

Excel-erator

Programmer's Guide and Reference
Licensed Program 2A55XL1 V1R7M0



Data Base Conversion

Edition

Seventh Edition (September 2009)

This edition applies to the licensed program Excel-erator (Program 2A55XL1), Version 1 Release 7 Modification 0, and to all subsequent releases and modifications until otherwise indicated in new editions. This revision makes all previous editions obsolete. Make sure you are using the proper edition for the level of the product.

This manual is available as option 1 from the XLERATOR menu or in PDF format in directory /Gumbo/Proddata/2A55XL1/doc on your System i and on the web.

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Chapter 1 Introduction

What's In This Chapter

This chapter introduces you to Excel-erator. The chapter:

- Gives an overview of Excel-erator.
- Describes the features of Excel-erator.
- Describes standard product support features.
- Describes Excel-erator's TOOBJ() parameter.
- Describes Excel-erator's relationship to other products.
- Outlines future directions for the product.
- Describes conventions used in this manual.

Excel-erator Overview

Excel-erator is an i5/OS based software utility that converts i5/OS database files into spreadsheets. The resulting PC files are either placed into any directory in i5/OS's Integrated File System or sent as an attachment to an email. With Excel-erator you can make i5/OS data available to your users in the form best suited to them.

Excel-erator Feature

Excel-erator converts database files into spreadsheets. Excel-erator supports the following database files:

- Physical files
- Logical files with a single record format

There are two commands that provide the conversion:

- Copy To Excel (CPYTOEXCEL)
- Send File Excel (SNDFEXCEL)

The Copy To Excel (CPYTOEXCEL) command takes a database file and an Integrated File System object (PC file) name as input. The file's contents are converted into a spreadsheet. The converted file is then placed in the requested Integrated File System object (PC file).

The Send File Excel (SNDFEXCEL) command takes a database file and an email address as input. The file's contents are converted into a spreadsheet. The converted file is then emailed to the requested recipient using i5/OS's built-in mail support. i5/OS delivers the mail in the manner appropriate to the recipient's mail client. The spreadsheet arrives as a MIME attachment to an email message.

When sending the email, you have a wide variety of options to tailor the delivered message to your specific needs. Addressing includes multiple recipients, copy recipients and blind copy recipients. Additionally, you can include multiple Reply-To: addresses as well as specify the email address the message appears to come from. Delivery confirmation by read receipt can also be specified. Optionally, a digitally signature can be included with the email.

Both commands can generate spreadsheets in Excel format or Comma Separated Values format. Where the format allow, the commands support:

- Multiple database files per spreadsheet
- Data in any coded character set ID (CCSID)
- Field selection and ordering
- Addition of title lines
- Selecting column headings from the file's field names, aliases or column headings (or *NONE)

- Control over column heading format including alignment, borders background pattern, bolding, etc.
- Addition of print header and print footer
- Selection of font typeface
- Addition of comments to cells
- File sharing settings including password protection and encryption
- Control over the color palette included in the spreadsheet

Commands to help you trouble shoot and, optionally, automatically configure i5/OS to send mail are also included with Excel-erator.

The conversion process is described in detail in Chapter 6 Conversion.

Standard Product Support Features

GUMBO's products include a range of standard features that make them easy to use, easy to manage, and easy to live with:

- Extensive manual, both online as menu option 1 and in PDF
- Context sensitive help for every command and parameter.
- Menu that provides organized access to the product's features.
- Products are packaged as licensed programs and participates in the full range of support provided by i5/OS Licensed program installation, PTF management, etc. are handled with the same commands used to manage IBM® software.
- Unlike IBM® Licensed Programs, our products are packaged to allow multiple releases to be installed at the same time which facilitates new release testing.
- Product PTFs are available on the web at www.gumbo.com.
- Our products include a hot site friendly automatic authorization function that allows you to immediately move operations to any back up or fail over machine without contacting us for a license key or authorization code.
- We include a Check Excel-erator Authorization (CHKXLAUT) command that allows you to exercise the product's authorization algorithm and insure there are no authorization "surprises".
- An installation verification option is available on the menu. You can easily verify that the product is correctly installed.
- All (applicable) objects in our products are digitally signed allowing you to verify their integrity. Modifications that could jeopardize the security of your system are easily detected with i5/OS's Check Object Integrity (CHKOBJITG) command.
- Our products are upward compatible with future releases of i5/OS. You can install a new releases of i5/OS without installing a new release from us.
- Our products are compatible with all i5/OS security levels. We use only published interfaces.

Excel-erator's TOOBJ() Parameter

The key to generating PC files when using Excel-erator's Copy To Excel (CPYTOEXCEL) command is the TOOBJ() parameter. The parameter specifies the name of the file in terms of i5/OS's Integrated File System.

An Object (PC file) is a path that specifies the name and location of the file in terms of i5/OS's Integrated File System.

Depending on the Integrated File System path specified, you can place the generated file in any file system known to i5/OS including writing directly to Windows systems on the network, another System i, Novell NetWare or NFS server. Run the Work with Object Links (WRKLNK) command to view the available directories and file systems.

As an example, the generated file can be placed in a directory in i5/OS's Open Systems file system (QOpenSys). To create file "ABC.TXT" in directory "MYDIRECTORY" in i5/OS's QOpenSys, use the following TOOBJ() parameter:

```
TOOBJ ( ' /QOpenSys/MYDIRECTORY/ABC . TXT ' )
```

The path you specify must follow the naming conventions of the file system involved. For example QOpenSys supports case-sensitive names and each component of the path can be up to 255 characters long. For complete details on file system name restrictions see the *Integrated File System* topic in the IBM i Information Center at <http://www.iseries.ibm.com/infocenter>.

For additional information see the *Accessing Files In The Integrated File System* section of this manual.

Note: We recommend that you not use the /QDLS file system, which is accessed using the WRKFLR command, unless you have a specific requirement for its features.

Excel-erator provides several special values that can be used to construct dynamic object (PC file) names. When the special values are found, the associated data is blank trimmed and substituted into the path specified when it is processed. If the data associated with a special value is blank, "BLANK" is substituted. If the data associated with a special value contains characters not allowed in a object name, question marks (?) for example, the name will be invalid and the command will fail. The special values must be delimited by an underscore ('_') a period ('.') a slash ('/' or '\') or another special value (which starts with '*').

The member related special values are:

*FILE	File name CHAR(10).
*FILELIB	Library containing the file CHAR(10).
*MBR	Member name CHAR(10).
*TEXT	Member Text 'description' CHAR(50).
*MBRCDAT	Date the member was created CHAR(7) CYYMMDD.
*MBRCCYY	CYY portion of *MBRCDAT CHAR(3).
*MBRCYY	YY portion of *MBRCDAT CHAR(2).
*MBRCMM	MM portion of *MBRCDAT CHAR(2).
*MBRCDD	DD portion of *MBRCDAT CHAR(2).
*MBRCTIM	Time the member was created CHAR(6) HHMMSS.
*MBRGDAT	Date the member was changed CHAR(7) CYYMMDD.
*MBRGYY	CYY portion of *MBRGDAT CHAR(3).
*MBRGYY	YY portion of *MBRGDAT CHAR(2).
*MBRGMM	MM portion of *MBRGDAT CHAR(2).
*MBRGDD	DD portion of *MBRGDAT CHAR(2).
*MBRGTIM	Time the member was changed CHAR(6) HHMMSS.

Product Positioning

Gumbo Software, Inc. has several i5/OS based products:

Number	Licensed Program
2A55RM1	Report Manager - Automates report distribution, bursting and spooled file management
2A55SM1	SpoolMail - Converts i5/OS spooled files into industry standard file formats and sends the resulting PC files to any email recipient
2A55SAM	Spool-a-Matic - Converts i5/OS spooled files into industry standard file formats and places the resulting PC files in the Integrated File System
2A55XL1	Excel-erator - Converts database files into spreadsheets placing the resulting PC files in the Integrated File System or sends the resulting PC files to any email recipient
2A55DCR	Dicer - Merges/sorts/splits/duplicates spooled files
2A55RDA	Report Designer - Edits DDS, RPG and ILE/RPG print specifications
2A55SM2	Gumbo Mail - Sends email from your applications

There is some overlap between and unique function within the products. Choose the product or combination of products that provide the function you need:

Function	Product						
	RML	SML	SAM	XL1	DCR	RDA	SM2
Primary input to product	SPL	SPL	SPL	DBF	SPL	SRC	IFS
Primary output from product	SPL	EML	IFS	I/E	SPL	SRC	EML
Monitor output queues for work	YES	YES	YES	-	-	-	-
Spooled file distribution	YES	-	-	-	-	-	-
Burst (split) spooled files	YES	YES	YES	-	YES	-	-
Merge/sort/duplicate spooled files	YES	-	-	-	YES	-	-
Convert spool to TXT PC file	YES	YES	YES	-	-	-	-
Convert spool to PDF/RTF/etc. PC file	-	YES	YES	-	-	-	-
Convert DB file to spreadsheet	-	-	-	YES	-	-	-
Email PC file as attachment	YES	YES	-	YES	-	-	YES
Write PC file to Integrated File System	YES	-	YES	YES	-	-	-
Set up i5/OS SMTP & mail router	YES	YES	-	YES	-	-	YES
Edit DDS, RPG, ILE/RPG source code	-	-	-	-	-	YES	-
Notes: DBF = Database file EML = Email IFS = PC file in the Integrated File System I/E = Both IFS and EML SPL = Spooled file SRC = Source code							

Future Directions

Future releases of Excel-erator will include enhanced functionality based on customer feedback. Additionally, enhancements are often added to a current release by Program Temporary Fix (PTF).

