Digital ANSI-Compliant Printing Protocol

Level 3 Programming Supplement

Order Number: EK-PPLV3-PS-001

This manual contains device-specific information about level 3 of the Digital ANSI-Compliant Printing Protocol (DEC PPL3), based on ANSI Standard X3.64. This protocol is used by the ANSI Text translator, which supports Digital's PostScript printers, and by Digital's family of DEClaser printers. For general information on DEC PPL3, refer to the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual*.

Revision/Update Information:	This is a revised manual.
Operating System and Version:	VMS, Version 5.3 or 5.4
Hardware Version:	DEClaser 1100 Printer, Version 1.0; DEClaser 2100/2200 Printer, Version 1.7; DEClaser 2100/2200 plus Printer, Version 2.0; DEClaser 3200 Printer, Version 1.0
Software Version:	ANSI Text Translator, Version 4.0

Digital Equipment Corporation
Maynard, Massachusetts

First Printing, June 1990,
Revised, January 1991
Revised, October 1991

The Reader's Comments form at the end of this document requests your critical evaluation to assist in preparing future documentation.

S1590

This document is available on CDROM.

This document was prepared with VAX DOCUMENT, Version 1.2.

digital™

Digital ANSI-Compliant Printing Protocol Level 3 Programming Supplement Change Notice

AD–PBWHA–T1

November 1990

The DEClaser 2100 and the DEClaser 2200 printers display some device-specific behavior that is not reflected in the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Supplement.* Please make these changes to your document.

Page 12-5:

Mapping Page Size to Physical Sheet Size

Add the following text after the bulleted list:

On the DEClaser 2200 printer, tumbled pages are printed differently if landscape orientation is selected.

- Sheets printed in duplex normal mode with landscape orientation selected are printed so that pages can be bound along the short edge.
- Sheets printed in duplex tumbled mode with landscape orientation selected are printed so that pages can be bound along the long edge.

Page 13-3:

Replace the paragraph that follows Table 13–2 (to the end of page 13–3) with the following paragraph:

Font cartridges modify the default Select Graphic Rendition (SGR) values. These modifications occur during power-up, Soft Terminal Reset (DECSTR), or Reset to Initial State (RIS). A Select Conformance Level (DECSCL) command causes SGR assignments to return to the values listed in Table 13–2, whether or not a font cartridge is installed.

Page 15-2:

Add the following text at the end of Section 15.1:

The DEClaser printers perform a conditional Sheet Feed upon receipt of a Soft Terminal Reset (DECSTR). Other Digital printers perform a conditional Form Feed upon receipt of a Soft Terminal Reset (DECSTR). If your document is to be printed in duplex mode on a DEClaser 2200, do not send a DECSTR command between pages. This results in simplex printing.

Page 15-5:

Set Sheet Size (DECSSS)

Add the following immediately after Table 15–3:

The DEClaser 2100 and 2200 printers default to A-size paper if the page size selected is smaller than the smallest size available.

Page 19-1:

Add the following after the first set of bullets:

To select DEC PPL3 mode from CaPSL emulation mode, specify the following sequence:

```
<ESC>  %    >
1/11   2/5  3/14
```

To select DEC PPL3 from emulation modes in other Digital printers, specify the Return from Other Coding Systems (ROCS) sequence documented in the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual.*

Contents

Preface xvii

Part I ANSI Text Translator

1 Overview

2 Logical to Physical Image

2.1 Translator Resolution 2–1
2.1.1 Horizontal Resolution 2–1
2.1.2 Vertical Resolution 2–2
2.2 Printable Area 2–4
2.3 Mapping Page Size to Physical Sheet Size 2–4
2.4 Positioning Accuracy 2–6
2.5 Justification 2–6

3 Initial State Values

3.1 Initial States Independent of Paper Size and Orientation 3–1
3.2 Initial States Based on Paper Size and Orientation 3–3

4 Maximum ANSI Text Translator Values

4.1 Maximum Parameter Values 4–1
4.2 Maximum Values for Translator Features 4–1

5 Paper Handling

5.1 Duplex Printing 5–1
5.2 Designating the Input Tray 5–1
5.3 Set Sheet Size (DECSSS) 5–3

6 Status and Error Reporting

7 Fonts for the ANSI Text Translator

7.1 Load Font File (DECLFF) Considerations 7–1
7.2 Font Repertory 7–1
7.3 Built-In Font File Repertory 7–2
7.3.1 Type Family Names 7–2
7.3.2 Built-In Type Family Names and IDs, Font IDs, and Font File IDs 7–3
7.3.3 Font Metrics 7–6
7.4 Built-In Algorithmic Transformations 7–6

8 Sixel Considerations

8.1 Macro Parameter Values 8–1
8.2 Miscellaneous Considerations and Restrictions 8–2
8.2.1 Valid Set Raster Attributes (DECGRA) Command 8–2
8.2.2 Restrictions 8–3

9 Alternative Protocols

10 Printer-Specific ANSI Text Translator Considerations

10.1 ScriptPrinter and LN03 Image Printers 10–1
10.1.1 Downline Loaded Font Capacity 10–2
10.1.2 Selecting the ANSI Text Translator 10–2
10.1.3 Default Settings 10–3
10.1.4 Printable Area 10–3
10.1.5 Sixel Graphics Resolution 10–4
10.1.6 Hints, Problems, and Solutions 10–4
10.2 PrintServer Network Printers 10–5
10.2.1 Downline Loaded Font Capacity 10–6
10.2.2 Selecting the ANSI Text Translator 10–6
10.2.3 Default Settings 10–7
10.2.4 Printable Area 10–8

10.2.5 Sixel Graphics Resolution 10–8
10.2.6 Hints, Problems, and Solutions 10–9
10.2.7 ANSI Text Performance 10–10
10.3 DEClaser Printers 10–10
10.3.1 Downline Loaded Font Capacity 10–11
10.3.2 Selecting the ANSI Text Translator 10–11
10.3.3 Default Settings 10–11
10.3.4 Printable Area 10–12
10.3.5 Sixel Graphics Resolution 10–14
10.3.6 Hints, Problems, and Solutions 10–15

Part II DEClaser 2100/2200 Printers

11 Overview

12 Logical to Physical Image

12.1 Printer Resolution 12–1
12.1.1 Horizontal Resolution 12–1
12.1.2 Vertical Resolution 12–2
12.2 Printable Area 12–4
12.2.1 Paper Sizes 12–4
12.2.2 Envelope Sizes 12–4
12.3 Mapping Page Size to Physical Sheet Size 12–5
12.4 Positioning Accuracy 12–7
12.5 Justification 12–7

13 Initial State Values

13.1 Initial States Independent of Paper Cassette 13–1
13.2 Power Up Initial States Based on Paper Cassette 13–5
13.3 Factory Defaults in Nonvolatile Memory 13–6
13.4 Macro Values in NVM 13–7
13.5 Protocol Selection in NVM 13–8

14 Maximum Printer Values

14.1 Maximum Parameter Values 14–1
14.2 Maximum Values for Printer Features 14–1

15 Paper Handling

15.1 Duplex Printing 15–1
15.2 Designating the Input Tray 15–3
15.3 Set Sheet Size (DECSSS) 15–4

16 Status and Error Reporting

16.1 Device Attributes Report (DAR) Parameters 16–2
16.2 Device Attributes (Secondary) Report (DA2R) Parameters 16–4
16.3 Error Parameters for Device Status Reports 16–7

17 Fonts for DEClaser 2100/2200 Printers

17.1 Load Font File (DECLFF) Considerations 17–1
17.2 Font Repertory 17–1
17.3 Built-In Font File Repertory 17–2
17.3.1 Type Family Names 17–2
17.3.2 Built-In Type Family Names and IDs, Font IDs, and Font File IDs 17–3
17.3.3 Font Metrics 17–8
17.4 Built-in Algorithmic Transformations 17–8
17.4.1 Memory Use 17–9
17.4.2 Spacing Criterion Fallback 17–10
17.4.3 Fallback Metrics for Mixed Font Files (DEClaser 2100/2200 plus Printers) 17–10
17.5 Font List (DEClaser 2100/2200 plus Printers) 17–10
17.6 Font File Validation Test Report (DEClaser 2100/2200 plus Printers) 17–10

18 Sixel Considerations

18.1 Macro Parameter Values 18–1
18.2 Miscellaneous Considerations and Restrictions 18–2
18.2.1 Valid Set Raster Attributes (DECGRA) Commands 18–2
18.2.2 Restrictions 18–3

19 Alternative Protocols

Part III DEClaser 1100 Printer

20 Overview

21 Logical to Physical Image

21.1 Printer Resolution 21–1
21.1.1 Horizontal Resolution 21–1
21.1.2 Vertical Resolution 21–2
21.2 Printable Area 21–4
21.2.1 Paper Sizes 21–4
21.2.2 Envelope Sizes 21–4
21.3 Mapping Page Size to Physical Sheet Size 21–5
21.4 Positioning Accuracy 21–7
21.5 Justification 21–7

22 Initial State Values

22.1 Initial States Independent of Paper Cassette 22–1
22.2 Initial States Based on Paper Cassette 22–5
22.3 Factory Defaults in Nonvolatile Memory 22–5
22.4 Macro Values in NVM 22–6
22.5 Protocol Selection in NVM 22–8

23 Maximum Printer Values

23.1 Maximum Parameter Values 23–1
23.2 Maximum Values for Printer Features 23–1

24 Paper Handling

24.1 Duplex Printing 24–1
24.2 Designating the Input Tray 24–2
24.3 Set Sheet Size (DECSSS) 24–3

25 Status and Error Reporting

25.1 Device Attributes Report (DAR) Parameters 25–2
25.2 Device Attributes (Secondary) Report (DA2R) Parameters 25–3
25.3 Error Parameters for Device Status Reports 25–5

26 Fonts for the DEClaser 1100 Printer

26.1 Load Font File (DECLFF) Considerations 26–1
26.2 Font Repertory 26–1
26.3 Built-In Font File Repertory 26–2
26.3.1 Type Family Names 26–3
26.3.2 Built-In Type Family Names and IDs, Font IDs, and Font File IDs 26–3
26.3.3 Font Metrics 26–8
26.4 Built-In Algorithmic Transformations 26–9
26.4.1 Memory Use 26–10
26.4.2 Fallback Metrics for Mixed Font Files 26–10
26.4.3 Spacing Criterion Fallback 26–10
26.5 Font List 26–10
26.6 Font File Validation Test Report 26–11

27 Sixel Considerations

27.1 Macro Parameter Values 27–1
27.2 Miscellaneous Considerations and Restrictions 27–2
27.2.1 Valid Set Raster Attributes (DECGRA) Commands 27–2
27.2.2 Restrictions 27–3

28 Alternative Protocols

29 Memory Management

Part IV DEClaser 3200 Printer

30 Overview

31 Logical to Physical Image

31.1 Printer Resolution 31–1
31.1.1 Horizontal Resolution 31–1
31.1.2 Vertical Resolution 31–2
31.2 Printable Area 31–4
31.2.1 Paper Sizes 31–4
31.2.2 Envelope Sizes 31–5
31.3 Mapping Page Size to Physical Sheet Size 31–5
31.4 Positioning Accuracy 31–7

32 Initial State Values

32.1 Initial States Independent of Paper Cassette 32–1
32.2 Initial States Based on Paper Size 32–4
32.3 Factory Defaults in Nonvolatile Memory 32–5

33 Maximum Printer Values

33.1 Maximum Parameter Values 33–1
33.2 Maximum Values for Printer Features 33–1

34 Paper Handling

34.1 Duplex Printing 34–1
34.2 Designating the Input Tray 34–2
34.3 Set Sheet Size (DECSSS) 34–3
34.4 Select Input Tray Failover (DECSITF) 34–5

35 Status and Error Reporting

35.1 Control Representation Mode (CRM) 35–2
35.2 Device Attributes (Secondary) Report (DAR) Parameters 35–2
35.3 Device Attributes (Secondary) Report (DA2R) Parameters 35–4
35.4 Error Parameters for Device Status Reports 35–6

36 Fonts for the DEClaser 3200 Printer

36.1 Load Font File (DECLFF) Considerations 36–1
36.2 Font Repertory 36–2
36.3 Built-in Font File Repertory 36–2
36.3.1 Type Family Names 36–3
36.3.2 Built-in Type Family Names and IDs, Font IDs, and Font File IDs 36–3
36.3.3 Font Metrics 36–7
36.4 Built-in Algorithmic Transformations 36–8
36.4.1 Memory Use 36–9
36.4.2 Spacing Criterion Fallback 36–9
36.4.3 Fallback Metrics for Mixed Font Files 36–10
36.5 Font File Validation Test Report 36–10

37 Sixel Considerations

37.1 Macro Parameter Values 37–1
37.2 Miscellaneous Considerations and Restrictions 37–2
37.2.1 Valid Set Raster Attributes (DECGRA) Commands 37–2
37.2.2 Restrictions 37–3

38 Alternative Protocols

Part V Appendixes

A Comparison of DEC PPL3 Commands by Printer

B Command Parameter Summaries

C Command Dictionary Supplement

DECFSR — Font Status Report (DECLFF, Ps2=2 or 3) C–2
DECSITF — Select Input Tray Failover C–4

D DEC PPL3 Printer Documentation

Index

Examples

5–1 Selecting an Input Tray with the Translator 5–3
15–1 Set Duplex Print Mode Command for DEClaser 2100/2200 Printers 15–2
15–2 Selecting an Input Tray for DEClaser 2100/2200 Printers . . . 15–4
16–1 DA Request and DAR Example for DEClaser 2100/2200 Printers 16–3
16–2 DA2 Request and DA2R Response for DEClaser 2200 plus Printers 16–6
24–1 Set Duplex Print Mode Command for the DEClaser 1100 Printer 24–2
25–1 DA Request and DAR Example for the DEClaser 1100 Printer 25–3
25–2 DA2 Request and DA2R Response for the DEClaser 1100 Printer 25–5
34–1 Set Duplex Print Mode Command for the DEClaser 3200 Printer 34–2
34–2 Selecting an Input Tray for DEClaser 3200 Printer 34–3
35–1 DA Request and DAR Example for the DEClaser 3200 Printer 35–3
35–2 DA2 Request and DA2R Response for the DEClaser 3200 Printer 35–6

Figures

2–1 Page Size Smaller Than Physical Sheet Size on the ANSI Text Translator 2–5
2–2 Page Size Larger Than Physical Sheet Size on the ANSI Text Translator 2–6
12–1 Page Size Smaller Than Physical Sheet Size on DEClaser 2100/2200 Printers 12–6
12–2 Page Size Larger Than Physical Sheet Size on DEClaser 2100/2200 Printers 12–7

21–1 Page Size Smaller Than Physical Sheet Size on the DEClaser 1100 Printer 21–6
21–2 Page Size Larger Than Physical Sheet Size on the DEClaser 1100 Printer 21–7
31–1 Page Size Smaller Than Physical Sheet Size on DEClaser 3200 Printer 31–6
31–2 Page Size Larger Than Physical Sheet Size on DEClaser 3200 Printer 31–7

Tables

2–1 Horizontal Pitches — ANSI Text Translator (Standard 300 Dots/Inch) 2–2
2–2 Vertical Pitches — ANSI Text Translator (Standard 300 Dots/Inch) 2–3
2–3 Minimum Printable Areas of the Translator by Paper Size 2–4
3–1 Initial State Values — ANSI Text Translator 3–2
3–2 Initial State Values of Select Graphic Rendition (SGR) Numbers 3–3
3–3 Initial State Values Based on Paper Size and Orientation . . . 3–4
4–1 Maximum Values Supported by the ANSI Text Translator . . . 4–1
5–1 Tray Selection With the ANSI Text Translator 5–2
7–1 Type Family Names in the ANSI Text Translator 7–2
7–2 Built-In Font File IDs 7–4
7–3 Font Metrics for the ANSI Text Translator 7–6
8–1 Macro Parameter Values for the ANSI Text Translator (Grid Sizes in Centipoints) 8–1
10–1 Printable Areas on the ScriptPrinter and the LN03 Image Printers 10–3
10–2 Printable Areas on PrintServer Network Printers 10–8
10–3 Printable Areas on DEClaser 1150 and DEClaser 2150/2250 Printers 10–13
10–4 Envelope Sizes Supported by DEClaser 1150 and DEClaser 2150/2250 Printers 10–13
12–1 Horizontal Pitches — DEClaser 2100/2200 Printers (Standard 300 Dots/Inch) 12–2
12–2 Vertical Pitches — DEClaser 2100/2200 Printers (Standard 300 Dots/Inch) 12–3

12–3 Printable Areas of the DEClaser 2100/2200 Printers in Centipoints 12–4
12–4 Maximum and Minimum Envelope Sizes for the DEClaser 2100/2200 Printers 12–5
13–1 Initial State Values for DEClaser 2100/2200 Printers 13–1
13–2 Initial State Values of Select Graphic Rendition (SGR) Numbers 13–3
13–3 Initialization Based on Paper Size 13–5
13–4 Factory Defaults in NVM for the DEClaser 2100/2200 Printers 13–6
13–5 Macro Values in NVM for DEClaser 2100/2200 Printers 13–7
13–6 DEClaser 2100/2200 Printers Protocol — NVM Selection and Installed Cartridge 13–8
14–1 Maximum Values Supported by DEClaser 2100/2200 Printers 14–1
15–1 Duplex Print Mode Fallbacks for the DEClaser 2100/2200 Printers 15–1
15–2 Tray Selection on DEClaser 2100/2200 Printers 15–3
15–3 Set Sheet Size (DECSSS) Parameters 15–4
16–1 Parameters for Primary DA Response for DEClaser 2100/2200 Printers 16–3
16–2 DAR Parameters (Alias Response) for DEClaser 2100/2200 Printers 16–4
16–3 Parameters for DA2 Responses for DEClaser 2100/2200 Printers 16–5
16–4 Protocol Codes for DA2R Responses 16–6
16–5 Error Parameters for Extended Printer Device Status Reports for DEClaser 2100/2200 Printers 16–7
17–1 Type Family Names in DEClaser 2100/2200 Printers 17–3
17–2 Built-In Font File IDs 17–4
17–3 Font Metrics for the DEClaser 2100/2200 Printers 17–8
17–4 Parameters for Load Font File (DECLFF) for the DEClaser 2100/2200 plus Printers 17–11
18–1 Macro Parameter Values for DEClaser 2100/2200 Printers (Grid Sizes in Centipoints) 18–1
21–1 Horizontal Pitches — DEClaser 1100 Printer (Standard 300 Dots/Inch) 21–2
21–2 Vertical Pitches — DEClaser 1100 Printer (Standard 300 Dots/Inch) 21–3

21–3 Printable Areas of the DEClaser 1100 Printer in Centipoints 21–4
21–4 Maximum and Minimum Envelope Sizes for the DEClaser 1100 Printer 21–4
22–1 Initial State Values for the DEClaser 1100 Printer 22–2
22–2 Initial State Values of Select Graphic Rendition (SGR) Numbers 22–4
22–3 Initialization Based on Paper Size 22–5
22–4 Factory Defaults in NVM for the DEClaser 1100 Printer 22–5
22–5 Macro Values in NVM for the DEClaser 1100 Printer 22–7
23–1 Maximum Values Supported by the DEClaser 1100 Printer 23–1
24–1 Duplex Print Mode Fallbacks for the DEClaser 1100 Printer 24–1
24–2 Tray Selection on the DEClaser 1100 Printer 24–3
24–3 Set Sheet Size (DECSSS) Parameters 24–3
25–1 Parameters for Primary DA Responses for the DEClaser 1100 Printer 25–2
25–2 DAR Parameters (Alias Response) for the DEClaser 1100 Printer 25–3
25–3 Parameters for DA2R Responses for the DEClaser 1100 Printer 25–4
25–4 Protocol Codes for DA2R Responses 25–5
25–5 Error Parameters for Extended Device Status Reports for the DEClaser 1100 Printer 25–6
26–1 Type Family Names in the DEClaser 1100 Printer 26–3
26–2 Built-In Font File IDs 26–4
26–3 Font Metrics for the DEClaser 1100 Printer 26–8
26–4 Parameters for Load Font File (DECLFF) for the DEClaser 1100 Printer 26–11
27–1 Macro Parameter Values for the DEClaser 1100 Printer (Grid Sizes in Centipoints) 27–2
31–1 Horizontal Pitches — DEClaser 3200 Printer (Standard 300 Dots/Inch) 31–2
31–2 Vertical Pitches — DEClaser 3200 Printer (Standard 300 Dots/Inch) 31–3
31–3 Printable Areas of the DEClaser 3200 Printer in Centipoints 31–4

31–4	Printable Area for Variable Size Paper for the DEClaser 3200 Printer	31–5
32–1	Initial State Values for the DEClaser 3200 Printer	32–1
32–2	Initial State Values of Select Graphic Rendition (SGR) Numbers	32–3
32–3	Initialization Based on Paper Size	32–4
32–4	Factory Defaults in NVM for the DEClaser 3200 Printer	32–5
33–1	Maximum Values Supported by the DEClaser 3200 Printer	33–1
34–1	Duplex Print Mode Fallbacks for the DEClaser 3200 Printer	34–1
34–2	Tray Selection on the DEClaser 3200 Printer	34–3
34–3	Set Sheet Size (DECSSS) Parameters	34–4
34–4	Discrete Paper Sizes for the DEClaser 3200 Printer	34–5
34–5	DECSITF Parameters for the DEClaser 3200 Printer	34–6
35–1	Parameters for Primary DA Response for the DEClaser 3200 Printer	35–2
35–2	DAR Parameters (Alias Response) for the DEClaser 3200 Printer	35–3
35–3	Parameters for DA2 Responses for the DEClaser 3200 Printer	35–4
35–4	Error Parameters for Extended Printer Device Status Reports for the DEClaser 3200 Printer	35–6
36–1	Type Family Names in the DEClaser 3200 Printer	36–3
36–2	Built-in Font File IDs	36–4
36–3	Font Metrics for the DEClaser 3200 Printer	36–8
36–4	Parameters for Load Font File (DECLFF) for the DEClaser 3200 Printer	36–10
37–1	Macro Parameter Values for the DEClaser 3200 Printer (Grid Sizes in Centipoints)	37–1
38–1	Protocols Supported by the DEClaser 3200 Printer	38–1
A–1	Comparison of DEC PPL3 Commands	A–2
A–2	Comparison of Extensions to the Protocol	A–13
A–3	Comparison of Exceptions to the Protocol	A–19
A–4	Alternative Protocols	A–20
B–1	Generic Error Codes for DEC PPL3 Device Status Reports	B–2
B–2	Explanations of DEC PPL3 Font File Validation Tests	B–3

Preface

Intended Audience

The *Digital ANSI-Compliant Printing Protocol Level 3 Programming Supplement* is for programmers interested in the following:

- Creating applications for specific level 3 devices
- Understanding how documents may appear on different level 3 devices

Devices include both printers and host-based translators.

Document Structure

This manual contains the following parts, chapters, and appendixes:

Part I — ANSI Text Translator

- Chapter 1 provides a brief overview of the ANSI Text translator.
- Chapter 2 explains the relationship between the logical information and the printing of the physical page in the translator environment.
- Chapter 3 lists initial state and job startup values for the translator.
- Chapter 4 lists maximum values for translator features.
- Chapter 5 explains paper handling when you are using the translator.
- Chapter 6 lists unsupported reporting commands.
- Chapter 7 lists fonts available to the translator.
- Chapter 8 lists sixel implementation characteristics specific to the translator.
- Chapter 9 discusses protocol switching when you are using the translator.
- Chapter 10 provides translator information specific to the ScriptPrinter printer and the LN03 Image printer, the PrintServer family of network printers, and the DEClaser family of PostScript printers.

Part II — DEClaser 2100/2200 Printers

- Chapter 11 describes the printer models.
- Chapter 12 explains the relationship between the logical information and the printing of the physical page in the DEClaser environment.
- Chapter 13 discusses reset and power-up values and lists initial state values for the printer.
- Chapter 14 lists maximum values for printer features.
- Chapter 15 explains paper handling for the printer.
- Chapter 16 describes reporting commands and lists error messages.
- Chapter 17 lists fonts available to the printer.
- Chapter 18 discusses sixel implementation specific to the DEClaser 2100/2200 printers.
- Chapter 19 discusses protocol switching when you are using the DEClaser 2100/2200 printers.

Part III — DEClaser 1100 Printer

- Chapter 20 provides a brief overview of the DEClaser 1100 printer.
- Chapter 21 explains the relationship between the logical information and the printing of the physical page in the DEClaser environment.
- Chapter 22 discusses reset and power-up values and lists initial state values for the printer.
- Chapter 23 lists maximum values for printer features.
- Chapter 24 explains paper handling for the printer.
- Chapter 25 describes reporting commands and lists error messages.
- Chapter 26 lists fonts available to the printer.
- Chapter 27 discusses sixel implementation specific to the DEClaser 1100 printer.
- Chapter 28 discusses protocol switching when using the DEClaser 1100 printer.
- Chapter 29 discusses memory management and the DEClaser 1100 printer.

Part IV — DEClaser 3200 Printer

- Chapter 30 describes the DEClaser 3200 printer.
- Chapter 31 explains the relationship between the logical information and the printing of the physical page in the DEClaser 3200 printer.
- Chapter 32 discusses reset and power-up values and lists initial state values for the printer.
- Chapter 33 lists maximum values for printer features.
- Chapter 34 explains paper handling for the printer.
- Chapter 35 describes reporting commands and lists error messages.
- Chapter 36 lists the fonts that come with the DEClaser 3200 printer.
- Chapter 37 discusses sixel implementation specific to the DEClaser 3200 printer.
- Chapter 38 discusses protocol switching when you are using the DEClaser 3200 printer.

Appendixes

- Appendix A compares the DEC PPL3 commands implemented in various Digital level 3 printers.
- Appendix B lists generic code error parameters for extended Device Status Reports (DSR), and font file validation error and warning parameters for Font Status Reports (DECFSR, DECLFF Ps2 = 2 or 3).
- Appendix C documents new DEC PPL3 commands not listed in the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual*.
- Appendix D lists other books associated with the Digital ANSI-Compliant Printing Protocol and level 3 printers.

Conventions

DEC PPL3 is used throughout the manual to indicate level 3 of the Digital ANSI-Compliant Printing Protocol. The following conventions are used throughout this manual:

Convention	Meaning
UPPERCASE	Mnemonics for DEC PPL3 commands as well as DCL commands and parameters are printed in text in uppercase.

Convention	Meaning
{ }	Braces enclose lists from which you must choose one alternative. The choices are listed vertically or separated by the vertical bar symbol (|).
. . .	When an item in command formats is followed by a horizontal ellipsis, you can repeat the item one or more times.
Bold	Indicates words the first time they appear and indicates ULTRIX commands, options, and file names in text.
Italics	Indicates variables in ULTRIX, VMS, and DEC PPL3 commands.

monospaced type	Illustrates a DEC PPL3 command. Below each character is a column/row number that indicates the coded character's position in a standard code table, for example:
	`CSI 2 ! v`
	`9/11 3/2 2/1 7/6`

SP	Indicates a space character (2/0) as part of the format of a DEC PPL3 command (`CSI 3 SP X`). Spaces appear between characters in commands for clarity; they are not part of the command syntax unless indicated with the SP character.

Part I

ANSI Text Translator

Part I of the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Supplement* describes the level 3 Digital ANSI-Compliant Printing Protocol (DEC PPL3) implementation specific to the translator. For general information on the Digital ANSI-Compliant Printing Protocol, based on ANSI X3.64, see the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual*.

- Chapter 1 provides a brief overview of the ANSI Text translator.
- Chapter 2 explains the relationship between the logical information and the printing of the physical page in the translator environment.
- Chapter 3 lists initial state and job startup values for the translator.
- Chapter 4 lists maximum values for the translator.
- Chapter 5 explains paper handling when using the translator.
- Chapter 6 lists unsupported reporting commands.
- Chapter 7 lists fonts available to the translator.
- Chapter 8 lists sixel implementation characteristics specific to the translator.
- Chapter 9 discusses protocol switching when using the translator.
- Chapter 10 provides translator information specific to the ScriptPrinter printer and the LN03 Image printer, the PrintServer family of network printers, and the DEClaser family of PostScript printers.

1
Overview

The ANSI Text translator converts files that conform to level 3 of the Digital ANSI-Compliant Printing Protocol, based on ANSI X3.64, into Adobe's PostScript page description language for printing on Digital's PostScript printers.

Not all Digital Postscript printers use every feature available in the ANSI translator. For example, not all Digital printers support the same paper sizes. For information on ANSI translation specific to the ScriptPrinter serial-line printer and the LN03 Image printer, see Section 10.1. For information specific to the PrintServer family of network printers, see Section 10.2. For information specific to the DEClaser family of PostScript printers, see Section 10.3.

Changes to the ANSI Text translator for Version 4.0 are as follows:

- Availability of soft font kits to emulate the functionality of font cartridges (See the *DECprint Printing Services User's Guide* for more information.)
- Subscript and superscript attributes now compatible with other DEC PPL3 printers
- Print command support of /HEADER and /SPACE through the symbiont (See the *DECprint Printing Services User's Guide* for more information.)

2

Logical to Physical Image

This chapter contains the following topics related to creating the physical image:

- Translator resolution, Section 2.1
- Printable area, Section 2.2
- Mapping the page size to the physical sheet size, Section 2.3
- Positioning accuracy, Section 2.4
- Justification, Section 2.5

2.1 Translator Resolution

The ANSI Text translator provides an internal addressing capability of 1/7200 inch (**centipoint** addressing) and the PostScript interpreter uses an imaging resolution of 300 x 300 dots/inch for supported devices. This addressing capability and imaging resolution support a wide range of standard font pitches and sixel graphics resolutions.

2.1.1 Horizontal Resolution

The ANSI Text translator supports the horizontal pitch values listed in Table 2–1 for the selective parameters (Ps) of the Set Horizontal Pitch (DECSHORP) and the Select Horizontal Spacing (SHS) commands. The table lists the average width of characters (target pitch) in characters/inch if this value is exact. If characters/inch is only an approximate value, the table provides the target value in inches with the approximate characters/inch value in parentheses.

Table 2–1 Horizontal Pitches — ANSI Text Translator (Standard 300 Dots/Inch)

Target Pitch (Char/Inch)	Target Value (Centipoints)	Actual Pitch (Char/Inch)	Actual Value (Centipoints)
5	1440.00	5.000	1440
6	1200.00	6.000	1200
(6.6) 10/66 in.	1090.90	6.605	1090
(8.25) 8/66 in.	872.72	8.265	872
(8.55) 28/240 in.	840.00	8.550	840
9	800.00	9.000	800
10	720.00	10.000	720
(10.3) 29/300 in.	696.00	10.344	696
12	600.00	12.000	600
12.77	563.82	12.788	563
(13.2) 5/66 in.	545.45	13.210	545
15	480.00	15.000	480
(16.5) 4/66 in.	436.36	16.510	436
(17.1) 14/240 in.	420.00	17.100	420
18	400.00	18.000	400

The macro parameter values for sixel graphics grid sizes and aspect ratios provided by the ANSI Text translator are shown in Table 8–1.

2.1.2 Vertical Resolution

The ANSI Text translator provides the vertical addressing capability for pitches required for existing fonts and graphics mode. For the fallback values for sixel graphics vertical grid sizes, see Table 8–1. Table 2–2 lists vertical pitch values supported for the selective parameters (Ps) of the Set Vertical Pitch (DECVERP) and the Select Vertical (Line) Spacing (SVS) commands. The second column, labeled Actual Value, gives the amount of white space between the lines in centipoints for each pitch selection.

Table 2–2 Vertical Pitches — ANSI Text Translator (Standard 300 Dots/Inch)

Target Pitch (Lines/Inch)	Actual Value (Centipoints)
2	3600
3	2400
4	1800
6	1200
8	900
12	600

Target Pitch (Lines/A-size Printable Area)	Actual Value (Centipoints)
22	3456
33	2304
44	1728
66	1152
88	864
132	576

Target Pitch (Lines/30 Millimeters)	Actual Value (Centipoints)
3	2856
4	2136
6	1416
12	720

Note

The translator implements values for the Spacing Pitch Increment (SPI) command as requested.

2.2 Printable Area

Table 2–3 shows the minimum printable area in centipoints specified by Digital for paper sizes supported by the ANSI Text translator and selected with the PRINT command as follows:

```
$ PRINT/PARAMETER=(DATA_TYPE=ANSI,PAGE_SIZE=logical-size)
```

For the maximum printable area of the paper sizes supported on the ScriptPrinter device and the LN03 Image printer, see Table 10–1. For the maximum printable area of the paper sizes supported on the PrintServer network printers, see Table 10–2. For the printable area of the paper sizes for the Page Format Select (PFS) and the Variable Page Format Select (DECVPFS) commands, see the respective commands in the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual.*

Table 2–3 Minimum Printable Areas of the Translator by Paper Size

Paper Size (Conventional Units)	Width (Centipoints)	Length (Centipoints)
A (8 1/2 in. x 11 in.)	57600	75600
A3 (297 mm x 420 mm)	80568	115488
A4 (210 mm x 297 mm)	55872	80568
A5 (148 mm x 210 mm)	38400	55920
B (11 in. x 17 in.)	75600	118800
B4 (250 mm x 353 mm)	69264	99567
B5 (176 mm x 250 mm)	48000	69264
Legal (8 1/2 in. x 14 in.)	56700	97200
Executive (7 1/2 in. x 10 1/2 in.)	50400	72000

2.3 Mapping Page Size to Physical Sheet Size

The Page Format Select (PFS) and Variable Page Format Select (DECVPFS) commands, or the PAGE_SIZE parameter on the PRINT command, provide a page size. The physical sheet size depends on the physical dimensions of the paper selected with a size switch on the printer or with the SHEET_SIZE parameter to the PRINT command. When the page size does not match the physical sheet size, the ANSI Text translator keeps the page and physical sheet aligned at the bottom left-hand corner.

- If the page size is smaller than the physical sheet size, the translator leaves white space on the right and top edges. See Figure 2–1.
- If the page size is larger than physical sheet size, the translator does not image characters that extend beyond the boundaries of the printable area in both the horizontal and vertical directions. See Figure 2–2.

Note

You can modify physical page mapping with the NUMBER_UP parameter to the PRINT command.

Figure 2–1 Page Size Smaller Than Physical Sheet Size on the ANSI Text Translator

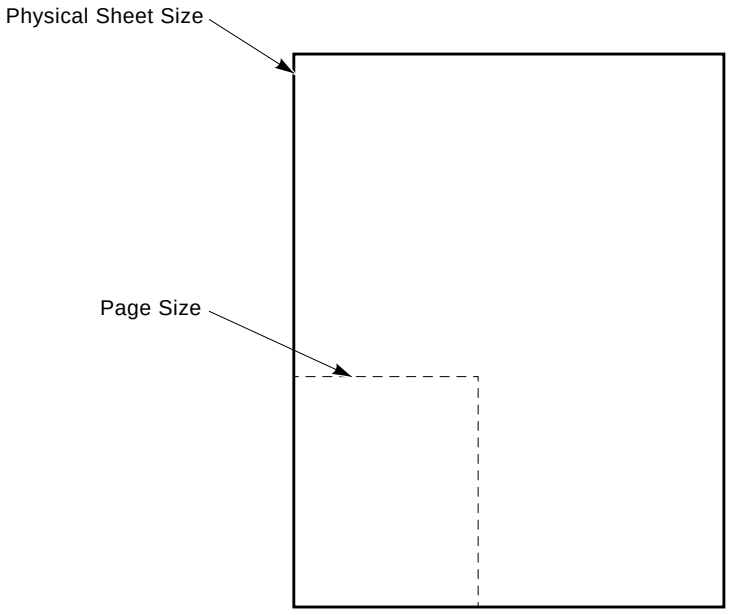
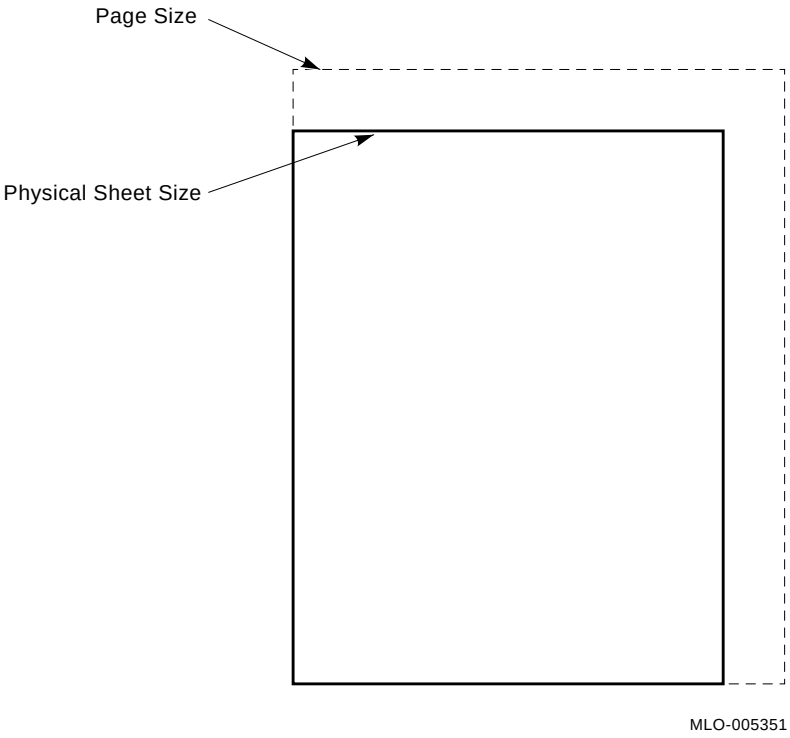


Figure 2–2 Page Size Larger Than Physical Sheet Size on the ANSI Text Translator



2.4 Positioning Accuracy

The ANSI Text translator rounds to the nearest pixel at imaging time, keeping distances in centipoints. Positioning is accurate to 1/2 pixel. For vectors, drawn with the Draw Vector (DECVEC) and Draw Relative Vector (DECRVEC) commands, values between 0 and 24 centipoints round to 1 pixel.

2.5 Justification

The ANSI Text translator discards the right bearing of the rightmost character on the line and the left bearing of the leftmost character on the line.

3
Initial State Values

The topics discussed in this chapter include the following:

- Initial state values for the translator, independent of paper size and page orientation, Section 3.1
- Initial state values based on paper size and page orientation, Section 3.2

Values in setup modules and forms that include setup modules can override initial state values.

3.1 Initial States Independent of Paper Size and Orientation

Table 3–1 and Table 3–2 list the values used by the translator at job startup and for Select Conformance Level (DECSCL), Soft Terminal Reset (DECSTR), and Reset to Initial State (RIS) commands. These values are independent of paper size and page orientation.

Table 3–1 Initial State Values — ANSI Text Translator

Variable or Control Function	DECSCL	Job Startup	DECSTR RIS
Origin (DECOPM)	Reset	Reset	Reset
Position Unit Mode[1]	Reset	Reset	Reset
Vertical spacing	Font-dependent	Font-dependent	Font-dependent
Horizontal spacing	Font-dependent	Font-dependent	Font-dependent
Size unit[1]	Decipoints	Decipoints	Decipoints
Active position	Origin	Origin	Origin
Horizontal tabs[2]	Every eight	Every eight	Every eight
Line Feed/New Line	Reset	Reset	Reset
CR/New Line Mode	Reset	Reset	Reset
Pitch Select Mode[3]	Set	Set	Set
Proportional spacing	Reset	Reset	Reset
Justify	Disabled	Disabled	Disabled
SGR attributes	Disabled	Disabled	Disabled
Vertical tabs[4]	Every VAI	Every VAI	Every VAI
G0	ASCII	ASCII	ASCII
G1	ASCII	ASCII	ASCII
G2	User Preference	User Preference	User Preference
G3	User Preference	User Preference	User Preference
GL	G0	G0	G0
GR	G2	G2	G2
GSS	10 points	10 points	10 points
GSM	100,100	100,100	100,100
Autowrap	Set	Set	Set
User Preference Set	DEC Supplemental	DEC Supplemental	Unchanged

[1]Because Position Unit Mode (PUM) is reset by default, Select Size Unit (SSU) is ignored for most commands.

[2]Horizontal tabs are set every eight columns, starting with column 9 (9,17, . . .). They fill the entire tab table.

[3]When DECPSM is reset, the Horizontal Advance Increment (HAI) is font-dependent.

[4]Vertical tabs are set every line or Vertical Advance Increment (VAI) and fill the entire tab table.

(continued on next page)

Table 3–1 (Cont.) Initial State Values — ANSI Text Translator

Variable or Control Function	DECSCL	Job Startup	DECSTR RIS
CRM	Unchanged	Reset	Unchanged
Tray selection (feeder)	Job default[5]	Job default	Job default

[5] Job default is the tray selected when the translator begins processing.

Table 3–2 Initial State Values of Select Graphic Rendition (SGR) Numbers

SGR	Assignment Type	ID	Meaning
10	Type family	DBULTN1	DEC Builtin1 family
11	Type family	RCOURIR	Courier family
12	Type family	RELITE0	Elite family
13	Font collection plus	RCOURIRJ02SK00GG	Courier 10 point, 10 pitch
14	Font collection plus	RELITE0L02SK00GG	Elite 10 point, 12 pitch
15	Font collection plus	RCOURIR101VK00GG	Courier 6.7 point, 13.6 pitch
16	Font collection plus	RCOURIR202SK00GG	Courier 10 point, 10.3 pitch
17	Type family	DBULTN1	DEC Builtin1 family
18	Type family	DBULTN1	DEC Builtin1 family
19	Type family	DBULTN1	DEC Builtin1 family

Soft font kits can modify the default Select Graphic Rendition (SGR) values. These modifications occur during power-up, Soft Terminal Reset (DECSTR), Reset to Initial State (RIS), and for the Select Conformance Level (DECSCL) command. The translator also references modifications to the SGR values made by the soft font kits on the Assign Type Family or Font (DECATFF) command when the string is null.

