

PRINTING SYSTEM

LASER

LPS 14: GEORGE 3 and 4 Software

LPS 14



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Preface

This publication describes the basic GEORGE 3 and 4 software that produces drive tapes for the ICL LPS14 Laser Printer. This software allows files that are currently printed by GEORGE 3 and 4 on standard 1900 printers to be printed in the same format on an LPS14.

Contents

The text of this publication is divided into chapters in the normal way, and each chapter is subdivided into sections. A section's level in the hierarchy is indicated by its number. Therefore, within Chapter *n*, first level section headings are numbered *n.1*, *n.2* and so on; second level headings are numbered *n.1.1*, *n.1.2* ... *n.2.1* and so on; third level headings are numbered *n.1.1.1*, *n.1.1.2* ... *n.1.2.1* and so on.

The contents list and index, and cross-references in the text, all refer to section numbers.

Pages are numbered within chapters, in the form *c-p*, where *c* is the chapter number and *p* the page number within that chapter. Figures and tables, where they appear, are also numbered within chapters, so that Figure *n.2* is the second figure in Chapter *n*, and Table *n.2* is the second table in that chapter.

Section numbers, page numbers and figure and table numbers in appendices are preceded by the letter A.

Preface

Introduction	Chapter 1
Introduction to LPS14	1.1
Introduction to the LPS software	1.2
Using the LPS software	Chapter 2
Introduction	2.1
The Property System	2.2
The LPS Properties and the George 3 Property System	2.2.1
The LPS Property Attributes	2.2.2
Consistency tests	2.2.3
Introduction to the Subject Program #XKNP	2.3
The LPS Subject program and the control macros	2.3.1
Operating information	Chapter 3
Tape handling under LPS	3.1
Appending files to tape and clearing tapes	3.1.1
The tape journal file	3.1.2
The LPSTAPELOG file	3.1.3
The duplicate tape facility	3.1.4
Messages to the 1900 operator	3.2
Tape requests	3.2.1
Error messages	3.2.2
The installation parameters LPSTIME and LPSVALUE	3.3
LPSVALUE values and action taken	3.3.1

Macro specifications	Chapter 4
The LPS property macros	4.1
LPSDEFAULTS	4.2
LPSPROPERTY	4.3
LPSATTRIBUTE	4.4
LPSWHATPROPS	4.5
The property file :LPSCONTROL.LPSPROPDESC	Appendix 1
The installation defaults records	A1.1
Suppression table	A1.1.1
Channel tables	A1.1.2
The LPS property set entrants	A1.2
Property attributes	Appendix 2
*CPI	A2.1
*LPI	A2.2
*LEN	A2.3
*CH _n	A2.4
*COP	A2.5
*OVN	A2.6
*SUP	A2.7
*FNT	A2.8
*WID	A2.9
*COL	A2.10
*STA	A2.11
Character sets and character conversions	Appendix 3
Files associated with the LPS subject program	Appendix 4
Tape journal files	A4.1
Format of JOURtan	A4.1.1
The Tape Log file	A4.2
The LPSINFO file	A4.3
The control macros LPSJDF and LPSRUN	Appendix 5
LPSJDF specification	A5.1
LPSRUN specification	A5.2
Subject program interfaces	Appendix 6
Parameters and entry points	A6.1
Parameters	A6.1.1
Entry points	A6.1.2

Peripheral channels	A6.2
Halts	A6.3
Error handling and error messages	A6.4
Setting up the LPS System on GEORGE 3 or 4	Appendix 7

1.1 Introduction to LPS14

The Laser Printing System, LPS14, is an off-line, high-speed, non-impact printer subsystem. The LPS14 can produce high quality printed output at a rate of 146x12 inch pages per minute, irrespective of character density per line and the number of lines per page. The data to be printed, and control information for print format, pitch, line-spacing, fount style and repertoire, is obtained from a magnetic tape known as the drive tape. The drive tape is prepared on the mainframe. It is then transported to the LPS14. The magnetic tapes are ICL 2900 standard 9-track, phase-encoded tapes with a standard 1900 header label.

1.2 Introduction to the LPS software

The LPS software under GEORGE 3 and 4 facilitates the definition of LPS properties. This enables the LPS subject program to intercept line printer listfiles with the defined properties and to spool these files to tape, together with the associated format information as defined by the properties. The files can then be printed by the Laser Printing System (LPS14).

The LPS properties are a subset of the line printer properties as held in :SYSTEM.PROPERTY. Separate property descriptions are held in the file :LPSCONTROL.LPSPROPDESC. The LPS property macros (LPSDEFAULTS,LPSPROPERTY, LPSATTRIBUTE and LPSWHATPROPS, see Chapter 4) provide the installation with the facilities to:

- 1 Set up a default property description (LPSDEFAULTS)
- 2 Add and cancel property descriptions (LPSPROPERTY)
- 3 Make available property sets to the LPS subject program, where a property set is either the null property (the installation default) or a combination of one to four properties (LPSATTRIBUTE)
- 4 Provide facilities to enable the user to obtain the descriptions of the property sets currently set up (LPSWHATPROPS)

The LPS subject program #XKNP is controlled by two macros LPSJDF and LPSRUN. These macros are described in Appendix 5. LPSJDF is issued at EMS. It initialises the parameters for LPSRUN and issues the first call of LPSRUN. On completion of a WAIT LPSTIME command, LPSRUN controls one run of the subject program and re-issues itself with a new jobname.

All relevant programs, macros and LPS files are held in the :LPSCONTROL directory. The one exception is the macro LPSWHATPROPS, which is held in the :MACROS directory. The tapes used by the LPS system are picked up from the tape pool and will remain 'owned' by :LPSCONTROL until they are returned to the tape pool. This normally happens only after the tapes have been printed on the laser printer.

The LPS software under GEORGE 3 and 4 makes the advantages of a high speed, non-impact printer available to an installation. Where possible, all current line printer facilities are provided for in such a way as to allow a user to use the laser printer, with little or no change being necessary to any existing job description. To achieve this end, the LPS software is designed to become an integral part of the currently implemented mechanisms in GEORGE 3 and 4 which control the spooling of files to line printers, using the property system (see *GEORGE 3 and 4 Operation Management TP4438*).

2.1 Introduction

A step-by-step description of how an LPS system is set up on GEORGE 3 and 4 is given in Appendix 7.

In general, once an installation manager has decided the type and frequency of listfile requests to be directed to the laser printer, his actions will be:

- 1 To define the LPS default attributes. To use these defaults to define, to the LPS system, the subset of GEORGE 3 and 4 line printer properties that will be used by LPS. The LPS property system macros LPSDEFAULTS and LPSPROPERTY will be used to achieve this
- 2 To decide on the allowed LPS property sets and to make these available using the LPSATTRIBUTE macro
- 3 To decide how to run the LPS software in conjunction with the current system, with particular reference to the destination of listfile requests. This may require:
 - (a) Changes to the types of GEORGE properties set up (that is, inclusive/exclusive and temporary/permanent)
 - (b) Changes to the method used for attributing central line printers
 - (c) Possibly running the restore time macro LFDBAID
- 4 To decide how to handle drive tapes, with particular reference to:
 - (a) Utilising the duplicate tape option
 - (b) Using a separate subset of the pool tapes
 - (c) Utilising the append option to provide efficient tape usage
 - (d) Utilising the LPS tape log to facilitate the batching of tape journals and tapes for transport to the laser printer
- 5 Decide on the initial settings and subsequent utilisation of the installation parameters LPSVALUE and LPSTIME

The subject program #XKNP selects central line printer listfiles, with the LPS defined properties, from :SYSTEM.OUTPUT.

The output from the LPS software is a series of standard 2900 magnetic tapes each commencing with a standard 1900 header label, written in a format suitable for LPS14. Each file is transcribed to a drive tape. The files are preceded by control information representing the user requirements for that file. The software has the facility to extend on to second and subsequent reels of tape as necessary.

One run of the subject program #XKNP causes each of the available LPS property sets to be actioned in the same order as held in LPSPROPDESC. In effect, the software acts as if it were a pseudo central line printer to which each of the properties which make up the property set has been attributed.

The heading for each list file will be similar to that produced by using the LISTFILE command on GEORGE 3. All restore time macros governing listfiles will action on LPS14 listings. Therefore, all debatching facilities, paper throws etc., governed by the installation will be available. The 'peripheral identifier' in the second line of the heading will be the character string LPS.

