

# Spool-a-Matic

Enhancement Summary

Licensed Program 2A55SAM V2R9M0



Spooled File Conversion

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## **Edition**

### **Eighteenth Edition (January 2020)**

This edition applies to the licensed program Spool-a-Matic (Program 2A55SAM), Version 2 Release 9 Modification 0.

This summary is available through option 1 of the SPLAMATIC menu, in PDF format in directory /Gumbo/Proddata/2A55SAM/doc on your system, and on the web at [www.gumbo.com](http://www.gumbo.com)

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## Installation Instructions

Follow these instructions to install Spool-a-Matic V2R9M0 on IBM i using physical media or a virtual image:

### Prepare

If you are upgrading a previous release (if Spool-a-Matic is currently installed), perform these steps before installing the software:

1. Read the Enhancement Summary to determine if any changes affect your installation.
2. Insure that the product is not in use, as the installation process must clear the product's library. This will fail if objects such as menus are in use. If the installation fails, the previous release will be restored.

### Install

**Note:** If you are installing from a save file downloaded as an executable zip (.exe), use the save file specific "readme.htm" instructions included in the download.

1. Sign on to the system as the security officer (QSECOFR).
2. Verify that your machine is at IBM i V7R3M0 or later by running:

```
WRKLICINF
```

**Note:** If you are running a version of IBM i earlier than V7R3M0 you cannot install Spool-a-Matic V2R9M0 on your machine. You must install an earlier version of Spool-a-Matic or upgrade the operating system.

3. Verify that user domain objects are allowed in the libraries SPLAMATIC and QSRV, by running:

```
WRKSYSVAL  SYSVAL(QALWUSRDMN)
```

Take option 5 to display the value. If the value is not \*ALL, use option 2 to add libraries SPLAMATIC and QSRV to the list of libraries where user domain objects are allowed.

**Note:** QSRV is required to correctly process PTFs when they are loaded and applied.

4. Insure that IBM i will be able to verify the signatures that we apply to our product's objects by installing our Signing Certificate and Root CA Certificate using Digital Certificate Manager. Alternately, insure that signature verification will not prevent the restore operation by running:

```
WRKSYSVAL  SYSVAL(QVFYOBJRST)
```

Take option 5 to display the value. If the value is 3 or higher, use option 2 to temporarily change the value to 1.

5. Mount the physical media or virtual image on the appropriate device.
6. Submit the Restore Licensed Program (RSTLICPGM) command to batch:

```
RSTLICPGM LICPGM(2A55SAM) DEV(device-name) LNG(2924)
```

**Note:** Where "device-name" is the device where the media or image was mounted and is usually OPT01.

**Note:** During the restore operation, the system operator message queue may receive inquiry message CPA3DE4 "Directory not registered. (C G)". Unless you are using a directory naming convention similar to ours (that is the directory specified in the CPA3DE4's second level text is unrelated to our software), you can safely respond with a "G" to reestablish the relationship between the directory and the product. Typically the message will occur three or four times.

## Finish

When the RSTLICPGM command completes, library SPLAMATIC and directory '/Gumbo/ProdData/2A55SAM' contain the new software. To complete the installation:

1. If you have an Authorization or Instructions letter with your permanent authorization code, enter the code now.

**Note:** Spool-a-Matic automatically grants 30 days usage for new installs or 90 days usage for release upgrades.

2. Retrieve the current cumulative Spool-a-Matic PTF package by running the following command:

```
SPLAMATIC/RTVGSIPTF
```

**Note:** **GUMBO** recommends downloading the current cumulative PTF package after installing the software.

3. Visit our PTF page at [www.gumbo.com](http://www.gumbo.com) and check the **Additional IBM i PTF Information** section for IBM PTFs you may need to install.
4. You can access the Spool-a-Matic menu by running the following command:

```
GO MENU(SPLAMATIC/SPLAMATIC)
```

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## Enhancements For Spool-a-Matic V2R9M0

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### What's In This Section

This section provides information on Spool-a-Matic enhancements for release V2R9M0, notes any customer code implications by marking them with a **COMPATIBILITY WARNING**, and describes where to find more information when applicable.

