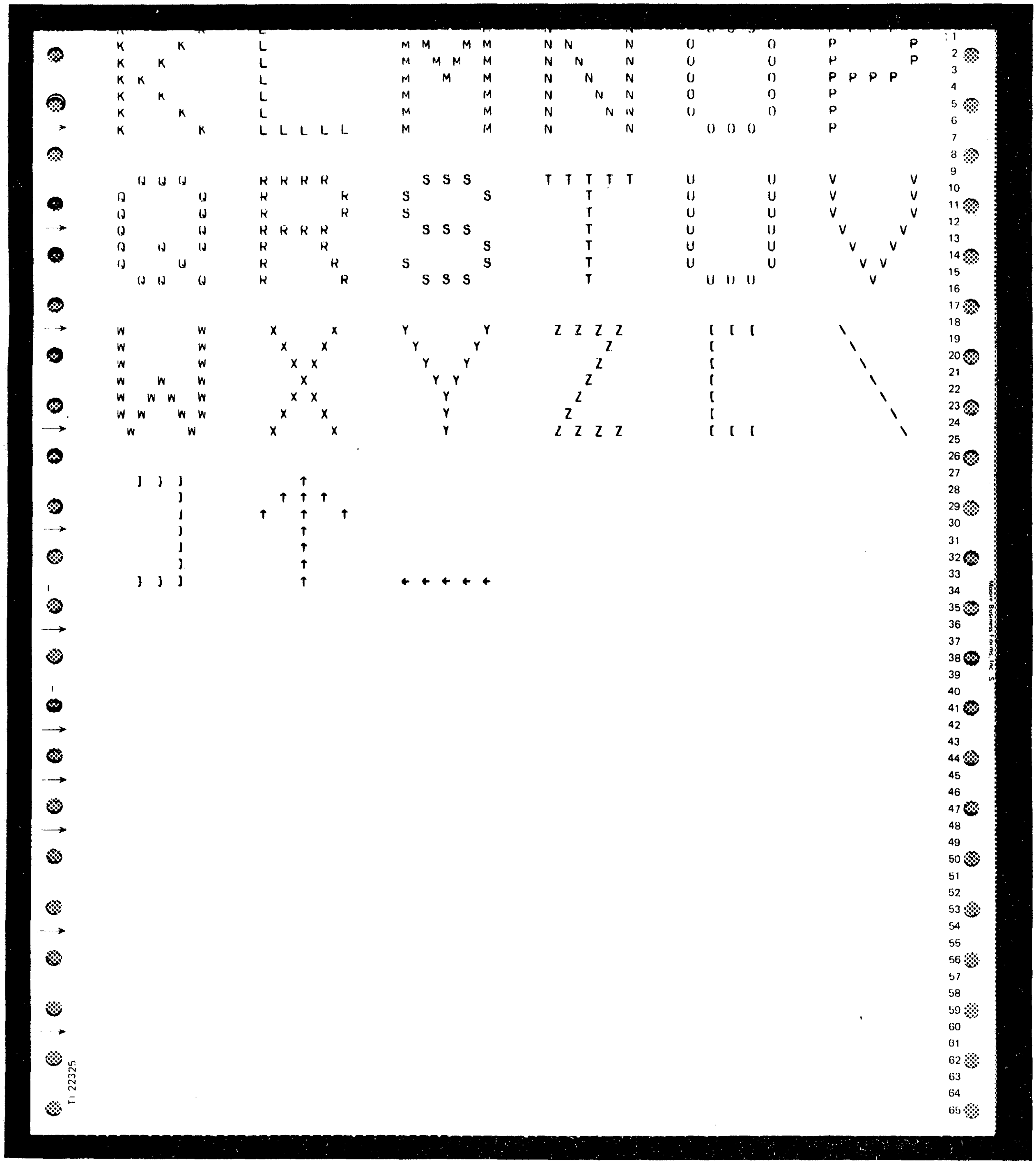

***** TI2260   TOP OF FORM TEST


THIS LINE IS AT THE TOP OF THE FORM


THIS LINE IS AT THE TOP OF THE FORM ---

TI-22325


***** T22260 CHARACTER SET TEST
TI-22325


TI 22325

```
*****  T32260    RIPPLE PATTERN TEST

!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-./01
"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-./012
#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-./0123
$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-./01234
%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-./012345
&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-./0123456
'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-./01234567
()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-./012345678
)*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-./0123456789
*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-./0123456789:
+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-./0123456789:;
,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-./0123456789:;<
-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-./0123456789:;<=
./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-./0123456789:;<=>
/0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-./0123456789:;<=>?
0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-./0123456789:;<=>?@
123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-./0123456789:;<=>?@A
23456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-./0123456789:;<=>?@AB
3456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-./0123456789:;<=>?@ABC
456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-./0123456789:;<=>?@ABCD
56789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-./0123456789:;<=>?@ABCDE
6789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-./0123456789:;<=>?@ABCDEF
789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFG
89:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGH
9:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHI
:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJ
;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJK
<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKL
=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLM
>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMN
?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNO
@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOP
ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQ
BCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQR
CDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRS
DEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRST
EFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTU
FGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUV
GHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVW
HIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWX
IJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXY
JKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ
KLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[
LMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\
MNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]
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OPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←
PQRSTUVWXYZ[\]↑←!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!
QRSTUVWXYZ[\]↑←!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"
RSTUVWXYZ[\]↑←!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#
STUVWXYZ[\]↑←!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$
TUVWXYZ[\]↑←!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%
UVWXYZ[\]↑←!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&
VWXYZ[\]↑←!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'
WXYZ[\]↑←!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'(
XYZ[\]↑←!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()
YZ[\]↑←!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*
Z[\]↑←!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+
[\]↑←!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,
\]↑←!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-
]↑←!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-.
↑←!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]↑←!"#$%&'()*+,-./
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```

```
***** 142260    BUFFER TEST

PR
PRIN
PRINTE
PRINTER*
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PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PR
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRIN
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PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRIN
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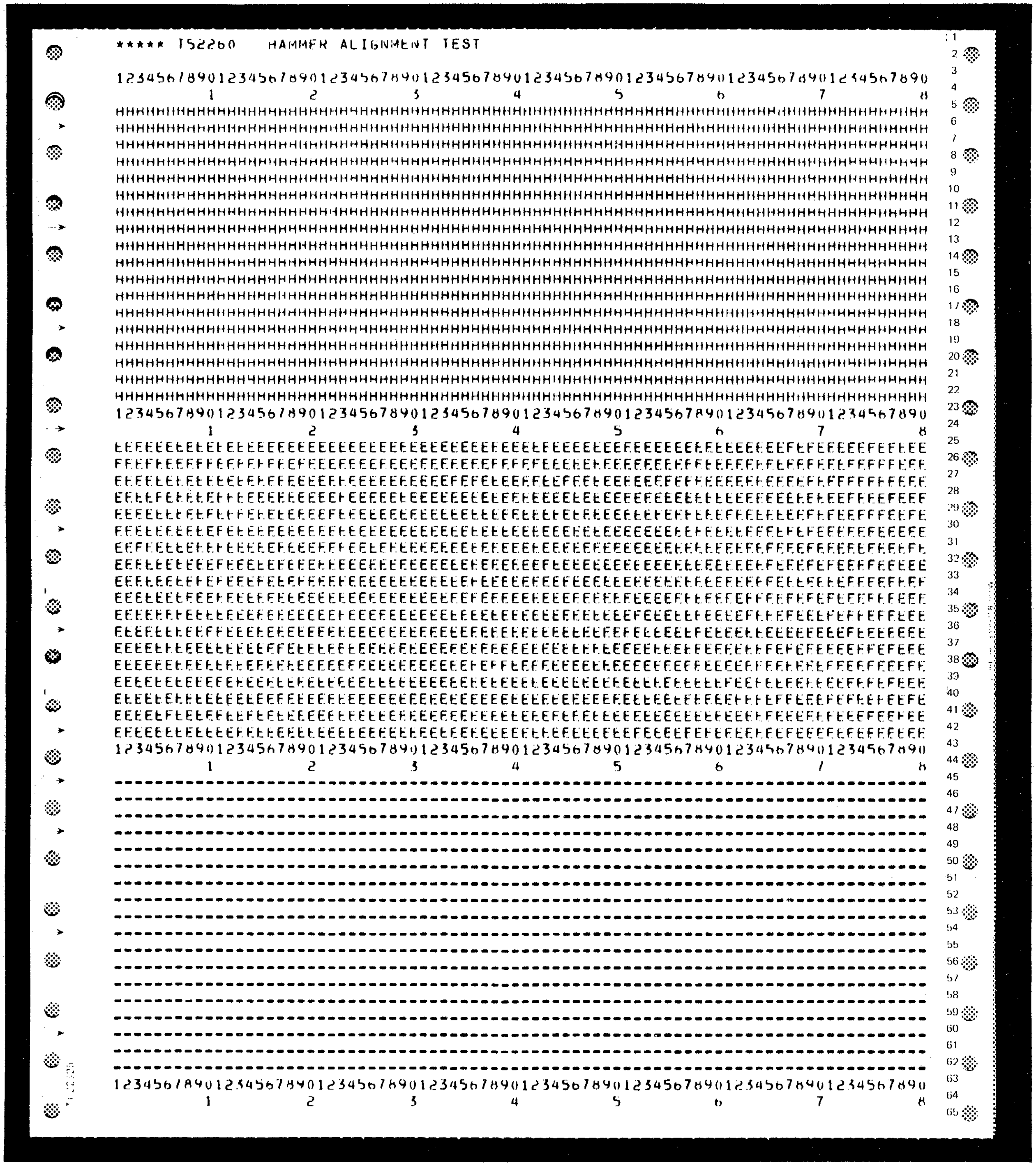
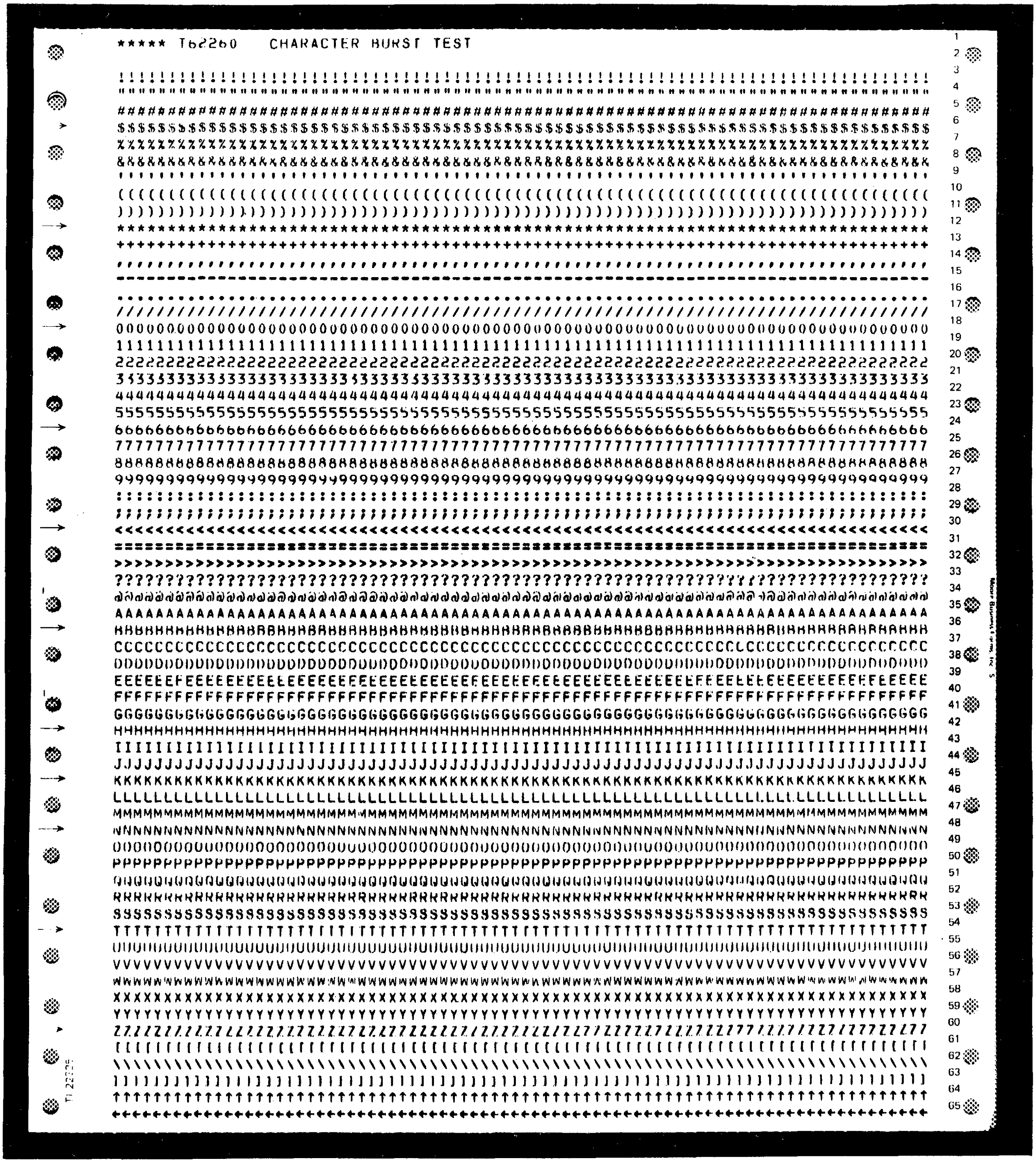
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTE
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRIN
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PR
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TES
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*T
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFF
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BU
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTE
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRIN
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PR
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TES
PRINTER*BUFFER*TEST*PRINTER*BUFFER*T
PRINTER*BUFFER*TEST*PRINTER*BUFFER
```

TI-22325