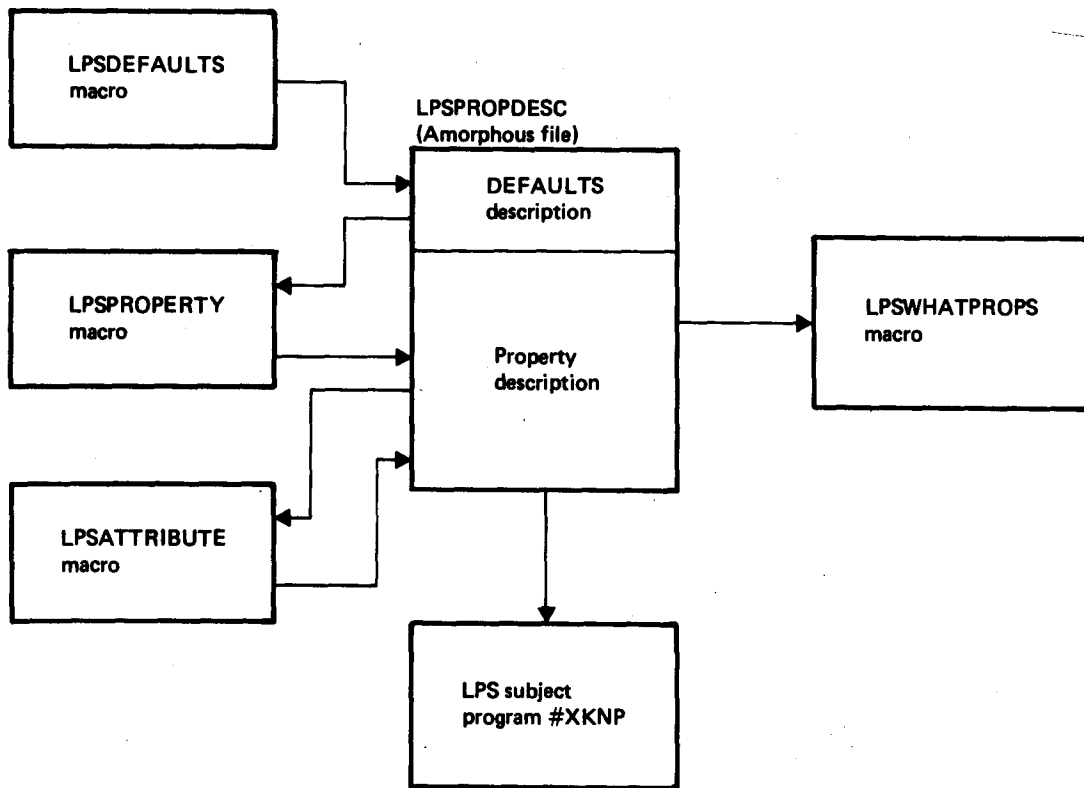


Figure 2.1 Schematic diagram of the LPS property system

2.2 The Property System

The following sections describe the LPS Property System.

2.2.1 The LPS Properties and the GEORGE 3 Property System

When a Property Set is set up by the LPSPROPERTY macro and made available by the LPSATTRIBUTE macro, no check is made that the relevant properties have been declared to GEORGE using the PROPERTY command. It is therefore the responsibility of the installation manager to ensure that all usable LPS Properties have been declared. The Properties should not be declared as console properties since LPS14 is only available as a central printer.

If a specific LPS Property Set is designed such that all associated listfiles should be directed to the Laser Printer, then all the Properties which make up the Property Set should be declared as permanent to prevent spurious 'PLEASE ATTRIBUTE' displays to the operator. The restore time macro LFDBAID should be run, otherwise a command error will occur since the Permanent Property is not attributed. Also, at least one of the Properties which make up the Property Set should be declared as exclusive. This property should not be attributed to any central line printer. If the null property is set up and made available on LPS, listfiles with no associated property will be output by either a central line printer or by LPS.

In effect, the laser printer may be treated as a central line printer to which each of the available LPS Property Sets are attributed in turn and remain attributed until there are no LISTFILES outstanding which would normally be directed to the printer.

Figure 2.1 describes the LPS Property system schematically.

2.2.2 The LPS Property Attributes

Each LPS property as defined by the Property Description in the LPSPROPDESC file (see Appendix 1), is made up of a set of LPS Property Attributes. Each attribute defines format information. This information is written to the drive tape, along with the file contents, to control the laser printer output.

Each attribute has an associated four-character directive. The first character of the directive is '*' (for example, *LEN,*COP etc) and the directive is used as a parameter identifier. Each attribute has an allowed set of values.

Table 2.1 lists the directives which can be specified to control the nature of the printed output on the LPS14. Appendix 2 defines them in more detail.

2.2.3 Consistency tests

Each of the macros LPSDEFAULTS, LPSPROPERTY and LPSATTRIBUTE has the capability to set up a property description in :LPSCONTROL.LPSPROPDESC. The property description must satisfy certain consistency tests between pairs of attributes as specified below:

**FNT and *LPI*

If *FNT defines a character set with frame depth m lines/inch ($m=6$ or 8) then *LPI must have a value less than or equal to m (for example, *LPI 8 and *FNT V030 is invalid)

**FNT and *CPI*

If *FNT defines a character set with frame width n characters/inch ($n=10$, 12 or 15) then *CPI must have a value less than or equal to n (for example *CPI = 12 and *FNT = V030 is invalid)

**CH_n and CH_m ($n \neq m$)*

The specified line numbers for channels n and m must be distinct (for example *CH2 7 and *CH4 7 is invalid)

**CH_n and *LEN*

*CH_n line numbers must be less than or equal to the *LEN value (for example *CH2 42 and *LEN 40 is invalid)

**SUP and *COP*

The maximum page copy value used in the suppression parameters must be less than or equal to the *COP value (for example *COP2 and *SUP L(1,2),C(1,2), P(0,3) is invalid)

**LEN and *LPI*

There are three consistency checks:

- 1 The implied form length must be a multiple of 1/6-inch units, thus for 8 LPI the value of *LEN must be a multiple of 4 (for example *LPI 8 and *LEN 21 is invalid)
- 2 The implied form length must be less than or equal to 14 inches. Thus allowing for the two 1/2 inch margins, the *LEN value must be less than or equal to 78 for 6 lines/inch (for example, *LEN79 and *LPI6 is invalid)
- 3 The minimum form length is 3 inches (for example *LPI 8 and *LEN 15 is invalid).

**WID, *CPI and *COL*

The implied form width must be less than or equal to 13.6 inches. Thus at 10 characters/inch with *COL having a value of zero the value of *WID must be less than or equal to 136. The extra line length given by *COL must leave the total line length less than 13.6 inches.

Error messages

When an inconsistency is detected the error message

**aaa NOT COMPATIBLE WITH *bbb*

is output, where **aaa* and **bbb* are the attributes involved.

Table 2.1
LPS Property Directives

<i>Keyword</i>	<i>Description</i>	<i>Range of values</i>	<i>Default</i>
*CPI	Character density	10, 12 or 15	10
*LPI	Line density	6 or 8	6
*LEN	Form length	12 to 78 at 6 lpi 16 to 104 at 8 lpi	66 -
*CH _n (n=2 to 7)	Channel positions	1 to *LEN value or NONE	NONE
*COP	Page copies	0 to 255	0
*OVN	Overlay negative	NONE or negative name	NONE
*SUP	data suppression	See 4.1	None
*FNT	Character set name	See Appendix 3	VO11
*WID	Maximum length of print line	20 to 136 at 10 cpi 20 to 163 at 12 cpi 20 to 204 at 15 cpi	136
*COL	First column shift	0 to 31	0
*STA	Special stationery	NONE or stationery name	NONE

A fuller description of these directives can be found in Appendix 2.

2.3 Introduction to the Subject Program #XKNP

The following section gives a brief introduction to the Subject Program.

2.3.1 The LPS Subject Program and the control macros

The LPS Subject Program #XKNP intercepts LISTFILE requests to line printers and examines the requests to find if their line printer properties are available on LPS. These listfiles are transcribed to a laser printer drive tape along with the control information, as specified by the property description (in

LPSPROPDESC) corresponding to the Property Set requested. The subject program will continue to run until there are no outstanding LISTFILE requests for any of the available property sets or LPSVALUE has been set to terminate the run (see section 3.3).

The running of the Subject Program is controlled by the command macros :LPSCONTROL.LPSJDF and :LPSCONTROL.LPSRUN (see Appendix 5). LPSJDF is issued at EMS and initialises for the first run of LPSRUN. LPSRUN re-issues itself after obeying a WAIT LPSTIME command and running the subject program.

Operator facilities for control of the Subject Program are provided for by the two installation parameters LPSVALUE and LPSTIME, (see section 3.3).

The following files are used by the subject program:

- 1 The tape journal files One file is associated with each drive tape and describes the tape contents
- 2 The LPSTAPELOG file This provides the installation with a means of keeping track of the drive tapes used
- 3 The LPSINFO file This holds information relevant to the Subject Program

A fuller description of these files is given in Appendix 4.

There are two basic facilities provided in connection with handling of the drive tapes. These are:

- 1 A facility to allow the installation to incorporate a duplicate tape option. In this case, two identical tapes are produced. One tape can then be retained as a security copy in case the other tape is damaged or misplaced
- 2 An automatic append to last tape used. This provides for minimum tape usage over a series of Subject Program runs

3.1 Tape handling under LPS

LPS uses 9 track phase encoded tape. The tapes have standard 1900 headers followed by a special drive tape format.

In order to utilise the GEORGE magnetic tape security system and to allow the operator choice of tapes when a new LPS tape is required, the following system has been adopted:

- 1 All tapes intended for LPS use should be introduced to the Tape Pool (see Chapter 4 GEORGE 3 and 4 Operating Systems). It is advisable to use some physical method to separate LPS tapes from other Pool Tapes
- 2 When a tape is required by the Subject Program, a GETONLINE is used. The tape is subsequently 'owned' by :LPSCONTROL thus ensuring its security with regards to the GEORGE system used
- 3 When a tape has been printed by the laser printer, the RETURN macro may be used to make the tape available for re-use

Figure 3.1 illustrates LPS tape handling.