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### Retrieve Gumbo PTF (RTVGSIPTF) Command Updated

#### COMPATIBILITY WARNING

Previously, the Retrieve Gumbo PTF (RTVGSIPTF) command supported downloading PTFs using the FTP protocol. With this release FTP support is removed.

HTTP is now the only protocol for PTF retrieval. If your network restricts HTTP access or if a proxy is required for HTTP access the RTVGSIPTF command will fail. If a proxy is required you must fill in the PROXY() parameter.

The protocol PROTOCOL() parameter remains to provide backward compatibility with existing customer programs. If PROTOCOL(\*FTP) is specified, a message is issued, and HTTP is used to communicate with the PTF server.

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### Update Sample Program

Spooled File User Defined Option Program (SPLSAMOPT) was update to include creation date, creation time, and system name. A monitor was added to catch command cancel.

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### PAGSLT() Enabled

Missing internal load rendered PAGSLT() ineffective.

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### Source Access Option Added To Menu

Spool-a-Matic menu option 71 was added to provide access to examples and source code included in the product.

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### New Barcode Support

PDF support has been added for the following barcodes and barcode modifiers:

Name (ID)-Mod	Description
<b>CODE128 (17)-03</b>	UCC/EAN 128
<b>CODE128 (17)-04</b>	UCC/EAN 128 and GS1-128
<b>CODE128 (17)-05</b>	USPS Intelligent Container
<b>DATABAR (36)-11</b>	GS1 DATABAR EXPANDED
<b>DATABAR (36)-12:1B</b>	GS1 DATABAR EXPANDED STACKED
<b>MAILMARK (37)-00</b>	Royal Mail Mailmark TYPE-C
<b>MAILMARK (37)-01</b>	Royal Mail Mailmark TYPE-L

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### Retrieve Gumbo PTF (RTVGSIPTF) Command Updated

Previously, the Retrieve Gumbo PTF (RTVGSIPTF) command downloaded PTFs using the FTP protocol. Now RTVGSIPTF uses HTTP. Additionally, RTVGSIPTF can access the PTF server through a proxy server, if required by your network, using the new PROXY() parameter.

We anticipate that some installations' networks will have problems accessing the PTF server over HTTP. On a temporary basis, RTVGSIPTF has introduced a PROTOCOL() parameter that allows you to switch back to the old FTP behavior while correcting problems with HTTP service. This parameter will ultimately be removed along with support for FTP as a transport mechanism.

### **COMPATIBILITY WARNING**

HTTP is now the default protocol for PTF retrieval. If your network restricts HTTP access or if a proxy is required for HTTP access the RTVGSIPTF command will fail. If a proxy is required you must fill in the PROXY() parameter. Otherwise you will have to specify PROTOCOL(\*FTP) while you resolve problems with HTTP access on your network.

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### **Spool Interface Rewritten**

Our WRKGSISPLF and WRKGSIOUTQ commands have been rewritten to employ newer and speedier APIs from IBM. They now more closely emulate the IBM analogues. Performance improvement is particularly noticeable with very large lists. See additional enhancements listed below.

---

### **AFP Processor Changes**

- EXTAFPRSC miscalculated buffering leading to duplicate data in extracted resource.
- EXTAFPRSC was being fooled by a name containing all blanks resulting in IFS1001 3014. Now a blank name isn't used as the resource's name.

---

### **Encryption Changes**

- Replaced RSA MD5 implementation with IBM's built-in API, removing RSA copyright statements and acknowledgements. The product's Export Control Classification Number (ECCN) remains EAR99-NLR i.e. innocuous and exportable anywhere.

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### **Final Form Text Generator Changes**

- Uninitialized pointer can cause MCH3601 during error clean up under some failure scenarios. Clean up is left incomplete.