Candidate enhancements include:

- Support for conversion to OpenDocument Format (ODF) as described in *ISO/IEC 26300:2006 Open Document Format for Office Applications (OpenDocument) v1.0*.
- Support for conversion to Office Open XML (OOXML) as described in *ISO/IEC 29500:2008*.
- Support for edit words in BIFF8 conversion.

Contact Gumbo Software Inc for information on scheduling or to suggest enhancements.

Manual Conventions

A note on conventions used in this manual. In several places, instructions for entering commands are given. When the command is intended to be run from a PC command prompt it is flagged by `pc`. When the command is intended to be run an i5/OS command line it is flagged by `u`, or is not flagged at all. `[Enter]` denotes the enter key.

Chapter 3 Menu

What's In This Chapter

This chapter describes how to access the Excel-erator menu, and reviews the functions that can be performed from the menu.

Accessing The Menu

The Excel-erator commands and functions that you will use most often are collected on a menu named XLERATOR. To access this menu use the Go To Menu (GO) command:

```
GO MENU (XLERATOR/XLERATOR)
```

Library XLERATOR is added to the product portion of the current thread's library list while the menu is displayed.

Menu Options

```
XLERATOR                Excel-erator                System:  XL1

Select one of the following:

    1. Online Manual

Excel-erator
    2. Copy To Excel                CPYTOEXCEL
    3. Send File Excel              SNDFEXCEL
    4. Verify the product is installed correctly  CHKPRDOPT

Other Options
    60. Mail Verification And Set Up  MAILSETUP
    61. Display Current PTF Status    DSPPTF
    62. Change Excel-erator Authorization  CHGXLIAUT
    63. Search Help Index            STRSCHIDX
    64. Change Excel-erator Default    CHGXLDFT
    65. Check Excel-erator Authorization  CHKXLIAUT
                                           Bottom

Selection or command
====>

F3=Exit  F4=Prompt  F9=Retrieve  F12=Cancel
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```

The Excel-erator (XLERATOR) menu options are summarized below:

Note: See the detailed descriptions in later chapters for a complete explanation of each option.

Option 1. Online Manual

The online manual allows you to view the contents of the Excel-erator Manual from a work station.

Option 2. Copy To Excel

The Copy To Excel (CPYTOEXCEL) command converts an i5/OS database file into an Excel spreadsheet which is stored in i5/OS's Integrated File System.

Option 3. Send File Excel

The Send File Excel (SNDFEXCEL) command converts one or more i5/OS database files into Excel spreadsheets which are then sent as an email to recipients.

Option 4. Verify the product is installed correctly CHKPRDOPT

Installation verification checks to make sure that Excel-erator has been correctly installed by running i5/OS's Check Product Option (CHKPRDOPT) command.

Option 60. Mail Verification And Set Up Menu

The Mail Verification And Set Up menu provides commands to help you set up mail on your system and verify that it is operating correctly.

Option 61. Display Current PTF Status

Displays the Excel-erator PTFs that have been applied to the software.

Option 62. Change Excel-erator Authorization

The Change Excel-erator Authorization (CHGXL1AUT) command changes the authorization code for Excel-erator. The command is used to extend a demonstration period or to permanently authorize Excel-erator for a system or a partition.

Option 63. Search Help Index

Search help index allows you to access the Excel-erator help index and search for specific information.

Option 64. Change Excel-erator Default

The Change Excel-erator Default (CHGXL1DFT) command changes values used by Excel-erator to control processing and other activities.

Option 65. Check Excel-erator Authorization

The Check Excel-erator Authorization (CHKXL1AUT) command executes Excel-erator's authorization verification function. This allows you to determine whether and how the product is authorized for use.

Chapter 4 Set Up

What's In This Chapter

This chapter provides information on setting up your System i to send email created by Excel-erator. If you do not intend to use Excel-erator to create email you can skip this chapter entirely. The chapter describes:

- How to select a quick start mail set up procedure.
- Quick start mail set up - Mail Router.
- Quick start mail set up - Direct Delivery.
- How to use the Verify/Set Up Local SMTP (VFYLOCAL) command.
- How to use the Verify/Set Up Mail Router (VFYROUTER) command.
- Manual mail set up steps you may need to perform.
- Additional mail set up resources.

Selecting The Quick Start Mail Set Up Procedure

Excel-erator creates email by constructing a MIME formatted message and passing it to i5/OS for processing and delivery. If your System i is already configured for email delivery, no additional set up is needed and you can skip this chapter. If Excel-erator is the first application on the System i to generate email for delivery, there are i5/OS configuration changes you must perform. Excel-erator includes a Mail Verification And Set Up menu (GO XLERATOR/MAILSETUP) that provides tools to help you make them.

But the scope of this chapter is limited. If any of the following apply to your installation, proceed directly to the Additional Mail Set Up Resources section for references to help in configuring i5/OS:

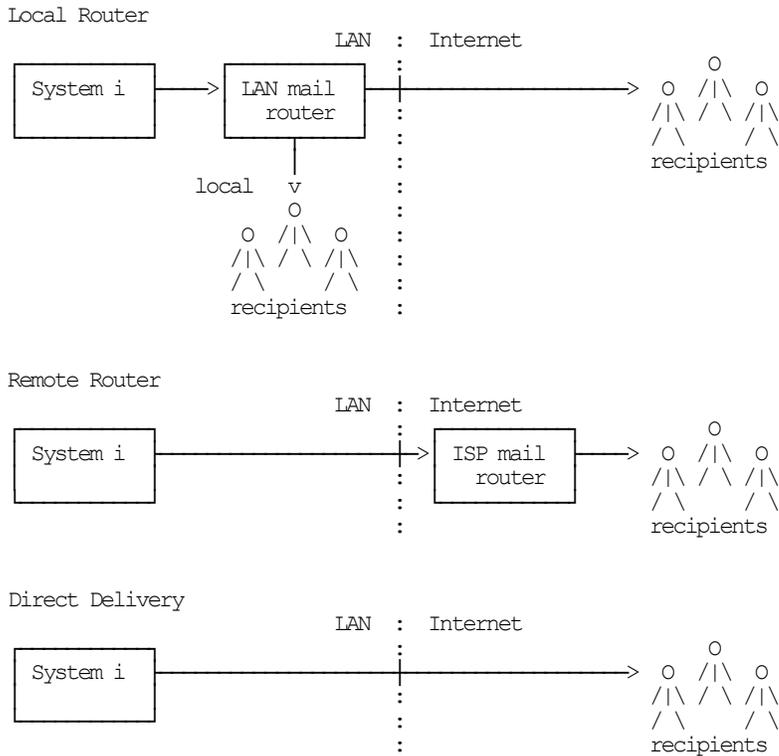
- Domino for i5/OS is installed on the system.
- Multiple TCP/IP interfaces (other than *LOOPBACK) are configured.
- Multiple email domains require support.

There are two quick start mail set up procedures for configuring i5/OS mail services described in this chapter. The procedures are:

- Quick start mail set up - Mail Router
- Quick start mail set up - Direct Delivery.

You only perform, at most, one of these. To select the correct procedure consider the following simplified configurations:

Figure: Mail Configurations



For most customers the System i is attached to a local area network that also has a mail server attached to it. Typically the mail server runs on a PC with Exchange, Notes, Domino, GroupWise or similar mail application installed. Also, typically, this mail server should be responsible for delivering mail, and will server as the mail router for the System i. If this is you situation, proceed to the Quick Start Mail Set Up - Mail Router section.

For some customers, the mail server belonging to their internet service provider (ISP) is used to deliver email. If the ISP's mail server DOES NOT require SMTP authentication, proceed to the Quick Start Mail Set Up - Mail Router section.

If you don't have a mail server capable of serving as a mail router, or if your ISP's mail server requires SMTP authentication in order to relay email, you must configure your System i to deliver email directly. Proceed to the Quick Start Mail Set Up - Direct Delivery section.

Quick Start Mail Set Up - Mail Router

To configure your System i to use a mail server as its mail router follow these steps. If any of the steps fail, move on to the detailed sections of this chapter.

1. Install Excel-erator on your System i (see the Installation chapter for details).
2. Display the main menu (GO XLERATOR/XLERATOR).
3. Run the option to verify that Excel-erator is installed correctly.
4. Display the Mail Verification And Set Up menu.
5. Run option 12 to set up the System i.
6. Determine the name and IP address of the mail router.
7. Run option 14 to set up the mail router specifying its name and IP.
8. Press F12 to return to the main menu.
9. Send a test to yourself using your "real" email address.
10. Check your email.

If after a reasonable time no email arrives perform the following additional steps.

1. Add your "real" email address to your directory entry by running (this example uses "real" email address "billg@acme.com" and the directory entry "MYUSER MYSYSTEM"):

