




GPLⁱ





Copyright © 2010 – 2015 JetLab S.r.l. All rights reserved.
4i is a JetLab S.r.l. trademark.


Microsoft, Windows, Windows NT, Windows XP, Windows Vista, Windows 7 and the Windows logo are trademarks or registered trademarks of Microsoft Corporation U.S. or other countries or both.

Java and all Java based trademarks and logo are trademarks or registered trademarks of Sun Microsystems, Inc. in the U.S. or other countries, or both.

UNIX is a registered trademark in the United States and other countries licensed exclusively through X/Open Company Limited.

IBM Server, IBM i5 iSeries 400, OS/400, IBM i, i5/OS for Power Systems, AS/400 are a trademark of IBM Corporation, U.S.

Other company, product, and service names, which may be denoted by a double asterisk (**), may be trademarks or service marks of others.



Contents

Contents	3
General description.....	4
Requirements	5
Install the conversion procedure	6
Activate Servers and Devices	7
Run the conversion procedure	7
Component analysis	9
PDF Model	9
Features of the conversion procedure	10
Assigning a PDF model	10
Event *ENDPAGE.....	10
Action *VARIABLE	11
Action *MODULE	11
Event *END.....	14
Action *ATTRIBUTE.....	14
Action *CONTAINER	14
Action *SERVICE.....	15

General description

This White Paper shows how to create a procedure to convert a Spool file into a customizable document.

In particular, the Spool file generated with the command

DSPLIB LIB(QGPL) OUTPUT(*PRINT) is converted

QPDSPLIB is the spool file.

This is a preview of the file

```
Display Spooled File
File . . . . . : QPDSPLIB                               Page/Line  1/1
Control . . . . . :                                     Columns  1 - 130
Find . . . . . :
*.....1.....2.....3.....4.....5.....6.....7.....8.....9.....0.....1.....2.....3
5761SS1 V6R1M0 080215          Display Library          9/01/15 14:20:52      Page  1
Library . . . . . : QGPL
Type . . . . . : PROD
Number of objects . . . . . : 379
Library ASP number . . . . . : 1
Library ASP device . . . . . : *SYSBAS
Library ASP group . . . . . : *SYSBAS
Create authority . . . . . : *SYSVAL
Text description . . . . . : General Purpose Library
Object   Type      Attribute      Size  Description
CRTCMDNG *PGM      CLLE          90112 solo per traduzioni
CRTCMDINGA *PGM      CLLE          86016 solo per traduzioni
G4IUS     *PGM      CLLE          73728 G4IUS
PROOF     *PGM      RPGLE        122880 Check out Installation
RLEQCMD   *PGM      CLP           73728 Initiation of iSecurity+WS: QCMD predecessor
SETITA    *PGM      CLLE          73728 Set ita Language Library.
SETIUSA   *PGM      CLLE          77824 Set us  Language Library.
SETUSA    *PGM      CLLE          77824 Set us  Language Library.
SPX251_2  *PGM      CLP           40960
More...
```

F3=Exit F12=Cancel F18=Left F20=Right F25=More keys

Requirements

These are the requirements that must be met in order to complete the activities found in this document.

- **GPL4i** is already installed and configured on the IBM I system.
[http://www.jetlab.com/downloads/gpl4i/
GPL4i-V2R0M0-WP001_Installation-ENG.pdf](http://www.jetlab.com/downloads/gpl4i/GPL4i-V2R0M0-WP001_Installation-ENG.pdf)
- The GPL4i User Tool library is already installed and configured on the IBM I system.
[http://www.jetlab.com/downloads/gpl4i/
GPL4i-V2R0M0-WP002_Examples-ENG.pdf](http://www.jetlab.com/downloads/gpl4i/GPL4i-V2R0M0-WP002_Examples-ENG.pdf)

This document is oriented towards IBM I programmers with knowledge of RPG language and the ILE environment.

Install the conversion procedure

In the GPL4IUT library a conversion procedure called QPDSPLIB has already been installed.

This procedure converts spool files called QPDSPLIB into customizable PDF documents.

Follow these steps to install into **GPL4i** the example procedure which has been distributed in the library.

___ Step 1

Connect to the IBM I as user R4SP020000 and install the procedure with the following command

```
RSTGPLPRC SAVF(GPL4IUT/QPDSPLIB) PROC(*SAVPROC)
```

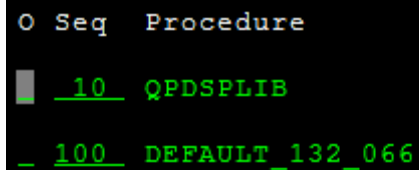
___ Step 2

Assign the right priority to the conversion procedure.