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### **Font Processor Changes**

- We were issuing diagnostic messages for each page when a spooled file specified a non-standard coded font and the coded font could not be found on the system. Messages are now only issued once per spooled file.
- X0ABCD no longer used as a default DBCS font.
- Now substitute Courier FGID of correct size for Symbol FGIDs: 8 > 11, 30 > 11, 80 > 75, 225 > 223.
- Avoid \*FGID alternative character set substitution from system table.
- When \*FGIDs were imbedded and when font internal height and external height disagreed, font height was correct on the first page only. The problem is corrected.
- Type 1 font resolution now strips marker fields from the font program resulting in a pure pfb. This resolves a complaint from more recent PDF/A validators such as veraPDF,



- There is a naming discrepancy between IBM and Adobe regarding the mu/micro glyph. This caused the character to non-display in some circumstances. We have standardized on Adobe's view and the discrepancy is resolved.
- Incorrect character positioning could occur when imbedding \*AUTO was used along with text relative positioning \*EXACT or \*EXACTMOD.
- Removed definition for font X0ABCD from internal font tables. This was an old work around that is no longer needed and gives incorrect results in some instances.
- This version of the font component ended, prematurely, reliance on source CCSID for font processing. Now source CCSID is again used as a last resort when font processing can't find any other means of determining CCSID. This primarily affects DBCS spooled files.
- Font processing is enhanced to parse and use information contained in font resources on the system and only referencing internal tables if the resource can't be found or if the resource doesn't contain the needed information.
- An internal change was made to avoid font resolution until the time information is needed, if ever.
- New export to allow retrieval of a font's Baseline Offset Default value.
- Update Baseline Offset Default retrieval to use FND Nominal Height if it is larger than Baseline Extent Max.
- Length and positioning were miscalculated for DBCS characters when processed in the presence of font resources. The old, correct, behavior has been restored.
- When determining a CCSID for a font based on GCSGID/CPGID fails, an attempt is made to identify a CCSID based on CPGID alone. This restores the previous behavior.
- Unicode map generation during code page \*FNTRSC resolution now suppressed when processing a single byte code page that represents an individual plane of a DBCS cpgid. This removes extraneous conversion failure messages.
- When font resources are substituted for FGID fonts, the resource's notion of size now overrules the GRID specification. This restores the old, correct, behavior.
- When OCRB was specified by FGID(3), an OCRA code page was selected incorrectly. Now OCRB CPGID 2086 is substituted for the CPGID 340 generated into the data stream and the error is avoided.
- Previously when producing unicode mappings when code page \*FNTRSCs were missing from the system, CPGID=37 was used as a default. Now the implied CPGID is used and accuracy increased for non CPGID=37 code pages.
- Test for equal character sets enhanced to look at the underlying \*FNTRSC and not the references, decreasing the number of false negatives.
- Processing enhanced to produce a unicode character map even in the absence of a code page \*FNTRSC object.
- New export allows retrieval of a font stack entry's opinion on the current effective ccsid.

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## FreeType Changes

- Update FreeType 2 code base from version 2.3.5 to version 2.6.2.

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## HTML Generator Changes

- Built in css changed from `tr { float: left; }` to `tr { float: none; }` to yield uniform "page" sizes during display.

- Support for \*AFPDS print data streams added.
- \*HTMLxxx transforms now support out of sequence data in a print data stream.
- \*HTMLxxx transforms now support mixed CCSID data in a print data stream. The specified source CCSID is used as a default value.
- \*HTMLxxx transforms now support complex over printing of DBCS data as well as other enhancements to overlap resolution.

## Integrated File System Changes

- New function to open (create) a file based on CCSID instead of CPGID added. This facilitates control over the created file's CCSID attribute.
- Glob (wildcard) processing was being too picky, only finding stream files in pure directories. Processing now correctly handles all Integrated File System objects including documents and folders.
- Potential memory leak under error conditions removed from glob processing.
- New internal version V1R5M0 of service program created to position for future enhancements.
- New functions to perform glob (wildcard) processing added.

## Message Environment Changes

- New export allows on the fly tuning of an existing message environment's diagnostic message delivery.