3.2 Initial States Based on Paper Size and Orientation

The bounds and the Select Graphic Rendition (SGR) parameter are determined at job startup and depend on the paper size and orientation you select using parameters to the PRINT command. Table 3–3 lists the bounds as a parameter of the Page Format Select (PFS) command or a Variable Page Format Select (DECVPFS) command. For PFS and DECVPFS values, see the description of the respective commands in the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual*.

Table 3–3 Initial State Values Based on Paper Size and Orientation

Size	Orientation	Bounds Definition	SGR[1]
A	Portrait	PFS ?20	10
A	Landscape	PFS ?21	15
A3	Portrait	DECVPFS for A3-size paper	16
A3	Landscape	DECVPFS for A3-size paper	15
A4	Portrait	PFS ?22	16
A4	Landscape	PFS ?23	15
A5	Portrait	DECVPFS for A5-size paper	16
A5	Landscape	DECVPFS for A5-size paper	15
B	Portrait	PFS ?26	10
B	Landscape	PFS ?27	15
B4	Portrait	DECVPFS for B4-size paper	16
B4	Landscape	DECVPFS for B4-size paper	15
B5	Portrait	DECVPFS for B5-size paper	16
B5	Landscape	DECVPFS for B5-size paper	15
Legal	Portrait	PFS ?24	10
Legal	Landscape	PFS ?25	15
Executive	Portrait	DECVPFS for executive-size paper	10
Executive	Landscape	DECVPFS executive-size paper	15

[1]The symbiont defines the SGR values. These values may change with different symbionts.

4

Maximum ANSI Text Translator Values

This chapter lists the maximum parameter values supported by the ANSI translator. The topics include:

- Maximum parameter values, Section 4.1
- Maximum values for translator features, Section 4.2

4.1 Maximum Parameter Values

The ANSI Text translator has the following limits for parameter values:

- Graphics repeat function (DECGRI) — 32K (32,767) limit. The translator sets values that exceed this limit to the limit value.
- Grid size parameter — 99 units for maximum horizontal grid size; 1000 for maximum aspect ratio (99,000 units for maximum vertical grid size).

4.2 Maximum Values for Translator Features

Table 4–1 lists the maximum values supported by the ANSI Text translator.

Table 4–1 Maximum Values Supported by the ANSI Text Translator

Translator Features	Maximum
Horizontal tabs	204
Vertical tabs	204
Number of trays	{3 | 2 | 1}[1]
Number of entries in font dictionary	256

[1]The number of trays depends on the destination. See Section 5.2 for more information on input tray destinations.

(continued on next page)

Table 4–1 (Cont.) Maximum Values Supported by the ANSI Text Translator

Translator Features	Maximum
Font RAM size	No limitation (virtual memory of the operating system)
Built-in bitmap RAM or graphics buffer	Full page bitmap of any supported paper size
Number of cartridge kits	Depends on the number of entries in the font dictionary and the font RAM size

5
Paper Handling

The following options specific to the ANSI Text translator are discussed in this chapter:

- Duplex printing, Section 5.1
- Input tray selection, Section 5.2
- Set sheet size, Section 5.3

5.1 Duplex Printing

The ANSI Text translator does not support the Set Duplex Print Mode (DECSDPM) command. For duplex printing with ANSI Text translator jobs, use the SIDES parameter on the PRINT command line. Currently, the only printers supported by the ANSI Text translator that print on both sides of the paper are the PrintServer 20 network printer and the DEClaser 2250 and 3250 printers.

5.2 Designating the Input Tray

The ANSI Text translator supports the Automatic Sheet Feeder (Input Tray) Control (DECASFC) command to select the appropriate tray for printers that have multiple trays:

```
CSI  Ps   !   v
9/11 3/xx 2/1 7/6
```

DECASFC causes a conditional Form Feed. Subsequent sheets come from the tray as indicated in the selective parameter (Ps) value in Table 5–1.

Table 5–1 Tray Selection With the ANSI Text Translator

Ps	Tray Selected	PrintServer Printers	DEClaser 2250 Printer[2]	Single Tray Printers[3]	DEClaser 3250 Printer[5]
0	No tray change	x	x	x	x
1	Top tray	x	x	x	x
2	Bottom tray	x	x	x[4]	x
3	Large capacity input tray	x			x[5]
3	Envelope feeder[1]		x		

[1]The envelope feeder is available as an option for the DEClaser 2250 printer and can be selected only with Ps = 3.

[2]When using special, one-sided paper, feed the paper faceup.

[3]Single tray printers supported by the translator include the DEClaser 1150 and 2150 printers, the ScriptPrinter printer, and the LN03 Image printer.

[4]The DEClaser 1150 can be configured with an optional cassette tray.

[5]The LCIT is an option. The optional MMF for the DEClaser 3250 can not be accessed via the ANSI Text translator. When using special, one-sided paper, feed the paper face down.

If your system manager has not changed the value, the default DECASFC parameter for the input tray is Ps = 3, which selects the large capacity input tray.

If your printer does not have multiple trays, the printer ejects the current page upon receipt of the command and continues printing from the same tray.

Override the DECASFC default with the following parameter to the PRINT command:

- On a VMS system:

  ```
  $ PRINT/PARAMETER=(INPUT_TRAY={TOP|MIDDLE|BOTTOM|LCIT})
  ```

  The BOTTOM and LCIT parameters both select the large capacity input tray.

- On an ULTRIX system:

  ```
  % lpr -Iinput_tray
  ```

  Select *input_tray* from *top, middle, bottom*, or *LCIT*. LCIT and bottom both select the large capacity input tray.

If you have a DECASFC command in the file to be printed, it overrides the PRINT command and parameters.

Example 5–1 shows the command that selects the top input tray.

Example 5–1 Selecting an Input Tray with the Translator

```
CSI  1   !   v
9/11 3/1 2/1 7/6
```

5.3 Set Sheet Size (DECSSS)

The ANSI Text translator does not support the Set Sheet Size (DECSSS) command. On devices supported by the translator, trays have tags that identify the size of the paper.

6

Status and Error Reporting

The ANSI Text translator does not support the following DEC PPL3 commands that relate to reporting:

- Cursor Position Report (CPR)
- Device Attributes (DA) request
- Device Attributes Report (DAR)
- Device Attributes (Secondary) DA2 request
- Device Attributes (Secondary) Report (DA2R)
- Request Font Status (DECRFS)
- Font Status Report (DECFSR)
- Device Status Request (DSR)
- Device Status Report (DSR)

For information on these commands, refer to the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual.*

7

Fonts for the ANSI Text Translator

This chapter discusses the following font-related topics:

- Load Font File (DECLFF) considerations, Section 7.1
- Font file repertory, Section 7.2
- Available built-in fonts, Section 7.3
- Algorithmic transformations for rendering attributes, Section 7.4

For more information on fonts and font selection, refer to the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual*.

7.1 Load Font File (DECLFF) Considerations

The ANSI Text translator can store up to 256 font files for downline loading to the PostScript printer. Font files that are downline loaded using the Load Font File (DECLFF) command must follow the Common Font File Format (CFFF). For information, refer to the *Font File Format User's Manual*.

7.2 Font Repertory

The ANSI Text translator font repertory consists of the following:

- Built-in fonts
- Digital Standard Font Files available in CFFF format, including soft font kits, that can be downline loaded
- Customer-provided font files in CFFF format that can be downline loaded
- Built-in algorithmic transformations

7.3 Built-In Font File Repertory

The ANSI Text translator has 20 built-in font files. These font files support the combination of five character sets in four fonts. The following fonts reside in the ANSI Text translator:

- Courier 10-point 10-pitch normal portrait (Normal means that the font is not bold, italic, or otherwise attributed.)
- Courier 10-point 10.3-pitch normal portrait
- Courier 6.7-point 13.6-pitch normal landscape
- Elite 10-point 12-pitch normal portrait (type style used by translator is Courier 10-point 12-pitch)

For each font, the following character sets reside in the printer:

- ASCII
- DEC Supplemental
- DEC Technical
- DEC Special Graphics (VT100 Line Drawing)
- ISO Latin-1 Supplemental

7.3.1 Type Family Names

Table 7–1 lists the type families and the associated type family IDs built into the ANSI Text translator.

Table 7–1 Type Family Names in the ANSI Text Translator

Type Family Name	Type Family ID (Seven Characters)
DEC Builtin1	DBULTN1[1]
Courier	RCOURIR[2]
Elite 12	RELITE0[2]
PI font	D000000[1]

[1]The "D" in the type family IDs for DEC Builtin1 and PI font indicates that the name is registered with Digital, but is not registered internationally.

[2]The "R" in the type family IDs for Courier and Elite 12 indicates that these names are either registered internationally or are in the public domain.

7.3.2 Built-In Type Family Names and IDs, Font IDs, and Font File IDs

Table 7–2 lists type family names, type family IDs, font IDs, and font file IDs built into the ANSI Text translator.

Each of the 20 font files contains a character set that has a style, an orientation, a point size, and a horizontal spacing. Table 7–2 contains 40 entries. The translator recognizes each font under two names:

- A name that is either internationally registered or in the public domain: for example, Courier or Elite 12
- A name registered by Digital: for example, Builtin or PI

For example, the following two entries are the same:

- Courier ASCII, 10 point, 10 pitch, Portrait font — (RCOURIR J 02S K 00 G G 00 01U ZZZZ 02 F 0 0 0)
- DEC BUILTIN1 ASCII, 10 point, 10 pitch, Portrait font — (DBULTN1 J 02S K 00 G G 00 01U ZZZZ 02 F 0 0 0)

In the ANSI Text translator, a font file has a 31-character name. The first seven characters are the **type family ID**, the first 12 characters are the **font collection ID**, and the first 16 characters define the **font ID**. The following example shows how the type families, font collections, fonts, and font files are related:

- A type family ID — DBULTN1
- A font collection ID — DBULTN1J02SK
- A font ID — DBULTN1J02SK00GG
- A font file ID — DBULTN1J02SK00GG0001UZZZZ02F000

In Table 7–2, the font ID, the font collection ID, and the font file ID are indicated by arrows.

Note

Spaces appear in the IDs for clarity; they are not part of the IDs.

Table 7–2 Built-In Font File IDs

Pitch	Type Size	Character Set	Font File ID——————————————————————> Font ID————————————> Font Collection ID—->
1. Type Family Name: DEC Builtin1 — Type Family ID: DBULTN1			
10	10	ASCII	DBULTN1 J 02S K 00 G G 00 01U ZZZZ 02 F 0 0 0
10	10	DEC Supplemental[1]	DBULTN1 J 02S K 00 G G 00 245 ZZZZ 02 F 0 0 0
10	10	ISO Latin-1 Supplemental	DBULTN1 J 02S K 00 G G 00 6DD ZZZZ 02 F 0 0 0
10.3	10	ASCII	DBULTN1 2 02S K 00 G G 00 01U ZZZZ 02 F 0 0 0
10.3	10	DEC Supplemental[1]	DBULTN1 2 02S K 00 G G 00 245 ZZZZ 02 F 0 0 0
10.3	10	ISO Latin-1 Supplemental	DBULTN1 2 02S K 00 G G 00 6DD ZZZZ 02 F 0 0 0
12	10	ASCII	DBULTN1 L 02S K 00 G G 00 01U ZZZZ 02 F 0 0 0
12	10	DEC Supplemental[1]	DBULTN1 L 02S K 00 G G 00 245 ZZZZ 02 F 0 0 0
12	10	ISO Latin-1 Supplemental	DBULTN1 L 02S K 00 G G 00 6DD ZZZZ 02 F 0 0 0
13.6	6.7	ASCII	DBULTN1 1 01V K 00 G G 00 01U ZZZZ 02 F 0 0 0
13.6	6.7	DEC Supplemental[1]	DBULTN1 1 01V K 00 G G 00 245 ZZZZ 02 F 0 0 0
13.6	6.7	ISO Latin-1 Supplemental	DBULTN1 1 01V K 00 G G 00 6DD ZZZZ 02 F 0 0 0
2. Type Family Name: Courier — Type Family ID: RCOURIR			
10	10	ASCII	RCOURIR J 02S K 00 G G 00 01U ZZZZ 02 F 0 0 0
10	10	DEC Supplemental[1]	RCOURIR J 02S K 00 G G 00 245 ZZZZ 02 F 0 0 0
10	10	DEC Technical	RCOURIR J 02S K 00 G G 00 01Q ZZZZ 02 F 0 0 0
10	10	DEC Special Graphics	RCOURIR J 02S K 00 G G 00 01C ZZZZ 02 F 0 0 0
10	10	ISO Latin-1 Supplemental	RCOURIR J 02S K 00 G G 00 6DD ZZZZ 02 F 0 0 0
10.3	10	ASCII	RCOURIR 2 02S K 00 G G 00 01U ZZZZ 02 F 0 0 0
10.3	10	DEC Supplemental[1]	RCOURIR 2 02S K 00 G G 00 245 ZZZZ 02 F 0 0 0
10.3	10	DEC Technical	RCOURIR 2 02S K 00 G G 00 01Q ZZZZ 02 F 0 0 0
10.3	10	DEC Special Graphics	RCOURIR 2 02S K 00 G G 00 01C ZZZZ 02 F 0 0 0
10.3	10	ISO Latin-1 Supplemental	RCOURIR 2 02S K 00 G G 00 6DD ZZZZ 02 F 0 0 0
13.6	6.7	ASCII	RCOURIR 1 01V K 00 G G 00 01U ZZZZ 02 F 0 0 0

[1]The character set ID field of 01O formerly identified DEC Supplemental. It is now used for user preference.

(continued on next page)

Table 7–2 (Cont.) Built-In Font File IDs

Pitch	Type Size	Character Set	Font File ID——————————————————————> Font ID————————————> Font Collection ID—->
2. Type Family Name: Courier — Type Family ID: RCOURIR			
13.6	6.7	DEC Supplemental[1]	RCOURIR 1 01V K 00 G G 00 245 ZZZZ 02 F 0 0 0
13.6	6.7	DEC Technical	RCOURIR 1 01V K 00 G G 00 01Q ZZZZ 02 F 0 0 0
13.6	6.7	DEC Special Graphics	RCOURIR 1 01V K 00 G G 00 01C ZZZZ 02 F 0 0 0
13.6	6.7	ISO Latin-1 Supplemental	RCOURIR 1 01V K 00 G G 00 6DD ZZZZ 02 F 0 0 0
3. Type Family Name: Elite 12 — Type Family ID: RELITE0			
12	10	ASCII	RELITE0 L 02S K 00 G G 00 01U ZZZZ 02 F 0 0 0
12	10	DEC Supplemental[1]	RELITE0 L 02S K 00 G G 00 245 ZZZZ 02 F 0 0 0
12	10	DEC Technical	RELITE0 L 02S K 00 G G 00 01Q ZZZZ 02 F 0 0 0
12	10	DEC Special Graphics	RELITE0 L 02S K 00 G G 00 01C ZZZZ 02 F 0 0 0
12	10	ISO Latin-1 Supplemental	RELITE0 L 02S K 00 G G 00 6DD ZZZZ 02 F 0 0 0
4. Type Family Name: PI Font — Type Family ID: D000000			
10	10	DEC Technical	D000000 J 02S K 00 G G 00 01Q ZZZZ 02 F 0 0 0
10	10	DEC Special Graphics	D000000 J 02S K 00 G G 00 01C ZZZZ 02 F 0 0 0
10.3	10	DEC Technical	D000000 2 02S K 00 G G 00 01Q ZZZZ 02 F 0 0 0
10.3	10	DEC Special Graphics	D000000 2 02S K 00 G G 00 01C ZZZZ 02 F 0 0 0
12	10	DEC Technical	D000000 L 02S K 00 G G 00 01Q ZZZZ 02 F 0 0 0
12	10	DEC Special Graphics	D000000 L 02S K 00 G G 00 01C ZZZZ 02 F 0 0 0
13.6	6.7	DEC Technical	D000000 1 01V K 00 G G 00 01Q ZZZZ 02 F 0 0 0
13.6	6.7	DEC Special Graphics	D000000 1 01V K 00 G G 00 01C ZZZZ 02 F 0 0 0

[1]The character set ID field of 01O formerly identified DEC Supplemental. It is now used for user preference.

7.3.3 Font Metrics

Table 7–3 lists the metrics in centipoints for the fonts built into the ANSI Text translator.

Table 7–3 Font Metrics for the ANSI Text Translator

CFFF Field	Courier 10	Courier 10.3	Elite 12	Courier 13.6
Total vertical size	1152	1152	1152	864
Above baseline offset	–840	–840	–840	–648
Below baseline offset	312	312	312	216
Minimum space size[1]	360	336	288	264
Width of space	720	696	600	528
Maximum space size[2]	1440	1392	1200	1056
Superscript vertical[3]	–576	–576	–576	–432
Subscript vertical[3]	576	576	576	432
Underline offset (height, thickness)	240, 72	240, 72	240, 72	168, 48
Strike-through offset (height, thickness)	–264, 72	–264, 72	–264, 72	–192, 48
Overline offset (height, thickness)	–912, 72	–912, 72	–912, 72	–480, 48

[1] In general, minimum space is calculated as 33% to 50% of width of space.

[2] In general, maximum space is calculated as 200% of width of space.

[3] In general, superscript and subscript offsets are one-half of the total vertical size.

7.4 Built-In Algorithmic Transformations

When the print job requires a font with a particular set of attributes, the translator first searches the current repertory for a font that contains the proper character set, in the proper style, in the proper horizontal and vertical size, with the desired attributes.

If the search fails to find a font with the desired attributes, the ANSI Text translator attempts to approximate the desired attributes by using algorithmic transformations on the existing repertory.

The ANSI Text translator provides fallback algorithmic transformations for the following:

- Bold (with shadow bold)
- Portrait/landscape orientation (rotating)
- Italic (by slanting the character)
- Underline
- Strike-through
- Overline
- National Replacement Character Sets (NRCS)

The ANSI Text translator always uses algorithmic transformations for the following:

- Horizontal spacing
- Vertical spacing
- Double underline

The ANSI Text translator does not provide fallbacks for the following attributes:

- Size scaling of any type
- Kerning

When the selected font is proportional and the requested font is monospaced, the ANSI Text translator left-justifies the proportional characters within the monospaced cell.

8

Sixel Considerations

This chapter discusses two topics related to sixel graphics:

- Macro parameter values, Section 8.1
- Miscellaneous considerations and restrictions to translation, Section 8.2

8.1 Macro Parameter Values

Table 8–1 compares the target values and the values implemented by the ANSI Text translator for the macro parameter (Ps1) of the sixel mode graphics device control string:

`DCS Ps1; Ps2; Pn3 q` *`picture_definition`* `ST`

Ps1 is a selective parameter that specifies the horizontal grid size and aspect ratio. Grid size measurements are given in centipoints.

Table 8–1 Macro Parameter Values for the ANSI Text Translator (Grid Sizes in Centipoints)

	Target Values			Translator Values		
Ps1	Approximate Horizontal Grid Size[1]	Aspect Ratio Vert:Horiz	Vertical Grid Size	Horizontal Grid Size	Aspect Ratio Vert:Horiz	Vertical Grid Size
0	54.60	200:100	100	48	200:100	96
1	54.60	200:100	100	48	200:100	96
2	22.22	450:100	100	21	451:100	96
3	33.33	300:100	100	32	300:100	96

[1] For true target values in 1/660 in., see the sixel information in the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual.*

(continued on next page)

Table 8–1 (Cont.) Macro Parameter Values for the ANSI Text Translator (Grid Sizes in Centipoints)

	Target Values			Translator Values		
Ps1	Approximate Horizontal Grid Size[1]	Aspect Ratio Vert:Horiz	Vertical Grid Size	Horizontal Grid Size	Aspect Ratio Vert:Horiz	Vertical Grid Size
4	40.00	250:100	100	38	252:100	96
5	54.60	183:100	100	48	200:100	96
6	66.66	150:100	100	64	150:100	96
7	76.90	130:100	100	74	129:100	96
8	89.20	112:100	100	86	111:100	96
9	100.00	100:100	100	96	100:100	96

[1]For true target values in 1/660 in., see the sixel information in the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual.*

8.2 Miscellaneous Considerations and Restrictions

Section 8.2.1 and Section 8.2.2 discuss valid Set Raster Attributes (DECGRA) commands and restrictions to the translation of sixel graphics.

8.2.1 Valid Set Raster Attributes (DECGRA) Command

The ANSI Text translator ignores a DECGRA command if the translator receives any of the following before the command:

- Graphics Repeat Introducer control character — DECGRI (!)
- Graphics Carriage Return control character — DECGCR ($)
- Graphics Next Line control character — DECGNL (–)
- Sixel data

Digital recommends that software always send a Set Raster Attributes (DECGRA) command before sending the sixel data and any other sixel graphics command.

8.2.2 Restrictions

The following restrictions apply when you use the ANSI Text translator to convert sixel graphics to the PostScript page description language:

- Colors map to black. This causes most color pictures to come out dark and not very clear.
- Sixel translation ignores extent parameters (Pn3 and Pn4) of the Set Raster Attributes (DECGRA) command.
- Sixel translation ignores the background select parameter (Ps2 of the sixel device control string). The translator assumes a white background.
- The maximum value for the horizontal grid size is 99 current units. (See the Select Size Unit (SSU) command in the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual*.)
- The maximum value for the aspect ratio is 1000. The horizontal grid size multiplied by the aspect ratio provides a maximum vertical grid size of 99,000 current units. (See the Select Size Unit (SSU) command in the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual*.)

9

Alternative Protocols

The ANSI Text translator does not support protocol switching. Therefore, the translator ignores the following DEC PPL3 commands:

- Select Other Coding System (SOCS)
- Return from Other Coding System (ROCS)
- IBM Proprinter Emulation Mode (DECIPEM)

For information on these commands, see the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual*.

10

Printer-Specific ANSI Text Translator Considerations

This chapter contains information on ANSI text translation specific to the following printers:

- ScriptPrinter and LN03 Image printers, Section 10.1
- PrintServer network printers, Section 10.2
- DEClaser printers, Section 10.3

10.1 ScriptPrinter and LN03 Image Printers

This section contains information on ANSI translation specific to the ScriptPrinter and LN03 Image printers. The following topics are discussed:

- Downline loaded font capacity, Section 10.1.1
- Selection of the ANSI Text translator, Section 10.1.2
- Default settings for the printers, Section 10.1.3
- Printable area, Section 10.1.4
- Sixel graphics resolution, Section 10.1.5
- Hints, problems, and solutions when using the translator, Section 10.1.6

For more information on the DEC PPL3 printer protocol, see the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual.*

10.1.1 Downline Loaded Font Capacity

The LN03R ScriptPrinter and the LN03 Image printers support fonts that reside permanently in the translator and fonts that are downline loaded in Digital Common Font File Format (CFFF). (See the *Font File Format User's Manual* for format information.) The translator converts downline loaded CFFF font files into the PostScript page description language before use. Up to 256 font files are available for downline loading for the printer when you use the ANSI Text translator, Version 4.0. With Version 3.1, 32 font files are available for downline loading to the printer.

Note

The downline loaded font capacity of the ANSI Text translator typically exceeds the font capacity of the printer. If the memory allotted to load fonts in the printer is full, the translator deletes all fonts from the printer memory before loading the new font. Your file prints more slowly if the translator needs to clear the printer memory before it can load the font you requested.

10.1.2 Selecting the ANSI Text Translator

To print your ANSI Text or sixel file on the ScriptPrinter printer or the LN03 Image printer, send it to a VMS print queue that uses this translator by default or use the VMS PRINT command with a DATA_TYPE parameter of ANSI:

```
$ PRINT/QUEUE=printername file-spec[,...]/PARAMETERS=(DATA_TYPE=ANSI)
```

The ANSI Text translator implements the following parameters to the PRINT command:

- /PAGE_ORIENTATION
- /PAGE_SIZE

For more information on using the ANSI Text translator with the ScriptPrinter printer or the LN03 Image printer, see the *DECprint Printing Services User's Guide*.

10.1.3 Default Settings

Table 3–1 and Table 3–2 list the initial state values that do not change with the default settings. See Table 3–3 for a list of the bounds and the Select Graphic Rendition (SGR) parameter determined at job startup depending on the paper size and orientation.

Several initial state values change in the ANSI Text translator depending on paper size and orientation (portrait and landscape). The ScriptPrinter and LN03 Image printers support the following sheet sizes:

A (Letter) 8 1/2 in. x 11 in. (216 mm x 279 mm)

A4 210 mm x 297 mm (8 34/127 in. x 11 88/127 in.)

However, with the layup feature provided with DECprint Printing Services software, you can map any logical page size supported by the translator to the physical sheet size regardless of the printer. For information on the layup feature, see the *DECprint Printing Services User's Guide* and the *DECprint Printing Services System Manager's Guide.*

You can change the default setting by using the /PAGE_SIZE=*logical-size* and /PAGE_ORIENTATION=*logical-orientation* parameters to the PRINT command.

10.1.4 Printable Area

Table 10–1 shows the printable area in centipoints of the paper sizes supported on the ScriptPrinter and LN03 Image printers.

Table 10–1 Printable Areas on the ScriptPrinter and the LN03 Image Printers

Paper Size (Conventional Units)	Width (Centipoints)	Length (Centipoints)
A (8 1/2 in. x 11 in.)	57600	76776
A4 (210 mm x 297 mm)	57600	81600

For minimum printable areas of other paper sizes supported by the ANSI Text translator, see Table 2–3.

10.1.5 Sixel Graphics Resolution

To achieve the fastest printing with sixel graphics on the LN03R ScriptPrinter printer, use a resolution of 75 dots/inch by selecting the following settings:

- Positioning Unit Mode (PUM) command set — CSI 11 h (9/11 3/1 3/1 6/8)
- Select Size Unit (SSU) command set to pixels, 1/300 in. — CSI 7 SP I (9/11 3/7 2/0 4/9)
- Horizontal grid size parameter (Pn3 of the sixel protocol selector) equal to 4
- Aspect ratio parameters of the Set Raster Attributes (DECGRA) command set to any 1:1 aspect ratio, for example, 1:1 or 2:2

When you select a resolution, keep the following in mind:

- If you select an aspect ratio other than 300 dots/inch, the printer uses a resolution conversion algorithm to provide a good-quality picture from your selected grid.
- If you select a resolution greater than 75 dots/inch, the printer does not receive information as fast as it can process information.
- If you select an integral ratio (300/resolution = integer), the printer takes less time to print than if you select a nonintegral ratio.

10.1.6 Hints, Problems, and Solutions

This section provides information on selecting page format and landscape pages.

Page Format

Use any of the following to select the page format:

- The Page Format Select (PFS) command:

```
CSI   Ps   SP  J
9/11  ***  2/0 4/10
```

- The Variable Page Format Select (DECVPFS) command:

```
CSI   Ps1  ;    Pn2  ;    . . .   ;    Pn11 SP  z
9/11  ***  3/11 ***  3/11       3/11 **** 2/0 7/10
```

- The PAGE_SIZE parameter to the PRINT command:

```
$ PRINT/PARAMETERS=(PAGE_SIZE=logical-size)
```

When you call the translator, it defaults to A-size paper, unless the system manager or user has changed the parameter.

Landscape Pages

You can do either of the following to print with the landscape orientation:

- Use the LANDSCAPE option with the PAGE_ORIENTATION parameter on the PRINT command:

  ```
  $ PRINT/PARAMETERS=(PAGE_ORIENTATION=LANDSCAPE)
  ```

- Use the following DEC PPL3 commands:

  - A Page Format Select (PFS) command with Ps = 1, 3, 5, 7, 9, ?21, ?23, ?25, or ?27
  - A Select Graphic Rendition (SGR) command with Ps = 15 (provides a pitch of 13.6 characters/inch)
  - A Set Horizontal Tab Stops (DECSHTS) command with tabs set every eight characters

  A Reset to Initial State (RIS) or Soft Terminal Reset (DECSTR) command received after these commands returns the option to the page orientation selected by the VMS PRINT command or the system manager.

10.2 PrintServer Network Printers

This section contains information on ANSI translation specific to the PrintServer family of network printers. The following topics are discussed:

- Downline loaded font capacity, Section 10.2.1
- Selection of the ANSI Text translator, Section 10.2.2
- Default settings, Section 10.2.3
- Printable area, Section 10.2.4
- Sixel graphics resolution, Section 10.2.5
- Hints, problems, and solutions when using PrintServer printers, Section 10.2.6
- ANSI implementation considerations, Section 10.2.7

For more information on the DEC PPL3 printer protocol, see the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual*.

10.2.1 Downline Loaded Font Capacity

A PrintServer system supports fonts that reside permanently in the translator and fonts that are downline loaded in Digital Common Font File Format (CFFF). (See the *Font File Format User's Manual* for format information.) The translator converts downline loaded CFFF font files into the PostScript page description language before use. Up to 256 font files are available for downline loading to a PrintServer network printer when you use the ANSI Text translator, Version 4.0. With Version 3.1, 32 font files are available for downline loading to the printer.

10.2.2 Selecting the ANSI Text Translator

To print your ANSI Text or sixel file on a PrintServer network printer, send it to a VMS print queue that uses this translator by default, or use the appropriate command for your operating system.

- On a VMS system, use the PRINT command with a DATA_TYPE parameter of ANSI:

  ```
  $ PRINT/QUEUE=LPSxx$server/PARAMETERS=(DATA_TYPE=ANSI) file-spec
  ```

- On an ULTRIX system, use the **lpr** command with a ***data_type*** option of ansi:

  ```
  % lpr -Pqueuename -Dansi file-spec
  ```

On an ULTRIX system, if the ***data_type*** option is not included in the **lpr** command, the print daemon uses the data type described in the **/etc/printcap** file. The default data type in this file is ansi. If no data type entry is found in the **/etc/printcap** file, the daemon sends the file to the printer without translation.

You must specify the name of the destination printer. This printer should be the one that your system administrator defined in the **/etc/printcap** file.

Note

ULTRIX **lpr** commands are case-sensitive.

For more information on the DATA_TYPE parameter to the PRINT command on a VMS system, refer to the *DECprint Printing Services User's Guide*. For more information on the ***data_type*** option to the **lpr** command on an ULTRIX system, refer to the *User's Guide: PrintServer Client for ULTRIX*.

10.2.3 Default Settings

Table 3–1 and Table 3–2 list the initial state values that do not change with the default setting. See Table 3–3 for a list of the bounds and the Select Graphic Rendition (SGR) parameters determined at job startup, depending on the paper size and orientation.

Several initial state values in the ANSI Text translator change, depending on the default paper size and orientation (portrait or landscape). You can select the following paper sizes with the PRINT command for the PrintServer network printers:

A (Letter)	8 1/2 in. x 11 in. (216 mm x 279 mm)
B	11 in. x 17 in. (279 mm x 432 mm)
A3	297 mm x 420 mm (11 88/127 in. x 16 68/127 in.)
A4	210 mm x 297 mm (8 34/127 in. x 11 88/127 in.)
B4	250 mm x 353 mm (9 107/127 in. x 13 114/127 in.)
A5	148 mm x 210 mm (5 105/127 in. x 8 34/127 in.)
B5	176 mm x 250 mm (6 118/127 in. x 9 107/127 in.)
Legal	8 1/2 in. x 14 in. (216 mm x 356 mm)
Executive	7 1/2 in. x 10 1/2 in. (191 mm x 267 mm)

If the system manager did not change the initial setting, the default setting is A-size paper, portrait orientation. You can change the default settings to print your file in the following ways:

- On a VMS system, use the /PAGE_SIZE=*logical-size*, /SHEET_SIZE=*physical-size*, and /PAGE_ORIENTATION=*logical-orientation* parameters on the PRINT command.
- On an ULTRIX system, use the **lpr -F*page_size***, **lpr -S*sheet_size***, or **lpr -O*page_orientation*** options to the line printer daemon (lpd).

For more information on VMS PRINT command qualifiers, refer to the *DECprint Printing Services User's Guide.* ULTRIX users refer to the *User's Guide: PrintServer Client for ULTRIX*.

10.2.4 Printable Area

Table 10–2 shows the printable area of the paper sizes supported on the PrintServer network printers.

Table 10–2 Printable Areas on PrintServer Network Printers

Paper Size (Conventional Units)	Width (Centipoints)	Length (Centipoints)
A (8 1/2 in. x 11 in.)	60024	78024
B (11 in. x 14 in.)	78024	121224
A3 (297 mm x 420 mm)	83016	117888
A4 (210 mm x 297 mm)	58368	83016
A5 (148 mm x 210 mm)	40776	58368
B4 (250 mm x 353 mm)	71668	102000
B5 (176 mm x 250 mm)	50424	71668
Legal (8 1/2 in. x 14 in.)	60024	99624
Executive (7 1/2 in. x 10 1/2 in.)	52824	74424

10.2.5 Sixel Graphics Resolution

To achieve the fastest printing with sixel graphics on a PrintServer network printer, use a resolution of 300 dots/inch by selecting the following settings:

- Positioning Unit Mode (PUM) command set — CSI 11 h (9/11 3/1 3/1 6/8)
- Select Size Unit (SSU) command set to pixels, 1/300 in. — CSI 7 SP I (9/11 3/7 2/0 4/9)
- Horizontal grid size parameter (Pn3 of the sixel protocol selector) equal to 1
- Aspect ratio parameters of the Set Raster Attributes (DECGRA) command set to any 1:1 aspect ratio, for example, 1:1 or 2:2

If you select a different integer ratio (300/resolution = integer) or a noninteger ratio, then the printer uses a resolution conversion algorithm to provide a good-quality picture from your selected grid. Noninteger ratios take longer to print than integer ratios.

10.2.6 Hints, Problems, and Solutions

This section provides information on selecting page format and landscape pages.

Page Format

On a VMS system, use any of the following to select the page format:

- The Page Format Select (PFS) command:

```
CSI   Ps   SP  J
9/11  ***  2/0 4/10
```

- The Variable Page Format Select (DECVPFS) command:

```
CSI   Ps1  ;    Pn2  ;    . . .   ;    Pn11 SP  z
9/11  ***  3/11 ***  3/11       3/11 **** 2/0 7/10
```

- The PAGE_SIZE parameter to the PRINT command:

```
$ PRINT/PARAMETERS=(PAGE_SIZE=logical-size)
```

On an ULTRIX system, use any of the following to select the page format:

- The Page Format Select (PFS) command:

```
CSI   Ps   SP  J
9/11  ***  2/0 4/10
```

- The Variable Page Format Select (DECVPFS) command:

```
CSI   Ps1  ;    Pn2  ;    . . .   ;    Pn11 SP  z
9/11  ***  3/11 ***  3/11       3/11 **** 2/0 7/10
```

- The ***page_size*** option to the printer daemon:

```
% lpr -Fpage_size
```

When you call the translator on a VMS system or call a filter for translation on an ULTRIX system, page size defaults to A-size, unless the system manager or a user has changed the orientation.

Landscape Pages

On a VMS system, use the LANDSCAPE parameter option to the PRINT command:

```
$ PRINT/PARAMETERS=(PAGE_ORIENTATION=LANDSCAPE)
```

On an ULTRIX system, use the **-Olandscape** option to the **lpr** command:

```
% lpr -Olandscape
```

You can also use the following DEC PPL3 commands to select the same option:

- A Page Format Select (PFS) command with Ps = 1, 3, 5, 7, 9, ?21, ?23, ?25, ?27
- A Select Graphic Rendition (SGR) command with Ps = 15 (provides a pitch of 13.6 characters/inch)
- A Set Horizontal Tab Stops (DECSHTS) command with tabs set every eight characters

A Reset to Initial State (RIS) or Soft Terminal Reset (DECSTR) command received after these commands returns the option to the page orientation selected by the VMS PRINT command or the system manager.

10.2.7 ANSI Text Performance

The ANSI Text translator drives your PrintServer network printer at its rated speed, under the following conditions:

- The pages consist only of text, with less than 3000 characters/page.
- The page size is either of the following:

A-size	8 1/2 in. x 11 in. (216 mm x 279 mm)
A4-size	210 mm x 297 mm (8 34/127 in. x 11 88/127 in.)

- The required fonts reside in the printer font memory.
- The host computer is suitably loaded.

10.3 DEClaser Printers

This section contains information on ANSI translation specific to the DEClaser 1150, 2150/2250, and 3250 printers. The following topics are discussed:

- Downline loaded font capacity, Section 10.3.1
- Selection of the ANSI Text translator, Section 10.3.2
- Default settings, Section 10.3.3
- Printable area, Section 10.3.4
- Sixel graphics resolution, Section 10.3.5
- Hints, problems, and solutions when using DEClaser printers, Section 10.3.6

For more information on the DEC PPL3 printer protocol, see the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual*.

10.3.1 Downline Loaded Font Capacity

The DEClaser printers support fonts that reside permanently in the translator and fonts that are downline loaded in Digital Common Font File Format (CFFF). (See the *Font File Format User's Manual* for format information.) The translator converts downline loaded CFFF font files into the PostScript page description language before use. Up to 256 font files are available for downline loading to a DEClaser printer when you use the ANSI Text translator, Version 4.0.

Note

The downline loaded font capacity of the ANSI Text translator typically exceeds the font capacity of the printer. If the memory allotted to load fonts in the printer is full, the translator deletes all fonts from the printer memory before loading the new font. Your file prints more slowly if the translator needs to clear the printer memory before it can load the font you requested.

10.3.2 Selecting the ANSI Text Translator

To print your ANSI Text or sixel file on a DEClaser printer, send it to a VMS print queue that uses this translator by default or use the VMS PRINT command with a DATA_TYPE parameter of ANSI:

```
$ PRINT/QUEUE=printername file-spec[,...]/PARAMETERS=(DATA_TYPE=ANSI)
```

The ANSI Text translator implements the following parameters to the PRINT command:

- /PAGE_ORIENTATION
- /PAGE_SIZE

10.3.3 Default Settings

Table 3–1 and Table 3–2 list the initial state values that do not change with the default setting. See Table 3–3 for a list of the bounds and the Select Graphic Rendition (SGR) parameters determined at job startup, depending on the paper size and orientation.

Several initial state values in the ANSI Text translator change, depending on the default paper size and orientation (portrait or landscape). The DEClaser 1150 printer and DEClaser 2150/2250 printers support the following sheet sizes:

A (Letter)	8 1/2 in. x 11 in. (216 mm x 279 mm)
A4	210 mm x 297 mm (8 34/127 in. x 11 88/127 in.)
A5	148 mm x 210 mm (5 105/127 in. x 8 34/127 in.)
B5	176 mm x 250 mm (6 118/127 in. x 9 107/127 in.)
Legal	8 1/2 in. x 14 in. (216 mm x 356 mm)
Executive	7 1/2 in. x 10 1/2 in. (191 mm x 267 mm)

For sheet sizes supported on the DEClaser 3250 printer, refer to Chapter 30.

However, with the layup feature provided with DECprint Printing Services software, you can map any logical page size supported by the translator to the physical sheet size regardless of the printer. For information on the layup feature, see the *DECprint Printing Services User's Guide* and the *DECprint Printing Services System Manager's Guide*.

You can change the default setting by using the /PAGE_SIZE=*logical-size* and /PAGE_ORIENTATION=*logical-orientation* parameters to the PRINT command.

10.3.4 Printable Area

Table 10–3 shows the printable area of the paper sizes supported on the DEClaser 1150 printer and DEClaser 2150/2250 printers. For the printable area of the paper sizes supported on the DEClaser 3250 printer, refer to Table 31–3.

Note

On the DEClaser 3250 printer, paper sizes and envelopes which can only be fed through the optional multi-media feeder (MMF) or the manual feed slot can not be accessed because of a limitation in Version 4.0 of the ANSI Text translator.

Table 10–3 Printable Areas on DEClaser 1150 and DEClaser 2150/2250 Printers

Paper Size (Conventional Units)	Width (Centipoints)	Length (Centipoints)
A (8 1/2 in. x 11 in.)	58320	77616
A4 (210 mm x 297 mm)	56423	82343
A5[1] (148 mm x 210 mm)	39143	58056
B5[1] (176 x 250 mm)	48744	71376
Legal (8 1/2 in. x 14 in.)	58320	99216
Executive (7 1/4 in. x 10 1/2 in.)	49896	74016

[1]A5- and B5-size paper can be used only with manual feed.

For minimum printable areas of other paper sizes supported by the ANSI Text translator, see Table 2–3.

In addition, the DEClaser 1150 printer and DEClaser 2150/2250 printers support the envelope sizes listed in Table 10–4. The DEClaser 2150/2250 printers support three ways to feed envelopes: manual feeding, the envelope cassette option, and the envelope feeder option. The DEClaser 1150 printer supports two ways to feed envelopes: manual feeding and the envelope cassette option. The envelope feeder option is available only on the DEClaser 2250 printer.

Table 10–4 Envelope Sizes Supported by DEClaser 1150 and DEClaser 2150/2250 Printers

Size	Dimensions (Millimeters)	Dimensions (Inches)	Feeding Method
C5	162 x 229	6 48/127 x 9 2/127	Manual
C5/6 (DL)	110 x 220	4 42/127 x 8 84/127	Manual, cassette, feeder
Business	104 31/40 x 241 3/10	4 1/8 x 9 1/2	Manual, cassette, feeder
7	98 17/40 x 190 1/2	3 7/8 x 7 1/2	Cassette, feeder
7 x 9	177 4/5 x 228 3/5	7 x 9	Manual

(continued on next page)

Table 10–4 (Cont.) Envelope Sizes Supported by DEClaser 1150 and DEClaser 2150/2250 Printers

Size	Dimensions (Millimeters)	Dimensions (Inches)	Feeding Method
Half letter	139 7/10 x 215 9/10	5 1/2 x 8 1/2	Manual
Two-thirds A4	198 x 210	7 101/127 x 8 34/127	Manual, cassette, feeder

10.3.5 Sixel Graphics Resolution

To achieve the fastest printing with sixel graphics on the DEClaser printers use a resolution of 75 dots/inch by selecting the following settings:

- Positioning Unit Mode (PUM) command set — CSI 11 h (9/11 3/1 3/1 6/8)
- Select Size Unit (SSU) command set to pixels, 1/300 in. — CSI 7 SP I (9/11 3/7 2/0 4/9)
- Horizontal grid size parameter (Pn3 of the sixel protocol selector) equal to 4
- Aspect ratio parameters of the Set Raster Attributes (DECGRA) command set to any 1:1 aspect ratio, for example, 1:1 or 2:2

When you select a resolution, keep the following in mind:

- If you select an aspect ratio other than 300 dots/inch, the printer uses a resolution conversion algorithm to provide a good-quality picture from your selected grid.
- If you select a resolution greater than 75 dots/inch, the printer does not receive information as fast as it can process information.
- If you select an integral ratio (300/resolution = integer), the printer takes less time to print than if you select a nonintegral ratio.