The WRKR4SPL command displays a list of conversion procedures installed.

Upon running the WRKR4SPL command a list of installed conversion procedures is shown.

Assure that the QPDSPLIB procedure comes before the default procedure.



Seq	Procedure
10	QPDSPLIB
100	DEFAULT_132_066

Activate Servers and Devices

GPL4i utilizes Devices to produce PDF documents or to activate archiving and distribution services.

Before continuing on converting the QPDSPLIB spool, the Server which controls the Device and the device itself need to be activated.

Follow these steps in order to activate the Server and the Device:

___ Step 1

Connect as user R4SP020000 and activate the server with the command:

```
STRSBS JTJT040000
```

___ Step 2

Activate the Device JTJT040000 with the following command:

```
STRR4DEV JTJT040000
```

Run the conversion procedure

Follow these steps to activate the conversion of spool files that list objects present in a library and to verify the result.

___ Step 1

Produce a spool file called QPDSPLIB in the system

```
DSPLIB LIB(QGPL) OUTPUT(*PRINT)
```

___ Step 2

Launch the spool file manager

```
WRKSPLF
```

Select the QPDSPLIB file with option 2 and modify the printer parameters

```
Printer . . . . . JTJT040000
```

Respond to the request to load the *STD module by selecting the same QPDSPLIB file with option 7 and respond with I=Ignore the message

```
Reply . . . I
```

___ Step 6

Verify that the document

```
/gpl4iut/temp/QPDSPLIB_<serial>.pdf
```

was generated. <serial> represents the IBM I serial number.

Open the document with any PDF reader.

This will be the result.

QPDSP LIB_5761SS1.pdf - Adobe Reader					
File Modifica Vista Finestra ?					
File personali 10 / 10 74% Strumenti Firma Commento					
Matricola	Versione OS	Data	Ora	Numero oggetti	Numero Asp
5761SS1	V6R1M0	11/09/14	16:46:50	461	1
QGPL					
Oggetto	Tipo	Attributo	Dimensione	Descrizione	
STRSEC	*CMD		8192	Start iSecurity	
STRSL	*CMD		8192	SL-Start Site License menu	
STRVIEW	*CMD		8192	Start View	
TMP628993	*CMD		8192	Change Application Container	
TMP628994	*CMD		8192	Deactivate Application Journal	
TMP628995	*CMD		8192	JR Define Journal Report Group Details	
TMP628996	*CMD		12288	Display Application by Receivers Business Analysis	
TMP628997	*CMD		12288	Display Application Journal Business Analysis	
TMP628998	*CMD		12288	Display File Journal Regulation Compli	
TMP628999	*CMD		12288	Display Set of Files Journal Application Trace	
TMP629000	*CMD		8192	End Real-Time Journaling	
TMP629001	*CMD		8192		
TMP629002	*CMD		12288	Retrieve Data-Base Updates	
TMP629003	*CMD		8192	GS Run Report Group	
TMP629004	*CMD		8192	Start Journal Menu	
TMP629005	*CMD		8192	Activate Application Journal	
TMP629006	*CMD		8192	Start Real-Time Journaling	
UPDSRVSEC	*CMD		8192	GS update Firewall-Server authority	
WRKFSSEC	*CMD		8192	Work with FileScope Security	
WRKFSTRC	*CMD		8192	FS trace	
WRKFVPT	*CMD		8192	Work with FILESCOPE ViewPoints	
WRKGSPCS	*CMD		8192	GS Work with GuardScope PCS security	
WRKRH	*CMD		8192	Work with remote Banking	
WRKSLAUT	*CMD		8192	SL-Work With Site License Authorization	
WRKSOFKEY	*CMD		8192		
WZRSRVSEC	*CMD		8192	GS Servers WIZARD	
QDSNX	*SBSD		73728	DSNX SUBSYSTEM DESCRIPTION	
QFNC	*SBSD		73728	Finance Subsystem	
QLMTUSRLIB	*DTAARA		8192		
QPWPS_MSGI	*DTAARA		8192		
QSSIMRI	*DTAARA		8192		
RLQCMDDFT	*DTAARA		8192	Security***WideScope Signon attributes	
XREF.QTEMP	*DTAARA		8192		
AA	*QRYDFN	QRY	16384		
CPYFFRMGST	*PNLGRP		8192		
GA4BLISTP	*PNLGRP		8192		
PDF	*PSFCFG		12288	Conversione PDF - Memorizza PDF in iet_env	
STRCODE	*USRSPC	USRDFT	8192	STRCODE Defaults	
Dimens. totale :			4659826688		

Component analysis

The following resources are used to obtain the PDF document.

