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                    PRINTER SPOOLER DOCUMENTATION
                           MANAGER GUIDE

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## 0.0 Introduction
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 See USER GUIDE !


## 1.0 Setting Up
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 The Printer  Spooler is primarily aimed  at use on LEVEL  3 WINCHESTER FILE
SERVERS. It's use on  floppy file servers of any type  is not recommended as
it will run like  a drain. It may also run on a  local winchester under ADFS
if you're extravagant enough,  but a LEVEL 3 file server  must be present to
provide the time and date.
 So the first thing to do is to  decide which filing system you are going to
run the printer spooler on.


## 1.1 Running under NFS
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 Firstly a  user id must be provided  for the spooler, the  spooler needs to
know what this id is so that it can automatically log on to the file server.
For this  user, the  BOOT option must  be UNSET,  or dire  consequences will
result when the spooler tries to log on.
 A  directory must  also be  created into  which the  spooled files  will be
placed, along with  a header file and footer file.  Naturally this directory
and these files must be available to the above use (i.e. must be readable).

 The spooler has built in defaults for these, they are:

*I AM SPOOLER   - For the user id (no password set)
PRINT           - The directory for spooling (in the urd)
HEADER          - For the header file (in the urd)
FOOTER          - For the footer file (in the urd)

 These defaults may be changed on starting up the spooler (see section 3.0).

1.2 Running under ADFS
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  Setting up is the same as for the NFS except that no user id is required.


2.0 The Header and Footer files
    ---------------------------

  These  files allow the spooler  to always print  a piece of text,  and send
control codes to the printer at the start and end of every print.

  The header file may contain a large banner  to be output at the top of each
print,
e.g.    A           CCCCC      000000     RRRRRR    N    N
         A A        C     C   0      0    R     R   NN   N
        A   A       C         0      0    R     R   N N  N
       AAAAAAA      C         0      0    RRRRRR    N  N N
      A       A     C     C   0      0    R    R    N   NN
     A         A    CCCCC      000000     R    R    N    N


  The last character  in the header file could be a  formfeed (ASCII char 12)
so that the users text always starts at the top of a page.

  A use  of the footer file is to  ensure the printer is always  left in some
default state. For example:  a dot matrix printer is being  used which has a
fast line printing mode  and a slow letter quality mode.  If the user wishes
to use the slow, letter quality mode they would send the appropriate control
codes, and at the end of the print a sequence of control  codes in the footer
file would reset the printer to the faster mode.

  The maximum size of the footer and header files is about &1000 = 4K bytes.


3.0 Command mode
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  On start up, and after a fatal error the printer spooler issues the prompt,

Command :

  There are 9 commands available :

                                    START
                                    FS
                                    ID
                                    DIR
                                    HEADER
                                    FOOTER
                                    COPIES
                                    SIZE
                                    NAME

  Enter the command and hit RETURN,  the program will then prompt for further
input (i.e. user id, directory or filename) if appropriate.

* commands can also be issued while in command mode.

e.g.

    *fx 5 2   - to set the printer type attached to the spooler.


## 3.1 START
    -----

 When all options have been set to  the required states START will start the
printer spooler.  The spooler  will issue  the message  'Ready :'  after its
initialisation.


## 3.2 FS (Default NET)
    ----------------

 The FS command is used to select  the filing system to use, and returns the
prompt,

Filing system to use (ADFS/NET) :

type ADFS or NET to select the filing system you wish to use.


## 3.3 ID (Default SPOOLER)
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 If the Network filing system is being  used, the spooler needs to know it's
userid for automatic logon. In response to the prompt,

User id for spooler :

type  <userid> [<password>]


## 3.4 DIR (Default <users root|$>.PRINT)
    ----------------------------------

 This selects the directory into which the spooling files will be placed. In
the NFS this is defined from the user's root directory, in the ADFS from the
root.  Any files in this directory will be printed, so on start up any files
present will be printed  and deleted. If the files where  print jobs this is
okay, however if a  file was, say, a machine code program  the effect on the
printer would be unpredictable.  If the spooler is running under  NFS on the
file server, other users must not be permitted access to this directory.