```
PRINTER*BUFFER*TEST*PRINTER*BUFF
PRINTER*BUFFER*TEST*PRINTER*BU
PRINTER*BUFFER*TEST*PRINTER*
PRINTER*BUFFER*TEST*PRINTE
PRINTER*BUFFER*TEST*PRIN
PRINTER*BUFFER*TEST*PR
PRINTER*BUFFER*TEST*
PRINTER*BUFFER*TES
PRINTER*BUFFER*T
PRINTER*BUFFER
PRINTER*BUFF
PRINTER*BU
PRINTER*
PRINTE
PRIN
PR
```

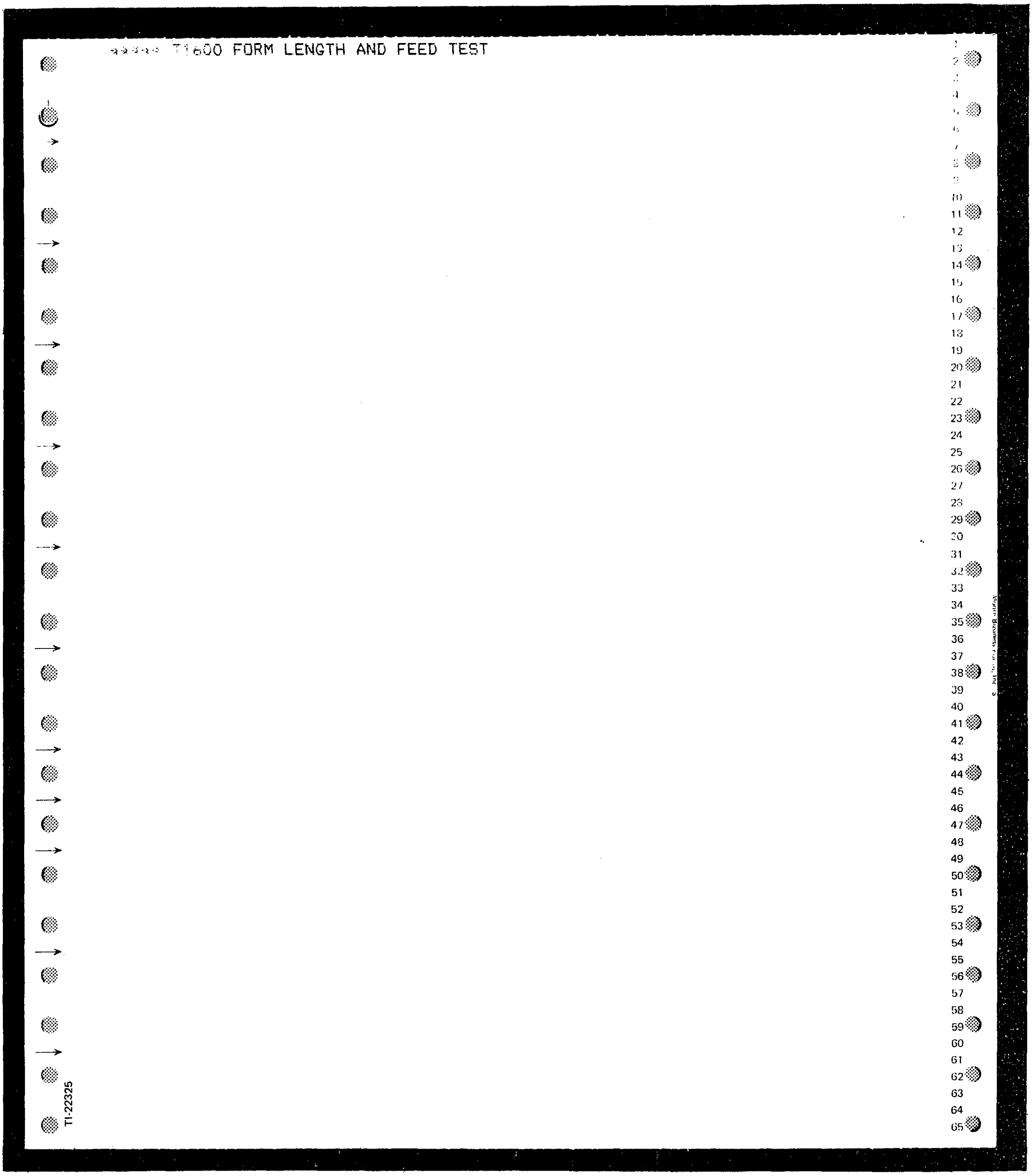

***** TS2260 HAMMER ALIGNMENT TEST
12345678901234567890123456789012345678901234567890123456789012345678901234567890

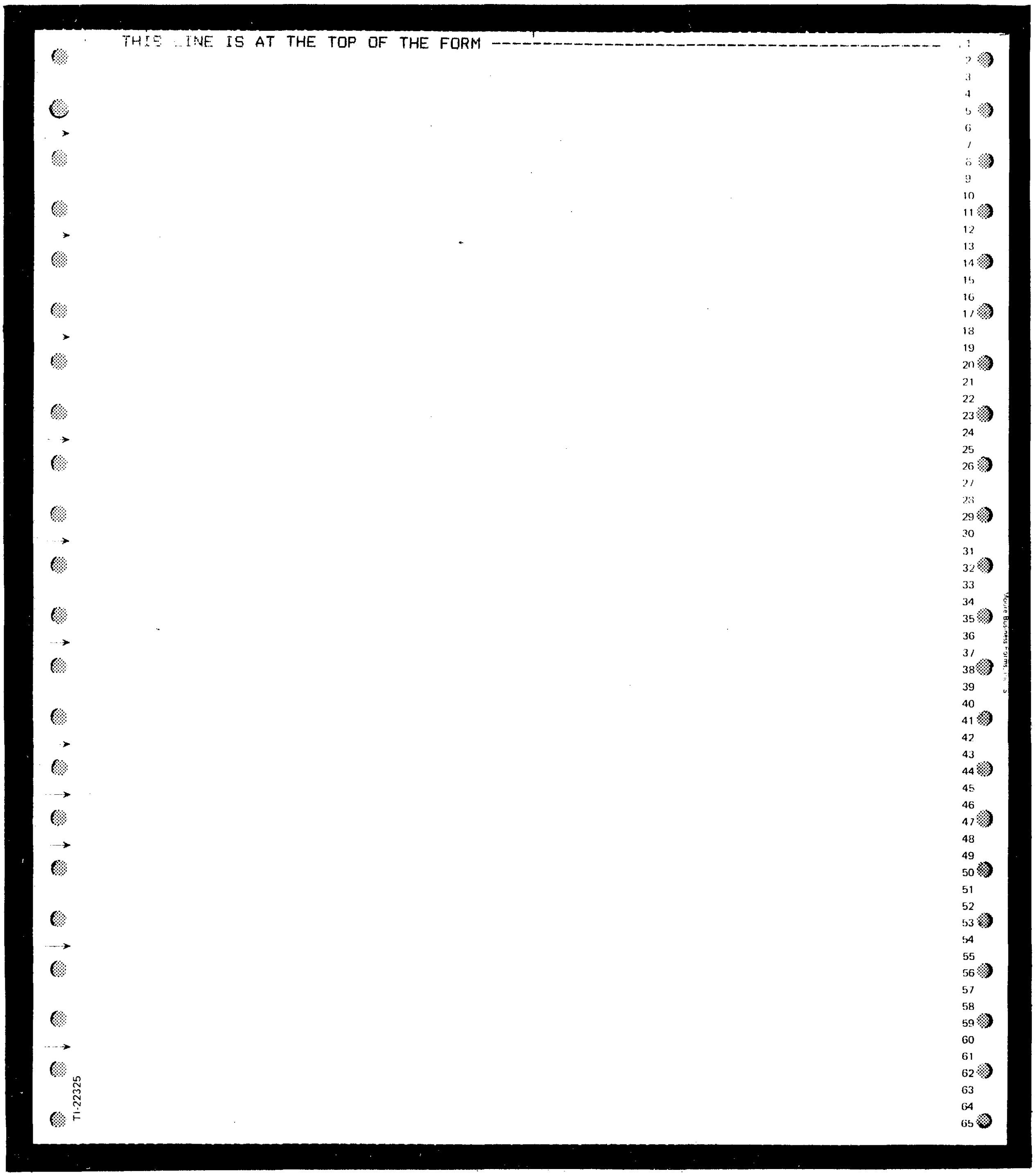

***** T62260 CHARACTER BURST TEST

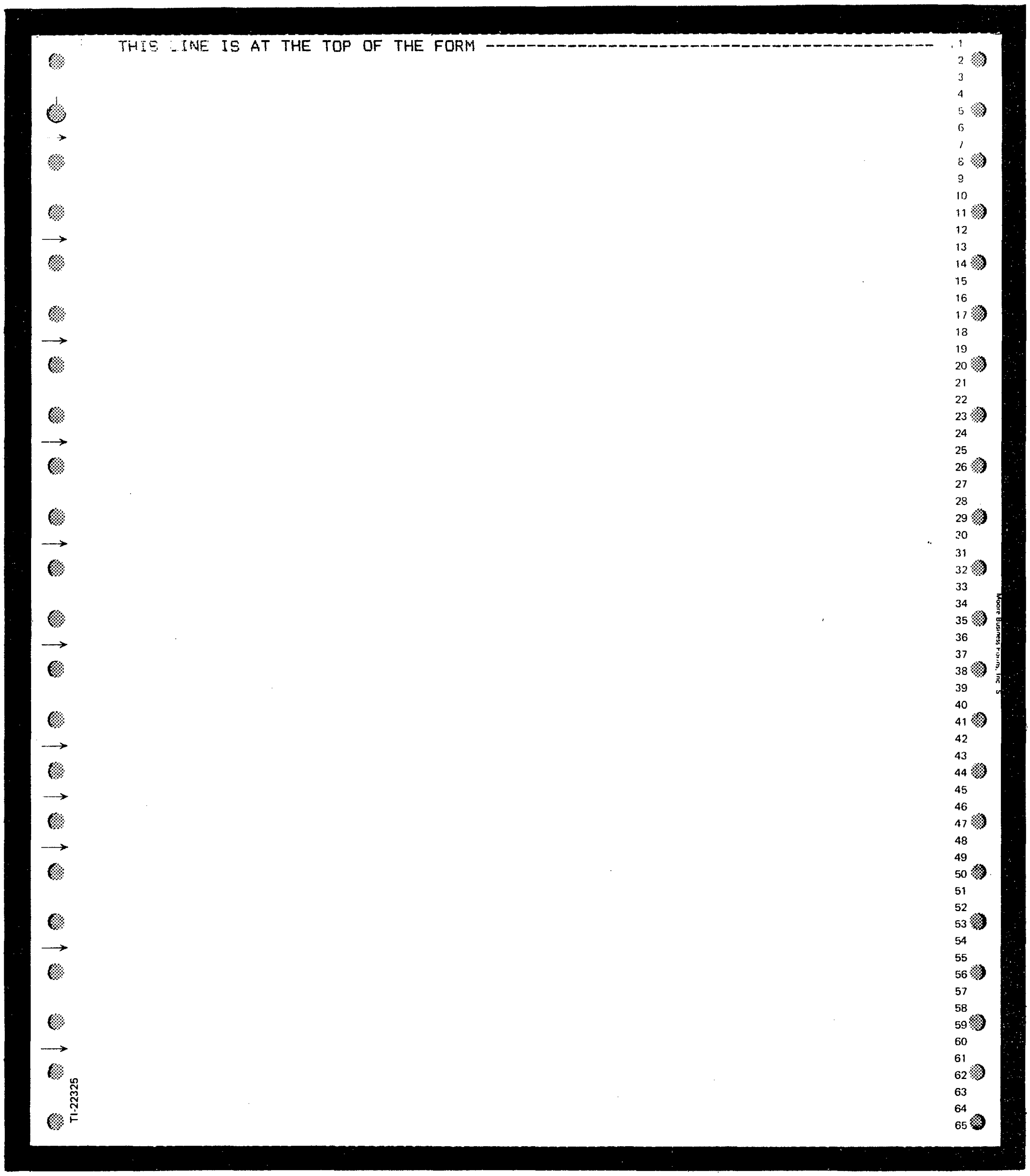
Appendix D

LP600 Output

The following pages are examples of the output of the LP600 tests when executed with the default options. You can use these examples for comparison with the output you receive from the LP600.

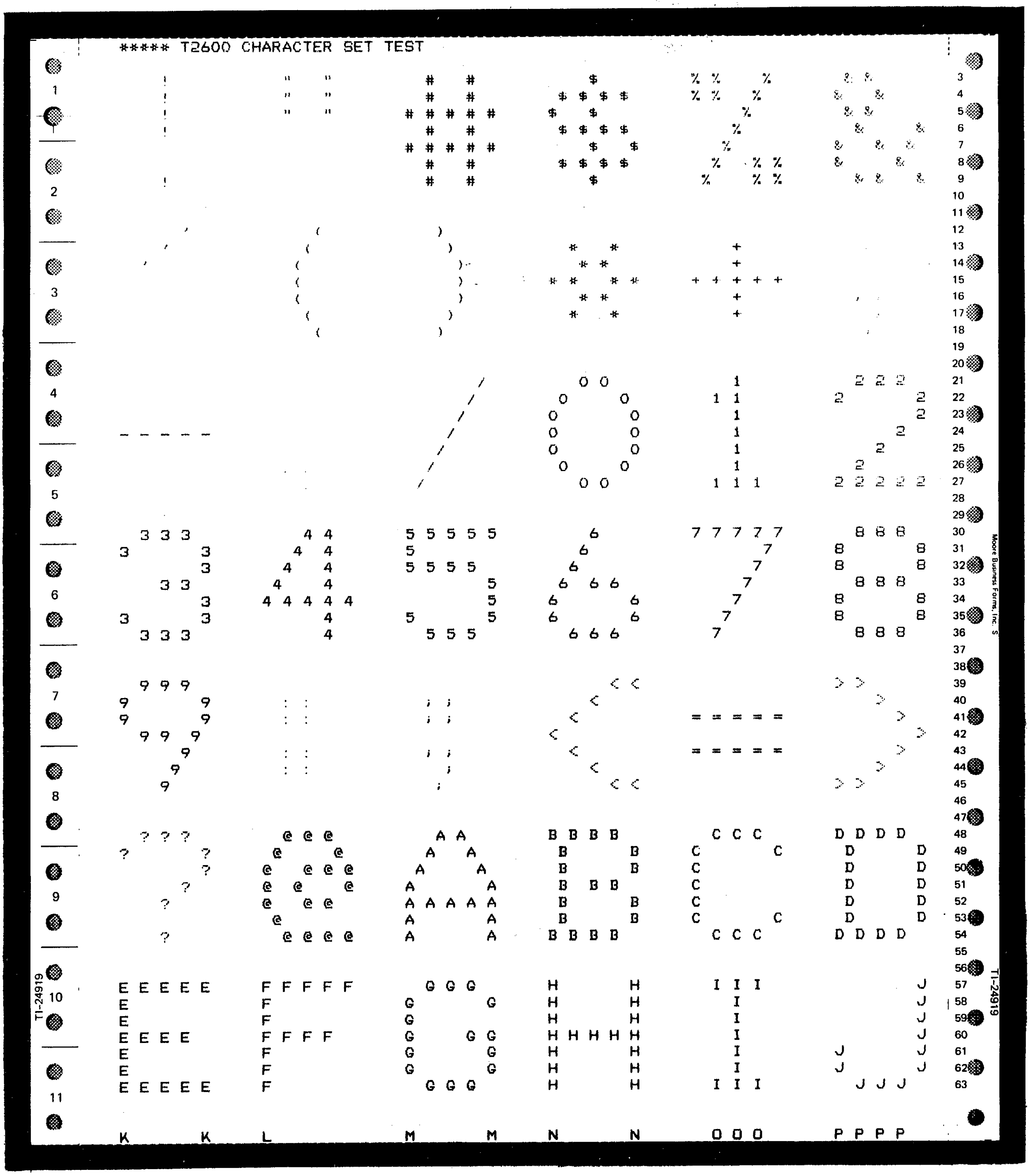

***** T1600 FORM LENGTH AND FEED TEST
TI-22325

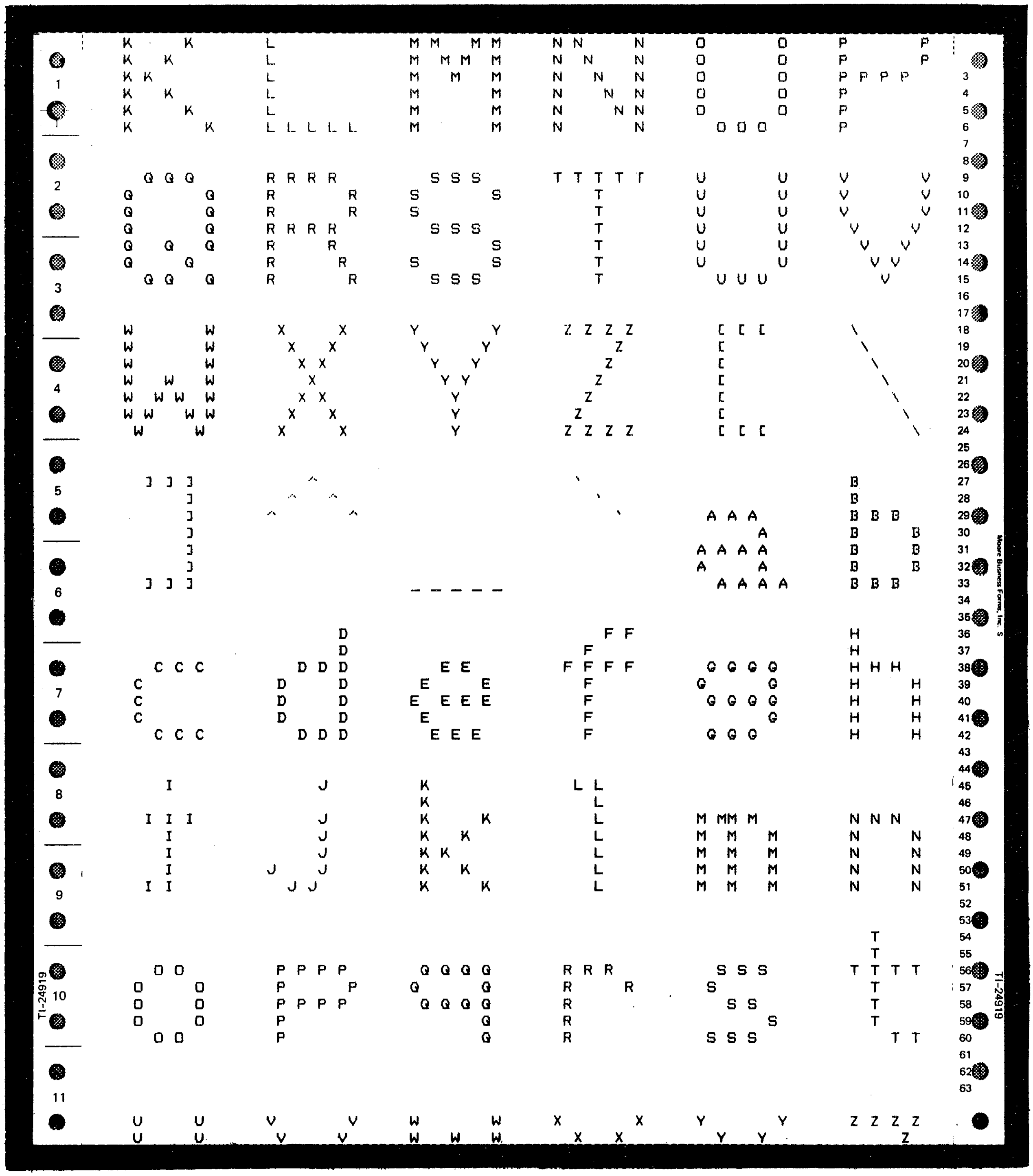

THIS LINE IS AT THE TOP OF THE FORM --
TI-22325

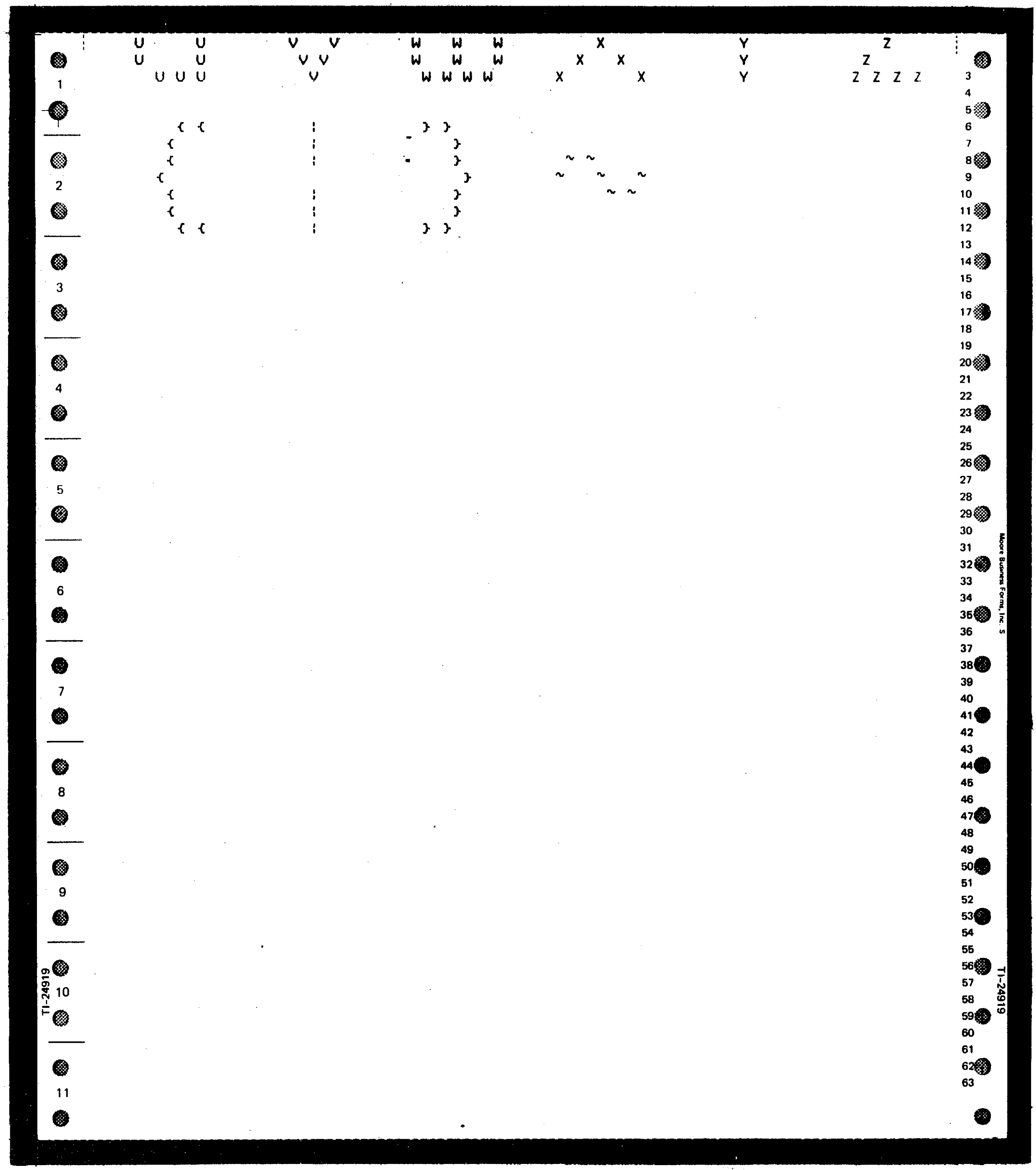


THIS LINE IS AT THE TOP OF THE FORM --

TI-22325


***** T2600 CHARACTER SET TEST
T1-24919


TI-24919
Moore Business Forms, Inc.


TI-24919

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***** T3600 RIPPLE TEST

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TI-24919

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***** T4600 BUFFER TEST

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TI-24919

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TI-24919

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***** T5600 HAMMER ALIGNMENT TEST

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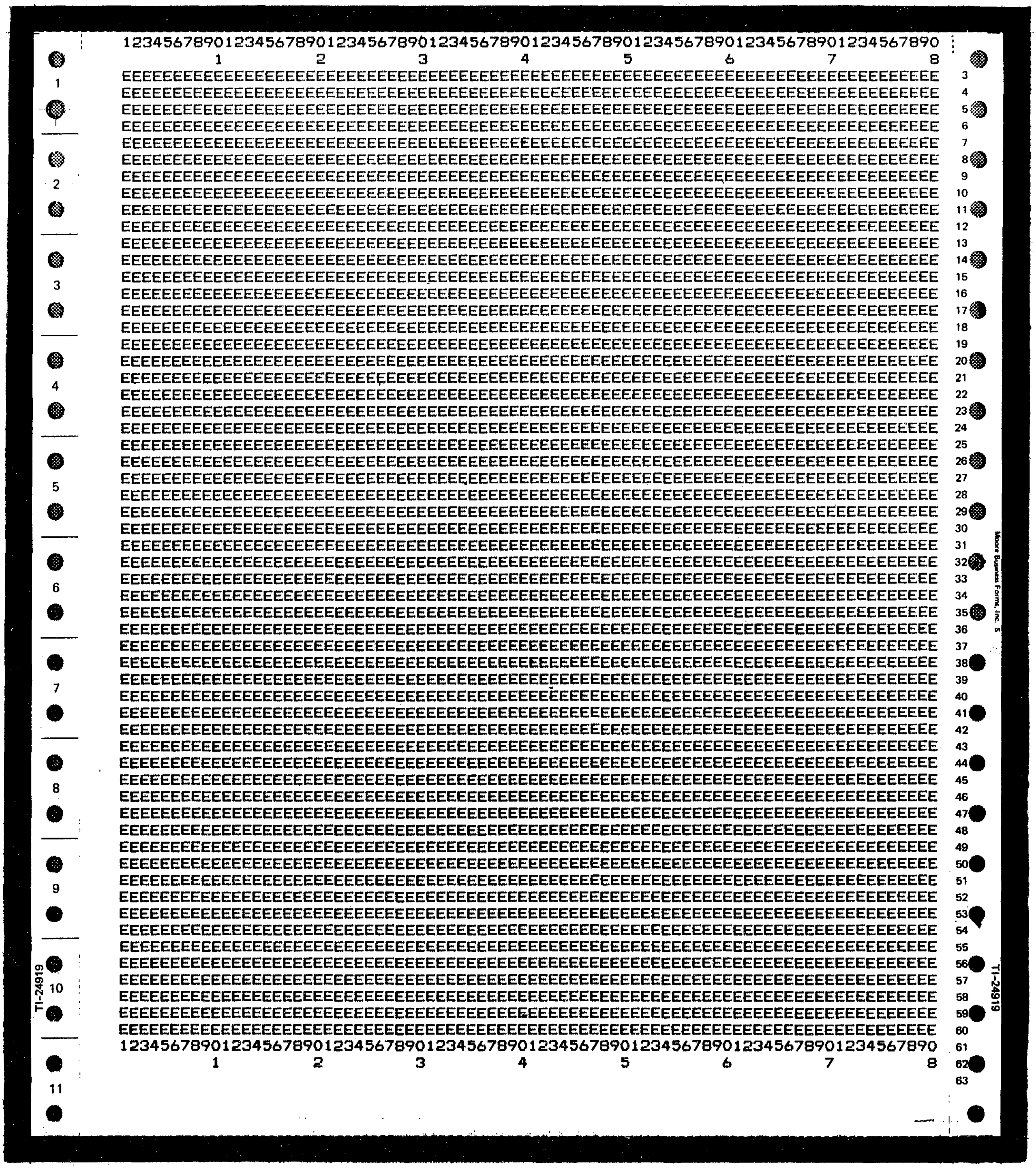

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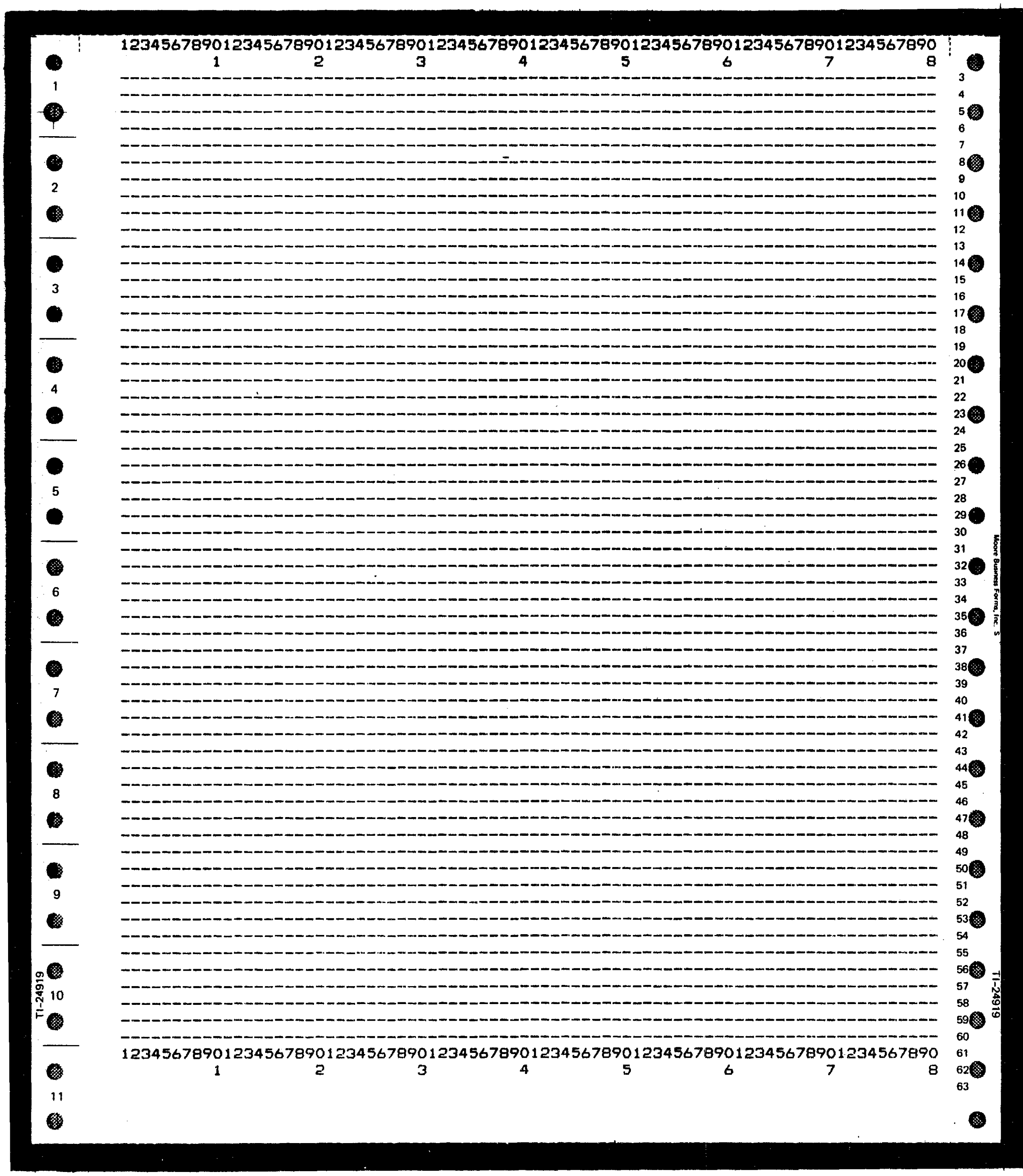

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***** T6600 8 LPI TEST

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Moore Business Forms, Inc

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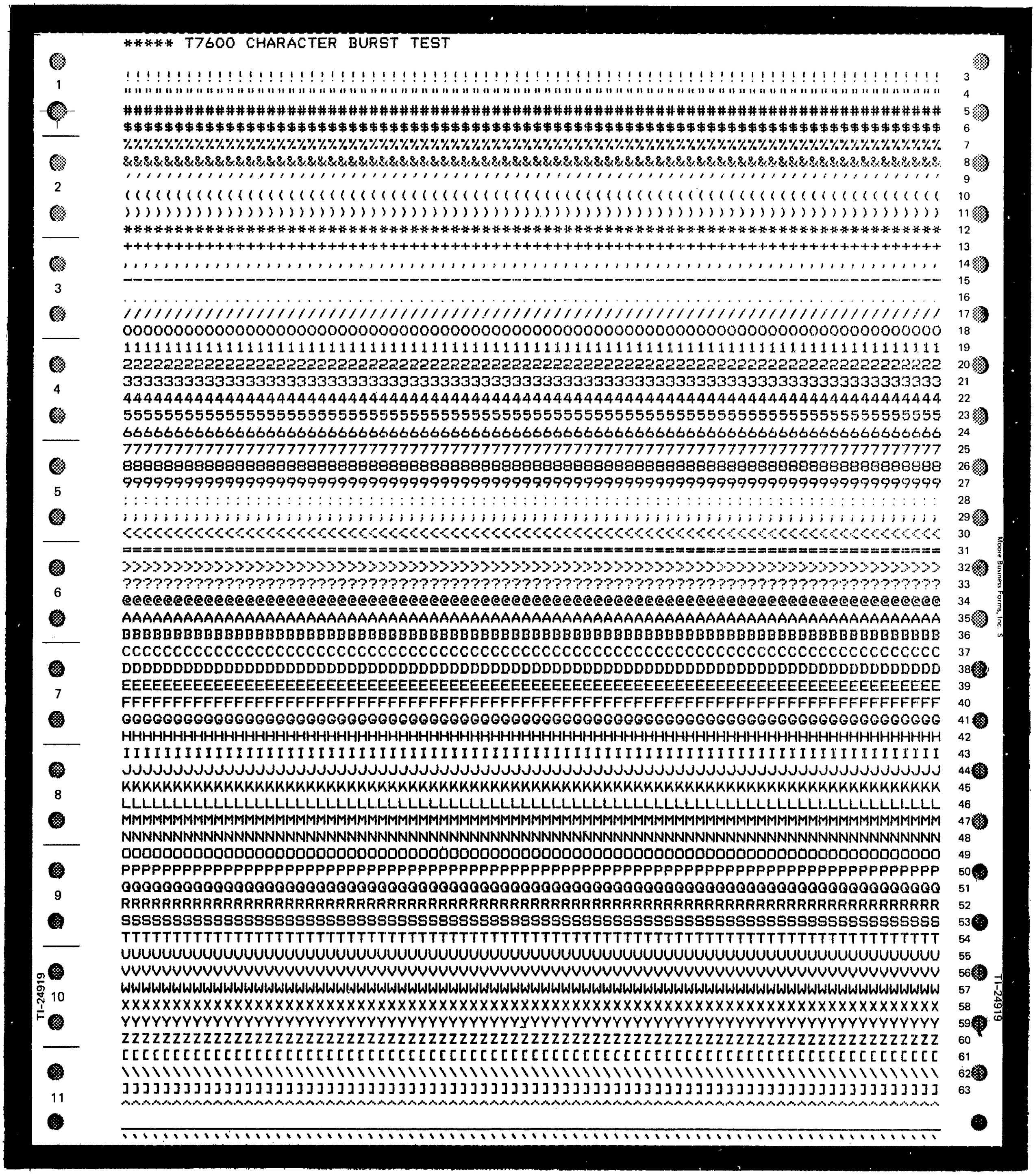
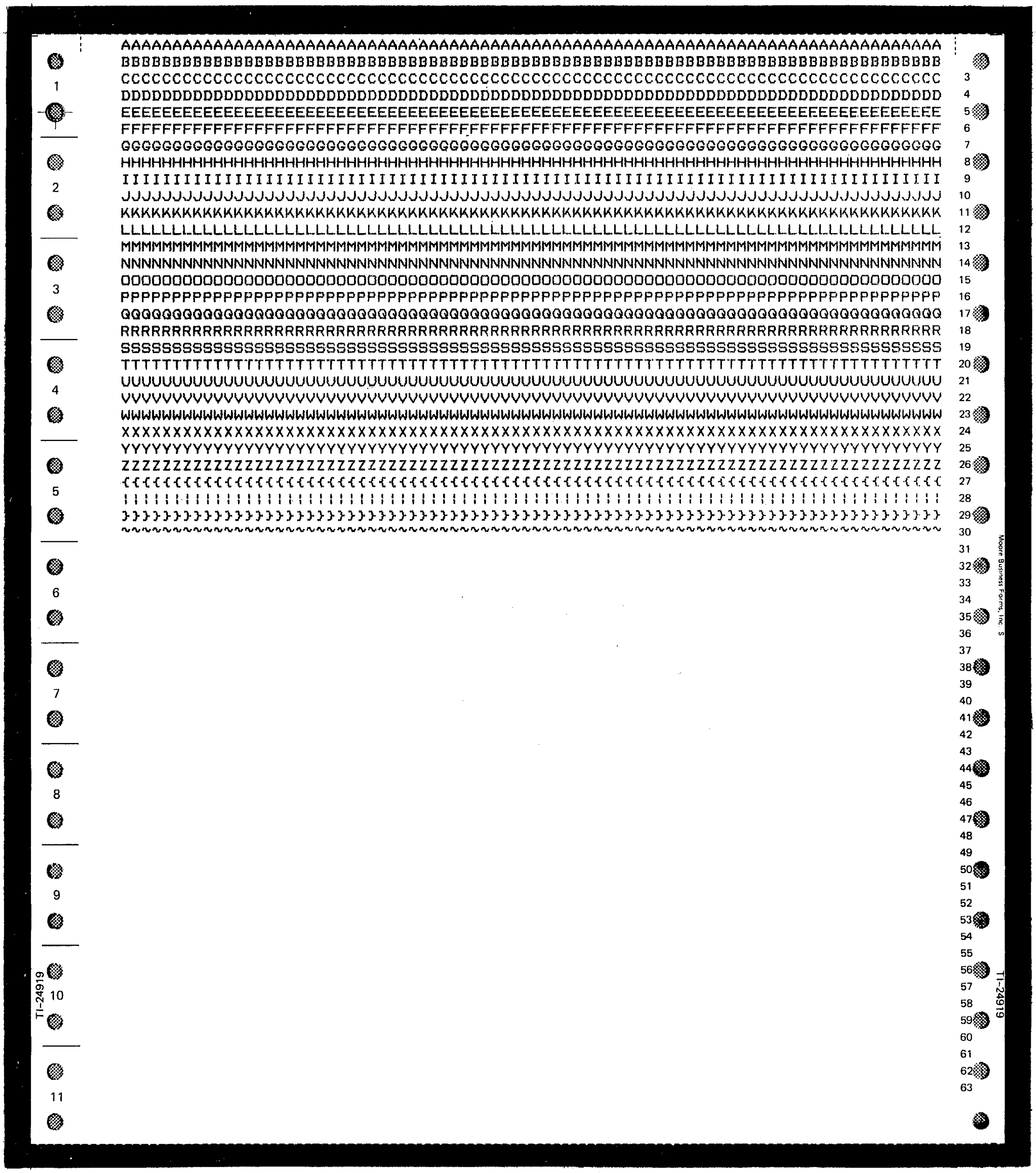

***** T7600 CHARACTER BURST TEST
Moore Business Forms, Inc.
TI-24919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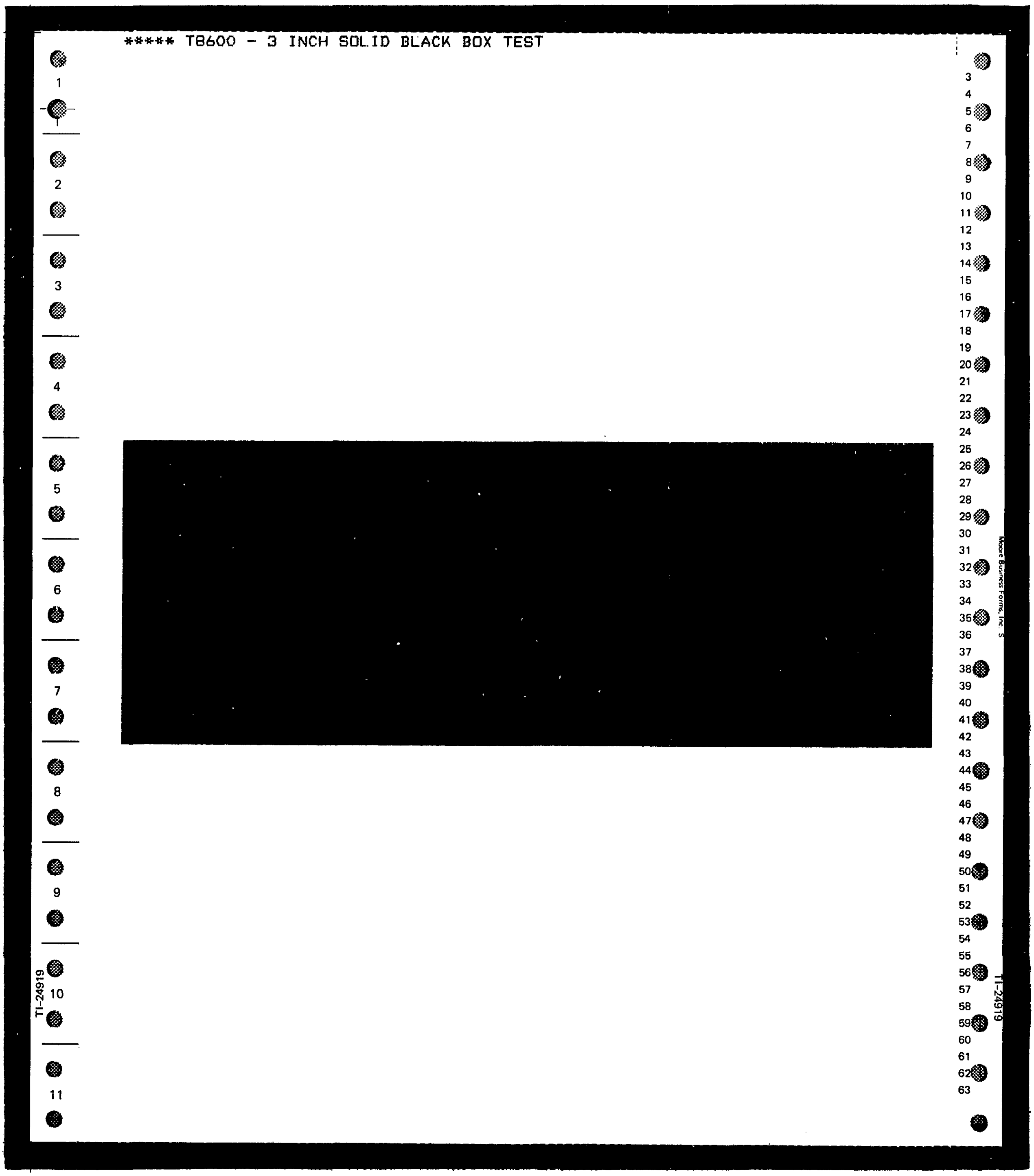
***** T8600 - 3 INCH SOLID BLACK BOX TEST

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***** T9600 CARRAIGE RETURN AND UNDERLINE

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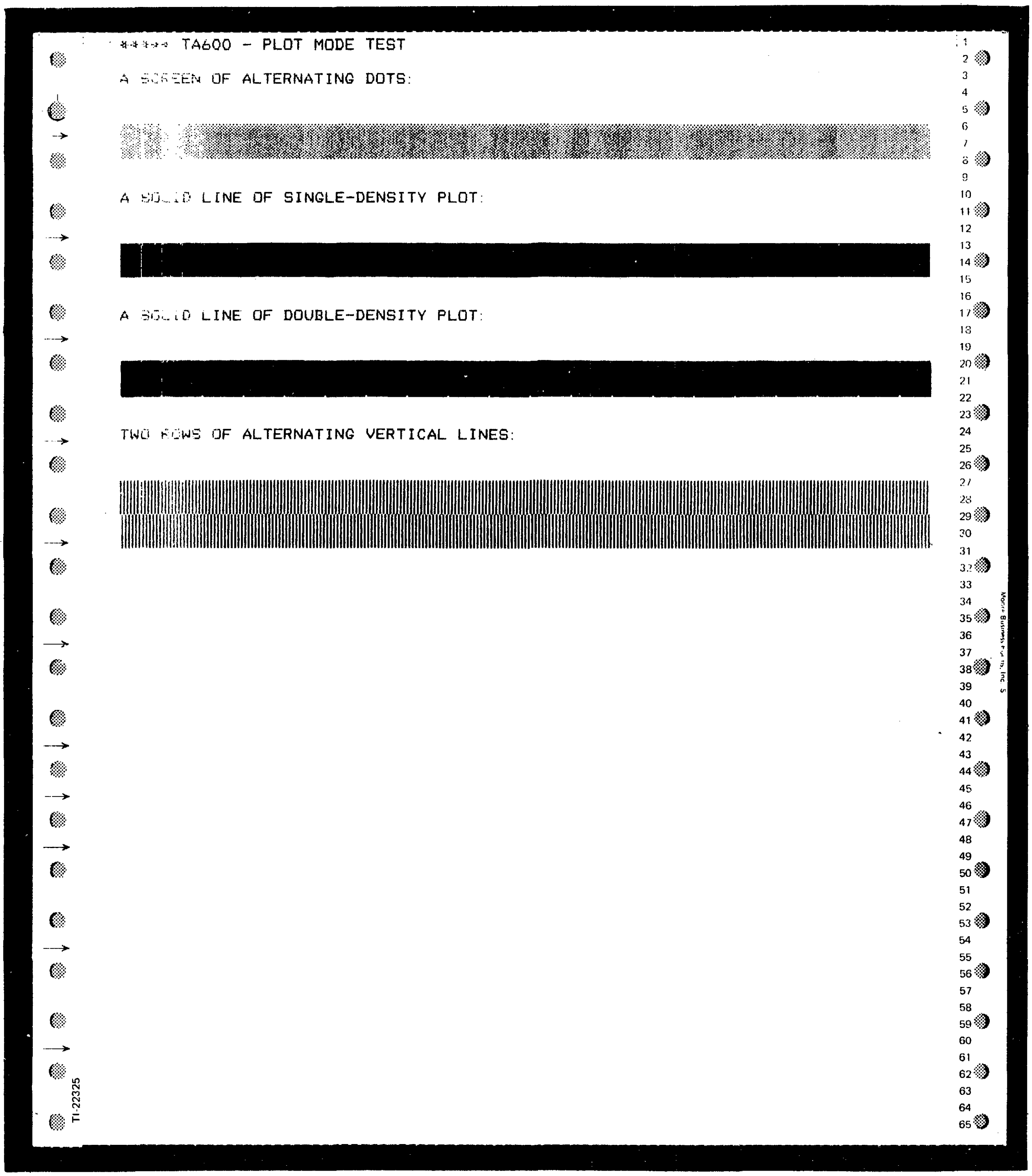


***** TA600 - PLOT MODE TEST

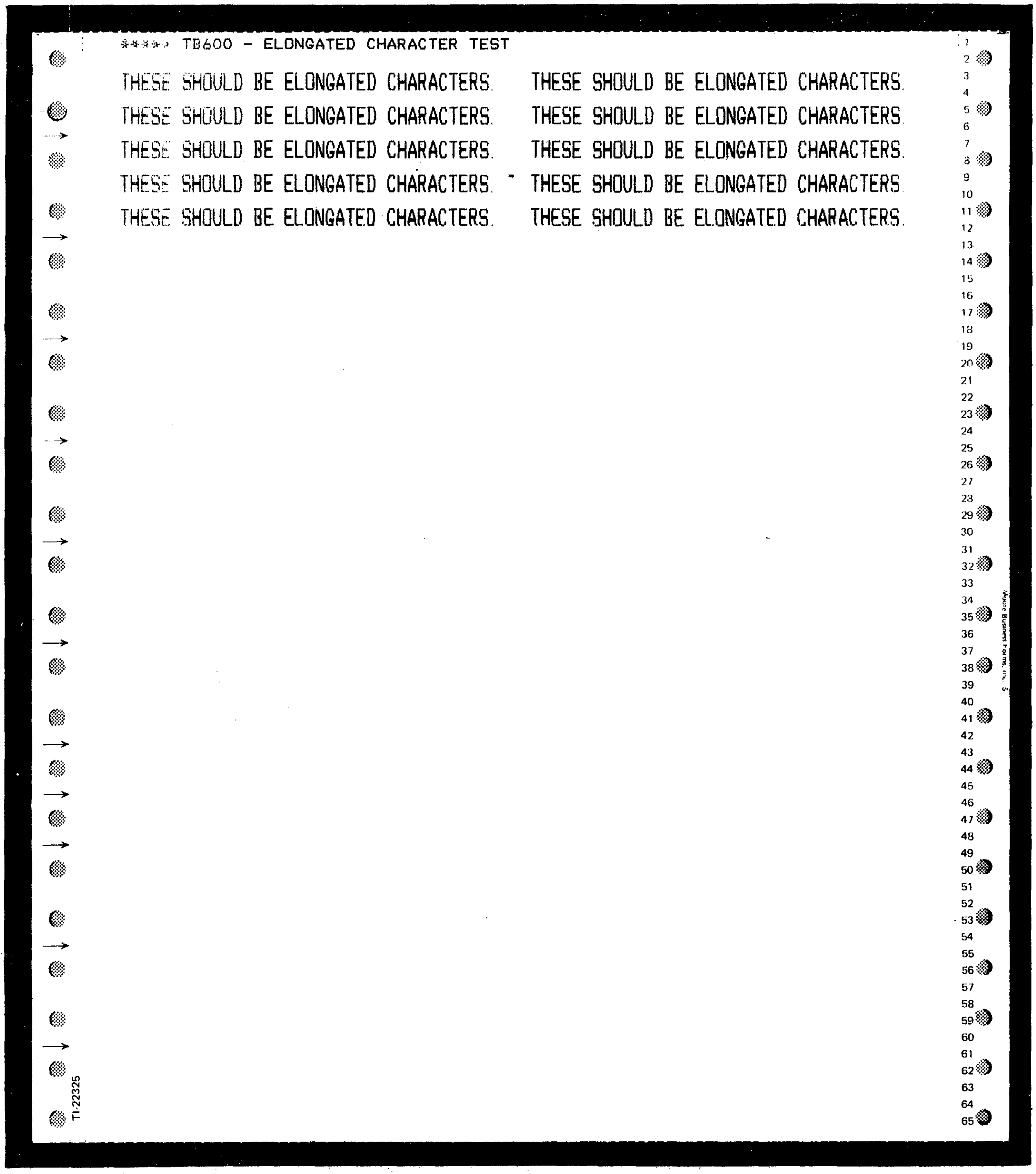
A SCREEN OF ALTERNATING DOTS:

A SOLID LINE OF SINGLE-DENSITY PLOT:

A SOLID LINE OF DOUBLE-DENSITY PLOT:

TWO ROWS OF ALTERNATING VERTICAL LINES:

TI-22325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***** TB600 - ELONGATED CHARACTER TEST
THESE SHOULD BE ELONGATED CHARACTERS.   THESE SHOULD BE ELONGATED CHARACTERS.
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***** TC600 - DELETE CHARACTERS TEST

15 BLANK SPACES SHOULD FOLLOW               15 BLANK SPACES SHOULD PRECEDE THIS
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15 BLANK SPACES SHOULD FOLLOW               15 BLANK SPACES SHOULD PRECEDE THIS
15 BLANK SPACES SHOULD FOLLOW               15 BLANK SPACES SHOULD PRECEDE THIS
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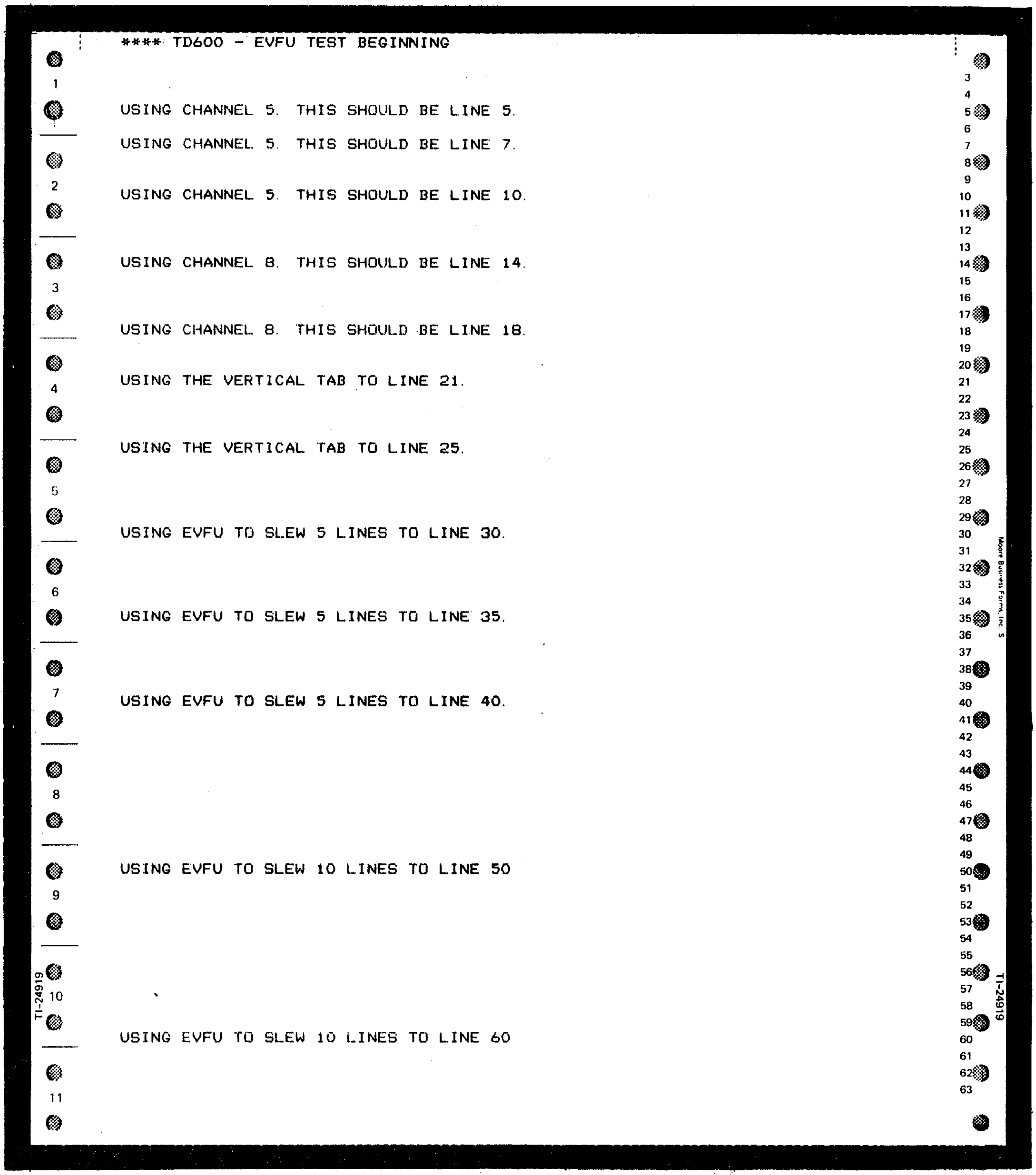
TI-24919



```
**** TD600 - EVFU TEST BEGINNING

USING CHANNEL 5.  THIS SHOULD BE LINE 5.
USING CHANNEL 5.  THIS SHOULD BE LINE 7.

USING CHANNEL 5.  THIS SHOULD BE LINE 10.

USING CHANNEL 8.  THIS SHOULD BE LINE 14.

USING CHANNEL 8.  THIS SHOULD BE LINE 18.

USING THE VERTICAL TAB TO LINE 21.

USING THE VERTICAL TAB TO LINE 25.

USING EVFU TO SLEW 5 LINES TO LINE 30.

USING EVFU TO SLEW 5 LINES TO LINE 35.

USING EVFU TO SLEW 5 LINES TO LINE 40.

USING EVFU TO SLEW 10 LINES TO LINE 50

USING EVFU TO SLEW 10 LINES TO LINE 60
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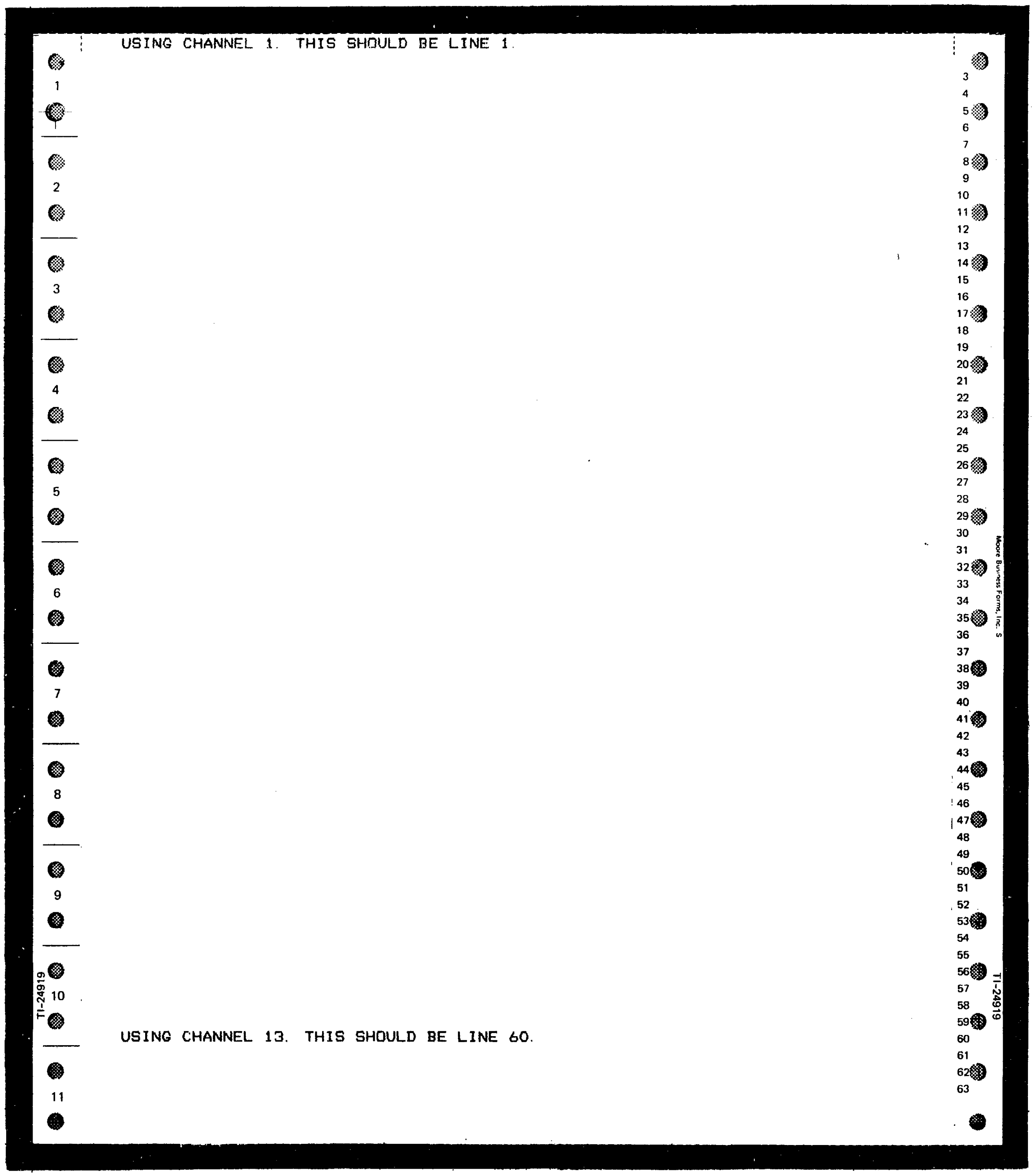
TI-24919