10.3.6 Hints, Problems, and Solutions

This section provides information on selecting page format and landscape pages.

Page Format

Use any of the following to select the page format:

- The Page Format Select (PFS) command:

```
CSI   Ps   SP  J
9/11  ***  2/0 4/10
```

- The Variable Page Format Select (DECVPFS) command:

```
CSI   Ps1  ;    Pn2  ;    . . .   ;    Pn11 SP  z
9/11  ***  3/11 ***  3/11       3/11 **** 2/0 7/10
```

- The PAGE_SIZE parameter to the PRINT command:

```
$ PRINT/PARAMETERS=(PAGE_SIZE=logical-size)
```

When you call the translator, it defaults to A-size paper, unless the system manager or user has changed the parameter.

Landscape Pages

You can do either of the following to print with the landscape orientation:

- Use the LANDSCAPE option with the PAGE_ORIENTATION parameter on the PRINT command:

```
$ PRINT/PARAMETERS=(PAGE_ORIENTATION=LANDSCAPE)
```

- Use the following DEC PPL3 commands:
  - A Page Format Select (PFS) command with Ps = 1, 3, 5, 7, 9, ?21, ?23, ?25, or ?27
  - A Select Graphic Rendition (SGR) command with Ps = 15 (provides a pitch of 13.6 characters/inch)
  - A Set Horizontal Tab Stops (DECSHTS) command with tabs set every eight characters

  A Reset to Initial State (RIS) or Soft Terminal Reset (DECSTR) command received after these commands returns the option to the page orientation selected by the VMS PRINT command or the system manager.

Part II

DEClaser 2100/2200 Printers

Part II describes the level 3 Digital ANSI-Compliant Printing Protocol (DEC PPL3) implementation specific to DEClaser 2100/2200 printers. The Digital ANSI-Compliant Printing Protocol is based on ANSI X3.64.

- Chapter 11 describes the printer models.
- Chapter 12 explains the relationship between the logical information and the printing of the physical page in the DEClaser environment.
- Chapter 13 discusses reset and power-up values and lists initial state values for the printer.
- Chapter 14 lists maximum values for printer features.
- Chapter 15 explains paper handling for the printer.
- Chapter 16 describes reporting commands and lists error messages.
- Chapter 17 lists fonts available to the printer.
- Chapter 18 discusses sixel implementation specific to the printer.
- Chapter 19 discusses protocol switching when using the DEClaser 2100/2200 printers.

11

Overview

DEClaser 2100/2200 printers are high-quality laser printers that can print text, graphics, and images on standard office envelopes, transparencies, and gummed labels and on the following paper sizes:

- A (Letter)
- A4
- A5
- B5
- Legal
- Executive (184 mm x 267 mm, 7 1/4 in. x 10 1/2 in.)

DEClaser 2100/2200 printers implement level 3 of the Digital ANSI-Compliant Printing Protocol (DEC PPL3) as described in the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual.*

The DEClaser 2100 printer is a **simplex** model; the DEClaser 2200 printer provides **duplex** printing capabilities.

Both printer models can print up to eight pages/minute.

DEClaser 2100/2200 plus Printers

The DEClaser 2100/2200 plus printers vary slightly from the DEClaser 2100/2200, Version 1.7 printers. Unless noted, "DEClaser 2100" refers to both the DEClaser 2100, Version 1.7 and DEClaser 2100 plus printers. "DEClaser 2200" refers to both the DEClaser 2200, Version 1.7 and DEClaser 2200 plus printers.

12

Logical to Physical Image

This chapter contains the following topics related to creating the physical image:

- Printer resolution, Section 12.1
- Printable area, Section 12.2
- Mapping the logical page to the physical sheet size, Section 12.3
- Positioning accuracy, Section 12.4
- Justification, Section 12.5

12.1 Printer Resolution

DEClaser 2100/2200 printers have an addressing capability and imaging resolution that support a wide range of standard font pitches and sixel graphics resolutions.

Internal addressing capability:	1/7200 inch (**centipoint** addressing)
Imaging resolution:	300 x 300 dots/inch

12.1.1 Horizontal Resolution

The DEClaser 2100/2200 printers support the horizontal pitch values listed in Table 12–1 for the selective parameters (Ps) of the Set Horizontal Pitch (DECSHORP) and the Select Horizontal Spacing (SHS) commands. Table 12–1 lists the average width of characters (target pitch) in characters/inch if this value is exact. If characters/inch is only an approximate value, then the table provides the target value in inches with the approximate characters/inch value in parentheses.

Table 12–1 Horizontal Pitches — DEClaser 2100/2200 Printers (Standard 300 Dots/Inch)

Target Pitch (Char/Inch)	Target Value (Centipoints)	Printer Pitch (Char/Inch)	Printer Value (Centipoints)
5	1440.00	5.000	1440
6	1200.00	6.000	1200
(6.6) 10/66 in.	1090.90	6.605	1090
(8.25) 8/66 in.	872.72	8.265	872
(8.55) 28/240 in.	840.00	8.550	840
9	800.00	9.000	800
10	720.00	10.000	720
(10.3) 29/300 in.	696.05	10.344	696
12	600.00	12.000	600
(13.2) 5/66 in.	545.45	13.210	545
15	480.00	15.000	480
(16.5) 4/66 in.	436.36	16.510	436
(17.1) 14/240 in.	420.00	17.100	421
18	400.00	18.000	400

The macro parameter values for sixel grid sizes and aspect ratios provided by DEClaser 2100/2200 printers are shown in Table 18–1.

12.1.2 Vertical Resolution

The DEClaser 2100/2200 printers' vertical addressing can provide the pitches required for existing fonts and graphics mode. Table 12–2 lists the vertical pitch values supported for the selective parameters (Ps) of the Set Vertical Pitch (DECVERP) and the Select Vertical (Line) Spacing (SVS) commands. Column 2 of Table 12–2, labeled Printer Value, gives the amount of white space between the lines in centipoints for each pitch selection.

Table 12–2 Vertical Pitches — DEClaser 2100/2200 Printers (Standard 300 Dots/Inch)

Target Pitch (Lines/Inch)	Printer Value (Centipoints)
2	3600
3	2400
4	1800
6	1200
8	900
12	600

Target Pitch (Lines/A-size Printable Area)	Printer Value (Centipoints)
22	3456
33	2304
44	1728
66	1152
88	864
132	576

Target Pitch (Lines/30 Millimeters)	Printer Value (Centipoints)
3	2856
4	2136
6	1416
12	720

Note

The DEClaser 2100/2200 printers implement values for the Spacing Pitch Increment (SPI) command as requested.

12.2 Printable Area

This section discusses the printable area for paper sizes and the maximum and minimum envelope sizes that DEClaser 2100/2200 printers support.

12.2.1 Paper Sizes

Table 12–3 shows the minimum printable area specified by Digital and the printable area of the DEClaser 2100/2200 printers in centipoints for supported paper sizes.

Table 12–3 Printable Areas of the DEClaser 2100/2200 Printers in Centipoints

Paper Size	Minimum		DEClaser Printer	
(Conventional Units)	Width	Length	Width	Length
A (8 1/2 in. x 11 in.)	57600	75600	57768	76320
A4 (210 mm x 297 mm)	55872	80568	56088	81288
A5 (148 mm x 210 mm)[1]	38400	55920	38544	56640
B5 (176 mm x 250 mm)[1]	48000	69264	48144	69960
Legal (8 1/2 in. x 14 in.)	57600	97200	57768	97920
Executive (7 1/4 in. x 10 1/2 in.)	50400	72000	49632	72744

[1] A5- and B5-size paper can be used only with manual feed.

12.2.2 Envelope Sizes

You can feed envelopes to DEClaser 2100/2200 printers manually or with the envelope cassette option. An additional option, an envelope feeder, is available for the DEClaser 2200 model. Table 12–4 lists the maximum and minimum envelope sizes supported for each method.

Table 12–4 Maximum and Minimum Envelope Sizes for the DEClaser 2100/2200 Printers

Feeding Method	Minimum Size	Maximum Size
Manual	100 mm x 190 mm 4 in. x 7 1/2 in.	216 mm x 356 mm 8 1/2 in. x 14 in.
Cassette option	95 mm x 190 mm 3 7/10 in. x 7 1/2 in.	180 mm x 260 mm 4 1/2 in. x 10 1/5 in.
Feeder option[1]	90 mm x 190 mm 3 3/5 in. x 7 1/2 in.	120 mm x 250 mm 4 7/10 in. x 9 4/5 in.

[1]The envelope feeder option is available only for the DEClaser 2200 printers.

12.3 Mapping Page Size to Physical Sheet Size

The Page Format Select (PFS) and Variable Page Format Select (DECVPFS) commands specify the page size. The physical sheet size depends on the paper cassette selected. When the page size does not match the physical sheet size, the DEClaser 2100/2200 printers keep the page and physical sheet aligned at the top left-hand corner.

- If the page size is smaller than the physical sheet size, the printer leaves white space on the right and bottom edges. See Figure 12–1.
- If the page size is larger than the physical sheet size, the printer does not image characters that extend beyond the boundaries of the printable area in both the horizontal and vertical directions. See Figure 12–2. In landscape mode, if the top left area extends outside the physical sheet area, it is not imaged.
- Sheets printed in duplex normal mode with landscape orientation print so that pages can be bound along the long edge.
- Sheets printed in duplex tumbled mode with landscape orientation selected are printed so that pages can be bound along the short edge.

DEClaser 2200 printer, Version 1.7

On the DEClaser 2200, Version 1.7 printer, handling of tumbled pages with landscape orientation is different from the DEClaser 2200 plus printer:

- Printing in duplex normal mode with landscape orientation provides pages that can be bound along the short edge.
- Printing in duplex tumbled mode with landscape orientation provides pages that can be bound along the long edge.

Figure 12–1 Page Size Smaller Than Physical Sheet Size on DEClaser 2100/2200 Printers

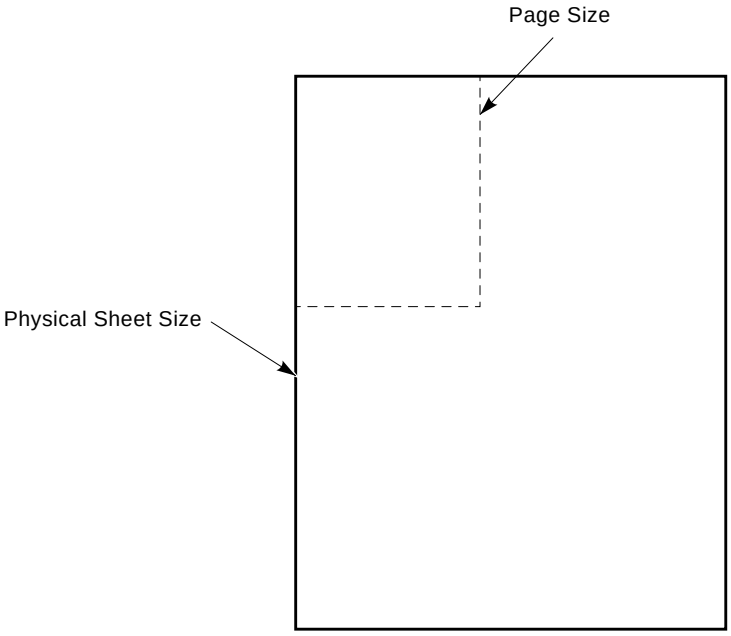
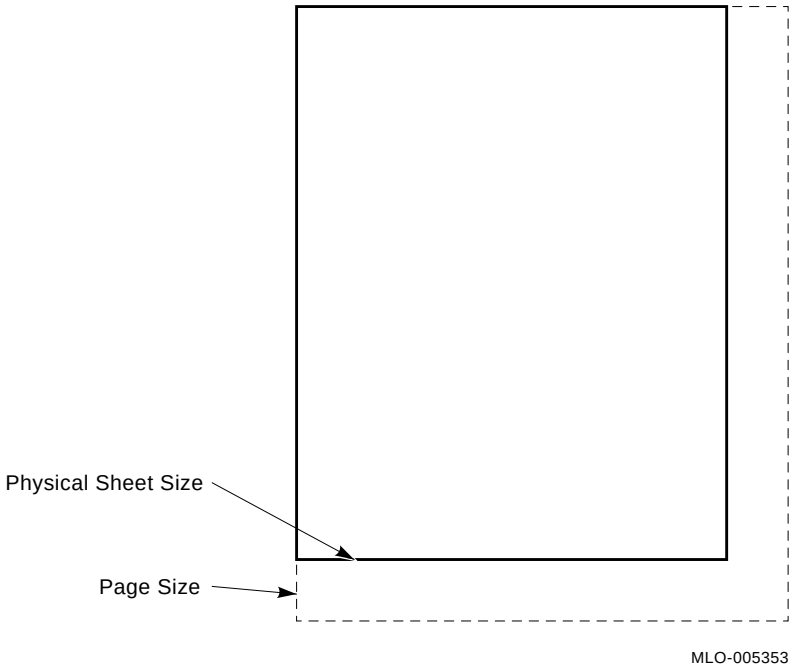


Figure 12–2 Page Size Larger Than Physical Sheet Size on DEClaser 2100/2200 Printers



12.4 Positioning Accuracy

DEClaser 2100/2200 printers keep distance in centipoints. When converting from centipoints to pixels for imaging, the DEClaser 2100/2200 printers truncate the fractional portion of pixels. Positioning is accurate to 1 pixel. For vectors drawn with the Draw Vector (DECVEC) and Draw Relative Vector (DECRVEC) commands, values between 0 and 24 centipoints round to 1 pixel.

12.5 Justification

DEClaser 2100/2200 printers do not discard either the right bearing of the rightmost character on the line or the left bearing of the leftmost character on the line.

13
Initial State Values

The topics discussed in this chapter include the following:

- Initial state values that are independent of the paper size in the selected paper cassette, Section 13.1
- Initial state values based on the paper cassette, Section 13.2
- Factory defaults in nonvolatile memory, Section 13.3
- Macro values in nonvolatile memory, Section 13.4
- Protocol selections for nonvolatile memory, Section 13.5

13.1 Initial States Independent of Paper Cassette

Tables 13–1 and 13–2 list the values used for power-up and the Select Conformance Level (DECSCL), Soft Terminal Reset (DECSTR), and Reset to Initial State (RIS) commands, independent of the paper cassette selection.

Table 13–1 Initial State Values for DEClaser 2100/2200 Printers

Variable or Control Function	DECSCL	Power-Up	DECSTR RIS	Front Panel
Origin (DECOPM)	Reset	Reset	Reset	Reset
Position Unit Mode[1]	Reset	Reset	Reset	Reset
Vertical spacing	Font-dependent	Font-dependent	Font-dependent	Font-dependent
Horizontal spacing	Font-dependent	Font-dependent	Font-dependent	Font-dependent
Size unit[1]	Decipoints	Decipoints	Decipoints	Decipoints

[1]Because Position Unit Mode (PUM) is reset by default, Select Size Unit (SSU) is ignored for most commands.

(continued on next page)

Table 13–1 (Cont.) Initial State Values for DEClaser 2100/2200 Printers

Variable or Control Function	DECSCL	Power-Up	DECSTR RIS	Front Panel
Active position	Origin	Origin	Origin	Origin
Horizontal tabs[2]	Every eight	Every eight	Every eight	Every eight
Line Feed/New Line	Reset	Reset	Reset	Reset
CR/New Line Mode	Reset	Reset	Reset	Reset
Pitch Select Mode[3]	Reset	Reset	Reset	Reset
Proportional spacing	Reset	Reset	Reset	Reset
Justify	Disabled	Disabled	Disabled	Disabled
SGR attributes	Disabled	Disabled	Disabled	Disabled
Vertical tabs[4]	Every VAI	Every VAI	Every VAI	Every VAI
G0	ASCII	ASCII	ASCII	ASCII
G1	ASCII	ASCII	ASCII	ASCII
G2	User Preference	User Preference	User Preference	User Preference
G3	User Preference	User Preference	User Preference	User Preference
GL	G0	G0	G0	G0
GR	G2	G2	G2	G2
GSS	10 points	10 points	10 points	10 points
GSM	100,100	100,100	100,100	100,100
Autowrap	Set	NVM[5]	RAM	RAM
User Preference Set	DEC Supplemental	NVM	Unchanged	Last Setting[6]
Unsolicited status reports	Disabled	Disabled	Unchanged	Disabled[7]

[2]Horizontal tabs are set every eight columns, starting with column 9 (9,17, . . .) and fill the entire tab table.

[3]When DECPSM is reset, the Horizontal Advance Increment (HAI) is font-dependent.

[4]Vertical tabs are set every line or Vertical Advance Increment (VAI) and fill the entire tab table.

[5]NVM indicates that the initial state value is stored in the nonvolatile memory.

[6]"Last Setting" is the value that was last set in the menu associated with the variable. This applies to all variables in the "Initial" menu. These settings can only take effect after a front panel reset.

[7]A front panel reset generates an initialization message, if enabled in the macro. (Only on the DEClaser 2100/2200 plus printer.)

(continued on next page)

Table 13–1 (Cont.) Initial State Values for DEClaser 2100/2200 Printers

Variable or Control Function	DECSCL	Power-Up	DECSTR RIS	Front Panel
Downloaded fonts	Deleted	None	Unchanged	Deleted[8]
CRM	Unchanged	Reset	Unchanged	Reset
Tray selection (feeder)	Upper	NVM	Unchanged	RAM
DECSNC (copy)	1	1	Unchanged	RAM
DECMM (paint)	Partial paint	NVM	Unchanged	Last Setting
DECSDPM	Simplex[9]	NVM	Unchanged	RAM
Failover[10]	Disabled	NVM	Unchanged	RAM
DECSSS (paper)	Letter (portrait)	NVM	Unchanged	Key[11]
C1 Receive	8-Bit	8-Bit	Unchanged	8-Bit
SOCS Protocol	Unchanged	NVM	DEC PPL3[12]	Unchanged
DSR Events	Unchanged	Cleared	Unchanged	Cleared[8]

[8]On the DEClaser 2100/2200, Version 1.7 printers, a front panel reset has no effect.

[9]The Initial state of the DECSDPM parameter is true simplex normal.

[10]DECSITF only applies to the DEClaser 2100/2200 plus printers.

[11]On the DEClaser 2100/2200 plus printers, a front panel reset identifies the physical paper size by the cassette key. On the DEClaser 2100/2200, Version 1.7 printers, a front panel reset has no effect.

[12]On the DEClaser 2100/2200 plus printers, a DECSTR causes a return to DEC PPL3 in Proprinter X24E and PCL modes, but not in PostScript. A RIS does not cause a change to the current protocol.

Table 13–2 Initial State Values of Select Graphic Rendition (SGR) Numbers

SGR	Assignment Type	ID	Meaning
10	Type family	DBULTN1	DEC Builtin1 family
11	Type family	RCOURIR	Courier family
12	Type family	RELITE0	Elite family
13	Font collection plus	RCOURIRJ02SK00GG[1]	Courier 10 point, 10 pitch
14	Font collection plus	RELITE0L02SK00GG[1]	Elite 10 point, 12 pitch

[1]The DEClaser 2100/2200 printers need only 15 bytes.

(continued on next page)

Table 13–2 (Cont.) Initial State Values of Select Graphic Rendition (SGR) Numbers

SGR	Assignment Type	ID	Meaning
15	Font collection plus	RCOURIR101VK00GG[1]	Courier 6.7 point, 13.6 pitch
16	Font collection plus	RCOURIR202SK00GG[1]	Courier 10 point, 10.3 pitch
17	Type family	DBULTN1	DEC Builtin1 family
18	Type family	DBULTN1	DEC Builtin1 family
19	Type family	DBULTN1	DEC Builtin1 family

[1]The DEClaser 2100/2200 printers need only 15 bytes.

Font cartridges modify the default Select Graphic Rendition (SGR) values. These modifications occur during the following instances:

- Power-up
- Soft Terminal Reset (DECSTR)
- Reset to Initial State (RIS)
- Select Conformance Level (DECSCL)

The printer also references modifications to the SGR values made by the font cartridge on the Assign Type Family or Font (DECATFF) command when the string is null.

DEClaser 2100/2200 Printers, Version 1.7

On the DEClaser 2100/2200, Version 1.7 printers, a Select Conformance Level (DECSCL) command causes SGR assignments to return to the Table 13–2 values, whether or not a font cartridge is installed.

13.2 Power Up Initial States Based on Paper Cassette

Table 13–3 lists the bounds and the Select Graphic Rendition (SGR) font selection parameter determined at power up initialization. The bounds and parameter depend on the paper size in the selected paper cassette. Table 13–3 lists the bounds based on one of the following:

- A parameter of the Page Format Select (PFS) command
- The Variable Page Format Select (DECVPFS) command
- The Set Sheet Size (DECSSS) command

For PFS and DECVPFS values, see the description of the respective commands in the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual.*

Table 13–3 Initialization Based on Paper Size

Paper Size	Bounds Definition	SGR
A	PFS ?20	10
A4	PFS ?22	16
Legal	PFS ?24	10
Executive	DECVPFS for executive-size paper	10
Envelope cassette Envelope feeder Manual Feed	A-size or A4-size paper, depending on the setting of the paper feature in NVM.	10 or 16

13.3 Factory Defaults in Nonvolatile Memory

Table 13–4 lists the factory defaults in the nonvolatile memory (NVM).

Table 13–4 Factory Defaults in NVM for the DEClaser 2100/2200 Printers

Item[1]	Factory Default[1]	Variable (Control Function)[2]
Feeder	Upper	Tray selection (DECASFC)
Copy	1	Number of copies (DECSNC)
AutoNL	On	Autowrap (DECAWM)
Macro	00	User Preference Set (DECAUPSS) Printer generic response (DAR) No power-up message[3]
Paint	Partial	96 Kbytes of memory reserved (DECMM)
Paper	Letter[4]	Sheet size (DECSSS)
Duplex	Off	True simplex normal (DECSDPM)
Message	English	N/A
Layout offsetX	+0.0	N/A
Layout offsetY	+0.0	N/A
I/F	RS232C	N/A
Baud	4800	N/A
Rsmode	8S	N/A
DTR	Fix-H	N/A
XON/XOFF	On	N/A
ETX/ACK	Off	N/A
Protocol selection	PostScript[5]	Select Other Coding System (SOCS)

[1]Columns 1 and 2 describe the terms used on the front panel, except for protocol selection.

[2]This table contains the default NVM values for the variables listed in column 1 of Table 13–1.

[3]Only on the DEClaser 2100/2200 plus printer.

[4]A4 size for worldwide models.

[5]Available if the PostScript cartridge is installed. For protocol selection fallbacks, see Table 13–6.

13.4 Macro Values in NVM

The Device Attribute Report (DAR) is a function of the printer ID selected in NVM. The printer ID is determined during power-up initialization.

The printer ID cannot be changed through software. It is determined only at initialization. Table 13–5 lists the macro values for nonvolatile memory.

Table 13–5 Macro Values in NVM for DEClaser 2100/2200 Printers

Value	Meaning
	User Preference Supplemental Set
00	DEC Supplemental
10	ISO Latin-1 Supplemental
20	JIS Katakana[1]
30	ISO Latin-Hebrew Supplemental
40	DEC Hebrew Supplemental
50	DEC 7-bit Hebrew
60	DEC Technical
	Initialization Message[2]
0	Initialization message disabled
5	Initialization message enabled
	Printer ID
0	DEC PPL3 generic response (factory default)
1	LN03 alias response

[1]This character set is not in a built-in font. It must be downline loaded or obtained from a font cartridge.

[2]The initialization message is only on the DEClaser 2100/2200 plus printer. If enabled, the printer sends the initialization message during power-up or a front panel reset.

The macro value is calculated as follows:

Macro Value = Printer ID +
Initialization Message ID[1] +
User Preference Supplemental Set

[1]Available only on the DEClaser 2100/2200 plus printer.

For example, a Printer ID value of 1, with the initialization message enabled (5), and a User Preference Supplemental Set value of 10 has a macro value of 16.

An undefined value for User Preference Supplemental Set is treated as 00.

13.5 Protocol Selection in NVM

Selection of the protocol depends on the following:

- Protocol stored in NVM
- Protocol cartridge installed in the printer at power-up

If the protocol stored in NVM matches the installed protocol cartridge, the DEClaser 2100/2200 printers select that protocol at power-up. Otherwise, the printers select DEC PPL3 at power-up.

DEClaser 2100/2200, Version 1.7 Printers

On the DEClaser 2100/2200, Version 1.7 printers, NVM selection is shown in Table 13–6.

Table 13–6 DEClaser 2100/2200 Printers Protocol — NVM Selection and Installed Cartridge

Stored in NVM	No Cartridge	PostScript Cartridge	CaPSL Cartridge	Both Cartridges
PostScript	DEC PPL3	PostScript	CaPSL	PostScript
CaPSL	DEC PPL3	PostScript	CaPSL	CaPSL
DEC PPL3	DEC PPL3	DEC PPL3	DEC PPL3	DEC PPL3

14
Maximum Printer Values

This chapter lists the maximum parameter values supported by the DEClaser 2100/2200 printers. The topics include:

- Maximum parameter values, Section 14.1
- Maximum values for printer features, Section 14.2

14.1 Maximum Parameter Values

DEClaser 2100/2200 printers have the following parameter value limitations:

- Graphics repeat function (DECGRI) — 32K (32,768) limit. The printer sets values that exceed this limit to the limit value.
- Grid size parameter — 99 units for maximum horizontal grid size; 1000 for maximum aspect ratio (99,000 units for maximum vertical grid size).

14.2 Maximum Values for Printer Features

Table 14–1 lists the maximum values supported by DEClaser 2100/2200 printers.

Table 14–1 Maximum Values Supported by DEClaser 2100/2200 Printers

Printer Feature	Maximum Value
Horizontal tabs	160
Vertical tabs	160
Number of trays	See Section 15.2
Number of entries in font dictionary	768

(continued on next page)

Table 14–1 (Cont.) Maximum Values Supported by DEClaser 2100/2200 Printers

Printer Feature	Maximum Value
Built-in font RAM size	{284 | 796} Kbytes[1]
Built-in bitmap RAM or graphics buffer	{284 | 796} Kbytes[1]
Option font ROM size	See cartridge
Optional bitmap RAM	{1 | 2 | 3} Mbytes[2]
Optional download RAM	{1 | 2 | 3} Mbytes[2]
Number of cartridge slots	2

[1]For the DEClaser 2100 printer, RAM size is 284 Kbytes; for the DEClaser 2200 printer, RAM size is 796 Kbytes.

[2]The total of both optional bitmap RAM and optional download RAM cannot exceed 3 Mbytes.

15
Paper Handling

The following options specific to the DEClaser 2100/2200 printers are discussed in this chapter:

- Duplex printing, Section 15.1
- Input tray selection, Section 15.2
- Set sheet size, Section 15.3

15.1 Duplex Printing

The DEClaser 2100 printer implements simplex (one-sided) printing; the DEClaser 2200 printer implements duplex (two-sided) printing.

You select the print mode with the Set Duplex Print Mode (DECSDPM) command.

- A DEClaser 2200 printer cannot tumble the front face of a sheet.
- A DEClaser 2100 printer cannot print physical duplex, nor can it tumble the front face of a sheet.

For a description of the DECSDPM command, see the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual*.

Table 15–1 lists the duplex modes and shows the fallback modes for each printer model when you select an unsupported DECSDPM parameter.

Table 15–1 Duplex Print Mode Fallbacks for the DEClaser 2100/2200 Printers

Ps	Duplex Mode	2100 Model	2200 Model
1	True simplex normal	1	1
2	True simplex tumbled	1	1

(continued on next page)

Table 15–1 (Cont.) Duplex Print Mode Fallbacks for the DEClaser 2100/2200 Printers

Ps	Duplex Mode	2100 Model	2200 Model
3	True duplex normal	5	3
4	True duplex tumbled	5	4
5	Duplex master normal	5	5
6	Duplex master tumbled	5	5
7	Simplex compressed normal	1	7
8	Simplex compressed tumbled	1	8

Example 15–1 shows two forms of the DECSDPM command. The first command with Ps = 1 selects a true simplex normal mode; Ps = 3 selects a true duplex normal mode. "Normal" indicates that the printer does not print documents tumbled.

Example 15–1 Set Duplex Print Mode Command for DEClaser 2100/2200 Printers

```
CSI  1   SP  x
9/11 3/1 2/0 7/8

CSI  3   SP  x
9/11 3/3 2/0 7/7
```

DEClaser 2100/2200, Version 1.7 Printers

The DEClaser 2100/2200, Version 1.7 printers perform a conditional Sheet Feed upon receipt of a Soft Terminal Reset (DECSTR).

Other Digital printers perform a conditional Form Feed upon receipt of a Soft Terminal Reset (DECSTR). If your document is to be printed in duplex mode on a DEClaser 2200, Version 1.7 printer, do not send a DECSTR command between pages; this results in simplex printing.

15.2 Designating the Input Tray

The DEClaser 2100 printer has one input tray and a manual feed slot. An optional envelope cassette is available for the printer that fits in the tray slot. You can also feed envelopes manually.

The DEClaser 2200 printer has two input trays (top tray and bottom tray) and a manual feed slot. In addition to manually feeding envelopes, you can also print envelopes on the DEClaser 2200 printer with the following options:

- An optional envelope cassette that can be installed in the top tray slot and selected from the top tray slot
- An optional envelope feeder that can be installed and selected from the envelope feeder slot

Use the Automatic Sheet Feeder (Input Tray) Control (DECASFC) command to select the appropriate tray or feed slot:

```
CSI  Ps   !   v
9/11 3/xx 2/1 7/6
```

The DECASFC command causes a conditional Form Feed. Subsequent sheets come from the tray as indicated in the selective parameter Ps in Table 15–2:

Table 15–2 Tray Selection on DEClaser 2100/2200 Printers

Ps	Tray Selected	2100 Model	2200 Model
0	No tray change	x	x
1	Top tray	x	x
2	Bottom tray		x
3	Envelope feeder[1]		x
99	Manual feed slot	x	x

[1]The envelope feeder is available as an option and can be selected only with Ps = 3.

The DEClaser 2100/2200 printers treat an unsupported parameter as Ps = 0.

Example 15–2 shows the commands to select — first, the top input tray and second, the manual feed slot.

Example 15–2 Selecting an Input Tray for DEClaser 2100/2200 Printers

```
CSI  1   !   v
9/11 3/1 2/1 7/6

CSI  9   9   !   v
9/11 3/9 3/9 2/1 7/6
```

For a description of the DECASFC command, see the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual.*

15.3 Set Sheet Size (DECSSS)

Use the Set Sheet Size (DECSSS) command to provide the paper size when paper size information is not available.

```
CSI  Pn1  ;    Ps2  ;    Pn3  ;    Pn4  SP   {
9/11 ***  3/11 ***  3/11 ***  3/11 ***  2/0  7/11
```

Table 15–3 lists the supported parameters for the DEClaser 2100/2200 printers.

Table 15–3 Set Sheet Size (DECSSS) Parameters

Value	Meaning
	Ps1
0	Any slot
1	Top tray
99	Manual feed slot
	Ps2
NA	Key number (ignored)
	Pn3
n	Width of the paper (defined as leading edge)
	Pn4
n	Length of the paper

Parameters Pn3 and Pn4 are expressed in pixels, decipoints, or centipoints, as defined by Select Size Unit (SSU), regardless of the setting of Positioning Unit Mode (PUM).

The smallest paper size you can define with DECSSS for DEClaser 2100/2200 printers is 97 mm x 148 mm. If you select a page that is smaller than the smallest size, the DEClaser 2100/2200 printers default to the minimum paper size.

DEClaser 2100/2200, Version 1.7 Printers

DEClaser 2100/2200, Version 1.7 printers default to A-size paper if the page size selected is smaller than the smallest size available.

For more information on the Set Sheet Size (DECSSS) command, see the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual*.

16

Status and Error Reporting

The topics discussed in this chapter include the following:

- Device Attributes Report (DAR) parameters, Section 16.1
- Device Attributes (Secondary) Report (DA2R) parameters, Section 16.2
- Error parameters for Device Status Reports, Section 16.3

This chapter discusses reports and lists the error parameters for printer device status reports for DEClaser 2100/2200 printers. These printers send the following reports:

- CPR — Reports current cursor position
- DAR — Responds to a Device Attributes (DA) request, Section 16.1
- DA2R — Responds to a Device Attributes (secondary) DA2 request, Section 16.2
- DECFSR (1 or 0) — Reports fonts currently available
- DECFSR (2 or 0) — Reports the memory available for downline loading in bytes
- DECFSR (DECLFF Ps2 = 2 or 3) — Reports font validation errors and warnings (DEClaser 2100/2200 plus printers only)
- DSR — Responds to a Device Status Report or an error if unsolicited reports are enabled, Section 16.3

For information on the Cursor Position Report (CPR) and the Font Status Report (DECFSR) commands, refer to the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual*.

16.1 Device Attributes Report (DAR) Parameters

Device Attributes Report (DAR) parameters allow the printer to identify itself as either of the following:

- A Digital level 3 printer — DAR (generic response)
- A previous model Digital printer (to allow backward compatibility) — DAR (alias response)

To request product identification for DEClaser 2100/2200 printers, the host must send a Device Attributes (DA) command:

```
CSI  c         or     CSI  0   c
9/11 6/3              9/11 3/0 6/3
```

DEClaser 2100/2200 printers respond to a Device Attributes (DA) command by sending a DAR (generic response):

```
CSI  ?    Ps1 ;    Ps2 ;     . . .   ;    Psn c
9/11 3/15 *** 3/11 *** 3/11  . . .   3/11 *** 6/3
```

For DEClaser 2100/2200 printers, Ps1 is 73 (3/7 3/3). This identifies the printers as Digital level 3 devices.

Ps2 to Ps*n* indicate which extensions or enhancements the DEClaser 2100/2200 printers support.

Table 16–1 lists the character form (Ps2 to Ps*n*) and code for each extension.

Table 16–1 Parameters for Primary DA Response for DEClaser 2100/2200 Printers

Character Form	Code	Extension
4	3/4	Sixel graphics
6	3/6	Sheet feeder
8	3/8	Legal-size paper handling
9	3/9	Variable Page Format Select (DECVPFS)
10	3/1 3/0	Vector drawing
11	3/1 3/1	Multiple copies
12	3/1 3/2	Hebrew
16	3/1 3/6	Logical duplex
18	3/1 3/8	Physical duplex[1]

[1]The physical duplex extension applies only to the DEClaser 2200 printer.

Example 16–1 shows a primary DA request to a DEClaser 2100 printer and a typical DAR (generic response) from the DEClaser 2100 printer:

Example 16–1 DA Request and DAR Example for DEClaser 2100/2200 Printers

```
CSI c        or        CSI 0 c

CSI ? 73;4;6;8;9;10;11;12;16  c
```

Table 16–2 lists the DAR (alias response) parameters supported by the DEClaser 2100/2200 printers for backwards compatibility.

Table 16–2 DAR Parameters (Alias Response) for DEClaser 2100/2200 Printers

Character Form	Code	Option
26	3/2 3/6	LN03 (base unit)

DEClaser 2100/2200 printers can be configured to send only the number 26 for compatibility with the LN03 printer:

```
CSI  ? 26 c
```

For more information on the Device Attributes Report (DAR) command, refer to the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual*.

16.2 Device Attributes (Secondary) Report (DA2R) Parameters

A secondary Device Attributes Report (DA2R) provides the following information about DEClaser 2100/2200 printers:

- Identifies the printer model (2100 or 2200)
- Names the firmware revision
- Lists the amount of memory in megabytes
- Indicates whether a protocol cartridge is installed

To request this information, the host sends a Device Attributes (Secondary) (DA2) command:

```
CSI  >    c         or       CSI  0   >    c
9/11 3/14 6/3                 9/11 3/0 3/14 6/3
```

In response to a secondary DA request, DEClaser 2100/2200 printers send a Device Attributes (Secondary) Report (DA2R):

```
CSI  >    Ps1 ;    Ps2 ;    Ps3 ;    Ps4 c
9/11 3/14 *** 3/11 *** 3/11 *** 3/11 *** 6/3
```

Table 16–3 lists the DA2R parameters supported by DEClaser 2100/2200 printers.

Table 16–3 Parameters for DA2 Responses for DEClaser 2100/2200 Printers

Character Form	Code	Description
		Ps1
46	3/4 3/6	DEClaser 2100 printer
47	3/4 3/7	DEClaser 2200 printer
		Ps2
xx	3/*x* 3/*x*	Firmware revision *x.x*
		Ps3
0	3/0	No additional memory installed
1	3/1	1-Mbyte memory card
2	3/2	2-Mbyte memory card
3	3/3	3-Mbyte memory card
		Ps4
		Ps4 is the sum of the codes of the installed protocols. Table 16–4 lists the protocol codes.
		Ps5[1]
yy	3/*y* 3/*y*	Minor firmware revision *yy*
00	3/0 3/0	Version x.x-00

[1]Only on the DEClaser 2100/2200 plus printers

Table 16–4 Protocol Codes for DA2R Responses

Code	Protocol
1	PostScript
2	CaPSL
4	IBM Proprinter X24E[1]
8	HP PCL 4[1]
16	Reserved
32	. . .

[1]Only on the DEClaser 2100/2200 plus printers

Example 16–2 shows a DA2 request and a DA2R response from a DEClaser 2200 plus printer, firmware Version 2.0–00, with a 3-Mbyte memory card and no protocol cartridge.

Example 16–2 DA2 Request and DA2R Response for DEClaser 2200 plus Printers

```
CSI > c        or        CSI > 0 c

CSI > 47;20;3;0;00 c
```

For more information on the Device Attributes (Secondary) Report (DA2R), see the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual*.

16.3 Error Parameters for Device Status Reports

Table 16–5 lists error parameters reported by DEClaser 2100/2200 printers for extended DSR reports. Each error parameter has a unique code that pinpoints the specific failure and a generic code that indicates the general type of failure. For example, in the error message ?218 ?36:

- ?218 is the specific code for a paper jam in the duplex transport path
- ?36 is a generic code for paper jams

Refer to Table B–1 for a list of generic codes and their meanings.

For more information on Device Status Reports and parameters, see the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual*.

Table 16–5 Error Parameters for Extended Printer Device Status Reports for DEClaser 2100/2200 Printers

Specific Code	Generic Code	Class	Meaning
			Controller Errors
?0	?57	Special	First report since initialization[1,2]
?0	?20	S:U	No malfunction detected
?101	?41	E	Complex data
?102	?41	E	Lost characters
?103	?44	E	Font memory full
?104	?44	S	Font dictionary full
?105	?41	E	Page memory full
?111	?42	E	Downline loaded font warning
?112	?42	E	Downline loaded font error (load aborted)

[1]Only on the DEClaser 2100/2200 plus printers

[2]If initialization message is enabled, see Section 13.4.