```
CHGDIRE USRID (MYUSER MYSYSTEM)
        MSFSRVLVL (*SYSMS) PREFADR (*SMTP)
        USRDFNFLD ((SMTPAUSRID SMTP 'billg')
                  (SMTPDMN SMTP 'acme.com'))
```

Note: If you are still signed on as QSECOFR, start a second session and sign on with your regular user profile to perform the send.

2. Display the Mail Verification And Set Up menu.
3. Run option 61 to restart/purge local mail on your System i.

Note: If your System i is currently being used to generate email from another application, make sure the Clear SMTP during restart (SMTPPURGE) and Clear MSF during restart (MSFPURGE) parameters specify *NO to prevent email from being deleted.

4. Send a test to yourself taking by taking the default *CURRENT.
5. Check your email.

If after a reasonable time no email arrives move on to the detailed sections of this chapter. For additional information see the *Trouble Shooting* chapter of this manual.

Quick Start Mail Set Up - Direct Delivery

If your installation does not include a mail server or if you can not use your ISP's mail server because it requires SMTP Authentication which is not support by i5/OS, you can configure your System i to directly deliver email to the world at large using the following steps. If any of the steps fail, move on to the detailed sections of this chapter.

1. Install Excel-erator on your System i (see the Installation chapter for details).
2. Display the main menu (GO XLERATOR/XLERATOR).
3. Run the option to verify that Excel-erator is installed correctly.
4. Display the Mail Verification And Set Up menu.
5. Run option 12 to set up the System i.
6. Configure i5/OS access to DNS (see Manual Mail Set Up Steps below).
7. Update the public DNS records for your domain (see Manual Mail Set Up Steps below).
8. Press F12 to return to the main menu.
9. Send a test to yourself using your "real" email address.
10. Check your email.

If after a reasonable time no email arrives perform the following additional steps.

1. Add your "real" email address to your directory entry by running (this example uses "real" email address "billg@acme.com" and the directory entry "MYUSER MYSYSTEM"):

```
CHGDIRE USRID (MYUSER MYSYSTEM)
        MSFSRVLVL (*SYSMS) PREFADR (*SMTP)
        USRDFNFLD ((SMTPAUSRID SMTP 'billg')
                  (SMTPDMN SMTP 'acme.com'))
```

Note: If you are still signed on as QSECOFR, start a second session and sign on with your regular user profile to perform the send.

2. Display the Mail Verification And Set Up menu.

3. Run option 61 to restart/purge local mail on your System i.

Note: If your System i is currently being used to generate email from another application, make sure the Clear SMTP during restart (SMTPPURGE) and Clear MSF during restart (MSFPURGE) parameters specify *NO to prevent email from being deleted.

4. Send a test to yourself taking by taking the default *CURRENT.
5. Check your email.

If after a reasonable time no email arrives move on to the detailed sections of this chapter. For additional information see the *Trouble Shooting* chapter of this manual.

Using The SMTP Set Up Command

The Verify/Set Up Local SMTP (VFYLOCAL) command performs automatic verification and set up of SMTP on your System i. The command accepts a single parameter that determines if changes are made to i5/OS. To verify the System i without making any changes select option 11 on the Mail Verification And Set Up menu or run the following command:

```
VFYLOCAL SETUP (*NO)
```

To make changes to your System i select option 12 on the Mail Verification And Set Up menu or run the following command:

```
VFYLOCAL SETUP (*YES)
```

In both cases SMTP verification is performed. Only if SETUP(*YES) is specified does the command try to perform set up functions. You must be authorized to perform all of the verification and set up functions or the command fails. You can insure that you are authorized to perform all functions by signing on as QSECOFR.

Note: If you prefer to manually perform the functions of this program see the Appendix for a detailed description.

A log of activity is created during verification and set up. To view the log run DSPJOB, take option 4 and display the last spooled file.

If errors were encountered, detailed information can be found in your joblog. To view the information generated by VFYLOCAL, run the following command after the command has completed:

```
DSPJOBLOG
```

When the joblog is displayed, press F10 to display detailed messages and F18 to position to the end of the log.

The recommended procedure is to run a verification first and review the results before running automatic set up.

Using The Mail Router Set Up Command

The Verify/Set Up Mail Router (VFYROUTER) command performs automatic verification and set up of a mail router for your System i. The command accepts a three parameters that determine if changes are made to i5/OS and the identity of the mail router. To verify the mail router without making any changes select option 13 on the Mail Verification And Set Up menu or run the following command (substitute the name and IP address of your external mail router for "host_name" and "ip"):

```
VFYROUTER RMTSYS(host_name) INTNETADR(ip) SETUP (*NO)
```

To make changes to your System i select option 14 on the Mail Verification And Set Up menu or run the following command (substitute the name and IP address of your external mail router for "host_name" and "ip"):

```
VFYROUTER RMTSYS(host_name) INTNETADR(ip) SETUP (*YES)
```

In both cases mail router verification is performed. Only if SETUP(*YES) is specified does the command try to perform set up functions. You must be authorized to perform all of the verification and set up functions or the command fails. You can insure that you are authorized to perform all functions by signing on as QSECOFR.

Note: If you prefer to manually perform the functions of this program see the Appendix for a detailed description.

A log of activity is created during verification and set up. To view the log run DSPJOB, take option 4 and display the last spooled file.

If errors were encountered, detailed information can be found in your joblog. To view the information generated by VFYROUTER, run the following command after the command has completed:

```
DSPJOBLOG
```

When the joblog is displayed, press F10 to display detailed messages and F18 to position to the end of the log.

The recommended procedure is to run a verification first and review the results before running automatic set up.

Manual Mail Set Up Steps You May Need To Perform

Depending on your System i, network configuration and your intended usage, there are several manual mail set up steps you may need to perform in order to use SMTP. These are described here.

- Installing TCP Connectivity Utilities

In order to send email from your System i, SMTP support must be installed. SMTP functions are delivered free of charge with i5/OS as part of a separately installed licensed program product: 5722-TC1 (V5) 5761-TC1 (V6) TCP/IP Connectivity Utilities. Detailed installation information and instructions can be found in *i5/OS and related software > Installing, upgrading, or deleting i5/OS and related software SC41-5120*.

- Changing Local Host and Domain Names

SMTP uses your System i's local host and domain name to identify itself to remote SMTP hosts to which it is sending mail. To configure the names:

- Run the Configure TCP/IP (CFGTCP) command.
- Select option 12 (Change TCP/IP domain information).
- Enter a host and domain name for your System i.

As an example, we use ofc.gumbo.com as the domain name and the mailout as the host name on our machine. If your domain is widget.com you might use:

```
Change TCP/IP Domain (CHGTCPDMN)

Type choices, press Enter.

Host name . . . . . 'mailout'

Domain name . . . . . 'ofc.widget.com'

Domain search list . . . . . *DFT

Host name search priority . . . *LOCAL *REMOTE, *LOCAL, *SAME
Domain name server:
  Internet address . . . . . '123.456.789.1'
                          '123.456.789.2'

Bottom
F3=Exit  F4=Prompt  F5=Refresh  F10=Additional parameters  F12=Cancel
F13=How to use this display  F24=More keys
```

- **Creating a TCP Interface**

A TCP interface establishes your System i identity (internet address) on a given line description. Typically the line description for a local area network is used.

In order to add a TCP interface to a line description, you must determine the IP address and subnet mask to use. If you have a network administrator or other person responsible for assigning internet (IP) addresses, contact them. If you will connect your System i directly to the Internet, you must request that your internet service provider assign you an IP address or you must request that the Internet Corporation for Assigned Names and Numbers (ICANN) assign you a network number. If you will not connect your System i directly to the internet, and otherwise do not have an IP address for your system, you can use IP address "192.168.1.1" and Subnet Mask "255.255.255.0". This number is taken from the class B "192.168.0.0" network which is reserved for internal networks as described in *RFC1597*. To add an interface after you have determined an IP address and subnet mask, run the following command:

```
ADDTCPIFC INTNETADR(192.168.1.1) +
          LIND(line_description_name) +
          SUBNETMASK(255.255.255.0)
```

Substitute your values for the three parameters.

- **Adding Host Name To Host Table**

In order to deliver email correctly i5/OS's SMTP host name must be associated with an IP address of one of its TCP interfaces. This can be accomplished through DNS or you can add a local host table entry. To add a host table entry for IP address "192.168.1.1" with host name mailout, run the following command:

```
ADDTCPHTE INTNETADR('192.168.1.1') +
          HOSTNAME(('mailout'))
```

Substitute your values for the two parameters. If the IP address already exists in the host table, use Change TCP/IP Host Table Entry (CHGTCPHTE) command to add the additional host name to the IP address.

- **Configuring i5/OS Access To DNS**

When not using a mail router, System i must access domain name system (DNS) servers to determine how to deliver email for a recipient. Typically IP addresses for DNS servers are supplied by your internet service provider (ISP) or network administrator. If neither are available, a reasonable guess as to the IPs to use can be retrieved from a PC attached to the local area network that contains the System i:

- **[PC]** Choose Start > Programs > Accessories > Command Prompt
- **[PC]** Run

```
ipconfig /all
```

- **[PC]** Note the IP addresses given for DNS Servers.

To configure System i to use DNS servers and confirm correct operation:

- From the System i command line, type CHGTCPDMN and press F4.
- Enter the DNS IP addresses in the Domain name server: Internet address (INTNETADR) parameter, press enter.