3.1.1 Appending files to tape and clearing tapes

LPS jobs run for a short period of time, wait and then run again. An append to tape option is available (set by LPSVALUE) that allows optimum tape usage.

The subject program can do either of the following:

- 1 Request the last tape used (if it is valid and the append to tape option is set) using the ONLINE command
- 2 Request a new tape from the pool using a GETONLINE command

If the operator replies CANTDO, then in case 1 a new tape is requested. In case 2, the LPS run finishes.

3.1.2 The tape journal file

Each pool tape to be used for LPS will have an associated journal file (in :LPSCONTROL) called JOUR tan . tan is the 8 digit, 1900 tape serial number. Where tan is less than 8 digits, it is right-justified and zero-filled. When a new serial number is to be used, the corresponding journal will be assigned. Appendix 4 gives a detailed description of the tape journal files.

3.1.3 The LPSTAPELOG file

When the first file has been successfully written to a drive tape (or tapes) a record specifying the tapes used is appended to the tape log. The tape log allows an installation to keep track of all LPSTAPES in use and provides a means for batching drive tapes and associated tape journals for transport to the LPS14 printer. The contents of the file are described in Appendix 4.

3.1.4 The duplicate tape facility

An option is provided to enable the user to obtain duplicate copies of tapes. For each tape there will be an identical one produced which can be retained as a security copy. This option is incorporated at the installation by setting the language code of the LPSINFO file to /DUAL (see section A4.3).

Information regarding duplicate tapes and tan s used are recorded in the LPSINFO file, the LPSTAPELOG file and the tape journal files (see Appendix 4).

3.2 Messages to the 1900 operator

3.2.1 Tape requests

The tape to be initially requested by the LPS job depends on the setting of the append option (set by LPSVALUE values 3 and 4, see section 3.3).

If the append option is not set, a GETONLINE is issued by the subject program to request a new tape. If the operator issues a CANTDO the current run of LPSRUN terminates after initiating the next LPSRUN.

If the append option is set, then LPSRUN controls the picking up of the append tape. There are two possibilities:

- 1 The append to tape option is not possible due to either:
 - (a) There is no last usable tape because the last tape used does not have a complete file on it, or the EOT has been reached, or a tape error has occurred.

If duplicate tapes are used and a tape error occurs, then a subsequent run with the dual tape option unset will cause the valid tape to be appended to
 - (b) The associated journal file does not exist.

The following message is output

APPEND TO TAPE OPTION NOT AVAILABLE

and LPSRUN continues as if the append option were not set

- 2 There is a last usable tape (or tapes). An ONLINE command is used to request the tape. If the operator issues a CANTDO, then action is as (1) above.

Continuation reels will be requested using a GETONLINE command.

3.2.2 Error messages

All errors encountered by the subject program which require diagnostic action will cause displays from LPSRUN of the form

LPS ERROR *nn mm*

where *nn* is an error number and *mm* an associated supplementary error number and

PLEASE INITIATE DIAGNOSTIC ACTION

Further information will have been appended to the LPSINFO file (see section A4.3). In order to provide time for diagnostic action to be taken on unrecognised errors, LPSTIME may be extended. In an extreme case, continuous wait can be entered, using LPSVALUE=5 (see section 3.3)

Appendix 6 contains further details on error handling.

For further information, see Appendix 5.

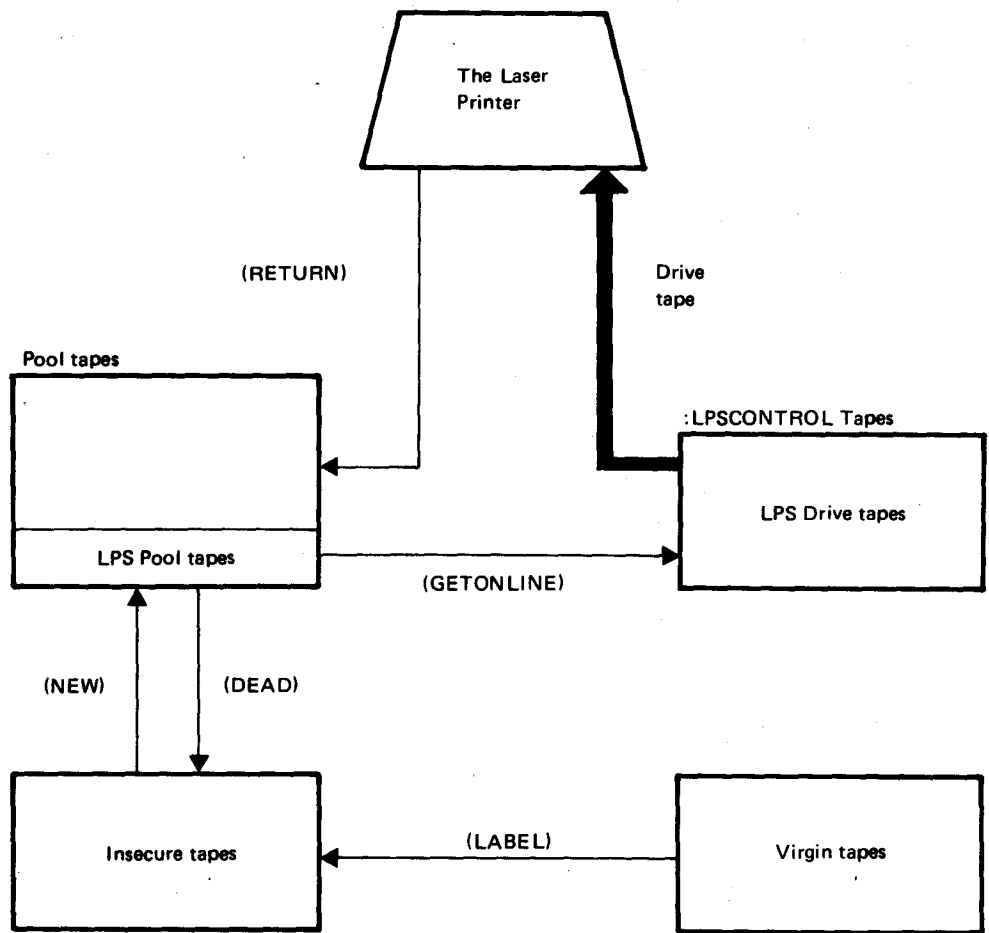


Figure 3.1 LPS tape handling

3.3 The installation parameters LPSTIME and LPSVALUE

The parameter LPSTIME controls the time between runs of the Subject Program. If the parameter is altered, notice will be taken of the change within a minute. If LPSTIME is set to zero the Subject Program will run continuously.

The parameter LPSVALUE always takes an integer value. The currently allowed non-zero values are 1 to 5, where each non-zero value represents an operator function as specified in section 3.3.1.

It is recommended that the use of these parameters is macroised for ease of use.

3.3.1 LPSVALUE values and action taken

<i>Value</i>	<i>Action</i>
0	No action
1	Terminate Job Completes the current file and terminates the run. The value is left as zero
2	Request Specific Property Completes the current file or all files for a special property set; the program then halts H2 to allow the macro to take the appropriate action The macro issues the question: WHAT LPS PROPERTY SET IS REQUIRED? to which the reply format is PR <i>property set</i> or ABANDON <i>property set</i> has the format null for the null LPS property set <i>property name</i> for a single property set <i>property name</i> &...& <i>property name</i> for a combination property set <i>property name</i> &...& <i>property name</i> where a continuation to the reply is required Up to four property sets are allowed. Where a property set is given, the program is re-entered with the property set as the first parameter If the property set requires a continuation the program halts H3 and the macro issues the question LPS PROPERTY SET CONTINUATION? for which the reply format and the action taken by the macro are as for the initial question If the program encounters an error one of the following messages is displayed HALTED:E1 Property set format invalid HALTED:E2 Property set not available DISPLAY: <i>propertyname</i> Property name specified HALTED:E3 does not exist The macro then re-issues the initial question

The possible error messages from the macro are

DISPLAY: REPLY EITHER 'PRPROP SET' OR 'ABANDON'

DISPLAY: INVALID PROPERTY SET FORMAT

DISPLAY: PROPERTY SET *property set*
and possibly

DISPLAY: *continued property set*

and

DISPLAY: NOT AVAILABLE ON LPS

DISPLAY: NULL PROPERTY SET NOT AVAILABLE ON LPS

DISPLAY: LPS PROPERTY *name* UNKNOWN

DISPLAY: LPS NULL PROPERTY UNKNOWN

In each case the macro re-issues the initial question

If the operator replies ABANDON, entry point 5 is used to ignore the specific property request.

LPSVALUE is always reset to zero

3 or 4

Automatic Append or Request New LPSTAPE.

These two values of LPSVALUE are used to allow the operator to specify whether or not the 'append to last tape used' function is to be automatically invoked. Setting of either value causes the append parameter to LPSRUN to be reset and the append value in LPSINFO to be updated, if necessary.

The values are checked for by LPSRUN, before entering the Subject Program, to determine whether the previous tape is to be appended or to a new LPSTAPE is to be used.

The value of LPSVALUE is left as zero, if it was initially set to 3 or 4

5

Continuous wait

Completes the current file and terminates the run. The next run of LPSRUN will cycle continuously on the WAIT LPSTIME command until LPSVALUE is reset or a FINISH NOW occurs

This chapter provides specifications for the LPS14 macros. The specifications are in the same format as that used for GEORGE 3 and 4 system macros.