USING CHANNEL 1. THIS SHOULD BE LINE 1.
USING CHANNEL 13. THIS SHOULD BE LINE 60.
TI-24919
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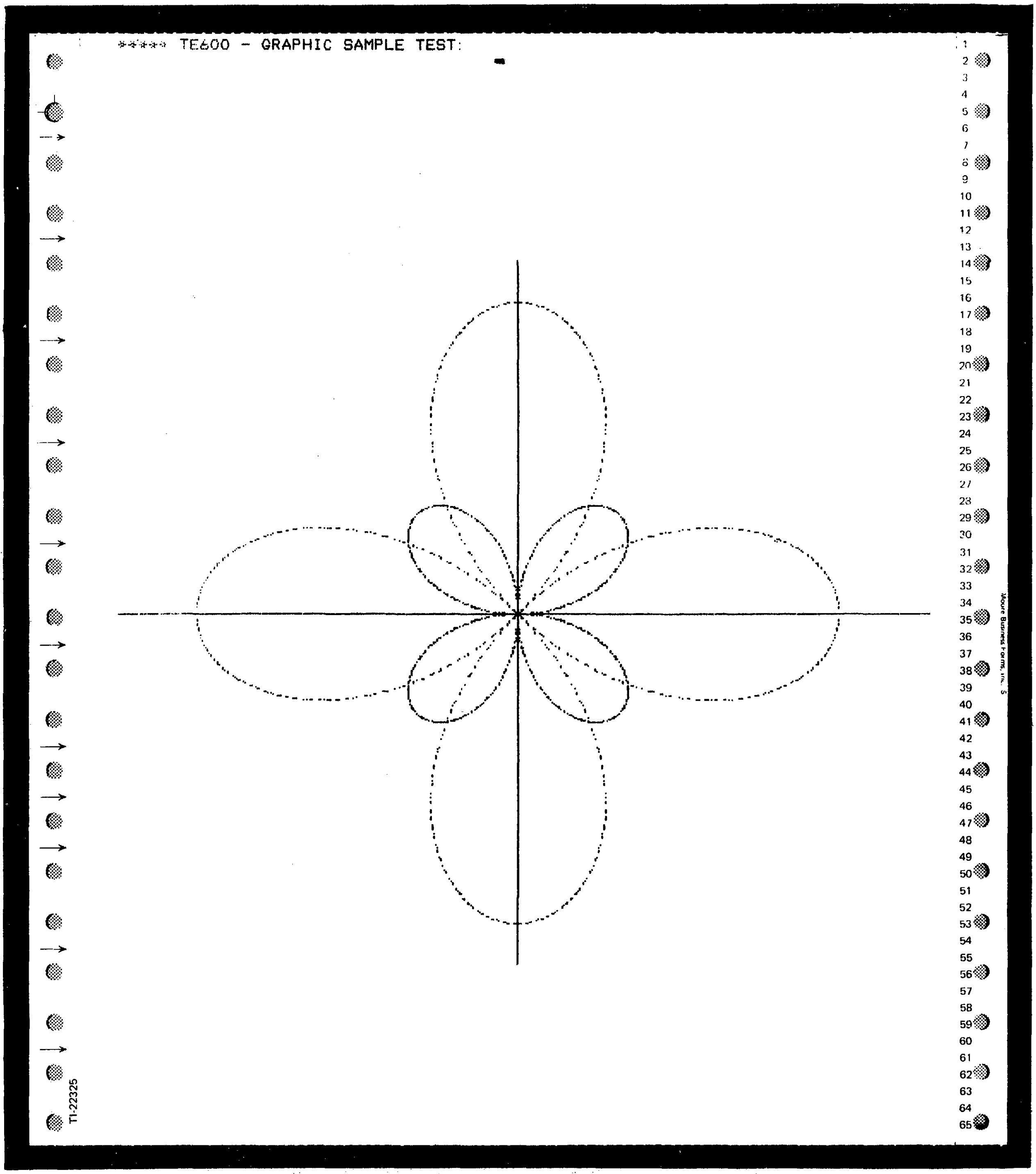
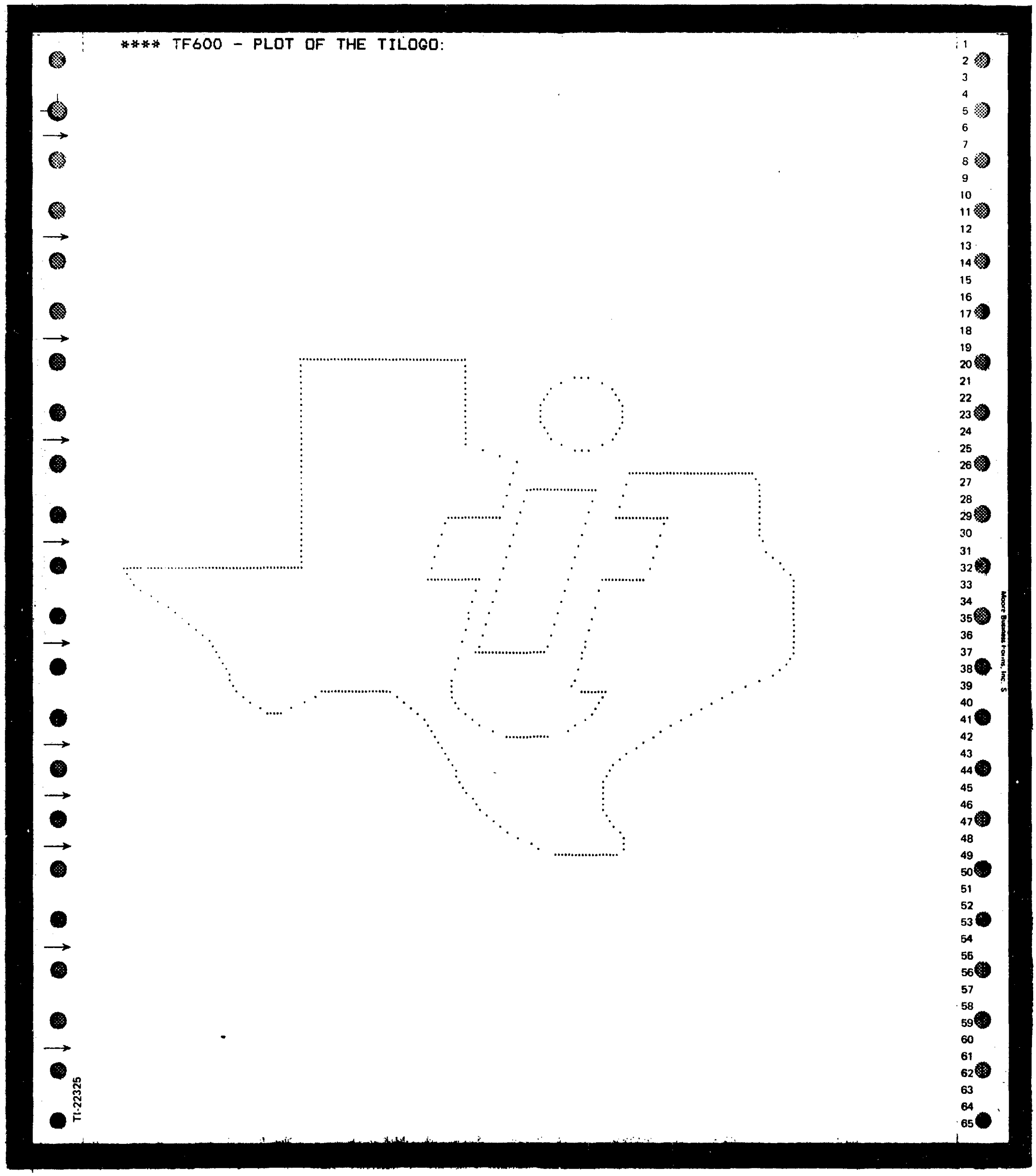
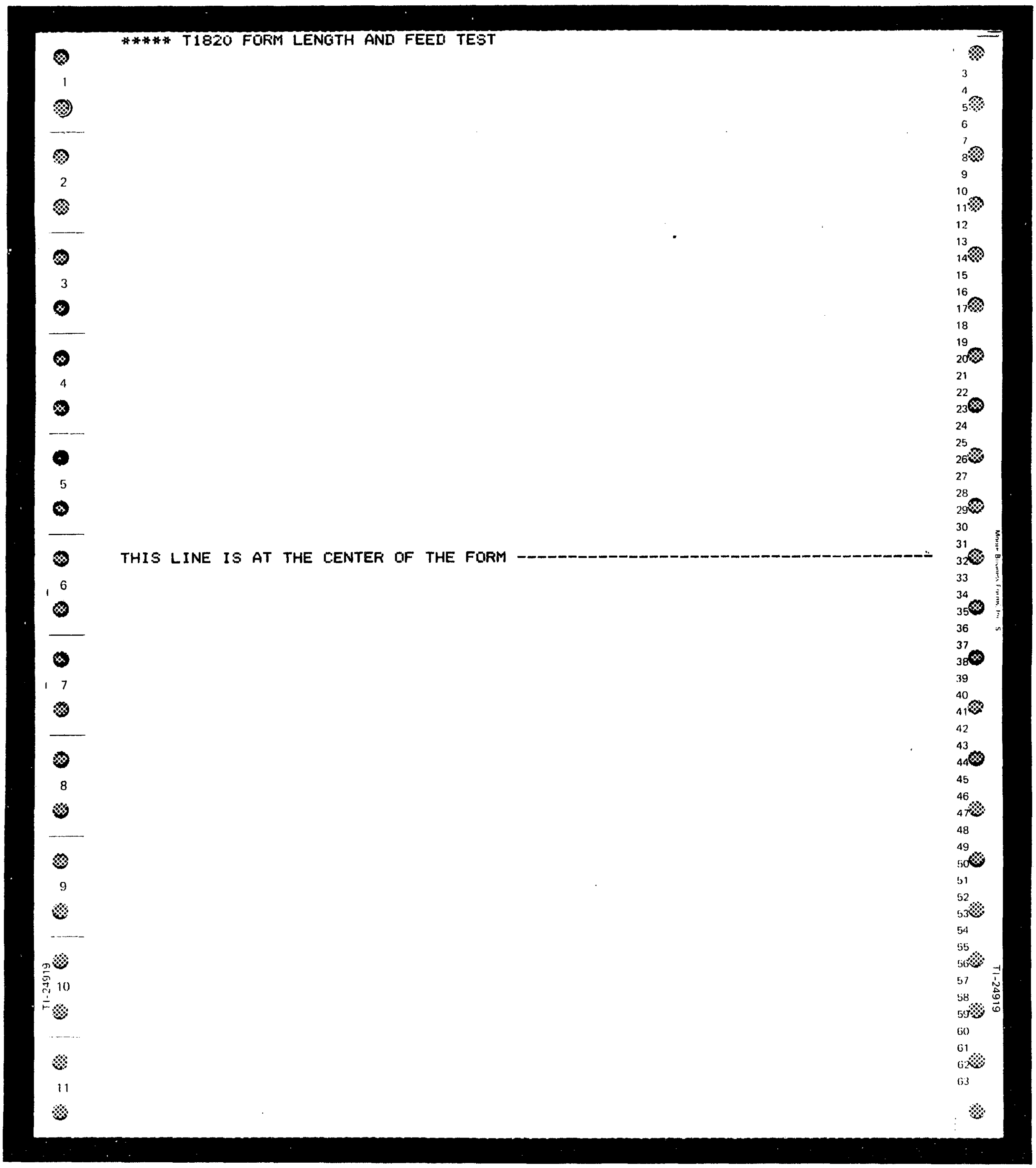

***** TE600 - GRAPHIC SAMPLE TEST:
TI-22325


**** TF600 - PLOT OF THE TILOGO:
TI-22325

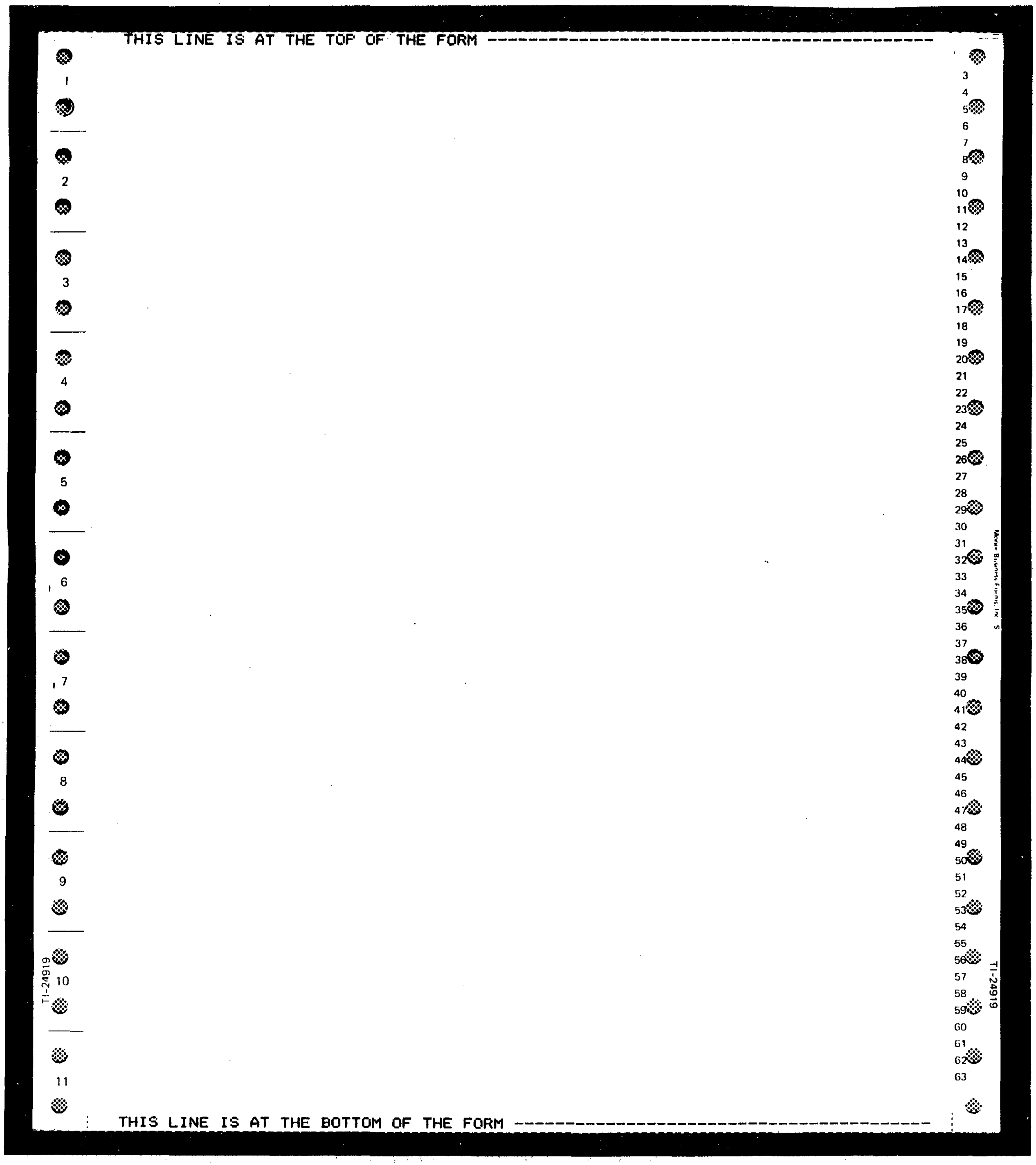
Appendix E

ST820 Output

The following pages are examples of the output of the ST820 tests when executed with the default options. You can use these examples for comparison with the output you receive.


***** TI820 FORM LENGTH AND FEED TEST

THIS LINE IS AT THE CENTER OF THE FORM --



THIS LINE IS AT THE TOP OF THE FORM ---

THIS LINE IS AT THE BOTTOM OF THE FORM --

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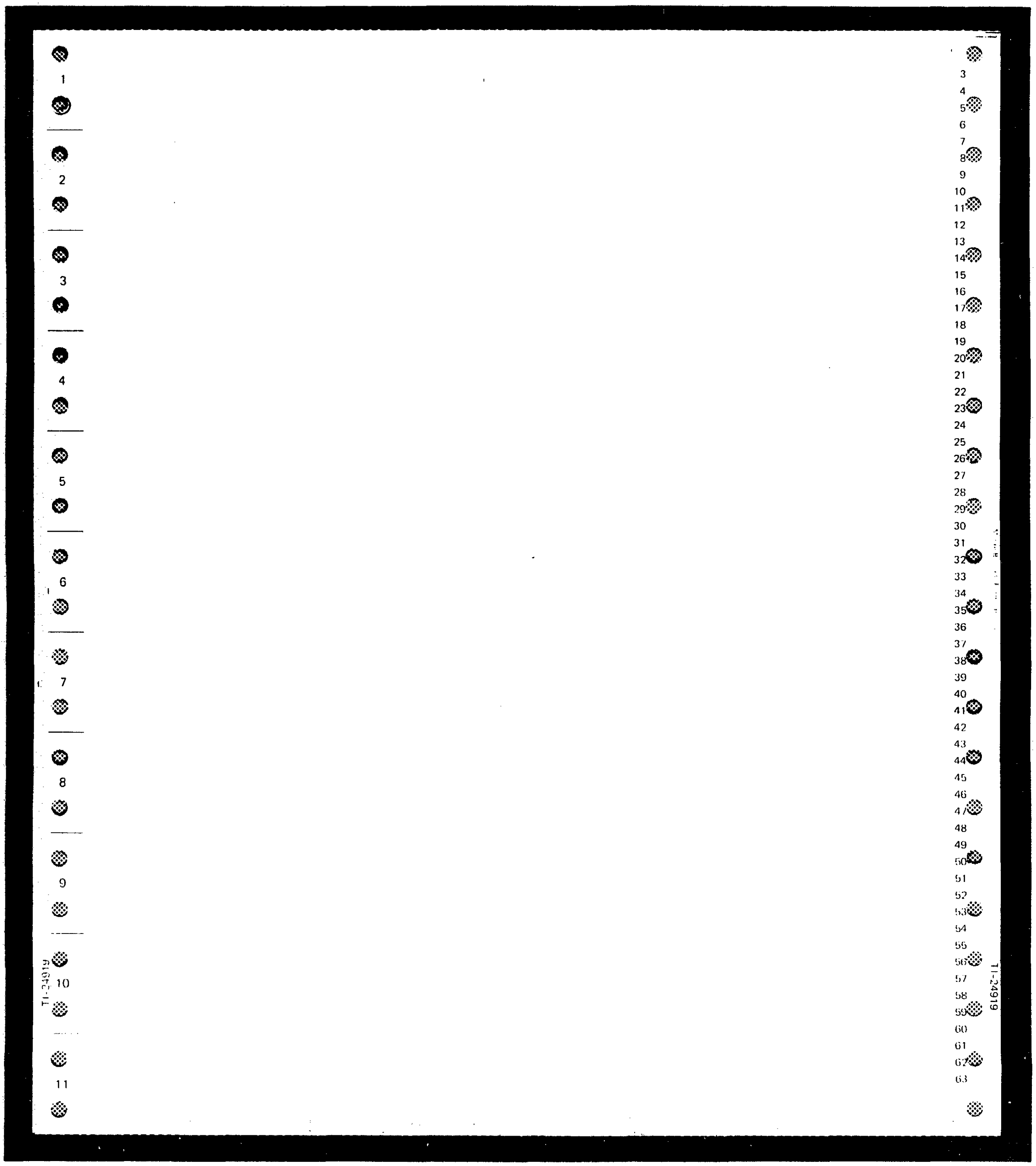
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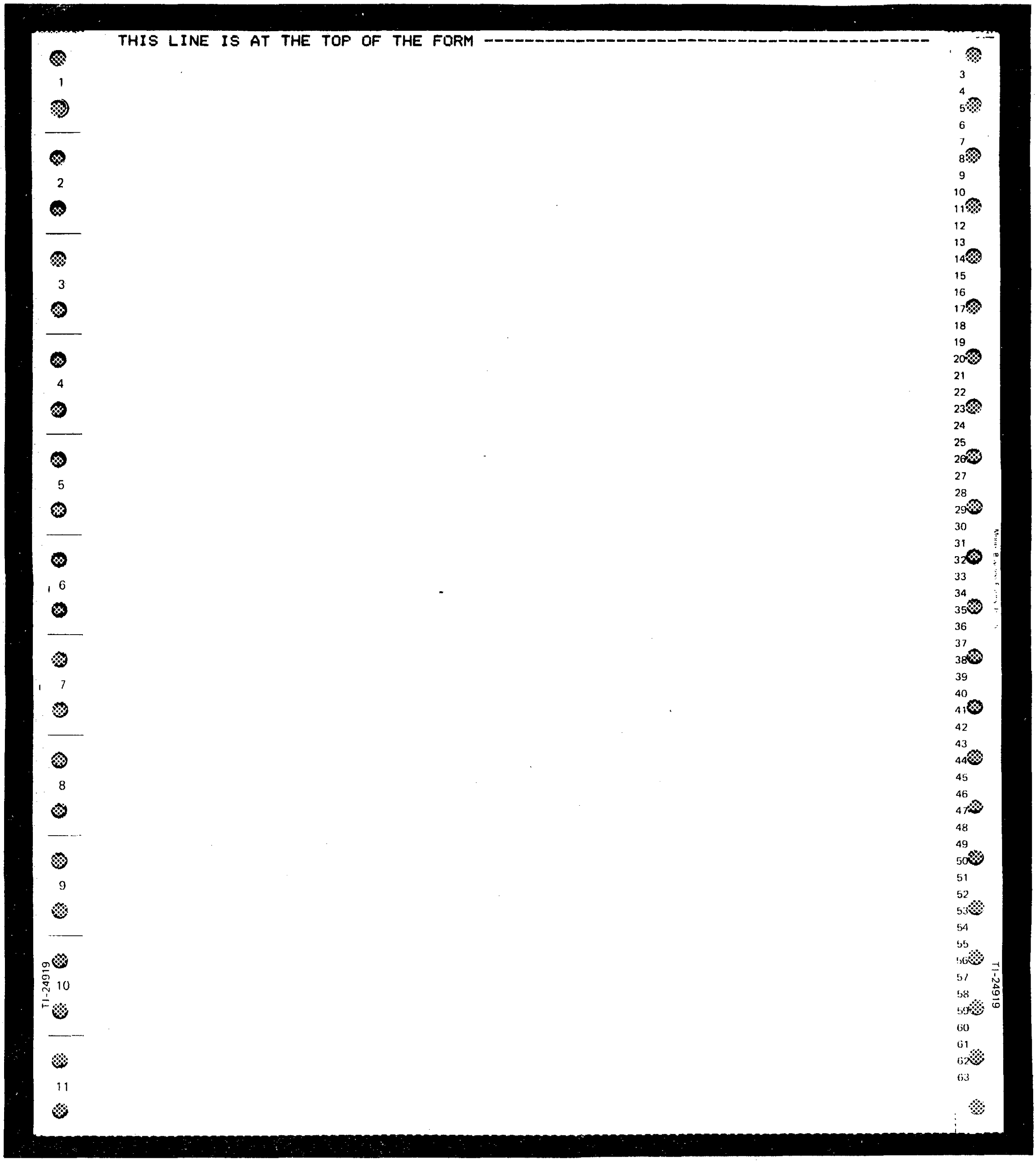
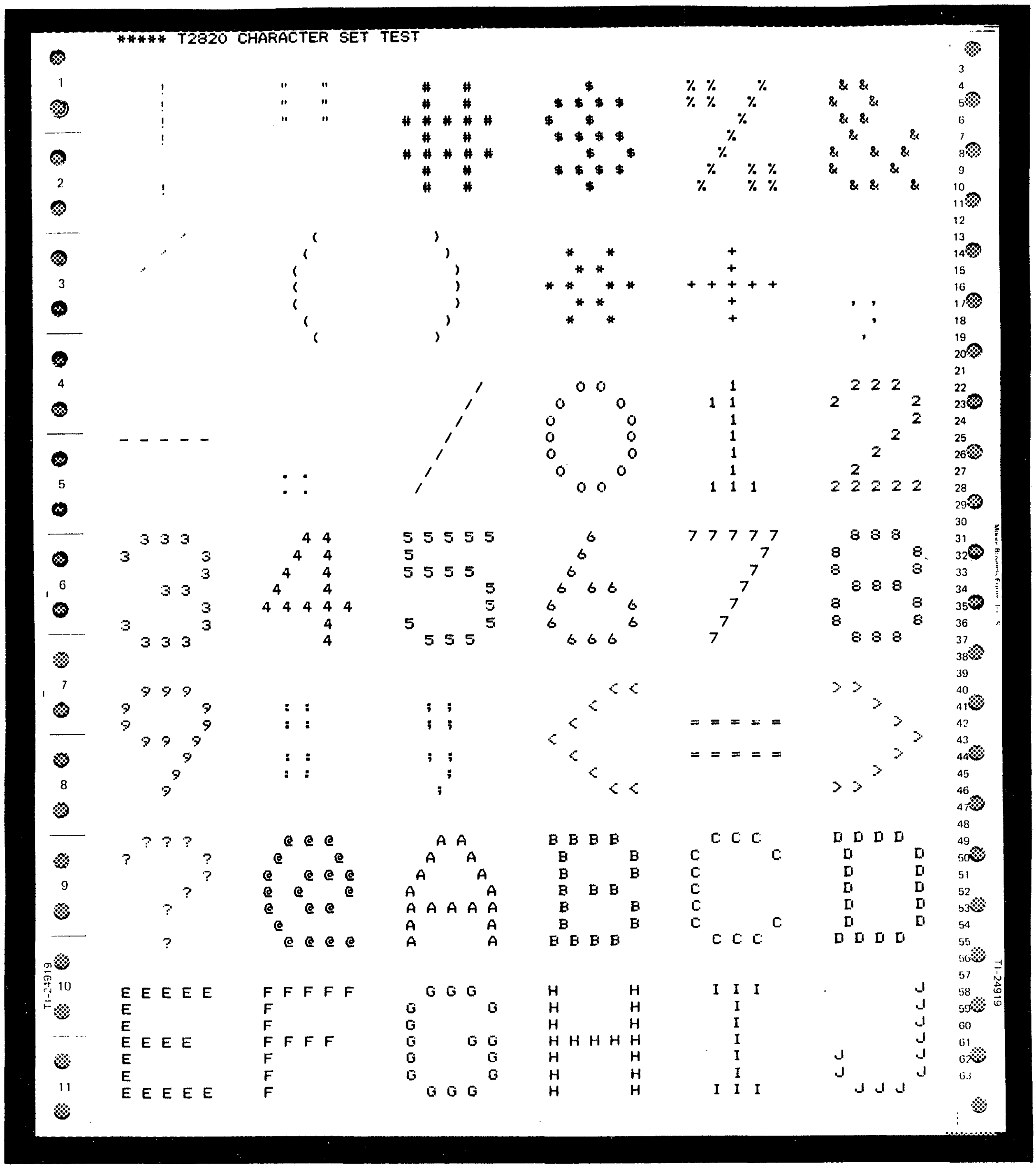
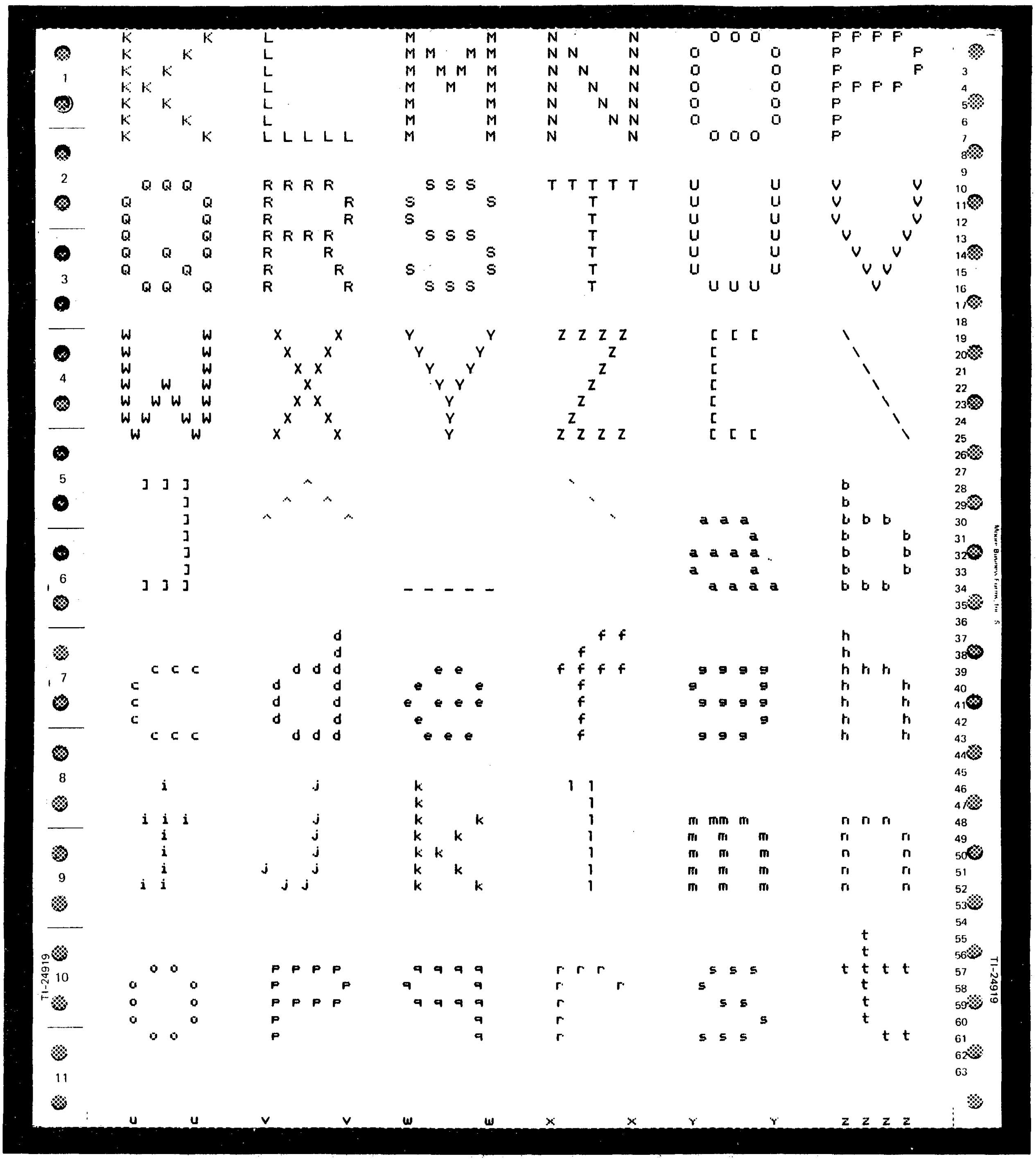

THIS LINE IS AT THE TOP OF THE FORM ---
TI-24919


***** T2820 CHARACTER SET TEST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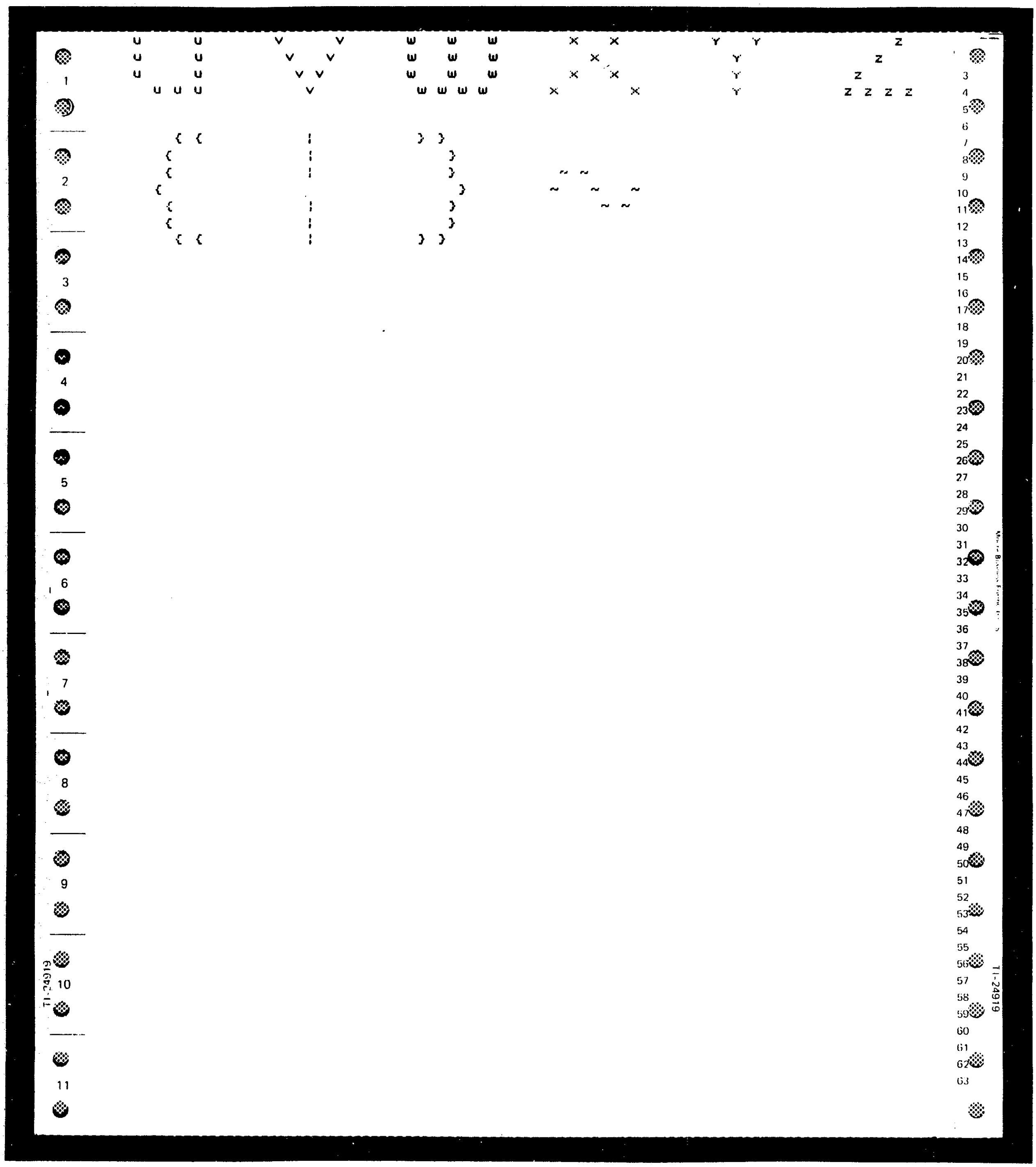
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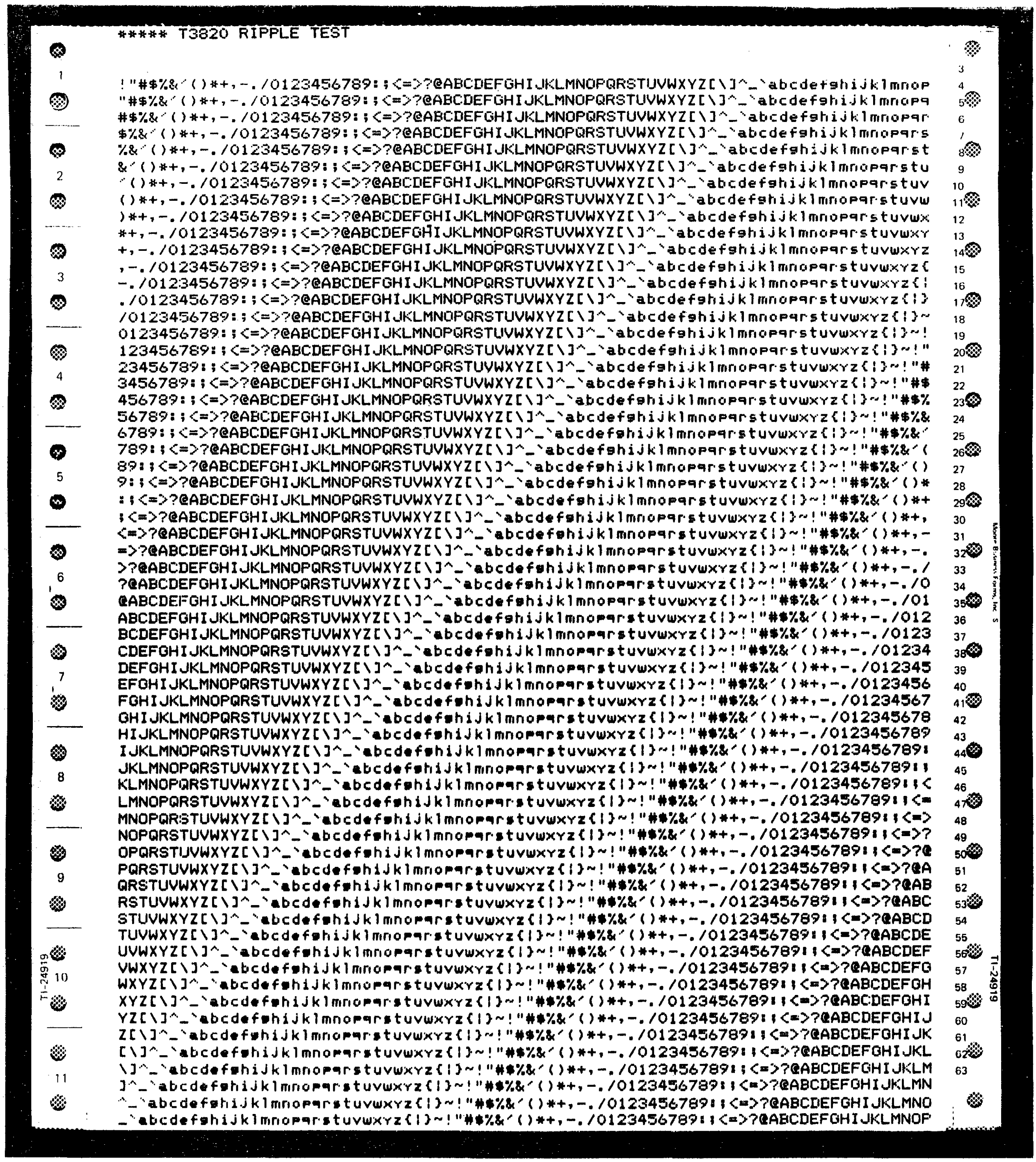

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***** T3820 RIPPLE TEST

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,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{
-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|
./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}
/0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~
0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!
123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"
23456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#
3456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$
456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%
56789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&
6789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'
789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'(
89:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()
9:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*
:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+
;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,
<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-
=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-.
>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./
?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0
@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./01
ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./012
BCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123
CDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./01234
DEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./012345
EFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456
FGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./01234567
GHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./012345678
HIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789
IJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:
JKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;
KLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<
LMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=
MNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>
NOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?
OPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@
PQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@A
QRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@AB
RSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABC
STUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCD
TUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDE
UVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEF
VWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFG
WXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGH
XYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHI
YZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJ
Z[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJK
[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKL
\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLM
]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMN
^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNO
_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOP
```

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```
`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQ
abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQR
bcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRS
cdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRST
defghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTU
efghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUV
fghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVW
ghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWX
hijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXY
ijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ
jklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[
klmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\
lmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]
mnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^
nopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_
opqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`
pqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`a
qrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`ab
rstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abc
stuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcd
tuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcde
uvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdef
vwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefg
wxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefgh
xyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghi
yz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghij
z{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijk
{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijkl
|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklm
}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmn
~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmno
```

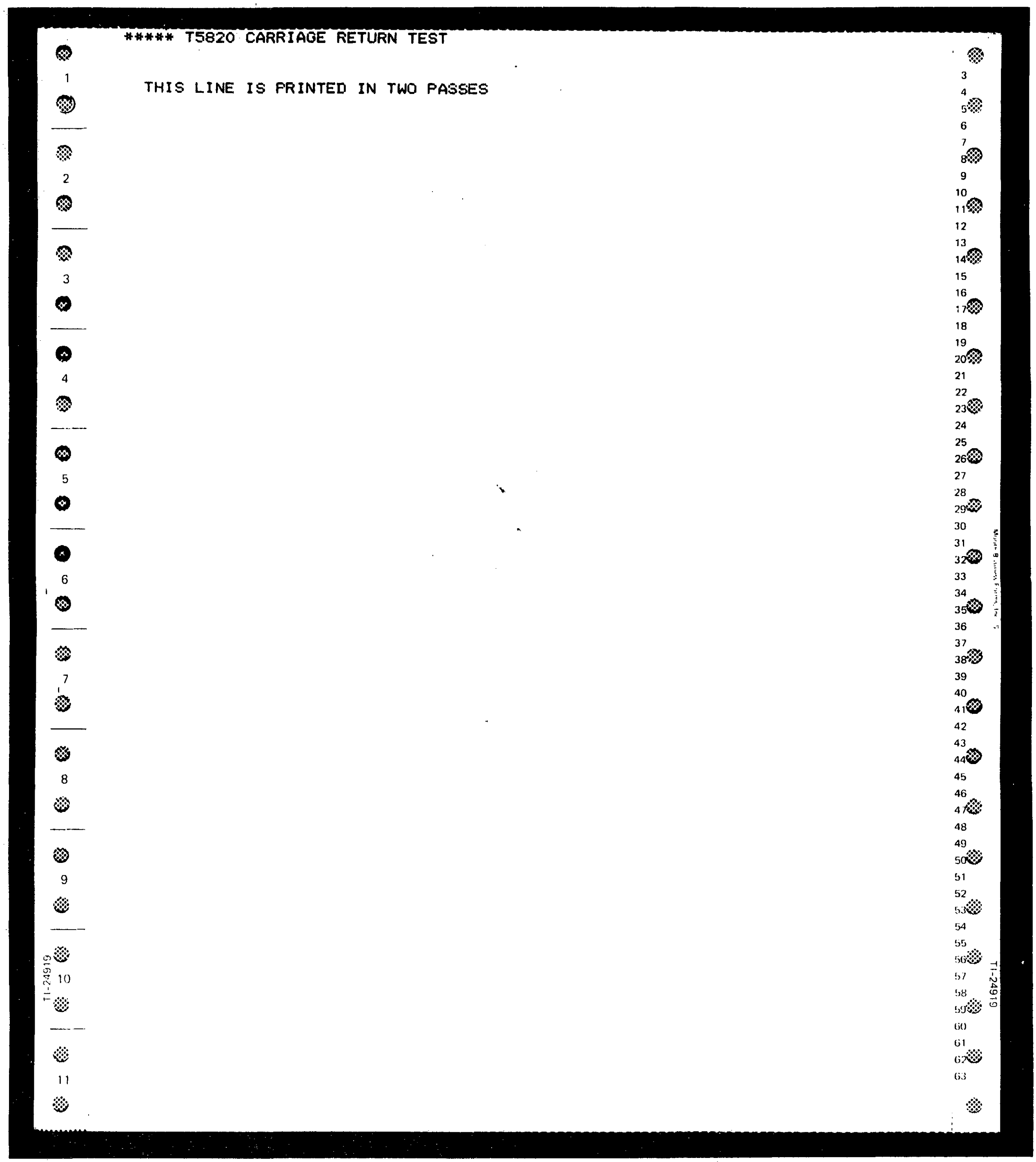
TI-24919

```
***** T4820 BUFFER TEST

PR
PRIN
PRINTE
PRINTER*
PRINTER*BU
PRINTER*BUFF
PRINTER*BUFFER
PRINTER*BUFFER*T
PRINTER*BUFFER*TES
PRINTER*BUFFER*TEST*
PRINTER*BUFFER*TEST*PR
PRINTER*BUFFER*TEST*PRIN
PRINTER*BUFFER*TEST*PRINTE
PRINTER*BUFFER*TEST*PRINTER*
PRINTER*BUFFER*TEST*PRINTER*BU
PRINTER*BUFFER*TEST*PRINTER*BUFF
PRINTER*BUFFER*TEST*PRINTER*BUFFER
PRINTER*BUFFER*TEST*PRINTER*BUFFER*T
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TES
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PR
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRIN
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTE
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BU
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFF
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*T
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TES
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PR
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRIN
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTE
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BU
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFF
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*T
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TES
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TES
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*T
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFF
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BU
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTE
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRIN
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PR
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TES
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*T
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFF
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BU
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTE
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRIN
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PR
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TES
PRINTER*BUFFER*TEST*PRINTER*BUFFER*T
```

```
PRINTER*BUFFER*TEST*PRINTER*BUFFER
PRINTER*BUFFER*TEST*PRINTER*BUFF
PRINTER*BUFFER*TEST*PRINTER*BU
PRINTER*BUFFER*TEST*PRINTER*
PRINTER*BUFFER*TEST*PRINTE
PRINTER*BUFFER*TEST*PRIN
PRINTER*BUFFER*TEST*PR
PRINTER*BUFFER*TEST*
PRINTER*BUFFER*TES
PRINTER*BUFFER*T
PRINTER*BUFFER
PRINTER*BUFF
PRINTER*BU
PRINTER*
PRINTE
PRIN
PR
```