Key to Error Class

S—State (cleared when error condition corrected)
E—Event (cleared when error report transmitted)
S:U—State (same as S, but additionally triggers unsolicited reports when enabled)
E:U—Event (same as E, but additionally triggers unsolicited reports when enabled)
Special–Sent (if enabled) as the first parameter on power-on or front panel reset operation

(continued on next page)

Table 16–5 (Cont.) Error Parameters for Extended Printer Device Status Reports for DEClaser 2100/2200 Printers

Specific Code	Generic Code	Class	Meaning
			Controller Errors
?113	?47	E	Error overflow (more than can be recorded)
?116	?43	E	Invalid parameter in control function
?117	?41	E	Justify buffer overflow
?122	?42	E	Inconsistent font file metrics[1]
?123	?40	E	No font file with current character set
?131	?22	E	Line error on received character
?132	?23	E	Line error — input buffer overflow
?133	?55	E:U	Data syntax switch failed; emulation not present or not installed
?134	?21	E:U	Font removed while printing
?142	?56	S:U	Insufficient memory for requested memory configuration
?163	?21	S:U	Expansion board ROM failure
?168	?21	S:U	Expansion board interface failure (major)
?169	?21	S:U	Expansion board interface failure (minor)
			Engine Errors
–	?24	S:U	Printer is off line[1]
?201	?34	S:U	Fixing (fuser) unit error
?202	?34	S:U	Optical system error
?203	?33	S	Toner low
?204	?34	S:U	Optical motor error

[1]Only on the DEClaser 2100/2200 plus printers

Key to Error Class

S—State (cleared when error condition corrected)
E—Event (cleared when error report transmitted)
S:U—State (same as S, but additionally triggers unsolicited reports when enabled)
E:U—Event (same as E, but additionally triggers unsolicited reports when enabled)
Special–Sent (if enabled) as the first parameter on power-on or front panel reset operation

(continued on next page)

Table 16–5 (Cont.) Error Parameters for Extended Printer Device Status Reports for DEClaser 2100/2200 Printers

Specific Code	Generic Code	Class	Meaning
			Engine Errors
?206	?27	S:U	Paper tray empty
?209	?33	E:U	User requested print check
?211	?34	S:U	Engine nonvolatile RAM error
?212	?26	S:U	Printer cover open
?216	?36	S:U	Paper jam
?218	?36	S:U	Paper jam in duplex transport path
?221	?37	S:U	Invalid command (internal)
?225	?37	S:U	Internal memory overflow error
?239	?21	S:U	No EP-S cartridge
?267	?34	S:U	Image data transfer timeout
?268	?34	S:U	Signal timeout
?269	?34	S:U	Illegal signal
?272	?34	S:U	Internal status parity error
?278	?34	S:U	Undefined operator call
?279	?34	S:U	Undefined service call
?280	?34	S:U	CPU timeout
?282	?34	S:U	Sub-CPU communications error
?283	?34	S:U	Sub-CPU microwire error
?289	?34	S:U	Duplex printing module error
			Media Errors or Requests
?310	?51	S:U	Load A4-size paper cassette

Key to Error Class

S—State (cleared when error condition corrected)
E—Event (cleared when error report transmitted)
S:U—State (same as S, but additionally triggers unsolicited reports when enabled)
E:U—Event (same as E, but additionally triggers unsolicited reports when enabled)
Special–Sent (if enabled) as the first parameter on power-on or front panel reset operation

(continued on next page)

Table 16–5 (Cont.) Error Parameters for Extended Printer Device Status Reports for DEClaser 2100/2200 Printers

Specific Code	Generic Code	Class	Meaning
			Media Errors or Requests
?311	?51	S:U	Load B5-size paper cassette
?312	?51	S:U	Load Letter-size paper cassette
?313	?51	S:U	Load Legal-size paper cassette
?314	?51	S:U	Load executive-size paper cassette
?315	?51	S:U	Load paper *paper_size* cassette
?316	?51	S:U	Load option
?320	?52	S:U	Request manual feed A4-size paper
?321	?52	S:U	Request manual feed B5-size paper
?322	?52	S:U	Request manual feed Letter-size paper
?323	?52	S:U	Request manual feed Legal-size paper
?324	?52	S:U	Request manual feed executive-size paper
?325	?52	S:U	Request manual feed paper *paper_size*
?331	?53	S:U	Selected media cannot be printed duplex
?332	?53	S:U	Cannot continue auto feed operation: paper out or not the requested size
?335	?53	S:U	Envelope cassette is in the wrong slot
?336	?53	S:U	Paper size requested not available in current tray
?340	?54	S:U	Output tray in wrong position for duplex printing
?341	?54	S:U	Output tray in wrong position for selected media

Key to Error Class

S—State (cleared when error condition corrected)
E—Event (cleared when error report transmitted)
S:U—State (same as S, but additionally triggers unsolicited reports when enabled)
E:U—Event (same as E, but additionally triggers unsolicited reports when enabled)
Special–Sent (if enabled) as the first parameter on power-on or front panel reset operation

17

Fonts for DEClaser 2100/2200 Printers

This chapter discusses the following topics related to fonts for DEClaser 2100/2200 printers:

- Load Font File (DECLFF) considerations, Section 17.1
- Font file repertory, Section 17.2
- Available built-in fonts, Section 17.3
- Algorithmic transformations for rendering attributes, Section 17.4

For more information on fonts and font selection, refer to the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual*.

17.1 Load Font File (DECLFF) Considerations

DEClaser 2100 printers have 284 Kbytes of built-in font memory available for downline loading of font files. DEClaser 2200 printers have 796 Kbytes of built-in font memory available for downline loading of font files. Both printer models can store up to 768 font files.

Font files that are downline loaded into the memory by the Load Font File (DECLFF) command must follow the Common Font File Format (CFFF). For information, see the *Font File Format User's Manual*.

17.2 Font Repertory

The font repertory of DEClaser 2100/2200 printers consists of the following:

- Built-in fonts
- Standard font cartridges
- Digital Standard Font Files available in CFFF format that can be downline loaded
- Customer-provided font files in CFFF format that can be downline loaded
- Built-in algorithmic transformations

17.3 Built-In Font File Repertory

DEClaser 2100/2200 printers have 36 built-in font files. These font files support the combination of nine character sets and four fonts. The following fonts reside in the DEClaser 2100/2200 printers:

- Courier 10-point 10-pitch normal portrait (Normal means that the font is not bold, italic, or otherwise attributed.)
- Courier 10-point 10.3-pitch normal portrait
- Courier 6.7-point 13.6-pitch normal landscape
- Elite 10-point 12-pitch normal portrait

For each font, the following character sets reside in the printer:

- ASCII
- DEC Supplemental
- ISO Latin-1 Supplemental
- DEC Technical
- DEC Special Graphics (VT100 Line Drawing)
- DEC 7-Bit Hebrew
- DEC Hebrew Supplemental
- ISO Latin-Hebrew Supplemental
- Legal

17.3.1 Type Family Names

Table 17–1 lists the type families and the associated type family IDs built into the DEClaser 2100/2200 printers.

Table 17–1 Type Family Names in DEClaser 2100/2200 Printers

Type Family Name	Type Family ID (Seven Characters)
DEC Builtin1	DBULTN1[1]
Courier	RCOURIR[2]
Elite 12	RELITE0[2]
PI font	D000000[1]

[1]The "D" in the type family IDs for DEC Builtin1 and PI font indicates that the name is registered with Digital, but is not registered internationally.

[2]The "R" in the type family IDs for Courier and Elite 12 indicates that these names are either registered internationally or are in the public domain.

17.3.2 Built-In Type Family Names and IDs, Font IDs, and Font File IDs

Table 17–2 lists type family names, type family IDs, font IDs, and font file IDs built into DEClaser 2100/2200 printers.

Each of the 36 font files contains a character set that has a style, an orientation, a point size, and a horizontal spacing. Table 17–2 contains 72 entries. The DEClaser 2100/2200 printers recognize two font names:

- A name that is either internationally registered or in the public domain, for example, Courier or Elite 12
- A name registered by Digital, for example, Builtin or PI

For example, the following two entries are the same:

- Courier ASCII, 10 point, 10 pitch, Portrait font — (RCOURIR J 02S K 00 G G 00 01U ZZZZ 02 F 0 0 0)
- DEC Builtin1 ASCII, 10 point, 10 pitch, Portrait font — (DBULTN1 J 02S K 00 G G 00 01U ZZZZ 02 F 0 0 0)

A **font file** has a 31-character name. The first seven characters are the **type family ID**, the first 12 characters are the **font collection ID**, and the first 16 characters define the **font ID**. The following example shows how the type families, fonts, and font files are related:

- A type family ID — DBULTN1
- A font collection ID — DBULTN1J02SK

- A font ID — DBULTN1J02SK00GG
- A font file ID — DBULTN1J02SK00GG0001UZZZZ02F000

In Table 17–2, the font ID, the font collection ID, and the font file ID are indicated by arrows.

Note

Spaces appear in the IDs for clarity; they are not part of the IDs.

Table 17–2 Built-In Font File IDs

Pitch	Type Size	Character Set	Font File ID——————————————————> Font ID————————————> Font Collection ID—->
1. Type Family Name: DEC Builtin1 — Type Family ID: DBULTN1			
10	10	ASCII	DBULTN1 J 02S K 00 G G 00 01U ZZZZ 02 F 0 0 0
10	10	DEC Supplemental[1]	DBULTN1 J 02S K 00 G G 00 245 ZZZZ 02 F 0 0 0
10	10	ISO Latin-1 Supplemental	DBULTN1 J 02S K 00 G G 00 6DD ZZZZ 02 F 0 0 0
10	10	DEC 7-Bit Hebrew	DBULTN1 J 02S K 00 G G 00 24D ZZZZ 02 F 0 0 0
10	10	DEC Hebrew Supplemental	DBULTN1 J 02S K 00 G G 00 1TG ZZZZ 02 F 0 0 0
10	10	ISO Latin-Hebrew Supplemental	DBULTN1 J 02S K 00 G G 00 6DK ZZZZ 02 F 0 0 0
10	10	Legal	DBULTN1 J 02S K 00 G G 00 244 ZZZZ 02 F 0 0 0
10.3	10	ASCII	DBULTN1 2 02S K 00 G G 00 01U ZZZZ 02 F 0 0 0
10.3	10	DEC Supplemental[1]	DBULTN1 2 02S K 00 G G 00 245 ZZZZ 02 F 0 0 0
10.3	10	ISO Latin-1 Supplemental	DBULTN1 2 02S K 00 G G 00 6DD ZZZZ 02 F 0 0 0
10.3	10	DEC 7-Bit Hebrew	DBULTN1 2 02S K 00 G G 00 24D ZZZZ 02 F 0 0 0
10.3	10	DEC Hebrew Supplemental	DBULTN1 2 02S K 00 G G 00 1TG ZZZZ 02 F 0 0 0
10.3	10	ISO Latin-Hebrew Supplemental	DBULTN1 2 02S K 00 G G 00 6DK ZZZZ 02 F 0 0 0
10.3	10	Legal	DBULTN1 2 02S K 00 G G 00 244 ZZZZ 02 F 0 0 0
12	10	ASCII	DBULTN1 L 02S K 00 G G 00 01U ZZZZ 02 F 0 0 0
12	10	DEC Supplemental[1]	DBULTN1 L 02S K 00 G G 00 245 ZZZZ 02 F 0 0 0

[1]The character set ID field of 01O formerly identified DEC Supplemental. It is now used for user preference.

(continued on next page)

Table 17–2 (Cont.) Built-In Font File IDs

Pitch	Type Size	Character Set	Font File ID——————————————————————> Font ID——————————————> Font Collection ID—->
1. Type Family Name: DEC Builtin1 — Type Family ID: DBULTN1			
12	10	ISO Latin-1 Supplemental	DBULTN1 L 02S K 00 G G 00 6DD ZZZZ 02 F 0 0 0
12	10	DEC 7-Bit Hebrew	DBULTN1 L 02S K 00 G G 00 24D ZZZZ 02 F 0 0 0
12	10	DEC Hebrew Supplemental	DBULTN1 L 02S K 00 G G 00 1TG ZZZZ 02 F 0 0 0
12	10	ISO Latin-Hebrew Supplemental	DBULTN1 L 02S K 00 G G 00 6DK ZZZZ 02 F 0 0 0
12	10	Legal	DBULTN1 L 02S K 00 G G 00 244 ZZZZ 02 F 0 0 0
13.6	6.7	ASCII	DBULTN1 1 01V K 00 G G 00 01U ZZZZ 02 F 0 0 0
13.6	6.7	DEC Supplemental[1]	DBULTN1 1 01V K 00 G G 00 245 ZZZZ 02 F 0 0 0
13.6	6.7	ISO Latin-1 Supplemental	DBULTN1 1 01V K 00 G G 00 6DD ZZZZ 02 F 0 0 0
13.6	6.7	DEC 7-Bit Hebrew	DBULTN1 1 01V K 00 G G 00 24D ZZZZ 02 F 0 0 0
13.6	6.7	DEC Hebrew Supplemental	DBULTN1 1 01V K 00 G G 00 1TG ZZZZ 02 F 0 0 0
13.6	6.7	ISO Latin-Hebrew Supplemental	DBULTN1 1 01V K 00 G G 00 6DK ZZZZ 02 F 0 0 0
13.6	6.7	Legal	DBULTN1 1 01V K 00 G G 00 244 ZZZZ 02 F 0 0 0
2. Type Family Name: Courier — Type Family ID: RCOURIR			
10	10	ASCII	RCOURIR J 02S K 00 G G 00 01U ZZZZ 02 F 0 0 0
10	10	DEC Supplemental[1]	RCOURIR J 02S K 00 G G 00 245 ZZZZ 02 F 0 0 0
10	10	DEC Technical	RCOURIR J 02S K 00 G G 00 01Q ZZZZ 02 F 0 0 0
10	10	DEC Special Graphics	RCOURIR J 02S K 00 G G 00 01C ZZZZ 02 F 0 0 0
10	10	ISO Latin-1 Supplemental	RCOURIR J 02S K 00 G G 00 6DD ZZZZ 02 F 0 0 0
10	10	DEC 7-Bit Hebrew	RCOURIR J 02S K 00 G G 00 24D ZZZZ 02 F 0 0 0
10	10	DEC Hebrew Supplemental	RCOURIR J 02S K 00 G G 00 1TG ZZZZ 02 F 0 0 0
10	10	ISO Latin-Hebrew Supplemental	RCOURIR J 02S K 00 G G 00 6DK ZZZZ 02 F 0 0 0
10	10	Legal	RCOURIR J 02S K 00 G G 00 244 ZZZZ 02 F 0 0 0
10.3	10	ASCII	RCOURIR 2 02S K 00 G G 00 01U ZZZZ 02 F 0 0 0

[1]The character set ID field of 01O formerly identified DEC Supplemental. It is now used for user preference.

(continued on next page)

Table 17–2 (Cont.) Built-In Font File IDs

Pitch	Type Size	Character Set	Font File ID——————————————————————> Font ID————————————> Font Collection ID—->
2. Type Family Name: Courier — Type Family ID: RCOURIR			
10.3	10	DEC Supplemental[1]	RCOURIR 2 02S K 00 G G 00 245 ZZZZ 02 F 0 0 0
10.3	10	DEC Technical	RCOURIR 2 02S K 00 G G 00 01Q ZZZZ 02 F 0 0 0
10.3	10	DEC Special Graphics	RCOURIR 2 02S K 00 G G 00 01C ZZZZ 02 F 0 0 0
10.3	10	ISO Latin-1 Supplemental	RCOURIR 2 02S K 00 G G 00 6DD ZZZZ 02 F 0 0 0
10.3	10	DEC 7-Bit Hebrew	RCOURIR 2 02S K 00 G G 00 24D ZZZZ 02 F 0 0 0
10.3	10	DEC Hebrew Supplemental	RCOURIR 2 02S K 00 G G 00 1TG ZZZZ 02 F 0 0 0
10.3	10	ISO Latin-Hebrew Supplemental	RCOURIR 2 02S K 00 G G 00 6DK ZZZZ 02 F 0 0 0
10.3	10	Legal	RCOURIR 2 02S K 00 G G 00 244 ZZZZ 02 F 0 0 0
13.6	6.7	ASCII	RCOURIR 1 01V K 00 G G 00 01U ZZZZ 02 F 0 0 0
13.6	6.7	DEC Supplemental[1]	RCOURIR 1 01V K 00 G G 00 245 ZZZZ 02 F 0 0 0
13.6	6.7	DEC Technical	RCOURIR 1 01V K 00 G G 00 01Q ZZZZ 02 F 0 0 0
13.6	6.7	DEC Special Graphics	RCOURIR 1 01V K 00 G G 00 01C ZZZZ 02 F 0 0 0
13.6	6.7	ISO Latin-1 Supplemental	RCOURIR 1 01V K 00 G G 00 6DD ZZZZ 02 F 0 0 0
13.6	6.7	DEC 7-Bit Hebrew	RCOURIR 1 01V K 00 G G 00 24D ZZZZ 02 F 0 0 0
13.6	6.7	DEC Hebrew Supplemental	RCOURIR 1 01V K 00 G G 00 1TG ZZZZ 02 F 0 0 0
13.6	6.7	ISO Latin-Hebrew Supplemental	RCOURIR 1 01V K 00 G G 00 6DK ZZZZ 02 F 0 0 0
13.6	6.7	Legal	RCOURIR 1 01V K 00 G G 00 244 ZZZZ 02 F 0 0 0
3. Type Family Name: Elite 12 — Type Family ID: RELITE0			
12	10	ASCII	RELITE0 L 02S K 00 G G 00 01U ZZZZ 02 F 0 0 0
12	10	DEC Supplemental[1]	RELITE0 L 02S K 00 G G 00 245 ZZZZ 02 F 0 0 0
12	10	DEC Technical	RELITE0 L 02S K 00 G G 00 01Q ZZZZ 02 F 0 0 0
12	10	DEC Special Graphics	RELITE0 L 02S K 00 G G 00 01C ZZZZ 02 F 0 0 0
12	10	ISO Latin-1 Supplemental	RELITE0 L 02S K 00 G G 00 6DD ZZZZ 02 F 0 0 0

[1]The character set ID field of 01O formerly identified DEC Supplemental. It is now used for user preference.

(continued on next page)

Table 17–2 (Cont.) Built-In Font File IDs

Pitch	Type Size	Character Set	Font File ID——————————————————————> Font ID————————————> Font Collection ID—->
3. Type Family Name: Elite 12 — Type Family ID: RELITE0			
12	10	DEC 7-Bit Hebrew	RELITE0 L 02S K 00 G G 00 24D ZZZZ 02 F 0 0 0
12	10	DEC Hebrew Supplemental	RELITE0 L 02S K 00 G G 00 1TG ZZZZ 02 F 0 0 0
12	10	ISO Latin-Hebrew Supplemental	RELITE0 L 02S K 00 G G 00 6DK ZZZZ 02 F 0 0 0
12	10	Legal	RELITE0 L 02S K 00 G G 00 244 ZZZZ 02 F 0 0 0
4. Type Family Name: PI Font — Type Family ID: D000000			
10	10	DEC Technical	D000000 J 02S K 00 G G 00 01Q ZZZZ 02 F 0 0 0
10	10	DEC Special Graphics	D000000 J 02S K 00 G G 00 01C ZZZZ 02 F 0 0 0
10.3	10	DEC Technical	D000000 2 02S K 00 G G 00 01Q ZZZZ 02 F 0 0 0
10.3	10	DEC Special Graphics	D000000 2 02S K 00 G G 00 01C ZZZZ 02 F 0 0 0
12	10	DEC Technical	D000000 L 02S K 00 G G 00 01Q ZZZZ 02 F 0 0 0
12	10	DEC Special Graphics	D000000 L 02S K 00 G G 00 01C ZZZZ 02 F 0 0 0
13.6	6.7	DEC Technical	D000000 1 01V K 00 G G 00 01Q ZZZZ 02 F 0 0 0
13.6	6.7	DEC Special Graphics	D000000 1 01V K 00 G G 00 01C ZZZZ 02 F 0 0 0

17.3.3 Font Metrics

Table 17–3 lists the metrics in centipoints for the fonts built into the DEClaser 2100/2200 printers. The first value in the heading represents the point size; the second value represents the pitch. For example, Courier 10, 10 is a Courier 10-point, 10-pitch font.

Table 17–3 Font Metrics for the DEClaser 2100/2200 Printers

Field	Courier 10, 10	Courier 10, 10.3	Elite 10, 12	Courier 6.7, 13.6
Total vertical size	1152	1152	1152	864
Above baseline offset	–840	–840	–840	–648
Below baseline offset	312	312	312	216
Minimum space size[1]	360	336	288	264
Nominal space size	720	696	600	528
Maximum space size[2]	1440	1392	1200	1056
Superscript vertical[3]	–576	–576	–576	–432
Subscript vertical[3]	576	576	576	432
Underline offset (height, thickness)	240, 72	240, 72	240, 72	168, 48
Strike-through offset (height, thickness)	–264, 72	–264, 72	–264, 72	–192, 48
Overline offset (height, thickness)	–912, 72	–912, 72	–912, 72	–480, 48

[1] In general, minimum space is calculated as 33% to 50% of width of space.

[2] In general, maximum space is calculated as 200% of width of space.

[3] In general, superscript and subscript offsets are one-half of the total vertical size.

17.4 Built-in Algorithmic Transformations

When the print job requires a font with a particular set of attributes, DEClaser 2100/2200 printers search the current repertory for a font that contains the proper character set, in the proper style, in the proper horizontal and vertical size, with the desired attributes.

If the search fails to find a font with the desired attributes, DEClaser 2100/2200 printers attempt to approximate the desired attributes by using algorithmic transformations on the existing repertory.

DEClaser 2100/2200 printers provide fallback algorithmic transformations for the following:

- Bold (shadow bold)
- Portrait/landscape orientation (rotation)
- Italic (character underline)
- Underline
- Strike-through
- Overline
- National Replacement Character Sets (NRCS)

DEClaser 2100/2200 printers use algorithmic transformations for the following:

- Horizontal spacing
- Vertical spacing
- Double underline

Fallbacks are not provided for the following attributes:

- Size scaling of any type
- Italics fallback by slanting the character
- Kerning

17.4.1 Memory Use

Only one algorithmic transformation uses memory: rotating the font to fit the page orientation. By default, DEClaser 2100/2200 printers store transmitted font file characters in portrait orientation. When you require landscape printing, the printer conserves memory by rotating only the fonts that the printer uses rather than all selected fonts.

If you require a font in landscape orientation only, you can further reduce the amount of memory that is used by specifying the orientation in the *font_record* of the Load Font File (DECLFF) command. To store a copy of the font in landscape format only, precede the *font_record* with an equal sign (=, 3/13):

DCS 0; 1; 1 y = *font_record*; *comment_record* ST

For more information on the Load Font File (DECLFF) command, refer to the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual*.

17.4.2 Spacing Criterion Fallback

When the selected font is proportional and the requested font is monospaced, the DEClaser 2100/2200 printers left-justify the proportional characters within the monospaced cell.

17.4.3 Fallback Metrics for Mixed Font Files (DEClaser 2100/2200 plus Printers)

The DEClaser 2100/2200 plus printers do not support fallback metrics for all categories of mixed text; however, the printers do support a fallback for inconsistent metrics when performing NRCS pairing. A Device Status Report (DSR) may be sent by the printer when inconsistent metrics are detected.

17.5 Font List (DEClaser 2100/2200 plus Printers)

The DEClaser 2100/2200 plus printers report the font SGR assignments contained in the font cartridges when printing the font list. The SGR assignment (as written in the cartridge) is displayed one line per SGR listing after the cartridge title line.

17.6 Font File Validation Test Report (DEClaser 2100/2200 plus Printers)

The DEClaser 2100/2200 plus printers generate reports of errors and warnings that occur during font file validation. You may use these reports for debugging purposes if you are designing font files for level 3 printers according to the Common Font File Format (CFFF).

Refer to Appendix C for a description of the Font Status Report (DECFSR) command.

You request this report through the second parameter (Ps2 = 2 or 3) of the Load Font File (DECLFF) command as described in Table 17–4. You can also request font file validation information to be printed through the second parameter (Ps2 = 4) of DECLFF.

Table 17–4 Parameters for Load Font File (DECLFF) for the DEClaser 2100/2200 plus Printers

Ps2	Action
0 or omitted	Print summary sheet.
1	Do not print summary sheet.
2	Send font error and warning information. Response is Font Status Report (DECFSR, DECLFF Ps2 = 2 or 3).
3	Same as 0 and 2.
4	Print font error and warning information on a separate sheet.
Any other value	Do not print summary sheet or send status report.

18

Sixel Considerations

This chapter discusses three topics related to sixel graphics:

- Macro parameter values, Section 18.1
- Valid Set Raster Attributes (DECGRA) commands, Section 18.2.1
- Restrictions, Section 18.2.2

18.1 Macro Parameter Values

Table 18–1 compares the target values and the values implemented by DEClaser 2100/2200 printers for the macro parameter (Ps1) of the sixel mode graphics device control string:

`DCS Ps1; Ps2; Pn3 q` *`picture_definition`* `ST`

Ps1 is a selective parameter that specifies the horizontal grid size and aspect ratio. Grid size measurements are given in centipoints.

Table 18–1 Macro Parameter Values for DEClaser 2100/2200 Printers (Grid Sizes in Centipoints)

	Target Values			DEClaser 2100/2200 Values		
Ps1	Approximate Horizontal Grid Size[1]	Aspect Ratio Vert:Horiz	Vertical Grid Size	Horizontal Grid Size	Aspect Ratio Vert:Horiz	Vertical Grid Size
0	54.60	200:100	100	48	200:100	96
1	54.60	200:100	100	48	200:100	96
2	22.22	450:100	100	21	451:100	96

[1] For true target values in 1/660 in., see the sixel information in the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual.*

(continued on next page)

Table 18–1 (Cont.) Macro Parameter Values for DEClaser 2100/2200 Printers (Grid Sizes in Centipoints)

	Target Values			DEClaser 2100/2200 Values		
Ps1	Approximate Horizontal Grid Size[1]	Aspect Ratio Vert:Horiz	Vertical Grid Size	Horizontal Grid Size	Aspect Ratio Vert:Horiz	Vertical Grid Size
3	33.33	300:100	100	32	300:100	96
4	40.00	250:100	100	38	252:100	96
5	54.60	183:100	100	48	200:100	96
6	66.66	150:100	100	64	150:100	96
7	76.90	130:100	100	74	129:100	96
8	89.20	112:100	100	86	111:100	96
9	100.00	100:100	100	96	100:100	96

[1] For true target values in 1/660 in., see the sixel information in the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual.*

18.2 Miscellaneous Considerations and Restrictions

Section 18.2.1 and Section 18.2.2 discuss valid Set Raster Attributes (DECGRA) commands and restrictions to the printing of sixel graphics.

18.2.1 Valid Set Raster Attributes (DECGRA) Commands

DEClaser 2100/2200 printers ignore a DECGRA command if they receive any of the following:

- Graphics Repeat Introducer control character — DECGRI (!)
- Graphics Carriage Return control character — DECGCR ($)
- Graphics Next Line control character — DECGNL (–)
- Sixel data

Digital recommends that software always send a Set Raster Attributes (DECGRA) command before sending the sixel data and any other sixel graphics command.

18.2.2 Restrictions

The following restrictions apply when you print sixel graphics on DEClaser 2100/2200 printers:

- Colors map to black. This causes most color pictures to come out dark and not very clear.
- Sixel printing ignores extent parameters (Pn3 and Pn4) of the Set Raster Attributes (DECGRA) command.
- Sixel printing ignores the background select parameter (Ps2 of the sixel device control string). The printer assumes a white background.
- The maximum value for the horizontal grid size is 99 current units. (See the Select Size Unit (SSU) command in the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual*.)
- The maximum value for the aspect ratio is 1000. The horizontal grid size multiplied by the aspect ratio provides a maximum vertical grid size of 99,000 current units. (See the Select Size Unit (SSU) command in the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual*.)

19
Alternative Protocols

DEClaser 2100/2200 printers support the following DEC PPL3 protocol switching commands:

- Select Other Coding System (SOCS)
- Return from Other Coding System (ROCS)
- IBM Proprinter Emulation Mode (DECIPEM) (DEClaser 2100/2200 plus printers only)

See your Digital sales representative for the protocols available for the DEClaser 2100/2200 printers.

DEClaser 2100/2200, Version 1.7 Printers

On the DEClaser 2100/2200, Version 1.7 printers, select DEC PPL3 from CaPSL emulation mode using the following escape sequence:

```
ESC    %    >
1/11   2/5  3/14
```

To select DEC PPL3 from emulation modes in other Digital printers, specify the Return from Other Coding Systems (ROCS) sequence in the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual*.

Part III

DEClaser 1100 Printer

Part III describes the level 3 Digital ANSI-Compliant Printing Protocol (DEC PPL3) implementation specific to the DEClaser 1100 printer. The Digital ANSI-Compliant Printing Protocol is based on ANSI X3.64.

- Chapter 20 provides a brief overview of the DEClaser 1100 printer.
- Chapter 21 explains the relationship between the logical information and the printing of the physical page in the DEClaser environment.
- Chapter 22 discusses reset and power-up values and lists initial state values for the printer.
- Chapter 23 lists maximum values for printer features.
- Chapter 24 explains paper handling for the printer.
- Chapter 25 describes reporting commands and lists error messages.
- Chapter 26 lists fonts available to the printer.
- Chapter 27 discusses sixel implementation specific to the printer.
- Chapter 28 discusses protocol switching when using the DEClaser 1100 printer.
- Chapter 29 discusses memory management considerations for the DEClaser 1100 printer.

20

Overview

The DEClaser 1100 printer is a high-quality laser printer that can print text, graphics, and images on standard office envelopes, transparencies, and gummed labels and on the following paper sizes:

- A (Letter)
- A4
- Legal
- Executive (184 mm x 267 mm, 7 1/4 in. x 10 1/2 in.)

DEClaser 1100 printers implement level 3 of the Digital ANSI-Compliant Printing Protocol (DEC PPL3) as described in the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual.*

The DEClaser 1100 printer is a **simplex** printer and can print up to four pages/minute.

21

Logical to Physical Image

This chapter contains the following topics related to creating the physical image:

- Printer resolution, Section 21.1
- Printable area, Section 21.2
- Mapping the logical page to the physical sheet size, Section 21.3
- Positioning accuracy, Section 21.4
- Justification, Section 21.5

21.1 Printer Resolution

The DEClaser 1100 printer has an addressing capability and imaging resolution support a wide range of standard font pitches and sixel graphics resolutions.

Internal addressing capability	1/7200 inch (**centipoint** addressing)
Imaging resolution	300 x 300 dots/inch

21.1.1 Horizontal Resolution

The DEClaser 1100 printer supports the horizontal pitch values listed in Table 21–1 for the selective parameters (Ps) of the Set Horizontal Pitch (DECSHORP) and the Select Horizontal Spacing (SHS) commands. Table 21–1 lists the average width of characters (target pitch) in characters/inch if this value is exact. If characters/inch is only an approximate value, then the table provides the target value in inches with the approximate characters/inch value in parentheses.

Table 21–1 Horizontal Pitches — DEClaser 1100 Printer (Standard 300 Dots/Inch)

Target Pitch (Char/Inch)	Target Value (Centipoints)	Printer Pitch (Char/Inch)	Printer Value (Centipoints)
5	1440.00	5.000	1440
6	1200.00	6.000	1200
(6.6) 10/66 in.	1090.90	6.605	1090
(8.25) 8/66 in.	872.72	8.265	872
(8.55) 28/240 in.	840.00	8.550	840
9	800.00	9.000	800
10	720.00	10.000	720
(10.3) 29/300 in.	696.00	10.344	696
12	600.00	12.000	600
(13.2) 5/66 in.	545.45	13.210	545
15	480.00	15.000	480
(16.5) 4/66 in.	436.36	16.510	436
(17.1) 14/240 in.	420.00	17.100	420
18	400.00	18.000	400

The macro parameter values for sixel graphics grid sizes and aspect ratios provided by the DEClaser 1100 printer are shown in Table 27–1.

21.1.2 Vertical Resolution

The DEClaser 1100 printer's vertical addressing can provide the pitches required for existing fonts and graphics mode. Table 21–2 lists the vertical pitch values supported for the selective parameters (Ps) of the Set Vertical Pitch (DECVERP) and the Select Vertical (Line) Spacing (SVS) commands. Column 2 of Table 21–2, Printer Value, gives the amount of white space between the lines in centipoints for each pitch selection.

Table 21–2 Vertical Pitches — DEClaser 1100 Printer (Standard 300 Dots/Inch)

Target Pitch (Lines/Inch)	Printer Value (Centipoints)
2	3600
3	2400
4	1800
6	1200
8	900
12	600

Target Pitch (Lines/A-size Printable Area)	Printer Value (Centipoints)
22	3456
33	2304
44	1728
66	1152
88	864
132	576

Target Pitch (Lines/30 Millimeters)	Printer Value (Centipoints)
3	2856
4	2136
6	1416
12	720

Note

The DEClaser 1100 printer implements values for the Spacing Pitch Increment (SPI) command as requested.

21.2 Printable Area

The printable area for paper sizes and the maximum and minimum envelope sizes supported by the DEClaser 1100 printer are discussed in Section 21.2.1 and Section 21.2.2.

21.2.1 Paper Sizes

Table 21–3 shows the minimum printable area specified by Digital and the printable area of the DEClaser 1100 printer in centipoints for supported paper sizes.

Table 21–3 Printable Areas of the DEClaser 1100 Printer in Centipoints

Paper Size	Minimum		DEClaser 1100 Printer	
(Conventional Units)	Width	Length	Width	Length
A (8 1/2 in. x 11 in.)	57600	75600	57768	76320
A4 (210 mm x 297 mm)	55872	80568	56088	81288
Legal (8 1/2 in. x 14 in.)	57600	97200	57768	97920
Executive (7 1/4 in. x 10 1/2 in.)	50400	72000	48600	72720

21.2.2 Envelope Sizes

The multipurpose tray can be used to feed envelopes into the DEClaser 1100 printer. An additional option, an envelope cassette, is available. Table 21–4 lists the maximum and minimum envelope sizes supported for each method.

Table 21–4 Maximum and Minimum Envelope Sizes for the DEClaser 1100 Printer

Feeding Method	Minimum Size	Maximum Size
Multipurpose tray	97 mm x 148 mm 3 3/5 in. x 5 4/5 in.	216 mm x 356 mm 8 1/2 in. x 14 in.
Cassette option	98 mm x 190 mm 3 7/10 in. x 7 1/2 in.	162 mm x 250 mm 6 1/3 in. x 9 4/5 in.

21.3 Mapping Page Size to Physical Sheet Size

The Page Format Select (PFS) and Variable Page Format Select (DECVPFS) commands specify the page size. The physical sheet size depends on the paper cassette selected. When the page size does not match the physical sheet size, the DEClaser 1100 printer keeps the page and physical sheet aligned at the top left-hand corner.

- If the page size is smaller than the physical sheet size, the printer leaves white space on the right and the bottom edges. See Figure 21–1.
- If the page size is larger than the physical sheet size, the printer does not image characters that extend beyond the boundaries of the printable area in both the horizontal and vertical directions. See Figure 21–2. In landscape mode, if the top left area extends outside the physical sheet area, it is not imaged.

Figure 21–1 Page Size Smaller Than Physical Sheet Size on the DEClaser 1100 Printer

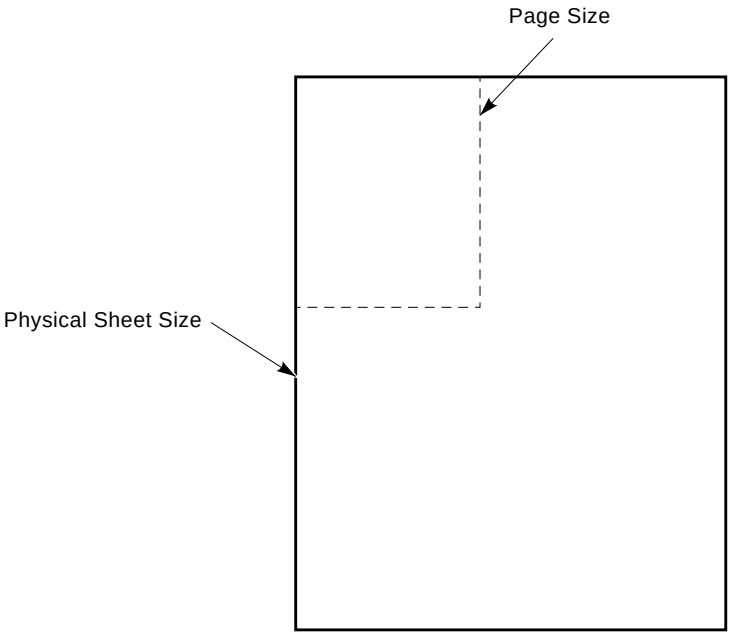
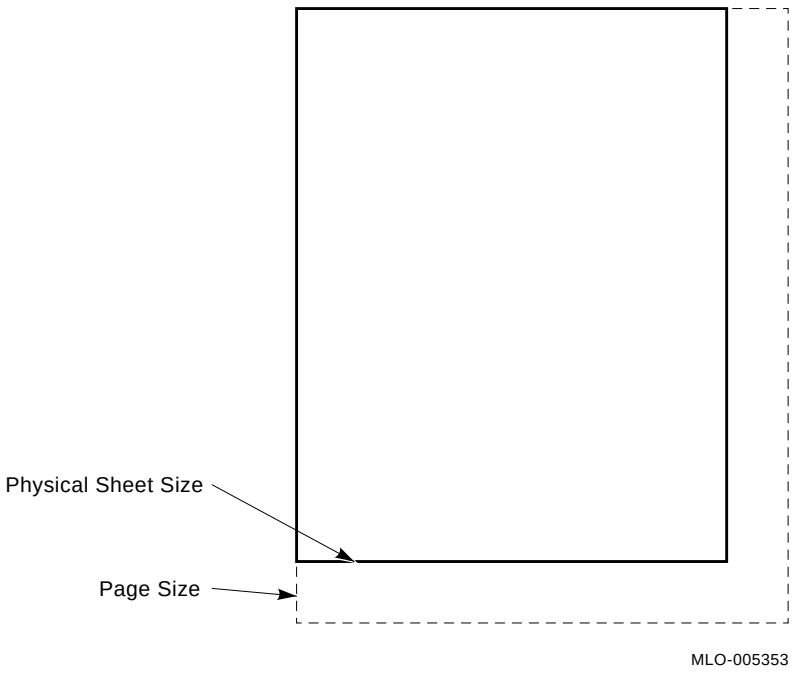


Figure 21–2 Page Size Larger Than Physical Sheet Size on the DEClaser 1100 Printer



21.4 Positioning Accuracy

The DEClaser 1100 printer keeps distance in centipoints. When converting from centipoints to pixels for imaging, the DEClaser 1100 printer truncates the fractional portion of pixels. Positioning is accurate to 1 pixel. For vectors drawn with the Draw Vector (DECVEC) and Draw Relative Vector (DECRVEC) commands, values between 0 and 24 centipoints round to 1 pixel.

21.5 Justification

The DEClaser 1100 printer does not discard either the right bearing of the rightmost character on the line or the left bearing of the leftmost character on the line.

22

Initial State Values

The topics discussed in this chapter include the following:

- Initial state values that are independent of the paper size in the selected paper cassette, Section 22.1
- Initial state values based on the paper cassette, Section 22.2
- Factory defaults in nonvolatile memory, Section 22.3
- Macro values in nonvolatile memory, Section 22.4
- Protocol selections for nonvolatile memory, Section 22.5

22.1 Initial States Independent of Paper Cassette

Tables 22–1 and 22–2 list the values used in the following instances, independent of the paper cassette selection:

- Power-up
- Front panel reset
- Select Conformance Level (DECSCL) command
- Soft Terminal Reset (DECSTR) command
- Reset to Initial State (RIS) command

Table 22–1 Initial State Values for the DEClaser 1100 Printer

Variable or Control Function	DECSCL	Power-Up	DECSTR RIS	Front Panel
Origin (DECOPM)	Reset	Reset	Reset	Reset
Position Unit Mode[1]	Reset	Reset	Reset	Reset
Vertical spacing	Font-dependent	Font-dependent	Font-dependent	Font-dependent
Horizontal spacing	Font-dependent	Font-dependent	Font-dependent	Font-dependent
Size unit[1]	Decipoints	Decipoints	Decipoints	Decipoints
Active position	Origin	Origin	Origin	Origin
Horizontal tabs[2]	Every eight	Every eight	Every eight	Every eight
Line Feed/New Line	Reset	Reset	Reset	Reset
CR/New Line Mode	Reset	Reset	Reset	Reset
Pitch Select Mode	Reset	Reset	Reset	Reset
Proportional spacing	Reset	Reset	Reset	Reset
Justify	Disabled	Disabled	Disabled	Disabled
SGR attributes	Disabled	Disabled	Disabled	Disabled
Vertical tabs[3]	Every VAI	Every VAI	Every VAI	Every VAI
G0	ASCII	ASCII	ASCII	ASCII
G1	ASCII	ASCII	ASCII	ASCII
G2	User Preference	User Preference	User Preference	User Preference
G3	User Preference	User Preference	User Preference	User Preference
GL	G0	G0	G0	G0
GR	G2	G2	G2	G2
GSS	10 points	10 points	10 points	10 points
GSM	100,100	100,100	100,100	100,100

[1]Because Position Unit Mode (PUM) is reset by default, Select Size Unit (SSU) is ignored for most commands.

[2]Horizontal tabs are set every eight columns, starting with column 9 (9,17, . . .) and fill the entire tab table.

[3]Vertical tabs are set every line or Vertical Advance Increment (VAI) and fill the entire tab table.

(continued on next page)

Table 22–1 (Cont.) Initial State Values for the DEClaser 1100 Printer

Variable or Control Function	DECSCL	Power-Up	DECSTR RIS	Front Panel
Autowrap (autoNL)	Set	NVM[4]	RAM[5]	RAM
User Preference Set (macro)[6]	DEC Supplemental	NVM	Unchanged	Last setting[7]
Unsolicited status reports	Disabled	Disabled	Unchanged	Disabled[8]
Downloaded fonts	Deleted	None	Unchanged	Deleted
CRM	Unchanged	Reset	Unchanged	Reset
Tray selection (feeder)	Cassette[9]	NVM	Unchanged	RAM
DECSNC (copy)	1	1	Unchanged	RAM
DECMM (paint)	Partial paint	NVM	Unchanged	Last setting
DECSDPM (duplex)	True simplex	True simplex	Unchanged	True simplex
DECSSS (paper)	Letter (portrait)	NVM	Unchanged	Key[10]
C1 Receive	8-Bit	8-Bit	Unchanged	8-Bit

[4]NVM indicates that the initial state value is stored in the nonvolatile memory of the DEClaser 1100 printer.

[5]RAM (random access memory) indicates that the initial state value is stored in the volatile memory of the DEClaser 1100 printer.

[6]Macro contains the Printer ID and initialization message as well as the User Preference Supplemental Set.

[7]Last setting is the value associated with the variable that was last set in the menu. This applies to variables in the "Initial" menu. These values take effect after a front panel reset.

[8]A front panel reset generates an initialization message, if enabled in the macro.

[9]If the paper cassette is not installed, the initial state value is multipurpose tray.

[10]If the tray selection is cassette, the printer takes the paper size from the cassette key. If the tray selection is the multipurpose tray, the printer takes the paper size from RAM.

Table 22–2 Initial State Values of Select Graphic Rendition (SGR) Numbers

SGR	Assignment Type	ID	Meaning
10	Type family	DBULTN1	DEC Builtin1 family
11	Type family	RCOURIR	Courier family
12	Type family	RELITE0	Elite family
13	Font collection plus	RCOURIRJ02SK00GG[1]	Courier 10 point, 10 pitch
14	Font collection plus	RELITE0L02SK00GG[1]	Elite 10 point, 12 pitch
15	Font collection plus	RCOURIR101VK00GG[1]	Courier 6.7 point, 13.6 pitch
16	Font collection plus	RCOURIR202SK00GG[1]	Courier 10 point, 10.3 pitch
17	Type family	DBULTN1	DEC Builtin1 family
18	Type family	DBULTN1	DEC Builtin1 family
19	Type family	DBULTN1	DEC Builtin1 family

[1]The DEClaser 1100 printer needs only 15 bytes.