4.1 The LPS Property Macros

Having initialised the LPS property system by using LPSDEFAULTS to set up the installation default property description in the file LPSPROPDESC, the remaining macros LPSPROPERTY, LPSATTRIBUTE and LPSWHATPROPS provide parallel facilities to their name-sake in-built commands in handling the LPS properties.

With the exception of LPSWHATPROPS, the macros must be run under :LPSCONTROL. Macro LPSWHATPROPS may be run from any user and is set up in :MACROS. All macros load an embedded program. If an installation requires to provide the LPS macro facilities to the operator then this may be macroised by setting up operator macros that issue runjobs on the appropriate command macro.

In the case of the LPSPROPERTY macro it should be noted that the use of the PROPERTY command is additional.

Formal specifications of the macros follow. The following macro issued errors are common to all macros:

```
DISPLAY:MACRO NOT ALLOWED IN NO USER CONTEXT  
DISPLAY:MACRO NOT ALLOWED IN CORE IMAGE CONTEXT  
DISPLAY:MACRO NOT ALLOWED IN BREAK-IN CONTEXT
```

If successful each macro has as its final display

```
DISPLAY: macro-name RUN SUCCESSFUL
```

Function

Initialises the LPS property system by setting up the installation default property description in file :LPSCONTROL.LPSPROPDESC.

Format

LPSDEFAULTS *CR *file description*

where the *CR *file description* parameter is optional

Forbidden contexts

This command can only be issued under :LPSCONTROL

Execution

If no *CR *file description* parameter is present the ICL standard defaults (see Appendix 2) are set up.

If the *CR *file description* parameter is present the file specified contains the attribute parameters whose formats are specified in Appendix 2 and that serve to define the installation defaults. Where an attribute is not specified the ICL standard default is assumed.

If successful the program halts HH and the macro issues the display:

DISPLAY:LPS PROPERTY FILE HAS BEEN INITIATED

If unsuccessful the macro or program will display an error message and if it is a program issued error the program will halt ER

Example

LPSDEFAULTS *CRINSTDEFAULTS

Error messages

1 Issued by the program:

(a) A self explanatory attribute error message and

DISPLAY:ATTRIBUTE PARAMETER ERROR

(b) A consistency error message (see section 2.2.3) and

DISPLAY: PROPERTY DESCRIPTION CONSISTENCY ERROR

2 Issued by the macro:

DISPLAY: MACRO MUST BE ISSUED FROM :LPSCONTROL

DISPLAY: *CR PARAMETER INVALID

Function

- 1 Introduces a new LPS property to the LPS property system
- 2 Removes an LPS property and all associated property sets from the LPS property system

Note: This macro does not access :SYSTEM.PROPERTY

Format

- 1 LPSPROPERTY *CR *file description*, PR *property name*
- 2 LPSPROPERTY CC PR *property name*

For format 1 the *CR *file description* parameter is optional and if omitted the following comma may also be omitted.

Property name must conform to local name format. The name may be omitted to allow a null LPS property to be set up and to be cancelled.

Forbidden Contents

This command can only be issued under :LPSCONTROL

Execution**Format 1**

If no *CR *file description* is present, the property set up will be equivalent to the installation defaults.

If the *CR *file description* parameter is present, the file specified contains the attribute parameters whose format is defined in Appendix 2 and that serve to define the property description. Where an attribute is not specified, the installation default is assumed.

If the property name is not known to the LPS system and parameter errors or attribute errors do not occur then the property with the associated description will be added to :LPSCONTROL.LPSPROPDESC.

If successful the program halts HH and the macro displays the message:

DISPLAY: LPS PROPERTY *name* NOW EXISTS
or
DISPLAY: LPS NULL PROPERTY NOW EXISTS

If unsuccessful, the macro or program will display an error message and if it is a program issued error the program will halt ER. See *Error messages* for further details.

Format 2

The entry for the specified property and any property sets containing the property are removed from :LPSCONTROL.LPSPROPDESC.

If any of the property sets containing the property are currently available to LPS (that is, an LPSATTRIBUTE command is outstanding), they will no longer be available except in the case where the LPS subject program is currently actioning one such property set. In this case the LPS subject program will continue to spool outstanding listfiles with the given property set until all such listfiles are cleared or the LPS subject program is terminated.

If successful, the program halts HH and the macro displays the message

DISPLAY: LPS PROPERTY *name* CANCELLED
or
DISPLAY: LPS NULL PROPERTY CANCELLED

If unsuccessful, the macro or program will display an error message and if it is a program issued error the program will halt ER. See *Error messages* for further details.

Examples

```

1  LPSPROPERTY *CR TENINCHPARS(1),PRTENINCHFORM
   LPSPROPERTY PR LPSINSTDEF
   LPSPROPERTY *CR NULLPARS,PR
2  LPSPROPERTY CC PR TENINCHFORM

```

Error messages

1 Issued by the program:

```

DISPLAY: LPS FILE FORMAT INVALID
DISPLAY: name IS NOT A LOCAL NAME
DISPLAY: LPS NULL PROPERTY EXISTS (format 1)
DISPLAY: LPS PROPERTY name EXISTS (format 1)
Self explanatory attribute error message and:
DISPLAY: ATTRIBUTE PARAMETER ERROR (format 1)
Consistency error message (see section 2.2.3) and
DISPLAY: PROPERTY DESCRIPTION CONSISTENCY ERROR (format 1)
DISPLAY: MAXIMUM PROPERTY LIMIT HAS BEEN REACHED (format 1)
DISPLAY: LPS NULL PROPERTY UNKNOWN (format 2)
DISPLAY: LPS PROPERTY name UNKNOWN (format 2)

```

2 Issued by the macro:

```

DISPLAY: LPS FILE NOT SET UP
DISPLAY: MACRO MUST BE ISSUED FROM :LPSCONTROL
DISPLAY: PROPERTY PARAMETER MISSING
DISPLAY: *CR PARAMETER INVALID (format 1)

```

Function

- 1 Makes an LPS property set available to the LPS subject program
- 2 Makes an LPS property set unavailable to the LPS subject program

Format

- 1 LPSATTRIBUTE PR *property set*
- 2 LPSATTRIBUTE CC PR *property set*

A property set can either be null or a set of one to four property names separated by ampersands.

Forbidden contexts

This command can only be issued under :LPSCONTROL

Execution**Format 1**

A check is made that all properties (or the null property) making up the property set are known to the LPS property system. In the case of the null or single property set the associated property descriptions in :LPSCONTROL.LPSPROPDESC are marked as available. For a property set made up of two or more LPS properties, a new property set description is set up in :LPSCONTROL.LPSPROPDESC.

If successful the program halts HH and the macro will display the messages:

DISPLAY: THE LPS PROPERTY SET

DISPLAY: *property set* (may require 2 displays)

DISPLAY: IS NOW AVAILABLE ON LPS

or

DISPLAY: THE NULL LPS PROPERTY SET

DISPLAY: IS NOW AVAILABLE ON LPS

If unsuccessful the macro or program will display an error message and if it is a program issued error the program will halt ER. See *Error messages* for further details.

Format 2

In the case of the null property set or single property set the associated property description in :LPSCONTROL.LPSPROPDESC is marked as not available. Where the property set is made up of two or more properties the associated property set entrant is removed from :LPSCONTROL.LPSPROPDESC.

If the LPS subject program is currently actioning the property set it will continue to spool out all such list files until they are cleared or the LPS subject program is terminated.

If successful the program halts HH and the macro will display the messages:

DISPLAY: THE LPS PROPERTY SET

DISPLAY: *property set* (may require 2 displays)

DISPLAY: IS NO LONGER AVAILABLE ON LPS

or

DISPLAY: THE NULL LPS PROPERTY SET

DISPLAY: IS NO LONGER AVAILABLE ON LPS

If unsuccessful, the macro or program will display an error message and if it is a program issued error, the program will halt ER. See *Error messages* for further details.

Examples

- 1 LPSATTRIBUTE PR TENINCHFORM&FORMOVERLAY
LPSATTRIBUTE PR
(attributes the null property)
- 2 LPSATTRIBUTE CC PRTENINCHFORM&FORMOVERLAY

Error messages

- 1 Issued by the program
 - DISPLAY: LPS FILE FORMAT INVALID
 - DISPLAY: *name* IS NOT A LOCAL NAME
 - DISPLAY: FORMAT ERROR IN PROPERTY PARAMETER
 - DISPLAY: LPS PROPERTY *name* UNKNOWN
 - DISPLAY: LPS NULL PROPERTY UNKNOWN (format 1)
 - DISPLAY: PROPERTY SET CURRENTLY KNOWN (format 1)
 - DISPLAY: *name* MAY NOT BE RESET TWICE (format 1)
(where *name* is an attribute identifier)
 - DISPLAY: MAXIMUM PROPERTY LIMIT HAS BEEN REACHED (format 1)
 - DISPLAY: *aaa* IS NOT COMPATIBLE WITH *bbb* (format 1)
(where *aaa*, *bbb* are attributes)
 - DISPLAY: PROPERTY SET NOT AVAILABLE (format 2)
- 2 Issued by the macro
 - DISPLAY: LPS FILE NOT SET UP
 - DISPLAY: MACRO MUST BE ISSUED FROM :LPSCONTROL
 - DISPLAY: PROPERTY PARAMETER MISSING
 - DISPLAY: PROPERTY PARAMETER TOO LONG

Function

- 1 Outputs a listing of all the LPS property sets known to the LPS property system
- 2 Outputs a listing in readable format of one of the property sets known to the LPS system
- 3 Outputs a listing in the same format as 2 of the LPS default settings

Format

- 1 LPSWHATPROPS *LF *file description*
- 2 LPSWHATPROPS PR *property set*, *LF *file description*
- 3 LPSWHATPROPS DEFAULTS

If *LF has no file description or the parameter is omitted the output will be sent to the monitoring file.