TI-24919



```
***** T5820 CARRIAGE RETURN TEST

  THIS LINE IS PRINTED IN TWO PASSES
```

TI-24919

```
***** T6820 TAB TO LINE TEST
THIS TEXT SHOULD BE AT LINE  2 -------------------------------------------------
THIS TEXT SHOULD BE AT LINE  3 -------------------------------------------------

THIS TEXT SHOULD BE AT LINE  5 -------------------------------------------------



THIS TEXT SHOULD BE AT LINE  9 -------------------------------------------------







THIS TEXT SHOULD BE AT LINE 17 -------------------------------------------------















THIS TEXT SHOULD BE AT LINE 33 -------------------------------------------------















THIS TEXT SHOULD BE AT LINE 49 -------------------------------------------------







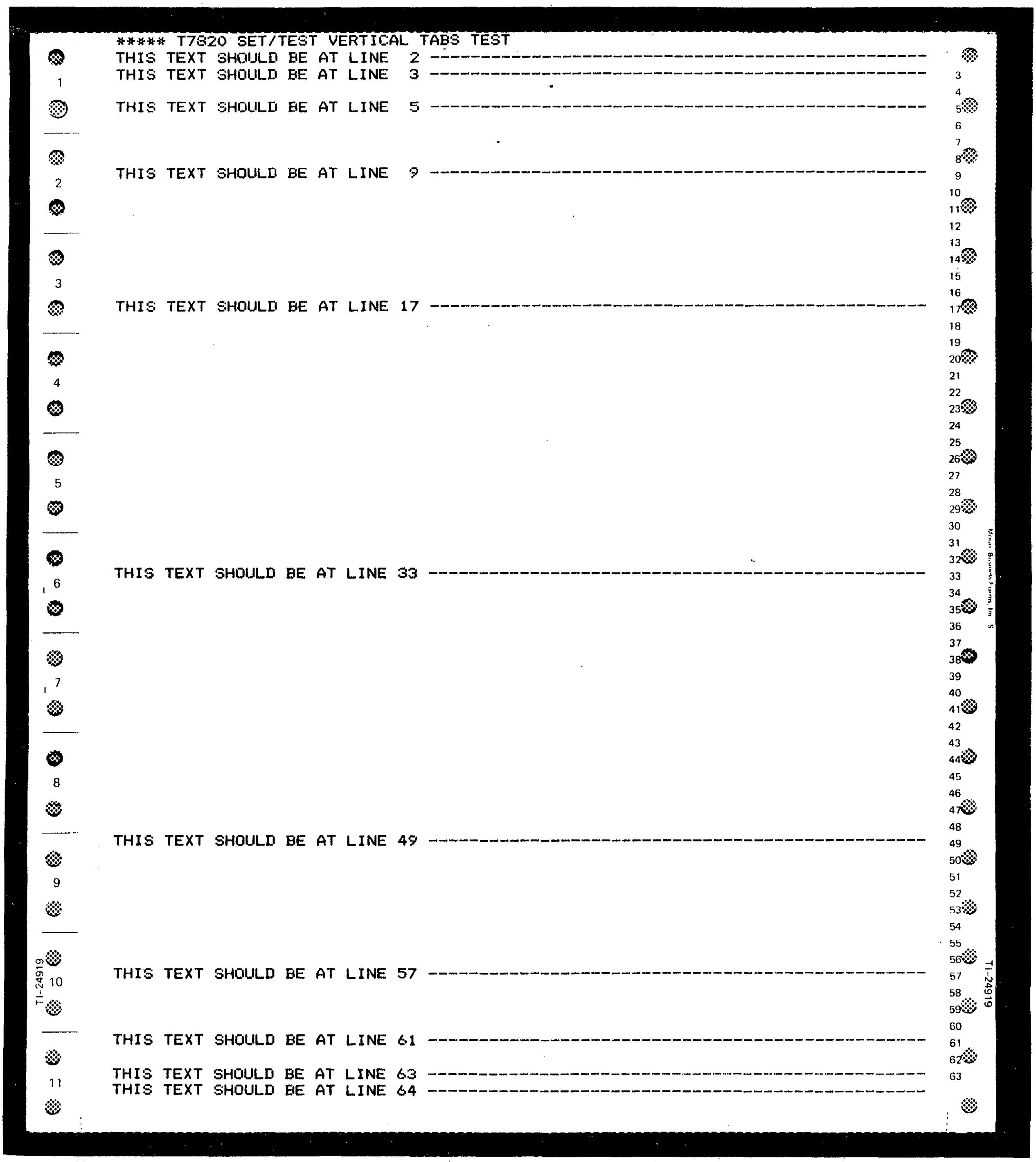
THIS TEXT SHOULD BE AT LINE 57 -------------------------------------------------



THIS TEXT SHOULD BE AT LINE 61 -------------------------------------------------

THIS TEXT SHOULD BE AT LINE 63 -------------------------------------------------
THIS TEXT SHOULD BE AT LINE 64 -------------------------------------------------
```

TI-24919



```
***** T7820 SET/TEST VERTICAL TABS TEST
THIS TEXT SHOULD BE AT LINE  2 ------------------------------------------------
THIS TEXT SHOULD BE AT LINE  3 ------------------------------------------------

THIS TEXT SHOULD BE AT LINE  5 ------------------------------------------------



THIS TEXT SHOULD BE AT LINE  9 ------------------------------------------------







THIS TEXT SHOULD BE AT LINE 17 ------------------------------------------------















THIS TEXT SHOULD BE AT LINE 33 ------------------------------------------------















THIS TEXT SHOULD BE AT LINE 49 ------------------------------------------------







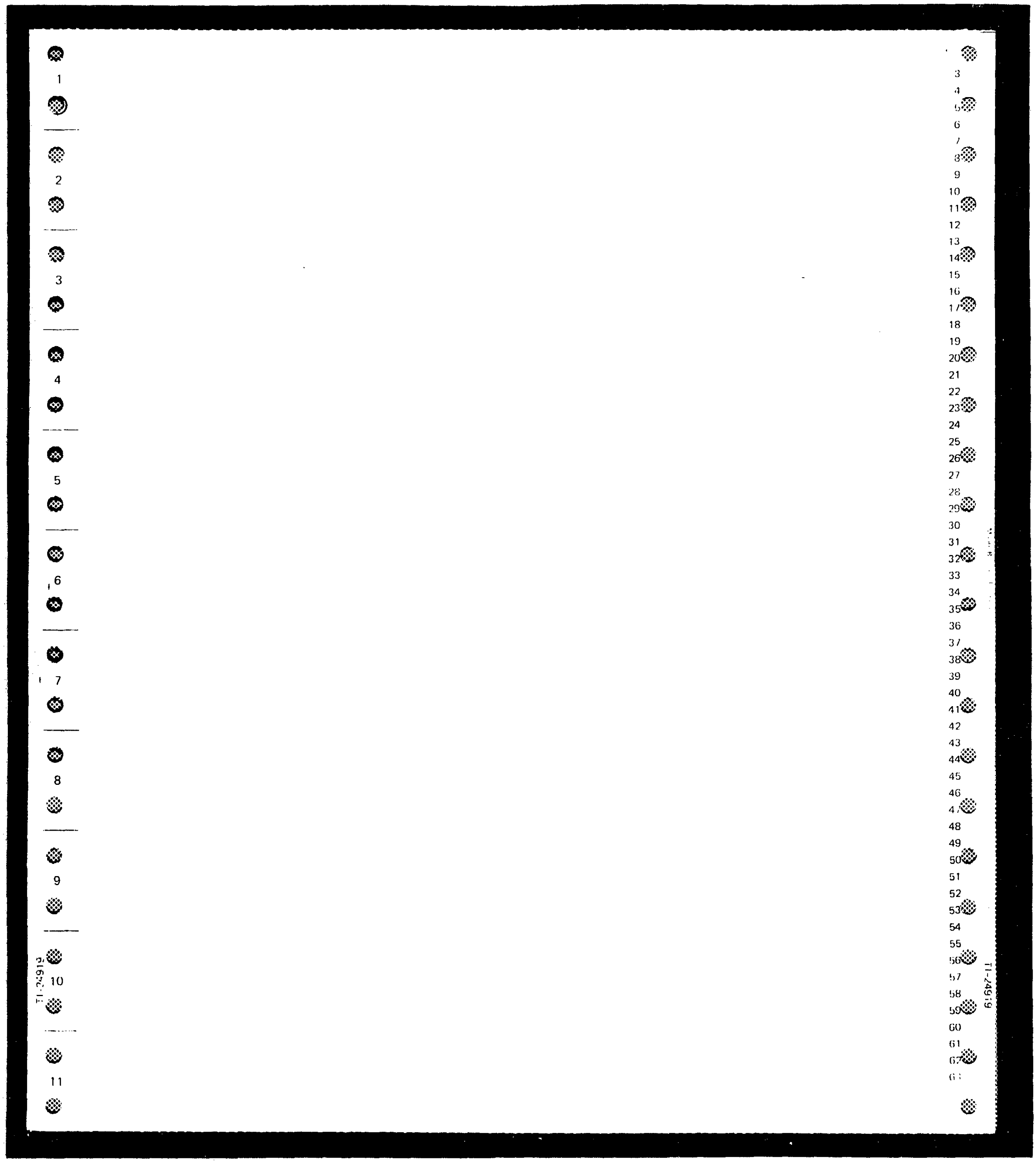
THIS TEXT SHOULD BE AT LINE 57 ------------------------------------------------



THIS TEXT SHOULD BE AT LINE 61 ------------------------------------------------

THIS TEXT SHOULD BE AT LINE 63 ------------------------------------------------
THIS TEXT SHOULD BE AT LINE 64 ------------------------------------------------
```

TI-24919


TI-24919

```
***** T8820 TAB TO ADDRESS TEST

         11111111112222222222333333333344444444445555555555666666666677777777778
12345678901234567890123456789012345678901234567890123456789012345678901234567890
 ↑ ↑   ↑       ↑                       ↑                       ↑       ↑   ↑ ↑

ARROWS SHOULD BE IN FOLLOWING COLUMNS:

      2    4    8   16   40   64   72   76   78
```

TI-24919

```
***** T9820 SET/TEST HORIZONTAL TAB TEST

         11111111112222222222333333333344444444445555555555666666666677777777778
12345678901234567890123456789012345678901234567890123456789012345678901234567890
 ↑ ↑   ↑       ↑                       ↑                       ↑       ↑   ↑ ↑

ARROWS SHOULD BE IN FOLLOWING COLUMNS:

      2    4    8   16   40   64   72   76   78
```

TI-24919

```
***** TA820 LINES AND CHARS/INCH TEST

BLOCK IS 10 CHRS/INCH AND 6 LINES/INCH

                                            XXXXXXXXXX
                                            XXXXXXXXXX
                                            XXXXXXXXXX
                                            XXXXXXXXXX
                                            XXXXXXXXXX
                                            XXXXXXXXXX

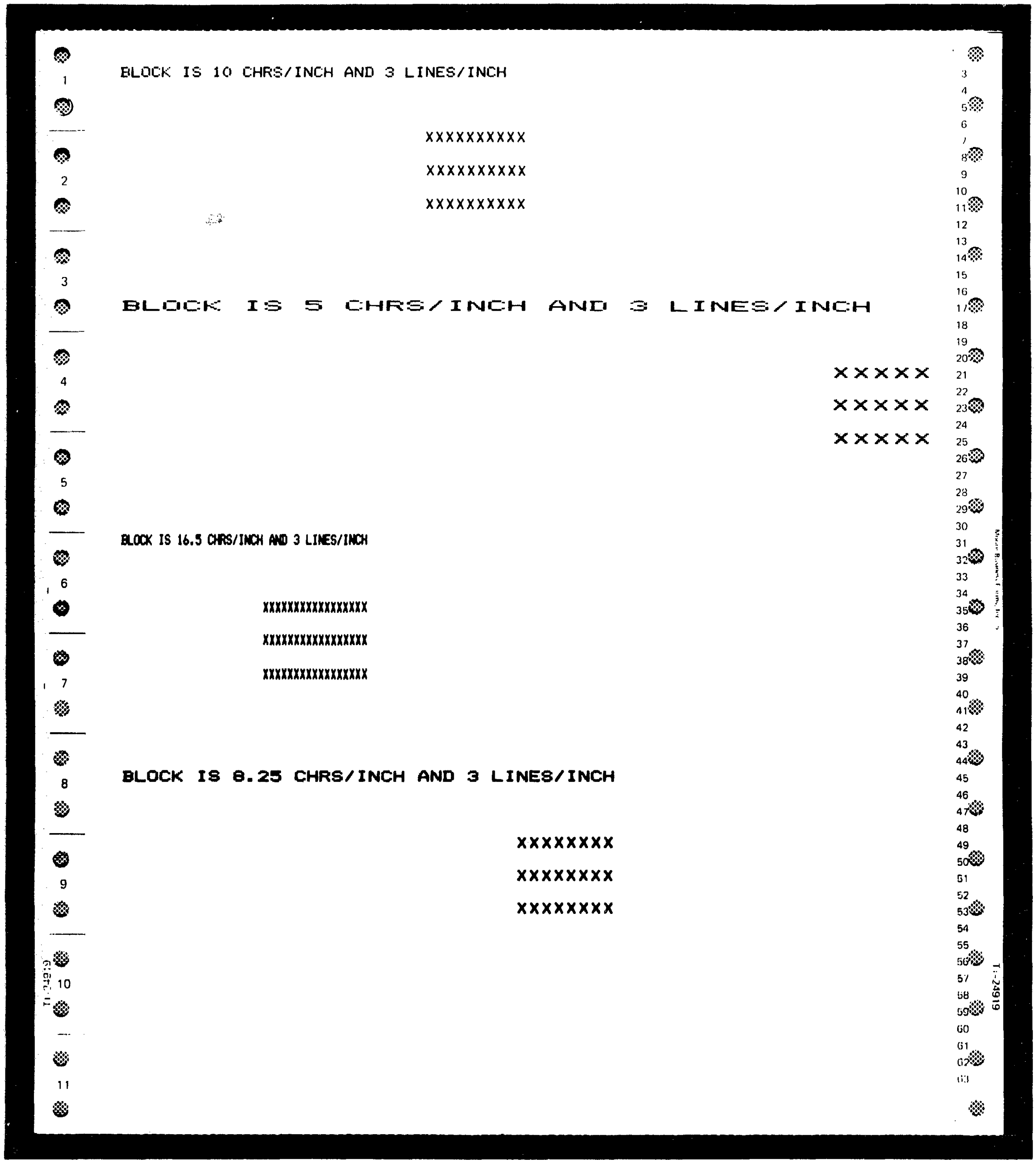
BLOCK IS 5 CHRS/INCH AND 6 LINES/INCH
                                                            XXXXX
                                                            XXXXX
                                                            XXXXX
                                                            XXXXX
                                                            XXXXX
                                                            XXXXX

BLOCK IS 16.5 CHRS/INCH AND 6 LINES/INCH

                              XXXXXXXXXXXXXXXXX
                              XXXXXXXXXXXXXXXXX
                              XXXXXXXXXXXXXXXXX
                              XXXXXXXXXXXXXXXXX
                              XXXXXXXXXXXXXXXXX
                              XXXXXXXXXXXXXXXXX

BLOCK IS 8.25 CHRS/INCH AND 6 LINES/INCH
                                         XXXXXXXX
                                         XXXXXXXX
                                         XXXXXXXX
                                         XXXXXXXX
                                         XXXXXXXX
                                         XXXXXXXX
```

TI-24919



```
BLOCK IS 10 CHRS/INCH AND 3 LINES/INCH

                                        XXXXXXXXXX
                                        XXXXXXXXXX
                                        XXXXXXXXXX

BLOCK IS 5 CHRS/INCH AND 3 LINES/INCH

                                                            XXXXX
                                                            XXXXX
                                                            XXXXX

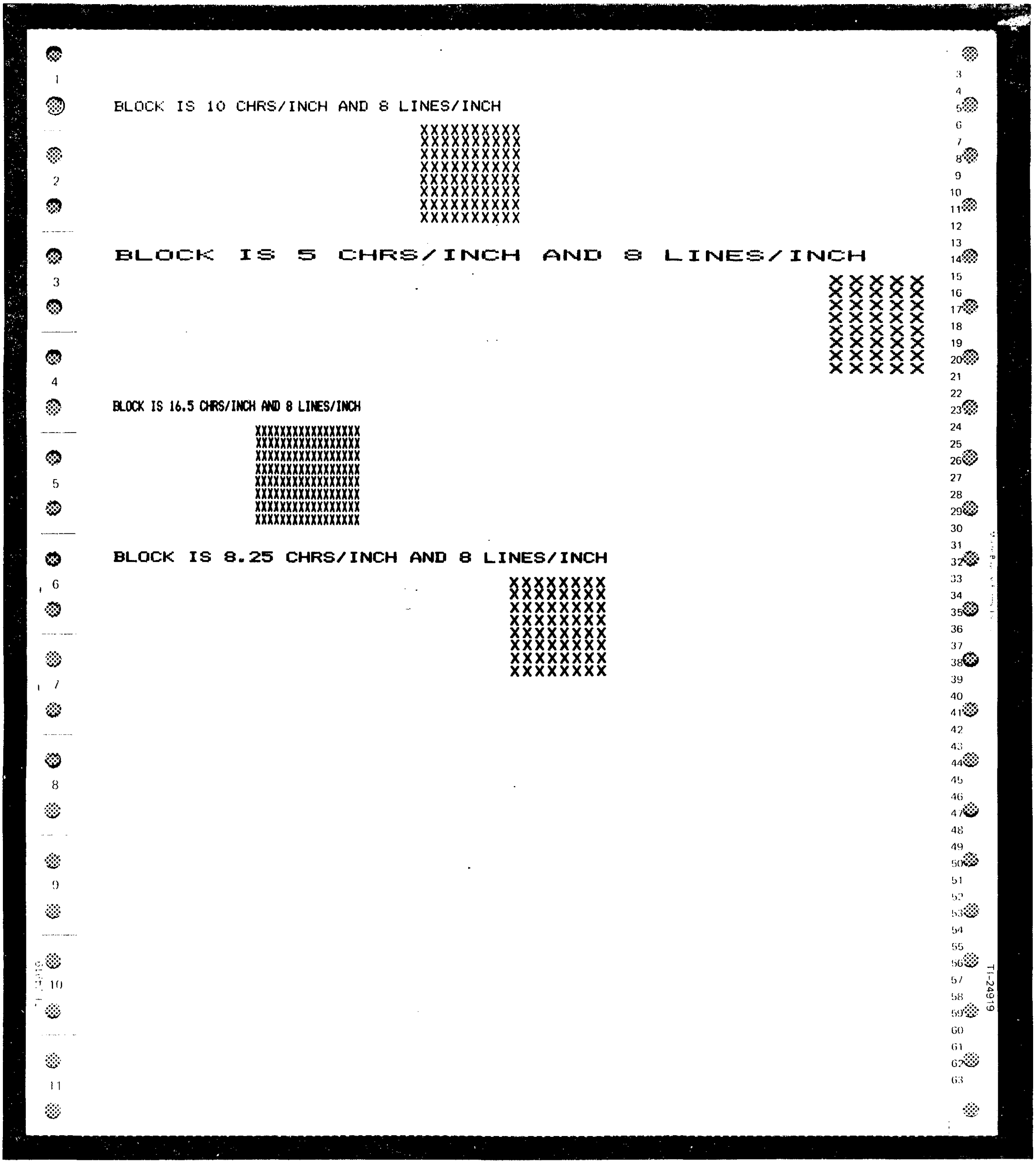
BLOCK IS 16.5 CHRS/INCH AND 3 LINES/INCH

                  XXXXXXXXXXXXXXXX
                  XXXXXXXXXXXXXXXX
                  XXXXXXXXXXXXXXXX

BLOCK IS 8.25 CHRS/INCH AND 3 LINES/INCH

                                        XXXXXXXX
                                        XXXXXXXX
                                        XXXXXXXX
```

TI-24919


BLOCK IS 10 CHRS/INCH AND 8 LINES/INCH
BLOCK IS 5 CHRS/INCH AND 8 LINES/INCH
BLOCK IS 16.5 CHRS/INCH AND 8 LINES/INCH
BLOCK IS 8.25 CHRS/INCH AND 8 LINES/INCH
TI-24919

```
BLOCK IS 10 CHRS/INCH AND 4 LINES/INCH

                    XXXXXXXXXX
                    XXXXXXXXXX
                    XXXXXXXXXX
                    XXXXXXXXXX

BLOCK IS 5 CHRS/INCH AND 4 LINES/INCH

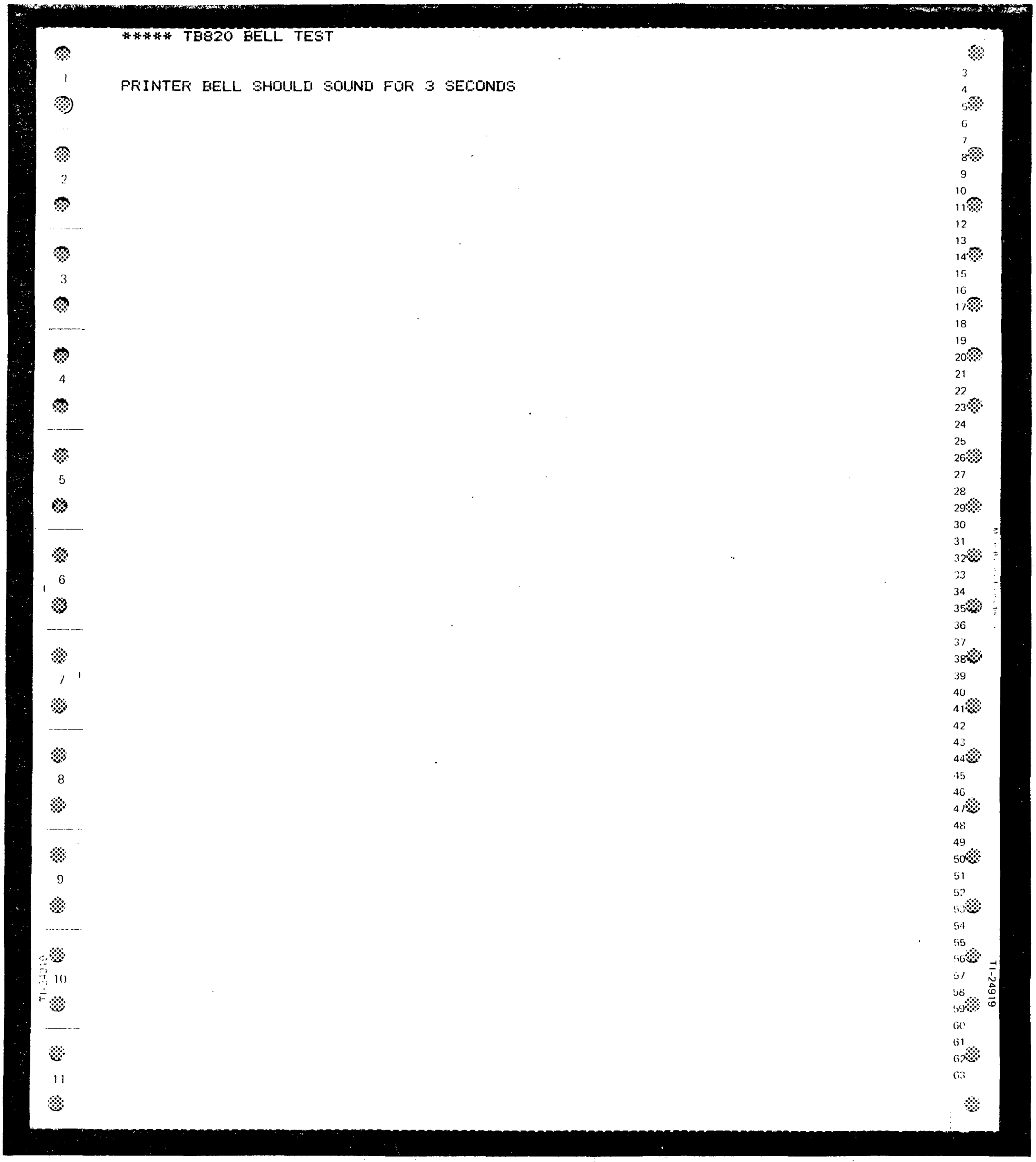
                                        XXXXX
                                        XXXXX
                                        XXXXX
                                        XXXXX

BLOCK IS 16.5 CHRS/INCH AND 4 LINES/INCH

          XXXXXXXXXXXXXXXXX
          XXXXXXXXXXXXXXXXX
          XXXXXXXXXXXXXXXXX
          XXXXXXXXXXXXXXXXX

BLOCK IS 8.25 CHRS/INCH AND 4 LINES/INCH

                          XXXXXXXX
                          XXXXXXXX
                          XXXXXXXX
                          XXXXXXXX
```


***** TB820 BELL TEST

PRINTER BELL SHOULD SOUND FOR 3 SECONDS

TI-24919

```
***** TC820 KEYBOARD TEST


DEPRESS KEY(S) SHOWN IN LEFT COLUMN
WITH UPPER CASE LOCK ENGAGED
(TAB - REPEAT ROW OF KEYS)
(RETURN - ABORTS TEST)

     KEY          CODE
--------------------------
      1            31
      2            32
      3            33
      4            34
      5            35
      6            36
      7            37
      8            38
      9            39
      0            30
      -            2D
      =            3D
      `            60

      1            31
      2            32
      3            33
      4            34
      5            35
      6            36
      7            37
      8            38
      9            39
      0            30
      -            2D
      =            3D
      `            60

     KEY          CODE
--------------------------
      Q            51
      W            57
      E            45
      R            52
      T            54
      Y            59
      U            55
      I            49
      O            4F
      P            50
      [            5B
      \            5C

      Q            51
      W            57
```

E	45
R	52
T	54
Y	59
U	55
I	49
O	4F
P	50
[	5B
\	5C

KEY	CODE
A	41
S	53
D	44
F	46
G	47
H	48
J	4A
K	4B
L	4C
;	3B
'	27
{	7B
A	41
S	53
D	44
F	46
G	47
H	48
J	4A
K	4B
L	4C
;	3B
'	27
{	7B

KEY	CODE
Z	5A
X	58
C	43
V	56
B	42
N	4E
M	4D
,	2C
.	2E
/	2F
Z	5A
X	58
C	43
V	56
B	42
N	4E
M	4D
,	2C
.	2E
/	2F

TI-24919

```
DEPRESS KEY(S) SHOWN IN LEFT COLUMN
WITHOUT UPPER CASE LOCK ENGAGED
(TAB - REPEAT ROW OF KEYS)
(RETURN - ABORTS TEST)

     KEY          CODE
---------------------------
      1            31
      2            32
      3            33
      4            34
      5            35
      6            36
      7            37
      8            38
      9            39
      0            30
      -            2D
      =            3D
      `            60

      1            31
      2            32
      3            33
      4            34
      5            35
      6            36
      7            37
      8            38
      9            39
      0            30
      -            2D
      =            3D
      `            60

     KEY          CODE
---------------------------
      q            71
      w            77
      e            65
      r            72
      t            74
      y            79
      u            75
      i            69
      o            6F
      p            70
      [            5B
      \            5C

      q            71
      w            77
      e            65
      r            72
      t            74
      y            79
      u            75
```

i	69
o	6F
p	70
[	5B
\	5C

KEY	CODE
a	61
s	73
d	64
f	66
g	67
h	68
j	6A
k	6B
l	6C
;	3B
'	27
{	7B
a	61
s	73
d	64
f	66
g	67
h	68
j	6A
k	6B
l	6C
;	3B
'	27
{	7B

KEY	CODE
z	7A
x	78
c	63
v	76
b	62
n	6E
m	6D
,	2C
.	2E
/	2F
z	7A
x	78
c	63
v	76
b	62
n	6E
m	6D
,	2C
.	2E
/	2F

TI-24919

```
DEPRESS KEY(S) SHOWN IN LEFT COLUMN
WITHOUT UPPER CASE LOCK ENGAGED
WITH SHIFT KEY HELD DOWN
(TAB - REPEAT ROW OF KEYS)
(RETURN - ABORTS TEST)

       KEY            CODE
 ---------------------------
        !              21
        @              40
        #              23
        $              24
        %              25
        ^              5E
        &              26
        *              2A
        (              28
        )              29
        _              5F
        +              2B
        ~              7E

        !              21
        @              40
        #              23
        $              24
        %              25
        ^              5E
        &              26
        *              2A
        (              28
        )              29
        _              5F
        +              2B
        ~              7E

       KEY            CODE
 ---------------------------
        Q              51
        W              57
        E              45
        R              52
        T              54
        Y              59
        U              55
        I              49
        O              4F
        P              50
        ]              5D
        |              7C

        Q              51
        W              57
        E              45
        R              52
        T              54
        Y              59
        U              55
        I              49
        O              4F
        P              50
        ]              5D
```

|	7C

KEY	CODE
A	41
S	53
D	44
F	46
G	47
H	48
J	4A
K	4B
L	4C
:	3A
"	22
}	7D
A	41
S	53
D	44
F	46
G	47
H	48
J	4A
K	4B
L	4C
:	3A
"	22
}	7D

KEY	CODE
Z	5A
X	58
C	43
V	56
B	42
N	4E
M	4D
<	3C
>	3E
?	3F
Z	5A
X	58
C	43
V	56
B	42
N	4E
M	4D
<	3C
>	3E
?	3F

DEPRESS KEY(S) SHOWN IN LEFT COLUMN
WITH CONTROL KEY HELD DOWN
(TAB - REPEAT ROW OF KEYS)
(RETURN - ABORTS TEST)

TI-24919

KEY	CODE
-	1F
=	1E
`	1C
	1F
	1E
	1C

KEY	CODE
W	17
E	05
T	14
Y	19
U	15
I	09
O	0F
[	00
	17
	05
	14
	19
	15
	09
	0F
	00

KEY	CODE
A	01
S	13
D	04
F	06
J	0A
K	0B
L	0C
{	1D
	01
	13
	04
	06
	0A
	0B
	0C
	1D

KEY	CODE
Z	1A
X	18
C	03
V	16
B	02
N	0E

```
      M              0D


                     1A
                     18
                     03
                     16
                     02
                     0E
                     0D




DEPRESS KEY(S) SHOWN IN LEFT COLUMN
(TAB - REPEAT ROW OF KEYS)
(RETURN - ABORTS TEST)


      KEY           CODE
-----------------------------
       TB            09
       LF            0A
       CR            0D
       SP            20

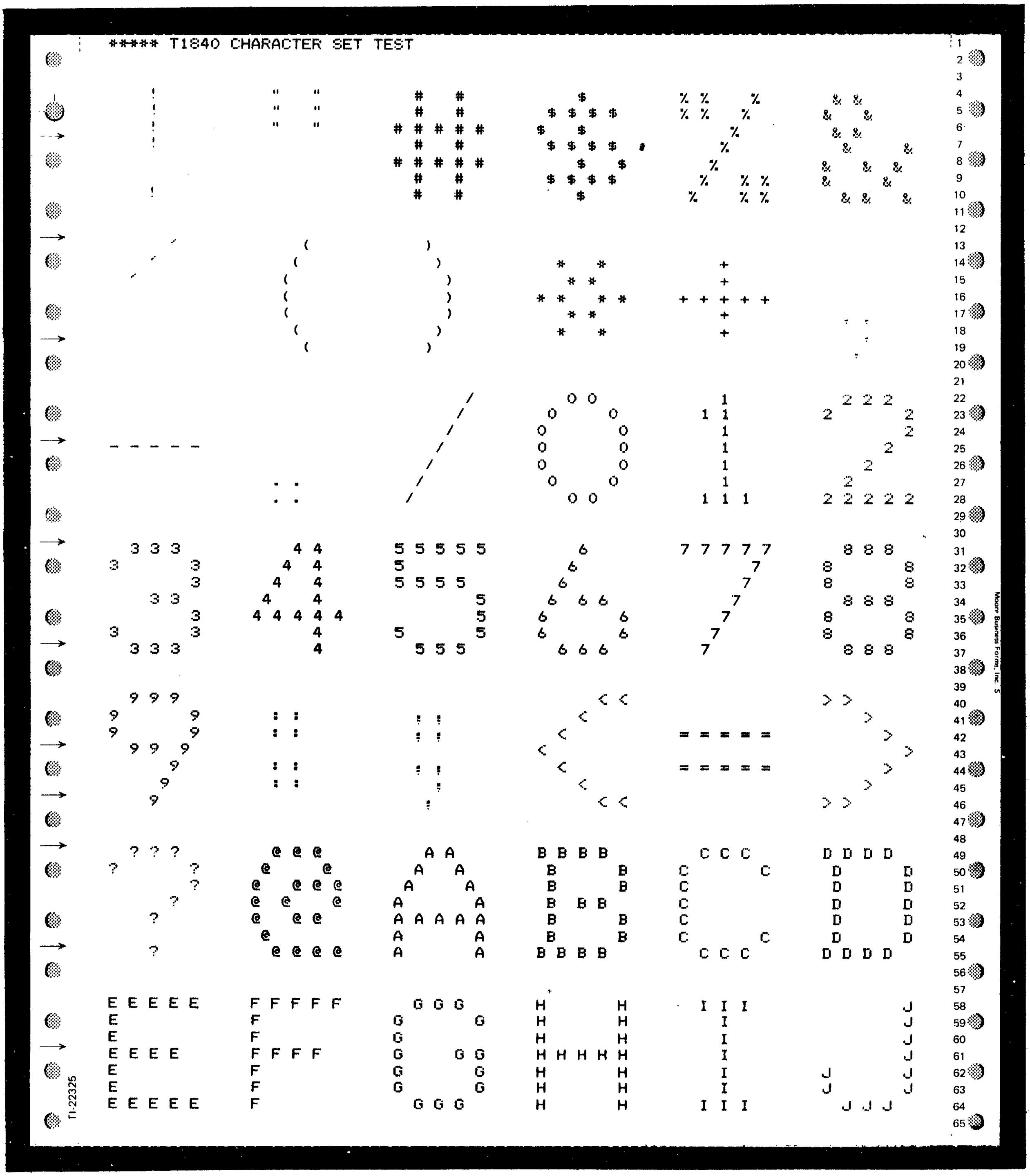

                     09
                     0A
                     0D
                     20
```

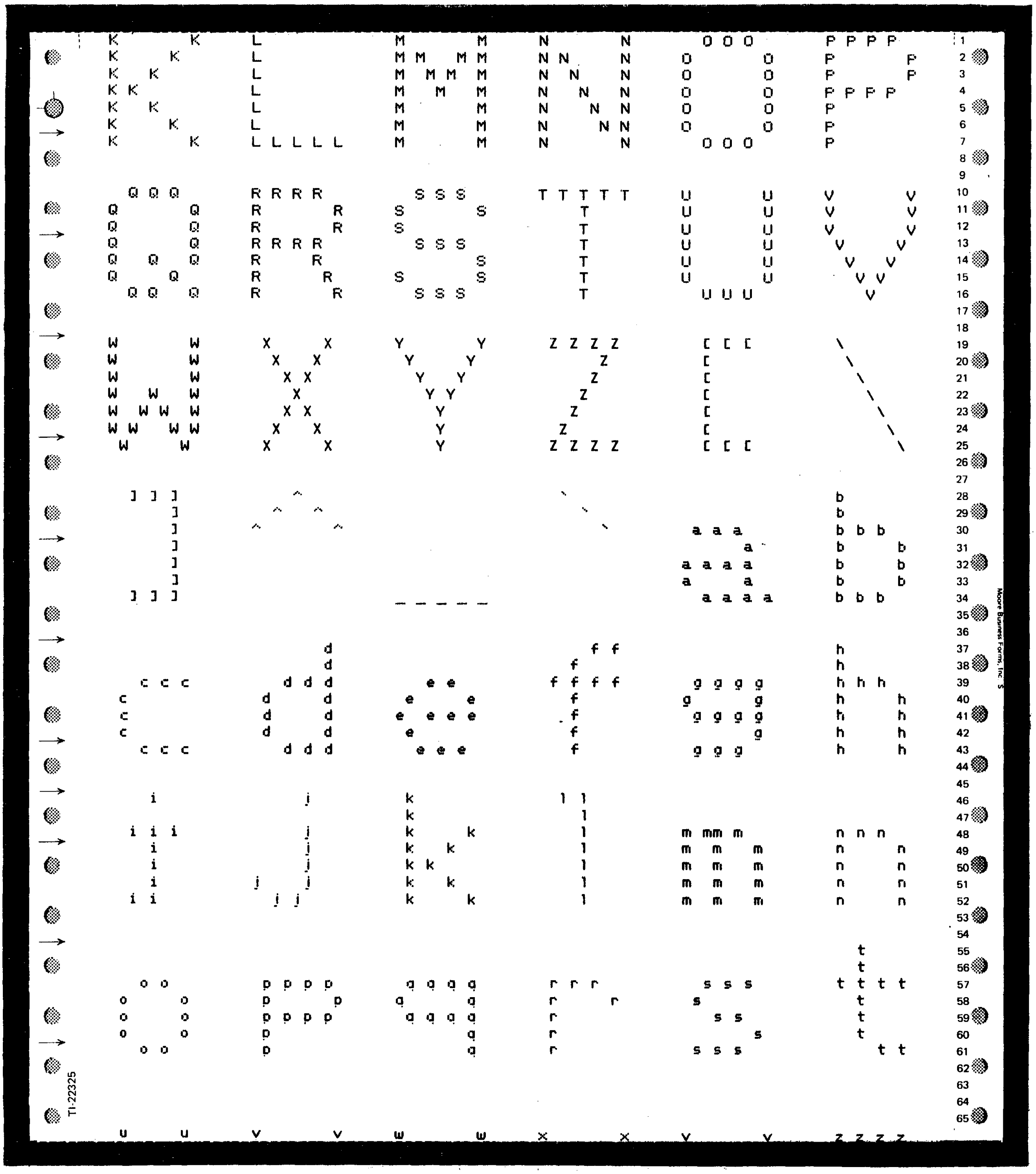
TI-24919

Appendix F

LP840 Output

The following pages are examples of the output of the LP840 tests when executed with the default options. You can use these examples for comparison with the output you receive.