## 3.5 HEADER (Default <users root|$>.HEADER)
    FOOTER (Default <users root|$>.FOOTER)
    ---------------------------------------

 These commands allow redefinition of the files to be used as the header and
footer files, the purpose of which is explained in (2.1).

## 3.6 COPIES (Default 1)
    ------------------

 A utility called  COPIES is provided which will allow  multiple copies of a
document to be printed from a single  copy sent to the spooler. This command
allows the  Network Manager  to set the  maximum number  of copies  that the
spooler  will print  for  one  document.  Between  1  and  8 copies  may  be
selected.


## 3.7 SIZE (Default &FFFFFFFF)
    -----------------------

 The Network Manager  can set the maximum size of document  to be printed by
the spooler with this command. Large unprinted  jobs then sit in the spooled
directory marked  'Too big'  until the  Network manager  (you) restart  them
using the utility SpoolSyst.

e.g.
    To set the maximum size to 64K

    type SIZE[RETURN]
         10000[RETURN]

The size must be entered in hexadecimal.


## 3.8 NAME (Default SPOOL)
    --------------------

 This gives the printer a name to respond to

e.g. In response to the prompt

    Printer name :

    type MATRIX[RETURN]

     this then sets the name of the  spooler, so that the spooler will reply
    to POLLPS if supplied with any of 'PRINT','SPOOL' or 'MATRIX'.


## 4.0 The Screen Display
    ------------------

 While running, the spooler displays it's current state on the screen. Under
the text 'Printer Spooler Vx.yz' appear  the stations from which the spooler
is receiving input (between zero and  four stations). Below this appears the
state of the printer, either

Printer Idle

if (amazingly) the printer is idle, or if the printer is active a display of
the form,

   Date 01/04/1984      Time 14:18:34
   Station  006  Time spooled 14:18:22

which is the information concerning the currently printing job.


## 4.1 The function keys
-----------------

 If  the printer  is idle,  pressing 'f0'  (function key  0) will  cause the
printer to do a formfeed (i.e. ASCII char 12)

 If the printer is busy, pressing 'f1' will prompt with

            A to abort print and delete this file
            C to continue printing this file
            R to restart printing this file
             Hit A/C/R :

 Hit the one of the keys A/C/R depending on your choice, e.g.
 'A' would be chosen if the file contains an illegal sequence of printer
     control codes, which has placed the printer in an unsuitable state.
 'C' would be chosen if the print was halfway through and the paper ran out.
 'R' would be chosen if say the printer jammed and ate half the print,
     and it was desired to restart the print from scratch.

 Key 'f2' is  used to take the spooler off line "gently".  If the spooler is
inactive on pressing 'f2' it will enter command mode immediately, however if
it is busy it will display the message

            Stopping Spooler

 When the current  spooling and printing is finished, it  will enter command
mode (note  that during  this time new  print requests  will be  receive 'No
Reply').
 While the 'Stopping Spooler' message  is displayed pressing 'f2' again will
countermand the previous 'f2', and the spooler will revert to normal.


## 4.2 The spool queue
----------------

 An entry in the spool queue is simply a file in the directory chosen by the
DIR  command. However,  files do  not become  eligible to  be printed  until
spooling  into  them  has  been  finished.  The  position  of  a  particular
(finished) print in the queue is then determined by two things.

(i)  Most importantly the initial letter of the filename.
     This can be one of { A L Y Z }.
     A - Maximum priority. This only happens if SPOOLSYST is used.
     L - Normal jobs.
     Y - These jobs are 'Too big'.
     Z - Suspended jobs.

(ii) Secondly the time at which the spool was started.
     After the first letter  are 6 numerals giving the time  the job started
     spooling.  Normal jobs  will  then print  out in  the  order that  they
     started spooling.

 The last three characters of the filename are the station number from which
the print originated.