Font cartridges modify the default Select Graphic Rendition (SGR) values. These modifications occur during the following instances:

- Power-up
- Soft Terminal Reset (DECSTR)
- Reset to Initial State (RIS)
- Select Conformance Level (DECSCL)

The printer also references modifications to the SGR values made by the font cartridge on the Assign Type Family or Font (DECATFF) command when the string is null.

22.2 Initial States Based on Paper Cassette

Table 22–3 lists the bounds and the Select Graphic Rendition (SGR) parameter determined at initialization. The bounds and parameter depend on the paper size you loaded into the selected paper cassette. Table 22–3 lists the bounds as one of the following:

- A parameter of the Page Format Select (PFS) command
- The Variable Page Format Select (DECVPFS) command
- The Set Sheet Size (DECSSS) command

Table 22–3 Initialization Based on Paper Size

Paper Size	Bounds Definition	SGR
A	PFS ?20	10
A4	PFS ?22	16
Legal	PFS ?24	10
Executive	DECVPFS for executive-size paper	10
Envelope or multipurpose tray	A- or A4-size paper, depending on the setting of the paper feature in NVM	10 or 16

22.3 Factory Defaults in Nonvolatile Memory

Table 22–4 lists the factory defaults in the nonvolatile memory (NVM) for the DEClaser 1100 printer.

Table 22–4 Factory Defaults in NVM for the DEClaser 1100 Printer

Item[1]	Factory Default [1]	Variable (Control Function)[2]
Feeder	Cassette	Tray selection (DECASFC)
Copy	1	Number of copies (DECSNC)
AutoNL	On	Autowrap (DECAWM)

[1]Columns 1 and 2 describe the terms used on the front panel of the DEClaser 1100 printer.

[2]This table contains the default NVM values for the DEClaser 1100 printer for the variables that are listed in column 1 of Table 22–1.

(continued on next page)

Table 22–4 (Cont.) Factory Defaults in NVM for the DEClaser 1100 Printer

Item[1]	Factory Default [1]	Variable (Control Function)[2]
Macro	00	User Preference Set (DECAUPSS) Printer generic response (DAR) No power-up message
Paint	Partial	96 Kbytes of memory reserved (DECMM)
Paper	Letter[3]	Sheet size (DECSSS)
Message	English	N/A
I/F	RS232C	N/A
Baud	4800	N/A
Rsmode	8S	N/A
DTR	Fix-H	N/A
XON/XOFF	On	N/A
ETX/ACK	Off	N/A
Protocol selection	PostScript	Select Other Coding System (SOCS)

[1]Columns 1 and 2 describe the terms used on the front panel of the DEClaser 1100 printer.

[2]This table contains the default NVM values for the DEClaser 1100 printer for the variables that are listed in column 1 of Table 22–1.

[3]A4 size for worldwide models.

22.4 Macro Values in NVM

The Device Attribute Report (DAR) is a function of the printer ID selected in NVM. The printer ID is determined during power-up initialization.

The printer ID cannot be changed through software. It is determined only at initialization. Table 22–5 lists the macro values for nonvolatile memory.

Table 22–5 Macro Values in NVM for the DEClaser 1100 Printer

Value	Meaning
	User Preference Supplemental Set
00	DEC Supplemental
10	ISO Latin-1 Supplemental
20	JIS Katakana[1]
30	ISO Latin-Hebrew Supplemental
40	DEC Hebrew Supplemental
50	DEC 7-bit Hebrew
60	DEC Technical
	Initialization Message[2]
0	Initialization message disabled
5	Initialization message enabled
	Printer ID
0	DEC PPL3 generic response (factory default)
1	LN03 alias response

[1]This character set is not in a built-in font. It must be downline loaded or obtained from a font cartridge.

[2]If enabled, the printer sends the initialization message during power-up or a front panel reset.

The macro value is calculated as follows:

Macro Value = Printer ID +
Initialization Message ID +
User Preference Supplemental Set

For example, a Printer ID value of 1, with the initialization message enabled (5), and a User Preference Supplemental Set value of 10 has a macro value of 16.

An undefined value for User Preference Supplemental Set is treated as 00; an undefined value for Printer ID is treated as 0.

22.5 Protocol Selection in NVM

Selection of the protocol depends on:

- Protocol stored in NVM
- Protocol cartridge installed in the printer at power-up

If the protocol stored in NVM matches the installed protocol cartridge, the DEClaser 1100 printer selects that protocol at power-up. Otherwise, the printer selects DEC PPL3 at power-up.

23

Maximum Printer Values

This chapter lists the maximum parameter values supported by the DEClaser 1100 printer. The topics include:

- Maximum parameter values, Section 23.1
- Maximum values for printer features, Section 23.2

23.1 Maximum Parameter Values

The DEClaser 1100 printer has the following parameter value limitations:

- Graphics repeat function (DECGRI) — 32K (32,767) limit. The printer sets values that exceed this limit to the limit value.
- Grid size parameter — 99 units for maximum horizontal grid size; 1000 for maximum aspect ratio (99,000 units for maximum vertical grid size).

23.2 Maximum Values for Printer Features

Table 23–1 lists the maximum values supported by the DEClaser 1100 printer.

Table 23–1 Maximum Values Supported by the DEClaser 1100 Printer

Printer Feature	Maximum Value
Horizontal tabs	160
Vertical tabs	160
Number of trays	2
Number of entries in font dictionary	768
Number of cartridge slots	2

(continued on next page)

Table 23–1 (Cont.) Maximum Values Supported by the DEClaser 1100 Printer

Printer Feature	Maximum Value
Built-in font RAM size[1]	284 KB min.
Built-in bitmap RAM or graphics buffer[1]	284 KB min.
Option font ROM size	See cartridge
Optional bitmap RAM[2]	{1 | 2} MB
Optional download RAM[2]	{1 | 2} MB

[1]The Built-in font memory and the Built-in bitmap memory comprise the same Built-in RAM memory.

[2]The optional bitmap memory and download memory comprise the same optional RAM memory; they cannot exceed 2.5 MB.

24

Paper Handling

The following options specific to the DEClaser 1100 printer are discussed in this chapter:

- Duplex printing, Section 24.1
- Input tray selection, Section 24.2
- Set sheet size, Section 24.3

24.1 Duplex Printing

The DEClaser 1100 printer implements simplex (one-sided) printing. The printer supports logical duplex printing but does not support physical duplex or tumbled printing.

The Set Duplex Print Mode (DECSDPM) command sets the print mode. Table 24–1 lists the duplex modes and shows the fallback modes for the DEClaser 1100 printer when you select an unsupported DECSDPM parameter. For a description of the DECSDPM command, see the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual*.

Table 24–1 Duplex Print Mode Fallbacks for the DEClaser 1100 Printer

Ps	Duplex Mode	1100 Model
1	True simplex normal	1
2	True simplex tumbled	1
3	True duplex normal	5
4	True duplex tumbled	5
5	Duplex master normal	5
6	Duplex master tumbled	5

(continued on next page)

Table 24–1 (Cont.) Duplex Print Mode Fallbacks for the DEClaser 1100 Printer

Ps	Duplex Mode	1100 Model
7	Simplex compressed normal	1
8	Simplex compressed tumbled	1

Example 24–1 shows two forms of the DECSDPM command. The first command with Ps = 1 selects a true simplex normal mode; Ps = 3, a true duplex normal mode, selects duplex master normal. "Normal" indicates that the printer does not tumble the front page.

Example 24–1 Set Duplex Print Mode Command for the DEClaser 1100 Printer

```
CSI  1   SP  x
9/11 3/1 2/0 7/8

CSI  3   SP  x
9/11 3/3 2/0 7/7
```

24.2 Designating the Input Tray

The DEClaser 1100 printer has a multipurpose tray and several optional paper cassettes available.

Use the Automatic Sheet Feeder (Input Tray) Control (DECASFC) command to select the appropriate tray:

```
CSI   Ps    !    v
9/11  3/xx  2/1  7/6
```

The DECASFC command causes a conditional Sheet Feed. Subsequent sheets come from the tray as indicated in the selective parameter Ps. Table 24–2 lists the tray selection parameters for the DEClaser 1100 printer.

Table 24–2 Tray Selection on the DEClaser 1100 Printer

Ps	Tray Selected
0	No tray change
1	Multipurpose tray[1]
2	Cassette tray

[1]When using the multipurpose tray, place special one-sided paper, such as letterhead, facedown on the tray.

24.3 Set Sheet Size (DECSSS)

Table 24–3 lists the Set Sheet Size parameters for the DEClaser 1100 printer.

Table 24–3 Set Sheet Size (DECSSS) Parameters

Value	Meaning
	Ps1
0	Any slot
1	Multipurpose tray
2	Paper cassette (if present)
	Ps2
N/A	Key number (ignored)
	Pn3
n	Width of the paper (defined as leading edge)
	Pn4
n	Length of the paper

Parameters Pn3 and Pn4 are expressed in pixels, decipoints, or centipoints, as defined by Select Size Unit (SSU), regardless of the setting of Positioning Unit Mode (PUM).

The smallest paper size you can define with DECSSS for the DEClaser 1100 printer is 97 mm x 148 mm. If you select a page size that is smaller than the smallest size, the DEClaser 1100 printer defaults to the minimum paper size.

For more information on the Set Sheet Size (DECSSS) command, see the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual*.

25

Status and Error Reporting

The topics discussed in this chapter include the following:

- Device Attributes Report (DAR) parameters, Section 25.1
- Device Attributes (Secondary) Report (DA2R) parameters, Section 25.2
- Error parameters for Device Status Reports, Section 25.3

This chapter discusses the DEClaser 1100 printer reports and lists the error parameters for printer device status reports. The DEClaser 1100 printer sends the following reports:

- CPR — Reports current cursor position
- DAR — Responds to a Device Attributes (DA) request, Section 25.1
- DA2R — Responds to a Device Attributes (secondary) DA2 request, Section 25.2
- DECFSR (1 or 0) — Reports fonts currently available
- DECFSR (2 or 0) — Reports the memory available (in bytes) for downline loading
- DECFSR (DECLFF Ps2=2 or 3) — Reports font validation errors and warnings
- DSR — Responds to a Device Status Report or an error if unsolicited reports are enabled, Section 25.3

For information on the Cursor Position Report (CPR) command and the Font Status Report (DECFSR) command with parameters 0, 1, or 2, refer to the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual*.

25.1 Device Attributes Report (DAR) Parameters

Device Attributes Report (DAR) parameters allow the printer to identify itself as either of the following:

- A Digital level 3 printer — DAR (generic response)
- A previous model Digital printer (to allow backward compatibility) — DAR (alias response)

To request product identification for the DEClaser 1100 printer, the host must send a Device Attributes (DA) command.

```
CSI  c          or     CSI  0   c
9/11 6/3               9/11 3/0 6/3
```

The DEClaser 1100 printer responds to a Device Attributes (DA) command by sending a DAR (generic response).

```
CSI  ?    Ps1 ;    Ps2 ;     . . .   ;    Psn c
9/11 3/15 *** 3/11 *** 3/11  . . .   3/11 *** 6/3
```

For the DEClaser 1100 printer, Ps1 is 73 (3/7 3/3). This identifies the printer as a Digital level 3 device.

Ps2 to Ps*n* indicate which extensions or enhancements that the DEClaser 1100 printer supports. Table 25–1 lists the character form (Ps2 to Ps*n*) and code for each extension.

Table 25–1 Parameters for Primary DA Responses for the DEClaser 1100 Printer

Character Form	Code	Extension
4	3/4	Sixel graphics
6	3/6	Sheet feeder
8	3/8	Legal-size paper handling
9	3/9	Variable Page Format Select (DECVPFS)
10	3/1 3/0	Vector drawing
11	3/1 3/1	Multiple copies
12	3/1 3/2	Hebrew
16	3/1 3/6	Logical duplex

Example 25–1 shows a primary DA request to a DEClaser 1100 printer and a typical DAR (generic response).

Example 25–1 DA Request and DAR Example for the DEClaser 1100 Printer

```
CSI c       or       CSI 0 c

CSI ? 73;4;6;8;9;10;11;12 c
```

Table 25–2 lists the DAR (alias response) parameters supported by the DEClaser 1100 printer for backward compatibility.

Table 25–2 DAR Parameters (Alias Response) for the DEClaser 1100 Printer

Character Form	Code	Option
26	3/2 3/6	LN03 (base unit)

The DEClaser 1100 printer can be configured to send only the number 26 for compatibility with the LN03 printer.

```
CSI  ? 26 c
```

For more information on the Device Attributes Report (DAR) command, refer to the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual*.

25.2 Device Attributes (Secondary) Report (DA2R) Parameters

A secondary Device Attributes Report (DA2R) provides the following information about the DEClaser 1100 printer:

- Printer model
- Major firmware revision
- Amount of memory in megabytes
- Which protocol cartridge is installed
- Minor firmware revision

To request this information, the host sends a Device Attributes (Secondary) (DA2) command.

```
CSI  >    c         or       CSI  >    0    c
9/11 3/14 6/3                9/11 3/14 3/0  6/3
```

In response to a secondary DA request, the DEClaser 1100 printer sends a Device Attributes (Secondary) Report (DA2R).

```
CSI  >    Ps1 ;    Ps2 ;    Ps3 ;    Ps4   Ps5  c
9/11 3/14 *** 3/11 *** 3/11 *** 3/11 ***   ***  6/3
```

Table 25–3 lists DA2R parameters supported by the DEClaser 1100 printer.

Table 25–3 Parameters for DA2R Responses for the DEClaser 1100 Printer

Character Form	Code	Description
		Ps1
51	3/5 3/1	DEClaser 1100
		Ps2
xx	3/*x* 3/*x*	Major firmware revision *x.x*
10	3/1 3/0	Version 1.0-yy
		Ps3
0	3/0	No additional memory installed
1	3/1	1-Mbyte memory card
2	3/2	2-Mbyte memory card
		Ps4
		Ps4 is the sum of the codes of the installed protocols. Table 25–4 lists the protocol codes.
		Ps5
yy	3/*y* 3/*y*	Minor firmware revision *yy*
00	3/0 3/0	Version xx-00

Table 25–4 Protocol Codes for DA2R Responses

Code	Protocol
1	PostScript
2	CaPSL
4	IBM Proprinter
8	HP PCL 4
16	reserved
32	. . .

For more information, see the user's guide of your protocol option cartridge.

Example 25–2 shows a DA2 request and a DA2R response from a DEClaser 1100 printer, firmware Version 1.0, with a 2-Mbyte memory card and no protocol cartridge.

Example 25–2 DA2 Request and DA2R Response for the DEClaser 1100 Printer

```
CSI > c        or        CSI > 0 c

CSI > 51;10;2;0;00
```

25.3 Error Parameters for Device Status Reports

Table 25–5 lists error parameters reported by the DEClaser 1100 printer for extended DSR reports. Each error parameter has a specific code that pinpoints the specific failure and a generic code that indicates the general type of failure.

Refer to Table B–1 for a list of generic codes and their meanings.

Table 25–5 Error Parameters for Extended Device Status Reports for the DEClaser 1100 Printer

Specific Code	Generic Code	Class	Meaning
			Controller Errors
?0	?57	Special	First report since initialization[1]
?0	?20	S:U	No malfunction detected
?101	?41	E	Complex data
?102	?41	E	Lost characters
?103	?44	E	Font memory full
?104	?44	S	Font dictionary full
?105	?41	E	Page memory full
?111	?42	E	Downline loaded font warning
?112	?42	E	Downline loaded font error (load aborted)
?113	?47	E	Error overflow (more than can be recorded)
?116	?43	E	Invalid parameter in control function
?117	?41	E	Justify buffer overflow
?123	?40	E	No font file with current character set
?122	?42	E	Inconsistent font file metrics
?131	?22	E	Line error on received character
?132	?23	E	Line error — input buffer overflow
?133	?55	E:U	Data syntax switch failed; emulation not present or not installed
?134	?21	E:U	Font removed while printing
?142	?56	S:U	Insufficient memory for requested memory configuration
?163	?21	S:U	Expansion board ROM failure

[1] If initialization message is enabled, see Section 22.4.

Key to Error Class

S—State (cleared when error condition corrected)
E—Event (cleared when error report transmitted)
S:U—State (same as S, but additionally triggers unsolicited reports when enabled)
E:U—Event (same as E, but additionally triggers unsolicited reports when enabled)
Special—Sent (if enabled) as the first parameter on power-on or front panel reset operation

(continued on next page)

Table 25–5 (Cont.) Error Parameters for Extended Device Status Reports for the DEClaser 1100 Printer

Specific Code	Generic Code	Class	Meaning
			Engine Errors
–	?24	S:U	Printer is off line
?201	?34	S:U	Fixing (fuser) unit error
?202	?34	S:U	Optical system error
?204	?34	S:U	Optical motor error
?206	?27	S:U	Paper tray empty
?209	?33	E:U	User requested print check
?211	?34	S:U	Engine nonvolatile RAM error
?212	?26	S:U	Printer cover open or No EP-L cartridge
?216	?36	S:U	Paper jam
?221	?37	S:U	Invalid command (internal)
?225	?37	S:U	Internal memory overflow error
?267	?34	S:U	Image data transfer timeout
?268	?34	S:U	Signal timeout
?269	?34	S:U	Illegal signal
?272	?34	S:U	Internal status parity error
?278	?34	S:U	Undefined operator call
?279	?34	S:U	Undefined service call
?280	?34	S:U	CPU timeout
?282	?34	S:U	Sub-CPU communications error
?283	?34	S:U	Sub-CPU microwire error

Key to Error Class

S—State (cleared when error condition corrected)
E—Event (cleared when error report transmitted)
S:U—State (same as S, but additionally triggers unsolicited reports when enabled)
E:U—Event (same as E, but additionally triggers unsolicited reports when enabled)
Special—Sent (if enabled) as the first parameter on power-on or front panel reset operation

(continued on next page)

Table 25–5 (Cont.) Error Parameters for Extended Device Status Reports for the DEClaser 1100 Printer

Specific Code	Generic Code	Class	Meaning
			Media Errors or Requests
?310	?51	S:U	Load A4-size paper cassette
?312	?51	S:U	Load Letter-size paper cassette
?313	?51	S:U	Load Legal-size paper cassette
?314	?51	S:U	Load executive-size paper cassette
?315	?51	S:U	Load paper *paper_size* cassette
?316	?51	S:U	Load option
?320	?52	S:U	Request manual feed A4-size paper
?322	?52	S:U	Request manual feed Letter-size paper
?323	?52	S:U	Request manual feed Legal-size paper
?324	?52	S:U	Request manual feed executive-size paper
?325	?52	S:U	Request manual feed paper *paper_size*

Key to Error Class

S—State (cleared when error condition corrected)
E—Event (cleared when error report transmitted)
S:U—State (same as S, but additionally triggers unsolicited reports when enabled)
E:U—Event (same as E, but additionally triggers unsolicited reports when enabled)
Special—Sent (if enabled) as the first parameter on power-on or front panel reset operation

26

Fonts for the DEClaser 1100 Printer

This chapter discusses the following topics related to fonts for the DEClaser 1100 printer:

- Load Font File (DECLFF) considerations, Section 26.1
- Font file repertory, Section 26.2
- Available built-in fonts, Section 26.3
- Algorithmic transformations for rendering attributes, Section 26.4

26.1 Load Font File (DECLFF) Considerations

The DEClaser 1100 printer has 284 Kbytes of built-in font memory available for downline loading and can store up to 768 font files. Memory can be upgraded to 2.5 MB, of which 2.284 MB is available for fonts.

Font files that are downline loaded into the memory of the DEClaser 1100 printer by the Load Font File (DECLFF) command must follow the Common Font File Format (CFFF). (See Section 26.6.)

26.2 Font Repertory

The DEClaser 1100 printer font repertory consists of the following:

- Built-in fonts
- Standard font cartridges
- Digital Standard Font Files available in CFFF format that can be downline loaded
- Customer-provided font files in CFFF format that can be downline loaded
- Built-in algorithmic transformations

26.3 Built-In Font File Repertory

The DEClaser 1100 printer has 36 built-in font files. These font files support the combination of nine character sets and four fonts. The following fonts reside in the DEClaser 1100 printer:

- Courier 10-point 10-pitch normal portrait
- Courier 10-point 10.3-pitch normal portrait
- Courier 6.7-point 13.6-pitch normal landscape
- Elite 10-point 12-pitch normal portrait

  "Normal" means that the font is not bold, italic, or otherwise attributed.

For each font, the following character sets reside in the printer:

- ASCII
- DEC Supplemental
- ISO Latin-1 Supplemental
- DEC Technical
- DEC Special Graphics (VT100 Line Drawing)
- DEC 7-Bit Hebrew
- DEC Hebrew Supplemental
- ISO Latin-Hebrew Supplemental
- Legal

26.3.1 Type Family Names

Table 26–1 lists the type families and the associated type family IDs built into the DEClaser 1100 printer.

Table 26–1 Type Family Names in the DEClaser 1100 Printer

Type Family Name	Type Family ID (Seven Characters)
DEC Builtin1	DBULTN1[1]
Courier	RCOURIR[2]
Elite 12	RELITE0[2]
PI font	D000000[1]

[1]The "D" in the type family IDs for DEC Builtin1 and PI font indicates that the name is registered with Digital, but is not registered internationally.

[2]The "R" in the type family IDs for Courier and Elite 12 indicates that these names are either registered internationally or are in the public domain.

26.3.2 Built-In Type Family Names and IDs, Font IDs, and Font File IDs

Table 26–2 lists type family names, type family IDs, font IDs, and font file IDs built into the DEClaser 1100 printer.

Each of the 36 font files contains a character set that has a style, an orientation, a point size, and a horizontal spacing. Table 26–2 contains 72 entries. The printer recognizes each font under two names:

- A name that is either internationally registered or in the public domain, for example, Courier or Elite 12
- A name registered by Digital, for example, Builtin or PI

For example, the following two entries are the same:

- Courier ASCII, 10 point, 10 pitch, Portrait font — (RCOURIR J 02S K 00 G G 00 01U ZZZZ 02 F 0 0 0)
- DEC Builtin1 ASCII, 10 point, 10 pitch, Portrait font — (DBULTN1 J 02S K 00 G G 00 01U ZZZZ 02 F 0 0 0)

In the DEClaser 1100 printer, a **font file** has a 31-character name. The first seven characters are the **type family ID**, the first 12 characters are the **font collection ID**, and the first 16 characters define the **font ID**. The following example shows how the type families, fonts, and font files are related:

- A font file ID — DBULTN1J02SK00GG0001UZZZZ02F000
- A type family ID — DBULTN1
- A font collection ID — DBULTN1J02SK
- A font ID — DBULTN1J02SK00GG

In Table 26–2, the font ID, the font collection ID, and the font file ID are indicated by arrows.

Note

Spaces appear in the IDs for clarity and are not part of the IDs.

Table 26–2 Built-In Font File IDs

Pitch	Type Size	Character Set	Font File ID——————————————————————> Font ID————————————> Font Collection ID—->
1. Type Family Name: DEC Builtin1 — Type Family ID: DBULTN1			
10	10	ASCII	DBULTN1 J 02S K 00 G G 00 01U ZZZZ 02 F 0 0 0
10	10	DEC Supplemental[1]	DBULTN1 J 02S K 00 G G 00 245 ZZZZ 02 F 0 0 0
10	10	ISO Latin-1 Supplemental	DBULTN1 J 02S K 00 G G 00 6DD ZZZZ 02 F 0 0 0
10	10	DEC 7-Bit Hebrew	DBULTN1 J 02S K 00 G G 00 24D ZZZZ 02 F 0 0 0
10	10	DEC Hebrew Supplemental	DBULTN1 J 02S K 00 G G 00 1TG ZZZZ 02 F 0 0 0
10	10	ISO Latin-Hebrew Supplemental	DBULTN1 J 02S K 00 G G 00 6DK ZZZZ 02 F 0 0 0
10	10	Legal	DBULTN1 J 02S K 00 G G 00 244 ZZZZ 02 F 0 0 0
10.3	10	ASCII	DBULTN1 2 02S K 00 G G 00 01U ZZZZ 02 F 0 0 0
10.3	10	DEC Supplemental[1]	DBULTN1 2 02S K 00 G G 00 245 ZZZZ 02 F 0 0 0

[1]The character set-ID field of 01O formerly identified DEC Supplemental. It is now for user preference.

(continued on next page)

Table 26–2 (Cont.) Built-In Font File IDs

Pitch	Type Size	Character Set	Font File ID——————————————————————> Font ID——————————————> Font Collection ID—->
1. Type Family Name: DEC Builtin1 — Type Family ID: DBULTN1			
10.3	10	ISO Latin-1 Supplemental	DBULTN1 2 02S K 00 G G 00 6DD ZZZZ 02 F 0 0 0
10.3	10	DEC 7-Bit Hebrew	DBULTN1 2 02S K 00 G G 00 24D ZZZZ 02 F 0 0 0
10.3	10	DEC Hebrew Supplemental	DBULTN1 2 02S K 00 G G 00 1TG ZZZZ 02 F 0 0 0
10.3	10	ISO Latin-Hebrew Supplemental	DBULTN1 2 02S K 00 G G 00 6DK ZZZZ 02 F 0 0 0
10.3	10	Legal	DBULTN1 2 02S K 00 G G 00 244 ZZZZ 02 F 0 0 0
12	10	ASCII	DBULTN1 L 02S K 00 G G 00 01U ZZZZ 02 F 0 0 0
12	10	DEC Supplemental[1]	DBULTN1 L 02S K 00 G G 00 245 ZZZZ 02 F 0 0 0
12	10	ISO Latin-1 Supplemental	DBULTN1 L 02S K 00 G G 00 6DD ZZZZ 02 F 0 0 0
12	10	DEC 7-Bit Hebrew	DBULTN1 L 02S K 00 G G 00 24D ZZZZ 02 F 0 0 0
12	10	DEC Hebrew Supplemental	DBULTN1 L 02S K 00 G G 00 1TG ZZZZ 02 F 0 0 0
12	10	ISO Latin-Hebrew Supplemental	DBULTN1 L 02S K 00 G G 00 6DK ZZZZ 02 F 0 0 0
12	10	Legal	DBULTN1 L 02S K 00 G G 00 244 ZZZZ 02 F 0 0 0
13.6	6.7	ASCII	DBULTN1 1 01V K 00 G G 00 01U ZZZZ 02 F 0 0 0
13.6	6.7	DEC Supplemental[1]	DBULTN1 1 01V K 00 G G 00 245 ZZZZ 02 F 0 0 0
13.6	6.7	ISO Latin-1 Supplemental	DBULTN1 1 01V K 00 G G 00 6DD ZZZZ 02 F 0 0 0
13.6	6.7	DEC 7-Bit Hebrew	DBULTN1 1 01V K 00 G G 00 24D ZZZZ 02 F 0 0 0
13.6	6.7	DEC Hebrew Supplemental	DBULTN1 1 01V K 00 G G 00 1TG ZZZZ 02 F 0 0 0
13.6	6.7	ISO Latin-Hebrew Supplemental	DBULTN1 1 01V K 00 G G 00 6DK ZZZZ 02 F 0 0 0
13.6	6.7	Legal	DBULTN1 1 01V K 00 G G 00 244 ZZZZ 02 F 0 0 0

[1]The character set-ID field of 01O formerly identified DEC Supplemental. It is now for user preference.

(continued on next page)

Table 26–2 (Cont.) Built-In Font File IDs

Pitch	Type Size	Character Set	Font File ID——————————————————————> Font ID————————————> Font Collection ID—->
2. Type Family Name: Courier — Type Family ID: RCOURIR			
10	10	ASCII	RCOURIR J 02S K 00 G G 00 01U ZZZZ 02 F 0 0 0
10	10	DEC Supplemental[1]	RCOURIR J 02S K 00 G G 00 245 ZZZZ 02 F 0 0 0
10	10	DEC Technical	RCOURIR J 02S K 00 G G 00 01Q ZZZZ 02 F 0 0 0
10	10	DEC Special Graphics	RCOURIR J 02S K 00 G G 00 01C ZZZZ 02 F 0 0 0
10	10	ISO Latin-1 Supplemental	RCOURIR J 02S K 00 G G 00 6DD ZZZZ 02 F 0 0 0
10	10	DEC 7-Bit Hebrew	RCOURIR J 02S K 00 G G 00 24D ZZZZ 02 F 0 0 0
10	10	DEC Hebrew Supplemental	RCOURIR J 02S K 00 G G 00 1TG ZZZZ 02 F 0 0 0
10	10	ISO Latin-Hebrew Supplemental	RCOURIR J 02S K 00 G G 00 6DK ZZZZ 02 F 0 0 0
10	10	Legal	RCOURIR J 02S K 00 G G 00 244 ZZZZ 02 F 0 0 0
10.3	10	ASCII	RCOURIR 2 02S K 00 G G 00 01U ZZZZ 02 F 0 0 0
10.3	10	DEC Supplemental[1]	RCOURIR 2 02S K 00 G G 00 245 ZZZZ 02 F 0 0 0
10.3	10	DEC Technical	RCOURIR 2 02S K 00 G G 00 01Q ZZZZ 02 F 0 0 0
10.3	10	DEC Special Graphics	RCOURIR 2 02S K 00 G G 00 01C ZZZZ 02 F 0 0 0
10.3	10	ISO Latin-1 Supplemental	RCOURIR 2 02S K 00 G G 00 6DD ZZZZ 02 F 0 0 0
10.3	10	DEC 7-Bit Hebrew	RCOURIR 2 02S K 00 G G 00 24D ZZZZ 02 F 0 0 0
10.3	10	DEC Hebrew Supplemental	RCOURIR 2 02S K 00 G G 00 1TG ZZZZ 02 F 0 0 0
10.3	10	ISO Latin-Hebrew Supplemental	RCOURIR 2 02S K 00 G G 00 6DK ZZZZ 02 F 0 0 0
10.3	10	Legal	RCOURIR 2 02S K 00 G G 00 244 ZZZZ 02 F 0 0 0
13.6	6.7	ASCII	RCOURIR 1 01V K 00 G G 00 01U ZZZZ 02 F 0 0 0
13.6	6.7	DEC Supplemental[1]	RCOURIR 1 01V K 00 G G 00 245 ZZZZ 02 F 0 0 0
13.6	6.7	DEC Technical	RCOURIR 1 01V K 00 G G 00 01Q ZZZZ 02 F 0 0 0

[1]The character set-ID field of 01O formerly identified DEC Supplemental. It is now for user preference.

(continued on next page)

Table 26–2 (Cont.) Built-In Font File IDs

Pitch	Type Size	Character Set	Font File ID——————————————————————> Font ID————————————> Font Collection ID—->
2. Type Family Name: Courier — Type Family ID: RCOURIR			
13.6	6.7	DEC Special Graphics	RCOURIR 1 01V K 00 G G 00 01C ZZZZ 02 F 0 0 0
13.6	6.7	ISO Latin-1 Supplemental	RCOURIR 1 01V K 00 G G 00 6DD ZZZZ 02 F 0 0 0
13.6	6.7	DEC 7-Bit Hebrew	RCOURIR 1 01V K 00 G G 00 24D ZZZZ 02 F 0 0 0
13.6	6.7	DEC Hebrew Supplemental	RCOURIR 1 01V K 00 G G 00 1TG ZZZZ 02 F 0 0 0
13.6	6.7	ISO Latin-Hebrew Supplemental	RCOURIR 1 01V K 00 G G 00 6DK ZZZZ 02 F 0 0 0
13.6	6.7	Legal	RCOURIR 1 01V K 00 G G 00 244 ZZZZ 02 F 0 0 0
3. Type Family Name: Elite 12 — Type Family ID: RELITE0			
12	10	ASCII	RELITE0 L 02S K 00 G G 00 01U ZZZZ 02 F 0 0 0
12	10	DEC Supplemental[1]	RELITE0 L 02S K 00 G G 00 245 ZZZZ 02 F 0 0 0
12	10	DEC Technical	RELITE0 L 02S K 00 G G 00 01Q ZZZZ 02 F 0 0 0
12	10	DEC Special Graphics	RELITE0 L 02S K 00 G G 00 01C ZZZZ 02 F 0 0 0
12	10	ISO Latin-1 Supplemental	RELITE0 L 02S K 00 G G 00 6DD ZZZZ 02 F 0 0 0
12	10	DEC 7-Bit Hebrew	RELITE0 L 02S K 00 G G 00 24D ZZZZ 02 F 0 0 0
12	10	DEC Hebrew Supplemental	RELITE0 L 02S K 00 G G 00 1TG ZZZZ 02 F 0 0 0
12	10	ISO Latin-Hebrew Supplemental	RELITE0 L 02S K 00 G G 00 6DK ZZZZ 02 F 0 0 0
12	10	Legal	RELITE0 L 02S K 00 G G 00 244 ZZZZ 02 F 0 0 0
4. Type Family Name: PI Font — Type Family ID: D000000			
10	10	DEC Technical	D000000 J 02S K 00 G G 00 01Q ZZZZ 02 F 0 0 0
10	10	DEC Special Graphics	D000000 J 02S K 00 G G 00 01C ZZZZ 02 F 0 0 0

[1]The character set-ID field of 01O formerly identified DEC Supplemental. It is now for user preference.

(continued on next page)

Table 26–2 (Cont.) Built-In Font File IDs

Pitch	Type Size	Character Set	Font File ID——————————————————————> Font ID————————————> Font Collection ID—->
4. Type Family Name: PI Font — Type Family ID: D000000			
10.3	10	DEC Technical	D000000 2 02S K 00 G G 00 01Q ZZZZ 02 F 0 0 0
10.3	10	DEC Special Graphics	D000000 2 02S K 00 G G 00 01C ZZZZ 02 F 0 0 0
12	10	DEC Technical	D000000 L 02S K 00 G G 00 01Q ZZZZ 02 F 0 0 0
12	10	DEC Special Graphics	D000000 L 02S K 00 G G 00 01C ZZZZ 02 F 0 0 0
13.6	6.7	DEC Technical	D000000 1 01V K 00 G G 00 01Q ZZZZ 02 F 0 0 0
13.6	6.7	DEC Special Graphics	D000000 1 01V K 00 G G 00 01C ZZZZ 02 F 0 0 0

26.3.3 Font Metrics

Table 26–3 lists the metrics in centipoints for the fonts built into the DEClaser 1100 printer. The first value in the heading represents the point size; the second value represents the pitch. For example, Courier 10,10 is a Courier 10-point, 10-pitch font.

Table 26–3 Font Metrics for the DEClaser 1100 Printer

Field	Courier 10,10	Courier 10,10.3	Elite 10,12	Courier 6.7,13.6
Total vertical size	1152	1152	1152	864
Above baseline offset	–840	–840	–840	–648
Below baseline offset	312	312	312	216
Minimum space size[1]	360	336	288	264
Nominal space size	720	696	600	528
Maximum space size[2]	1440	1392	1200	1056
Superscript vertical[3]	–576	–576	–576	–432
Subscript vertical[3]	576	576	576	432

[1]In general, minimum space is calculated as 33% to 50% of width of space.

[2]In general, maximum space is calculated as 200% of width of space.

[3]In general, superscript and subscript offsets are one-half of the total vertical size.

(continued on next page)

Table 26–3 (Cont.) Font Metrics for the DEClaser 1100 Printer

Field	Courier 10,10	Courier 10,10.3	Elite 10,12	Courier 6.7,13.6
Underline offset (height, thickness)	240,72	240,72	240,72	168,48
Strike-through offset (height, thickness)	–264,72	–264,72	–264,72	–192,48
Overline offset (height, thickness)	–912,72	–912,72	–912,72	–480,48

26.4 Built-In Algorithmic Transformations

When the print job requires a font with a particular set of attributes, the DEClaser 1100 printer first searches the current repertory for a font that contains the proper character set, in the proper style, in the proper horizontal and vertical size, with the desired attributes.

If the search fails to find a font with the desired attributes, the DEClaser 1100 printer attempts to approximate the desired attributes by using algorithmic transformations on the existing repertory.

The DEClaser 1100 printer provides fallback algorithmic transformations for the following:

- Bold (shadow bold)
- Portrait/landscape orientation (rotation)
- Italic (character underline)
- Underline
- Strike-through
- Overline
- National Replacement Character Sets (NRCS)

The DEClaser 1100 printer always uses algorithmic transformations for the following:

- Horizontal spacing
- Vertical spacing
- Double underline

The DEClaser 1100 printer does not provide fallbacks for the following attributes:

- Size scaling of any type
- Italics fallback by slanting the character
- Kerning

26.4.1 Memory Use

Rotating the font to fit the page orientation is the only algorithmic transformation that uses memory. By default, the DEClaser 1100 printer stores transmitted font file characters in portrait orientation. When you require landscape printing, the printer conserves memory by rotating only the fonts that the printer uses rather than all fonts that are selected.

If you require a font in landscape orientation only, you can further reduce the amount of memory that is used by specifying the orientation in the *font_record* section of the Load Font File (DECLFF) command. To store a copy of the font in landscape format only, precede the *font_record* with an equal sign (=, 3/13):

DCS 0; 1; 1 y =*font_record*; *comment_record* ST

26.4.2 Fallback Metrics for Mixed Font Files

The DEClaser 1100 printer does not support fallback metrics for all categories of mixed text; however, the printer does support a fallback for inconsistent metrics when performing NRCS pairing. The printer sends a Device Status Report (DSR), if enabled, when inconsistent metrics are detected.

26.4.3 Spacing Criterion Fallback

When the selected font is proportional and the requested font is monospaced, the DEClaser 1100 printer left-justifies the proportional characters within the monospaced cell.

26.5 Font List

The DEClaser 1100 printer reports the font SGR assignments contained in the font cartridges when printing the font list. The SGR assignment (as written in the cartridge) is displayed one line per SGR listing after the cartridge title line.

26.6 Font File Validation Test Report

The DEClaser 1100 printer generates a report of errors and warnings that occur during font file validation. You may use this report for debugging purposes if you are designing font files for Digital level 3 printers according to the Common Font File Format (CFFF).

Refer to Appendix C for a description of the Font Status Report (DECFSR) command. You request this report through the second parameter (Ps2 = 2 or 3) of the Load Font File (DECLFF) command as described in Table 26–4.

Table 26–4 Parameters for Load Font File (DECLFF) for the DEClaser 1100 Printer

Ps2	Action
0 or omitted	Print summary sheet.
1	Do not print summary sheet.
2	Send font error and warning information. Response is Font Status Report (DECFSR, DECLFF Ps2=2 or 3).
3	Same as 0 and 2.
Any other value	Do not print summary sheet or send status report.

27

Sixel Considerations

This chapter discusses three topics related to sixel graphics:

- Macro parameter values, Section 27.1
- Valid Set Raster Attributes (DECGRA) commands, Section 27.2.1
- Restrictions, Section 27.2.2

27.1 Macro Parameter Values

Table 27–1 compares the target values and the values implemented by the DEClaser 1100 printer for the macro parameter (Ps1) of the sixel mode graphics device control string:

`DCS Ps1; Ps2; Pn3 q` *`picture_definition`* `ST`

Ps1 is a selective parameter that specifies the horizontal grid size and aspect ratio. Grid size measurements are given in centipoints. Ps2 and Pn3 are described in the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual.*

Table 27–1 Macro Parameter Values for the DEClaser 1100 Printer (Grid Sizes in Centipoints)

	Target Values			DEClaser 1100 Printer Values		
Ps1	Approximate Horizontal Grid Size[1]	Aspect Ratio Vert:Horiz	Vert. Grid Size	Horiz. Grid Size	Aspect Ratio Vert:Horiz	Vert. Grid Size
0	54.60	200:100	100	48	200:100	96
1	54.60	200:100	100	48	200:100	96
2	22.22	450:100	100	21	451:100	96
3	33.33	300:100	100	32	300:100	96
4	40.00	250:100	100	38	252:100	96
5	54.60	183:100	100	48	200:100	96
6	66.66	150:100	100	64	150:100	96
7	76.90	130:100	100	74	129:100	96
8	89.20	112:100	100	86	111:100	96
9	100.00	100:100	100	96	100:100	96

[1]For true target values in 1/660 in., see the sixel information in the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual.*

27.2 Miscellaneous Considerations and Restrictions

Section 27.2.1 and Section 27.2.2 discuss valid Set Raster Attributes (DECGRA) commands and restrictions to the printing of sixel graphics.

27.2.1 Valid Set Raster Attributes (DECGRA) Commands

The DEClaser 1100 printer ignores a DECGRA command if the printer receives any of the following:

- Graphics Repeat Introducer control character — DECGRI (!)
- Graphics Carriage Return control character — DECGCR ($)
- Graphics Next Line control character — DECGNL (–)
- Sixel data

Digital recommends that software always send a Set Raster Attributes (DECGRA) command before sending the sixel data and any other sixel graphics command.

27.2.2 Restrictions

The following restrictions apply when you print sixel graphics on the DEClaser 1100 printer:

- Colors map to black. This causes most color pictures to come out dark and not very clear.
- Sixel printing ignores extent parameters (Pn3 and Pn4) of the Set Raster Attributes (DECGRA) command.
- Sixel printing ignores the background select parameter (Ps2 of the sixel device control string). The printer assumes a white background.
- The maximum value for the horizontal grid size is 99 current units. (See the Select Size Unit (SSU) command in the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual*.)
- The maximum value for the aspect ratio is 1000. The horizontal grid size multiplied by the aspect ratio provides a maximum vertical grid size of 99,000 current units. (See the Select Size Unit (SSU) command in the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual*.)