## PDF Generator Changes

- Erroneous message ID PDF0066 issued in all cases when \*PDF\* transforms specified.
- C/J/K DBCS fonts were too large after COR was applied and overlapped vertically. Sizing is corrected and overlap removed.
- C/J/K SBCS CCSIDs now converted correctly and presented with Adobe Asian Fonts.
- Buffer overflow exposure removed for barcodes:

<b>Name (ID)</b>	<b>Description</b>
<b>CODE128 (17)</b>	UCC/EAN 128
<b>RM4SCC (26)</b>	Royal Mail
<b>DUTCHKIX (26)</b>	Dutch KIX
<b>JPBC (27)</b>	Japan Postal
<b>AP4SCC (31)</b>	Australian Post
<b>CODE93 (33)</b>	Code 93
<b>INTELMAIL (34)</b>	Intelligent Mail Barcode
<b>DATABAR (36)</b>	GS1-DataBar

- Eliminated duplicate encoding, differences, and widths font information in generated file.
- Added new \*PREBLEND32RGB PDF image process blending (PDFIMGPBL) special value. With it 32 bit CMYK images are rendered with a RGB color model in the generated pdf. This can improve the appearance of an image.
- \*PREBLEND32RGB enabled on CHGSAMDFT command.
- Document string processing was enhanced. If conversion of data to Adobe's document string encoding would result in an incorrect or invalid string, the string is converted to

unicode instead. This corrects for rare and unlikely problems. For example, if a non-breaking space (x41) was included in the subject, it would display as a euro symbol.

- Internal DBCS font mapping table corrected and expanded to include all CCSIDs that map to Adobe built-in Asian fonts. CCSIDs 290, 833, 836, 1027, 1364, 1399, 4930, 4933, 5123, 13121, 13124, 16684, 28709 were added and now AFPDS data in these CCSIDs correctly map to the appropriate built-in.
- Apple's PDF viewer chokes when \*V5 encryption is specified. Their viewer shows a blank page because they are expecting an optional length value which, being optional, we didn't include. The length value is now included and 256AES encrypted files display without issue.
- PDF/A file validation was failing for files that contained bookmarks and for files produced with TXTRELPOS(\*EXACTMOD) when \*TYPE3 fonts were used. These now validate.
- Previously underscoring was accomplished by 'printing' the underscore character (\_). This method could produce length oddities. Underscoring has been re-implemented as a graphic line with improved start and stop accuracy.
- Certain raster fonts (ex. C0S0CR12) contain a discrepancy between the stated point size and the 'Baseline offset default' value. Sizing an Adobe builtin font using point size gave a result that was 'too small'. When the values diverge we now use 'Baseline offset default' to calculate size for the builtin giving results that better approximate the printed page.
- Missing resource messages generated during processing limited to 12.
- Internal changes allow a print data stream's contents to determine when DBCS processing is required to correctly render a spooled file. Previously processing was driven by the target CCSID specified on the command.
- Internal table mapping CCSID to Adobe Asian font name expanded to include SBCS CCSIDs used in ES 1301 mixed single and double byte CCSIDs.
- Text relative positioning \*EXACTMOD was incorrectly treated as \*EXACT when fonts were imbedded. The old, correct, behavior is restored.
- Font encoding when code page \*FNTRSCs are missing from the system is enhanced. Previously a missing code page \*FNTRSC was assumed to be CPGID=37 which gave erroneous results on non-US systems.
- Barcode processing enhanced:
  - CODE93 now supported.
  - DATABAR(GS1) now supported, except expanded Tye3 GS1.
  - Interleaved 2-of-5 now supports modifiers 0x03 and 0x04 (Bearer Bars).
  - DDS \*SWIDTH(symbol\_width) parameter now supported.
  - Print emulation switched from IPDS to HPT resulting in slightly smaller barcodes.
- Barcode support has been extended to include QR Code.
- Previously PDFNTIMB(\*FGID) looked for font resources in a list derived from the as shipped system font table. If no match was found, nothing was imbedded. Now if no match is found, Type 1 fonts present on every system are used. A font is always imbedded.
- Previously multiple copies of a font imbedded for an FGID or for PDF/A might be included unnecessarily. Multiples are now avoided.
- Incorrect data in an internal Intelligent Mail table resulted in invalid barcodes being generated something like 1.5% of the time.
- Inadvertent trimming of odd length single byte character strings within CJK double byte \*SCS spooled files has been corrected.