A property set can either be null or a set of one to four property names separated by ampersands.

Forbidden Contexts

NO USER

Execution**Format 1**

The format of the output listing is:

LPS PROPERTY SETS

A *first property set* (or NULL if null set)
A *second property set*

.
.
.

(The letter A appears as the first character of the line only if the property set is available)

or

NO PROPERTIES SET UP

Formats 2 and 3

The format of the output listing is

LPS PROPERTY SET: *property set*

LINES PER FORM =	n1, @ n2 LPI
COLUMNS PER LINE =	n3 @ n4 CPI
FIRST COLUMN SHIFT =	n5
CHANNEL 2 POSITIONS =	n61,n62,...or NONE (see note 1)
.	.
.	.
.	.
CHANNEL 7 POSITIONS =	n71, n72...
PAGE COPIES =	n8
SUPPRESSION AREAS =	LINES l1.1 TO l1.2 COLUMNS c1.1 TO c1.2 PAGES p1 TO p2 or NONE (see note 2)
STATIONERY =	<i>stationery name</i> or STANDARD
OVERLAY NEGATIVE =	<i>negative name</i> or NONE
CHARACTER SET =	<i>font name</i> USING n9 REPERTOIRE SET (see note 3)

Notes

- 1 Channel position lines may be multiple
- 2 Additional column and page pairs take the form
COLUMNS *c2.1* TO *c2.2* PAGES *p1* to *p2*
Further suppression areas result in multiple line output
- 3 *n9* is 64 or 96
- 4 A maximum of 80 characters per line is output

Examples

- 1 LPSWHATPROPS
- 2 LPSWHATPROPS PRTENINCHFORM&FORMOVERLAY,*LFWPFORM(1)
- 3 LPSWHATPROPS DEFAULTS

Error messages

- 1 Issued by the program:
 - (a) All formats
DISPLAY: LPS FILE FORMAT INVALID
 - (b) Format 2 only
DISPLAY :*name* IS NOT A LOCAL NAME
DISPLAY: FORMAT ERROR IN PROPERTY PARAMETER
DISPLAY: LPS NULL PROPERTY *name* UNKNOWN
DISPLAY: LPS PROPERTY *name* UNKNOWN
DISPLAY: PROPERTY SET NOT AVAILABLE
- 2 Issued by the macro
DISPLAY: LPS FILE NOT SET UP
DISPLAY: PROPERTY PARAMETER TOO LONG

The property description file :LPSCONTROL.LPSPROPDESC is a serial file (not indexed) that contains all the information relevant to the LPS property system. As well as the installation's LPS default information, the file contains a separate two record entry for each property set known to the LPS system.

The installation's LPS default information is set up using the LPSDEFAULTS macro. Single property entrants and the null property entrant may be added and deleted using the LPSPROPERTY macro. Property set entrants made up of up to four known LPS properties may be made available for use by the LPS subject program #XKNP using LPSATTRIBUTE. Information may be obtained from the file using the LPSWHATPROPS macro.

The overall file format is:

- Records 1 to n The installation default information consists of a variable number of records to allow for additions to the character set information. The actual number of records is given by the property set entrants offset in word 8 of record 1
- Record n upwards The LPS property set entrants are each made up of two records. The entrants are ordered primarily on number of properties in the set (null property first). The property set entrants are further ordered by treating the concatenated names as multi-word positive integers and ordering these in descending order
- Terminator record ****

A1.1 The installation defaults records

- Record 1: The defaults header record

<i>Word</i>	<i>Contents</i>
0	zero
1 to 3	DEFAULTS
4 and 5	Date file last written to in format <i>dd/mm/yy</i>
6 and 7	Time file last written to in format <i>hh/mm/ss</i>
8	First property set entrant offset (currently fixed at 2)
- Record 2: The defaults description record

<i>Word</i>	<i>Contents</i>
0	Page width
1	Page length
2	Character repertoire (64 or 96)
3	Characters per inch
4	Lines per inch
5	First column shift
6	Number of page copies
7	CTB and MXM identifiers

Character 0 = 0 if standard 64 CTB
 = 1 if standard 128 CTB

Character 1 to 3 =
 MXM identifier given by
 omitting the V from the font
 name,
 for example 011 for V011

8 to 10 Stationery name
 or
 First word zero for none

11 to 13 Negative name
 or
 First word zero for none

14 to 43 Channel tables (see section A1.1.2)

44 to 103 Suppression tables (see section A1.1.1)

Record 3

The font table

Word

Contents

0

Number of fonts

1 onwards

Font table made up of fixed length entries in the format

Word

Contents

0

Font name V_{nnn}

1

Bits 0 to 5 :associated CTB (0 if B64, 1 if B128)

Bits 15 to 23 :character repertoire value
 (64 or 96)

2

Bits 0 to 5 Frame depth in lines per inch
 (6 or 8)

Bits 15 to 23 Frame width in characters
 per inch (10, 12 or 15)

3

Zero

A1.1.1 Suppression table

The suppression table is made up of a series of consecutive variable length suppression records and is preceded by the table length in the first word. The first word is zero if there is no suppression.

A suppression record has the format:

Word

Contents

0

Total length of the record in words

1

Maximum number of suppression bytes in one line. (See note 3)

2

First line number where suppression record is valid

3

Last line number + 1 where suppression record is valid

4 to $3+2n$

n pairs of control words defining column positions and associated pages where suppression is turned on and off (see notes 1 and 2).

Notes

1 The minimum number of control word pairs (n) is 1

2 Each control word has the form::

Bits 0 to 5: 0lppps

where: ppp = first page copy to which suppression applies .

l = 0 if suppression byte required

= 1 if suppression off byte required

Bits 6 to 11 = Number of extra consecutive page copies to which suppression applies (zero if only one page copy). (Suppression is allowed only on page copies 0 to 4)

Bits 12 to 14 = 0

Bits 15 to 23 = Column number before which suppression bytes are to be inserted

Each consecutive pair of control words should define the suppression on and suppression off bytes for the same range of pages. Column numbers must be in ascending order (equality allowed) for the $2n$ control words in a record

3 The maximum number of suppression bytes in one line is given by summing the number of extra consecutive page copies + 1 for each control word in a suppression record which must be less than or equal to 60

A1.1.2 Channel tables

Each channel table is made up of five words and corresponds to the line positions of a specific track for tracks 2 to 7. Each five word channel table is a bit pattern of the line position where bit 0 of word 0 is set if no line positions have been given.

A1.2 The LPS property set entrants:

Record 1: The property set header

<i>Word</i>	<i>Contents</i>
0	zero
1	Bits 0 to 5 = 1 if property set is currently available (LPSATTRIBUTE macro used) =0 otherwise Bits 6 to 23 = n the number of properties in the set (values 0 to 4)
2	Property names in descending order (treated as three-word positive integers)

Record 2: The property set description

The format is equivalent to the defaults description record

The macros LPSDEFAULTS and LPSPROPERTY optionally require an attribute parameter file that defines a property description.

All parameters are optional and with the exception of continuation parameters for the same attributes and the terminator parameter may be supplied in any order. The parameters are 80-character card images with columns 1 to 4 containing the attribute identifier and columns 5 to 80 the attribute value in free format.

A2.1 *CPI

Directive name	*CPI
Purpose	*CPI specifies the number of columns per inch
Range of values	10 12, or 15 (see Appendix 3)
Default value	10

See also section A2.9, *WID

A2.2 *LPI

Directive name	*LPI
Purpose	*LPI specifies the number of lines per inch
Range of values	6 or 8 (see Appendix 3)
Default value	6

See also section A2.3, *LEN

A2.3 *LEN

Directive name	*LEN
Purpose	*LEN describes the number of printable lines
Range of values	12 to 78 at 6 lpi, 16 to 104 at 8 lpi
Default value	66

The length of the form is given by dividing the number of printable lines (*LEN) by the number of lines per inch (*LPI) and adding one inch for the half-inch margins at the top and bottom of the form.

A2.4 *CH_n

Directive name	*CH _n (where n = 2 to 7)
Purpose	*CH _n defines channel positions for the control of stationery movement
Range of values	2 to *LEN
Default value	NONE

Channel positions 2 to 7 correspond to track positions 2 to 7 as set on a 1900 page control loop.

There may be multiple values, which must be separated by commas. The multiple values can continue on a new line with *CH_n repeated.

If records are met where the PFCC character indicates a channel throw and the appropriate *CH_n has not been specified, a throw to channel 1 (top of form) will be initiated.

Each line number quoted in any of the channel directives must be unique. Line numbers within channels must be in ascending order.