28

Alternative Protocols

The DEClaser 1100 printer supports the following DEC PPL3 protocol switching commands:

- Select Other Coding System (SOCS)
- Return from Other Coding System (ROCS)
- IBM Proprinter Emulation Mode (DECIPEM)

See your Digital sales representative for the protocols available for the DEClaser 1100 printer.

29

Memory Management

The DEClaser 1100 printer does not support Ps5 of the Memory Management (DECMM) command. For more information on DECMM, see the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual.*

Part IV

DEClaser 3200 Printer

Part IV describes the level 3 Digital ANSI-Compliant Printing Protocol (DEC PPL3) implementation specific to the DEClaser 3200 printer. The Digital ANSI-Compliant Printing Protocol is based on ANSI X3.64.

- Chapter 30 provides a brief overview of the DEClaser 3200 printer.
- Chapter 31 explains the relationship between the logical information and the printing of the physical page in the DEClaser 3200 printer.
- Chapter 32 discusses reset and power-up values and lists initial state values for the printer.
- Chapter 33 lists maximum values for printer features.
- Chapter 34 explains paper handling for the printer.
- Chapter 35 describes reporting commands and lists error messages.
- Chapter 36 lists the fonts that come with the DEClaser 3200 printer.
- Chapter 37 discusses sixel implementation specific to the printer.
- Chapter 38 discusses protocol switching when using the DEClaser 3200 printer.

30

Overview

The DEClaser 3200 printer is a high-quality laser printer that can print text, graphics, and images on standard office envelopes, transparencies, and gummed labels and on the following paper sizes:

- Half Letter (8.5 in. x 5.5 in.)
- Letter (8.5 in. x 11 in.)
- 8.5 in. x 12.4 in.
- Legal (8.5 in. x 14 in.)
- Executive (7.25 in. x 10.5 in.)
- 8 in. x 10 in.
- 8 in. x 13 in.
- ISO A4 (210 mm x 297 mm)
- 8.3 in. x 13 in.
- 8.5 in. x 10.8 in.
- ISO A5 (148 mm x 210 mm)
- JIS B5 (182 mm x 257 mm)

The DEClaser 3200 printer implements level 3 of the Digital ANSI-Compliant Printing Protocol (DEC PPL3) as described in the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual.*

The DEClaser 3200 printer has both **simplex** and **duplex** printing capabilities. The printer can print up to 13 pages/minute for simplex printing and up to 11 pages/minute for duplex printing.

31

Logical to Physical Image

This chapter contains the following topics related to creating the physical image:

- Printer resolution, Section 31.1
- Printable area, Section 31.2
- Mapping the logical page to the physical sheet size, Section 31.3
- Positioning accuracy, Section 31.4

31.1 Printer Resolution

The DEClaser 3200 printer has an internal addressing capability of 1/7200 inch (**centipoint** addressing) and provides an imaging resolution of 300 x 300 dots/inch. This addressing capability and imaging resolution support a wide range of standard font pitches and sixel graphics resolutions.

31.1.1 Horizontal Resolution

The DEClaser 3200 printer supports the horizontal pitch values listed in Table 31–1 for the selective parameters (Ps) of the Set Horizontal Pitch (DECSHORP) and the Select Horizontal Spacing (SHS) commands. Table 31–1 lists the average width of characters (target pitch) in characters/inch if this value is exact. If characters per inch is only an approximate value, then the table provides the target value of character width in fractions of an inch per character with the approximate characters per inch value in parentheses.

Table 31–1 Horizontal Pitches — DEClaser 3200 Printer (Standard 300 Dots/Inch)

Target Pitch (Char/Inch)	Target Value (Centipoints)	Printer Pitch (Char/Inch)	Printer Value (Centipoints)
5	1440.00	5.000	1440
6	1200.00	6.000	1200
(6.6) 10/66 in.	1090.90	6.605	1090
(8.25) 8/66 in.	872.72	8.265	872
(8.55) 28/240 in.	840.00	8.550	840
9	800.00	9.000	800
10	720.00	10.000	720
(10.3) 29/300 in.	696.05	10.344	696
12	600.00	12.000	600
(13.2) 5/66 in.	545.45	13.210	545
15	480.00	15.000	480
(16.5) 4/66 in.	436.36	16.510	436
(17.1) 14/240 in.	420.00	17.100	420
18	400.00	18.000	400

The macro parameter values for sixel grid sizes and aspect ratios provided by the DEClaser 3200 printer are shown in Table 37–1.

31.1.2 Vertical Resolution

The DEClaser 3200 printer's vertical addressing can provide the pitches required for existing fonts and for sixel graphics mode. Table 31–2 lists the vertical pitch values supported for the selective parameters (Ps) of the Set Vertical Pitch (DECVERP) and the Select Vertical (Line) Spacing (SVS) commands.

Table 31–2 Vertical Pitches — DEClaser 3200 Printer (Standard 300 Dots/Inch)

Target Pitch (Lines/Inch)	Printer Value[1] (Centipoints)
2	3600
3	2400
4	1800
6	1200
8	900
12	600

Target Pitch (Lines/A-size Printable Area)	Printer Value[1] (Centipoints)
22	3456
33	2304
44	1728
66	1152
88	864
132	576

Target Pitch (Lines/30 Millimeters)	Printer Value[1] (Centipoints)
3	2856
4	2136
6	1416
12	720

[1]These values represent the amount of white space between lines for each pitch value.

Note

The DEClaser 3200 printer supports pitch values specified by the Spacing Pitch Increment (SPI) command as requested.

31.2 Printable Area

This section discusses the printable area for paper sizes and the maximum and minimum envelope sizes that the DEClaser 3200 printer supports.

If a character extends beyond the printable area, the character is truncated and no portion of the character is printed.

31.2.1 Paper Sizes

Table 31–3 shows the minimum printable area specified by Digital and the printable area of the DEClaser 3200 printer in centipoints for supported paper sizes.

Table 31–3 Printable Areas of the DEClaser 3200 Printer in Centipoints

Paper Size	Minimum		DEClaser Printer	
(Conventional Units)	Width	Length	Width	Length
Half Letter (8.5 in. x 5.5 in.)[1]	36000	57600	39600	60312
Letter (8.5 in. x 11 in.)	57600	75600	61200	78312
8.5 x 12.4 (215 mm x 315 mm)	57345	85691	60912	88392
Legal (8.5 in. x 14 in.)	57600	97200	61200	99912
8 x 10 (8 in. x 10 in.)	54000	68400	57600	71112
8 x 13 (8 in. x 13 in.)	54000	90000	57600	92712
ISO A4 (210 mm x 297 mm)	55872	80568	59544	83352
8.3 x 13 (210 mm x 330 mm)	55872	88943	59544	92640
8.5 x 10.8 (215 mm x 275 mm)	57345	74353	60912	77088
ISO A5 (148 mm x 210 mm)[1]	38400	55920	38544	69960
JIS B5 (182 mm x 257 mm)[1]	48000	69264	49920	70151
Executive (7.25 in. x 10.5 in.)	48800	72000	52200	74712

[1] Paper size can be used only with manual feed or the optional multi-media feeder.

Table 31–4 lists the minimum and maximum printable areas for media fed into the manual feed slot on the DEClaser 3200 printer.

Table 31–4 Printable Area for Variable Size Paper for the DEClaser 3200 Printer

Feeding Method	Minimum Size	Maximum Size
Manual feed slot	100 mm x 190 mm 4.125 in. x 7.5 in. 29700 cpt[1] x 54000 cpt[1]	257 mm x 364 mm 10.12 in. x 14.33 in. 72864 cpt[1] x 103176 cpt[1]
Multi-media feeder	100 mm x 215 mm 4.125 in. x 7.5 in. 29700 cpt[1] x 61200 cpt[1]	257 mm x 297 mm 8.5 in x 11.69 in. 72864 cpt[1] x 84168 cpt[1]

[1]Centipoint is abbreviated as cpt.

The manual feed slot supports the standard single sheet feeder and an optional multi-media feeder (MMF) for variable size paper. These manual slot feeders can support the paper sizes listed in Table 31–3.

31.2.2 Envelope Sizes

You can feed envelopes in to the DEClaser 3200 printer with the standard manual single sheet feeder or the optional multi-media feeder (MMF). These feeders support the following envelope sizes:

- U.S. No. 10 envelope (4.125 in x 9.5 in.)
- C5 envelope (162 mm x 229 mm)
- DL envelope (110 mm x 220 mm)

See Table 31–4 for the maximum and minimum sizes supported for variable size media.

31.3 Mapping Page Size to Physical Sheet Size

The Page Format Select (PFS) and Variable Page Format Select (DECVPFS) commands specify the page size. The physical sheet size depends on the paper cassette selected. When the page size does not match the physical sheet size, the DEClaser 3200 printer keeps the page and physical sheet aligned at the top left-hand corner.

- If the page size is smaller than the physical sheet size, the printer leaves white space on the right and bottom edges. See Figure 31–1.

- If the page size is larger than the physical sheet size, the printer does not image characters that extend beyond the boundaries of the printable area in both the horizontal and vertical directions. See Figure 31–2.
- Sheets printed in duplex normal mode with landscape orientation print so that pages can be bound along the long edge.
- Sheets printed in duplex tumbled mode with landscape orientation selected are printed so that pages can be bound along the short edge.

Figure 31–1 Page Size Smaller Than Physical Sheet Size on DEClaser 3200 Printer

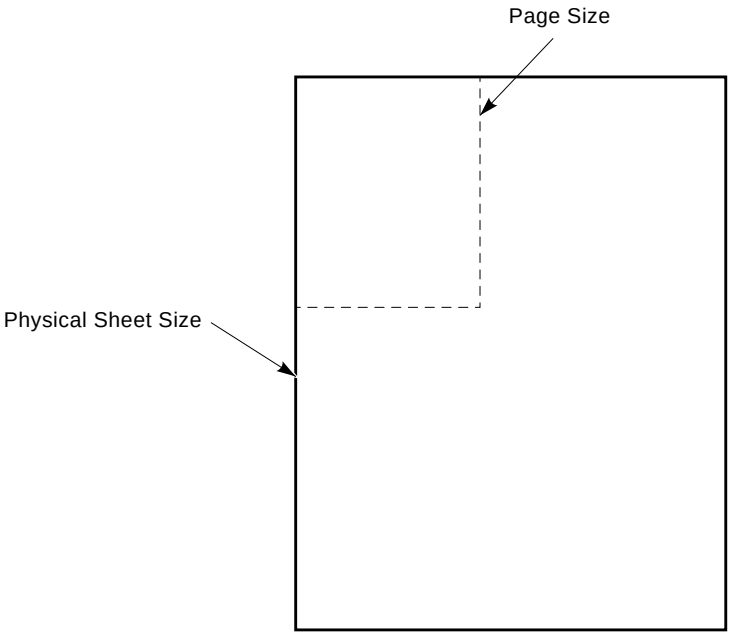
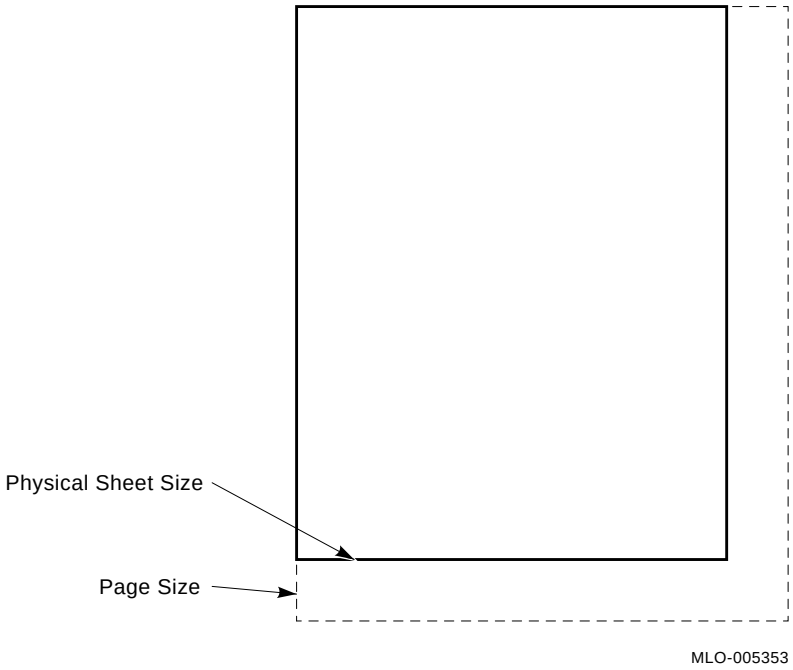


Figure 31–2 Page Size Larger Than Physical Sheet Size on DEClaser 3200 Printer



31.4 Positioning Accuracy

The DEClaser 3200 printer rounds to the nearest pixel at imaging time and keeps distance in centipoints. Positioning is accurate to 1/2 pixel. For vectors drawn with the Draw Vector (DECVEC) and Draw Relative Vector (DECRVEC) commands, values between 0 and 24 centipoints round to 1 pixel.

32

Initial State Values

The topics discussed in this chapter include the following:

- Initial state values that are independent of the paper size in the selected paper cassette, Section 32.1
- Initial state values based on the paper cassette, Section 32.2
- Factory defaults in nonvolatile memory, Section 32.3

32.1 Initial States Independent of Paper Cassette

Tables 32–1 and 32–2 list the values used for power-up and the Select Conformance Level (DECSCL), Soft Terminal Reset (DECSTR), and Reset to Initial State (RIS) commands, independent of the paper cassette selection.

Table 32–1 Initial State Values for the DEClaser 3200 Printer

Variable or Control Function	DECSCL†	Power-Up‡	DECSTR RIS
Origin (DECOPM)	Reset	Reset	Reset
Position Unit Mode[1]	Reset	Reset	Reset
Vertical spacing	Font-dependent	Font-dependent	Font-dependent
Horizontal spacing	Font-dependent	Font-dependent	Font-dependent
Size unit[1]	Decipoints	Decipoints	Decipoints
Active position	Origin	Origin	Origin

[1]Because Position Unit Mode (PUM) is reset by default, Select Size Unit (SSU) is ignored for most commands.

†When "RECALL FACT DEFAULTS" is selected from the DEClaser 3200 front panel, these values are used.

‡When "PRINTER RESET" is selected from the DEClaser 3200 front panel, these values are used.

(continued on next page)

Table 32–1 (Cont.) Initial State Values for the DEClaser 3200 Printer

Variable or Control Function	DECSCL†	Power-Up‡	DECSTR RIS
Horizontal tabs[2]	Every eight	Every eight	Every eight
Line Feed/New Line	Reset	NVM	NVM
CR/New Line Mode	Reset	Reset	Reset
Pitch Select Mode[3]	Reset	Reset	Reset
Proportional spacing	Reset	Reset	Reset
Justify	Disabled	Disabled	Disabled
SGR attributes	Disabled	Disabled	Disabled
Vertical tabs[4]	Every VAI	Every VAI	Every VAI
G0	ASCII	ASCII	ASCII
G1	ASCII	ASCII	ASCII
G2	User Preference	User Preference	User Preference
G3	User Preference	User Preference	User Preference
GL	G0	G0	G0
GR	G2	G2	G2
GSS	10 points	10 points	10 points
GSM	100,100	100,100	100,100
Autowrap	Set	NVM[5]	NVM
User Preference Set	DEC Supplemental	NVM	Unchanged
Unsolicited status reports	Disabled	Disabled	Unchanged
Downloaded fonts	Deleted	None	Unchanged
CRM	Unchanged	Reset	Unchanged
Tray selection (feeder)	Tray 1	NVM	Unchanged

[2]Horizontal tabs are set every eight columns, starting with column 9 (9,17, . . .) and fill the entire tab table.

[3]When DECPSM is reset, the Horizontal Advance Increment (HAI) is font-dependent.

[4]Vertical tabs are set every line or Vertical Advance Increment (VAI) and fill the entire tab table.

[5]NVM indicates that the initial state value is stored in the nonvolatile memory.

†When "RECALL FACT DEFAULTS" is selected from the DEClaser 3200 front panel, these values are used.

‡When "PRINTER RESET" is selected from the DEClaser 3200 front panel, these values are used.

(continued on next page)

Table 32–1 (Cont.) Initial State Values for the DEClaser 3200 Printer

Variable or Control Function	DECSCL†	Power-Up‡	DECSTR RIS
DECSNC (copy)	1	1	Unchanged
DECMM (reservation)	Partial	NVM	Unchanged
DECSDPM	Simplex[6]	NVM	Unchanged
DECSSS (paper size)[7]	Letter (portrait)	NVM[8]	Unchanged
C1 Receive	8-Bit	8-Bit	Unchanged
Initialization message	Unchanged	NVM	Unchanged
Device ID	Unchanged	NVM	Unchanged
Failover	Disabled	NVM	Unchanged
Automatic Test Mode	Unchanged	Disabled	Unchanged
Document finishing	No offset	No offset	Unchanged

[6]The initial state of the DECSDPM command is true simplex normal.

[7]See Section 34.3 for the paper size specifications for the various input trays.

[8]The paper size specification for the adjustable paper cassette is saved in nonvolatile memory only. If the paper size specification for the manual feed slot or multi-media feeder is installed, it is initialized to Letter (portrait).

†When "RECALL FACT DEFAULTS" is selected from the DEClaser 3200 front panel, these values are used.

‡When "PRINTER RESET" is selected from the DEClaser 3200 front panel, these values are used.

Table 32–2 Initial State Values of Select Graphic Rendition (SGR) Numbers

SGR	Assignment Type	ID	Meaning
10	Type family	DBULTN1	DEC Builtin1 family
11	Type family	RCOURIR	Courier family
12	Type family	RELITE0	Elite family
13	Font collection plus	RCOURIRJ02SK00GG	Courier 10 point, 10 pitch
14	Font collection plus	RELITE0L02SK00GG	Elite 10 point, 12 pitch
15	Font collection plus	RCOURIR101VK00GG	Courier 6.7 point, 13.6 pitch

(continued on next page)

Table 32–2 (Cont.) Initial State Values of Select Graphic Rendition (SGR) Numbers

SGR	Assignment Type	ID	Meaning
16	Font collection plus	RCOURIR202SK00GG	Courier 10 point, 10.3 pitch
17	Type family	DBULTN1	DEC Builtin1 family
18	Type family	DBULTN1	DEC Builtin1 family
19	Type family	DBULTN1	DEC Builtin1 family

Font cartridges modify the default Select Graphic Rendition (SGR) values. These modifications occur during power-up, Soft Terminal Reset (DECSTR), or Reset to Initial State (RIS), and for Select Conformance Level (DECSCL). The printer also references modifications to the SGR values made by the font cartridge on the Assign Type Family or Font (DECATFF) command when the string is null.

32.2 Initial States Based on Paper Size

Table 32–3 lists the bounds and the Select Graphic Rendition (SGR) font-selection parameter determined at initialization.

For fixed size paper trays, the bounds and parameter depend on the paper size of the selected paper tray. Table 32–3 lists the bounds for fixed size paper trays based on a parameter of the Page Format Select (PFS) command. For PFS values, see the description of the command in the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual.*

For variable size trays, the bounds depend on the paper size stored in nonvolatile memory selected by the front panel or by the Select Sheet Size (DECSSS) command. See Section 34.3.

Table 32–3 Initialization Based on Paper Size

Paper Size	Bounds Definition	SGR
Letter	PFS ?20	10
A4	PFS ?22	16
Legal	PFS ?24	10

(continued on next page)

Table 32–3 (Cont.) Initialization Based on Paper Size

Paper Size	Bounds Definition	SGR
Variable size tray A[1]	DECSSS[2]	10
Variable size tray B[1]	DECSSS[2]	10
Large capacity input tray	Letter or A4, depending on the model	
Multi-media feeder	DECSSS[2]	10
Manual feed slot	DECSSS[2]	10

[1]See Section 34.3 for paper size specification for variable size trays in each input tray slot.

[2]See Table 34–3 for the initial state of DECSSS.

32.3 Factory Defaults in Nonvolatile Memory

Table 32–4 lists the factory defaults in the nonvolatile memory (NVM).

Table 32–4 Factory Defaults in NVM for the DEClaser 3200 Printer

Item[1]	Factory Default[1]	Variable (Control Function) Affected
PROTOCOL	DEC PPL3	Protocol
TRAY SELECTION (PPL3)	TRAY 1	Tray Selection and Failover
DUPLEX (PPL3)	SIMPLEX NORMAL	DECSDPM
NEW LINE (PPL3)	OFF	Line Feed/New Line
MEM MGT (PPL3)	PARTIAL	DECMM (reservation)
AUTOWRAP (PPL3)	ON	Autowrap
USER PREF SET (PPL3)	DEC SUPPLMT SET	User Preference Set

[1]Columns 1 and 2 are the terms used on the front panel.

(continued on next page)

Table 32–4 (Cont.) Factory Defaults in NVM for the DEClaser 3200 Printer

Item[1]	Factory Default[1]	Variable (Control Function) Affected
DEVICE ID (PPL3)	DEC PPL3	Device ID
POWER-UP MESSAGE (PPL3)	OFF	Initialization message
CTRL REPN MODE (PPL3)	OFF	Control Representation Mode (CRM)
ALARM	ONCE	N/A
ADJUSTABLE CASSETTE	LETTER	DECSSS (paper size)
COMM INTERFACE	SERIAL	N/A
BAUD RATE	9600	N/A
PARITY	8 BIT NONE	N/A
FLOW CONTROL	XON/XOFF 2-WAY	N/A
DISPLAY LANGUAGE	ENGLISH	N/A
COMM ERROR	CONTINUE	N/A

[1]Columns 1 and 2 are the terms used on the front panel.

33

Maximum Printer Values

This chapter lists the maximum parameter values supported by the DEClaser 3200 printer. The topics include:

- Maximum parameter values, Section 33.1
- Maximum values for printer features, Section 33.2

33.1 Maximum Parameter Values

The DEClaser 3200 printer has the following parameter value limitations:

- Graphics repeat function (DECGRI) — 32K (32767) limit. The printer sets values to the limit value.
- Grid size parameter — 99 units for maximum horizontal grid size; 1000 for maximum aspect ratio (99000 units for maximum vertical grid size).

33.2 Maximum Values for Printer Features

Table 33–1 lists the maximum values supported by DEClaser 3200 printer.

Table 33–1 Maximum Values Supported by the DEClaser 3200 Printer

Printer Feature	Maximum Value
Horizontal tabs	168
Vertical tabs	168
Number of trays	See Section 34.2
Number of entries in font dictionary	256 + 100 for each MB of optional RAM
Built-in download font RAM size	approximately 700 KB [1]

[1] In the DEClaser 3200 printer, font RAM and bitmap RAM share the built-in 700 KB RAM.

(continued on next page)

Table 33–1 (Cont.) Maximum Values Supported by the DEClaser 3200 Printer

Printer Feature	Maximum Value
Built-in bitmap RAM or graphics buffer	approximately 700 KB[1]
Optional bitmap RAM	{2 | 4 | 6 | 8 | 10} MB[2]
Optional download RAM	{2 | 4 | 6 | 8 | 10} MB[2]
Number of font cartridge slots	2

[1]In the DEClaser 3200 printer, font RAM and bitmap RAM share the built-in 700 KB RAM.

[2]The total of both optional bitmap memory and optional download memory cannot exceed 10 MB. You must remove 512 KB of built-in RAM to install all 10 MB of optional memory.

34

Paper Handling

The following options specific to the DEClaser 3200 printer are discussed in this chapter:

- Duplex printing, Section 34.1
- Input tray selection, Section 34.2
- Set sheet size, Section 34.3
- Select input tray failover, Section 34.4

34.1 Duplex Printing

The DEClaser 3200 printer implements simplex (one-sided), duplex (two-sided), and tumble printing with the following exceptions:

- Paper must be at least 10.5 in. (266.7 mm) in length to print in physical duplex mode.
- The manual feed slot and the optional multi-media feeder support printing only in simplex mode.

You select the print mode with the Set Duplex Print Mode (DECSDPM) command or from the front panel. Table 34–1 lists the duplex modes and shows the fallback modes for the printer when an exception occurs. For a description of the DECSDPM command, see the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual.*

Table 34–1 Duplex Print Mode Fallbacks for the DEClaser 3200 Printer

Ps	Duplex Mode	3200 Model
1	True simplex normal	1

(continued on next page)

Table 34–1 (Cont.) Duplex Print Mode Fallbacks for the DEClaser 3200 Printer

Ps	Duplex Mode	3200 Model
2	True simplex tumbled	2
3	True duplex normal	5
4	True duplex tumbled	6
5	Duplex master normal	5
6	Duplex master tumbled	6
7	Simplex compressed normal	1
8	Simplex compressed tumbled	2

Example 34–1 shows two forms of the DECSDPM command. The first command with Ps = 1 selects a true simplex normal mode; Ps = 3, a true duplex normal mode, selects duplex master normal. "Normal" indicates that the printer does not print documents tumbled.

Example 34–1 Set Duplex Print Mode Command for the DEClaser 3200 Printer

```
CSI  1   SP  x
9/11 3/1 2/0 7/8

CSI  3   SP  x
9/11 3/3 2/0 7/8
```

34.2 Designating the Input Tray

The DEClaser 3200 printer has two input trays (top tray and bottom tray) and a manual feed slot. The input tray slots support either fixed size or adjustable paper cassettes. The manual feed slot accommodates the standard single-sheet feeder, an optional multi-media feeder, or an optional large capacity input tray.

Use the Automatic Sheet Feeder (Input Tray) Control (DECASFC) command to select the appropriate tray or feed slot:

```
CSI  Ps   !   v
9/11 3/xx 2/1 7/6
```

The DECASFC command causes a conditional Form Feed. Subsequent sheets come from the tray as indicated in the selective parameter Ps in Table 34–2:

Table 34–2 Tray Selection on the DEClaser 3200 Printer

Ps	Tray Selected
0	No tray change
1	Top tray
2	Bottom tray
3	Large capacity input tray[1]
4	Multi-media feeder[1,2]
99	Manual feed slot[2]

[1]You can select this feeder with the specified parameter when the option is installed.

[2]The manual feed slot is not available when the multi-media feeder is installed.

The DEClaser 3200 printer treats both an unsupported parameter and a parameter value for an option that is not available as Ps = 0.

Example 34–2 shows the commands to select — first, the top input tray, and second, the manual feed slot.

Example 34–2 Selecting an Input Tray for DEClaser 3200 Printer

```
CSI  1   !   v
9/11 3/1 2/1 7/6

CSI  9   9   !   v
9/11 3/9 3/9 2/1 7/6
```

For a description of the DECASFC command, see the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual.*

34.3 Set Sheet Size (DECSSS)

The DEClaser 3200 printer supports an adjustable paper cassette with two keys (A and B) for the standard input slots. In addition, the printer supports several paper sizes for each keyed adjustable cassette for each of the input tray slots. You specify the paper size from the front panel or with the Set Sheet Size (DECSSS) command.

The DEClaser 3200 printer also requires that you specify paper size for the manual feed slot and the optional multi-media feeder when they are available. You specify the paper size for the multi-media feeder or the manual feed slot by using DECSSS.

Use the Set Sheet Size (DECSSS) command to provide the paper size when paper size information is not available.

```
CSI  Ps1  ;    Ps2  ;    Pn3  ;    Pn4  SP   {
9/11 ***  3/11 ***  3/11 ***  3/11 ***  2/0  7/11
```

Table 34–3 lists the supported parameters for the DEClaser 3200 printer for the adjustable paper cassette, the multi-media feeder, and the manual feed slot.

Table 34–3 Set Sheet Size (DECSSS) Parameters

Ps1	Ps2	Input Tray
0	1	Top or Bottom tray with Key “A”
0	2	Top or Bottom tray with Key “B”
1	1	Top tray, Key “A”
1	2	Top tray, Key “B”
2	1	Bottom tray, Key “A”
2	2	Bottom tray, Key “B”
4	any	Multi-media Feeder[1]
99	any	Manual feed slot[2]

[1]You can specify the size of this tray only when this option is installed.

[2]You can specify the size of this tray only when the multi-media feeder is not installed.

Parameters Pn3 and Pn4 are expressed in pixels, decipoints, or centipoints, as defined by Select Size Unit (SSU), regardless of the setting of Positioning Unit Mode (PUM). Parameters Pn3 and Pn4 specify the sheet's width and length, respectively. The DEClaser 3200 printer restricts these values for the adjustable paper cassette to the values listed in Table 34–4. You may save one of these discrete values in nonvolatile memory.

If the DECSSS command does not match the paper size in Table 34–4, the printer selects a paper size equal to or larger than the requested size. The printer front panel displays the selected paper size and you may save this value in nonvolatile memory.

The DEClaser 3200 printer does not restrict the size of paper fed through the manual feed slot or through the optional multi-media feeder.

Table 34–4 Discrete Paper Sizes for the DEClaser 3200 Printer

Paper Size[1]	Conventional Units		Centipoints	
	Width	Length	Width	Length
Letter	8.5 in.	11 in.	61200	79200
8.5 x 12.4	215 mm	315 mm	61200	93528
Legal	8.5 in.	14 in.	61200	100800
Executive	7.25 in.	10.5 in.	52200	75600
8 x 10	8 in.	10 in.	57600	72000
8 x 13	8 in.	13 in.	57600	93600
A4	210 mm	297 mm	59544	84168
8.3 x 13	210 mm	330 mm	59544	93528
8.5 x 10.8	215 mm	275 mm	60912	77976

[1] Paper size names listed in this column are displayed on the DEClaser 3200 front panel.

For more information on the Set Sheet Size (DECSSS) command, see the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual*.

34.4 Select Input Tray Failover (DECSITF)

The DEClaser 3200 printer supports a composite tray definition for failover. When a paper tray that is part of the composite tray is empty, the DEClaser 3200 printer selects paper from the next tray in the composite tray definition instead of reporting a paper-out error condition. You can define the composite tray from the printer front panel or with the Select Input Tray Failover (DECSITF) command.

```
CSI   Ps1   ;      . . .    ;    Psn  SP  w
9/11  ***   3/11   . . .    3/11 ***  2/0   7/7
```

Table 34–5 lists the parameter values available for the composite tray definition for the DEClaser 3200 printer.

Table 34–5 DECSITF Parameters for the DEClaser 3200 Printer

Value	Meaning
	Ps1
0	Disable composite input trays
1	Composite tray 1
	Ps2 to Ps*n*
1	Top tray
2	Bottom tray
3	Large capacity input tray[1]

[1]You can only select these feeders with the specified parameter when the option is installed.

For more information on Select Input Tray Failover (DECSITF) command, see the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual* (or Appendix C).

If the large capacity input tray is installed and is part of the composite tray definition, the DEClaser 3200 printer attempts to feed from the LCIT first. The manual feed slot or multi-media feeder (if installed) may not be part of the composite tray definition.

35

Status and Error Reporting

The topics discussed in this chapter include the following:

- Control Representation Mode, Section 35.1
- Device Attributes Report parameters, Section 35.2
- Device Attributes (secondary) Report parameters, Section 35.3
- Error parameters for Device Status Reports, Section 35.4

This chapter discusses reports and lists the error parameters for printer device status reports for DEClaser 3200 printer. The printer sends the following reports:

- CPR — Reports current cursor position
- DAR — Response to a Device Attributes (DA) request, Section 35.2
- DA2R — Response to a Device Attributes (secondary) DA2 request, Section 35.3
- DECFSR (1 or 0) — Reports fonts currently available
- DECFSR (2 or 0) — Reports the memory available for downline loading in bytes
- DECFSR (DECLFF, Ps2 = 2 or 3) — Reports font validation errors and warnings.
- DSR — Response to a Device Status Report or an error if unsolicited reports are enabled, Section 35.4

For information on the Cursor Position Report (CPR) and the Font Status Report (DECFSR) commands, refer to the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual*.

35.1 Control Representation Mode (CRM)

The Control Representation mode can be set by the software or from the front panel. If Control Representation mode is enabled by the software, it is disabled from the software only. If Control Representation mode is enabled from the front panel, it is disabled from the front panel only.

35.2 Device Attributes (Secondary) Report (DAR) Parameters

Device Attributes Report (DAR) parameters allow the printer to identify itself as either of the following:

- A Digital level 3 printer — DAR (generic response)
- A previous model Digital printer (to allow backward compatibility) — DAR (alias response)

To request product identification for the DEClaser 3200 printer, the host must send a Device Attributes (DA) command:

```
CSI  c         or     CSI  0   c
9/11 6/3              9/11 3/0 6/3
```

The DEClaser 3200 printer responds to a Device Attributes (DA) command by sending a DAR (generic response):

```
CSI  ?    Ps1 ;    Ps2 ;     . . .   ;    Psn c
9/11 3/15 *** 3/11 *** 3/11  . . .   3/11 *** 6/3
```

For the DEClaser 3200 printer, Ps1 is 73 (3/7 3/3). This identifies the printer as a Digital level 3 device.

Ps2 to Ps*n* indicate which extensions or enhancements the DEClaser 3200 printer supports. Table 35–1 lists the character form (Ps2 to Ps*n*) and code for each extension.

Table 35–1 Parameters for Primary DA Response for the DEClaser 3200 Printer

Character Form	Code	Extension
4	3/4	Sixel graphics
6	3/6	Sheet feeder
8	3/8	Legal-size paper handling

(continued on next page)

Table 35–1 (Cont.) Parameters for Primary DA Response for the DEClaser 3200 Printer

Character Form	Code	Extension
9	3/9	Variable Page Format Select (DECVPFS)
10	3/1 3/0	Vector drawing
11	3/1 3/1	Multiple copies
12	3/1 3/2	Hebrew character sets
16	3/1 3/6	Logical duplex printing
18	3/1 3/8	Physical duplex printing
19	3/1 3/9	Front face tumble printing

Example 35–1 shows a primary DA request to a DEClaser 3200 printer and the DAR (generic response) from the DEClaser 3200 printer:

Example 35–1 DA Request and DAR Example for the DEClaser 3200 Printer

```
CSI c        or        CSI 0 c

CSI ? 73;4;6;8;9;10;11;12;16;18;19  c
```

Table 35–2 lists the DAR (alias response) parameters supported by the DEClaser 3200 printer for backwards compatibility.

Table 35–2 DAR Parameters (Alias Response) for the DEClaser 3200 Printer

Character Form	Code	Option
26	3/2 3/6	LN03 (base unit)

The DEClaser 3200 printer can be configured to send a response compatible with the LN03 printer:

```
CSI  ? 26 c
```

For more information on the Device Attributes Report (DAR) command, refer to the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual*.

35.3 Device Attributes (Secondary) Report (DA2R) Parameters

A Secondary Device Attributes Report (DA2R) provides the following information about the DEClaser 3200 printer:

- Identifies the printer model
- Names the firmware revision
- Lists the amount of memory in megabytes
- Indicates whether protocol cartridges are installed
- Identifies input paper handling options
- Identifies engine or controller options

To request this information, the host sends a Device Attributes (Secondary) (DA2) command:

```
CSI  >    c         or       CSI  0   >    c
9/11 3/14 6/3                 9/11 3/0 3/14 6/3
```

In response to a secondary DA request, the DEClaser 3200 printer sends a Device Attributes (Secondary) Report (DA2R):

```
CSI  >    Ps1 ;    Ps2 ;    Ps3 ;    Ps4 c
9/11 3/14 *** 3/11 *** 3/11 *** 3/11 *** 6/3
```

Table 35–3 lists the DA2R parameters supported by the DEClaser 3200 printer.

Table 35–3 Parameters for DA2 Responses for the DEClaser 3200 Printer

Character Form	Code	Description
		Ps1
53	3/5 3/3	DEClaser 3200 printer
		Ps2
xx	3/*x* 3/*x*	Firmware revision *x.x*
10	3/1 3/0	Version 1.0-*yy*

(continued on next page)

Table 35–3 (Cont.) Parameters for DA2 Responses for the DEClaser 3200 Printer

Character Form	Code	Description
		Ps3
0	3/0	No memory card installed
2	3/2	one 2-MB memory card
4	3/4	two 2-MB memory cards
6	3/6	three 2-MB memory cards
8	3/8	four 2-MB memory cards
10	3/1 3/0	five 2-MB memory cards
		Ps4
8	3/8	HP PCL 4
9	3/9	HP PCL 4 + PostScript cartridge
		Ps5
yy	3/y 3/y	Firmware edit revision *yy*
00	3/0 3/0	Version *x.x*-00
		Ps6
0	3/0	No input paper handing options
1	3/1	Large capacity input tray
2	3/2	Multi-media feeder
		Ps7
0	3/0	No internal options
1	3/1	Coprocessor installed

Example 35–2 shows a DA2 request and a DA2R response from a DEClaser 3200 printer, firmware Version 1.0, with three 2-MB memory cards, a PostScript option installed, firmware edit Version 3, with no input paper handling options, and a coprocessor installed:

Example 35–2 DA2 Request and DA2R Response for the DEClaser 3200 Printer

```
CSI > c        or        CSI > 0 c

CSI > 53;10;6;9;03;0;1 c
```

For more information on the Device Attributes (Secondary) Report (DA2R), see the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual*.

35.4 Error Parameters for Device Status Reports

Table 35–4 lists error parameters reported by the DEClaser 3200 printer for extended DSR reports. Each error parameter has a unique code that pinpoints the specific failure and a generic code that indicates the general type of failure. For example, in the error message ?218 ?36:

- ?218 is the specific code for a paper jam in the duplex transport path
- ?36 is a generic code for paper jams

Refer to Table B–1 for a list of generic codes and their meanings.

For more information on Device Status Reports and parameters, see the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual*.

Table 35–4 Error Parameters for Extended Printer Device Status Reports for the DEClaser 3200 Printer

Specific Code	Generic Code	Class	Meaning
			Controller Errors
?0	?57	Special	First report since initialization
?0	?20	S:U	No malfunction detected

Key to Error Class

S—State (cleared when error condition corrected)

E—Event (cleared when error report transmitted)

S:U—State (same as S, but additionally triggers unsolicited reports when enabled)

E:U—Event (same as E, but additionally triggers unsolicited reports when enabled)

Special—Sent (if enabled) as the first parameter on power-on or front panel reset operation

(continued on next page)

Table 35–4 (Cont.) Error Parameters for Extended Printer Device Status Reports for the DEClaser 3200 Printer

Specific Code	Generic Code	Class	Meaning
			Controller Errors
?101	?41	E	Complex data
?102	?41	E	Lost characters
?103	?44	E	Font memory full
?104	?44	S	Font dictionary full
?105	?41	E	Page memory full
?111	?42	E	Downline loaded font warning
?112	?42	E	Downline loaded font error (load aborted)
?113	?47	E	Error overflow (more than can be recorded)
?117	?41	E	Justify buffer overflow
?122	?42	E	Inconsistent font file metrics
?123	?40	E	No font file with current character set
?129	?22	E	Unknown communication fault
?130	?22	E	DSR/DTR line error
?131	?22	E	Line error on received character
?132	?23	E	Line error — input buffer overflow
?133	?55	S:U	Protocol switch failed: emulation not present, not installed, or protocol board or cartridge failed
?142	?56	S:U	Insufficient memory for requested memory configuration
?151	?21	S:U	Cartridge 1 failure
?152	?21	S:U	Cartridge 2 failure

Key to Error Class

S—State (cleared when error condition corrected)

E—Event (cleared when error report transmitted)

S:U—State (same as S, but additionally triggers unsolicited reports when enabled)

E:U—Event (same as E, but additionally triggers unsolicited reports when enabled)

Special—Sent (if enabled) as the first parameter on power-on or front panel reset operation

(continued on next page)

Table 35–4 (Cont.) Error Parameters for Extended Printer Device Status Reports for the DEClaser 3200 Printer

Specific Code	Generic Code	Class	Meaning
			Controller Errors
?164	?21	S:U	Expansion board RAM failure
?165	?34	S:U	Coprocessor failure
			Engine Errors
?200	?59	S	Fuser powered down (power saver)
?201	?34	S:U	Fixing (fuser) unit error
?203	?33	S	Toner low
?206	?27	S:U	Paper tray empty
?211	?34	S:U	Engine nonvolatile RAM error
?212	?26	S:U	Printer cover open
?213	?24	S:U	Printer is off line
?214	?36	S:U	Paper transport or eject jam
?215	?36	S:U	Paper misfeed jam
?216	?36	S:U	Paper jam
?218	?36	S:U	Paper jam in duplex transport path
?230	?50	S:U	Output tray is full
?231	?21	S:U	Output-tray offset failure
?291	?35	S:U	Developer CRU fault
?292	?35	S:U	Photoreceptor CRU fault

Key to Error Class

S—State (cleared when error condition corrected)

E—Event (cleared when error report transmitted)

S:U—State (same as S, but additionally triggers unsolicited reports when enabled)

E:U—Event (same as E, but additionally triggers unsolicited reports when enabled)

Special—Sent (if enabled) as the first parameter on power-on or front panel reset operation

(continued on next page)

Table 35–4 (Cont.) Error Parameters for Extended Printer Device Status Reports for the DEClaser 3200 Printer

Specific Code	Generic Code	Class	Meaning
			Media Errors or Requests
?319	?51	S:U	Input tray missing
?329	?52	S:U	Request for manual feed

Key to Error Class

S—State (cleared when error condition corrected)

E—Event (cleared when error report transmitted)

S:U—State (same as S, but additionally triggers unsolicited reports when enabled)

E:U—Event (same as E, but additionally triggers unsolicited reports when enabled)

Special—Sent (if enabled) as the first parameter on power-on or front panel reset operation

36

Fonts for the DEClaser 3200 Printer

This chapter discusses the following topics related to fonts for the DEClaser 3200 printer:

- Load font file (DECLFF) considerations, Section 36.1
- Font file repertory, Section 36.2
- Custom font cartridges
- Available built-in fonts, Section 36.3
- Algorithmic transformations for rendering attributes, Section 36.4
- Font file validation test report, Section 36.5

For more information on fonts and font selection, refer to the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual.*

36.1 Load Font File (DECLFF) Considerations

The DEClaser 3200 printer has approximately 700 Kbytes of built-in font memory available for downline loading of font files and can store up to 256 font files. The memory for downline loading fonts can be increased with optional memory. See Chapter 33, which lists the values for the maximum RAM memory.