***** T1840 CHARACTER SET TEST
TI-22325


TI-22325
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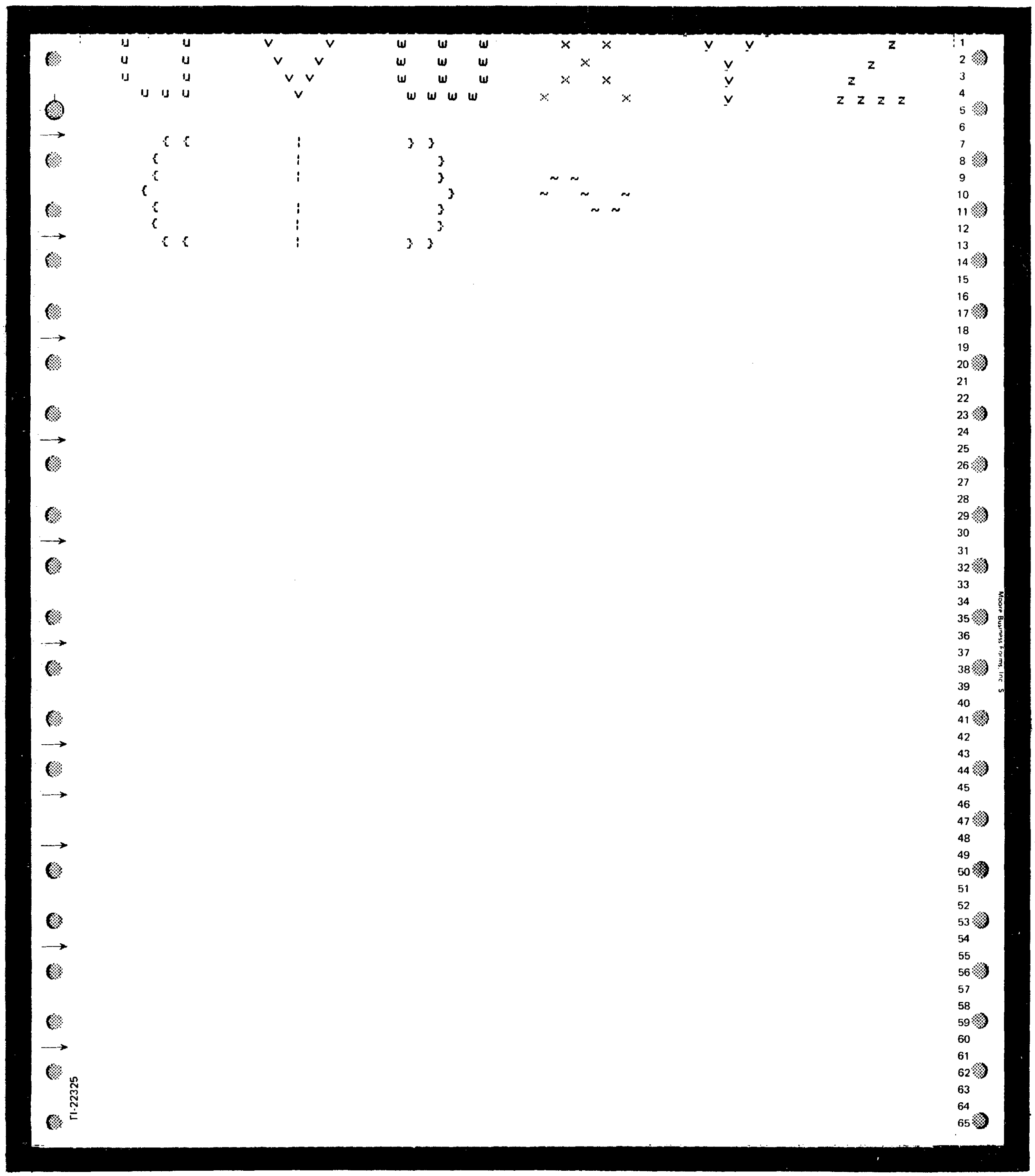
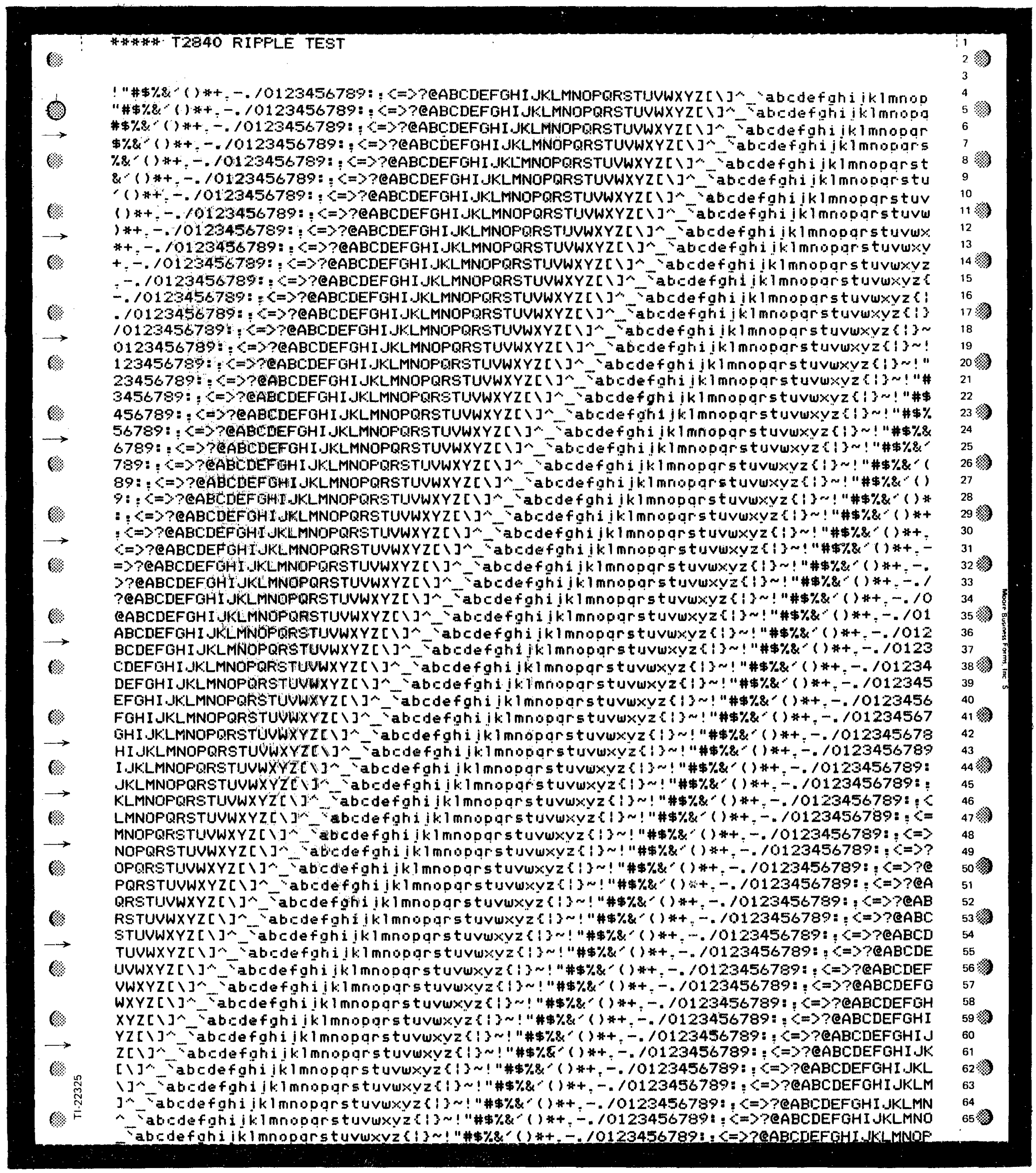

TI-22325



```
***** T2840 RIPPLE TEST

!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnop
"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopq
#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqr
$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrs
%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrst
&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstu
'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuv
()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvw
)*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwx
*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxy
+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz
,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{
-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|
./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}
/0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~
0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!
123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"
23456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#
3456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$
456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%
56789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&
6789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'
789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'(
89:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()
9:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*
:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+
;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,
<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-
=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-.
>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./
?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0
@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./01
ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./012
BCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123
CDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./01234
DEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./012345
EFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456
FGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./01234567
GHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./012345678
HIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789
IJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:
JKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;
KLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<
LMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=
MNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>
NOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?
OPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@
PQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@A
QRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@AB
RSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABC
STUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCD
TUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDE
UVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEF
VWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFG
WXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGH
XYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHI
YZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJ
Z[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJK
[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKL
\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLM
]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMN
^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNO
_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOP
```

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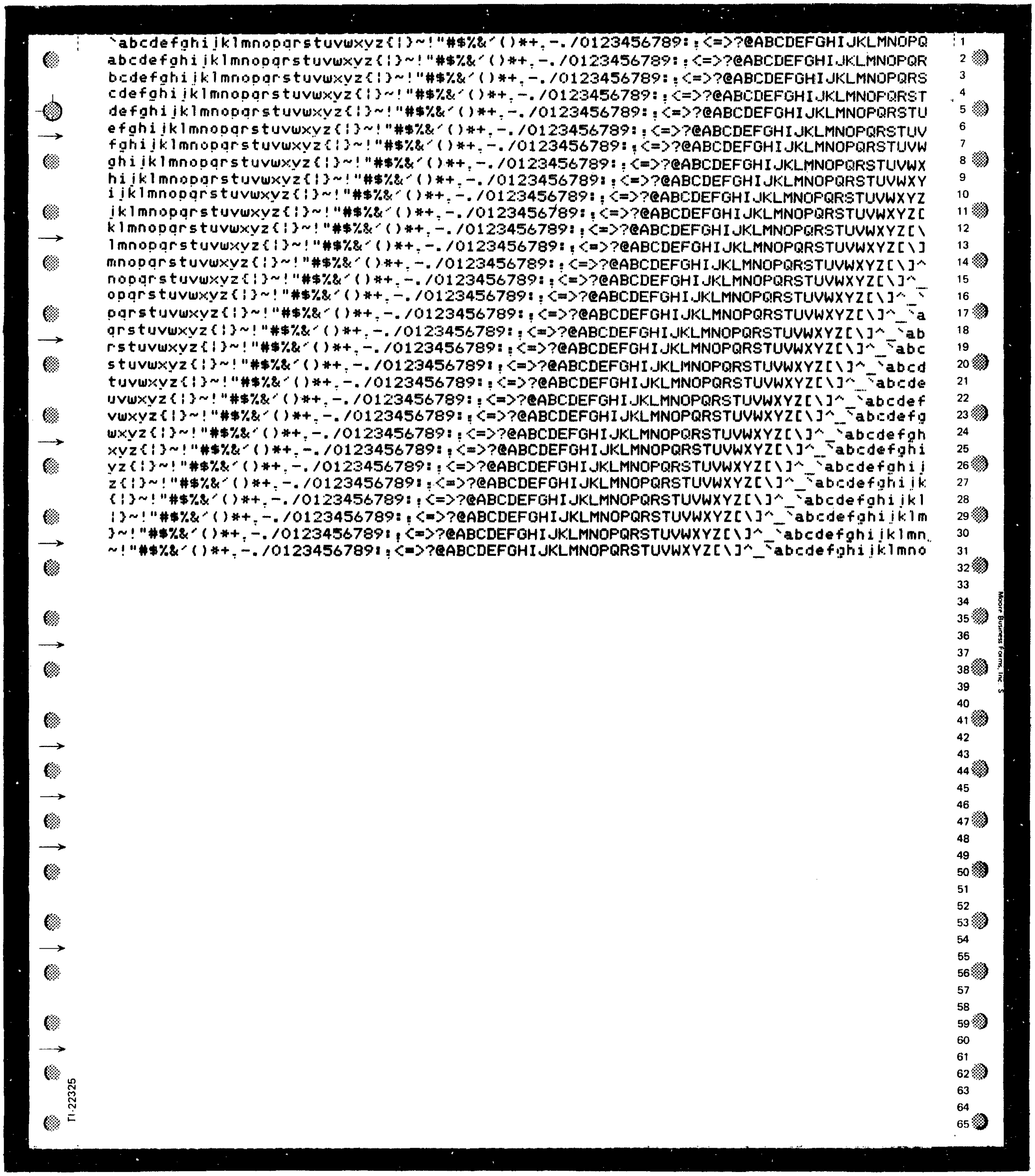

`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQ
abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQR
bcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRS
cdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRST
defghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTU
efghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUV
fghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVW
ghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWX
hijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXY
ijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ
jklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[
klmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\
lmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]
mnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^
nopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_
opqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`
pqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`a
qrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`ab
rstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abc
stuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcd
tuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcde
uvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdef
vwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefg
wxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefgh
xyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghi
yz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghij
z{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijk
{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijkl
|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklm
}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmn
~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmno
Moore Business Forms, Inc.
TI-22325

```
***** T3840 BUFFER TEST


PR
PRIN
PRINTE
PRINTER*
PRINTER*BU
PRINTER*BUFF
PRINTER*BUFFER
PRINTER*BUFFER*T
PRINTER*BUFFER*TES
PRINTER*BUFFER*TEST*
PRINTER*BUFFER*TEST*PR
PRINTER*BUFFER*TEST*PRIN
PRINTER*BUFFER*TEST*PRINTE
PRINTER*BUFFER*TEST*PRINTER*
PRINTER*BUFFER*TEST*PRINTER*BU
PRINTER*BUFFER*TEST*PRINTER*BUFF
PRINTER*BUFFER*TEST*PRINTER*BUFFER
PRINTER*BUFFER*TEST*PRINTER*BUFFER*T
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PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PR
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRIN
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTE
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BU
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFF
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*T
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TES
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*
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PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRIN
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PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TES
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*T
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFF
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PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTE
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRIN
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PR
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*TES
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER*T
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFF
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BU
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTE
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRIN
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PR
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*
PRINTER*BUFFER*TEST*PRINTER*BUFFER*TES
PRINTER*BUFFER*TEST*PRINTER*BUFFER*T
```

Moore Business Forms, Inc

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```
PRINTER*BUFFER*TEST*PRINTER*BUFFER
PRINTER*BUFFER*TEST*PRINTER*BUFF
PRINTER*BUFFER*TEST*PRINTER*BU
PRINTER*BUFFER*TEST*PRINTER*
PRINTER*BUFFER*TEST*PRINTE
PRINTER*BUFFER*TEST*PRIN
PRINTER*BUFFER*TEST*PR
PRINTER*BUFFER*TEST*
PRINTER*BUFFER*TES
PRINTER*BUFFER*T
PRINTER*BUFFER
PRINTER*BUFF
PRINTER*BU
PRINTER*
PRINTE
PRIN
PR
```

TI-22325

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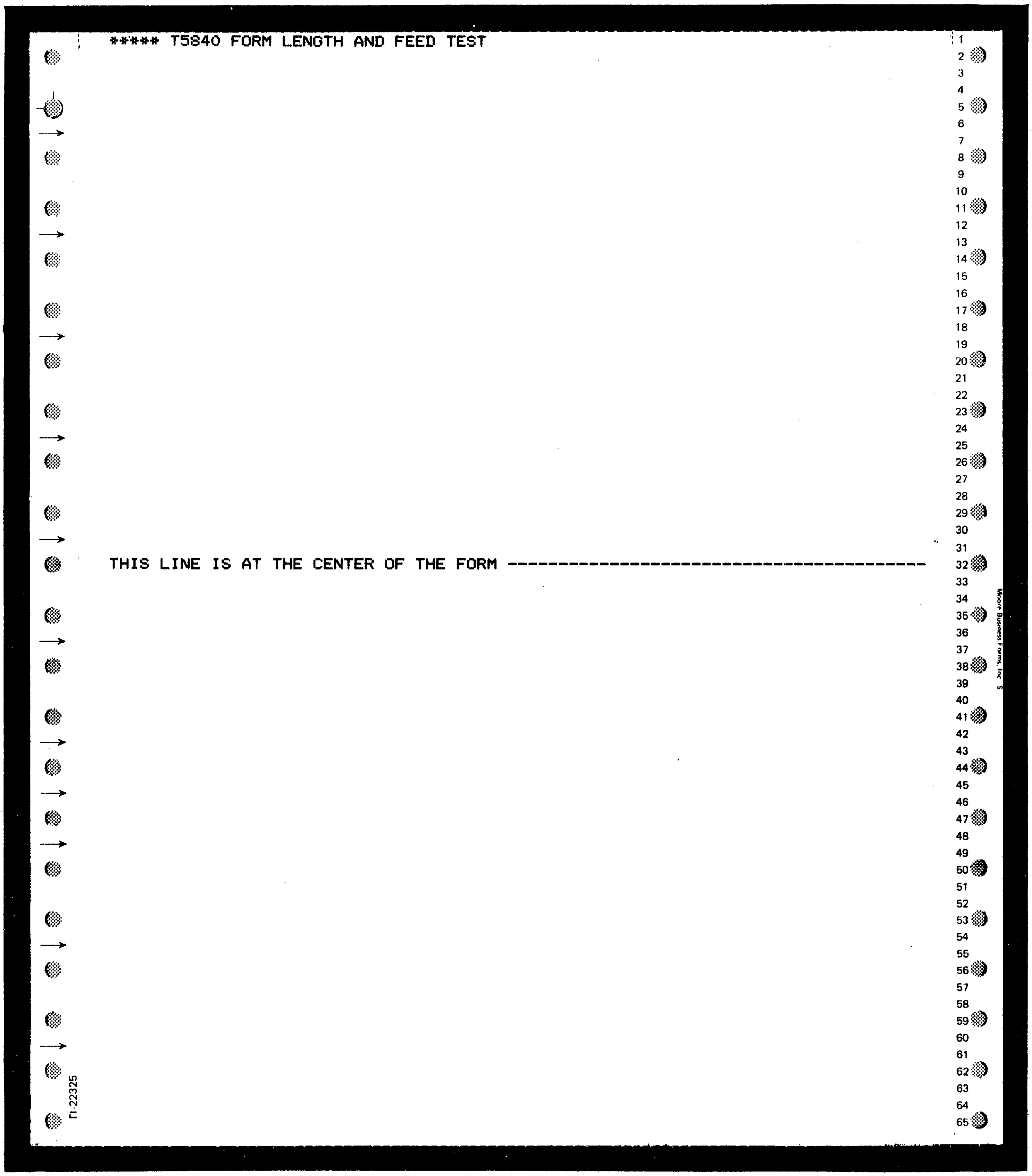
```
***** T4840 CARRIAGE RETURN TEST

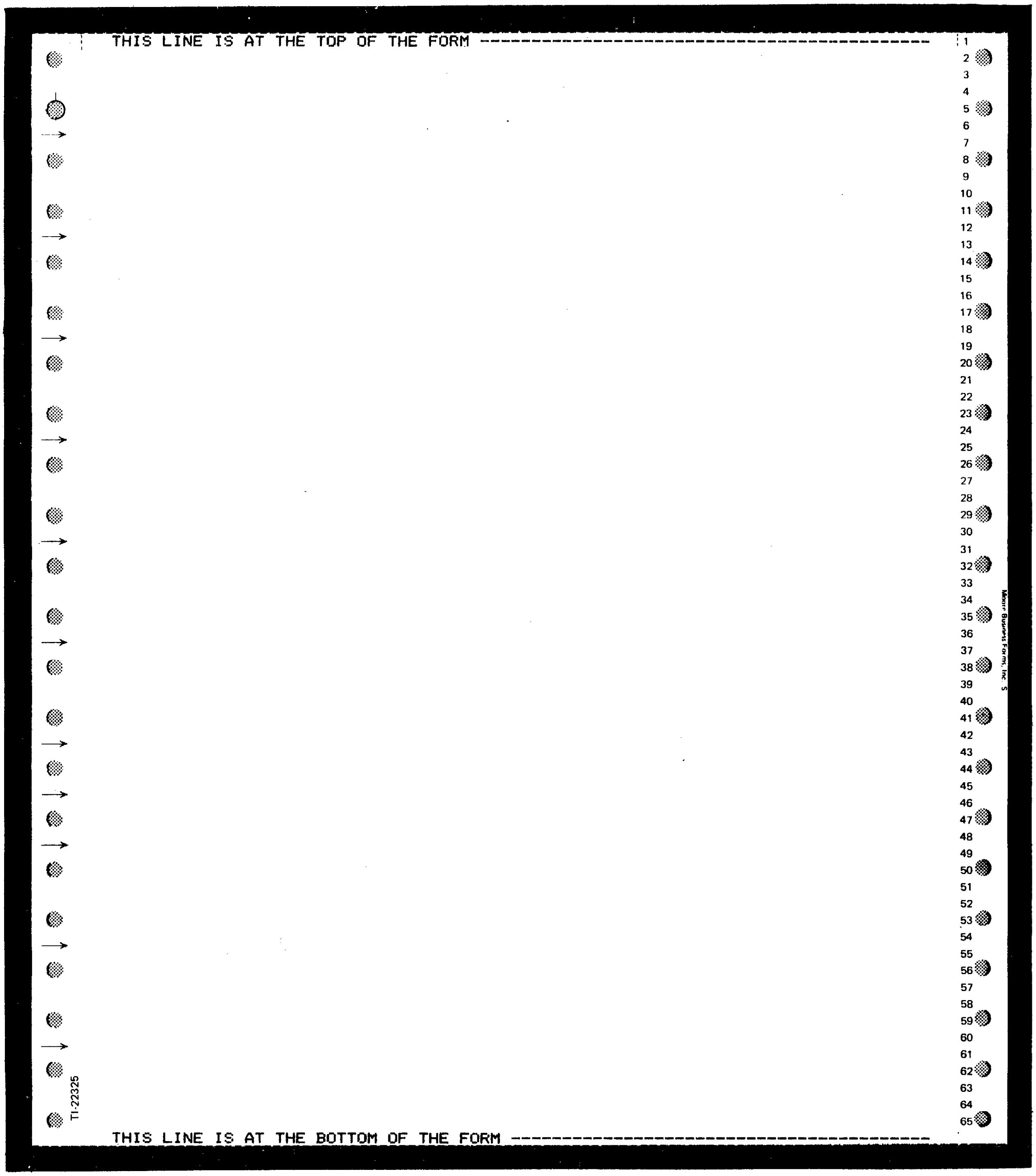
  THIS LINE IS PRINTED IN TWO PASSES
```

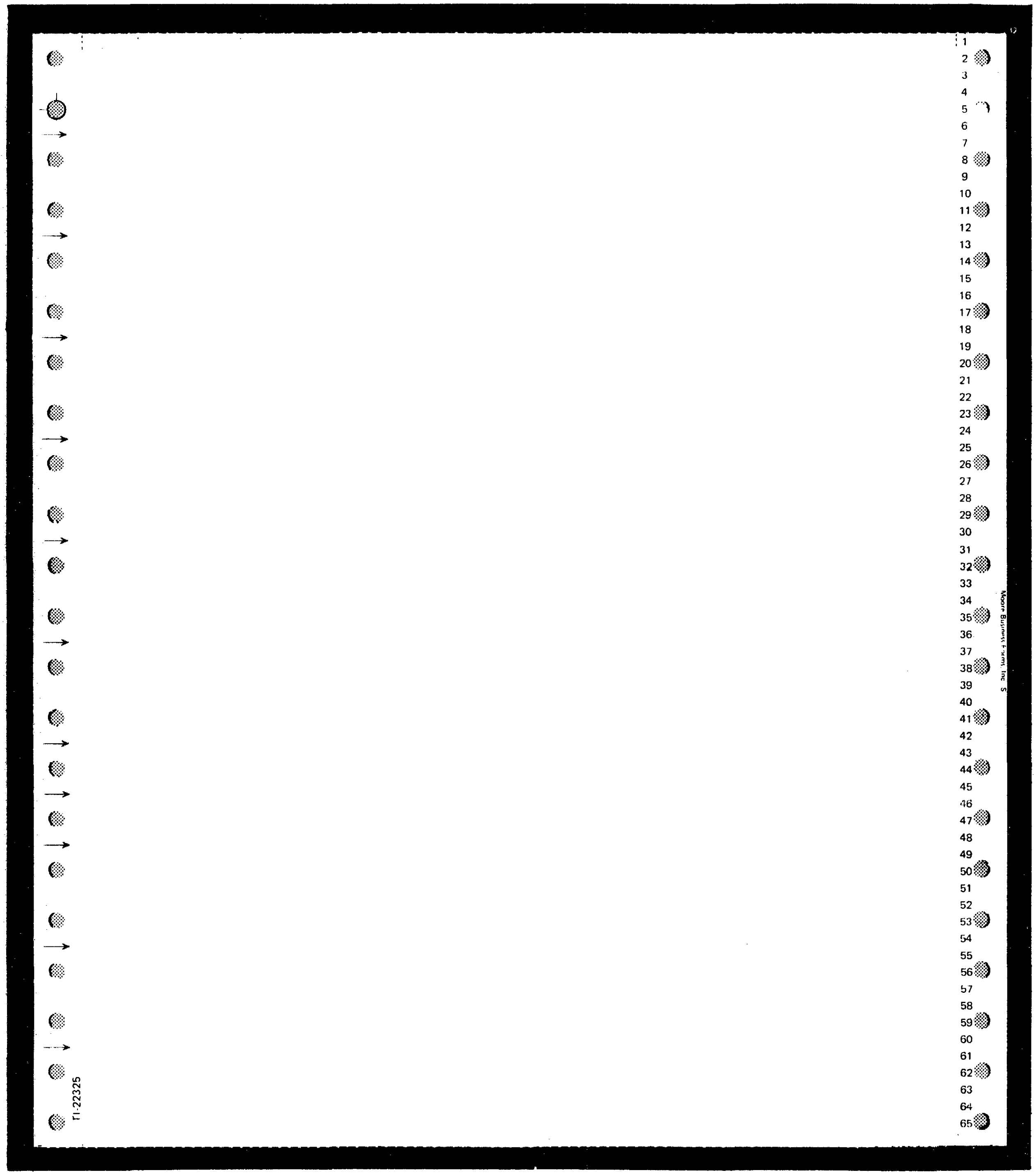
TI-22325



```
***** T5840 FORM LENGTH AND FEED TEST

THIS LINE IS AT THE CENTER OF THE FORM ----------------------------------------
```


THIS LINE IS AT THE TOP OF THE FORM --
THIS LINE IS AT THE BOTTOM OF THE FORM ------------------------------------
TI-22325


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
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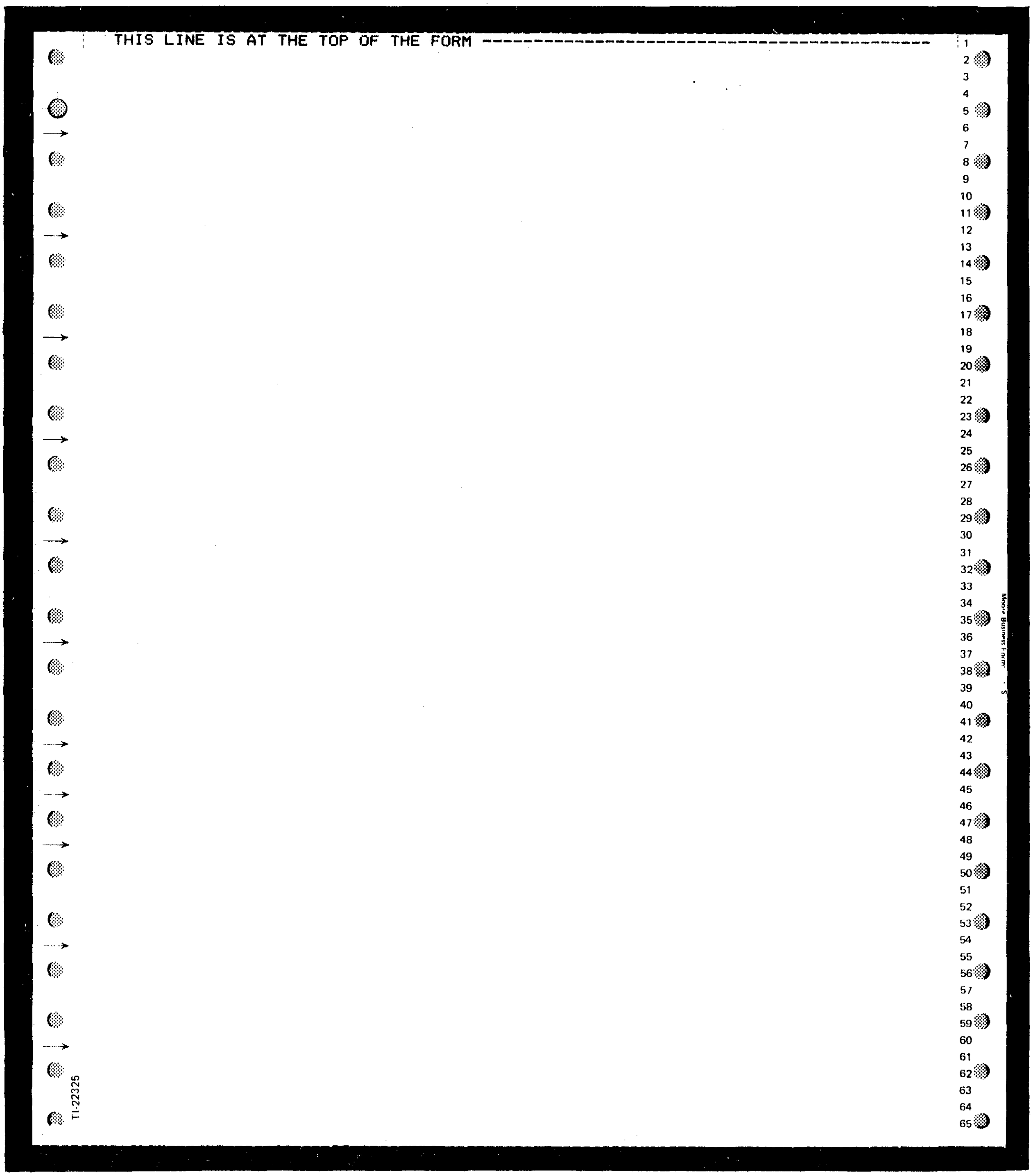
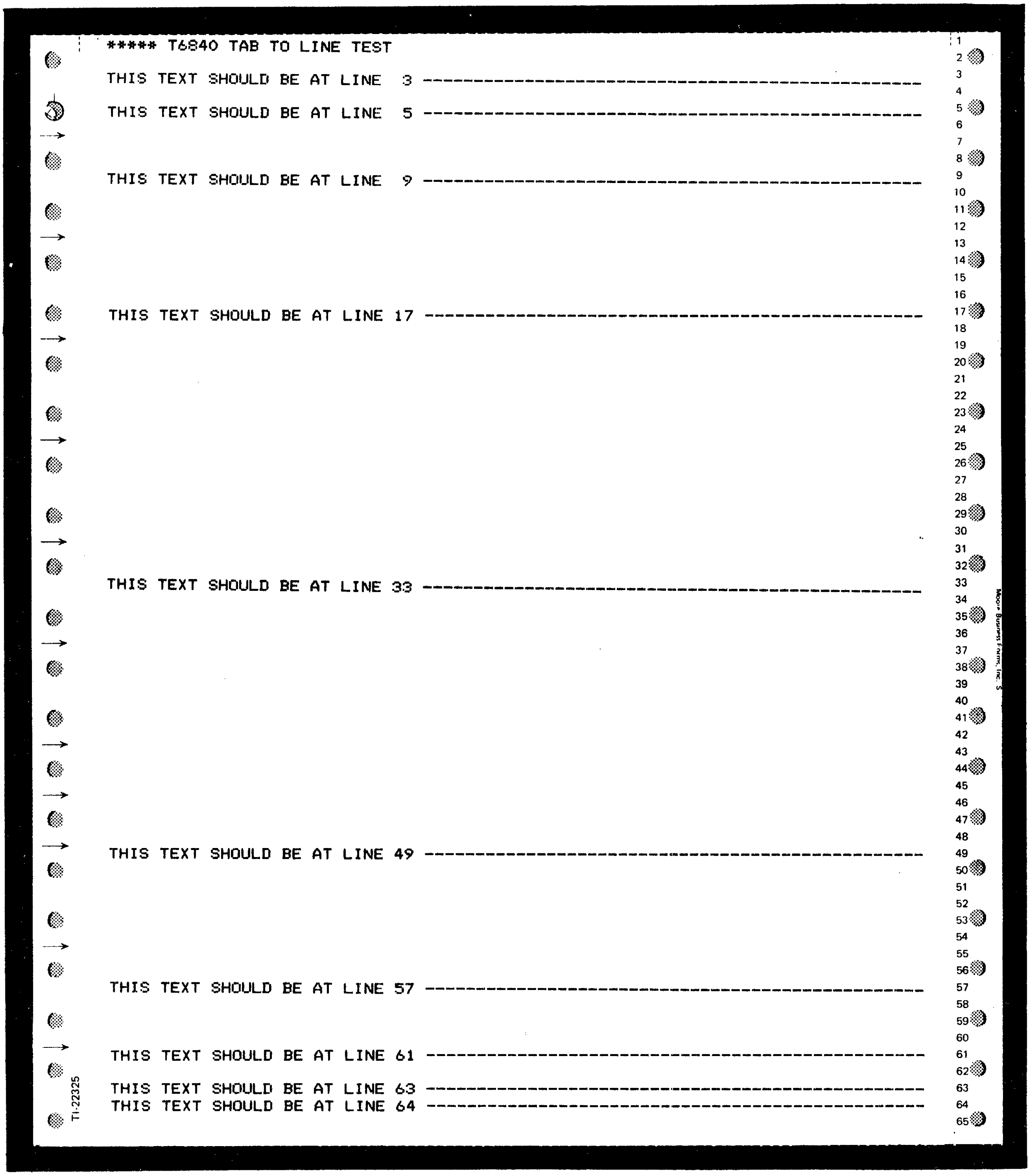
TI-22325



THIS LINE IS AT THE TOP OF THE FORM --
TI-22325



```
***** T6840 TAB TO LINE TEST
THIS TEXT SHOULD BE AT LINE  3 -----------------------------------------------------
THIS TEXT SHOULD BE AT LINE  5 -----------------------------------------------------
THIS TEXT SHOULD BE AT LINE  9 -----------------------------------------------------
THIS TEXT SHOULD BE AT LINE 17 -----------------------------------------------------
THIS TEXT SHOULD BE AT LINE 33 -----------------------------------------------------
THIS TEXT SHOULD BE AT LINE 49 -----------------------------------------------------
THIS TEXT SHOULD BE AT LINE 57 -----------------------------------------------------
THIS TEXT SHOULD BE AT LINE 61 -----------------------------------------------------
THIS TEXT SHOULD BE AT LINE 63 -----------------------------------------------------
THIS TEXT SHOULD BE AT LINE 64 -----------------------------------------------------
```

TI-22325

```
***** T7840 SET/TEST VERTICAL TABS TEST
THIS TEXT SHOULD BE AT LINE  2 ------------------------------------------------
THIS TEXT SHOULD BE AT LINE  3 ------------------------------------------------

THIS TEXT SHOULD BE AT LINE  5 ------------------------------------------------



THIS TEXT SHOULD BE AT LINE  9 ------------------------------------------------







THIS TEXT SHOULD BE AT LINE 17 ------------------------------------------------















THIS TEXT SHOULD BE AT LINE 33 ------------------------------------------------















THIS TEXT SHOULD BE AT LINE 49 ------------------------------------------------







THIS TEXT SHOULD BE AT LINE 57 ------------------------------------------------



THIS TEXT SHOULD BE AT LINE 61 ------------------------------------------------

THIS TEXT SHOULD BE AT LINE 63 ------------------------------------------------
THIS TEXT SHOULD BE AT LINE 64 ------------------------------------------------
```

TI-22325

Moore Business Forms, Inc.