Examples, using 12 inch stationery (print lines total 66)

*CH2 10,20,30,40,50
*CH3 23,46

A2.5 *COP

Directive name *COP
Purpose *COP controls the number of page copies
Range of values 0 to 255
Default value 0

*COP is used to indicate the number of extra page copies required and gives a result equivalent to the use of multi-part paper. Where the length of a form is less than seven inches, there are either two or three forms per page.
Example (giving an equivalent of 2 part paper)

*COP 1

A2.6 *OVN

Directive name *OVN
Purpose *OVN specifies which, if any, overlay negative is to be used
Possible value a name of maximum 12 characters
Default value NONE

The name must conform to GEORGE local name standards.

*OVN is used to ask the operator to load the appropriate Forms Overlay Negative. The name specified in the directive is the name that the operator will recognise as identifying a particular overlay. Overlay negative is the negative of a form which is placed round the drum such that records and positive are printed together making pre printed stationery redundant. On the LPS14 printer, the first file for which a change of overlay negative is required will cause the printer to halt and output the message

name NEGATIVE REQUIRED

Example

*OVN TAXFORM

A2.7 *SUP

Directive name *SUP
Purpose *SUP defines any data suppression that is required
Values see below
Default value NONE

*SUP allows part of a form to be suppressed. On an impact printer using, for example, two part stationery, the stationery itself may have areas blocked out such that the information only occurs on the master or on the copy. On the laser printer, the copies follow one another (see *COP) and so the areas to be suppressed must be stated explicitly.

The areas to be suppressed are given by line number, the column number and page copy number. The first printable line is line 1 and the leftmost printable column is column 1. The first (master) page is number 0 and the copies 1 to 4.

Suppression can occur on the master and up to four copies, but can only occur on consecutive page copies.

Each *SUP directive defines a series of lines where the columns to be suppressed are identical. {See Figure A2.1 and examples}

The simplest format of the *SUP directive is:

*SUP L(L₁,L₂),C(C₁,C₂),P(P₁,P₂)

where:

L₁ and L₂ are the printable line numbers at which the new suppression layout starts and finishes

C₁ and C₂ are the first and last suppression columns

P₁ and P₂ are the first and last page-copy numbers. The top copy starts at 0 so the page-copy values are 0 to 4

The simplest format is for one area of suppression. If only one line, column or page is affected, the number pair must be the same. For example, L(30,30) operates on line 30 only.

Multiple suppression areas are covered by repeating column numbers and page-copy numbers. The column and page-copy elements are paired and must always be quoted in pairs. The allowed number of *SUP directives decreases as the number of column and page-copy pairs in any one directive increases. The actual number of *SUP directives allowed is given by allocating a value of $4 + 2n$ per directive, where n is the number of column and page-copy pairs in the directive. The total value for all *SUP directives must not exceed 60.

Continuation of a directive is allowed on consecutive lines. Each continuation directive must begin with a new column and page-copy pair, that is

*SUP C(C₁,C₂),P(P₁,P₂)
 C₁ may equal C₂ and P₁ may equal P₂.

For consecutive column and page-copy pairs, the first column number in the second pair must be greater than the second column number in the first pair.

That is, in

SUPC(C₁,C₂),P(P₁,P₂),C(C₃,C₄),P(P₃,P₄)

C₃ must be greater than C₂

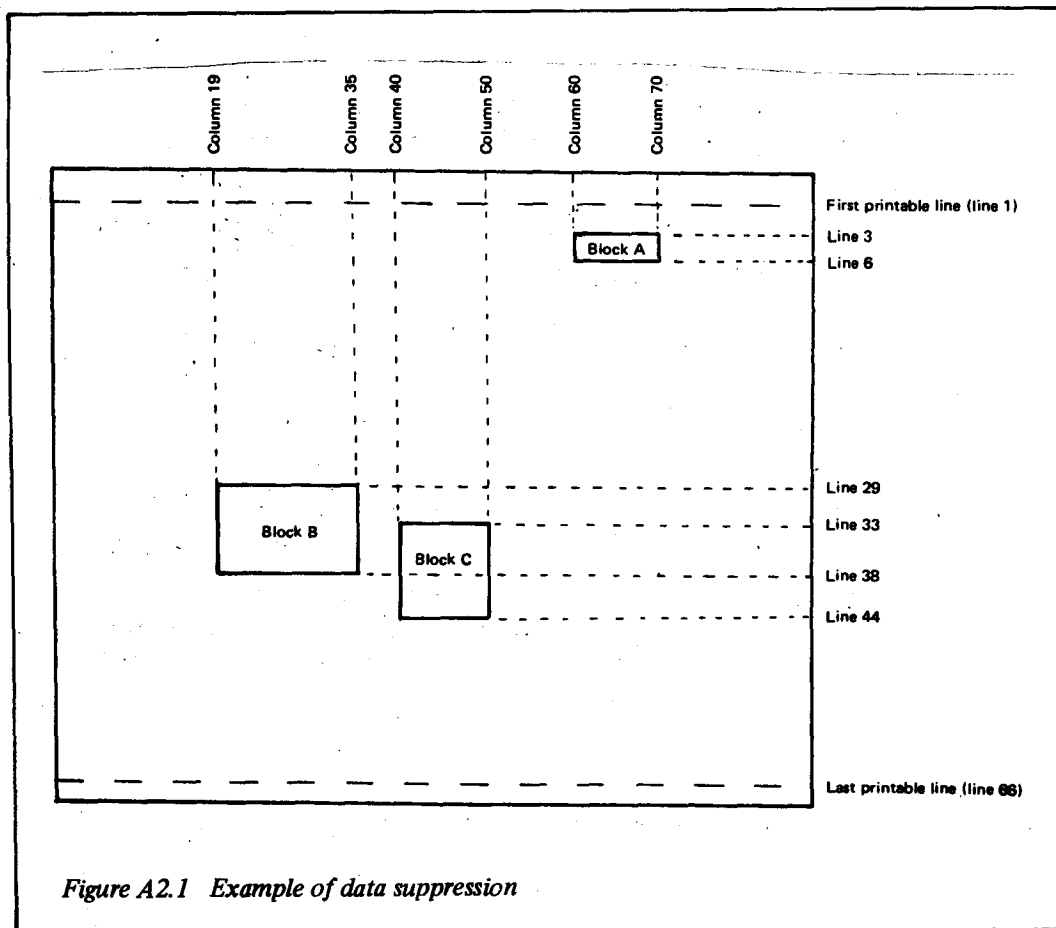


Figure A2.1 Example of data suppression

The *SUP parameters are:
 *SUP L(3,6),C(60,70),P(0,0)
 *SUP L(29,32),C(19,35),P(0,0)
 *SUP L(33,38),C(19,35),P(0,0),C(40,50),P(0,0)
 *SUP L(39,44),C(40,50),P(0,0)

In the above example, P(0,0) means page-copy zero, that is, suppression starts and finishes at copy 0.

If the above example had *COP=2 and suppression was required on page-copies 1 and 2 for block C, and A and B were required to be suppressed on all page-copies, the *SUP parameters are:

*SUP L(3,6),C(60,70),P(0,2)
*SUP L(29,32),C(19,35),P(0,2)
*SUP L(33,38),C(19,35),P(0,2),C(40,50),P(1,2)
*SUP L(39,44),C(40,50),P(1,2)

A2.8 *FNT

Directive name *FNT
Purpose *FNT specifies the character set to be used and is dependent on *CPI and *LPI

Range of values one name from V010,V011,V030,V032,V035
Default value V011

*FNT allows the character set of printed output to be specified.

V010 gives the standard 1900 64 character set printed in OCR-B
V011 gives a standard 1900 96 character set printed in OCR-B
V030, V032, V035 give standard 1900 64 character sets printed in gothic type

For further information on character sets, see Appendix 3

Example

*FNT V011

A2.9 *WID

Directive name *WID
Purpose *WID specifies the maximum number of columns per line
Range of values 20 to 136 at 10 cpi
20 to 163 at 12 cpi
20 to 204 at 15 cpi
Default value 136

Records longer than the specified width will be output as more than one line, as presently implemented on George.

The width of the form must be equal or greater than the width in inches given by dividing the number of columns (*WID) by the number of columns per inch (*CPI) and adding the first column shift (*COL multiplied by 1/10 inch) and one inch for the guide holes.

Example

*WID 120

A2.10 *COL

Directive name *COL
Purpose *COL specifies the first column shift
Range of values 0 to 31
Default value 0

The value is given in units of 1/10th of an inch

A2.11 *STA

Directive name *STA
Purpose *STA specifies special stationery
Possible value a name of maximum 12 characters
Default value NONE

*STA allows the user to specify that a special stationery is required.

The name specified in the parameter must conform to George local name standards.

On the LPS14 printer, the first file for which a change of stationery is required will cause the printer to halt and output the message

name STATIONERY REQUIRED

If subsequently, standard stationery is required, the LPS14 halts with the message

STANDARD STATIONERY REQUIRED

Example

*STA GREENPAPER

Table A3.1 defines the character sets available and the character and line density at which they should be printed. When using these character sets for printing data certain character conversions take place. These conversions are based on encoding conventions employed in the 1900 GEORGE 3 operating system.