Font files that are downline loaded into the memory by the Load Font File (DECLFF) command must follow the Common Font File Format (CFFF). For information, see the *Font File Format User's Manual.*

If you select a guaranteed imaging mode with the Memory Management (DECMM) command, bitmap memory is reserved. This reduces the memory available for downline loading fonts. See the description of DECMM in the *Font File Format User's Manual.*

36.2 Font Repertory

The font repertory of DEClaser 3200 printer consists of the following:

- Built-in fonts
- Standard or custom font cartridges
- Digital Standard Font Files available in CFFF format that can be downline loaded
- Customer-provided font files in CFFF format that can be downline loaded
- Built-in algorithmic transformations

36.3 Built-in Font File Repertory

The DEClaser 3200 printer has 36 built-in font files. These font files support the combination of nine character sets and four fonts. The following fonts reside in the DEClaser 3200 printer:

- Courier 10-point 10-pitch normal portrait (normal means that the font is not bold, italic, or otherwise attributed)
- Courier 10-point 10.3-pitch normal portrait
- Courier 6.7-point 13.6-pitch normal landscape
- Elite 10-point 12-pitch normal portrait

For each font, the following character sets reside in the printer:

- ASCII
- DEC Supplemental
- ISO Latin-1 Supplemental
- DEC Technical
- DEC Special Graphics (VT100 Line Drawing)
- DEC 7-Bit Hebrew
- DEC Hebrew Supplemental
- ISO Latin-Hebrew Supplemental
- Legal

36.3.1 Type Family Names

Table 36–1 lists the type families and the associated type family IDs built into the DEClaser 3200 printer.

Table 36–1 Type Family Names in the DEClaser 3200 Printer

Type Family Name	Type Family ID (Seven Characters)
DEC Builtin1	DBULTN1[1]
Courier	RCOURIR[2]
Elite 12	RELITE0[2]
PI font	D000000[1]

[1]The "D" in the type family IDs for DEC Builtin1 and PI font indicates that the name is registered with Digital, but is not registered internationally.

[2]The "R" in the type family IDs for Courier and Elite 12 indicates that these names are either registered internationally or are in the public domain.

36.3.2 Built-in Type Family Names and IDs, Font IDs, and Font File IDs

Table 36–2 lists type family names, type family IDs, font IDs, and font file IDs built into DEClaser 3200 printer.

Each of the 36 font files contains a character set that has a style, an orientation, a point size, and a horizontal spacing. Table 36–2 contains 72 entries. The DEClaser 3200 printer recognizes two font names for each font file:

- A name that is either internationally registered or in the public domain, for example, Courier or Elite 12
- A name registered by Digital, for example, Builtin or PI

For example, the following two entries are the same:

- Courier ASCII, 10 point, 10 pitch, Portrait font — (RCOURIR J 02S K 00 G G 00 01U ZZZZ 02 F 0 0 0)
- DEC Builtin1 ASCII, 10 point, 10 pitch, Portrait font — (DBULTN1 J 02S K 00 G G 00 01U ZZZZ 02 F 0 0 0)

A **font file** has a 31-character name. The first seven characters are the **type family ID**, the first 12 characters are the **font collection ID**, and the first 16 characters define the **font ID**. The following example shows how the type families, fonts, and font files are related:

- A type family ID — DBULTN1
- A font collection ID — DBULTN1J02SK
- A font ID — DBULTN1J02SK00GG
- A font file ID — DBULTN1J02SK00GG0001UZZZZ02F000

In Table 36–2, the font ID, the font collection ID, and the font file ID are indicated by arrows.

Note

Spaces appear in the IDs for clarity; they are not part of the IDs.

Table 36–2 Built-in Font File IDs

Pitch	Type Size	Character Set	Font File ID——————————————————–> Font ID——————————> Font Collection ID->
1. Type Family Name: DEC Builtin1 — Type Family ID: DBULTN1			
10	10	ASCII	DBULTN1 J 02S K 00 G G 00 01U ZZZZ 02 F 0 0 0
10	10	DEC Supplemental[1]	DBULTN1 J 02S K 00 G G 00 245 ZZZZ 02 F 0 0 0
10	10	ISO Latin-1 Supplemental	DBULTN1 J 02S K 00 G G 00 6DD ZZZZ 02 F 0 0 0
10	10	DEC 7-Bit Hebrew	DBULTN1 J 02S K 00 G G 00 24D ZZZZ 02 F 0 0 0
10	10	DEC Hebrew Supplemental	DBULTN1 J 02S K 00 G G 00 1TG ZZZZ 02 F 0 0 0
10	10	ISO Latin-Hebrew Supplemental	DBULTN1 J 02S K 00 G G 00 6DK ZZZZ 02 F 0 0 0
10	10	Legal	DBULTN1 J 02S K 00 G G 00 244 ZZZZ 02 F 0 0 0
10.3	10	ASCII	DBULTN1 2 02S K 00 G G 00 01U ZZZZ 02 F 0 0 0
10.3	10	DEC Supplemental[1]	DBULTN1 2 02S K 00 G G 00 245 ZZZZ 02 F 0 0 0
10.3	10	ISO Latin-1 Supplemental	DBULTN1 2 02S K 00 G G 00 6DD ZZZZ 02 F 0 0 0

[1]The character set ID field of 01O formerly identified DEC Supplemental. It is now used for User Preference.

(continued on next page)

Table 36–2 (Cont.) Built-in Font File IDs

Pitch	Type Size	Character Set	Font File ID——————————————————–> Font ID————————–> Font Collection ID->
1. Type Family Name: DEC Builtin1 — Type Family ID: DBULTN1			
10.3	10	DEC 7-Bit Hebrew	DBULTN1 2 02S K 00 G G 00 24D ZZZZ 02 F 0 0 0
10.3	10	DEC Hebrew Supplemental	DBULTN1 2 02S K 00 G G 00 1TG ZZZZ 02 F 0 0 0
10.3	10	ISO Latin-Hebrew Supplemental	DBULTN1 2 02S K 00 G G 00 6DK ZZZZ 02 F 0 0 0
10.3	10	Legal	DBULTN1 2 02S K 00 G G 00 244 ZZZZ 02 F 0 0 0
12	10	ASCII	DBULTN1 L 02S K 00 G G 00 01U ZZZZ 02 F 0 0 0
12	10	DEC Supplemental[1]	DBULTN1 L 02S K 00 G G 00 245 ZZZZ 02 F 0 0 0
12	10	ISO Latin-1 Supplemental	DBULTN1 L 02S K 00 G G 00 6DD ZZZZ 02 F 0 0 0
12	10	DEC 7-Bit Hebrew	DBULTN1 L 02S K 00 G G 00 24D ZZZZ 02 F 0 0 0
12	10	DEC Hebrew Supplemental	DBULTN1 L 02S K 00 G G 00 1TG ZZZZ 02 F 0 0 0
12	10	ISO Latin-Hebrew Supplemental	DBULTN1 L 02S K 00 G G 00 6DK ZZZZ 02 F 0 0 0
12	10	Legal	DBULTN1 L 02S K 00 G G 00 244 ZZZZ 02 F 0 0 0
13.6	6.7	ASCII	DBULTN1 1 01V K 00 G G 00 01U ZZZZ 02 F 0 0 0
13.6	6.7	DEC Supplemental[1]	DBULTN1 1 01V K 00 G G 00 245 ZZZZ 02 F 0 0 0
13.6	6.7	ISO Latin-1 Supplemental	DBULTN1 1 01V K 00 G G 00 6DD ZZZZ 02 F 0 0 0
13.6	6.7	DEC 7-Bit Hebrew	DBULTN1 1 01V K 00 G G 00 24D ZZZZ 02 F 0 0 0
13.6	6.7	DEC Hebrew Supplemental	DBULTN1 1 01V K 00 G G 00 1TG ZZZZ 02 F 0 0 0
13.6	6.7	ISO Latin-Hebrew Supplemental	DBULTN1 1 01V K 00 G G 00 6DK ZZZZ 02 F 0 0 0
13.6	6.7	Legal	DBULTN1 1 01V K 00 G G 00 244 ZZZZ 02 F 0 0 0
2. Type Family Name: Courier — Type Family ID: RCOURIR			
10	10	ASCII	RCOURIR J 02S K 00 G G 00 01U ZZZZ 02 F 0 0 0
10	10	DEC Supplemental[1]	RCOURIR J 02S K 00 G G 00 245 ZZZZ 02 F 0 0 0
10	10	DEC Technical	RCOURIR J 02S K 00 G G 00 01Q ZZZZ 02 F 0 0 0
10	10	DEC Special Graphics	RCOURIR J 02S K 00 G G 00 01C ZZZZ 02 F 0 0 0

[1]The character set ID field of 01O formerly identified DEC Supplemental. It is now used for User Preference.

(continued on next page)

Table 36–2 (Cont.) Built-in Font File IDs

Pitch	Type Size	Character Set	Font File ID——————————————————–> Font ID————————–> Font Collection ID->
2. Type Family Name: Courier — Type Family ID: RCOURIR			
10	10	ISO Latin-1 Supplemental	RCOURIR J 02S K 00 G G 00 6DD ZZZZ 02 F 0 0 0
10	10	DEC 7-Bit Hebrew	RCOURIR J 02S K 00 G G 00 24D ZZZZ 02 F 0 0 0
10	10	DEC Hebrew Supplemental	RCOURIR J 02S K 00 G G 00 1TG ZZZZ 02 F 0 0 0
10	10	ISO Latin-Hebrew Supplemental	RCOURIR J 02S K 00 G G 00 6DK ZZZZ 02 F 0 0 0
10	10	Legal	RCOURIR J 02S K 00 G G 00 244 ZZZZ 02 F 0 0 0
10.3	10	ASCII	RCOURIR 2 02S K 00 G G 00 01U ZZZZ 02 F 0 0 0
10.3	10	DEC Supplemental[1]	RCOURIR 2 02S K 00 G G 00 245 ZZZZ 02 F 0 0 0
10.3	10	DEC Technical	RCOURIR 2 02S K 00 G G 00 01Q ZZZZ 02 F 0 0 0
10.3	10	DEC Special Graphics	RCOURIR 2 02S K 00 G G 00 01C ZZZZ 02 F 0 0 0
10.3	10	ISO Latin-1 Supplemental	RCOURIR 2 02S K 00 G G 00 6DD ZZZZ 02 F 0 0 0
10.3	10	DEC 7-Bit Hebrew	RCOURIR 2 02S K 00 G G 00 24D ZZZZ 02 F 0 0 0
10.3	10	DEC Hebrew Supplemental	RCOURIR 2 02S K 00 G G 00 1TG ZZZZ 02 F 0 0 0
10.3	10	ISO Latin-Hebrew Supplemental	RCOURIR 2 02S K 00 G G 00 6DK ZZZZ 02 F 0 0 0
10.3	10	Legal	RCOURIR 2 02S K 00 G G 00 244 ZZZZ 02 F 0 0 0
13.6	6.7	ASCII	RCOURIR 1 01V K 00 G G 00 01U ZZZZ 02 F 0 0 0
13.6	6.7	DEC Supplemental[1]	RCOURIR 1 01V K 00 G G 00 245 ZZZZ 02 F 0 0 0
13.6	6.7	DEC Technical	RCOURIR 1 01V K 00 G G 00 01Q ZZZZ 02 F 0 0 0
13.6	6.7	DEC Special Graphics	RCOURIR 1 01V K 00 G G 00 01C ZZZZ 02 F 0 0 0
13.6	6.7	ISO Latin-1 Supplemental	RCOURIR 1 01V K 00 G G 00 6DD ZZZZ 02 F 0 0 0
13.6	6.7	DEC 7-Bit Hebrew	RCOURIR 1 01V K 00 G G 00 24D ZZZZ 02 F 0 0 0
13.6	6.7	DEC Hebrew Supplemental	RCOURIR 1 01V K 00 G G 00 1TG ZZZZ 02 F 0 0 0
13.6	6.7	ISO Latin-Hebrew Supplemental	RCOURIR 1 01V K 00 G G 00 6DK ZZZZ 02 F 0 0 0
13.6	6.7	Legal	RCOURIR 1 01V K 00 G G 00 244 ZZZZ 02 F 0 0 0

[1]The character set ID field of 01O formerly identified DEC Supplemental. It is now used for User Preference.

(continued on next page)

Table 36–2 (Cont.) Built-in Font File IDs

Pitch	Type Size	Character Set	Font File ID——————————————————–> Font ID————————–> Font Collection ID->
3. Type Family Name: Elite 12 — Type Family ID: RELITE0			
12	10	ASCII	RELITE0 L 02S K 00 G G 00 01U ZZZZ 02 F 0 0 0
12	10	DEC Supplemental[1]	RELITE0 L 02S K 00 G G 00 245 ZZZZ 02 F 0 0 0
12	10	DEC Technical	RELITE0 L 02S K 00 G G 00 01Q ZZZZ 02 F 0 0 0
12	10	DEC Special Graphics	RELITE0 L 02S K 00 G G 00 01C ZZZZ 02 F 0 0 0
12	10	ISO Latin-1 Supplemental	RELITE0 L 02S K 00 G G 00 6DD ZZZZ 02 F 0 0 0
12	10	DEC 7-Bit Hebrew	RELITE0 L 02S K 00 G G 00 24D ZZZZ 02 F 0 0 0
12	10	DEC Hebrew Supplemental	RELITE0 L 02S K 00 G G 00 1TG ZZZZ 02 F 0 0 0
12	10	ISO Latin-Hebrew Supplemental	RELITE0 L 02S K 00 G G 00 6DK ZZZZ 02 F 0 0 0
12	10	Legal	RELITE0 L 02S K 00 G G 00 244 ZZZZ 02 F 0 0 0
4. Type Family Name: PI Font — Type Family ID: D000000			
10	10	DEC Technical	D000000 J 02S K 00 G G 00 01Q ZZZZ 02 F 0 0 0
10	10	DEC Special Graphics	D000000 J 02S K 00 G G 00 01C ZZZZ 02 F 0 0 0
10.3	10	DEC Technical	D000000 2 02S K 00 G G 00 01Q ZZZZ 02 F 0 0 0
10.3	10	DEC Special Graphics	D000000 2 02S K 00 G G 00 01C ZZZZ 02 F 0 0 0
12	10	DEC Technical	D000000 L 02S K 00 G G 00 01Q ZZZZ 02 F 0 0 0
12	10	DEC Special Graphics	D000000 L 02S K 00 G G 00 01C ZZZZ 02 F 0 0 0
13.6	6.7	DEC Technical	D000000 1 01V K 00 G G 00 01Q ZZZZ 02 F 0 0 0
13.6	6.7	DEC Special Graphics	D000000 1 01V K 00 G G 00 01C ZZZZ 02 F 0 0 0

[1]The character set ID field of 01O formerly identified DEC Supplemental. It is now used for User Preference.

36.3.3 Font Metrics

Table 36–3 lists the metrics in centipoints for the fonts built into the DEClaser 3200 printer.

Table 36–3 Font Metrics for the DEClaser 3200 Printer

Field	Courier 10	Courier 10.3	Elite 12	Courier 13.6
Total vertical size	1152	1152	1152	864
Minimum space size[1]	360	336	288	264
Nominal space size	720	696	600	528
Maximum space size[2]	1440	1392	1200	1056
Above baseline offset[3]	–840	–840	–840	–648
Below baseline offset[3]	312	312	312	216
Superscript vertical[3]	–576	–576	–576	–432
Subscript vertical[3]	576	576	576	432
Underline offset[3]	240	240	240	168
Underline thickness	72	72	72	48
Strike-through offset[3]	–264	–264	–264	–192
Strike-through thickness	72	72	72	48
Overline offset[3]	–912	–912	–912	–480
Overline offset (height, thickness)	72	72	72	48

[1] In general, minimum space is calculated as 33% to 50% of width of space.

[2] In general, maximum space is calculated as 200% of width of space.

[3] Vertical offsets are relative to the baseline.

36.4 Built-in Algorithmic Transformations

When the print job requires a font with a particular set of attributes, the DEClaser 3200 printer searches the current repertory for a font that contains the proper character set, in the proper style, in the proper horizontal and vertical size, with the desired attributes.

If the search fails to find a font with the desired attributes, DEClaser 3200 printer attempts to approximate the desired attributes by using algorithmic transformations on the existing repertory.

The DEClaser 3200 printer provides fallback algorithmic transformations for the following:

- Bold (shadow bold)
- Portrait/landscape orientation (rotation)

- Italic (character underline)
- Underline
- Strike-through
- Overline
- National Replacement Character sets (NRCS)

The DEClaser 3200 printer uses algorithmic transformations for the following:

- Horizontal spacing
- Vertical spacing
- Double underline

Fallbacks are not provided for the following attributes:

- Size scaling of any type
- Italics fall back by slanting the character
- Kerning

36.4.1 Memory Use

Only one algorithmic transformation uses memory: rotating the font to fit the page orientation. By default, the DEClaser 3200 printer stores transmitted font file characters in portrait orientation. When you require landscape printing, the printer conserves memory by rotating only the fonts that the printer uses rather than all selected fonts.

If you require a font in landscape orientation only, you can further reduce the amount of memory that is used by specifying the orientation in the *font_record* of the Load Font File (DECLFF) command. To store a copy of the font in landscape format only, precede the *font_record* with an equal sign (=, 3/13):

```
DCS 0; 1; 1 y =font_record; comment_record ST
```

For more information on the Load Font File (DECLFF) command, refer to the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual*.

36.4.2 Spacing Criterion Fallback

When the selected font is proportional and the requested font is monospaced, the DEClaser 3200 printer left-justifies the proportional characters within the monospaced cell.

36.4.3 Fallback Metrics for Mixed Font Files

The DEClaser 3200 printer does not support fallback metrics for all categories of mixed text; however, the printers do support a fallback for inconsistent metrics when performing NRCS pairing. A Device Status report (DSR) may be sent by the printer when inconsistent metrics are detected.

36.5 Font File Validation Test Report

The DEClaser 3200 printer generates a report of errors and warnings that occur during font file validation. You may use this report for debugging purposes if you are designing font files for Digital level 3 printers according to the Common Font File Format (CFFF).

Refer to Appendix C for a description of the Font Status Report (DECFSR) command. You request this report through the second parameter (Ps2 = 2 or 3) of the Load Font File (DECLFF) command as described in Table 26–4.

Table 36–4 Parameters for Load Font File (DECLFF) for the DEClaser 3200 Printer

Ps2	Action
0 or omitted	Print summary sheet.
1	Do not print summary sheet.
2	Send font error and warning information. Response is Font Status Report (DECFSR, DECLFF Ps2=2 or 3).
3	Same as 0 and 2.
Any other value	Do not print summary sheet or send status report.

37

Sixel Considerations

This chapter discusses three topics related to sixel graphics:

- Macro parameter values, Section 37.1
- Valid Set Raster Attributes (DECGRA) commands, Section 37.2.1
- Restrictions, Section 37.2.2

37.1 Macro Parameter Values

Table 37–1 compares the target values and the values implemented by the DEClaser 3200 printer for the macro parameter (Ps1) of the sixel mode graphics device control string:

`DCS Ps1; Ps2; Pn3 q` *`picture_definition`* `ST`

Ps1 is a selective parameter that specifies the horizontal grid size and aspect ratio. Grid size measurements are given in centipoints.

Table 37–1 Macro Parameter Values for the DEClaser 3200 Printer (Grid Sizes in Centipoints)

	Target Values			DEClaser 3200 Values		
Ps1	Approximate Horizontal Grid Size[1]	Aspect Ratio Vert:Horiz	Vertical Grid Size	Horizontal Grid Size	Aspect Ratio Vert:Horiz	Vertical Grid Size
0	54.60	200:100	100	48	200:100	96
1	54.60	200:100	100	48	200:100	96
2	22.22	450:100	100	21	451:100	96

[1] For true target values in 1/660 in., see the sixel information in the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual.*

(continued on next page)

Table 37–1 (Cont.) Macro Parameter Values for the DEClaser 3200 Printer (Grid Sizes in Centipoints)

	Target Values			DEClaser 3200 Values		
Ps1	Approximate Horizontal Grid Size[1]	Aspect Ratio Vert:Horiz	Vertical Grid Size	Horizontal Grid Size	Aspect Ratio Vert:Horiz	Vertical Grid Size
3	33.33	300:100	100	32	300:100	96
4	40.00	250:100	100	38	252:100	96
5	54.60	183:100	100	48	200:100	96
6	66.66	150:100	100	64	150:100	96
7	76.90	130:100	100	74	129:100	96
8	89.20	112:100	100	86	111:100	96
9	100.00	100:100	100	96	100:100	96

[1] For true target values in 1/660 in., see the sixel information in the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual.*

37.2 Miscellaneous Considerations and Restrictions

Section 37.2.1 and Section 37.2.2 discuss valid Set Raster Attributes (DECGRA) commands and restrictions to the printing of sixel graphics.

37.2.1 Valid Set Raster Attributes (DECGRA) Commands

The DEClaser 3200 printer ignores a DECGRA command if the command includes any of the following sixel control codes or sixel data:

- Graphics Repeat Introducer control character — DECGRI (!)
- Graphics Carriage Return control character — DECGCR ($)
- Graphics Next Line control character — DECGNL (–)
- Sixel data
- Graphics Color Introducer — DECGCI (#) (this is otherwise ignored by the monochrome DEClaser 3200 printer)

Digital recommends that software always send a Set Raster Attributes (DECGRA) command before sending the sixel data or any other sixel graphics command.

37.2.2 Restrictions

The following restrictions apply when you print sixel graphics on the DEClaser 3200 printer:

- Colors map to black. This causes most color pictures to come out dark and not very clear.
- Sixel printing ignores the extent parameters (Pn3 and Pn4) of the Set Raster Attributes (DECGRA) command.
- Sixel printing ignores the background select parameter (Ps2 of the sixel device control string). The printer assumes a white background.
- The maximum value for the horizontal grid size is 99 current units. (See the Select Size Unit (SSU) command in the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual*.)
- The maximum value for the aspect ratio is 1000. The horizontal grid size multiplied by the aspect ratio provides a maximum vertical grid size of 99,000 current units. (See the Select Size Unit (SSU) command in the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual*.)

38

Alternative Protocols

The DEClaser 3200 printer supports the following DEC PPL3 protocol switching commands:

- Select Other Coding System (SOCS)
- Return from Other Coding System (ROCS)

Table 38–1 lists the protocols available for the DEClaser 3200 printer.

Table 38–1 Protocols Supported by the DEClaser 3200 Printer

Resident Protocol	Optional Protocols
Digital ANSI-Compliant Printing Protocol, level 3 (DEC PPL3)	PostScript Interpreter
LaserJet IID Printer Emulation (LJ2D)	

Part V
Appendixes

This part consists of appendixes that provide the following information concerning DEC PPL3 devices:

- Appendix A compares the Digital ANSI-Compliant Printing Protocol commands supported by the LN03 PLUS printer, the ANSI Text translator, DEClaser 2100/2200 printers, DEClaser 2100/2200 plus printers, DEClaser 1100 printer, and the DEClaser 3200 printer.
- Appendix B lists generic code error parameters for extended Device Status Reports (DSR) and font file validation error and warning parameters for Font Status Reports (DECFSR, DECLFF Ps2 = 2 or 3).
- Appendix C documents new DEC PPL3 commands not listed in the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual*.
- Appendix D lists other books associated with the Digital ANSI-Compliant Printing Protocol and level 3 printers.

A

Comparison of DEC PPL3 Commands by Printer

Table A–1 compares the Digital ANSI-Compliant Printing Protocol (DEC PPL3) commands supported by the LN03 PLUS desktop laser printer, the ANSI Text translator, the DEClaser 2100/2200 printers, the DEClaser 2100/2200 plus printers, the DEClaser 1100 printer, and the DEClaser 3200 printer. The table lists the commands according to levels and extensions of the Digital ANSI-Compliant Printing Protocol. Each command is classified as belonging to a level or to an extension of the protocol.

Each level of the protocol includes the commands of all lower-numbered levels. Level 3 of the protocol (DEC PPL3) contains the commands of level 1 (DEC PPL1) and level 2 (DEC PPL2), as well as those commands labeled level 3. Level 2 contains the commands labeled DEC PPL1 and DEC PPL2.

Table A–2 compares commands that are extensions to the protocol and Table A–3 compares commands that are exceptions to the protocol. Table A–4 compares device support of alternative protocols.

Table A–1 Comparison of DEC PPL3 Commands

Command	LN03 PLUS Printer	ANSI Trans-lator	DEClaser 2100/2200 Printers	DEClaser 1100 Printer	DEClaser 3200 Printer
DEC PPL1 Commands					
C0 Control Characters					
BEL — Bell	–	–	–	–	–
BS — Backspace	o	o	o	o	o
CAN — Cancel	o	o	o	o	o
CR — Carriage Return	o	o	o	o	o
DEL — Delete	o	o	o	o	o
FF — Form Feed	o	o	o	o	o
HT — Horizontal Tab	o	o	o	o	o
LF — Line Feed	o	o	o	o	o
LS0 (SI) — Locking Shift 0 (Shift In)	o	o	o	o	o
LS1 (SO) — Locking Shift 1 (Shift Out)	o	o	o	o	o
NUL — Null	o	o	o	o	o
SUB — Substitute	o	o	o	o	o
VT — Vertical Tab	o	o	o	o	o
C1 Control Characters					
PLD — Partial Line Down	o	o	o	o	o
PLU — Partial Line Up	o	o	o	o	o
SS2 — Single Shift 2	o	o	o	o	o

Table Key:

o — Command present

n — Command present, partial implementation

f — Command present, fallback implementation

– — Command not present

(continued on next page)

Table A–1 (Cont.) Comparison of DEC PPL3 Commands

Command	LN03 PLUS Printer	ANSI Trans-lator	DEClaser 2100/2200 Printers	DEClaser 1100 Printer	DEClaser 3200 Printer
DEC PPL1 Commands					
SS3 — Single Shift 3	o	o	o	o	o
Understanding 8-bit C1 characters	o	o	o	o	o
Understanding 7-bit ESC Fe form of C1	o	o	o	o	o
Ignore unimplemented control strings	o	o	o	o	o
Character Set Repertoire and Designation					
ASCII	o	o	o	o	o
British	o	o	o	o	o
French	o	o	o	o	o
German	o	o	o	o	o
Norwegian/Danish	o	o	o	o	o
DEC Finnish	o	o	o	o	o
DEC French-Canadian	o	o	o	o	o
DEC Dutch	o	o	o	o	o
DEC Norwegian/Danish	o	o	o	o	o
DEC Swedish	o	o	o	o	o
DEC Swiss	o	o	o	o	o
DEC Portuguese	–	o	o	o	o

Table Key:

o — Command present

n — Command present, partial implementation

f — Command present, fallback implementation

– — Command not present

(continued on next page)

Table A–1 (Cont.) Comparison of DEC PPL3 Commands

Command	LN03 PLUS Printer	ANSI Trans-lator	DEClaser 2100/2200 Printers	DEClaser 1100 Printer	DEClaser 3200 Printer
DEC PPL1 Commands					
ISO Italian	o	o	o	o	o
ISO Spanish	o	o	o	o	o
JIS Roman	o	o	o	o	o
DEC Special Graphics	o	o	o	o	o
DEC Supplemental	o	o	o	o	o
DEC Technical	o	o	o	o	o
LA120 fallback DEC Finnish	o	o	o	o	o
LA120 fallback DEC French-Canadian	o	o	o	o	o
LA120 fallback DEC Norwegian/Danish	o	o	o	o	o
LA120 fallback DEC Swedish	o	o	o	o	o
Command Dictionary					
DECSCL — Reset to Digital defaults	–	o	o	o	o
DECSHORP — Set HAI[1] to desired value	n[2]	o	o	o	o

[1]Horizontal Advance Increment.

[2]For specific information on the implementation of this command, refer to the documentation for the device.

Table Key:

o — Command present

n — Command present, partial implementation

f — Command present, fallback implementation

– — Command not present

(continued on next page)

Table A–1 (Cont.) Comparison of DEC PPL3 Commands

Command	LN03 PLUS Printer	ANSI Trans-lator	DEClaser 2100/2200 Printers	DEClaser 1100 Printer	DEClaser 3200 Printer
DEC PPL1 Commands					
DECSLPP — Set Lines Per Page	o	o	o	o	o
DECSTR — Soft Terminal Reset (RIS)	o	o	o	o	o
DECVERP — Set VAI[3] to desired value	n[2]	o	o	o	o
LS2 — Locking Shift for G2	o	o	o	o	o
LS3 — Locking Shift for G3	o	o	o	o	o
LS1R — Locking Shift for G1 Right	o	o	o	o	o
LS2R — Locking Shift for G2 Right	o	o	o	o	o
LS3R — Locking Shift for G3 Right	o	o	o	o	o
RIS — Reset to Initial State (DECSTR)	o	o	o	o	o
SGR — Off, bold, underline — Ps = 0,1,22,4,24	o	o	o	o	o
SP — Space	o	o	o	o	o

[2]For specific information on the implementation of this command, refer to the documentation for the device.

[3]Vertical Advance Increment.

Table Key:

o — Command present

n — Command present, partial implementation

f — Command present, fallback implementation

– — Command not present

(continued on next page)

Table A–1 (Cont.) Comparison of DEC PPL3 Commands

Command	LN03 PLUS Printer	ANSI Trans-lator	DEClaser 2100/2200 Printers	DEClaser 1100 Printer	DEClaser 3200 Printer
DEC PPL1 Commands					
Interrogation					
DA — Request Device Attributes	o	–	o	o	o
DAR — Report CSI?71c — Level 1 Printer	–	–	–	–	–
DA2 — Request Device Attributes (Secondary)	–	–	o	o	o
DA2R — Report Device Attributes (Secondary)	–	–	o	o	o
DSR — Request Device Status Report	o	–	o	o	o
DSR — Base solicited responses — Ps = 0,3,5	o	–	o	o	o
DSR — Unsolicited/ generic format — Ps = ?1,2,3	o	–	o	o	o
DEC PPL2 Commands					
C1 Control Characters					
HTS — Horizontal Tab Set	o	o	o	o	o
IND — Forward Index	o	o	o	o	o
NEL — Next Line	o	o	o	o	o
VTS — Vertical Tab Set	o	o	o	o	o

Table Key:

o — Command present

n — Command present, partial implementation

f — Command present, fallback implementation

– — Command not present

(continued on next page)

Table A–1 (Cont.) Comparison of DEC PPL3 Commands

Command	LN03 PLUS Printer	ANSI Trans-lator	DEClaser 2100/2200 Printers	DEClaser 1100 Printer	DEClaser 3200 Printer
DEC PPL2 Commands					
Character Set Repertoire and Designation					
DEC Supplemental [new sequence]	–	o	o	o	o
ISO Latin-1 Supplemental [96]	–	o	o	o	o
User-Preference Supplemental	–	o	o	o	o
Legal	–[4]	–[4]	o	o	o
Command Dictionary					
ASCEF — Announce Subset of Code Extension Facilities (F = L,M,N)	–	o	o	o	o
CUU — Cursor Up	o	o	o	o	o
DECAUPSS — Assign User Preference Supplemental Set	–	o	o	o	o
DECAWM — Autowrap Mode	o	o	o	o	o
DECCAHT — Clear All Horizontal Tabs (TBC = 3)	o	o	o	o	o
DECCAVT — Clear All Vertical Tabs (TBC = 4)	o	o	o	o	o
DECCRNLM — Carriage Return/New Line Mode	o	o	o	o	o
DECHTS — Horizontal Tab Set (HTS)	o	o	o	o	o

[4]This character set is available in cartridge or downline loaded font files.

Table Key:

o — Command present

n — Command present, partial implementation

f — Command present, fallback implementation

– — Command not present

(continued on next page)

Table A–1 (Cont.) Comparison of DEC PPL3 Commands

Command	LN03 PLUS Printer	ANSI Trans-lator	DEClaser 2100/2200 Printers	DEClaser 1100 Printer	DEClaser 3200 Printer
DEC PPL2 Commands					
DECPSM — Horizontal Pitch Select Mode	o	o	o	o	o
DECSHTS — Set Horizontal Tab Stops	o	o	o	o	o
DECSLRM — Set Left and Right Margins	o	o	o	o	o
DECSTBM — Set Top and Bottom Margins	o	o	o	o	o
DECSVTS — Set Vertical Tabs	o	o	o	o	o
DECVTS — Vertical Tab Set (VTS)	o	o	o	o	o
LNM — Line Feed/New Line Mode	o	o	o	o	o
HPA — Horizontal Position Absolute	o	o	o	o	o
HPR — Horizontal Position Relative	o	o	o	o	o
S7C1R — Select 7-bit C1 Receive	o	N/A	o	o	o
S8C1R — Select 8-bit C1 Receive	o	N/A	o	o	o
SGR — Italics — Ps = 3,23	o	o	o	o	o
SGR — Strike-through — Ps = 9,29	o	o	o	o	o
SGR — Font selection — Ps = 10—19	o	o	o	o	o
SGR — Subscript/superscript — Ps = ?0,?4,?5,?24	–	o	o	o	o
SGR — Overline — Ps = 53,55,?0,?6,?26	–	o	o	o	o
TBC — Tabulation Clear — Ps = 0,1,2,3,4	o	o	o	o	o
VPA — Vertical Position Absolute	o	o	o	o	o

Table Key:

o — Command present

n — Command present, partial implementation

f — Command present, fallback implementation

– — Command not present

(continued on next page)

Table A–1 (Cont.) Comparison of DEC PPL3 Commands

Command	LN03 PLUS Printer	ANSI Trans-lator	DEClaser 2100/2200 Printers	DEClaser 1100 Printer	DEClaser 3200 Printer
DEC PPL2 Commands					
VPR — Vertical Position Relative	o	o	o	o	o
Interrogation					
DAR — Report CSI?72c — Level 2 Printer	–	–	–	–	–
DECFSR — Font Status Report — Ps = 3 (cartridge)	–	–	–	–	–
DECRFS — Request Cartridge Font Status	–	–	–	–	–
DEC PPL3 Commands					
C1 Control Characters					
RI — Reverse Index	o	o	o	o	o
Command Dictionary					
DECATFF — Assign Type Family or Font	n	o	o	o	o
DECDTFF— Delete Type Family or Font File	o	o	o	o	o
DECLFF — Load Digital CFFF Font File	o	o	o	o	o

Table Key:

o — Command present

n — Command present, partial implementation

f — Command present, fallback implementation

– — Command not present

(continued on next page)

Table A–1 (Cont.) Comparison of DEC PPL3 Commands

Command	LN03 PLUS Printer	ANSI Trans-lator	DEClaser 2100/2200 Printers	DEClaser 1100 Printer	DEClaser 3200 Printer
DEC PPL3 Commands					
DECOPM — Origin Placement Mode	o	o	o	o	o
DECPSP — Proportional Spacing Mode	o	o	o	o	o
DECSCL — Select Conformance Level 3	–	o	o	o	o
GSM — Graphic Size Modification	o	o	o	o	o
GSS — Graphic Size Selection	o	o	o	o	o
HPB — Horizontal Position Backwards	o	o	o	o	o
JFY — Justify — Ps = 0,2,?2	o	o	o	o	o
PFS — Page Format Select — Ps = 0—7, ?20—?23 (Letter and A4 paper)	o	o	o	o	o
PUM — Positioning Unit Mode	o	o	o	o	o
SHS — Select Horizontal Spacing	o	o	o	o	o
SPI — Spacing Increment	o	o	o	o	o

Table Key:

o — Command present

n — Command present, partial implementation

f — Command present, fallback implementation

– — Command not present

(continued on next page)

Table A–1 (Cont.) Comparison of DEC PPL3 Commands

Command	LN03 PLUS Printer	ANSI Trans-lator	DEClaser 2100/2200 Printers	DEClaser 1100 Printer	DEClaser 3200 Printer
DEC PPL3 Commands					
SSU — Select Size Unit — Ps = 0,2,7 (decipoint, pixel)	o	o	o	o	o
SSU — Select Size Unit — Ps = ?1 (centipoint)	–	o	o	o	o
SVS — Select Vertical Spacing	o	o	o	o	o
VPB — Vertical Position Backwards	o	o	o	o	o
Interrogation					
CPR — Cursor Position Report	o	–	o	o	o
DAR — Report CSI?73c — Level 3 Printer	–	–	o	o	o
DSR — Request CPR — Ps = 6	o	–	o	o	o
DSR — Extended Response Format	o	–	o	o	o
DECFSR — Font Status Report — Ps = 1,2	o	–	o	o	o

Table Key:

o — Command present

n — Command present, partial implementation

f — Command present, fallback implementation

– — Command not present

(continued on next page)

Table A–1 (Cont.) Comparison of DEC PPL3 Commands

Command	LN03 PLUS Printer	ANSI Trans-lator	DEClaser 2100/2200 Printers	DEClaser 1100 Printer	DEClaser 3200 Printer
DEC PPL3 Commands					
DECFSR[5] — Validation Test Report — Ps = 4	–	–	–[6]	o	o
DECLFF — Request Validation Test Report —					
Ps = 2 or 3	–	–	–[6]	o[7]	o[8]
Ps = 4	–	–	–[6]	–	–
DECRFS — Request Font Status	o	–	o	o	o

[5]This command is described in Appendix C.

[6]This command is available on the DEClaser 2100/2200 plus printers, see Section 17.6

[7]This command is described in Section 26.6.

[8]This command is described in Section 36.5.

Table Key:

o — Command present

n — Command present, partial implementation

f — Command present, fallback implementation

– — Command not present

Table A–2 Comparison of Extensions to the Protocol

Command	LN03 PLUS Printer	ANSI Trans-lator	DEClaser 2100/2200 Printers	DEClaser 1100 Printer	DEClaser 3200 Printer
Sixel Extension (4)					
Command Dictionary					
DCS — Sixel Graphics Mode — q(7/01)	o	o	o	o	o
Interrogation					
DAR — Report extension parameter — ;4	–	–	o	o	o
Katakana Extension (5)					
Character Set Repertoire and Designation					
JIS Katakana	–[1]	–[1]	–[1]	–[1]	–[1]
Interrogation					
DAR — Report extension parameter — ;5	–	–	–	–	–
Sheet Feeder Extension (6)					
Command Dictionary					
DECASFC — Sheet Feeder (one tray) — Ps = 0,1	–	o	o	o	o
DECASFC — Two-tray control — Ps = 2	–	o	o	o	o

[1]This character set is available with downline loaded font files.

Table Key:

o — Command present

n — Command present, partial implementation

f — Command present, fallback implementation

– — Command not present

(continued on next page)

Table A–2 (Cont.) Comparison of Extensions to the Protocol

Command	LN03 PLUS Printer	ANSI Trans-lator	DEClaser 2100/2200 Printers	DEClaser 1100 Printer	DEClaser 3200 Printer
Sheet Feeder Extension (6)					
DECASFC — Three-tray control — Ps = 3	–	o	o	–	o
DECASFC — Four-tray control — Ps = 4	–	–	–	–	o
DECASFC — Manual feed — Ps = 99	–	–	o	–	o
Interrogation					
DAR — Report extension parameter — ;6	–	–	o	o	o
Legal-Size Paper Handling Extension (8)					
Command Dictionary					
PFS — Page Format Select — Ps = 8, 9, ?24, ?25	–	o	o	o	o
Interrogation					
DAR — Report extension parameter — ;8	–	–	o	o	o
Variable Page Format Selection Extension (9)					
Command Dictionary					
DECVPFS — Variable Page Format Select	–	o	o	o	o

Table Key:

o — Command present

n — Command present, partial implementation

f — Command present, fallback implementation

– — Command not present

(continued on next page)

Table A–2 (Cont.) Comparison of Extensions to the Protocol

Command	LN03 PLUS Printer	ANSI Trans-lator	DEClaser 2100/2200 Printers	DEClaser 1100 Printer	DEClaser 3200 Printer
Variable Page Format Selection Extension (9)					
Interrogation					
DAR — Report extension parameter — ;9	–	–	o	o	o
Vector Drawing Extension (10)					
Command Dictionary					
DECRVEC — Draw Relative Vector	–	o	o	o	o
DECVEC — Draw Vector	o	o	o	o	o
Interrogation					
DAR — Report extension parameter — ;10	–	–	o	o	o
Multiple Copies Extension (11)					
Command Dictionary					
DECSNC — Set Number of Copies	–	– [2]	o	o	o
Interrogation					
DAR — Report extension parameter — ;11	–	–	o	o	o

[2]This extension is implemented by the symbiont.

Table Key:

o — Command present

n — Command present, partial implementation

f — Command present, fallback implementation

– — Command not present

(continued on next page)

Table A–2 (Cont.) Comparison of Extensions to the Protocol

Command	LN03 PLUS Printer	ANSI Trans-lator	DEClaser 2100/2200 Printers	DEClaser 1100 Printer	DEClaser 3200 Printer
Hebrew Extension (12)					
Character Set Repertoire and Designation					
DEC Hebrew-7	–[1]	–[1]	o	o	o
DEC Hebrew Supplemental	–[1]	–[1]	o	o	o
ISO Latin-Hebrew Supplemental	–[1]	–[1]	o	o	o
Interrogation					
DAR — Report extension parameter — ;12	–	–	o	o	o
Logical Duplex Extension (16)					
Command Dictionary					
DECNS — Newsheet	–	–	o	o	o
DECSDPM — Duplex Printing Mode — Ps = 1,5	–	–[2]	o	o	o
Interrogation					
DAR — Report extension parameter — ;16	–	–	o	o	o

[1]This character set is available with downline loaded font files.

[2]This extension is implemented by the symbiont.