```
***** T8840 REMOTE ON/OFF TEST


THIS MESSAGE SHOULD APPEAR ONLY 3 TIMES.
THIS MESSAGE SHOULD APPEAR ONLY 3 TIMES.
THIS MESSAGE SHOULD APPEAR ONLY 3 TIMES.
```

TI-22325

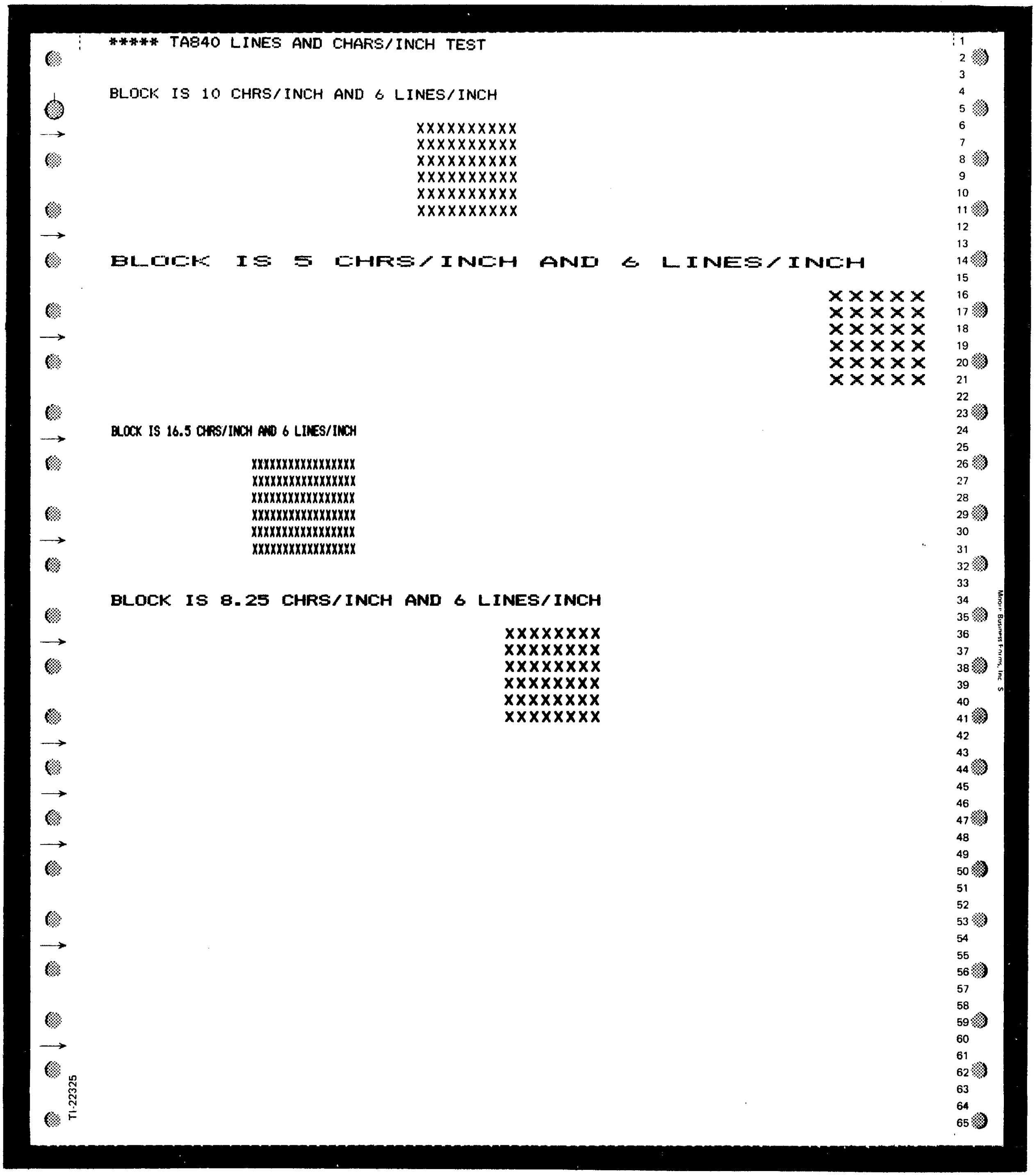
```
***** T9840 SET/TEST HORIZONTAL TAB TEST

         1111111111222222222233333333334444444444555555555566666666667777777778
12345678901234567890123456789012345678901234567890123456789012345678901234567890
 ↑ ↑   ↑       ↑                       ↑                       ↑       ↑   ↑ ↑

ARROWS SHOULD BE IN FOLLOWING COLUMNS:

      2    4    8   16   40   64   72   76   78
```

TI-22325



***** TA840 LINES AND CHARS/INCH TEST
BLOCK IS 10 CHRS/INCH AND 6 LINES/INCH
XXXXXXXXXX
XXXXXXXXXX
XXXXXXXXXX
XXXXXXXXXX
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XXXXXXXXXX
BLOCK IS 5 CHRS/INCH AND 6 LINES/INCH
XXXXX
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XXXXX
BLOCK IS 16.5 CHRS/INCH AND 6 LINES/INCH
XXXXXXXXXXXXXXXXX
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XXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXX
XXXXXXXXXXXXXXXXX
BLOCK IS 8.25 CHRS/INCH AND 6 LINES/INCH
XXXXXXXX
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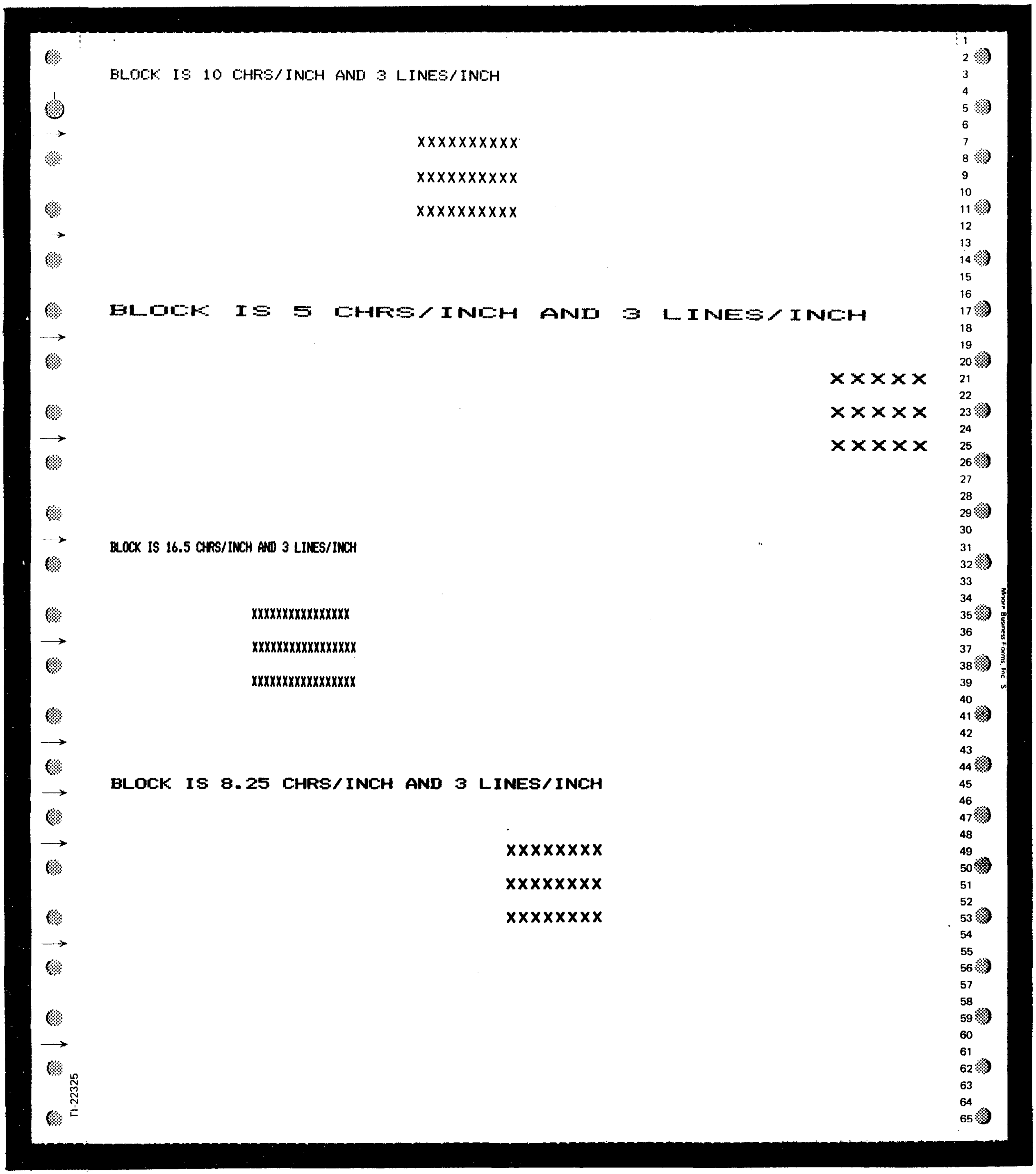
TI-22325



BLOCK IS 10 CHRS/INCH AND 3 LINES/INCH

XXXXXXXXXX

XXXXXXXXXX

XXXXXXXXXX

BLOCK IS 5 CHRS/INCH AND 3 LINES/INCH

XXXXX

XXXXX

XXXXX

BLOCK IS 16.5 CHRS/INCH AND 3 LINES/INCH

XXXXXXXXXXXXXXXX

XXXXXXXXXXXXXXXXX

XXXXXXXXXXXXXXXXX

BLOCK IS 8.25 CHRS/INCH AND 3 LINES/INCH

XXXXXXXX

XXXXXXXX

XXXXXXXX

TI-22325

```
BLOCK IS 10 CHRS/INCH AND 8 LINES/INCH
                                        XXXXXXXXXX
                                        XXXXXXXXXX
                                        XXXXXXXXXX
                                        XXXXXXXXXX
                                        XXXXXXXXXX
                                        XXXXXXXXXX
                                        XXXXXXXXXX
                                        XXXXXXXXXX

BLOCK IS 5 CHRS/INCH AND 8 LINES/INCH
                                                    XXXXX
                                                    XXXXX
                                                    XXXXX
                                                    XXXXX
                                                    XXXXX
                                                    XXXXX
                                                    XXXXX
                                                    XXXXX

BLOCK IS 16.5 CHRS/INCH AND 8 LINES/INCH
                        XXXXXXXXXXXXXXXXX
                        XXXXXXXXXXXXXXXXX
                        XXXXXXXXXXXXXXXXX
                        XXXXXXXXXXXXXXXXX
                        XXXXXXXXXXXXXXXXX
                        XXXXXXXXXXXXXXXXX
                        XXXXXXXXXXXXXXXXX
                        XXXXXXXXXXXXXXXXX

BLOCK IS 8.25 CHRS/INCH AND 8 LINES/INCH
                                    XXXXXXXX
                                    XXXXXXXX
                                    XXXXXXXX
                                    XXXXXXXX
                                    XXXXXXXX
                                    XXXXXXXX
                                    XXXXXXXX
                                    XXXXXXXX
```

TI-22325

```
BLOCK IS 10 CHRS/INCH AND 4 LINES/INCH

                                XXXXXXXXXX
                                XXXXXXXXXX
                                XXXXXXXXXX
                                XXXXXXXXXX


BLOCK IS 5 CHRS/INCH AND 4 LINES/INCH

                                                            XXXXX
                                                            XXXXX
                                                            XXXXX
                                                            XXXXX


BLOCK IS 16.5 CHRS/INCH AND 4 LINES/INCH

                XXXXXXXXXXXXXXXXX
                XXXXXXXXXXXXXXXXX
                XXXXXXXXXXXXXXXXX
                XXXXXXXXXXXXXXXXX


BLOCK IS 8.25 CHRS/INCH AND 4 LINES/INCH

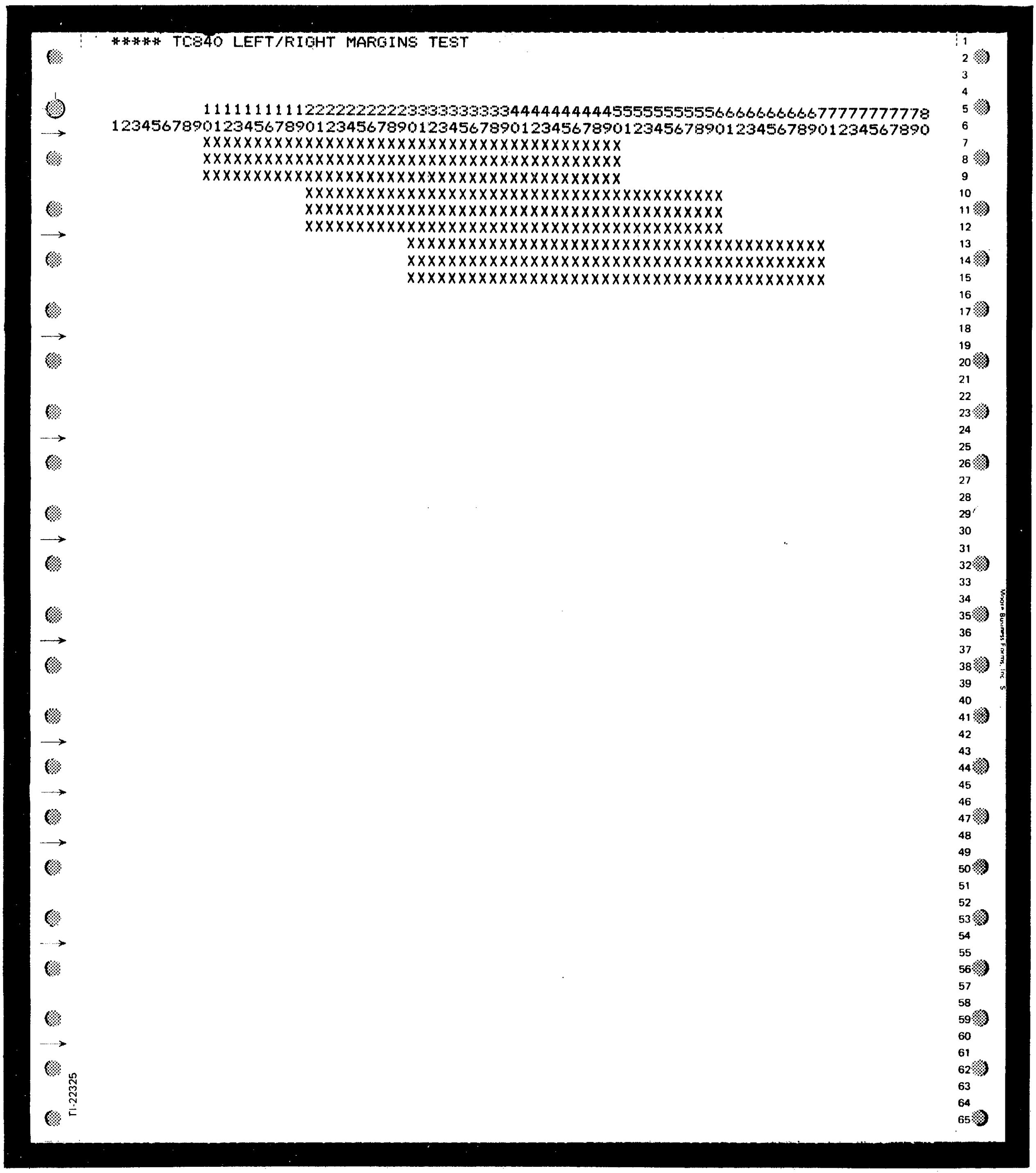
                                        XXXXXXXX
                                        XXXXXXXX
                                        XXXXXXXX
                                        XXXXXXXX
```

TI-22325

```
***** TB840 BELL TEST

PRINTER BELL SHOULD SOUND FOR 3 SECONDS
```

TI-22325



```
***** TC840 LEFT/RIGHT MARGINS TEST



         1111111111222222222233333333334444444444555555555566666666667777777777 8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
         XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
         XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
         XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
                   XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
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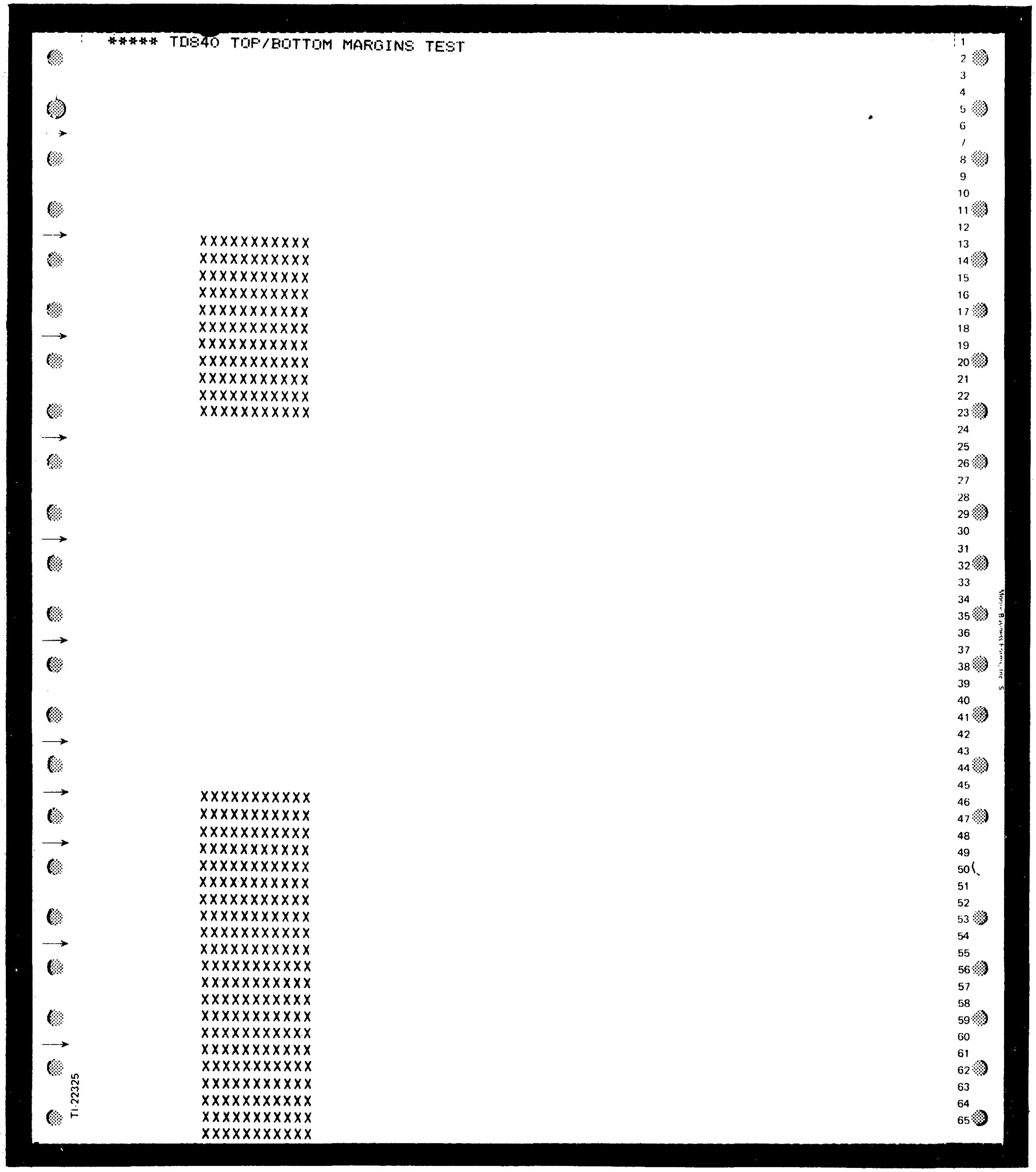
                             XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
```

TI-22325



```
***** TD840 TOP/BOTTOM MARGINS TEST











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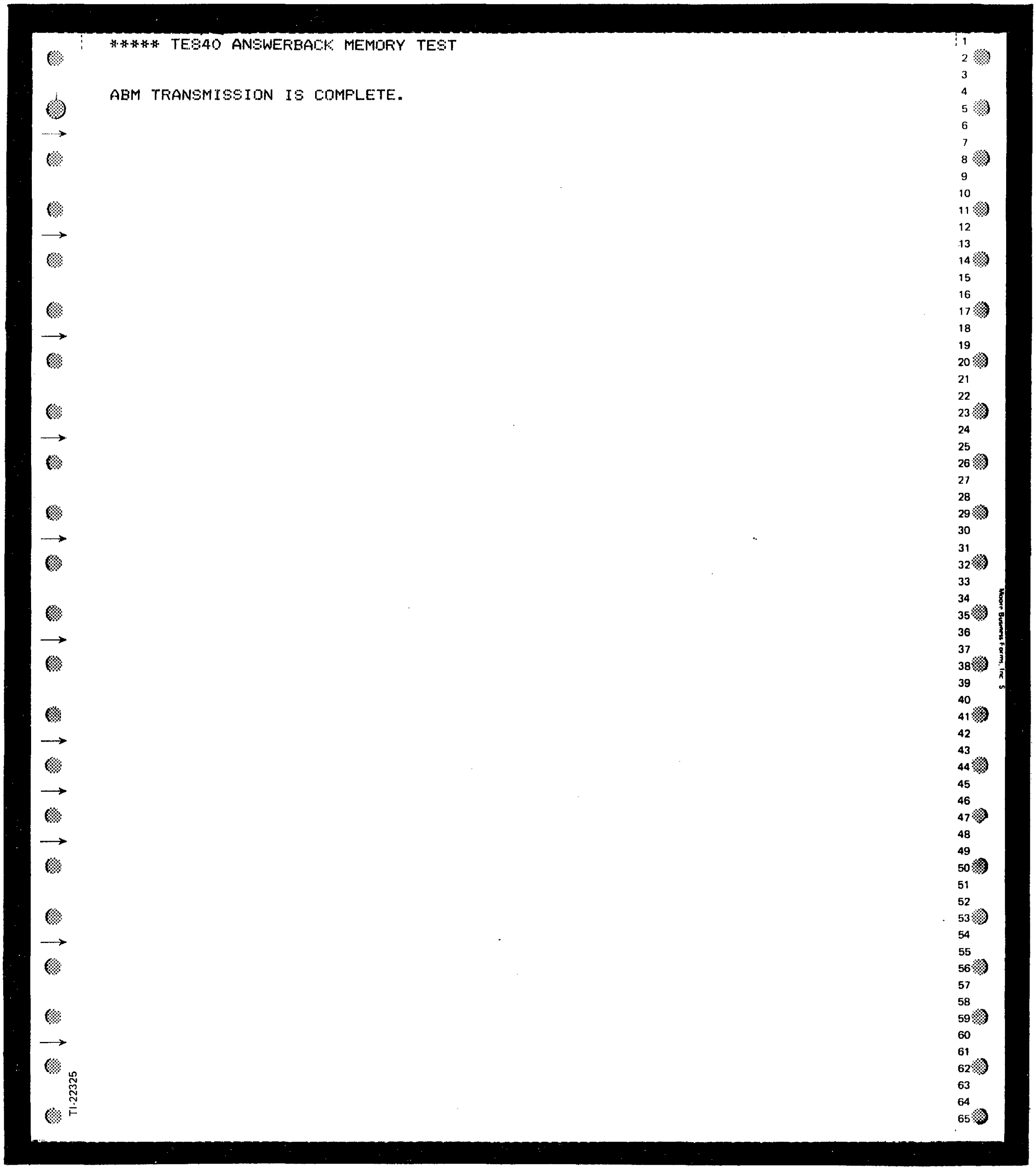
TI-22325



```
***** TE840 ANSWERBACK MEMORY TEST

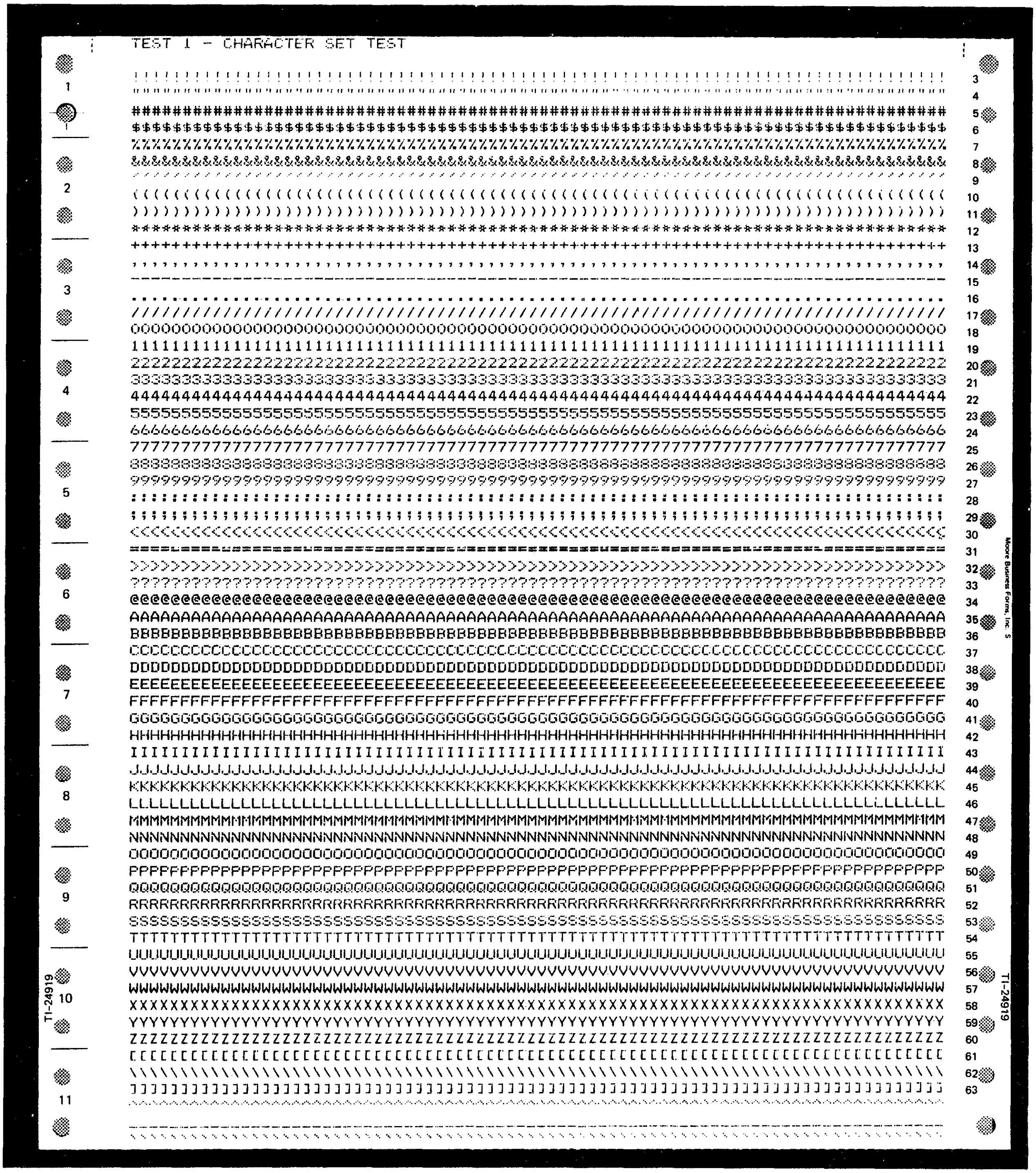
ABM TRANSMISSION IS COMPLETE.
```