Further information concerning each print job  is help as the load and exec
addresses of the file. If the  catalogue information concerning a particular
file is read into a control block it will consist of the following :

```
        Catalogue information       Spooler information

        Address of filename LSB  00  LSB Address of filename
                            MSB  01  MSB

        Load address        LSB  02  Network number (See Econet Bridge!)
        of file                  03  Number of copies to print - 1
                                 04  ---
                            MSB  05   |
                                      |  Six character string
        Execute address     LSB  06   |  as supplied by *COPIES
        of file                  07   |  or all &FF if none
                                 08   |
                            MSB  09  ---

        Length              LSB  0A  LSB  Length
        of file                  0B       of file
                                 0C
                            MSB  0D  MSB

        Attributes               0E  Attributes

        Disc address        LSB  0F  LSB Disc address
                                 10
                            MSB  11  MSB
```

 It is a  string containing this information that is  returned by the SPOOLQ
utility.
 Simply  by changing the  first character of each  file name we  can restart
'Suspended' or 'Too big' jobs, and suspend 'Spooled jobs'.


5.0 POLLPS interface
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   The  POLLPS  interface  is  a method  of  finding  the  state  of  printer
servers/spoolers attached to your Econet.

 An 8 byte packet is sent to the printer on port &9F, consisting of,

        6 byte string
        1 byte reason code
        1 byte argument

 Currently there are  6 valid reason codes. The descriptions  below show how
the printer spooler responds to these various reason codes.

 The printer replies to the sender on port &9E.

 There are two utilities provided which use this interface.
 The  normal POLLPS  which works  with both  servers and  spoolers, and  the
utility SPOOLQ which works only with spoolers.

5.1 Reason code 1  - Poll printer.
     -------------------------------


 The  printer will  reply if  the 6  character string  sent is  one that  it
recognises. All printers  respond to PRINT, spoolers also  respond to SPOOL,
and both servers and spoolers can respond to a string entered on start up.

 The printer responds with 3 bytes

byte 0  Status            0 free, 1 busy,
                          2 jammed completely, 3 jammed printer
     1  Station number    Only if status is busy
     2  Unused

Notes:
  (i)   Printer servers respond with  the station number they are busy with,
  however as a printer  spooler is only busy if all  four  channels on the it
  are  being  used at  once,  the  station  number  will be zero. This is to
  differentiate between spoolers and servers.
  (ii)  The status  code 2 is returned by a printer  server or spooler. This
  indicates that no print  jobs will be accepted. In the case of the spooler
  it means that the network manager is taking the spooler 'off line'.
  (iii) Status code 3 is only returned  by spoolers. This indicates that the
  physical printer  is jammed,  but print  jobs will  still be  accepted and
  spooled.


5.2 Reason code 2  - Poll and connect.
     ---------------------------------


 Never  implemented; in  printer spooler will  be treated as  code 1  - Poll
printer.

5.3 Reason code 3  - Poll despooling job.
     ------------------------------------
 If a job is being despooled then a  text string is returned to the caller (
<128 bytes  in length)  terminated by a  byte containing &FF.  If no  job is
despooling 3 zero bytes are returned.



5.4 Reason code 4  - Poll spooling jobs.
     -----------------------------------


 The argument stipulates which entry in  the list of spooling jobs to return
information about. It may take a value  between 0 and 3 inclusive. Similarly
to Code 3 a text string or 3 zero bytes are returned.



5.5 Reason code 5  - Poll all jobs.
    -------------------------------


 Again the  argument byte stipulates the  number of the job  in the complete
queue to return information  about, and the returned info is  as for Codes 3
and 4.  This call will  return information  on all spooling,  despooling and
passive jobs (i.e. awaiting printing).

5.6 Reason code 6  - Printer name
    ----------------------------


  The name allocated to the printer on start up (on the spooler this defaults
to SPOOL) is returned in 6 bytes padded to the right with zeros.



6.0 The change queue interface
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  It happens quite often that a job  in the printer queue is no longer wanted
or it is desired to suspend a job. This interface exists to do exactly that.
It allows normal users to remove, suspend or resume their jobs in the queue.
An extension  allows the  network manager the  above type  of access  to any
files, allows him to  give a job maximum priority, and  restart prints which
are 'Too big'.

  Users are  provided with the utilities KILLPRINT, RESUME  and SUSPEND which
use this  interface, the  network manager  has the  utility SPOOLSYST  which
performs all these functions and more.