Table Key:

o — Command present

n — Command present, partial implementation

f — Command present, fallback implementation

– — Command not present

(continued on next page)

Table A–2 (Cont.) Comparison of Extensions to the Protocol

Command	LN03 PLUS Printer	ANSI Trans-lator	DEClaser 2100/2200 Printers	DEClaser 1100 Printer	DEClaser 3200 Printer
Physical Duplex Extension (18)					
Command Dictionary					
DECSDPM — Duplex Printing Mode — Ps = 3,4,7,8	–	–[2]	o[4]	f	o
Interrogation					
DAR — Report extension parameter — ;18	–	–	o[3]	–	o
Front Face Tumbling Extension (19)					
Command Dictionary					
DECSDPM — Duplex Printing Mode — Ps = 2,6	–	–[4]	f	f	o
Interrogation					
DAR — Report extension parameter — ;19	–	–	–	–	o

[2]This extension is implemented by the symbiont.

[3]Implemented in the DEClaser 2200 printer; not implemented in the DEClaser 2100 printer.

[4]Implemented in the DEClaser 2200 printer. The DEClaser 2100 printer does a fallback implementation.

Table Key:

o — Command present

n — Command present, partial implementation

f — Command present, fallback implementation

– — Command not present

(continued on next page)

Table A–2 (Cont.) Comparison of Extensions to the Protocol

Command	LN03 PLUS Printer	ANSI Trans-lator	DEClaser 2100/2200 Printers	DEClaser 1100 Printer	DEClaser 3200 Printer
B-Size Paper Handling Extension (22)					
Command Dictionary					
PFS — Page Format Select — Ps = ?26,?27	–	o	–	–	–
Interrogation					
DAR — Report extension parameter — ;22	–	–	–	–	–

Table Key:

o — Command present

n — Command present, partial implementation

f — Command present, fallback implementation

– — Command not present

Table A–3 Comparison of Exceptions to the Protocol

Command	LN03 PLUS Printer	ANSI Trans-lator	DEClaser 2100/2200 Printers	DEClaser 1100 Printer	DEClaser 3200 Printer
DAR — Compatibility Reports					
CSI ? 10;3 c — LA100	o	–	–	–	–
CSI ? 26 c — LN03	o	–	o	o	o
CSI ? 13 c — LQP02	o	–	–	–	–
DECID — Request ID	o	–	–	–	–
CRM — Control Representation Mode	–	o	o	o	o
DECMM — Memory Management	–	–[2]	o	o	o
DECSITF[1] — Select Input Tray Failover	–	–	–[3]	–	o
DECSSS — Set Sheet Size	–	–	o	o	o

[1]Refer to Appendix C for the description of this command.

[2]Sufficient memory is available in the ANSI translator. Implementation of this command is not required.

[3]This command is available on the DEClaser 2100/2200 plus printer.

Table Key:

o — Command present

– — Command not present

Table A–4 Alternative Protocols

Command	LN03 PLUS Printer	ANSI Trans-lator	DEClaser 2100/2200 Printers	DEClaser 1100 Printer	DEClaser 3200 Printer
DECIPEM — IBM Proprinter Emulation Mode	o[1]	–	–[2]	–	–
DECTEK — Tektronix 4010/4014 Emulation	o	–	–	–	–
SOCS — Select Other Coding System (CaPSL)	–	–	o[1]	o[1]	–
SOCS — Select Other Coding System (IBM Proprinter)	–	–	–[2]	o[1]	–
SOCS — Select Other Coding System (LaserJet IID Printer Emulation)	–	–	–[2]	o[1]	o
SOCS — Select Other Coding System (PostScript)	–	–	o[1]	o[1]	o[1]
ROCS — Return from Other Coding System	–	–	o	o	o

[1]This alternative protocol requires an optional cartridge or module board in this printer.

[2]This command is available on the DEClaser 2100/2200 plus printers and requires an optional cartridge.

Table Key:

o — Command present

– — Command not present

B

Command Parameter Summaries

Table B–1 lists generic error parameters defined in DEC PPL3 for extended Device Status Reports (DSR). This table is for reference only. Refer to product-specific parts of this document for a list of reports implemented for a particular printer.

Table B–2 lists and provides a brief explanation for font file validation error and warning parameters for the Font Status Report (DECFSR, DECLFF Ps2 = 2 or 3) command. This command reports problems found during the font file validation process. Specific fields in the Common Font File Format (CFFF) are referenced in Table B–2 to explain the validation problems. Refer to Appendix B of the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual* and the *Font File Format User's Manual* for more information on these CFFF fields.

Table B–1 Generic Error Codes for DEC PPL3 Device Status Reports

Generic Code	Meaning
20	No malfunction detected
21	Hardware failure
22	Communication I/O failure (event)
23	Input buffer overflow (event)
24	Printer off line
26	Cover open
27	Paper out
33	Toner low
34	Call Digital Services; major failure
35	Perform user maintenance
36	Paper jam
40	Character not available (event)
41	Line content error
42	Font downline load or validation error (event)
44	Font memory exceeded (event)
46	Toner collection bottle full
47	Too many errors (Since last extended report, device detected more errors than can be queued.)
50	Output tray full
51	No error; paper tray request
52	No error; manual feed request
53	Input tray configuration error or conflict
54	Output tray configuration error or conflict
55	Alternate protocol error
56	Memory management error or conflict
57	Initialization message
59	Device warming up

Several font file validation tests compare pointers against the number of bytes of data in the font file being tested. In Table B–2, this value is referred to as **byte_count**.

Table B–2 Explanations of DEC PPL3 Font File Validation Tests

Test Number and Category		Name of Validation Test	Brief Explanation
31	Warning	Inconsistent font weight	The Font Weight [3.4.11] is not equal to the Weight [A.2.6] component of the font file ID.[1]
32	Warning	Inconsistent Italics style	The italics bit in Flags [3.4.1] is not equal to the corresponding bit of the Style [A.2.5] component in the font file ID.[1]
33	Warning	Inconsistent Underline style	The underline bit in Flags [3.4.1] is not equal to the corresponding bit of the Style [A.2.5] component in the font file ID.[1]
34	Warning	Inconsistent Overline style	The overline bit in Flags [3.4.1] is not equal to the corresponding bit of the Style [A.2.5] component in the font file ID.[1]
35	Warning	Inconsistent Strike-through style	The strike-through bit in Flags [3.4.1] is not equal to the corresponding bit of the Style [A.2.5] component in the font file ID.[1]
36	Warning	Inconsistent Monospaced style	The setting of the monospaced bit in Flags [3.4.1] does not match the Spacing [A.2.2] component of the font file ID.[1]
37	Warning	Inconsistent Type size	Type Size [3.4.8] is not equal to the Type Size [A.2.3] component of the font file ID.[1]
38	Warning	Inconsistent identifiers	The common bytes of the Type Family ID [3.4.3], the Font ID [3.4.5], and the Font File ID [3.3.4] are not the same.[1]
41	Error	Insufficient data	Number of Bytes [3.3.1] is greater than byte_count.
42	Error	Length too small	The Character Directory [3.6] pointer is greater than byte_count.
43	Error	Font File Identifier: incorrect length	The Font File ID [3.3.4] must be 31 characters long.

[1]This warning indicates that the font file may be treated differently in some level 3 printers.

(continued on next page)

Table B–2 (Cont.) Explanations of DEC PPL3 Font File Validation Tests

Test Number and Category		Name of Validation Test	Brief Explanation
44	Error	Character set identifier: incorrect length	The maximum length of the Character Set Designator [3.4.2] string is 32 bytes.
45	Error	Multiple font segments unsupported	Multiple font segments are not supported. The address and size of the Font Segment Table [3.3.11] and the Number of Font Segments [3.7.1] must be zero.
46	Error	Bad pointer: String Pool Region	The String Pool Region [3.3.13] pointer is greater than byte_count.
47	Error	Bad pointer: character definition	The Character Definition Region [3.3.15] pointer is greater than byte_count.
48	Error	Font File Identifier: illegal format	The Font File ID [3.3.4] contains illegal characters.
49	Error	Compressed rasters unsupported	Compressed raster format is not supported. The corresponding bit in Organizational Flags [3.3.17] must be reset.
50	Error	Rotated fonts unsupported	Rotated fonts are not supported. The Rotation [A.2.8] component of the font file ID must be zero.
51	Error	Font Parameter Region size incorrect	The Font Parameter Region [3.3.9] size is not 124 bytes.
52	Warning	Large Value flag set	The Large Value flag of the Organizational Flags [3.3.17] is set.[2]
53	Error	Character parameter size incorrect	The Size of Character Parameters [3.3.18] must be 8 or 16.
54	Error	Font resolution unsupported	Only 300 dots/inch font files are supported. The Resolution [A.2.12] component of the font file ID must be "F".
55	Error	Aspect Ratio unsupported	Pixel Aspect Ratio [3.4.14] must indicate a 1:1 ratio.
56	Warning	Character Subsets unsupported	The only valid Character Subset [A.2.10] is "ZZZZ".[2]

[2]This warning has no effect on font file processing in current level 3 printers.

(continued on next page)

Table B–2 (Cont.) Explanations of DEC PPL3 Font File Validation Tests

Test Number and Category		Name of Validation Test	Brief Explanation
57	Error	Encoding unsupported	Only binary encoding is supported. The File Encoding [A.2.11] component of the font file ID must be "02".
58	Error	Fractional spacing: undefined	If byte 8 of the Spacing [A.2.2] component of the font file ID is "E" to "S", then byte 29 of the Spacing [A.2.2] component must have a value of "0" to "9" or "A" to "J".
59	Error	Character range: First Character incorrect	First Character [3.3.16.1] is less than 32 (Space).
60	Error	Character range: Last Character incorrect	Last Character [3.3.16.2] is greater than 127 (DEL).
61	Error	Error character: Flag flag not set	The Flag flag in the error character Flags [3.11.1.2] is not set.
62	Error	Error character: TYPE1 field incorrect	The TYPE1 [3.11.2.2] field in the error character definition must be 81h.
63	Error	Error character: multiple font segments	The error character flags cannot indicate multiple segments. Bit 31 of the Error Character Locator [3.3.16.5] must be reset.
64	Error	Bad pointer: character definition	A character definition pointer (Primary Locator [3.6.1]) is greater than byte_count.
65	Error	Character replacement unsupported	Character replacement is not supported. Bit 31 of the Primary Locator [3.6.1] for each character definition must be reset.
66	Error	Character: Flag flag not set	The Flag flag in Flags [3.11.1.2] for each character definition must be set.
67	Error	Character: TYPE1 field incorrect	The TYPE1 [3.11.2.2] field in each character definition must be 81h.
68	Warning	Portrait byte_count error	Portrait Byte Count [3.3.19.7] is not equal to byte_count for the portrait version of the font file. The actual byte_count is used.
69	Error	Character range: inversion	Last Character [3.3.16.2] is less than First Character [3.3.16.1]
70	Error	Critical parameter is zero	Width of Space [3.5.4.4] is zero or the numerator or denominator of Font Horizontal Proportional Fraction [3.4.13] is zero.

(continued on next page)

Table B–2 (Cont.) Explanations of DEC PPL3 Font File Validation Tests

Test Number and Category		Name of Validation Test	Brief Explanation
71	Warning	Spacing: inconsistent	Average Character Width [3.4.9] does not equal Width of Space [3.5.4.4] in a monospaced font. If different, Width of Space [3.5.4.4] is used.
72	Error	Character: inconsistent character width	Width of Space [3.5.4.4] does not equal the Nominal Width [3.11.1.3] of each character definition in a monospaced font.
73	Error	Type Size too large	Type Size [3.4.8] is greater than 216 points (3 inches).
74	Error	Total Vertical Size too large	Total Vertical Size [3.5.5.4] is greater than 216 points (3 inches).
79	Warning	Landscape byte_count error	Landscape Byte Count [3.3.19.8] is not equal to byte_count for the landscape version of the font file. The actual byte_ count is used.
83	Warning	Mixed byte_count error	Mixed Byte Count [3.3.19.9] is not equal to the byte_count for both the portrait and landscape version of the font file. The actual byte_count is used.
101	Error	Bad pointer: error character	Error Character Locator [3.3.16.8] is greater than byte_count.
102	Warning	Bad pointer: font attribute region	The Font Attributes [3.3.8] pointer is greater than byte_count.[1]
103	Warning	Bad pointer: font parameter region	The Font Parameters [3.3.9] pointer is greater than byte_count.[1]
104	Error	Bad pointer: Type Family Name	The Type Family Name [3.4.4] pointer is greater than byte_count.
105	Warning	Character: orientation unsupported	Orientation [3.11.2.1] for each character definition must be zero. Level 3 printers will ignore nonzero values and treat the character orientation as zero.

[1]This warning indicates that the font file may be treated differently in some level 3 printers.

(continued on next page)

Table B–2 (Cont.) Explanations of DEC PPL3 Font File Validation Tests

Test Number and Category		Name of Validation Test	Brief Explanation
106	Error	Bad pointer: character definition	A character definition pointer (Primary Locator [3.6.1], including the error character definition pointer) is greater than byte_count. This error also occurs if the character definition pointer plus the size of the character raster (Rows [3.11.2.4] * Columns [3.11.2.5]) is greater than byte_count.
107	Error	Bad pointer: Character Set Designator	The Character Set Designator pointer [3.4.2] is greater than byte_count.
108	Error	Bad pointer: Font Segment Table	The Font Segment Table [3.3.11] is greater than byte_count.
109	Error	Character Directory incomplete	The size of the Character Directory (based on Character Directory [3.6], Last Character [3.3.16.2], and First Character [3.3.16.1]) exceeds byte_count.

C

Command Dictionary Supplement

This appendix provides definitions of new DEC PPL3 commands not listed in the *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual*. These commands are implemented on some level 3 printers only, see Appendix A.

DECFSR — Font Status Report (DECLFF, Ps2=2 or 3)

List of errors and warnings incurred during font download.

Source: Device **Destination:** Symbiont

Format

```
ESC  P    4    "    {     report_string   ESC     \
1/11 5/0  3/4  2/2  7/11  *********       1/11    5/12
```

Description

Sent in response to Load Font File (DECLFF) after the download process has occurred. This report is sent only if Ps2 of the DECLFF command equals 2 or 3.

Report_string represents the list of downline loaded errors and warnings that occurred during the font download. One report is sent for each font file loaded. The warning and error codes are listed in Appendix B. Within each report, warnings and errors are sent in the order in which they are listed in Appendix B. Use Device Status Report (DSR) to determine the severity (error or warning) of the returned codes. Errors are considered fatal. If the printer encounters an error, the download is aborted and the report is terminated.

Report_string contains the following information in this order:

1. Font File ID (CFFF 3.3.5) followed by a comma (,).
   This field contains the received font file ID, even if it was incomplete or missing.
2. Carriage Return and Line Feed (<CR> and <LF>).
3. List of errors (or warnings), separated by semicolons (;)
   Carriage Returns and Line Feeds (<CR> and <LF>) may occur in long reports.
4. String terminator <ESC>\.

An example of a font error report follows:

```
<ESC>P4"{RCOURIRJ02SK00GG0001UZZZZ02F000,<CR><LF>
52;56;71;75;68<CR><LF>
<ESC>\
```

If no error or warning occurs, the device returns a code of 0 (3/0), as follows:

```
<ESC>P4"{RCOURIRJ02SK00GG0001UZZZZ02F000,<CR><LF>
0<ESC>\
```

Error Handling

If DECLFF is sent with Ps2 = 2 or 3, but no *font_record* (see DECLFF), the printer ignores the request for a report. No DECFSR is sent.

If the Font File ID (CFFF 3.3.5) does not contain 31 characters, the device reports as much of the field as possible. Therefore, it is possible for this field to be blank in the report.

DECSITF — Select Input Tray Failover

Designates the input trays used for **failover**. The term **failover** means the printer will select another input tray if the selected input tray runs out of paper.

Source: Symbiont **Destination:** Level 3 Exception

Format

```
CSI   Ps1  ;   Ps2  ;   . . .   ;   Psn  SP  w
9/11  ***  3/11 ***  3/11 . . .  3/11 ***  2/0 7/7
```

Description

This command defines the paper tray failover rules for the device. A **composite tray** may be defined by the DECSITF command, across which paper tray failover may occur. When a paper tray that is part of a composite tray becomes empty, the device will failover to the next tray in the composite tray definition, instead of reporting a paper-out error condition.

Selective parameters for DECSITF are as follows:

Ps1	Action
0	Disable all composite input trays
1	Define composite tray 1

Subsequent parameters identify the trays that comprise the composite tray specified by Ps1. The value of these parameters is equal to the input tray selection parameter value for the Automatic Sheet Feeder Control (DECASFC) command.

Ps2–Ps*n*	Action
n	Designates the tray as a member of a composite tray.

The paper trays that may be part of a composite tray are device dependent. For more information on paper handling on your device, refer to the appropriate part and chapter in this manual.

The trays comprising a composite tray must all have the same paper size, defined by either a key on the input tray or by the Set Sheet Size (DECSSS) command. This is determined at the time of failover, not when the command is received.

This command only affects sheets printed subsequent to the receipt of this command. The command DECSITF cannot be used to clear a paper-out condition. A member of the composite tray need not be present when the command is received but must be present at the time of failover, or the device considers the next tray in the composite tray definition.

When all of the paper trays in the composite tray definition are empty, a paper-out condition occurs. Printing resumes when any of the trays in the composite tray definition is reloaded. If multiple trays are loaded, the device resumes printing from the same tray from which the last page was printed.

Side Effects

The device performs a conditional Sheet Feed upon receipt of DECSITF.

The interactions between Automatic Sheet Feeder Control (DECASFC) and DECSITF can be stated as follows:

- The device always attempts to print the first page after DECASFC *n* from tray *n*. If tray *n* is empty, the device checks the composite tray definition for possible failover.
- DECSITF (*a*, *b*, . . .) changes the composite tray definition. The device always attempts to print the first page after DECSITF from tray *n* (established by DECASFC). If tray *n* is empty at imaging time, the device checks the new composite tray definition (*a*, *b*, . . .) for failover possibilities.
- The device images all other pages from the same tray as the previous page. If there is a paper-out condition in that tray, the device checks the composite tray definition (*a*, *b*, . . .) for failover possibilities.

Error Handling

If an unsupported Ps1 is received, the command is ignored and a conditional Sheet Feed is performed.

If a subsequent parameter is received that is not associated with an input tray, or is associated with an input tray that is not supported for failover, only that parameter is ignored.

D

DEC PPL3 Printer Documentation

This appendix contains a listing of DEC PPL3 printer and programming documents and documentation kits and their respective order numbers. For ordering instructions, see How To Order Additional Documentation, at the end of this book.

Books associated with the Digital ANSI-Compliant Printing Protocol and level 3 printers are as follows:

DEClaser 1100 Printer

- Complete documentation kit (order number: EK–D1100–DK)
  - *DEClaser 1100 Printer Installation Guide*
  - *DEClaser 1100 Printer Operator's Guide*

DEClaser 2100 Printer

- Complete documentation kit (order number: (EK–D2100–DK)
  - *DEClaser 2100 Printer Installation Guide*
  - *DEClaser 2100 Printer Operator's Guide*

DEClaser 2200 Printer

- Complete documentation kit (order number: (EK–D2200–DK)
  - *DEClaser 2200 Printer Installation Guide*
  - *DEClaser 2200 Printer Operator's Guide*

DEClaser 2100 plus Printer

- Complete documentation kit (order number: (EK–DECLA–DK)
  - *DEClaser 2100 plus Printer Installation Guide*
  - *DEClaser 2100 plus Printer Operator's Guide*

DEClaser 2200 plus Printer

- Complete documentation kit (order number: (EK–DECLB–DK)
  - *DEClaser 2200 plus Printer Installation Guide*
  - *DEClaser 2200 plus Printer Operator's Guide*

DEClaser 3200 Printer

- Complete documentation kit (order number: (EK–D3200–DK)
  - *DEClaser 3200 Printer Installation Guide*
  - *DEClaser 3200 Printer Operator's Guide*
  - *DEClaser 3200 Printer Quick Reference Guide* (EK–DEC32–RF)

DECprint Printing Services Software for VMS

- Complete documentation kit (order number: QA–YNCAA–GZ)
  - *DECprint Printing Services Software Installation Guide*
  - *DECprint Printing Services User's Guide*
  - *DECprint Printing Services System Manager's Guide*

Digital ANSI-Compliant Level 3 Printing Protocol

- Complete documentation kit (order number: EK–PPLV3–DK)
  - *Digital ANSI-Compliant Printing Protocol Level 3 Programming Reference Manual (EK-PPLV3-PM)*
  - *Digital ANSI-Compliant Printing Protocol Level 3 Programming Supplement (EK–PPLV3–PS)*

DECprint Utility for PostScript to Sixel Printing for VMS

- Complete documentation kit (order number: QA–VZPAA–GZ)
  - *Installation/User's Guide: DECprint Utility for PostScript to Sixel Printing for VMS*

PrintServer Client Software for ULTRIX

This documentation kit applies only for ULTRIX operating systems, Version 4.0 and lower.

- Complete documentation kit (order number: QA–VVMAA–GZ)
  - *Installation Guide: PrintServer Client for ULTRIX*
  - *User's Guide: PrintServer Client for ULTRIX*

- *Reference Card: PrintServer Client for ULTRIX*
- *Release Notes: PrintServer Client for ULTRIX*

PrintServer Source Kit for ULTRIX

- Documentation can be ordered only as part of a media kit (order number: QB–VVMA9–YM)
  - *Porting Guide: PrintServer TCP/IP Client for ULTRIX*
  - *Release Notes: PrintServer TCP/IP Client for ULTRIX*

Other Programming Documentation

- *Font File Format User's Guide* (EK–CFFFM–UG)

Index

A

Addressing capability
  ANSI Text translator, 2–1
  DEClaser 1100 printer, 21–1
  DEClaser 2100/2200 printers, 12–1
  DEClaser 3200 printer, 31–1
Algorithmic transformations
  font attributes
    ANSI Text translator, 7–6
    DEClaser 1100 printer, 26–9
    DEClaser 2100/2200 printers, 17–8
    DEClaser 3200 printer, 36–8
  memory use
    DEClaser 1100 printer, 26–10
    DEClaser 2100/2200 printers, 17–9
    DEClaser 3200 printer, 36–9
Alternative protocols
  ANSI Text translator, 9–1
  DEClaser 1100 printer, 28–1
  DEClaser 2100/2200 printers, 19–1
  DEClaser 3200 printer, 38–1
Attributes
  ANSI Text translator, 7–6
  DEClaser 1100 printer, 26–9
  DEClaser 2100/2200 printers, 17–8
  DEClaser 3200 printer, 36–8
Automatic Sheet Feeder Control (DECASFC) command
  ANSI Text translator, 5–1
  DEClaser 1100 printer, 24–2
  DEClaser 2100/2200 printers, 15–3
  DEClaser 3200 printer, 34–2

B

Bold attribute
  ANSI Text translator, 7–7
  DEClaser 1100 printer, 26–9
  DEClaser 2100/2200 printers, 17–9
  DEClaser 3200 printer, 36–8

C

Character sets
  ANSI Text translator, 7–2
  DEClaser 1100 printer, 26–2
  DEClaser 2100/2200 printers, 17–2
  DEClaser 3200 printer, 36–2
Commands
  comparison by printer, A–1
  generic error parameter summary, B–1
Control representation mode
  DEClaser 3200 printer, 35–2
CPR
  See Cursor Position Report (CPR) command
Cursor Position Report (CPR) command
  DEClaser 1100 printer, 25–1
  DEClaser 2100/2200 printers, 16–1
  DEClaser 3200 printer, 35–1

D

DA2R (Device Attributes (Secondary) Report) command
  DEClaser 1100 printer, 25–1
  DEClaser 2100/2200 printers, 16–1
  DEClaser 3200 printer, 35–1
DAR (Device Attributes Report) command
  DEClaser 1100 printer, 25–1
  DEClaser 2100/2200 printers, 16–1
  DEClaser 3200 printer, 35–1
Debugging software
  font error and warning report, 36–10, C–2
DECASFC
  See Automatic Sheet Feeder Control (DECASFC) command
DECFSR (Font Status Report) command, 36–10, B–1, C–2
  DEClaser 1100 printer, 25–1
  DEClaser 2100/2200 printers, 16–1, 17–10
  DEClaser 3200 printer, 35–1
DECGRA, 37–2
DECIPEM (IBM Proprinter Emulation Mode) command
  ANSI Text translator, 9–1
  DEClaser 1100 printer, 28–1
  DEClaser 2100/2200 printers, 19–1
DEClaser 1150 printer
  ANSI translation specific to, 10–10 to 10–15
  downline loaded font capacity, 10–2, 10–11
  printing ANSI/sixel files, 10–11
DEClaser 2150/2250 printer
  downline loaded font capacity, 10–2
DEClaser 2150/2250 printers
  ANSI translation specific to, 10–10 to 10–15
  downline loaded font capacity, 10–11
  printing ANSI/sixel files, 10–11
DEClaser 3250 printer
  ANSI translation specific to, 10–1 to 10–5
DEClaser 3250 printer (Cont.)
  downline loaded font capacity, 10–2
  printing ANSI/sixel files, 10–6
DECLFF (Load Font File) command
  ANSI Text translator, 7–1
  DEClaser 1100 printer, 26–1, 26–10, 26–11
  DEClaser 2100/2200 printers, 17–1, 17–9, 17–11
  DEClaser 3200 printer, 36–1, 36–9
DECSDPM (Set Duplex Print Mode) command
  ANSI Text translator, 5–1
  DEClaser 1100 printer, 24–1
  DEClaser 2100/2200 printers, 15–1
  DEClaser 3200 printer, 34–1
DECSHORP (Set Horizontal Pitch) command
  ANSI Text translator, 2–1
  DEClaser 1100 printer, 21–1
  DEClaser 2100/2200 printers, 12–1
  DEClaser 3200 printer, 31–1
DECSITF (Select Input Tray Failover) command, C–4
  for the DEClaser 3200 printer, 34–5
DECSSS (Set Sheet Size) command
  ANSI Text translator, 5–3
  DEClaser 1100 printer, 24–3
  DEClaser 2100/2200 printers, 15–4
  DEClaser 3200 printer, 34–3
Default settings
  DEClaser 1100 printer, 22–1, 22–5
  DEClaser 1150 printer, 10–11
  DEClaser 2100/2200 printers, 13–1
  DEClaser 2150/2250 printers, 10–11
  DEClaser 3250 printer, 10–3, 10–7, 10–11
  LN03 Image printer, 10–3, 10–7
  PrintServer printers, 10–7
  ScriptPrinter printer, 10–3
  SGR numbers
    ANSI Text translator, 3–3
    DEClaser 1100 printer, 22–4
    DEClaser 2100/2200 printers, 13–4
    DEClaser 3200 printer, 32–3
  with paper cassette

Default settings
with paper cassette (Cont.)
DEClaser 1100 printer, 22–5
DEClaser 2100/2200 printers, 13–5
with paper size
DEClaser 3200 printer, 32–4
with paper size and orientation
ANSI Text translator, 3–3
Device Attributes (Secondary) Report (DA2R)
DEClaser 1100 printer, 25–1, 25–3
DEClaser 2100/2200 printers, 16–1, 16–4
DEClaser 3200 printer, 35–1, 35–4
Device Attributes Report (DAR)
alias response parameters
DEClaser 1100 printer, 25–3
DEClaser 2100/2200 printers, 16–4
DEClaser 3200 printer, 35–3
DEClaser 1100 printer, 25–2
DEClaser 2100/2200 printers, 16–2
DEClaser 3200 printer, 35–2
generic response parameters
DEClaser 1100 printer, 25–2
DEClaser 2100/2200 printers, 16–3
DEClaser 3200 printer, 35–2
Device Status Report (DSR)
command
DEClaser 1100 printer, 25–1
DEClaser 2100/2200 printers, 16–1
DEClaser 3200 printer, 35–1
error parameters
DEClaser 1100 printer, 25–5
DEClaser 2100/2200 printers, 16–7
DEClaser 3200 printer, 35–6
Documentation
DEC PPL3 printers, D–1
Double underline
ANSI Text translator, 7–7
DEClaser 1100 printer, 26–9
DEClaser 2100/2200 printers, 17–9
DEClaser 3200 printer, 36–9
Downline loaded font capacity
DEClaser 1150 printer, 10–11
DEClaser 2150/2250 printers, 10–11
PrintServer printers, 10–6
ScriptPrinter and LN03 Image printers, 10–2
DSR (Device Status Report) command
DEClaser 1100 printer, 25–1
DEClaser 2100/2200 printers, 16–1
DEClaser 3200 printer, 35–1
generic error codes, B–2
Duplex printing
ANSI Text translator, 5–1
DEClaser 1100 printer, 24–1
DEClaser 2100/2200 printers, 15–1
DEClaser 3200 printer, 34–1

E

Envelope sizes
DEClaser 1100 printer, 21–4
DEClaser 2100/2200 printers, 12–4
DEClaser 2150/2250 printers, 10–13
DEClaser 3200 printer, 31–5
Error and status reporting
DEClaser 1100 printer, 25–1
DEClaser 2100/2200 printers, 16–1
DEClaser 3200 printer, 35–1
Error parameters
Device Status Reports, B–2
DEClaser 1100 printer, 25–5
DEClaser 2100/2200 printers, 16–7
DEClaser 3200 printer, 35–6
generic error codes, B–2
Error parameter summary, B–1
Extensions
comparison by printer, A–1

F

Factory defaults in NVM
DEClaser 1100 printer printer, 22–5
DEClaser 2100/2200 printers, 13–6
DEClaser 3200 printer, 32–5
Failover, C–4
Fallback metrics, 17–10, 26–10, 36–10
Font
reporting errors and warnings, C–2
Font file validation, B–3
DEClaser 1100 printer, 26–11
DEClaser 2100/2200 printers, 17–10

Font file validation (Cont.)
DEClaser 3200 printer, 36–10
summary of errors, B–1
Font list, 17–10, 26–10
Font metrics
for the ANSI Text translator, 7–6
for the DEClaser 1100 printer, 26–8
for the DEClaser 2100/2200 printers, 17–8
for the DEClaser 3200 printer, 36–7
Font repertory
ANSI Text translator, 7–1
built-in fonts, 7–2
DEClaser 1100 printer, 26–1
built-in fonts, 26–2
DEClaser 2100/2200 printers, 17–1
built-in fonts, 17–2
DEClaser 3200 printer, 36–2
built-in fonts, 36–2
Fonts, downline loaded
in DEClaser 1150 printer, 10–11
in DEClaser 2150/2250 printers, 10–11
in PrintServer printers, 10–6
in ScriptPrinter or LN03 Image printers, 10–2
Font Status Report (DECFSR) command, C–2
DEClaser 1100 printer, 25–1
DEClaser 2100/2200 printers, 16–1, 17–10
DEClaser 3200 printer, 35–1

H

Horizontal resolution
ANSI Text translator, 2–1
DEClaser 1100 printer, 21–1
DEClaser 2100/2200 printers, 12–1
DEClaser 3200 printer, 31–1
Horizontal spacing
ANSI Text translator, 7–7
DEClaser 1100 printer, 26–9
DEClaser 3200 printer, 36–9

I

IBM Proprinter Emulation Mode (DECIPEM) command
ANSI Text translator, 9–1
DEClaser 1100 printer, 28–1
DEClaser 2100/2200 printers, 19–1
Initial state values
DEClaser 1100 printer, 22–1
DEClaser 1150 printer, 10–11
DEClaser 2100/2200 printers, 13–1
DEClaser 2150/2250 printers, 10–11
DEClaser 3250 printer, 10–11
LN03 Image printer, 10–3
PrintServer printers, 10–7
ScriptPrinter printer, 10–3
SGR numbers
ANSI Text translator, 3–3
DEClaser 1100 printer, 22–4
DEClaser 2100/2200 printers, 13–3
DEClaser 3200 printer, 32–3
with paper cassette
DEClaser 1100 printer, 22–5
DEClaser 2100/2200 printers, 13–5
with paper size
DEClaser 3200 printer, 32–4
with paper size and orientation
ANSI Text translator, 3–3
Input tray
ANSI Text translator, selecting with, 5–1
DEClaser 1100 printer, selecting on, 24–2
DEClaser 2100/2200 printers, selecting on, 15–3
DEClaser 3200 printer, selecting on, 34–2
failover, C–4
Italic attribute
ANSI Text translator, 7–7
DEClaser 1100 printer, 26–9
DEClaser 2100/2200 printers, 17–9
DEClaser 3200 printer, 36–8

J

Justification, 2–6
  DEClaser 1100 printer, 21–7
  DEClaser DEClaser 2100/2200 printers, 12–7

K

Kerning
  ANSI Text translator, 7–7
  DEClaser 1100 printer, 26–10
  DEClaser 2100/2200 printers, 17–9
  DEClaser 3200 printer, 36–9

L

LN03 Image printer
  ANSI translation specific to, 10–1, 10–5
  printing ANSI/sixel files, 10–2
Load Font File (DECLFF) command
  ANSI Text translator, 7–1
  DEClaser 1100 printer, 26–1, 26–10, 26–11
  DEClaser 2100/2200 printers, 17–1, 17–9, 17–11
  DEClaser 3200 printer, 36–1, 36–9

M

Macro parameter
  ANSI Text translator values, 8–1
  DEClaser 1100 printer values, 27–1
  DEClaser 2100/2200 printer values, 18–1
  DEClaser 3200 printer values, 37–1
Macro values, NVM
  for DEClaser 1100 printer, 22–6
  for DEClaser 2100/2200 printers, 13–7
Maximum values
  ANSI Text translator, 4–1
  DEClaser 1100 printer, 23–1
  DEClaser 2100/2200 printers, 14–1
  DEClaser 3200 printer, 33–1
Memory use, reducing
  DEClaser 1100 printer, 26–10
Memory use, reducing (Cont.)
  DEClaser 2100/2200 printers, 17–9
  DEClaser 3200 printer, 36–9
Miscellaneous considerations and restrictions, 37–2

N

National Replacement Character sets (NRCS)
  DEClaser 3200 printer, 36–8
National Replacement Character Sets (NRCS)
  ANSI Text translator, 7–7
  DEClaser 1100 printer, 26–9
  DEClaser 2100/2200 printers, 17–9
NVM
  factory defaults
    DEClaser 1100 printer printer, 22–5
    DEClaser 2100/2200 printers, 13–6
    DEClaser 3200 printer, 32–5
  macro values
    for DEClaser 1100 printer, 22–6
    for DEClaser 2100/2200 printers, 13–7

O

Orientation
  ANSI Text translator, 7–7
  DEClaser 1100 printer, 26–9
  DEClaser 2100/2200 printers, 17–9
  DEClaser 3200 printer, 36–8
Overline attribute
  ANSI Text translator, 7–7
  DEClaser 1100 printer, 26–9
  DEClaser 2100/2200 printers, 17–9
  DEClaser 3200 printer, 36–8

P

Page format, orientation
  DEClaser 1150 printer, 10–15
  DEClaser 2150/2250 printers, 10–15
  LN03R ScriptPrinter printer, 10–4
  PrintServer printers, 10–9

Page size, mapping to physical sheet size
ANSI Text translator, 2–4
DEClaser 1100 printer, 21–5
DEClaser 2100/2200 printers, 12–5
DEClaser 3200 printer, 31–5
Paper handling, 34–1
Paper tray
failover, C–4
Parameters
warning, B–1
Parameter values, maximum
ANSI Text translator, 4–1
DEClaser 1100 printer, 23–1
DEClaser 2100/2200 printers, 14–1
DEClaser 3200 printer, 33–1
Position accuracy
DEClaser 1100 printer, 21–7
DEClaser 3200 printer, 31–7
DEClaser DEClaser 2100/2200 printers, 12–7
Printable area
ANSI Text translator, 2–4
DEClaser 1100 printer, 21–4
DEClaser 1150 printer, 10–12
DEClaser 2100/2200 printers, 12–4
DEClaser 2150/2250 printers, 10–12
DEClaser 3200 printer, 31–4
LN03 Image printer, 10–3
PrintServer printers, 10–8
ScriptPrinter printer, 10–3
Printer
commands compared by, A–1
Printer documentation, D–1
Printer identification, 35–2
DEClaser 1100 printer, 25–2
DEClaser 2100/2200 printers, 16–2
Printer reports
ANSI translator, 6–1
DEClaser 1100 printer, 25–1
DEClaser 2100/2200 printers, 16–1
DEClaser 3200 printer, 35–1
Printing ANSI files
on DEClaser 2150/2250 printers, 10–11
on LN03 Image printer, 10–2
on PrintServer printers, 10–6
Printing ANSI files (Cont.)
on ScriptPrinter printer, 10–2
on the DEClaser 1150 printer, 10–11
Printing sixel files
on DEClaser 2150/2250 printers, 10–11
on LN03 Image printer, 10–2
on PrintServer printers, 10–6
on ScriptPrinter printer, 10–2
on the DEClaser 1150 printer, 10–11
PrintServer printers
downline loaded font capacity, 10–6
printing ANSI/sixel files, 10–6
Protocols, alternative
ANSI Text translator, 9–1
DEClaser 1100 printer, 28–1
DEClaser 2100/2200 printers, 19–1
DEClaser 3200 printer, 38–1

R

Reports
ANSI Text translator, 6–1
Device Attributes (Secondary) Report (DA2R)
DEClaser 1100 printer, 25–3
DEClaser 2100/2200 printers, 16–4
DEClaser 3200 printer, 35–4
Device Attributes Report (DAR)
DEClaser 1100 printer, 25–2
DEClaser 2100/2200 printers, 16–2
DEClaser 3200 printer, 35–2
font errors and warnings, C–2
font status, C–2
Resolution
ANSI Text translator, 2–1
DEClaser 1100 printer, 21–1
DEClaser 2100/2200 printers, 12–1
DEClaser 3200 printer, 31–1
horizontal
ANSI Text translator, 2–1
DEClaser 1100 printer, 21–1
DEClaser 2100/2200 printers, 12–1
DEClaser 3200 printer, 31–1
vertical
ANSI Text translator, 2–2
DEClaser 1100 printer, 21–2

Resolution
vertical (Cont.)
DEClaser 2100/2200 printers, 12–2
DEClaser 3200 printer, 31–2
Return from Other Coding System (ROCS) command
ANSI Text translator, 9–1
DEClaser 1100 printer, 28–1
DEClaser 2100/2200 printers, 19–1
DEClaser 3200 printer, 38–1
ROCS (Return from Other Coding System) command
ANSI Text translator, 9–1
DEClaser 1100 printer, 28–1
DEClaser 2100/2200 printers, 19–1
DEClaser 3200 printer, 38–1

S

Scaling
ANSI Text translator, 7–7
DEClaser 1100 printer, 26–10
DEClaser 2100/2200 printers, 17–9
DEClaser 3200 printer, 36–9
ScriptPrinter printer
ANSI translation specific to, 10–1, 10–5
downline loaded font capacity, 10–2
printing ANSI/sixel files, 10–2
Select Input Tray Failover (DECSITF) command, C–4
for the DEClaser 3200 printer, 34–5
Select Other Coding System (SOCS) command
ANSI Text translator, 9–1
DEClaser 1100 printer, 28–1
DEClaser 2100/2200 printers, 19–1
DEClaser 3200 printer, 38–1
Set Duplex Print Mode (DECSDPM) command
ANSI Text translator, 5–1
DEClaser 1100 printer, 24–1
DEClaser 2100/2200 printers, 15–1
DEClaser 3200 printer, 34–1
Set Horizontal Pitch (DECSHORP) command
ANSI Text translator, 2–1
DEClaser 1100 printer, 21–1
Set Horizontal Pitch (DECSHORP) command (Cont.)
DEClaser 2100/2200 printers, 12–1
DEClaser 3200 printer, 31–1
Set Sheet Size (DECSSS) command
ANSI Text translator, 5–3
DEClaser 1100 printer, 24–3
DEClaser 2100/2200 printers, 15–4
DEClaser 3200 printer, 34–3
Sheet feeder, C–4
Sixel graphics
macro parameter values
ANSI Text translator, 8–1
DEClaser 1100 printer, 27–1
DEClaser 2100/2200 printers, 18–1
DEClaser 3200 printer, 37–1
resolution
DEClaser 1150 printer, 10–14
DEClaser 2150/2250 printers, 10–14
PrinterServer printers, 10–8
ScriptPrinter printer, 10–4
SOCS (Select Other Coding System) command
ANSI Text translator, 9–1
DEClaser 1100 printer, 28–1
DEClaser 2100/2200 printers, 19–1
DEClaser 3200 printer, 38–1
Spacing criterion fallback, 7–7, 17–10, 36–9
DEClaser 1100 printer, 26–10
Status and error reporting, 35–1
Strike-through attribute
ANSI Text translator, 7–7
DEClaser 1100 printer, 26–9
DEClaser 2100/2200 printers, 17–9
DEClaser 3200 printer, 36–8

T

Tray selection, C–4
Two-sided printing
ANSI Text translator, 5–1
DEClaser 1100 printer, 24–1
DEClaser 2100/2200 printers, 15–1
DEClaser 3200 printer, 34–1
Type families
ANSI Text translator, 7–2

Type families (Cont.)
DEClaser 1100 printer, 26–3
DEClaser 2100/2200 printers, 17–2
DEClaser 3200 printer, 36–3
Type family names, 36–3

U

Underlining attributes
ANSI Text translator, 7–7
DEClaser 1100 printer, 26–9
DEClaser 2100/2200 printers, 17–9
DEClaser 3200 printer, 36–8

V

Validation tests
for downline loaded font files, B–3
Valid set raster attributes commands (DECGRA), 37–2
Vertical resolution
ANSI Text translator, 2–2
DEClaser 1100 printer, 21–2
DEClaser 2100/2200 printers, 12–2
DEClaser 3200 printer, 31–2
Vertical spacing
ANSI Text translator, 7–7
DEClaser 1100 printer, 26–9
DEClaser 2100/2200 printers, 17–9
DEClaser 3200 printer, 36–9