TI-22325

Appendix G

CPTEST Output

The following pages are examples of the output of printers using the CPTEST diagnostic when executed with the default options. You can use these examples for comparison with the output you receive.



```
TEST 1 - CHARACTER SET TEST

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TI-24919
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TEST 2 - RIPPLE TEST

!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnop
"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopq
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DEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./012345
EFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456
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RSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABC
STUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCD
TUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDE
UVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEF
VWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFG
WXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGH
XYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHI
YZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJ
Z[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJK
[\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKL
\]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLM
]^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMN
^_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNO
_`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOP
`abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQ
abcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQR
bcdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRS
cdefghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRST
defghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTU
efghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUV
fghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVW
ghijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWX
hijklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXY
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jklmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[
klmnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\
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mnopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^
nopqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_
opqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`
pqrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`a
qrstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`ab
rstuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abc
stuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcd
tuvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcde
uvwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdef
vwxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefg
wxyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefgh
xyz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghi
yz{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghij
z{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijk
{|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijkl
|}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklm
}~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmn
~!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmno

TEST 3 - BUFFER TEST
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PR
PRIN
PRINTE
PRINTER*
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PRINTER*BUFFER
PRINTER*BUFFER*T
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PRINTER*BUFFER*TEST*PRINTER*BUFFER*TEST*PRINTER*BUFFER
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TEST 4 - JITTER TEST

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TEST 5 - JITTER INTERVAL TEST

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TEST 6 - CENTER OUT TEST

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TEST 7 - ALTERNATING LEFT TO RIGHT TEST

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TEST 8 - ALTERNATING RIGHT TO LEFT TEST

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TEST 9 - INTERPLACED JITTER TEST

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TEST 10 - OVERSTRIKE TEST
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TEST 11 - ALTERNATING OVERSTRIKE TEST

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TEST 12 - RANDOM PRINT TEST

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TEST 13 - LEFT TO RIGHT INVERTED STRIKE TEST

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HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
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HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH


TEST 14 - RIGHT TO LEFT INVERTED STRIKE TEST

HHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHHH
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TEST 15 - BLACK LINE TEST

████████████████████████████████████████████████████████████████████████████████
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Appendix H

Messages

H.1 GENERAL INFORMATION

This appendix lists the Online Diagnostics messages that are installed in the file, volume-name.S$ODIAG.MSG. The driver or the device diagnostic task extracts a message as needed from the file and fills in any information needed to complete the message. It then displays the message at the control terminal and/or copies it to the diagnostic history file, volume-name.S$ODIAG.HISTROY, depending on the message type code.

Each message is shown here as it is stored in the file. Information about the message and details of action that should be taken follow the message.

H.2 MESSAGE FORMAT

The messages are composed of a maximum of 5 lines of 74 characters each. Each message includes 3 fields:

- Message serial number (DTNN)
- Message type code (C)
- Message text (TEXT)

H.2.1 Message Serial Number

The message serial number, DTNN, is four hexadecimal digits formatted as follows:

- D = Number representing the device type or name of the originating task
- T = Test number, if originated from a device diagnostic task
- NN = Unique number of the message within the test

Table H-1 lists the numbers in field D of the message serial number.

Table H-1. Message Module/Device Numbers

Number (D)	Module/Device
0	Online Diagnostics Driver
1	ST820
2	LP810, RP810
3	LP2260
4	CPTEST (LP850)
5	ST911
6	XDISK (Extended Disk)
7	DSRW (Nonextended Disk)
8	MT979
9	LP600
A	ST940
B	LP840
D	ST931
F	MEMxx

As an example, the message serial number for the MT979 Test 8, message number 2, is as follows:

8802

H.2.2 Message Type Code

The message type code consists of one character and indicates the classification of the message. Table H-2 lists the message type codes and associated classifications. Status messages (code S) are the only messages not stored in the diagnostic history file.

Table H-2. Message Type Codes

Code (C)	Classification
E	Error
F	Fatal
I	Informational
W	Warning
S	Suppress From History File
T	Test

H.2.3 Message Text

The message text is the only message field that you can modify. It is from 1 to 370 characters, and is in an abbreviated form to conserve space at the message output device and the history file. Many of the message text fields contain variable data items, called fill-ins. In the following paragraphs, these fill-ins are represented by the characters ?n, where n is a number from >0 to >F, which is the relative number of fill-in within the message. When the messages are displayed on the screen or placed in the history file, the driver or diagnostic task has filled in the appropriate information. In some cases, the fill-in is a DNOS error code which you may need to look up in the *DNOS Messages and Codes Error Reference Manual.*

The messages in the following paragraphs are listed in groups depending on the diagnostic task from which they originate, and, within the task, in ascending order of message serial number. The message text is shown as it appears at the control terminal except that in the manual, the variable field fill-ins are still represented by ?n. The n represents the relative number of the fill-in within the message (0 for first, 1 for second, etc). The message is described, and, when appropriate, action which you should take is given.

H.3 ONLINE DIAGNOSTICS DRIVER MESSAGES

Online Diagnostics Driver issues the following messages, most of which provide information about driver activities. However, some messages indicate abnormal internal conditions that require reinstallation of the Online Diagnostics Object Kit. SVC and SCI hexadecimal error codes are explained in the *DNOS Messages and Codes Reference Manual.*

0001 I DNOS ONLINE DIAGNOSTICS VERSION 1.2.0 BEGINNING EXECUTION. AT ANY TIME, ENTER THE WORD 'HELP' FOR MORE INFORMATION.

This is the message displayed by the driver that indicates that the Online Diagnostics Driver is in execution.

0002 W MESSAGE ?0 IS TOO LONG FOR MESSAGE BUFFER.

The message text of the indicated message serial number (?0) is larger than the maximum allowable number of characters. This is an internal design restriction.

0003 S DEVICE ?0 MUST BE IN THE DIAGNOSTIC STATE TO TEST. IF THERE IS A PRINTER ATTACHED TO THIS DEVICE, IT MUST ALSO BE PLACED INTO THE DIAGNOSTIC STATE. TO PLACE A DEVICE INTO THE DIAGNOSTIC STATE, USE THE ONLINE 'DIAG' VERB.

The target device (?0) is not in the proper device state. Use the Show System Device List (SD) verb to see what state it is in. If in online, use the driver's DIAG verb to change to diagnostic state. If it is offline, you must terminate the driver and use SCI ON or DIAG commands. If it is in use, you cannot change it to the diagnostic state.

0004 F SVC ERROR > 2B?0 WHILE ATTEMPTING TO BID DEVICE DIAGNOSTIC NO ?1

The SVC code for Execute Task (> 2B) generated the error (?0) when the driver attempted to start a diagnostic task for the device (?1). SVC ERROR > 2B is an error code for which an explanation can be found in the *DNOS Messages and Codes Reference Manual.*

0005 S DEVICE ?0 IS ALREADY EXECUTING!

You have attempted to start a diagnostic for a device (?0) that is being tested.

0006 S DEVICE ?0 NOT FOUND IN THE PHYSICAL DEVICE TABLE!

You have attempted to start a diagnostic for a device that is not configured on your system.

0007 S DEVICE ?0 IS NOT EXECUTING!

You have attempted to modify or inquire about a nonexistent diagnostic task.

0008 S DEVICE ?0 IS SELECTED.

The device (?0) has been selected by the driver for testing.

0009 S DEVICE ?0 HAS STARTED EXECUTION.

The diagnostic task for the device (?0) has started.

000A S ONLINE DRIVER AVAILABLE — PRESS 'COMMAND' FOR NEXT COMMAND VERB

The driver is monitoring the diagnostic message queue. You may now leave the diagnostic session unattended. To regain the attention of the driver, press the Command key.

000B F MESSAGE ?0 RECEIVED FROM UNKNOWN TASK. RUNTIME ID = ?1

A message from an unidentified task was found in the diagnostic message queue. Terminate this diagnostic session and start again. When the session is terminated, you may need to issue the Show Task Status (STS) and Kill Task (KT) commands to ensure that no leftover diagnostic tasks are hung in task state 9 waiting for a message to be processed.

000C E MESSAGE ?0 NOT FOUND IN THE MESSAGE FILE.

The message number (?0) was not on file when the driver tried to access it.

000D S ILLEGAL INPUT. ENTER CORRECT INPUT OR ENTER 'HELP' FOR ASSISTANCE.

You entered invalid input. Reenter the correct input or use the Help feature.

000E I DNOS ONLINE DIAGNOSTICS COMPLETED EXECUTION.

This is an informational message, displayed when the driver completes execution.

000F S DEVICE ?0 TERMINATION STARTED.

The diagnostic task for device name ?0 has begun end of task procedures.

0010 E FILL IN MATERIAL FOR MESSAGE #?0 COMING ACROSS T QUEUE FROM THE INDICATED DIAGNOSTIC IS TOO LONG (DETECTED IN ROUTINE CHECK Q).

The variable data is larger than the allotted internal buffer space allocated by the driver.

0011 S DEVICE ?0 IS AN UNSUPPORTED DEVICE

You have attempted to start a diagnostic for a device (?0) that is not supported by a diagnostic task.

0012 S <u>DEVICE STATE AVAILABLE FOR TEST</u>

This message is used in setting up the device table displayed by the SD command verb.

0013 S ?0 ?1 ?2

This message is also used in the SD command verb device table. The ?0 is device ID, ?1 is device state, and ?2 is 'YES' or 'NO'.

0014 S COMMAND VERB NOT VALID IN BATCH MODE.

The following command verbs are valid only during interactive diagnostic sessions: Show Diagnostic Files (SF), List Device Configuration (LDC), Show Memory Map (SMM), and Show Progress (SP).

0015 S SF COMMAND VERB INVALID WHEN DIAGNOSTIC HISTORY NOT A DNOS FILE.

You have assigned a device rather than a file, or the null file name DUMY, to the diagnostic history file. The SF command verb with the default option does not work under such conditions.

0016 S COMMAND VERB ONLY VALID IN VDT MODE.

The Show Memory Map (SMM) and Show Progress (SP) command verbs can be used only with a video display terminal (VDT):

0017 E FILL IN MATERIAL FOR A DRIVER MESSAGE FROM THE MESSAGE FILE IS TOO LONG (DETECTED IN ROUTINE FILL).

0018 F STARTING STATE NOT FOUND!

0019 F ACTION NOT FOUND. ACTION NAME: ?0

001A F ACTION ?0 HAS UNDEFINED TASK, OVERLAY, OR FUNCTION NUMBERS!

001B F TOO MANY ACTIONS!

001C F UNKNOWN STATE ERROR NAME! ERROR NAME = ?0

001D F UNKNOWN STATE ESCAPE NAME! ESCAPE NAME = ?0

Messages 0018 through 001D indicate abnormal internal conditions in the driver. You should reinstall the Online Diagnostics Object Kit.

001E S ILLEGAL INPUT! INPUT = ?0

The data you entered (?0) is not valid.

001F F NEW STATE IS UNDEFINED! STAYING IN SAME STATE.

0020 F FUNCTION NOT FOUND! FUNCTION NUMBER = ?0

0021 F TOO MANY DEFAULT STATES!

0022 F CANNED FUNCTION NUMBER OUT OF RANGE! FUNCTION NUMBER = ?0

0023 F INPUT PARAMETER TO ACTION OUT OF RANGE!

Messages 001F through 0023 indicate abnormal internal conditions in the driver. You should reinstall the Online Diagnostics Object Kit.

0024 F SSIRP CALLS NOT SUPPORTED BY ONLINES.

0025 F ABNORMAL TERMINATION FROM UNKNOWN DEVICE! RUNTIME ID = ?0.

Both the driver and device diagnostic task have aborted. Check messages in the diagnostic history file to determine the cause of the fatal error and correct before trying the diagnostic session again.

0026 S ATTEMPT TO RUN DIAGNOSTIC ON A DEVICE NOT SUPPORTED BY ONLINE DIAGNOSTICS. SEE USER'S GUIDE FOR A LIST OF SUPPORTED DEVICES.

You can also display a table of supported devices on your terminal by entering the Show Supported Devices (SSD) command verb.

0027 F ABNORMAL TERMINATION FROM DEVICE DIAGNOSTIC > ?0.

A fatal run-time error in the diagnostic task for the device name ?0 has occurred. Look at the diagnostic history file to determine the cause of the error.

0028 S MEMORY DIAGNOSTIC ALREADY EXECUTING.

0029 E ERROR ?0 WHILE ATTEMPTING A SHOW FILE.

An SCI error has been made. See the *DNOS Messages and Codes Reference Manual* for SCI errors.

002A S SF COMMAND FOR FILE SELECTED INVALID IN TTY MODE.

The SF command verb works only in VDT mode.

002B S TOTAL NUMBER OF ERRORS REPORTED = ?0

This message is displayed at the end of the diagnostic session. Look in the diagnostic history file for more information about the errors.

002C I UNABLE TO PLACE ?0 IN DIAGNOSTIC STATE.

You have tried to place a device that is either in use or offline in the diagnostic state. See message 0003.

002D I UNABLE TO PLACE ?0 IN ONLINE STATE.

You have tried to place a device that is either in use or offline in the online state. If the device is in use as a target device for a diagnostic task, the task must terminate before you can place the device online.

002E I NO ERRORS LOGGED FOR REQUESTED DEVICE(S)

An SF verb with ERRORS option was selected and no errors were found in the online diagnostic history file.

002F E ERROR >2B?0 WHILE ATTEMPTING TO BID SYSTEM LOG ANALYSIS TASK.

An Execute Task (>2B) error (?0) has been detected. See the *DNOS Messages and Codes Reference Manual* for SVC errors.

0030 S SYSTEM LOG ANALYSIS TASK HAS BEGUN EXECUTION.

0031 S ENDING HEAD IS GREATER THAN STARTING HEAD. REENTER VALUES.

You have made an error in responding to the prompt for starting and ending heads for a disk test.

0032 S ENDING CYLINDER IS GREATER THAN STARTING CYLINDER. REENTER VALUES.

You have made an error in responding to the prompt for starting and ending cylinders for a disk test.

0033 S DEVICE MUST BE OF TYPE DISK IN ORDER TO EXECUTE CLEAN HEADS VERB.

You can execute the Clean Heads on FD1000 DSDD (CH) command verb only on FD1000 diskettes.

0034 E ERROR >2B?0 WHILE ATTEMPTING TO BID SHOW MEMORY MAP TASK.

0035 W CHANGE EXECUTION COMMAND IS NOT ALLOWED FOR MEMXX DEVICES.

The CE command verb cannot be executed in the memory diagnostic task.

0036 S CURRENTLY RUNNING MAXIMUM NUMBER OF MEMORY TASKS ALLOWED FOR YOUR SYSTEM!

0038 W *** WARNING *** – CLEANUP WAS NOT COMPLETE. USE A KT ON LEFTOVER TASKS.

0039 E FILL IN MATERIAL FOR A DRIVER STATE PROMPT IS TOO LONG (DETECTED IN ROUTINE FILLST).

0040 E ERROR PERFORMING I/O ?0. ERROR FROM MODULE ?1. MODULE CALLED FROM ?2. I/O STATUS = >?3.

An I/O SVC error has occurred. The ?0 is the SVC subopcode; ?1 is the procedure in which the error was detected; ?2 is the test or procedure from which the error routine was called; and ?3 is the SVC error code. See the *DNOS Messages and Codes Reference Manual*.

0041 F DEVICE ?0 IS OFFLINE OR NOT READY.

The task checked the ready bit on the communications register unit (CRU) input line and found device ?0 was not ready.

0042 F INTERFACE VERIFICATION ERROR: CHECK CABLE AND/OR INTERFACE.

The task checked the interface verification error bit on the CRU input line and found it set.

0043 F DEVICE IS POWERED OFF

0044 F FATAL ERROR WHILE ASSIGNING LUNO TO .S$UTIL.

0045 E ERROR >2B?0 WHILE ATTEMPTING TO BID LIST DEVICE CONFIGURATION

An SCI error (>?0) has been encountered in executing the SD command verb. See the *DNOS Messages and Codes Reference Manual* for SCI bid task errors.

0046 E ERROR WHILE ATTEMPTING TO MAP ODIAG SYNONYM.

0047 E ERROR > ?0 WHILE ATTEMPTING TO DELETE LDC TEMPORARY FILE.

0050 E ERROR WHILE ATTEMTING TO GET PROGRAM FILE LUNO!

0101 S *** DEVICE DIAGNOSTIC ABNORMAL TERMINATION MESSAGE ***

0102 S *** DEVICE DIAGNOSTIC PASSES INCREMENT MESSAGE ***

0103 S *** DEVICE DIAGNOSTIC OPERATIONS INCREMENT MESSAGE ***

Messages 0101 through 0103 precede other messages when execution of the Check Message Queue (CQ) command verb produces a message. The messages will be displayed if possible or will go into the history file if they cannot be displayed.

0402 I DEVICE DIAGNOSTIC ?0 TERMINATED WITH ?1 ERRORS, ?2 PASSES.

This message lists the number of errors or the number of passes through all of the tests. The fill-in numbers are in decimal.

0840 E FILL IN MATERIAL FOR MESSAGE THAT BELONGS TO THE INDICATED DIAGNOSTIC IS TOO LONG (DETECTED IN ROUTINE DDFILL).

0901 W ASSIGN LUNO SVC ERROR > 21 – THE DRIVE DOES NOT HAVE A DISK VOLUME INSTALLED IN IT. INSTALL A DISK VOLUME AND RETRY THIS DEVICE.

You attempted to start a diagnostic for a disk drive that has no volume installed or the volume name on the disk pack could not be read.

0940 E IOSTATUS ERROR > ?0 IN SPECIFIC OPERATION REQUEST > ?1.

An SVC error (?0) has occurred during the specific operation code (?1). See the *DNOS Messages and Codes Reference Manual*.

0941 E REQUESTED SVC SUBOPCODE IS UNUSED!

You selected an SVC operation code that is not used for this device.

0942 E INVALID SPECIFIC OPERATION WAS REQUESTED!

You entered a number that is not a valid SVC operation code for this device. To see the valid SVC operation codes, use the help feature, the Show Operation Codes (SO) verb, or Appendix H of this manual.

0943 E INVALID TEST NUMBER REQUEST!

You entered a test number that is not within the range of valid test numbers for this device. Enter the word HELP or refer to Appendix H of this manual to see the test tables.

0944 E ASSIGN LUNO SVC ERROR >27 – THE DISK VOLUME DOES NOT CONTAIN THE DIAGNOSTIC FILE '.S$DIAG'. THE PACK MAY NEED TO BE INITIALIZED.

All disk packs initialized under DNOS 1.1, DX10 3.3, or later will contain a diagnostic file named volumename.S$DIAG. If your disk pack does not, you need to initialize the disks, using the Initialize New Volume (INV) command, under the appropriate operating system.

0946 E ERROR PERFORMING CHANGE TASK PRIORITY. ERROR FROM MODULE CHGPRI. MODULE CALLED FROM REDMSG. ERROR CODE = >11?0.

A request for a change in task priority generated an error. Priority must be greater than 0 and less than 4. Retry the request.

0947 E LDC OUTPUT NOT COMPATIBLE WITH ACTUAL PDT STRUCTURE.

The List Device Configuration (LDC) command verb has produced a display that does not represent the actual devices on your physical device table.

0948 E I/O TIMEOUT ERROR WHILE PERFORMING I/O OPERATION >?0.

When the Online Diagnostic Driver attempts to read a device's characteristics, (or to perform an I/O operation), but cannot find the device (or receives no response), it reports this error.

0949 E I/O ERROR >?0 WHILE PERFORMING I/O OPERATION >?1.

When the Online Diagnostic Driver attempts to read a device's characteristics, (or to perform an I/O operation), but cannot find the device (or receives no response), it reports this error.

H.4 ST820 — 820 KSR TERMINAL MESSAGES

The following messages are produced by the diagnostic task for the 820 KSR terminal.

1000 I DNOS ST820 DEVICE DIAGNOSTIC VERSION 1.2.0 STARTING EXECUTION: RUN ID=>?0.

The device diagnostic task for the 820 KSR terminal has started and has been assigned a run ID of (?0).

1100 T TEST 1 — FORM LENGTH AND FEED TEST BEGINNING.

Test 1 has started.

1200 T TEST 2 — CHARACTER SET TEST BEGINNING.

Test 2 has started.

1300 T TEST 3 — RIPPLE PATTERN TEST BEGINNING.

Test 3 has started.

1400 T TEST 4 — BUFFER LENGTH TEST BEGINNING.

Test 4 has started.

1500 T TEST 5 — CARRIAGE RETURN TEST BEGINNING.

Test 5 has started.

1600 T TEST 6 — TAB TO LINE TEST BEGINNING.

Test 6 has started.

1700 T TEST 7 — SET/TEST VERTICAL TABS TEST BEGINNING.

Test 7 has started.

1800 T TEST 8 — TAB TO ADDRESS TEST BEGINNING.

Test 8 has started.

1900 T TEST 9 — SET/TEST HORIZONTAL TABS TEST BEGINNING.

Test 9 has started.

1A00 T TEST 10 — LINES AND CHARACTERS PER INCH TEST BEGINNING.

Test 10 has started.

1B00 T TEST 11 — BELL TEST BEGINNING.

Test 11 has started.

1C00 T TEST 12 — INTERACTIVE KEYBOARD TEST BEGINNING.

Test 12 has started.

1C41 E ST820 KEYBOARD CODE DOES NOT MATCH REQUIRED CODE. EXPECTED DATA BYTE = >?0, ACTUAL DATA BYTE = >?1.

In the interactive keyboard test, the entered value does not match the expected value.

H.5 LP810 — 810 LINE PRINTER MESSAGES

The following messages are produced by the diagnostic task for the 810 Line Printer in both device classes LP and RP.

2000 I DNOS LP810 DEVICE DIAGNOSTIC VERSION 1.2.0 STARTING EXECUTION RUN: ID=>?0.

The diagnostic task for the 810 line printer has started and has been assigned a run ID of (?0).

2100 T TEST 1 — FORM LENGTH AND FEED TEST BEGINNING.

Test 1 has started.

2200 T TEST 2 — CHARACTER SET TEST BEGINNING.

Test 2 has started.

2300 T TEST 3 — RIPPLE PATTERN TEST BEGINNING.

Test 3 has started.

2400 T TEST 4 — BUFFER LENGTH TEST BEGINNING.

Test 4 has started.

2500 T TEST 5 — CARRIAGE RETURN TEST BEGINNING.

Test 5 has started.

2600 T TEST 6 — TAB TO LINE TEST BEGINNING.

Test 6 has started.

2700 T TEST 7 — SET/TEST VERTICAL TABS TEST BEGINNING.

Test 7 has started.

2800 T TEST 8 — TAB TO ADDRESS TEST BEGINNING.

Test 8 has started.

2900 T TEST 9 — SET/TEST HORIZONTAL TABS TEST BEGINNING.

Test 9 has started.

2A00 T TEST 10 — LINES AND CHARACTERS PER INCH TEST BEGINNING.

Test 10 has started.

2B00 T TEST 11 — BELL TEST BEGINNING.

Test 11 has started.

H.6 LP2230/LP2260 — 2230/2260 LINE PRINTER MESSAGES

The following messages are produced by the diagnostic task for the 2230 and 2260 Line Printers.

3000 I DNOS LP2260 DEVICE DIAGNOSTIC VERSION 1.2.0 STARTING EXECUTION: RUN ID = > ?0.

The diagnostic task for the 2230/2260 line printer has started and has been assigned a run ID of (?0).

3100 T TEST 1 — FORM LENGTH AND FEED TEST BEGINNING.

Test 1 has started.

3200 T TEST 2 — CHARACTER SET TEST BEGINNING.

Test 2 has started.

3300 T TEST 3 — RIPPLE PATTERN TEST BEGINNING.

Test 3 has started.

3400 T TEST 4 — BUFFER LENGTH TEST BEGINNING.

Test 4 has started.

3500 T TEST 5 — HAMMER ALIGNMENT TEST BEGINNING.

Test 5 has started.

3600 T TEST 6 — CHARACTER BURST TEST BEGINNING.

Test 6 has started.

H.7 CPTEST — CHARACTER PRINTER MESSAGES

The following messages are produced by the diagnostic task for character printers.

4000 I DNOS CPTEST DIAGNOSTIC VERSION 1.2.0 STARTING EXECUTION: RUN ID => ?0.

The device diagnostic task for character printers has started and has been assigned a run ID of (?0).

4100 T TEST 1 — CHARACTER SET TEST BEGINNING.

Test 1 has started.

4180 T TEST 16 — PRINT WHEEL TEST BEGINNING.

Test 16 has started.

4200 T TEST 2 — RIPPLE DUMP TEST BEGINNING.

Test 2 has started.

4280 T TEST 17 — NEGATIVE LINE FEED TEST BEGINNING.

Test 17 has started.

4300 T TEST 3 — BUFFER TEST BEGINNING.

Test 3 has started.

4380 T TEST 18 — SUPERSCRIPT AND SUBSCRIPT TEST BEGINNING.

Test 18 has started.

4400 T TEST 4 — JITTER TEST BEGINNING.

4500 T TEST 5 — JITTER INTERVAL TEST BEGINNING.

Test 5 has started.

4600 T TEST 6 — CENTER-OUT TEST BEGINNING.

Test 6 has started.

4700 T TEST 7 — ALTERNATING RIGHT TO LEFT TEST BEGINNING.

Test 7 has started.

4800 T TEST 8 — ALTERNATING LEFT TO RIGHT TEST BEGINNING.

Test 8 has started.

4900 T TEST 9 — INTERPLACED TEST BEGINNING.

Test 9 has started.

4A00 T TEST 10 — OVERSTRIKE TEST BEGINNING.

Test 10 has started.

4B00 T TEST 11 — ALTERNATING OVERSTRIKE TEST BEGINNING.

Test 11 has started.

4C00 T TEST 12 — RANDOM PRINT TEST BEGINNING.

Test 12 has started.

4D00 T TEST 13 — LEFT TO RIGHT INVERTED STRIKE TEST BEGINNING.

Test 13 has started.

4E00 T TEST 14 — RIGHT TO LEFT INVERTED STRIKE TEST BEGINNING.

Test 14 has started.

4F00 T TEST 15 — BLACK LINE TEST BEGINNING.

Test 15 has started.

H.8 ST911 — 911 VDT MESSAGES

The following messages are produced by the diagnostic task for the Model 911 Video Display Terminal.

5000 I DNOS ST911 DEVICE DIAGNOSTIC VERSION 1.2.0 STARTING EXECUTION: RUN ID = > ?0.

The diagnostic task for the Model 911 VDT has started and has been assigned a run ID of (?0).

5100 T TEST 1 — ONES AND ZEROS TEST BEGINNING.

Test 1 has started.

5141 E MEMORY ERROR! ONE'S TEST PATTERN CHANGED.

The ones and zeros test wrote all ones to the 911 VDT controller memory and read back something other than all ones.

5142 E MEMORY ERROR! ZERO'S TEST PATTERN CHANGED.

The ones and zeros test wrote all zeros to the 911 VDT controller memory and read back something other than all zeros.

5200 T TEST 2 — SCROLL TEST BEGINNING.

Test 2 has started.

5241 E ST911 MEMORY ERROR! SCROLL TEST PATTERN CHANGED. EXPECTED DATA = >?0, ACTUAL DATA =>?1, AT ROW = >?2, COLUMN = >?3.

The scroll test wrote A through Z followed by blanks to the bottom line, scrolled it to the top line, and read back the top line with compare error ?1 (instead of ?0) at row ?2, column ?3.

5300 T TEST 3 — BEEPER TEST BEGINNING.

Test 3 has started.

5400 T TEST 4 — INTENSITY TEST BEGINNING.

Test 4 has started.

5500 T TEST 5 — CHARACTER GENERATOR TEST BEGINNING.

Test 5 has started.

5600 T TEST 6 — NONBLINKING/BLINKING CURSOR TEST BEGINNING.

Test 6 has started. This is an interactive test. Go to the target terminal and respond to the test.

5700 T TEST 7 — KEYBOARD TEST BEGINNING.

Test 7 has started. This is an interactive test. Go to the target terminal and respond to the test.

5741 E ST911 KEYBOARD CODE DOES NOT MATCH REQUIRED CODE. EXPECTED DATA BYTE = >?0, ACTUAL DATA BYTE = >?1.

The entered hexadecimal value does not match the expected hexadecimal value.

H.9 DS — DISK MESSAGES

The following messages are produced by the diagnostic task for the device class DS.

6000 I DNOS EXTENDED DISK DIAGNOSTIC VERSION 1.2.0 STARTING EXECUTION: RUN ID = > ?0.

The diagnostic task for class DS has started and has been assigned a run ID of (> ?0).

6001 W SVC ERROR >09 (EXTENDED DISK I/O ATTEMPTED BY A NONPRIVILEGED PROGRAM). THE EXTENDED DISK TESTS WILL RUN ONLY UNDER ?0 OR LATER RELEASES.

6003 W SVC ERROR >02 (YOUR SYSGEN DOES NOT SUPPORT THE EXTENDED DISK TESTS THE SYSGEN PROMPT 'ONLINE DIAGNOSTICS?' MUST BE ANSWERED 'YES')

6004 W LAST OPERATION WAS RETRIED BY THE DISK CONTROLLER. HEAD ADDRESS = > ?0. CYLINDER ADDRESS = > ?1.

The disk controller automatically retried the last operation and set the retry bit in controller status.

6005 W LAST OPERATION REQUIRED 'ECC' CORRECTION TO RECOVER THE DATA. HEAD ADDRESS = > ?0 CYLINDER ADDRESS = > ?1.

During a read data operation, a data error occurred and the controller made an attempt to correct it. If the data error is also set, then the attempt was not successful; otherwise it was successful.

6006 W LAST OPERATION WAS PERFORMED WITH HEAD OFFSET ENABLED. HEAD ADDRESS = > ?0 CYLINDER ADDRESS = > ?1.

The head offset could have been either forward or reverse.

6007 I TPCS IMAGES: BEFORE = > ?0 > ?1 > ?2 > ?3 > ?4 > ?5 > ?6 > ?7
AFTER = > ?8 > ?9 > ?A > ?B > ?C > ?D > ?E > ?F

This message displays all eight TILINE Peripheral Control Space (TPCS) registers before and after the I/O was performed. It will follow message number 6040 which reports the command issued, the number of retries made by the diagnostic task, and so on.

6040 E ********************** DISK STATUS ERROR ****************************
?0 ?1 AFTER ?2 RETRIES.
STATUS DESCRIPTION = ?3.
HEAD ADDRESS = > ?4. CYLINDER ADDRESS > ?5. SVC STATUS = > ?6.

When this message appears at the terminal, the diagnostic task has replaced ?0 with the last command issued, ?1 with the word 'passed' or 'failed' depending on the status returned at the end of the retry sequence, and ?2 with the number of times the diagnostic task retried the command. This does not include any retries made by the controller. See message 6004. ?3 is filled in with a brief description of the status returned by the controller. ?4 and ?5 are the current head and cylinder addresses respectively, expressed in hexadecimal. ?6 is the SVC block status byte returned by the operating system.

6042 E DISK TYPE CANNOT BE IDENTIFIED (STORE REGISTERS DATA INVALID).

The data recovered does not match any of the known disk information data blocks; therefore, the disk cannot be identified. This is a fatal error.

6043 E ILLEGAL HEAD OR CYLINDER ADDRESS ENTERED FOR THIS DISK TYPE.

Use the help feature or see Appendix H of this manual to determine head/cylinder ranges for this disk.

6044 E SVC ERROR > ?0 WHILE ATTEMPTING TO GET DATE AND TIME.

An error has occurred while the task is processing SVC code > 03. See the *DNOS Messages and Codes Reference Manual*.

6045 E SVC ERROR > E8 PASSWORD 4 (MINUTE) ERROR — INITIALIZE DATE AND TIME (IDT) AND TRY EXECUTING THE DIAGNOSTIC TASK AGAIN.

An operating system/diagnostics interface error has occurred. If the message persists after execution of an Initialize Date and Time (IDT) command, the system software or the system clock has failed.

6046 E DISK MUST BE IN THE DIAGNOSTIC STATE TO RUN THE EXTENDED WRITE TESTS.

You have attempted to perform an extended write test with the disk in the ON state.

6047 E ID COMPARE ERROR (HEADER VERIFICATION ERROR) ON HEAD > ?0, CYLINDER > ?1. POSSIBLE BAD TRACK THAT SHOULD BE MAPPED IN THE DISK ERROR MAP.

The actual head and cylinder addresses read from the header do not match the expected head/cylinder address that is calculated by the test.

6048 E RESTORE COMMAND TERMINATED WITH A FATAL ERROR. DISK STATUS = > ?0, CONTROLLER STATUS = > ?1, SVC STATUS = > ?2.

6049 E TEST ABORTED BECAUSE AN EXCESSIVE NUMBER (> ?0) OF RESTORES WERE REQUIRED.

If any one test is required to issue more than 10 restores to recover from an error, the test terminates with a fatal error.

6080 T HEAD CLEANING PROCEDURE (CH) VERB FOR FD1000 DISK DRIVE BEGINNING.

6081 I HEAD CLEANING PROCEDURE (CH) VERB FOR FD1000 DISK DRIVE COMPLETE.

60C1 E THE 'CH' VERB MAY BE RUN ONLY ON A FD1000 DISK DRIVE WITH A SPECIAL 'CLEANING' DISKETTE INSTALLED.

6100 T EXTENDED DISK TEST 1 BEGINNING – READ SPECIFIED TRACKS.

Test 1 has started.

6200 T EXTENDED DISK TEST 2 BEGINNING – CONSECUTIVE SECTOR READ.

Test 2 has started.

6300 T EXTENDED DISK TEST 3 BEGINNING – JITTER SEEK/READ.

Test 3 has started.

6400 T EXTENDED DISK TEST 4 BEGINNING – RANDOM SEEK/READ.

Test 4 has started.

6500 T EXTENDED DISK TEST 5 BEGINNING – CRESCENDO SEEK/READ.

Test 5 has started.

6A00 T EXTENDED DISK TEST 10 BEGINNING – ID ERROR STATUS CHECK.

Test 10 has started.

6A01 W TEST 10 WAS NOT RUN ON THE TARGET DISK BECAUSE ITS CONTROLLER DOES NOT SUPPORT ALL FUNCTIONS NECESSARY TO MODIFY AND/OR RECOVER HEADER ID WORDS.

6A41 E THE DISK CONTROLLER FAILED TO SET THE ID ERROR BIT WHEN A HEADER CRC ERROR WAS FORCED. THE CRC LOGIC OR THE UNFORMATTED WRITE COMMAND FAILED.

6B00 T EXTENDED DISK TEST 11 BEGINNING – FORMAT/VERIFY TRACKS.

Test 11 has started.

6C00 T EXTENDED DISK TEST 12 BEGINNING – WRITE/READ/COMPARE TRACKS.

Test 12 has started.

6C01 I SECTOR = >?0 , WORD = >?1, EXPECTED DATA = >?2, ACTUAL DATA = >?3.

6C02 I TOTAL WORDS COMPARED THIS TRACK = >?0. TOTAL DATA COMPARE ERRORS THIS TRACK = >?1.

6C41 E **** DATA COMPARE ERROR(S) **** HEAD = >?0, CYLINDER = >?1.

6D00 T EXTENDED DISK TEST 13 BEGINNING – COMPREHENSIVE WRITE/SEEK/READ.

Test 13 has started.

7000 I DISK DEVICE DIAGNOSTIC VERSION 1.2.0 STARTING EXECUTION: RUN ID = >?0.

7040 E ERROR IN LOGICAL RECORD LENGTH OF FILE VOLUMENAME.S$ODDWRT!

The logical record length returned from the Read ASCII operation is not the same as the logical record length returned from the Open LUNO operation.

7041 E DIAGNOSTIC CYLINDER READ COMPARE ERROR. WORD = >?0, RECORD = >?1 EXPECTED DATA = >?2, DATA READ = >?3

The data read from the diagnostic cylinder does not match the expected data. The word number and record number are shown, along with the expected data and the actual data read. All numbers are in hexadecimal.

7042 E BUFFER COMPARE TERMINATED ON FIVE COMPARE ERRORS. WORD = >?0, RECORD = >?1, EXPECTED DATA = >?2, DATA READ = >?

The comparison of data read from the diagnostic cylinder and the expected data has failed five times. The test aborts. All numbers are in hexadecimal.

7100 T TEST 1 — READ DIAGNOSTIC CYLINDER TEST BEGINNING.

Test 1 has started.

7200 T TEST 2 — READ DIAGNOSTIC CYLINDER WITH HEAD MOTION TEST BEGINNING.

Test 2 has started.

7300 T TEST 3 — READ/WRITE RANDOM PATTERN TEST BEGINNING.

Test 3 has started.

7400 T TEST 4 — READ/WRITE PATTERNS TEST BEGINNING.

Test 4 has started.

7441 E READ/WRITE DATA PATTERN OUT OF RANGE!

H.10 MT979 — 979, 979A, AND MT1600 MAGNETIC TAPE MESSAGES

The following messages are produced by the diagnostic task for Models 979, 979A, and MT1600 Magnetic Tape Drives.

8000 I DNOS MT979 DEVICE DIAGNOSTIC VERSION 1.2.0 STARTING EXECUTION: RUN ID=>?0.

The diagnostic task for the 979, 979A, and MT1600 Magnetic Tape Drives has started and has been assigned the run ID (>?0).

8045 F DIAGNOSTIC TERMINATED DUE TO END OF TAPE WHILE WRITING!

The task detected an end-of-tape (EOT) while performing a write operation. This condition should not exist. The task is terminated.

8046 F DIAGNOSTIC TERMINATED DUE TO END OF TAPE WHILE READING!

The task detected an EOT while performing a read operation. This condition should not exist. The task is terminated.

8100 T TEST 1 — MT979 BASIC READ/WRITE TEST WITH REWIND BEGINNING.

Test 1 has started.

8200 T TEST 2 — MT979 BASIC READ/WRITE TEST WITH BACKSPACE BEGINNING.

Test 2 has started.

8300 T TEST 3 — MT979 FORWARD CREEP TEST BEGINNING.

Test 3 has started.

8400 T TEST 4 — MT979 EVEN/ODD WRITE AND READ TEST BEGINNING.

Test 4 has started.

8500 T TEST 5 — MT979 SPECIAL MOVEMENT AND END OF FILE TEST BEGINNING.

Test 5 has started.

8543 E END OF FILE NOT DETECTED ON BACK SPACE OPERATION!

An end-of-file (EOF) condition should have been recognized after the backspace operation completed.

8544 E END OF FILE NOT DETECTED ON FORWARD SPACE OPERATION!

An EOF condition should have been recognized after the forward space operation completed.

8545 E END OF FILE NOT DETECTED ON A READ ASCII OPERATION!

An EOF condition should have been recognized after the Read ASCII operation completed.

8546 E A RECORD LENGTH OF >?0 RETURNED FROM A READ ASCII, EXPECTED RECORD LENGTH >?1.

The expected and actual record lengths of a record read by this task did not agree. Both lengths are displayed in hexadecimal.

8600 T TEST 6 — MT979 WRITE FULL REEL OF TAPE, CHECK EOT TEST BEGINNING.

Test 6 has started.

8601 I TEST 6 NORMAL TERMINATION — END OF TAPE WAS DETECTED.

An EOT condition was recognized. Test 6 has ended normally.

8700 T TEST 7 — MT979 READ FULL REEL OF TAPE, CHECK EOT TEST BEGINNING.

Test 7 has started.

8701 I TEST 7 NORMAL TERMINATION — END OF TAPE WAS DETECTED.

An EOT condition was recognized. Test 7 has ended normally.

8745 E MT979 DATA COMPARE ERROR. WORD NUMBER = >?0 ACTUAL DATA WORD READ = >?1, DATA WRITTEN = >?2.

The data comparison has failed. The word number within the record, actual word read, and the data that was written are displayed in hexadecimal.

8746 E BUFFER COMPARE TERMINATED ON FIVE COMPARE ERRORS. WORD NUMBER = >?0, ACTUAL DATA WORD READ = >?1, DATA WRITTEN = >?2.

The comparison for this record has ended because five failures have occurred.

8800 T TEST 8 — MT979 WRITE RING AND RECORDING TEST BEGINNING

Test 8 has started.

8802 I TAPE UNIT IS ONLINE, WITH WRITE RING INSTALLED.

This is an informational message from Test 8.

8803 I TAPE UNIT IS ONLINE, NO WRITE RING INSTALLED.

This is an informational message from Test 8.

8804 I TAPE UNIT IS OFFLINE.

This is an informational message from Test 8.

8805 I PHASE-ENCODED RECORDING, 1600 BITS PER INCH (BPI).

This tape drive is using the phase-encoded (PE) recording method, and the recording density is 1600 bits per inch (bpi).

8806 I NON-RETURN TO ZERO INVERTED (NRZI) RECORDING, 800 BITS PER INCH (BPI).

This tape drive is using the non-return-to-zero inverted (NRZI) recording method, and the recording density is 800 bpi.

8840 E MT979 DATA COMPARE ERROR. BYTE NUMBER=>?0, ACTUAL DATA BYTE READ=>?1, DATA WRITTEN=>?3.

The data comparison has failed. The byte number, actual byte read, and the data that was written are displayed. All numbers are in hexadecimal.

8841 E BUFFER COMPARE TERMINATED ON FIVE COMPARE ERRORS. BYTE NUMBER=>?0, ACTUAL DATA BYTE READ=>?1, DATA WRITTEN=>?3.

The comparison for this record has ended because five failures have occurred.

H.11 LP300/LP600 — 300/600 LINE PRINTER MESSAGES

The following messages are produced by the diagnostic task for the Models 300 and 600 Line Printers.

9000 I DNOS LP600 DIAGNOSTIC VERSION 1.2.0 EXECUTION: RUN ID = > ?0.

The diagnostic task for the Model LP300/LP600 Line Printer has started and has been assigned run ID of (> ?0).

9100 T TEST 1 — FORM LENGTH AND FEED TEST BEGINNING.

Test 1 has started.

9200 T TEST 2 — CHARACTER SET TEST BEGINNING.

Test 2 has started.

9300 T TEST 3 — RIPPLE PATTERN TEST BEGINNING.

Test 3 has started.

9400 T TEST 4 — BUFFER LENGTH TEST BEGINNING.

Test 4 has started.

9500 T TEST 5 — HAMMER ALIGNMENT TEST BEGINNING.

Test 5 has started.

9600 T TEST 6 — EIGHT LINES PER INCH TEST BEGINNING.

Test 6 has started.

9700 T TEST 7 — CHARACTER BURST TEST BEGINNING.

Test 7 has started.

9800 T TEST 8 — SOLID BLACK BOX TEST BEGINNING.

Test 8 has started.

9900 T TEST 9 — CARRIAGE RETURN AND UNDERLINE TEST BEGINNING.

Test 9 has started.

9A00 T TEST 10 — PLOT MODE TEST BEGINNING.

Test 10 has started.

9B00 T TEST 11 — ELONGATED CHARACTERS TEST BEGINNING.

Test 11 has started.

9C00 T TEST 12 — DELETE CHARACTERS TEST BEGINNING.

Test 12 has started.

9D00 T TEST 13 — ELECTRONIC VERTICAL FORMAT UNIT TEST BEGINNING.

Test 13 has started.

9E00 T TEST 14 — GRAPHIC EXAMPLE PLOT TEST BEGINNING.

Test 14 has started.

9F00 T TEST 15 — TI LOGO PLOT TEST BEGINNING.

Test 15 has started.

H.12 ST940 — 940 EVT MESSAGES

The following messages are produced by the diagnostic task for the Model 940 Electronic Video Terminal (EVT).

A000 I DNOS ST940 DIAGNOSTIC VERSION 1.0.0 STARTING EXECUTION: RUN ID = > ?0.

The diagnostic task for the 940 EVT has started and has been assigned the run ID (> ?0).

A100 T TEST 1 — MEMORY TEST BEGINNING.

Test 1 has started.

A200 T TEST 2 — BEEPER TEST BEGINNING.

Test 2 has started.

A300 T TEST 3 — INTENSITY TEST BEGINNING.

Test 3 has started.

A400 T TEST 4 — SCROLLING TEST BEGINNING.

Test 4 has started.

A441 E ST940 MEMORY ERROR! SCROLL TEST PATTERN CHANGED. EXPECTED DATA = > ?0, ACTUAL; DATA = > ?1, AT ROW = > 3, COLUMN = > ?3.

A500 T TEST 5 — CURSOR TEST BEGINNING.

Test 5 has started.

A600 T TEST 6 — KEYBOARD TEST BEGINNING.

Test 6 has started.

A641 E ST940 KEYBOARD CODE DOES NOT MATCH REQUIRED CODE. EXPECTED DATA BYTE = > ?0, ACTUAL DATA BYTE = > ?1.

A700 T TEST 7 — HOST INITIATED SELF TESTS BEGINNING

Test 7 has started.

A741 E SELF TEST ?0 FAILED.

H.13 LP840 — 840 RO PRINTER MESSAGES

The following messages are produced by the diagnostic task for the Model 840 RO Printer.

B000 I DNOS LP840 DEVICE DIAGNOSTIC VERSION 1.0.0 STARTING EXECUTION: RUN ID = > ?0.

The diagnostic task for the 840 RO line printer has started and has been assigned the run ID (> ?0).

B100 T TEST 1 — CHARACTER SET TEST BEGINNING.

Test 1 has started.

B200 T TEST 2 — RIPPLE PATTERN TEST BEGINNING.

Test 2 has started.

B300 T TEST 3 — BUFFER LENGTH TEST BEGINNING.

Test 3 has started.

B400 T TEST 4 — CARRIAGE RETURN TEST BEGINNING.

Test 4 has started.

B500 T TEST 5 — FORM LENGTH AND FEED TEST BEGINNING.

Test 5 has started.

B600 T TEST 6 — TAB TO LINE TEST BEGINNING.

Test 6 has started.

B700 T TEST 7 — SET/TEST VERTICAL TABS TEST BEGINNING.

Test 7 has started.

B800 T TEST 8 — REMOTE ON/OFF TEST BEGINNING.

Test 8 has started.

B900 T TEST 9 — SET/TEST HORIZONTAL TABS TEST BEGINNING.

Test 9 has started.

BA00 T TEST 10 — LINES AND CHARACTERS PER INCH TEST BEGINNING.

Test 10 has started.

BB00 T TEST 11 — BELL TEST BEGINNING.

Test 11 has started.

BC00 T TEST 12 — LEFT/RIGHT MARGINS TEST BEGINNING.

Test 12 has started.

BD00 T TEST 13 — TOP/BOTTOM MARGINS TEST BEGINNING.

Test 13 has started.

BE00 T TEST 14 — ANSWERBACK MEMORY REMOTE TRIGGER TEST BEGINNING.

Test 14 has started.

H.14 ST931 — 931 VDT MESSAGES

The following messages are produced by the 931 VDT diagnostic task.

D000 I DNOS ST931 DEVICE DIAGNOSTIC VERSION 1.0.0 STARTING EXECUTION: RUN ID = > ?0

The diagnostic task for the 931 VDT has started and has been assigned the run ID (> ?0).

D002 I WARNING! PROBABLE CRT MONITOR OR SWEEP BOARD FAILURE.

D003 I WARNING! PROBABLE KEYBOARD FAILURE.

D004 I WARNING! PROBABLE TERMINAL CONTROL BOARD FAILURE.

D005 I WARNING! PROBABLE P/S WITH FIBER OPTICS FAILURE.

D006 I WARNING! PROBABLE P/S WITHOUT FIBER OPTICS FAILURE.

D007 I WARNING! PROBABLE AUX COMM PORT FAILURE.

D008 I WARNING! PROBABLE HOST/931 COMMUNICATIONS FAILURE.

D100 T TEST 1 — COMMUNICATIONS TEST BEGINNING.

Test 1 has started.

D140 S ERROR IN TERMINAL ID, EXPECTED – 931 – RECEIVED – ?0 – .

D141 S ERROR IN DATA LOOPBACK TEST, TRANSMITTED 79 CHARACTERS BUT ONLY RECEIVED ?0 CHARACTER(S).

D142 S ERROR, EXCESSIVE PARITY ERRORS DETECTED BY THE 931.

D200 T TEST 2 — HOST INITIATED SELF TEST BEGINNING.

Test 2 has started.

D201 S 931 RAM SELF TEST PASSED.

D202 S 931 ROM ?0: VERSION ?1, REVISION ?2, TI P/N ?3: ?4 CRC.

D240 E ERROR, 931 RAM SELF TEST FAILED

D241 E ERROR, 931 ROM SELF TEST FAILED

D300 I TEST 3 — CURSOR TEST BEGINNING.

Test 3 has started.

D340 E ERROR, CURSOR FAILED TO RETURN TO INITIAL POSITION.

D341 S CURSOR ?0 COMMAND FROM ROW ?1 COLUMN ?2 PLACED CURSOR AT ROW ?3 COLUMN ?4.

D342 E ?0 MODE ERROR CURSOR ?1 COMMAND FROM ROW ?2 COLUMN ?3 PLACED CURSOR AT ROW ?4 COLUMN ?5.

D400 T TEST 4 — THROUGHPUT TEST BEGINNING.

Test 4 has started.

D440 E ERROR, LOSS OF 931 PACING.

D441 E THROUGHPUT TEST ERROR — ?0 CHARACTERS WERE READ, OUT OF 1920 WRITTEN

D500 T SHOW GRAPHICS TEST BEGINNING.

Test 5 has started.

D600 T SHOW MASK TEST BEGINNING.

Test 6 has started.

D700 T VIDEO MONITOR TEST BEGINNING.

Test 7 has started.

D800 T AUXILIARY PORT TEST BEGINNING.

Test 8 has started.

D840 E PORT PRINTER EITHER OFFLINE OR NOT READY.

D841 E 931 DIAGNOSTIC IS NOT INITIALIZED TO TEST THE AUX PORT.

D900 T KEYBOARD TEST BEGINNING.

Test 9 has started.

D940 E RECEIVED ILLEGAL KEY CODE: CODE = ?0.

D941 E NONSUPPORTED MODE CHANGE OCCURRED.

H.15 MEMORY EXERCISER MESSAGES

The following messages are produced by the memory exerciser diagnostic task.

F000 I DNOS MEMXX DIAGNOSTIC VERSION 1.2.0 STARTING EXECUTION: RUN ID = > ?0.

The diagnostic task for the memory has started and has been assigned the run ID (> ?0).

F041 E TASK = > ?0, WORD = > ?1, DATA READ = > ?2, EXPECTED DATA = > ?3.

The data read does not match the expected data. The task and word hexadecimal numbers are given along with the actual data read and the expected data.

F042 E BUFFER COMPARE TERMINATED ON FIVE COMPARE ERRORS.

The test has terminated because the data has been compared five times and failed.

F043 E READ/WRITE PATTERN NUMBER OUT OF RANGE!

F044 E OPERATION MODE NOT ALLOWED. MEMXX TASK EXECUTED IN TEST MODE.

F100 T TEST 1 — READ/WRITE > 0101 PATTERN TEST BEGINNING.

Test 1 has started.

F200 T TEST 2 — READ/WRITE > AAAA PATTERN TEST BEGINNING.

Test 2 has started.

F300 T TEST 3 — READ/WRITE > 5555 PATTERN TEST BEGINNING.

Test 3 has started.

F400 T TEST 4 — READ/WRITE > FFFF PATTERN TEST BEGINNING.

Test 4 has started.

F500 T TEST 5 — READ/WRITE > 0000 PATTERN TEST BEGINNING.

Test 5 has started.

F600 T TEST 6 — READ/WRITE I — INDEX PATTERN TEST BEGINNING.

Test 6 has started.

F700 T TEST 7 — READ/WRITE I-INVERSE PATTERN TEST BEGINNING.

Test 7 has started.

F800 T TEST 8 — READ/WRITE > DB67 PATTERN TEST BEGINNING.

Test 8 has started.

Appendix I

Reference Tables

I.1 GENERAL INFORMATION

Appendix I supplies you with quick-reference tables to use in responding to the prompts displayed by the Online Diagnostics Driver when you are starting a diagnostic session. Most of these tables and charts are available to you online if you have installed the Help feature. You can display them as you select your options in the long message level or when you enter the HELP command verb. If you have not installed the help feature, study these tables and charts so you can find them quickly when you need them. The reference tables and charts included are:

- Test tables for device diagnostic tasks (includes summary of each test)
- I/O SVC subopcode charts
- Charts for disk head and cylinder ranges

I.2 TEST TABLES

The test tables contain very brief summaries of the information in Section 5. They are the same test tables that you can display by operating in the long message level or by entering the word HELP (or H) in response to a prompt requesting a test number.

I.2.1 Line Printer Tests

The diagnostic tasks for line printers supports the Models 810, 840 RO, 850 (CPTEST), 2230/2260, and 300/600 Line Printers. Many of the tests are similar, but, since there are some differences in the tests for each model, separate tables are shown.

I.2.1.1 LP810 Test Summary Table. The line printer diagnostic task executes the tests summarized in Table I-1 on the 810 line printer.

Table I-1. Summary of LP810 Tests

THE FOLLOWING TESTS ARE PERFORMED BY THE LP810 DIAGNOSTIC TASK:

TEST	1 –	FORM LENGTH AND FEED TEST: A MESSAGE IS WRITTEN AT THE TOP, CENTER, AND BOTTOM OF A FORM.
TEST	2 –	CHARACTER SET TEST: THE 810 CHARACTER SET IS PRINTED IN BLOCK FORMAT REPRESENTING DOT MATRIX STRUCTURE.
TEST	3 –	RIPPLE PATTERN TEST: 94 LINES OF A RIPPLE PATTERN OF ALL NON-GRAPHIC CHARACTERS IS PRINTED.
TEST	4 –	BUFFER LENGTH TEST: (1) OUTPUT BUFFERS FROM 1 TO 80 OR 132 CHARACTERS LONG. (2) OUTPUT BUFFERS FROM 80 OR 132 TO 1 CHARACTER LONG.
TEST	5 –	CARRIAGE RETURN TEST: PRINTS A MESSAGE IN TWO PASSES.
TEST	6 –	TAB TO LINE TEST: MESSAGES ARE PRINTED AT PRESET LINES.
TEST	7 –	SET/TEST VERTICAL TABS TEST: CAUSES PRINTER TO TAB TO PRESET VERTICAL TABS.
TEST	8 –	TAB TO ADDRESS TEST: WRITES LINES OF NUMBERS THAT IDENTIFY HORIZONTAL TAB SETTINGS.
TEST	9 –	SET/TEST HORIZONTAL TABS TEST: SETS HORIZONTAL TAB STOP AND PRINTS AN UP ARROW AT EACH TAB STOP.
TEST	10 –	LINES AND CHARACTERS PER INCH TEST: PRINTS SEVERAL MESSAGES AT VARIOUS LINES AND CHARACTERS PER INCH.
TEST	11 –	BELL TEST: SOUNDS THE PRINTER ALARM FOR THREE SECONDS.

I.2.1.2 LP840 Test Summary Tables. The line printer diagnostic task performs the tests listed in Table I-2 when the 840 RO line printer being tested does not have the device/forms control (DFC) option.

Table I-2. Summary of LP840 Tests 1 Through 4

THE FOLLOWING TESTS ARE PERFORMED BY THE LP840 DIAGNOSTIC TASK:

TEST	1 –	CHARACTER SET TEST: THE CHARACTER SET IS PRINTED IN BLOCK FORMAT.
TEST	2 –	RIPPLE PATTERN TEST: 94 LINES OF A RIPPLE PATTERN OF ALL NONGRAPHIC CHARACTERS ARE PRINTED.
TEST	3 –	BUFFER LENGTH TEST: (1) OUTPUT BUFFERS FROM 1 TO 80 OR 132 CHARACTERS LONG. (2) OUTPUT BUFFERS FROM 80 OR 132 TO 1 CHARACTER LONG.
TEST	4 –	CARRIAGE RETURN TEST: PRINTS A MESSAGE IN TWO PASSES.

When the 840 RO line printer has the DFC option, the diagnostic task executes the tests summarized in Table I-3.

Table I-3. Summary of LP840 Tests

THE FOLLOWING TESTS ARE PERFORMED BY THE LP840 DIAGNOSTIC TASK:

TEST	1 –	CHARACTER SET TEST: THE CHARACTER SET IS PRINTED IN BLOCK FORMAT.
TEST	2 –	RIPPLE PATTERN TEST: 94 LINES OF A RIPPLE PATTERN OF ALL NONGRAPHIC CHARACTERS ARE PRINTED.
TEST	3 –	BUFFER LENGTH TEST: (1) OUTPUT BUFFERS FROM 1 TO 80 OR 132 CHARACTERS LONG. (2) OUTPUT BUFFERS FROM 80 OR 132 TO 1 CHARACTER LONG.
TEST	4 –	CARRIAGE RETURN TEST: PRINTS A MESSAGE IN TWO PASSES.
TEST	5 –	FORM LENGTH AND FEED TEST: A MESSAGE IS WRITTEN AT THE TOP, CENTER AND BOTTOM OF A FORM.
TEST	6 –	TAB TO LINE TEST: MESSAGES ARE PRINTED AT PRESET TABS.
TEST	7 –	SET/TEST VERTICAL TABS: CAUSES PRINTER TO TEST PRESET TABS.
TEST	8 –	REMOTE ON/OFF TEST: TESTS THE PRINTER'S ON AND OFF COMMANDS.
TEST	9 –	SET/TEST HORIZONTAL TABS: SETS HORIZONTAL TAB STOPS AND PRINTS AN UP ARROW AT EACH TAB STOP.
TEST	10 –	LINES AND CHARACTERS PER INCH TEST: PRINTS SEVERAL MESSAGES AT VARIOUS LINES AND CHARACTERS PER INCH.
TEST	11 –	BELL TEST: SOUNDS THE PRINTER ALARM FOR THREE SECONDS.
TEST	12 –	LEFT/RIGHT MARGINS TEST: MODIFIES THE LEFT AND RIGHT MARGINS.
TEST	13 –	TOP/BOTTOM MARGINS TEST: MODIFIES THE TOP AND BOTTOM MARGINS.
TEST	14 –	ABM TEST: TESTS OUT THE ANSWERBACK MEMORY FEATURE.

I.2.1.3 LP850 (CPTEST) Test Summary Tables. The line printer diagnostic task performs the tests listed in Table I-4.

Table I-4. Summary of LP850 (CPTEST) Tests

THE FOLLOWING TESTS ARE PERFORMED BY THE CPTEST DIAGNOSTIC TASK:

TEST	1	–	CHARACTER SET TEST: THE CHARACTER SET IS PRINTED IN BLOCK FORMAT.
TEST	2	–	RIPPLE PATTERN TEST: 94 LINES OF A RIPPLE PATTERN OF ALL NONGRAPHIC CHARACTERS ARE PRINTED.
TEST	3	–	BUFFER TEST: (1) OUTPUT BUFFERS FROM 1 TO 80 OR 132 CHARACTERS LONG. (2) OUTPUT BUFFERS FROM 80 OR 132 TO 1 CHARACTER LONG.
TEST	4	–	JITTER TEST: OUTPUTS A CHARACTER PATTERN FROM LEFT TO RIGHT WORKING TO THE CENTER OF A LINE.
TEST	5	–	JITTER INTERVAL TEST: PERFORMS THE JITTER TEST IN INTERVALS.
TEST	6	–	CENTER OUT TEST: OUTPUTS A PATTERN WORKING FROM THE CENTER OF A LINE OUTWARDS TO THE LEFT AND RIGHT MARGINS.
TEST	7	–	ALTERNATING LEFT TO RIGHT TEST: OUTPUTS A CHARACTER PATTERN FROM LEFT MARGIN TO CENTER, AND CENTER TO RIGHT MARGIN.
TEST	8	–	ALTERNATING RIGHT TO LEFT TEST: OUTPUTS A CHARACTER PATTERN FROM RIGHT MARGIN TO CENTER, AND CENTER TO LEFT MARGIN.
TEST	9	-	INTERPLACED JITTER TEST: PERFORMS A JITTER TEST IN TWO PASSES.
TEST	10	–	OVERSTRIKE TEST: PRINTS AND THEN OVERPRINTS A LINE.
TEST	11	–	ALTERNATING OVERSTRIKE TEST: PERFORMS TEST 7 AND PRINTS OVER THE LINE BY PERFORMING TEST 8.
TEST	12	–	RANDOM PRINT TEST: OUTPUTS A LINE OF CHARACTERS IN A RANDOM SEQUENCE.
TEST	13	–	LEFT TO RIGHT INVERTED STRIKE TEST: PRINTS A LINE OF CHARACTERS IN A STAGGERED FASHION FROM LEFT TO RIGHT.
TEST	14	–	RIGHT TO LEFT INVERTED STRIKE TEST: PRINTS A LINE OF CHARACTERS IN A STAGGERED FASHION FROM RIGHT TO LEFT.
TEST	15	–	BLACK LINE TEST: PRINTS A SOLID BLACK LINE IN A SERIES OF OVER-STRIKES.

I.2.1.4 LP2230/LP2260 Test Summary Table. The task executes the tests in Table I-5 for the 2230/2260 line printer.

Table I-5. Summary of LP2230/LP2260 Tests

THE FOLLOWING TESTS ARE PERFORMED BY THE LP2230/LP2260 DIAGNOSTIC TASK:

TEST	1 –	FORM LENGTH AND FEED TEST: EXECUTES 2 FORM FEEDS AND WRITES A MESSAGE AT THE TOP OF EACH FORM.
TEST	2 –	CHARACTER SET TEST: THE LP2230/LP2260 CHARACTER SET IS PRINTED IN BLOCK FORMAT.
TEST	3 –	RIPPLE PATTERN TEST: 94 LINES OF A RIPPLE PATTERN IS PRINTED.
TEST	4 –	BUFFER LENGTH TEST: (1) OUTPUT BUFFERS FROM 1 TO 80 OR 132 CHARACTERS LONG. (2) OUTPUT BUFFERS FROM 80 OR 132 TO 1 CHARACTER LONG.
TEST	5 –	HAMMER ALIGNMENT TEST: ISOLATES DEFECTIVE OR MISALIGNED HAMMERS BY PRINTING OUT LINES OF H'S, E'S, AND HYPHENS.
TEST	6 –	CHARACTER BURST TEST: PRINTS A FULL LINE OF EACH AVAILABLE CHARACTER ON THE LP2230/LP2260.

I.2.1.5 LP300/LP600 Test Summary Table. The task executes the tests in Table I-6 for the 300/600 line printer.

Table I-6. Summary of LP300/LP600 Tests

THE FOLLOWING TESTS ARE PERFORMED BY THE LP300/LP600 DIAGNOSTIC TASK:

TEST	1 –	FORM LENGTH AND FEED TEST: EXECUTES 2 FORM FEEDS AND WRITES A MESSAGE AT THE TOP OF EACH FORM.
TEST	2 –	CHARACTER SET TEST: THE CHARACTER SET IS PRINTED IN BLOCK FORMAT.
TEST	3 –	RIPPLE PATTERN TEST: 94 LINES OF A RIPPLE PATTERN IS PRINTED.
TEST	4 –	BUFFER LENGTH TEST: (1) OUTPUT BUFFERS FROM 1 TO 80 OR 132 CHARACTER LONG. (2) OUTPUT BUFFERS FROM 80 OR 132 TO 1 CHARACTERS LONG.
TEST	5 –	HAMMER ALIGNMENT TEST: ISOLATES DEFECTIVE OR MISALIGNED HAMMERS BY PRINTING OUT LINES OF H'S, E'S, AND HYPHENS.
TEST	6 –	EIGHT LINES PER INCH TEST: TESTS CONTROL OF 8 LPI OPTION.
TEST	7 –	CHARACTER BURST TEST: PRINTS A FULL LINE OF EACH AVAILABLE CHARACTER ON THE PRINTRONIX LINE PRINTER.
TEST	8 –	SOLID BLACK BOX TEST: PRINTS 3 INCH BOX IN PLOT MODE.
TEST	9 –	CARRIAGE RETURN AND UNDERLINE TEST: UNDERLINES MESSAGES.
TEST	10 –	PLOT MODE TEST: PRINTS SEVERAL DESIGNS IN PLOT MODE.
TEST	11 –	ELONGATED CHARACTERS TEST: TESTS ELONGATED CHARACTER OPTION.
TEST	12 –	DELETE CHARACTERS TEST: TESTS DELETE CHARACTER OPTION.
TEST	13 –	EVFU TEST: THE ELECTRONIC VERTICAL FORMAT UNIT IS TESTED.
TEST	14 –	GRAPHIC EXAMPLE PLOT TEST: PRINTS OUT A GRAPHIC DESIGN.
TEST	15 –	TI LOGO PLOT TEST: PRINTS THE TI LOGO IN PLOT MODE.

I.2.2 Keyboard Devices Tests

The diagnostic task for keyboard devices supports the Model 820 KSR Terminal, the Model 911 Video Display Terminal, and the Model 940 Electronic Video Terminal. A separate test table is shown for each one.

I.2.2.1 ST820 Test Summary Table. The task executes the tests summarized in Table I-7 for the 820 KSR terminal. Except for Test 12, the interactive terminal test, the ST820 KSR tests are the same as the 810 line printer tests.

Table I-7. Summary of ST820 Tests