```
Change TCP/IP Domain (CHGTCPDMN)

Type choices, press Enter.

Host name . . . . . 'mailout'

Domain name . . . . . 'ofc.widget.com'

Domain search list . . . . . *DFT

Host name search priority . . . *LOCAL *REMOTE, *LOCAL, *SAME
Domain name server:
  Internet address . . . . . '123.456.789.1'
                           '123.456.789.2'

Bottom
F3=Exit F4=Prompt F5=Refresh F10=Additional parameters F12=Cancel
F13=How to use this display F24=More keys
```

This example uses the fictitious DNS IP addresses 123.456.789.1 and 123.456.789.2

- o Run the command:

```
ping ibm.com
```

- o If you do not get the message "Unknown host, ibm.com" DNS is working correctly.

Note: You may or may not get ping replies, but that isn't important.

- Updating Public DNS Records

When directly delivering email to the world at large, System i contacts each recipient's mail server and introduces itself using the fully qualified SMTP host name configured using the Change TCP/IP Domain (CHGTCPDMN) command. In the example below, the machine introduces itself as mailout.ofc.widget.com.

```

Change TCP/IP Domain (CHGTCPDMN)

Type choices, press Enter.

Host name . . . . . 'mailout'

Domain name . . . . . 'ofc.widget.com'

Domain search list . . . . . *DFT

Host name search priority . . . *LOCAL *REMOTE, *LOCAL, *SAME
Domain name server:
  Internet address . . . . . '123.456.789.1'
                               '123.456.789.2'

Bottom
F3=Exit   F4=Prompt   F5=Refresh   F10=Additional parameters   F12=Cancel
F13=How to use this display   F24=More keys

```

When a recipient's mail server is contacted by i5/OS, the mail server sees the traffic as coming from the publicly visible IP address of your connection. For example, the external IP address of your DSL modem. To determine the IP address seen externally go to <http://network-tools.com>. The IP address shown in the search box is the external public IP address of your connection.

Increasingly, mail servers are confirming the identity of machines sending email by performing a DNS look up on the fully qualified host name sent during the introduction, mailout.ofc.widget.com in this example. If the IP address returned by DNS is not the same as the visible IP address the traffic is coming from, email is rejected or discarded as spam.

To insure that your System i passes this test, you must add, or have your domain registrar add, an address record for your System i's fully qualified SMTP host name to the DNS records for your domain. In this example:

```
mailout.ofc.widget.com. IN A nnn.nnn.nnn.nnn
```

Is added to the DNS records for the domain widget.com where nnn.nnn.nnn.nnn is the publicly visible IP address determined above.

- Setting Up Local Users

A local user is someone who has a user profile (sign-on) on your System i. You should set up each local user who will be sending email to insure that the apparent "From:" address in the email will be correct and to insure that replies reach the sender. You do not need to set up local users who will not be sending mail. To configure hypothetical user JOE SALES (user profile JOES) as joe@acme.com, perform the following:

- If Joe already has a directory entry run:

```

CHGDIRE USRID(JOE SALES) MSFSRVLVL(*SYSMS)
          PREFADR(*SMTP)
          USRDFNFLD((SMTPAUSRID SMTP 'joe')
                  (SMTPDMN SMTP 'acme.com'))

```

- If Joe doesn't have a directory entry run:

```

ADDIRE USRID(JOE SALES) USRD('Sample entry')
      USER(JOES) SYSNAME(*LCL)
      MSFSRVLVL(*SYSMS) PREFADR(*SMTP)
      USRDFNFLD((SMTPAUSRID SMTP 'joe')
                (SMTPDMN SMTP 'acme.com'))

```

The user is now ready to send mail from your System i as joe@acme.com. For more details or information on setting up remote users see the *Email Addresses* section of the *Implementation* chapter of this manual.

- Changing The System Start Program

You may wish to check your system's start up program to insure that the required subsystems are started automatically when your System i IPLs. The following steps are recommended:

- Insure that the SMTP server starts automatically when the Start TCP/IP (STRTCP) command is run:

```
CHGSMTPA AUTOSTART(*YES)
```

- Insure that your system start up program starts TCP/IP by including the command:

```
STRTCP
```

- Insure that your system start up program starts the i5/OS Mail Server by including the command:

```
STRMSF
```

- Changing The Time Zone System Value

The time stamp placed in the email is based on the QTIMZON system value. Since most System i have the correct time, an incorrect time stamp usually indicates an incorrect time zone setting. For information on correctly setting the QTIMZON system value see the *System management > Time management* topic in the IBM i Information Center at <http://www.iseries.ibm.com/infocenter>.

Note: QTIMZON also affects the timestamp applied to files in the Integrated File System (IFS).

- Changing The SMTP Port Number

Some installations use an SMTP port number other than the well known port 25. You can control the port number used by i5/OS's SMTP stack by running the Configure TCP/IP (CFGTCP) command, selecting option 21. Configure related tables, then selecting option 1. Work with service table entries.

Additional Mail Set Up Resources

The information in this chapter was drawn and condensed from the IBM i Information Center. You can find additional detail and more comprehensive coverage of i5/OS configuration by going to the *Networking > TCP/IP applications, protocols, and services > E-mail* topic in the IBM i Information Center at <http://www.iseries.ibm.com/infocenter>.

For Domino on System i users, our software uses i5/OS's SMTP services to deliver mail. Valuable information on setting up Domino's and i5/OS's SMTP stack to coexist on the same System i can be found in the IBM Redbook *V5*

TCP/IP Applications on the IBM eServer iSeries Server SG24-6321 available at
<http://www.iseries.ibm.com/infocenter>.

Chapter 5 Implementation

What's In This Chapter

This chapter describes how to implement Excel-erator in your environment. The chapter:

- Gives an overview of implementation choices.
- Describes changing programs to process files.
- Describes manually processing files.
- Describes accessing files in the Integrated File System.
- Shows how to create PDM options for Excel-erator's commands.
- Shows how to use OPNQRYF to select specific records.
- Describes using format codes in headers and footers.
- Describes email address details.
- Describes adding line breaks to the message.
- Describes digitally signing the message.
- Describes a CL coding tip.
- Describes changing command defaults.

Overview

Excel-erator converts database files into spreadsheets. There are two commands that provide the conversion:

- Copy To Excel (CPYTOEXCEL)
- Send File Excel (SNDFEXCEL)

To implement Excel-erator in your environment you have two basic choices:

1. Modify each program that creates files that will be converted to directly run the Copy To Excel (CPYTOEXCEL) or the Send File Excel (SNDFEXCEL) command.

Pros	The file is always processed as soon as it is created.
Cons	Programs must be modified and recompiled.

2. Manually run the Copy To Excel (CPYTOEXCEL) or the Send File Excel (SNDFEXCEL) command from a command line.

Pros	Good for casual or on demand use, no program changes required.
Cons	Requires manual operations and scheduling.

See the following sections for a detailed discussion of the choices.

Changing Programs

Excel-erator can be implemented by changing the programs that create files to convert or email them directly. A typical batch Control Language (CL) program that creates a file would contain the following CL sequence:

```
      .  
OVRDBF  FILE (INVENTORY)  TOFILE (INVLIB/INVENTORY)  
OVRDBF  FILE (INVSTATUS)  TOFILE (INVLIB/INVSTATUS)  
CLRPFM  FILE (INVLIB/INVSTATUS)  
CALL    PGM (INVLIB/INV320)  
      .  
      .
```

If program INV320 generates file INVSTATUS then the following changes will convert the file to the /Excel/INV320 directory and create a file with the date and time created as the name:

```
.
OVRDBF FILE (INVENTORY) TOFILE (INVLIB/INVENTORY)
OVRDBF FILE (INVSTATUS) TOFILE (INVLIB/INVSTATUS)
CLRPFM FILE (INVLIB/INVSTATUS)
CALL PGM(INVLIB/INV320)
CPYTOEXCEL FROMFILE (INVLIB/INVSTATUS) +
          TOOBJ ('/Excel/INV320/InventoryStatus.xls')
.
```

The file is converted as soon as program INV320 has completed processing.

Alternately, the following changes will email the file to "billg@acme.com":