PDF Model

The form utilized is contained in the file

/gp14iut/QPDSPLIB.zip

and is called

QPDSPLIB.pdf

As shown in the following image, it is a PDF which contains the following fields of text:

The screenshot displays the Adobe Acrobat Pro interface with the QPDSPLIB.pdf form open. The form is structured as follows:

- Header Section:** Contains five fields: **Matricola** (SERIAL), **Versione OS** (VERSION), **Data** (DATE), **Ora** (TIME), and **Numero oggetti** (NUMOBJECT).
- Library Section:** A large rectangular field labeled **LIBRARY**.
- Table Section:** A table with the following columns: **Oggetto**, **Tipo**, **Attributo**, **Dimensione**, and **Descrizione**. The table contains two rows: **TOTAL** and **FILLER**.

The right sidebar shows the **Fields** list, which includes the following fields:

- SERIAL
- VERSION
- DATE
- TIME
- TOTAL
- NUMASP
- NUMOBJECT
- OBJ
- ATTRIBUTE
- LIBRARY
- FILLER
- DESCR
- DIM
- TOTALDIM

The spool file conversion procedure will be the reference point to the field contained in the above form.

Features of the conversion procedure

The command `WRKR4SPL` shows the conversion procedures installed in *GPL4i*

```
Procedure list
Type options, press Enter.
  2=Change 4=Delete M=Pdf template A=Actions E=Events T=Test S=Save
```

O	Seq	Procedure	File	User	Printer	User data	Form type	Job
	10	QPDSPLIB	QPDSPLIB	*ANY	*ANY	*ANY	*ANY	*ANY
-	100	DEFAULT_132_066	*ANY	*ANY	*ANY	*ANY	*ANY	*ANY

Assigning a PDF model

Selecting the `QPDSPLIB` procedure with option `M=Pdf models management` shows the `.zip` file that contains the Forms useful to the conversion to generate PDFs.

```
List of Pdf Templates assigned to procedure QPDSPLIB
Type options, press Enter.
  2=Change 4=Delete
```

O	Lang	Ver	Zip File containing Pdf Templates
	ITA	001	/GPL4IUT/[%PROCEDURE].zip

Selecting option `E=Events` with the `QPDSPLIB` procedure shows the events controlled by the procedure.

```
List QPDSPLIB procedure events
Type options, press Enter.
  4=Delete A=Actions C=Conditions
```

O	Seq	Event
		*END
-		*END_PAGE

Event *ENDPAGE

The `*END_PAGE` event verifies itself every time *GPL4i* analyzes a page of spool file that it is elaborating.

Selecting the event with option `A=Action management` shows the actions that the procedure carries out to verify the event.

The actions assigned to the `*END_PAGE` event are as follows:

```

Action list

Procedure name. .: QPDSPLIB

Event name. . . .: *END_PAGE

Type options, press Enter.

    2=Change    4=Delete        A=Attributes

O Seq  Type      Action
  _ 1  *VARIABLE  variable
  _ 2  *MODULE    module

```

Action *VARIABLE

The action *VARIABLE allows you to initialize some variables by obtaining the values from the current page of the spool file.

Selecting the action with option A=Attributes management shows the rules to initialize the variables.

```

Variable list

Procedure name. . .: QPDSPLIB

Action name . . . .: variable

User Exit (lib/pgm):  /

Seq  Row  Col.  Leng  Variable
  _ 1   _ 1   _ 2   _ 7  SERIAL
  _ 2   _ 1  _ 97   _ 8  DATE
  _ 3   _ 1  _ 99   _ 8  TIME

```

For example, in this case the content of line 1 column 2 for a length of 7 will be utilized to initialize the SERIAL variables.

This variable will be utilized to compose the name of the PDF.

Action *MODULE

The Action *MODULE allows you to evaluate the fields of the Form with the content of the current page of Spool file. Selecting the action with option A=Attributes management the rules to initiate the fields of the Form are shown and whichever form to be utilized is stabilized.

Field list						
Procedure name. . . : QPDSPLIB						
Action name . . . : module						
Pdf Template. . . : QPDSPLIB.pdf						
User Exit (lib/pgm): GPL4IUT / QPDSPLIBUE						
From		To				
Seq	Row	Row	Col.	Leng	Pdf template field name	Record name
1	3		46	10	LIBRARY	
2	5		46	10	NUMOBJECT	
3	6		46	5	NUMASP	
4	1		2	7	SERIAL	
5	1		10	6	VERSION	
6	1		97	8	DATE	
7	1		106	8	TIME	
8	14		4	10	OBJ	RECORD1
9	14		16	9	TYPE	RECORD1
10	14		26	10	ATTRIBUTE	RECORD1
11	14		40	12	DIM	RECORD1
12	14		54	72	DESCR	RECORD1
13	52		17	16	TOTAL	RECORD2
14	52		40	12	TOTALDIM	RECORD2
15	55		1	130	FILLER	RECORD3

For example, in this case the content present in line 3 column 46 for a length of 10 will be utilized to initiate the library variable.