```
THE FOLLOWING TESTS ARE PERFORMED BY THE ST820 DIAGNOSTIC TASK:

TEST   1 - FORM LENGTH AND FEED TEST: A MESSAGE IS WRITTEN AT THE TOP, CEN-
           TER AND BOTTOM OF A FORM.
TEST   2 - CHARACTER SET TEST: THE CHARACTER SET IS PRINTED IN BLOCK
           FORMAT.
TEST   3 - RIPPLE PATTERN TEST: 94 LINES OF A RIPPLE PATTERN OF ALL
           NONGRAPHIC CHARACTERS ARE PRINTED.
TEST   4 - BUFFER LENGTH TEST:
           (1) OUTPUT BUFFERS FROM 1 TO 80 OR 132 CHARACTERS LONG.
           (2) OUTPUT BUFFERS FROM 80 OR 132 TO 1 CHARACTER LONG.
TEST   5 - CARRIAGE RETURN TEST: PRINTS A MESSAGE IN TWO PASSES.
TEST   6 - TAB TO LINE TEST: MESSAGES ARE PRINTED AT PRESET TABS.
TEST   7 - SET/TEST VERTICAL TABS: CAUSES PRINTER TO TEST PRESET TABS.
TEST   8 - TAB TO ADDRESS TEST: WRITES LINES OF NUMBERS THAT IDENTIFY THE
           HORIZONTAL TAB SETTINGS.
TEST   9 - SET/TEST HORIZONTAL TABS TEST: SETS HORIZONTAL TAB STOPS AND
           PRINTS AN UP ARROW AT EACH TAB STOP.
TEST  10 - LINES AND CHARACTERS PER INCH TEST: PRINTS SEVERAL MESSAGES AT
           VARIOUS LINES AND CHARACTERS PER INCH.
TEST  11 - BELL TEST: SOUNDS THE PRINTER ALARM FOR THREE SECONDS.
TEST  12 - KEYBOARD TEST (INTERACTIVE): COMPARES CHARACTERS READ FROM THE
           TARGET KEYBOARD TO EXPECTED VALUES.
```

I.2.2.2 ST911 Test Summary Table. The keyboard device diagnostic task executes the tests summarized in Table I-8 on the 911 VDT.

Table I-8. Summary of ST911 Tests

THE FOLLOWING TESTS ARE PERFORMED BY THE ST911 DIAGNOSTIC TASK:

TEST	1 –	ONES AND ZEROS TEST: EXERCISES THE CONTROLLER MEMORY.
TEST	2 –	SCROLL TEST: THE LETTERS A THRU Z APPEAR ON THE SCREEN MOVING FROM THE BOTTOM TO THE TOP.
TEST	3 –	BEEPER TEST: SOUNDS THE AUDIBLE ALARM FOR A SPECIFIED NUMBER OF SECONDS.
TEST	4 –	INTENSITY TEST: WRITES A RIPPLE PATTERN IN LOW INTENSITY, THEN WRITES THE PATTERN IN HIGH INTENSITY OVER IT.
TEST	5 –	CHARACTER GENERATOR TEST: GENERATES THE 911 CONTROLLER BOARD CHARACTER SET.
TEST	6 –	NONBLINKING/BLINKING CURSOR TEST (INTERACTIVE): EXERCISES THE ABILITY TO DISPLAY A NONBLINKING OR BLINKING CURSOR.
TEST	7 –	KEYBOARD TEST (INTERACTIVE): COMPARES CHARACTERS READ FROM THE TARGET KEYBOARD TO EXPECTED VALUES.

I.2.2.3 ST931 Test Summary Table. The keyboard device diagnostic task executes the tests summarized in Table I-9 on the 931 VDT.

Table I-9. Summary of ST931 Tests

THE FOLLOWING TESTS ARE PERFORMED BY THE ST931 DIAGNOSTIC TASK:

TEST	1 –	COMMUNICATIONS: CHECKS THE COMMUNICATIONS INTERFACE BETWEEN THE COMPUTER AND THE TARGET TERMINAL.
TEST	2 –	RAM/ROM HOST INITIATED SELF TESTS: PERFORMS A CRC CHECK ON RAM AND ROM.
TEST	3	CURSOR: CHECKS THE TERMINAL'S ABILITY TO PERFORM CURSOR FUNCTIONS.
TEST	4 –	THROUGHPUT: VERIFIES THAT THE TARGET TERMINAL IS ABLE TO ACCEPT A FULL SCREEN OF CHARACTERS WITHOUT PACING.
TEST	5 –	SHOW GRAPHICS: DISPLAYS ALL THE AVAILABLE BLOCK GRAPHICS CHARACTERS (IN THE SHAPE OF A SQUARE).
TEST	6 –	SHOW MASK: FILLS THE SCREEN WITH INDIVIDUAL CHARACTERS (O).
TEST	7 –	VIDEO MONITOR: CHECKS TO SEE IF THE 931 VDT HARDWARE CAN EXTEND A GRAPHICS CHARACTER ACROSS THE HORIZONTAL AND VERTICAL CHARACTER CELL BOUNDARIES. VERIFIES THE CHARACTER GENERATOR ROMS. CHECKS CURSOR FUNCTIONS. CHECKS THAT THE HARDWARE CAN DISPLAY ALL CHARACTER ATTRIBUTES.
TEST	8 –	AUXILIARY PORT (INTERACTIVE): VERIFIES THAT THE AUXILIARY PORT CAN HANDLE DATA TRANSMISSION.
TEST	9 –	KEYBOARD (INTERACTIVE): VERIFIES THAT THE 931 KEYBOARD GENERATES THE CORRECT RAW ASCII KEYCODES PROCESSED INTERNALLY BY THE 931.

I.2.2.4 ST940 Test Summary Table. The keyboard device diagnostic task executes the tests summarized in Table I-10 on the 940 EVT.

Table I-10. Summary of ST940 Tests

THE FOLLOWING TESTS ARE PERFORMED BY THE ST940 DIAGNOSTIC TASK:

TEST	1 –	MEMORY TEST: EXERCISES THE CONTROLLER MEMORY.
TEST	2 –	BEEPER TEST: SOUNDS THE AUDIBLE ALARM FOR A SPECIFIED NUMBER OF SECONDS.
TEST	3 –	INTENSITY TEST: WRITES A RIPPLE PATTERN IN LOW INTENSITY, THEN WRITES THE PATTERN IN HIGH INTENSITY OVER IT.
TEST	4 –	SCROLLING TEST: A PATTERN IS PLACED ON THE SCREEN AND IS SCROLLED UP AND DOWN IN REGULAR AND SMOOTH SCROLLING. THE TEST IS THEN DONE IN 132-CHARACTER MODE.
TEST	5 –	CURSOR TEST: EACH ROW AND COLUMN POSITION IS TESTED IN 80- AND 132-CHARACTER MODE. THE CURSOR'S ADDRESSING ABILITY IS ALSO TESTED BY PLACING THE CURSOR IN ALL 4 CORNERS.
TEST	6 –	KEYBOARD TEST (INTERACTIVE): COMPARES CHARACTERS READ FROM THE TARGET KEYBOARD TO EXPECTED VALUES.

I.2.3 Disk Test Summary Tables

The disk diagnostic task executes the tests summarized in Table I-11 and Table I-12.

Table I-11. Summary of Disk Tests

THE FOLLOWING TESTS ARE PERFORMED BY THE NONEXTENDED DISK DIAGNOSTIC TASK:

NOTE: AN INITIALIZED AND INSTALLED DISK VOLUME MUST BE USED TO TO EXECUTE THE FOLLOWING TESTS.

TEST	1 –	READ DIAGNOSTIC CYLINDER TEST: READ/COMPARE OF S$DIAG FILE.
TEST	2 –	READ DIAGNOSTIC CYLINDER WITH HEAD MOTION: S$DIAG AND VCATALOG.
TEST	3 –	READ/WRITE RANDOM PATTERN TEST: WRITE/READ OF FILE S$ODDWRT.
TEST	4 –	READ/WRITE PATTERNS TEST: WRITE/READ SET PATTERNS OF S$ODDWRT.

Table I-12. Summary of Extended Disk Tests

THE FOLLOWING TESTS ARE PERFORMED BY THE EXTENDED READ DISK DIAGNOSTIC TASK:

NOTE: AN INITIALIZED AND INSTALLED DISK VOLUME MUST BE USED TO TO EXECUTE THE FOLLOWING TESTS.

TEST 1 – READ SPECIFIED TRACKS TEST: FULL TRACK READ WITH CRC CHECK.
TEST 2 – CONSECUTIVE SECTOR READ: INCREMENTAL READ OF ALL SECTORS OF THE INNER AND OUTER TRACKS.
TEST 3 – JITTER SEEK: SEEKS FROM CENTER TRACK OUT TO BOTH LIMITS.
TEST 4 – RANDOM SEEK TEST: SEEKS TO RANDOM GENERATED TRACK ADDRESSES.
TEST 5 – CRESCENDO SEEK: COMPREHENSIVE TRACK TO TRACK SEEK.

THE FOLLOWING WRITE TESTS ARE PERFORMED BY THE EXTENDED DISK TASK:

NOTE: USE SCRATCH MEDIA AND THE DISK IN DIAGNOSTIC STATE TO EXECUTE THE FOLLOWING TESTS.

TEST 10 – ID ERROR STATUS CHECK: INSURE ID ERROR BIT OPERATION.
TEST 11 – WRITE FORMAT/VERIFY TRACKS: FORMATS AND VERIFIES TRACKS.
TEST 12 – WRITE/READ/COMPARE TRACKS: WRITES DATA PATTERN TO SELECTED TRACKS, READS AND COMPARES DATA BIT TO BIT.
TEST 13 – COMPREHENSIVE WRITE/SEEK/READ: WRITES AND READS ALL TRACKS SEQUENTIALLY AND PERFORMS ALL SEEK LENGTHS.

I.2.4 Magnetic Tape Test Summary Table

The magnetic tape diagnostic task executes the tests summarized in Table I-13.

Table I-13. Summary of MT979 Tests

THE FOLLOWING ARE TESTS PERFORMED BY THE MT979 DIAGNOSTIC TASK:

TEST	1 –	BASIC READ/WRITE TEST WITH REWIND: (1) REWINDS TAPE. (2) WRITES A RECORD 256 CHARACTERS LONG. (3) REWINDS TAPE. SHOULD BE POSITIONED AT THE BEGINNING OF THE RECORD WRITTEN IN STEP 2. (4) READS RECORD. (5) RECORDS ERROR IF THERE IS DISCREPANCY
TEST	2 –	BASIC READ/WRITE TEST WITH BACKSPACE: (1) WRITES A RECORD. (2) BACKSPACES TO BEGINNING OF RECORD. (3) READS THE RECORD. (4) RECORDS ERROR IF THERE IS DISCREPANCY.
TEST	3 –	FORWARD CREEP TEST: THE PATTERN IS WRITE, WRITE, BACK-SPACE, READ. ALTERNATING RECORDS ARE READ AND COMPARED.
TEST	4 –	EVEN/ODD WRITE AND READ TEST: RECORDS OF DIFFERENT LENGTHS ARE WRITTEN, AND THEN READ AND COMPARED FOR ERRORS.
TEST	5 –	SPECIAL MOVEMENT AND END OF FILE: OPERATIONS CHECKED ARE FORWARD SPACING, BACKSPACING, AND CHECK FOR EOF CONDITION.
TEST	6 –	WRITE FULL REEL OF TAPE, CHECK EOT: WRITES A FULL REEL OF RECORDS AND CHECKS FOR AN END OF TAPE (EOT) CONDITION.
TEST	7 –	READ FULL REEL OF TAPE, CHECK EOT: READS THE RECORDS ON TAPE FROM TEST 6 AND COMPARES RECORDS FOR ERRORS.
TEST	8 –	WRITE RING AND RECORDING TYPE CHECK: CHECKS THE WRITE RING STATUS BIT, THE DEVICE STATUS, AND RECORDING TYPE STATUS BITS.

I.3 SUBOPCODE CHARTS FOR OPERATION EXECUTION MODE

When a device diagnostic task executes in the operation execution mode, it causes the device to respond to appropriate I/O SVC subopcodes. When you choose to execute in the operation execution mode, you must also choose the subopcode. You can find the valid subopcodes for each device class either online by entering the Show SVC Operation Codes (SO) command verb or in the charts shown in this appendix. You can use the SO command verb only if you have installed the help feature.

I.3.1 Device Class LP Subopcode Chart

The validity column of Table I-14 shows whether line printers respond, ignore, or return error codes to each subopcode.

Table I-14. Subopcode Chart for Line Printers

Operation	Code	Validity
OPEN	00	R
CLOSE	01	R
CLOSE/EOF	02	R
OPEN/REWIND	03	R
CLOSE/UNLOAD	04	R
READ STATUS	05	I
FORWARD SPACE	06	I
BACK SPACE	07	I
UNUSED	08	E
READ ASCII	09	E
READ DIRECT	0A	E
WRITE ASCII	0B	R
WRITE DIRECT	0C	E
WRITE EOF	0D	R
REWIND	0E	R
UNLOAD	0F	I

FOR VALIDITY = R, device responds to subopcode
I, device ignores subopcode
E, device returns error code

I.3.2 Device Class ST Subopcode Chart

The validity column of Table I-15 shows the subopcodes to which keyboard devices respond.

Table I-15. Subopcode Chart for Keyboard Devices

Operation	Code	Validity
OPEN	00	R
CLOSE	01	R
CLOSE/EOF	02	R
OPEN/REWIND	03	R
CLOSE/UNLOAD	04	R
READ STATUS	05	R
FORWARD SPACE	06	I
BACK SPACE	07	I
UNUSED	08	E
READ ASCII	09	R
READ DIRECT	0A	R
WRITE ASCII	0B	R
WRITE DIRECT	0C	R
WRITE EOF	0D	I
REWIND	0E	R
UNLOAD	0F	I

FOR VALIDITY = R, device responds to subopcode
I, device ignores subopcode
E, device returns error code

I.3.3 Device Class MT Subopcode Chart

The validity column of Table I-16 shows the subopcodes to which magnetic tapes respond.

Table I-16. Subopcode Chart for Magnetic Tapes

Operation	Code	Validity
OPEN	00	R
CLOSE	01	R
CLOSE/EOF	02	R
OPEN/REWIND	03	R
CLOSE/UNLOAD	04	R
READ STATUS	05	R
FORWARD SPACE	06	R
BACK SPACE	07	R
UNUSED	08	E
READ ASCII	09	R
READ DIRECT	0A	R
WRITE ASCII	0B	R
WRITE DIRECT	0C	R
WRITE EOF	0D	R
REWIND	0E	R
UNLOAD	0F	R

FOR VALIDITY = R, device responds to subopcode
I, device ignores subopcode
E, device returns error code

I.4 CHARTS FOR DISK HEADS AND CYLINDERS

When you choose to execute extended disk tests 1, 5, 11, or 12, you are asked to indicate the tracks to which you want to read or write by specifying starting and ending heads and cylinders. If you have installed the help feature, you can display the charts that show head and cylinder ranges for each disk model supported by Online Diagnostics.

I.4.1 Disk Head Range Chart

Table I-17 shows the chart displaying head ranges.

Table I-17. Disk Head Range Chart

Disk Type		Head Range
FD1000		0 – 1
DS31		0 – 1
DS10		0 – 1
DS25		0 – 4
DS50		0 – 4
DS80		0 – 4
DS200		0 – 18
DS300		0 – 18
CD1400	(32mb REMOVABLE)	0
CD1400	(32mb FIXED)	0
CD1400	(64mb FIXED)	0 – 2
CD1400	(96mb FIXED)	0 – 4
WD500		0 – 3
WD800	(2 PLATTERS)	0 – 2
WD800	(4 PLATTERS)	0 – 6

I.4.2 Disk Cylinder Range Chart

Table I-18 is the chart that displays the cylinder ranges.

Table I-18. Disk Cylinder Range Chart

Disk Type		Cylinder Range
FD1000		0 – 76
DS31		0 – 202
DS10		0 – 407
DS25		0 – 407
DS50		0 – 814
DS80		0 – 802
DS200		0 – 814
DS300		0 – 802
CD1400	(32mb REMOVABLE)	0 – 820
CD1400	(32mb FIXED)	0 – 820
CD1400	(64mb FIXED)	0 – 820
CD1400	(96mb FIXED)	0 – 820
WD500		0 – 149
WD800	(2 PLATTERS)	0 – 650
WD800	(4 PLATTERS)	0 – 650

Glossary

This glossary provides short explanations of many of the terms used in this manual. The terms are arranged alphabetically except for symbols, which are located at the end. For a more complete glossary of DNOS data processing terms see the *DNOS Concepts and Facilities Manual.*

ASCII — American National Standard Code for Information Interchange. A method for data representation.

Batch Mode — Under DNOS, SCI commands can be executed from any terminal, sequential file, or sequential device. When the input device is other than a terminal, that is, it is a sequential file or device, SCI is said to be running in batch mode. In this mode, all parameters must be supplied in KEYWORD = value format.

Buffer — Storage used to compensate for differences in the rate of data flow, time of occurrence of events, packing of data, or transmitting data from one location to another.

Cache Memory — A portion of memory that operates much faster than primary memory and in which the controller stores frequently-used data from primary memory.

Change Command Verbs — The subset of command verbs that alter the execution options of the diagnostic tasks after they have started. They can be used at any time during the diagnostic session.

Command — A directive to perform an action. The System Command Interpreter (SCI) is provided to interpret commands and initiate utilities as needed to perform the desired functions.

Command Verbs — Instructions entered at the control terminal that request actions of the Online Diagnostics Driver. The command verbs have two-character mnemonics, or abbreviations, that are entered at the control terminal. Command verb mnemonics may be the same as SCI mnemonics, but are distinguished from SCI commands because they control only the Online Diagnostics Driver.

Concatenated File — A set of two or more physical files (sequential or relative record) considered as a logically contiguous set of data. A concatenated file is accessible by the logical name used when defining the concatenated file.

Control Terminal — The terminal at which you activate the Online Diagnostics Driver (ODD). When Online Diagnostics executes in foreground, the control terminal cannot access SCI until the Quit Online Diagnostics (QD) verb ends the diagnostic session. When executed in background, the control terminal can access SCI during the diagnostic session.

CRC — See Cyclic Redundancy Check.

Creep — The positioning of a magnetic tape at slightly different positions each time a record is read or written. When each of these small variations is in the forward direction, the tape slowly moves ahead. This is called forward creep.

Cyclic Redundancy Check (CRC) — A method of error detection that matches CRC characters generated by transmitting and receiving data. CRC characters are compared in the 931 VDT and 940 EVT self-tests, in Test 1 of the extended read only disk test, and in Test 10 of the extended write/read disk tests.

Cylinder — The bands on the recording surfaces of a multiplatter disk that are accessed when the disk heads are in one position. Each recording band is called a track and is divided into sectors.

Data Pattern — The hexadecimal values that fill the input/output (I/O) buffers for the use of the diagnostic tasks. The data pattern is requested for each applicable device class by the Execute Diagnostic Task (XD) command verb.

Device Class — The first two characters of a device name identify the class of the device. For example, in the line printer device name LP01, LP is the device class, 01 is the device number.

Device Service Routine (DSR) — A routine within the operating system that communicates directly with an I/O device. It services interrupts and performs the desired I/O operations.

Device State — The state of a device: online, offline, or diagnostic. Device states are modified with the ON and DIAG commands. Devices other than disk units must be in the diagnostic state to be accessible to the driver for testing. Disks can be tested while in the online state.

Diagnostic Cylinder — The file named volumename.S$DIAG, allocated by DNOS and DX10 when you initialize disks with the Initialize New Volume (INV) command. It is located on the innermost cylinder of the disk and is used by the disk diagnostic task.

Diagnostic Error File — A file, line printer, or class ST device on which the Online Diagnostic Driver stores error records extracted from the history file. The file is created when the SF command verb receives the ERRORS response to the ENTER FILE NAME? prompt.

Diagnostic History File — A file, line printer, or class ST device on which the Online Diagnostics Driver records the error and activity messages for the current diagnostic session.

Diagnostic Message Queue — A first-in first-out (FIFO) waiting list of service requests from operating diagnostic tasks to the Online Diagnostic Driver. When the driver is not waiting for responses from the terminal, it is monitoring the message queue.

Diagnostic Session — The period of time from the activation of the Online Diagnostics Driver until the termination of the driver.

Diagnostic State — A device state that allows diagnostic testing. See Device State.

Diagnostic Task — The task that performs tests or operations on a given device class. The group of tests for any one device class.

Diagnostics — Computer programs specifically designed to exercise hardware devices with the intention of provoking specific types of errors to provide information about hardware malfunctions. This information is used to determine what types of repairs, if any, are required.

Driver — The Online Diagnostics Driver. The task that initiates and controls the device diagnostic tasks.

DSR — See Device Service Routine.

ECC — See Error Detection and Correcting Circuit.

Error Detection and Correcting Circuit (ECC) — A circuit in the controller of the DS80, DS300, and CD1400 disk systems that detects and corrects certain types of errors.

Execute Command Verbs — The subset of command verbs that start the tasks and select the execution options.

Execution Mode — A diagnostic task can be executed in two ways, or modes: by executing the tests provided with the driver, or repeatedly executing a specific supervisor call (SVC) operation code. The execution mode is selected by the responses to the prompts of the XD command verb, and changed with the Change Execution Mode (CE) command verb.

Execution Options — The execution options are: diagnostic task priority, execution mode, and termination mode.

Format — (1) The arrangement or layout of data on a data medium. (2) A disk operation performed when a disk is initialized with the INV command or when the I/O SVC subopcode >08, Write Format operation, is performed. The operation defines the number of sectors per record on all tracks (INV) or on one track (subopcode >08).

Hard Break — Termination of a task by DNOS caused by the following steps. Press the Attention key, release it, and hold down the Control key while you press the X key. (See Appendix A for a listing of key names applicable for your specific terminal.) For Online Diagnostics, the hard break terminates the diagnostic session, but you must perform a Kill Task (KT) command on any diagnostic tasks that may still be operating. To find these tasks, perform a Show Task Status (STS) command.

Messages — SCI, SVC, system log, and Online Diagnostics messages are used in initializing, executing, and interpreting Online Diagnostics and the System Log Analysis Task. All of the Online Diagnostics messages are listed and explained in Appendix H. System log messages are summarized and explained in the System Log Analysis Task reports and in Section 6 of this manual. For further explanation of SCI and SVC messages, see the *DNOS Messages and Codes Reference Manual.*

Offline — A device state in which the device is not under the control of, nor is accessible to, the operating system.

Online — A device state in which the device is under the control of, and is accessible to, the operating system.

Online Diagnostics — Diagnostics that execute under the control of, and are accessible to, the operating system. This eliminates the need to shut down the entire system for diagnostic testing. Even though the target devices (except disks) cannot be online while being tested, the tests are controlled from a terminal that is online, and so the diagnostic system is said to be online.

Online Diagnostics Driver — A task that executes under the control of the operating system, through which Online Diagnostics tasks are started, controlled, and terminated by command verbs. The driver handles requests for messages and services made by the diagnostic tasks. It records activity on the diagnostic history file. The driver is activated at the control terminal.

Opcode — An SVC operation code. See SVC Operation Codes.

Refresh — The process of repeatedly producing a display image on a cathode ray tube (CRT) screen so that the image remains visible.

SCI — See System Command Interpreter.

Show Command Verbs — The subset of command verbs that display information at the control terminal.

SVC Operation Code — Supervisor calls (SVCs) are the programmer interface to the operating system. An SVC operation code is a call to the operating system for a specific service. An Online Diagnostics session executing in operation mode uses subopcodes of the I/O SVC operations code 00.

System Command Interpreter (SCI) — The user interface to the operating system.

System Diagnostics — A group of programs that isolate errors in TI 990 computers and peripheral devices that are supported by the operating system; they can operate while normal system operation continues.

System Log Analysis Task — A nonprivileged task that sorts, compresses, and provides reports on the information in the system log file.

System Log Files — Files maintained by the operating system to record system activities, including device errors, memory errors, and task errors.

Target Device — The device that is to be tested by the diagnostic task.

Task — A program that executes under the control of the operating system. Tasks may cause other tasks to begin or end. For example, the Online Diagnostics Driver task causes the diagnostic tasks to begin and end.

Terminate Command Verbs — A subset of command verbs which end the diagnostic tasks and end the diagnostic session.

Termination Mode — The termination mode sets the conditions under which the testing done by the diagnostic task is to end. The diagnostic task will run until the specified one of four conditions is met. See paragraph 1.2.2.3 for a list of the conditions.

Unit Diagnostics — A group of programs that isolate hardware errors in TI 990 computers and peripheral devices when the operating system is shut down. Two types of tests are performed by the programs: stand-alone tests and tests running under DOCS, a small operating system that supports tests requiring user interaction.

VDT Mode — A screen-oriented mode of operation that has the ability to read and write fields at any position on the screen. Video terminals can be used in TTY mode as well as VDT mode, but utilize their full power and speed only in the latter.

Volume — A logical device, such as a disk pack or magnetic tape reel, that can be uniquely identified by name and that can store one or more logical files.

Volume Name — A character string that identifies a volume. Disk volume names can contain up to eight alphanumeric characters, but must begin with a letter.

> — A symbol used to indicate that the digits following the symbol are base 16 (hexadecimal) digits.

Index

This index lists key words and concepts covered in this manual together with references to the area(s) in the manual in which they are covered. The key words and concepts appear on the left side of the index column. The references along the right side of the column specify the following manual areas:

- Sections — References to sections of the manual appear as "Section N" with the symbol n representing a numeric quantity.

- Appendixes — References to appendixes of the manual appear as "Appendix X" with the symbol X representing a capital letter.

- Paragraphs — References to paragraphs of the manual appear as a string of alphanumeric characters punctuated with decimal points. The first character of the string refers to the section or appendix of the manual in which the paragraph is found. The following numbers are paragraph numbers.

  Examples: 3.5.2 refers to Section 3, paragraph 5.2.
  A.2 refers to Appendix A, paragraph 2.

- Tables — References to tables in the manual are represented by the letter T followed immediately by a character that represents the section or appendix that contains the table. The second character is followed by a dash (-) and the ordered number of the table in that section or appendix.

  Examples: T3-10 refers to Section 3, Table 10.
  TB-4 refers to Appendix B, Table 4.

- Figures — References to figures in the manual are represented by the letter F followed immediately by a character that represents the section or appendix that contains the figure. The second character is followed by a dash (-) and the ordered number of the figure in that section or appendix of the manual.

  Examples: F2-7 refers to Section 2, Figure 7.
  FG-1 refers to Appendix G, Figure 1.

- See and see also references — Reference that direct you to other entries in the index.

You can find the page numbers that correspond to the see references in the table of contents, the list of illustrations, and the list of tables.

CUT ALONG LINE

USER'S RESPONSE SHEET

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Manual Date: 15 November 1983 **Date of This Letter:** ______

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