```
.
OVRDBF FILE (INVENTORY) TOFILE (INVLIB/INVENTORY)
OVRDBF FILE (INVSTATUS) TOFILE (INVLIB/INVSTATUS)
CLRPFM FILE (INVLIB/INVSTATUS)
CALL PGM(INVLIB/INV320)
SNDFEXCEL SNDF ( (INVLIB/INVSTATUS) ) +
          TO ( (billg@acme.com) )
.
```

The file is emailed as soon as program INV320 has completed processing.

Manually Processing Files

Excel-erator can be implemented by assigning an operator the task of manually converting files. The Copy To Excel (CPYTOEXCEL) and Send File Excel (SNDFEXCEL) commands can be run from any command line or from the XLERATOR menu.

Accessing Files In The Integrated File System

Files are created in i5/OS's Integrated File System (IFS). There are a variety of ways to access the contents of the IFS. The following common methods are described here:

- Accessing the file from a PC using i5/OS's support for Windows Network Neighborhood (NetServer).
- Creating the file directly on a Windows machine using the IFS's QNTC file system.
- Transferring the file using FTP from a PC.
- Transferring the file using FTP from i5/OS.
- Accessing the file from a PC using iSeries Access.

Complete, detailed, information can be found in the *Files and file systems > Integrated file system* topic in the IBM i Information Center at <http://www.iseries.ibm.com/infocenter>.

Windows Network Neighborhood (NetServer)

i5/OS Support for Windows Network Neighborhood (NetServer) allows a TCP/IP attached PC to access the Integrated File System using the file and print sharing built into Windows.

i5/OS NetServer support does not require you to install any additional software on your personal computer. Similarly, NetServer does not require any software other than base i5/OS V4R2M0 or later.

Follow these guidelines to get your System i set up to use NetServer. These instructions assume that you do not have access to System i Navigator support. Whenever possible, you should use System i Navigator.

Note: You must have *IOSYSCFG special authority to change any part of NetServer configuration. In addition, you must have *SECADM special authority to change the NetServer guest user profile. These changes will take effect the next time NetServer is started.

1. Verify that TCP/IP support is configured on your System i.
2. Use the Work with Subsystems (WRKSBS) command to confirm that the QSERVER subsystem has started.
3. Verify that the NetServer name is unique on the network. To change the NetServer default server and domain name, use the following command:

```
CALL QZLSCHSN PARM(server_name domain_name  
                  'text description or comment' X'00000000')
```

4. To change NetServer guest support, use the following command:

```
CALL QZLSCHSG PARM(guest_user_profile X'00000000')
```

Users who require the file and print-sharing capabilities of NetServer, but do not have an i5/OS user profile need a guest user profile.

Note: The Guest User Profile should not have a password or any special authority.

5. Stop and start NetServer, using the following commands:

```
ENDTCPSVR SERVER (*NETSVR)  
STRTCPSVR SERVER (*NETSVR)
```

The only directory that is automatically shared with the network is the \QCA400 directory. To create additional shares you must use iSeries Navigator and follow these steps:

1. Open a connection to your System i in iSeries Navigator.
2. Expand Network.
3. Expand Servers.
4. Click TCP/IP to retrieve a list of TCP/IP servers available.
5. Right-click NetServer and select Open.
6. Right-click Shared Objects and select New and then File.
7. Use the General Properties page to configure the new file share with a name, description, access, maximum number of users, and directory path name.

Note: The iSeries Navigator online help provides more details about NetServer file share properties.

Once a share has been created, map to it from your Windows PC by following these steps:

1. Right-click the Start button and choose Explore to open the Windows Explorer.
2. Open the Tools pull-down menu on the Windows Explorer and select Map network drive.
3. Select the letter of a free drive for the file share.
4. Enter the name of a NetServer file share. For example:

```
\\server_name\Sharename
```

Note: server_name is the system name of NetServer on System i, and Sharename is the name of the file share you want to use.

5. Click OK.

Alternately you can use Network Neighborhood to access the share:

1. Open Windows Network Neighborhood.
2. Open QSYSTEM1 (Where QSYSTEM1 is the server name of NetServer on System i).
3. Select a file share.

QNTC File System

i5/OS's QNTC file system allows the Integrated File System to write directly to Windows file shares (disk) as if it were local i5/OS disk storage.

Path (file) names in QNTC consist of the file system name, the Windows server name, the sharename, the directory and sub-directory names, and the object name. Path (file) names have the following form:

```
/QNTC/Servername/Sharename/MyDirectory/MyFile.pdf
```

Use the Make Directory (MKDIR) command to add a Windows machine to QNTC. For example:

```
MKDIR DIR ('/QNTC/NTSRV1')
```

Adds the NTSRV1 server into the QNTC file system directory structure to enable access of files and directories on that server.

For additional detailed information, search IBM i Information Center for "QNTC".

FTP Using PC

FTP can be used from your PC to transfer the files to another system. In brief, the steps for retrieving the file /mydirectory/myfile.pdf from IFS to your PC are:

Note: `[PC]` denotes an operation performed on your PC. `[I]` denotes an operation performed on your System i. `[Enter]` denotes the enter key.

1. `[I]` Insure the i5/OS FTP server is active by running this command from a command line:

```
STRTCPSVR SERVER (*FTP)
```

2. `[PC]` Choose Start > Programs > Accessories > Command Prompt to open a command prompt.
3. `[PC]` Open an FTP connection to the System i by running (use your system's name or IP address):

```
FTP system_name [Enter]
```

4. `[PC]` Enter a user name and password as prompted.
5. `[PC]` Change to binary (image) mode by running:

```
binary [Enter]
```

6. `[PC]` Switch to i5/OS Integrated File System by running:

```
quote site namefmt 1 [Enter]
```

7. `[PC]` Retrieve the file by running:

```
get /mydirectory/myfile.pdf [Enter]
```

8. `[PC]` End FTP and command prompt by running:

```
quit [Enter]
exit [Enter]
```

For more details see *Networking* topic in the IBM i Information Center at <http://www.iseries.ibm.com/infocenter>.

FTP Using i5/OS

FTP can be used from i5/OS to transfer the files to another system interactively or in batch. The interactive procedure is similar to the PC procedure, using "put" instead of "get". In brief, the steps for transferring the file /mydirectory/myfile.pdf from IFS to another system in batch are:

1. Create a source member containing the FTP commands that you would otherwise have to type at the terminal during an interactive session with the target server. By way of example, we use the following command sequence in member FTPCMDS in QGPL/QCLSRC.

```
user password
binary
namefmt 1
put /mydirectory/myfile.pdf
quit
```

2. Add the following statements to your program:

```
...
OVRDBF FILE (INPUT) TOFILE (QGPL/QCLSRC) MBR (FTPCMDS)
OVRDBF FILE (OUTPUT) TOFILE (QGPL/QCLSRC) MBR (FTPLOG)
FTP      RMTSYS (system_name)
...
```

For more details see *Networking* topic in the IBM i Information Center at <http://www.iseries.ibm.com/infocenter>.

System i Access

System i Access includes software that connects to the System i and makes the integrated file system available to the PC. For more information see *System i Access* topic in the IBM i Information Center at <http://www.iseries.ibm.com/infocenter>.

Creating PDM Options For Excel-erator

IBM's Program Development Manager (PDM) allows creation of user-defined options. For additional information see *iSeries Programming Development Manager User's Guide SC09-2133*.

Creating A PDM Option For CPYTOEXCEL

The following steps will create the user-defined option "XL" which will submit a job to run the CPYTOEXCEL command from within PDM when "XL" is keyed next to a member name:

- Enter PDM by using the WRKMBRPDM command.
- Press F16 to work with user defined options.
- Press F6 to create a new user defined option.

```

Create User-Defined Option

Type changes, press Enter.

Option . . . . . XL Option to create

Command . . . . . /* Excel-erator CPYTOEXCEL Batch */
sbmjob job(&N) jobd(&J) cmd(xlerator/cpytoexcel fromfile(&l/&f)
toobj('/Excel/*filelib.*file.*mbr.xls') frommbr(&n) crtmdir(*yes))

F3=Exit      F4=Prompt      F12=Cancel

```

- Key the user defined option definition as shown above, and press Enter.
- Press F3 to exit the Work with User-Defined Options display. Now key XL in the option field for members to submit a batch conversion.

Creating A PDM Option For SNDFEXCEL

The following steps will create the user-defined option "XS" which will prompt the SNDFEXCEL command from within PDM when "XS" is keyed next to a file name:

- Enter PDM by using the WRKMBRPDM command.
- Press F16 to work with user defined options.
- Press F6 to create a new user defined option.

```

Create User-Defined Option

Type changes, press Enter.