The screenshot shows a PDF form with the following fields:

- Matricola: SERIAL
- Versione OS: VERSION
- Data: DATE
- Ora: TIME
- LIBRARY (large field, highlighted with a blue arrow)
- Oggetto: TOTAL
- Tipo: TOTAL
- Attributo: TOTAL
- Dimensione: TOTAL
- FILLER

The right sidebar shows the Fields panel with a list of fields: SERIAL, VERSION, DATE, TIME, TYPE, TOTAL, NUMASP, NUMOBJECT, and FILLER.

Some fields were grouped by assigning them a reference and a record name.

The fields TOTAL and TOALDIM were assigned to RECORD2.

The field FILLER to RECORD3.

All other fields to RECORD1.

This assignment was made because in the QPDSPLIB spool file, from line 14 and down, 3 typologies of different lines can be printed:

The references to an object present in the library

CRTCMDING *PGM CLLE 90112 solo per traduzioni

The totals

Total size : 4652556288

Indication of the end of the list

* * * * end of list * * * *

Because of this, the line assigned to the field is ignored.

The UserExit GPL4IUT/ QPDSPLIBUE will indicate to the **GPL4i** conversion procedure which record to assign to the current line.

In effect in the RPG source GPL4IUT/QRPGLESRC(QPDSPLIBUE) the request coming from **GPL4i** is controlled.

```
c          select
* Which record is present in the line furnished in input?
Nella riga fornita in input quale Record è presente ?
c          when          Procedure = 'QPDSPLIB'
c                      and Event = '*END_PAGE'
c                      and Action = 'module'
c                      and ActionType = '*MODULE'
c                      and InfoName = '**RECORD'
c                      and Row > 13
```

The caller program is indicated which group record:

```
c          select
c          when          %scan('* * * * F I N ':InfoValue) > 0
c          eval          RecordsOn(3) = '1'
c          when          %scan('Dimens. totale ':InfoValue) > 0
c          eval          RecordsOn(2) = '1'
c          Other
c          eval          RecordsOn(1) = '1'
c          ends1
```

For every grouping made, by pressing F10=Group detail, the reference field and the pixel height of the record format are shown.

```
Record name . . . . . : RECORD1
Reference field . . . . . : OBJ
Pixel height. . . . . : 10
```

The reference field represents a field present in the Form that **GPL4i** will use as a reference point for positioning it in the PDF page.

Instead, the height represents the downward vertical movement for every line starting from the field of reference.

Event *END

The event *END verifies itself at the end of the spool file elaboration.

The actions assigned to the event *END are as following:

```

Action list

Procedure name. .: QPDSPLIB

Event name. . . .: *END

Type options, press Enter.

    2=Change    4=Delete    A=Attributes

O Seq  Type      Action
- - - - -
1  1  *ATTRIBUTE  attribute
2  2  *CONTAINER  container
3  3  *SERVICE   service
```

Action *ATTRIBUTE

The action *ATTRIBUTE allows you to assign user data to a document (information useful only if archive services are activated)

Selecting the action with option A=Attributes management shows the attributes to assign to the document.

```

List of *ATTRIBUTE

Seq  Attribute (?) / Value  (?)
- - - - -
1  Serial_Number
   [&SERIAL]
2  Date
   [&DATE]
3  Time
   [&TIME]
```

Action *CONTAINER

The action *CONTAINER allows you to assign a folder to the document (information useful only if archive services are activated)

Selecting the action with option A=Attributes management shows the folder assigned to the document.

```

Folder

Name. . . . . : [&PROCEDURE]
```

Action *SERVICE

The action *SERVICE allows you to assign additional services to the document.

Selecting the action with option A=Attributes management shows the available services:

```

List of available services

Service type. . . : █ 1=Email
                   █ 2=Save
                   █ 3=Show
                   █ 4=Store on DMS Client
                   █ 5=Print
                   █ 6=Fax
                   █ 7=Service on demand
                   █ 8=Store on DMS Web
```

In this procedure the Save service was only assigned to define the name of the PDF to be generated.

```

List of *SERVICE

Hold service: █ (Y/N)

Seq  Attribute (?) / Value  (?)  (?=List active attributes or variables)
---  -
 1_  path
     /GPL4IUT/temp/[%PROCEDURE]_[%SERIAL].pdf
 2_  replace
     true
```