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## Print Data Stream Changes

- New export added to improve space/memory management between service program and clients.
- Page buffering enhanced to handle DBCS data with encoding schemes other than x1301.
- Uninitialized variable causes \*TXTxxx conversion failure when splitting the spooled file with PAGDTA() parameter.
- Internal modifications to increase modularity.
- Page buffer concept and supporting functions added. Page buffers allow out of sequence print data to be processed correctly by sequence oriented transforms such as txt, html, etc.

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## Program Distribution Changes

- Added field fix manager processing to delete resolved font resource users spaces, if requested by a PTF, in order to force regeneration.
- RTVGSIPTF anonymous FTP logon updated to include @gumbo.com.
- A new object signing certificate, to replace the previously used and expiring one, was placed into service on our development systems. If you are using CHKOBJITG to verify the integrity of objects in our software, load the new certificate into the \*SIGNATUREVERIFICATION certificate store.

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## PTOCA Processor Changes

- Added processing and macros to track and return start and end positions for overstrike and underscore.

---

## qrencode Changes

- Initial build. Portions of the Libqrencode 3.9.0 library have been compiled into a service program to generate QR Code barcodes. Libqrencode is a C library for encoding data in a QR Code symbol, a kind of 2D symbology that can be scanned by handy terminals such as a mobile phone with CCD. The capacity of QR Code is up to 7000 digits or 4000 characters, and is highly robust.

Libqrencode supports QR Code model 2, described in JIS (Japanese Industrial Standards) X0510:2004 or ISO/IEC 18004.

Due to the range of implementer choices provided in the QR Code standard (JIS X0510:2004 or ISO/IEC 18004), the symbols generated by Libqrencode and IBM i are not identical square for square even though they provide identical output from a scanner.

---

## RTF Generator Changes

- Support for \*AFPDS print data streams added.
- \*RTFxxx transforms now support out of sequence data in a print data stream.
- \*RTFxxx transforms now support mixed CCSID data in a print data stream. The specified source CCSID is used as a default value.

- \*RTFxxx transforms now support complex over printing of DBCS data as well as other enhancements to overlap resolution.
- \*RTFxxx transforms can now target CCSID \*UNICODE and \*UTF8.

---

## Conversion Processor Changes

- Spooled file delete was missing system name and date/time selection processing causing failed delete on systems with wrapped job numbers. The error is corrected.
- Update conversion to enable \*AFPDS processing by \*HTMxxx and \*RTFxxx transforms.
- New text transform, \*TXTNONBLANK, has been added. The transform compresses out all lines containing only white space. This processing is similar to that of IBM i and i Access.

---

## SCS Processor Changes

- Invalid channel number in SCS control VCS (vertical channel select) was treated as a fatal error. Now the control is ignored and processing continues.

---

## Spool Indexing Changes

- Two new parameters, JOBSYSNAME() and CRTDATE(), have been added to the DMPIP, DSPPSGDTA and RTVPAGDTA commands. These have the same meaning and usage as those found on IBM's spooled file related commands and allow you to select specific spooled files when file/job/user/jobnbr/splfnbr are not unique.

---

## Space Management Changes

- Free function avoids call to OS when no memory to free.
- New String Space functions SpcSspGetNextVs2() and SpcSspLoadCurrentVs2() added.

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## Spool File Changes

- Added system name and create date/time to delete function.

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## Spool Management Changes

- CRTSPLSAVF command now saves QCHRIDCTL system value.

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## Spool User Interface Changes

- Selection check at the wrong point in the code resulted in poor performance on systems with many spooled files.

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## Text Generation Changes

- \*TXTxxx conversions now correctly process \*FORMDEF print resources and correctly apply text suppression for \*AFPDS spooled files. Previously text suppression was ignored and all text appeared in the generated output.

## **COMPATIBILITY WARNING**

- Previously out of order print data could result in odd generated output. Now each page's content is buffered in order to correctly position print text in the generated output.
- \*TXTxxx conversions now support mixed CCSID data in a print data stream. The specified source CCSID is used as a default value.
- Overlap resolution for \*TXTxxx conversions has been enhanced to better render the print data. Complex and DBCS over printing are now supported.