Table 3.1
Available character sets

<i>Identifier (*FNT)</i>	<i>*CPI</i>	<i>*LPI</i>	<i>Repertoire Type</i>	<i>Notes</i>
V010	10	6	64	OCR-B 1,2
V011	10	6	96	OCR-B 1
V030	10	6	64	Gothic 1,2
V032	12	8	64	Gothic 1,2,3
V035	15	8	64	Gothic 1,2,3

Notes:

- 1 The following character conversions always take place to ensure consistency across character sets

1900	LPS
#	\
+	^ (circumflex)
+	_ (underline)
- 2 For shift files the character conversions that take place when using a 64 character set (for example, V010) are as for shift files printed on a 64-repertoire printer as currently implemented by GEORGE3
- 3 The values of *CPI and *LPI used with a specific character set must be such as to define a frame size greater than or equal to the character size. Thus the value of *CPI and *LPI used must be less than or equal to the values given for the specific character set

As well as the the property file LPSPROPDESC the Subject Program and its command macros read, write and update special files associated with the running of LPS under GEORGE 3. Each of these files is contained in :LPSCONTROL.

A4.1 Tape Journal Files

Each Pool tape to be used for LPS will have an associated journal file called JOUR tsn , where tsn is the 1900 tape serial number. The journal files are amorphous.

If the duplicate tape option is used, then equivalent information is written to both journal files, for the duplicate tapes.

Each LPS tape sent to the LPS Printer should be accompanied by its associated journal file. When a tape is re-used (it must have already been RETURNED to the Tape Pool), the associated journal file is overwritten. When the append-to-tape function is being used, the associated journal file is appended to. If a tape is no longer to be used as a LPS tape the associated journal file should be erased.

A4.1.1 Format of JOUR tsn

JOURNAL FOR TAPE tsn
=====

DUPLICATE TAPE tsn

see note 2

IDE DOCUMENT DESCRIPTION OR SYSTEM MESSAGE

Initial System Messages
Document Description (Repeated)
Final System Message (not always present)

Notes

- 1 tsn is the 1900 tape serial number. It is up to eight octal digits, right justified and prefilled with zeros.
- 2 The 'DUPLICATE TAPE record' and the following space line is present only if duplicate tapes are being used
- 3 There are either one or two Initial System Messages. The first always takes the form:

OUTPUT FROM $name&version$ STARTED ON $date$ AT $time$

where

$name&version$ refer to the version of LPS14 used

$date$ takes the form dd/mm/yy

$time$ takes the form hh/mm/ss

The second initial system message will be present only if the tape is a continuation of a previous tape. It takes the form:

CONTINUED FROM TAPE tsn

where tsn refers to the previous tape used

- 4 The Document Description is made up of two records. The first takes the form:

$file\ id$ LISTING OF $file\ description$ BY JB
' $username. jobname$ ' ' ON dd/mm/yy AT hh/mm/ss ' $exception$
 $messages$

where

$file\ id$ is a four character file identifier of the form $annn$ where a is the debatching character (value A to Z) and nnn is the file number in the multi-volume file set (value 001 to 999)

file description takes the form:

:Directory.local name (generation number/language code)

Username and *Jobname* identify the job from which the listfile was issued

Exception messages is a list of up to four words containing exception conditions for the file:

word 1: *CON if the file is split between two tapes

word 2: *INC if file is incomplete (FINISH NOW has occurred)

word 3: *CUR current lines (indicated as LINE CORRUPT in listing) are present

word 4: *OVP overprint attempted

The second document description record takes the form:

REQUIREMENTS - *statname* STATIONERY AND *negname* NEGATIVE

where

(a) *statname* is the special stationery name or STANDARD

(b) AND *negname* NEGATIVE is present only if an overlay negative is required. If it is, *negname* is the overlay negative name

5 The 'Final System Message' is present only if one of the following is true:

(a) a further continuation reel is used

(b) tape error has caused an attempt to tidy the end of the tape

(c) an append to tape is not possible

In case (a) the message is:

CONTINUED ON TAPE *tan*

where *tan* refers to the next reel.

Where there has been a failure to pick up a continuation tape the last record in the journal will be the document description record with a *CON exception message.

In the second case the possible messages are:

TAPE TIDY UNSUCCESSFUL

TAPE TIDY SUCCESSFUL

In the final case the message is:

TAPE APPEND FAILED

A4.2 The Tape Log File

Successive generations of the graphic file :LPSCONTROL.LPSTAPELOG are used to keep a log of the LPS tapes used. Each time a new LPSTAPE is used a record with the following form is appended:

words 0 and 1: The date the tape was first used, in the format dd/mm/yy

words 2 and 3: The time the tape was first used, in the form hh/mm/ss

words 4 and 5: Tape serial number of the tape in the format of eight octal characters

words 6 and 7: Tape serial number of duplicate tape in the format of eight octal characters; or spaces if there is no duplicate tape

word 8: *CON if this is a continuation tape

When LPSTAPELOG is full the next generation is used.

The Tape Log is designed to allow an installation a means of LPSTAPE management. The contents of the logs may be extracted and erased by user written macros. For example, if LPSTAPELOG contains only those entries relevant to unprinted tapes, then a macro could list the associated journal files and

erase the LPSTAPELOG entries, thus allowing for batching of tapes for transportation to the LPS14 Printer.

A4.3 The LPSINFO File

This graphic file has three distinct functions:

- 1 By renaming or initially setting this file up (contents should be one **** record) with a language code of /DUAL, an installation may incorporate the duplicate tape option (see section 3.5)
- 2 The first record of the file contains information to be held between GEORGE sessions, in the format:

word 0: Zero if append to last tape option, otherwise 1

words 1 and 2: Last *tsn* used

words 3 and 4: Duplicate last *tsn* used

Tape serial numbers are held as a string of eight right justified zero prefilled, octal digits. If no valid previous last *tsn* is known, then the associated value will be set to 77777777
- 3 Any error messages from the Subject Program are appended to the file to allow diagnostics to take place (see Appendix 6)

A5.1 LPSJDF specification

LPSJDF is issued at EMS. It checks for the existence of LPSINFO and checks the validity of the contents of its first record in order to issue the first LPSRUN. The initial parameters to LPSRUN are as specified in the LPSRUN specification. If LPSINFO does not exist or has an invalid format, it is set with a valid default format of no last tape known and append to next tape option.

A5.2 LPSRUN specification

LPSRUN is the macro that is initially issued from LPSJDF at EMS and which subsequently re-issues itself with a new jobname (LPSJOB_n n = 0,1,...9). Each run of the macro corresponds to one run of the Subject Program (one LPS run) preceded by a WAIT LPSTIME command. Information is passed from one LPS run to the next via the LPSRUN parameters. A subset of this information is held in LPSINFO such that it may be retained between GEORGE sessions. LPSINFO will be updated each time a request for changed defaults is made using LPSCONTROL.

The parameters to LPSRUN are:

Parameter	Description	Value set by LPSJDF
A	Automatic append or new tape (0 if append, 1 if new tape)	Held in LPSINFO
B	Last <i>tsn</i> used (eight octal character <i>tsn</i> or 7777777 to indicate no last usable tape)	Held in LPSINFO
C	Last duplicate <i>tsn</i> used (as above)	Held in LPSINFO

After completing the WAIT LPSTIME command the macro checks for any change to the *duplicate tape* and *automatic append to next tape* options and takes appropriate actions.

Program #XKNP is loaded and the appropriate files assigned as specified in Appendix 6. The subject program is entered as specified in Appendix 6, normal halts being handled as described in that appendix. Known possible program events (for example, FINISHED or TIME UP) are checked for, and appropriate action taken. Unless LPSVALUE has been set to 5, the macro will re-issue itself issuing a new jobname and updated parameters.

A6.1 Parameters and entry points

A6.1.1 Parameters

#XKNP is controlled by the cycle of property sets in LPSDETAILS and LPSCONTROL. The program is entered with one compact parameter in the form of a character string of words, defined below.

<i>Word</i>	<i>Content</i>
0	0000 if using one tape 0001 if using two tapes
1	0000 if append to given tape 0001 if new tape required
2	0000 if automatic append as default 0001 if automatic new tape as default
3 and 4	Last tape <i>tsn</i> or 77777777 if no last usable tape
5 and 6	Last duplicate tape <i>tsn</i> or 77777777 if no last usable duplicate tape

A6.1.2 Entry points

<i>Entry point</i>	<i>Description</i>
0	Start of run
5	Attempt to specify given property set abandoned
6	Magnetic tape error

A6.2 Peripheral channels

<i>Peripheral channel</i>	<i>File description and/or use</i>	<i>Assignment</i>
*FHO	The LPLIST GEORGE 3/4 Interface Channel. Allows #XKNP to 'read' the formatted LISTFILE output	Start of Run
*FH1	:LPSCONTROL.JOUR <i>tsn</i> where <i>tsn</i> is the current tape serial number	<ol style="list-style-type: none"> 1 If append to last tape, assigned at start of run for reading, and released when read 2 For a new tape and each continuation tape assigned when the first complete file has been written to a tape in order that the headings and initial file identifier message may be written to it. <p>Subsequent to these two cases, the file is assigned, a file identifier message appended and the file released when a file has been successfully written to tape</p>