   To use  this  interface  a packet  is  sent to  the  spooler  on port  &9D
consisting of 8 bytes :

            1 byte reason code
            6 byte time identification (if relevant)
            1 byte - zero (0)

  The  spooler will reply with  3 bytes on  port &9D; if the  transaction was
successful the 3 bytes  will be  &FF, if unsuccessful (no  such file,  wrong
station) the 3 bytes will be zero.

  The reason code takes the values 0 to 2 inclusive and &80 to &83 inclusive.
 Reason codes 0  to 2 are available to the user  in the utilities KILLPRINT,
RESUME, SUSPEND, and can only effect prints from the same station.
 Reason codes &80 to &83 are  available to the network manager by SPOOLSYST.
This utility  should be kept  well away from normal  users as it  can effect
print jobs from any station.

  The  time identification consists  of a 6 character  string of the  time (2
bytes hours,  2 bytes minutes,  2 bytes  seconds), which corresponds  to the
time of the print to be affected.

  All the following  reason codes will result in a  failed transaction if the
file to be effected is being spooled into  at the time (You cannot rename an
OPEN file) with the exception of code 0 from the same station as the print -
see 6.1 below.



6.1 Reason code 0 - Delete a file
    ----------------------------


  If the user is currently sending information to the spooler the time string
is insignificant, and the currently spooling job is marked for deletion when
it finishes. Spooling may continue, but when ctrl+c is typed the whole print
will be killed. (Note that the  supplied utility KILLPRINT stops the network

ROM printing by doing a ctrl+c).
 If the print has finished and is  anywhere in the queue ( 'Suspended', 'Too
big', 'Printing' or simply 'Spooled' )  sending the relevant time will cause
it to be deleted, even if currently being printed.


6.2 Reason code 1 - Resume a file
    -----------------------------

 By the supplying the relevant time a 'Suspended' job will be placed back in
the normal  queue -  this has  no effect on  'Too big' jobs. This  works by
renaming the file to have a first character of 'L' instead of 'Z'.


6.3 Reason code 2 - Suspend a file
    -----------------------------

 This  has the  opposite effect  to code  1. A  normal job,  if not  already
printing, will be  suspended by renaming a  file starting with 'L'  to start
with 'Z'.

Note that codes 0  to 2 will also effect jobs from the  same station even if
given maximum priority by the network manager.


6.4 Reason code &80 - System delete a file
    --------------------------------------

 By supplying the relevant time any file from any station can be deleted, as
long as it is not being spooled into.


6.5 Reason code &81 - System resume
    -------------------------------

 As code 1, but this also effects  'Too big' files, and of course files from
any station.


6.6 Reason code &82 - System suspend
    --------------------------------

 As code 2, and also effecting 'Too big' files and files from any station.


6.7 Reason code &83 - System priority
    ---------------------------------

 This  causes the relevant  job to be  placed at the  front of the  queue by
renaming the file to start with an 'A'.  This also effects any file from any
station.

7.0 Extended print interface
    ------------------------

 Before printing starts the person wishing to print may send a packet to the
spooler on port &9E consisting of 8 bytes,

        1 byte - zero
        1 byte - (number of copies - 1)
        6 byte - text string

 If a print started with the normal ctrl+b within the normal time out period
(approx 256 seconds)  this will cause the  specified number of copies  to be
printed, and  the given text  string to be associated  with the print  - see
4.2.


8.0 The Utilities
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 The utilities supplied for use by the user are detailed in the USER GUIDE.
 The only utility for use exclusively by  the network manager ( and it would
be best kept that way ) is SPOOLSYST.


8.1 SPOOLSYST
    ---------

  This combines  the utilities  KILLPRINT,  RESUME, SUSPEND  and gives  them
privilege over  all stations (  change queue  interface reason codes  &80 to
&82) and adds the ability to give a job high priority ( code &83).

 The syntax for SPOOLSYST is :

    *SPOOLSYST <hh:mm:ss> <K|P|R|S>

Where the letters stand for :
        K - Delete the print (KILLPRINT)
        P - Give file maximum priority
        R - Replace file in queue (RESUME)
        S - Place file in suspended state (SUSPEND)