*FH2	:LPSCONTROL.JOUR $dtan$ where $dtan$ is the duplicate tape serial number. Only used with duplicate tape option	As *FH1
*FH3	Used to read to values of the installation parameter LPSVALUE and LPSTIME	ACCESS command used with information type HLSACTIVE at start of run
*FH4	:LPSCONTROL.LPSPROPDESC	Assigned and released by the subject program for each property set for which there are outstanding listfile commands
*MT0	Drive tape	<ol style="list-style-type: none"> 1 If append to last tape the last tape is ONLINED at the start of run. (If CANTDO a new tape is picked up). 2 For new tapes and continuation tapes a GETONLINE is used to pick up an LPSTAPE from the tape pool
*MT1	Duplicate drive tape. Used only with duplicate tape option	As *MT0
*CP0	:LPSCONTROL.LPSINFO	As well as being read and updated by LPSJDF and LPSRUN this file is also updated by the Subject Program to indicate the last tape used or when there is no usable last tape or to append error information. In each case the file is assigned, updated and released. (No usable last tape is set when EOT or a tape error is encountered. Last usable tape is set when the first file has been copied to tape)
*CP1	:LPSCONTROL.LPSTAPELOG.	The file is assigned and released each time a new LPSTAPE is used

A6.3 Halts

The possible program halts and subsequent macro action is:

<i>HALT</i>	<i>Description</i>	<i>LPSRUN action</i>
H1	Run terminated successfully	<p>Picks up the following information from the 'current display':</p> <p><i>words</i> 0 and 1: Last tan used (characters)</p> <p><i>words</i> 2 and 3: Last duplicate tan used (characters)</p> <p>and uses it to issue the next LPSJOB</p>
H2, H3 E1, E2 and E3	See LPSVALUE value 2, section 3.3	

LPS ERROR *nn*
mm (*nn* is the
error number and
and *mm* is the
supplementary
error number see
section A6.4

An error has been encountered
by #XKNP. The program
errors information has been
appended to LPSINFO and
the current display contains
the information as specified
for HALT:H1

The displays:
LPS ERROR *n*
mm and
PLEASE INITIATE
DIAGNOSTIC ACTION
will be output to the
operators console.

A further run of LPSRUN
will be initiated.

(Note: The operator
should extend LPSTIME
to allow the
diagnostic action to
take place)

A6.4 Error handling and error messages

If the subject program cannot complete the listing for any reason; for example, operator CANTDOes request to load a continuation reel, the program will RELEase the file handler channel. Thus, when output begins again, the listing will start from the beginning. Any dis-connection of the file handler from the subject program before the listing is complete, will have the same effect. There is no facility for the subject program to terminate and restart a listing part way through.

George 3 maintains the normal 'file-freezing' interlocks for files being listed. Over a system break, :SYSTEM.OUTPUT is "tidied up" in the usual way, such that any listing currently being implemented is marked as not yet implemented.

If, on restart, the append option is set (LPSVALUE=3) the subject program will append to the last tape used thus providing complete error recovery after system breaks. If duplicate tapes are used and a magnetic tape error occurs then, if on recovery the duplicate tape option is unset and the append tape option set, the next LPSRUN will cause the error-free tape to be appended to. Any errors encountered by #XKNP will cause the program to halt LPS ERROR *nn* *mm* and error information to be appended to LPSINFO. *nn* is the error number and *mm* is the supplementary error number.

The two displays

LPS ERROR *nn* *mm*

and

PLEASE INITIATE DIAGNOSTIC ACTION

are output to the operator's console.

The following table describes the current errors and the appropriate action taken by LPSRUN.

Error Number(nn)	Description	Supplementary Error Number(mm)	Description	Information appended to LPSINFO
01	Initial Parameter Invalid	01		01 00 ERROR IN INITIAL PARAMETER
02	LPSPRODESC Invalid	01	File format error	02 01 ERROR IN LPSPRODESC
		02	Invalid repertoire information or invalid property name format.	02 02 ERROR IN LPSPRODESC
03	Append to tape failure	03	No properties available	02 03 NO PROPERTIES AVAILABLE
		01	Error on first tape	03 01 READ ERROR ON TAPE ten -APPEND FAILED
		02	Error on dual tape	03 02 READ ERROR ON TAPE $dten$ -APPEND FAILED
04	Tape error before 1st file written to tape	03	Invalid journal file	03 03 JOUR ten ERROR-APPEND FAILED
		01	Error on 1st new tape	04 01 WRITE ERROR ON TAPE ten -NOFILES WRITTEN
05	Tape tidy successful after magnetic tape write errors	02	Error on dual new tape	04 02 WRITE ERROR ON TAPE $dten$ -NOFILES WRITTEN
		03	Error on 1st continuation tape	04 03 WRITE ERROR ON TAPE ten -NOFILES WRITTEN
06	Tape tidy unsuccessful after magnetic tape write error	04	Error on dual continuation tape	04 04 WRITE ERROR ON TAPE $dten$ -NOFILES WRITTEN
		01	Error on 1st tape	05 01 WRITE ERROR ON TAPE $sden$ -TIDY SUCCESSFUL
07	Failure to assign LPS FILE	02	Error on dual tape	05 02 WRITE ERROR ON TAPE $sden$ -TIDY SUCCESSFUL
		01	Error on 1st tape	06 01 WRITE ERROR ON TAPE $dten$ -TIDY UNSUCCESSFUL
08	Invalid parameter format after halt 'H2'	02	Error on dual tape	06 01 WRITE ERROR ON TAPE ten -TIDY UNSUCCESSFUL
		03	JOUR ten	07 01 FAILURE TO ASSIGN JOUR ten
09	Properties not known by George or console properties found.	04	JOUR $dten$	07 02 FAILURE TO ASSIGN JOUR $dten$
		05	LPSINFO	07 03 FAILURE TO ASSIGN LPSINFO
		04	LPSTAPELOG	07 04 FAILURE TO ASSIGN LPSTAPELOG
		05	LPSPRODESC	07 05 FAILURE TO ASSIGN LPSPRODESC
08	Invalid parameter format after halt 'H2'	01		08 01 ERROR IN PROPERTY SET PARAMETER
09	Properties not known by George or console properties found.	01		09 01 LPS INVALID PROPERTIES Property list (Maximum of five names. Console properties followed by CONSOLE) MAX NUMBER EXCEEDED (Only present if more than five properties)

This appendix gives a step by step description of how to set up and initialise the LPS system LPS14.20 on George 3 or 4.

Step 1

Set up the directory :LPSCONTROL with privileges ACTIVOP and HLSEXT. Give the user :LPSCONTROL sufficient MONEY and TIME rations as well as sufficient SPACENT budget for the maximum number of LPS tapes to be used.

Step 2

If the duplicate tape option is required, set up the file :LPSCONTROL.LPSINFO (/DUAL) containing a single **** record.

Step 3

Depending on the operator facilities required macroise the following:

- 1 The control of parameters LPSTIME and LPSVALUE to allow the operator to resume, halt, turn on or off the append-to-tape option and request a specific property set
- 2 The control of the LPS macros LPSDEFAULT (best set by the installation manager), LPSPROPERTY, LPSATTRIBUTE and LPSWHATPROPS
- 3 Tape handling (setting on or off the duplicate tape option, returning LPS tapes to the tape pool and using the LPSTAPELOG files to clear all journal files associated with drive tapes to be printed on the LPS14 printer)

Step 4

NEWCOPYIN the subject program #XKNP, the control macros LPSJDF and LPSRUN and the LPS macros (with the exceptions of LPSWHATPROPS) into directory :LPSCONTROL from the release tape using the following parameters:

```
PROGRAM XKNP, PROGRAM XKNP
LPSJDF, LPSJDF
LPSRUN, LPSRUN
LPSDEFAULTS, LPSDEFAULTS
LPSPROPERTY, LPSPROPERTY
LPSATTRIBUTE, LPSATTRIBUTE
****
```

Step 5

NEWCOPYIN the LPS macro LPSWHATPROPS into directory :MACROS from the release tape using the parameter.

```
LPSWHATPROPS, :MACRO.LPSWHATPROPS
****
```

Step 6

Until GEORGE 3 (8.65) is available, the following must be performed for GEORGE 3 (8.64).

Copy in the parameter files LPSG3SRCPARS and LPSG3MENDS using NEWCOPYIN into a user name independent of existing GEORGE source.

The data contained within the file LPSG3SRCPARS is itself a set of NEWCOPYIN parameters and this should be used to perform a further NEWCOPYIN run, to read in the new GEORGE 3 chapters and macros necessary to run the LPS subject program. It is essential to create files of the same name, version number and generation as provided in the parameter file LPSG3SRCPARS for compatibility with standard GEORGE. Following copying the files into the filestore, the user must perform a restore with the file LPSG3MENDS, using his own user name.

It is recommended that :GEO is not used as this may jeopardise other corrections, as the new version numbers may not be compatible.

It should be noted that certain files referred to in LPSG3MENDS have been dumped to the NEWCOPYOUT tape with slightly amended file names. In each case, the amended file name is a concatenation of the original file name and the generation number. For example, NEWINST (864) has been dumped as NEWINST864. This avoids confusion between standard issued GEORGE chapters and their macros and their LPS counterparts.

Step 7

Turn LPS on using the restore time macro LPS. The specification of this macro is as follows

Function

Allows or suppresses the initiation of an LPS job

Format

LPS ON
or
LPS OFF

Execution

If the parameter is ON the LPS job is started at EMS. If it is OFF, the job is not started. On the standard issue LPS OFF is set

Error message

PARAMETER MUST BE ON OR OFF