Option . . . . . XS Option to create

Command . . . . . /* Excel-erator SNDFEXCEL */
?xlerator/sndfexcel sndf((&l/&n))

F3=Exit      F4=Prompt      F12=Cancel

```

- Key the user defined option definition as shown above, and press Enter.

- Press F3 to exit the Work with User-Defined Options display. Now key XS in the option field for a file to send it.

Selecting Records With OPNQRYF

In some cases, you may wish to create a spreadsheet containing a subset of records from the underlying database file. This can be accomplished using i5/OS's Open Query File (OPNQRYF) command.

As an example, suppose you wish to select only the records for customer A1234 from the invoice records file QGPL/QINVREC which contains the field CUST. To accomplish this with OPNQRYF, run the following commands:

```
OVRDBF      FILE(QINVREC) TOFILE(QGPL/QINVREC) OVRSCOPE(*JOB)
             SHARE(*YES)
OPNQRYF     FILE((QINVREC)) QRYSLT('CUST *EQ 'A1234''')
             OPNSCOPE(*JOB)
CPYTOEXCEL  FROMFILE(QINVREC)
             TOOBJ('/Excel/CustA1234InvoiceRecords.xls')
CLOF       OPNID(QINVREC)
DLTOVR     FILE(QINVREC) LVL(*JOB)
```

This procedure also works with the Send File Excel (SNDFEXCEL) command.

Using Format Codes In Headers And Footers

BIFF8 supports the use of format codes in the print headers and print footers that can be entered on the PRTHEADER() and PRTFOOTER() parameters. Some of the codes and their meaning are:

Format Code	Description
&L	Left-aligns the characters that follow.
&C	Centers the characters that follow.
&R	Right-aligns the characters that follow.
&B	Turns bold printing on or off.
&I	Turns italic printing on or off.
&D	Prints the current date.
&T	Prints the current time.
&F	Prints the name of the document.
&A	Prints the name of the worksheet.
&P	Prints the page number.
&&	Prints a single ampersand.
&N	Prints the total number of pages in the document.

As an example, to generate a spreadsheet with page numbers as the print footer, specify the following

```
CPYTOEXCEL ... PRTFOOTER('Page: &P of &N')
```

This also works with the Send File Excel (SNDFEXCEL) command.

Email Addresses

There are three choices for addressing mail created by Excel-erator, direct SMTP addressing, special values, and directory entries stored in the system distribution directory. With direct SMTP addressing, you enter the email address directly on the parameter, no additional address set up is required. Excel-erator supports the full range of email address formats, including route specification and *RFC3490 Internationalizing Domain Names in Applications (IDNA)*. Valid formats for email addresses include:

- 'mali@acme.com'
- '<mali@acme.com>'
- 'Mohammed Ali <mali@acme.com>'
- '"Mohammed Ali" <mali@acme.com>'

- 'Mohammed Ali (I am the Greatest) <mali@acme.com>'

In all of these examples the message is delivered to the mail box mali@acme.com.

Address Resolution For Special Values

Excel-erator supplies several special values for specifying email addresses. For example *CURRENT is the default value on the From (originator) Address parameter.

Excel-erator uses the following steps to resolve an email address for special values that imply an i5/OS user profile.

- If the user profile implied by the special value is enrolled in the system distribution directory and the entry contains an email address the email address is used.
- If the user profile implied by the special value is enrolled in the system distribution directory and the entry does not contain an email address an i5/OS style address is generated in the form: usrid?address@host.domain.
- If the user profile implied by the special value is not enrolled in the system distribution directory an email address is generated in the form: userprofile@host.domain

Note: In the above, host and domain are taken from the values entered on the CFGTCP option 12 panel.

Therefore to have the correct email address resolved you should add or update a system distribution directory entry for each user profile that will be referenced by the special values you will use. Usually this is every user profile that will send email.

Setting Up Directory Entry Email Addresses For Local Users

i5/OS's system distribution directory can contain addressing information for users. Directory entries can be created for users who are local to the System i (have an i5/OS user profile) and for users who are remote (do not have an i5/OS user profile). Local users can receive their mail on the System i using i5/OS's POP server or from a remote mail application such as Exchange. You should set up each local user who will be sending email to insure that the apparent "From:" address in the email will be correct and to insure that replies reach the sender. To add a directory entry for user profile MYUSER run the following command: (for this example assume the user's email address is billg@acme.com):

```
ADDIRE USRID(MYUSER MYSYSTEM) USRD('Sample entry')
      USER(MYUSER) SYSNAME(*LCL)
      MSFSRVLVL(*SYSMS) PREFADR(*SMTP)
      USRDFNFLD((SMTPAUSRID SMTP 'billg')
                (SMTPDMN SMTP 'acme.com'))
```

Note: If you are running Lotus Domino for i5/OS run:

```
ADDIRE USRID(MYUSER MYSYSTEM) USRD('Sample entry')
      USER(MYUSER) SYSNAME(*LCL)
      MSFSRVLVL(*DOMINO) PREFADR(*SMTP)
      USRDFNFLD((SMTPAUSRID SMTP 'billg')
                (SMTPDMN SMTP 'acme.com'))
```

To update an existing directory entry for user profile MYUSER run the following command:

```
CHGDIRE USRID(MYUSER MYSYSTEM)
        MSFSRVLVL(*SYSMS) PREFADR(*SMTP)
        USRDFNFLD((SMTPAUSRID SMTP 'billg')
                  (SMTPDMN SMTP 'acme.com'))
```

Setting Up Directory Entry Email Addresses For Remote Users

You do not need to set up remote user in order to send them email, but it will enable you to use distribution lists. To add a directory entry for a remote user who will receive email mail from the System i run the following command (for this example assume the user's email address is johnp@acme.com):

```

ADDDIRE USRID(RMT1 EMAIL) USRD('Sample entry 2')
      USER(*NONE) SYSNAME(TCPIP)
      MSFSRVLVL(*SYSMS) PREFADR(*SMTP)
      USRDFNFLD((SMTPAUSRID SMTP 'johnp')
                (SMTPDMN SMTP 'acme.com'))

```

Note: The choice of USRID(RMT1 EMAIL) is arbitrary, select names that are convenient. The system name must be TCPIP.

To add a directory entry for a Domino user who does not have an i5/OS user profile run the following command (for this example assume the user's email address is `suej@acme.com`):

```

ADDDIRE USRID(DOMINO EMAIL) USRD('Sample entry 3')
      USER(*NONE) SYSNAME(TCPIP)
      MSFSRVLVL(*DOMINO) PREFADR(*SMTP)
      USRDFNFLD((SMTPAUSRID SMTP 'suej')
                (SMTPDMN SMTP 'acme.com'))

```

Note: The choice of USRID(DOMINO EMAIL) is arbitrary, select names that are convenient. The system name must be TCPIP.

Using Distribution Lists

Once you have directory entries set up you can also set up distribution lists. These are lists of recipients (both local and remote) that can be maintained independently of the programs that use the lists. By sending to a distribution list, you send to each entry on the list.

Like directory entries, distribution list IDs have two parts. To make it convenient to manage the system, set up a naming convention for list IDs; for example, INV320 REPORT and INV330 REPORT could be list IDs for recipients of the INV320 and INV330 reports respectively. Such a convention allows lists to be easily associated with their use.

Suppose that the INV320 report should be sent to `billg@acme.com` and to `johnp@acme.com`. To create a distribution list to reflect this, run the following commands:

1. Create the distribution list:

```

CRTDSTL LSTID(INV320 REPORT)
      LSTD('INV320 report distribution')

```

2. Add 2 entries to the distribution list:

```

ADDSTLE LSTID(INV320 REPORT)
      USRID((MYUSER MYSYSTEM) (RMT1 EMAIL))

```

You are now ready to send to the two users with one command by specifying the To (distribution list) parameter:

```
(other command parameters) ... TOUSRID(INV320 REPORT)
```

Adding Line Breaks To The Message

The following CL program fragment shows how to create a message variable that contains a line break (carriage return/line feed pair):

```

...
DCL VAR(&MSG) TYPE(*CHAR) LEN(2048)
DCL VAR(&CRLF) TYPE(*CHAR) LEN(2) VALUE(X'0D25')
...
CHGVAR VAR(&MSG) +
      VALUE('First line.' *CAT &CRLF *CAT 'Second line.')
...

```

The resulting message is:

```
First line.  
Second line.
```

In Cobol, a similar result can be had using the hexadecimal literal X"0D25".

Digitally Signing The Message

Email produced by Excel-erator can be, optionally, digitally signed using S/MIME Signed Message format. S/MIME (Secure / Multipurpose Internet Mail Extensions) is a standard for public key encryption and signing of email encapsulated in MIME. A signed message is an ordinary message with a digital signature added by the sender. The signature has two purposes: it identifies the sender, and it verifies that the content of the message has not been altered since the message was sent.

You create digitally signed email by specifying an Application ID when the email is created. There are two ways to accomplish this: at the command level and at the system (or LPAR) level. The command level overrules the system level. For command level, specify an Application ID directly on the send command's new Signing key (SGNKEY) parameter. For the system level, specify an Application ID on the CHGXLDFT command's new Signing key (SGNKEY) parameter.

The shipped default values for the Signing key (SGNKEY) parameters are *DEFAULT and *NONE respectively.

Application ID refers to the name you have given to a digital certificate when placing it in the *OBJECTSIGNING Certificate Store using i5/OS's Digital Certificate Manager (DCM). DCM is option 34 of i5/OS. You can determine if DCM has been installed by running the Display Software Resources (DSPSFWRSC) command.

Complete information on setting up DCM, creating and storing certificates and adding Application IDs, can be found in the *Security > Digital Certificate Manager* topic in the IBM i Information Center at <http://www.iseries.ibm.com/infocenter>.

CL Coding Tip

Many of our commands accept a variable number of values for a given parameter. For example, the Send Spool Mail (SNDSPLMAIL) command accepts up to 300 email addresses on the recipient parameter. When writing CL programs, the problem of how to code for a variable number of email addresses without coding the SNDSPLMAIL command multiple times (once for each address count) arises. The solution is a little known CL trick for coding "no value" in a variable. "No value" is represented in CL by '*N'. Consider the following program fragment:

```
PGM  
DCL      VAR (&ADD1) TYPE (*CHAR) LEN (128) VALUE ('*N')  
DCL      VAR (&ADD2) TYPE (*CHAR) LEN (128) VALUE ('*N')  
DCL      VAR (&ADD3) TYPE (*CHAR) LEN (128) VALUE ('*N')  
.  
CHGVAR   VAR (&ADD1) VALUE (NOBODY@GUMBO.COM)  
.  
SNDSPLMAIL FILE (QPDSPLIB) TRANSFORM (*TXT) +  
            TOSMTPNAME ((&ADD1) (&ADD2) (&ADD3))  
.  
ENDPGM
```

Since &ADD2 and &ADD3 contain '*N' they are treated as if they weren't specified on the command and the email is sent to only one address.

Changing Command Defaults

As with any CL command, you can change the default values of the commands found in our products. You do this using the i5/OS Change Command Default (CHGCMDDDFT) command.

But before you do, there are some gotchas (Slang term for "I got you": a trap) you should be aware of. You WILL lose the change each time a new release of the product is installed, and you COULD lose the change when PTFs are applied to the product. You must then reapply the default change.

As an example, to change the default transform on SpoolMail's SNDSPLMAIL command from *TXT to *PDF4, run the following:

```
CHGCMDDEF CMD(SNDSPLMAIL) NEWDEF('TRANSFORM(*PDF4)')
```

GUMBO recommends AGAINST changing command defaults, we know from the calls for support we receive that this regularly causes problems for customers.

Chapter 6 Conversion

What's In This Chapter

This chapter describes the file conversion available with Excel-erator. The chapter:

- Gives an overview of the available conversions.
- Describes BIFF8 conversion details and limitations.
- Describes BIFF4 conversion details and limitations.
- Describes CSVUTF8 conversion details and limitations.
- Describes CSVUTF8M conversion details and limitations.
- Describes CSVRFC conversion details and limitations.

Overview

Excel-erator retrieves the requested database file from i5/OS and converts the data into a PC file in spreadsheet format.

The transform parameter determines the type of conversion performed and therefore the format of the generated spreadsheet. The supported formats are:

Transform	Format Description
*BIFF8	Microsoft's Binary Interchange File Format Version 8, the format used by Excel version 8.0 (Excel 97/98), Excel 9.0 (Excel 2000/2001), Excel 10.0 (Excel XP/v.X) and Excel 11.0 (Excel 2003/2004).
*BIFF4	Microsoft's Binary Interchange File Format Version 4, the format used by Excel version 4.0 (Excel 4.0). Note: *BIFF4 is include for compatibility reasons and its use is not recommended in preference to *BIFF8
*CSVUTF8	Comma Separated Values (CSV) format. Data is converted to UTF-8.
*CSVUTF8M	Comma Separated Values (CSV) format. Data is converted to UTF-8 and Byte Order Mark xEFBBBF is inserted at the start of the file.
*CSVRFC	Comma Separated Values (CSV) format. Data is converted to US-ASCII in strict compliance with <i>RFC4180 Common Format and MIME Type for Comma-Separated Values (CSV) Files</i>

For all transforms, each record in the database file creates a row in the spreadsheet, while each selected field in the record creates a cell in the row.

The following sections describe the conversions in more detail.

BIFF8 Conversion Details And Limitations

Details

The BIFF8 conversion creates Microsoft Excel 2003/2004 spreadsheets. The first rows of the spreadsheet contain the title lines specified on the Sheet title (SHEETTITLE) parameter, followed by column headings specified on the Column headings (COLHDG) parameter which serve as column headings for the cells in subsequent rows. The generated spreadsheet contains the field selected from the input file's record format. Fields containing character data (types A, J, E, O, G) are converted to BIFF8's internal encoding based on the field's coded character set identifier (CCSID).

Note: Values specified in the Target coded character set id (TRGCCSID), and Source coded character set id (SRCCCSID) parameters are ignored.

The conversion of fields to cells depends on the field's data type:

Data Type	Processing
A (Character)	Converted to a text cell in BIFF8's internal format based on the CCSID of the field.
P (Packed decimal)	Converted to a number cell.
S (Zoned decimal)	Converted to a number cell.
B (Binary)	Converted to a number cell.

F (Floating point)	Converted to a number cell.
H (Hexadecimal)	Copied to a text cell without conversion.
L (Date)	Converted to a date cell with *ISO formatting.
T (Time)	Converted to a time cell with *ISO formatting.
Z (Timestamp)	Converted to a date cell with *ISO formatting. The microseconds are omitted.
J (DBCS-Only)	Converted to a text cell in BIFF8's internal format based on the CCSID of the field.
E (DBCS-Either)	Converted to a text cell in BIFF8's internal format based on the CCSID of the field.
O (DBCS-Open)	Converted to a text cell in BIFF8's internal format based on the CCSID of the field.
G (DBCS-Graphic)	Converted to a text cell in BIFF8's internal format based on the CCSID of the field.
1 (BLOB)	Omitted and a warning is issued.
2 (CLOB)	Omitted and a warning is issued.
3 (DBCLOB)	Omitted and a warning is issued.
4 (Datalink)	Omitted and a warning is issued.

Our calls to the underlying i5/OS apis specify that overrides should be processed when retrieving file information and data.

Limitations

Microsoft's BIFF8 spreadsheet format and Excel-erator impose certain limits on the conversion process. These are:

- A spreadsheet may have no more than 32 worksheets.
- When a database file has more than 65536 records it is split into multiple worksheets of 65536 rows each. This gives an effective limit of 2,097,152 records.
- A spreadsheet may have no more than 256 columns.
- All BIFF8 numbers are represented internally as long doubles which can give slightly different decimal position results. That is, the i5/OS value 123.456 might show up as 123.456001 when viewed in the cell.
- Logical files are supported, but only if they have a single record format.
- BIFF8's format strings do not support the features of i5/OS's edit words. A trivial translation is performed.

BIFF4 Conversion Details And Limitations

Details

The BIFF4 conversion creates Microsoft Excel 4.0 spreadsheets. The first rows of the spreadsheet contain the title lines specified on the Sheet title (SHEETTITLE) parameter, followed by column headings specified on the Column headings (COLHDG) parameter which serve as column headings for the cells in subsequent rows. The generated spreadsheet contains the field selected from the input file's record format. These are converted from EBCDIC to ASCII based on the values specified in the command's Target coded character set id (TRGCCSID), and Source coded character set id (SRCCSID) parameters.

The conversion of fields to cells depends on the field's data type:

Data Type	Processing
A (Character)	Converted to a text cell based on the SRCCSID and TRGCCSID. The data is trimmed if it exceeds the Excel maximum of 255.
P (Packed decimal)	Converted to a number cell.
S (Zoned decimal)	Converted to a number cell.
B (Binary)	Converted to a number cell.
F (Floating point)	Converted to a number cell.
H (Hexadecimal)	Copied to a text cell without conversion.
L (Date)	Converted to a date cell with *ISO formatting.
T (Time)	Converted to a time cell with *ISO formatting.
Z (Timestamp)	Converted to a date cell with *ISO formatting. The microseconds are omitted.
J (DBCS-Only)	Omitted and a warning is issued.
E (DBCS-Either)	Omitted and a warning is issued.

O (DBCS-Open)	Omitted and a warning is issued.
G (DBCS-Graphic)	Omitted and a warning is issued.
1 (BLOB)	Omitted and a warning is issued.
2 (CLOB)	Omitted and a warning is issued.
3 (DBCLOB)	Omitted and a warning is issued.
4 (Datalink)	Omitted and a warning is issued.

Our calls to the underlying i5/OS apis specify that overrides should be processed when retrieving file information and data.

Limitations

Microsoft's BIFF4 spreadsheet format and Excel-erator impose certain limits on the conversion process. These are:

- Double byte character set data is not supported.
- A spreadsheet may have only one worksheet.
- A spreadsheet may have no more than 65536 rows.
- A spreadsheet may have no more than 256 columns.
- A character field may have a maximum length of 255.
- All BIFF4 numbers are represented internally as long doubles which can give slightly different decimal position results. That is, the i5/OS value 123.456 might show up as 123.456001 when viewed in the cell.
- Logical files are supported, but only if they have a single record format.
- BIFF4's format strings do not support the features of i5/OS's edit words. A trivial translation is performed.

CSVUTF8 Conversion Details And Limitations

Details

The CSVUTF8 conversion creates Comma Separated Values spreadsheets in compliance with *RFC4180 Common Format and MIME Type for Comma-Separated Values (CSV) Files* with one exception noted below. The first rows of the spreadsheet can optionally contain column headings as specified on the Column headings (COLHDG) parameter. These serve as column headings for the cells in subsequent rows. The generated spreadsheet contains the field selected from the input file's record format. While RFC4180 only allows US-ASCII, fields containing character data (types A, J, E, O, G) are converted to UTF8 based on the field's coded character set identifier (CCSID). This insures that any and all character data can be included. If the character data happens to all be US-ASCII, the resulting file is strictly compliant with RFC4180.

Note: Values specified in the Target coded character set id (TRGCCSID), and Source coded character set id (SRCCCSID) parameters are ignored.

The conversion of fields to values depends on the field's data type. In all cases, quoting rules are applied after conversion, as needed:

Data Type	Processing
A (Character)	Converted to UTF8 based on the CCSID of the field.
P (Packed decimal)	Converted to a UTF8 character value with EDTCDE() or EDTWRD() applied if specified.
S (Zoned decimal)	Converted to a UTF8 character value with EDTCDE() or EDTWRD() applied if specified.
B (Binary)	Converted to a UTF8 character value with EDTCDE() or EDTWRD() applied if specified.
F (Floating point)	Converted to a UTF8 character value in external floating point format.
H (Hexadecimal)	Copied without conversion.
L (Date)	Converted to a UTF8 character value based on the specified DATFMT() and DATSEP().
T (Time)	Converted to a UTF8 character value based on the specified TIMFMT() and TIMSEP().
Z (Timestamp)	Converted to a UTF8 character value.
J (DBCS-Only)	Converted to UTF8 based on the CCSID of the field.
E (DBCS-Either)	Converted to UTF8 based on the CCSID of the field.
O (DBCS-Open)	Converted to UTF8 based on the CCSID of the field.

G (DBCS-Graphic)	Converted to UTF8 based on the CCSID of the field.
1 (BLOB)	Omitted and a warning is issued.
2 (CLOB)	Omitted and a warning is issued.
3 (DBCLOB)	Omitted and a warning is issued.
4 (Datalink)	Omitted and a warning is issued.

Our calls to the underlying i5/OS apis specify that overrides should be processed when retrieving file information and data.

Limitations

Comma Separated Value and Excel-erator impose certain limits on the conversion process. These are:

- A spreadsheet may have only one database member.
- Logical files are supported, but only if they have a single record format.
- Bolding requests are ignored.
- BIFF specific parameters such as:
 - Sheet name (SHEETNAME)
 - Sheet title (SHEETTITLE)
 - Add worksheet (ADDWS)
 - Print header (PRTHEADER)
 - Print footer (PRTFOOTER)
 - Font typeface (FONT)
 - Cell comments (COMMENT)
 - File sharing (FILESHARE)
 - Column heading format (COLHDGFMT)
 - Color palette (PALETTE)

are ignored.

CSVUTF8M Conversion Details And Limitations

Details

The CSVUTF8M conversion is identical to CSVUTF8 in all respects except one. For CSVUTF8M a byte order mark of xEBBBF is placed at the beginning of the generated file.

Limitations

Same as CSVUTF8 limitations listed above.

CSVRFC Conversion Details And Limitations

Details

The CSVRFC conversion is identical to CSVUTF8 in all respects except one. For CSVRFC if any data can not be converted to US-ASCII (CCSID=367), the conversion process fails and a spreadsheet is not generated.

Limitations

Same as CSVUTF8 limitations listed above with one addition:

- All data must convert to US-ASCII (CCSID=367).

Chapter 7 Commands

What's In This Chapter

This chapter describes the control language (CL) commands supplied by Excel-erator. The commands are arranged in alphabetic order by command name (mnemonic). Each description includes environment and threadsafe classification, a brief general description, detailed parameter explanations, examples and message information. Additional explanatory material can be found in the *Programming > CL overview and concepts* topic in the IBM i Information Center at <http://www.iseries.ibm.com/infocenter>.

Change Excel-erator Authorization (CHGXL1AUT)

Where allowed to run: All environments (*ALL)

Threadsafe: No

The Change Excel-erator Authorization (CHGXL1AUT) command changes the authorization code for Excel-erator. The command is used to extend a demonstration period or to permanently authorize Excel-erator for a system or a partition.

Parameters

Keyword	Description	Choices	Notes
AUTH	Authorization code	<i>Hexadecimal value</i>	Required, Positional 1
EXPDAT	Expiration date (CCYYMMDD)	<i>Character value, <u>*NONE</u></i>	Optional, Positional 2
LICTYP	License type	<i><u>*SYS</u>, *LPAR</i>	Optional, Positional 3
PRCMAX	Processor maximum capacity	<i>Decimal number</i>	Optional, Positional 4

Authorization code (AUTH)

Specifies the authorization code to use. The authorization code is 8 hex digits that may be entered in upper or lower case.

This is a required parameter.

hexadecimal value Specify the case insensitive authorization code.

Expiration date (CCYYMMDD) (EXPDAT)

Specifies the date on which the authorization expires.

***NONE** The authorization is permanent.
date The date on which the authorization expires in CCYYMMDD format.

License type (LICTYP)

Specifies the type of license that is authorized.

***SYS** The authorization is for a system wide license which enables any and all partitions on the system but is specific to the processor group.

Note: The authorization code must be entered in each partition.

***LPAR** The license is specific to one of the partitions on the system and specific to a number of processors within the partition. A partition license must be entered in the partition for which it is intended.

Processor maximum capacity (PRCMAX)

Specifies the maximum processor capacity for which the partition is licensed. The value is expressed in terms of processors where 1.00 is 100% of a processor's capacity or the same as 1 processor, .50 is 50% of a processor's capacity or .5 processors, 2.00 is 200% of a processor's capacity or 2 processors, etc.

decimal number Specify the maximum processor capacity.

Examples

Example 1:

```
CHGXL1AUT AUTH(01234567)
```

This command changes the authorization code to a permanent system wide license code.

Example 2:

```
CHGXL1AUT AUTH(01234567) LICTYP(*LPAR) PRCMAX(1.3)
```

This command changes the authorization code to a permanent partition only license code for 1.3 processors in the current partition.

Change Excel-erator Default (CHGXL1DFT)

Where allowed to run: All environments (*ALL)

Threadsafe: No

The Change Excel-erator Default (CHGXL1DFT) command changes values used by Excel-erator to control processing and other activities.

Parameters

Keyword	Description	Choices	Notes
SGNKEY	Signing key	Single values: *SAME , *NONE Other values: <i>Element list</i>	Optional, Positional 1
	Element 1: Application ID	<i>Character value</i>	

Signing key (SGNKEY)

Specifies the default digital certificate used to sign email.

The signature included with the email allows the recipient to validate the identity of the sender and provides additional assurance that the email has not been tampered with after it is signed.

A certificate is referenced by specifying the name (Application ID) of an object signing application created using i5/OS's Digital Certificate Manager.

*SAME	The value is not changed.
*NONE	No signing operation is performed.
<i>application-id</i>	Specify the application identifier to use in the signing operation.

Examples

Example 1:

```
CHGXL1DFT  SGNKEY (*NONE)
```

This command removes the default digital certificate. By default, emails are not signed.

Example 2:

```
CHGXL1DFT  SGNKEY (WIDGETEMAIL)
```

This command changes the application identifier used to locate a digital certificate used to sign email, by default.

Check Excel-erator Authorization (CHKXL1AUT)

Where allowed to run: All environments (*ALL)

Threadsafe: No

The Check Excel-erator Authorization (CHKXL1AUT) command executes Excel-erator's authorization verification function. This allows you to determine whether and how the product is authorized for use.

Parameters

Keyword	Description	Choices	Notes
MSGQ	Message queue	Single values: <u>*NONE</u> Other values: <i>Qualified object name</i>	Optional, Positional 1
	Qualifier 1: Message queue	<i>Name</i>	
	Qualifier 2: Library	<i>Name</i> , <u>*LIBL</u> , *CURLIB	

Message queue (MSGQ)

Specifies a message queue that should receive messages if the product is not permanently authorized.

Single values

*NONE Messages are not sent to an external message queue.

Qualifier 1: Message queue

name Specify the name message queue that receives messages.

Qualifier 2: Library

*LIBL All libraries in the thread's library list are searched.

*CURLIB Use the current library for the job. If no library is specified as the current library for the job, QGPL is used.

name Specify the name of the library.

Examples

Example 1:

```
CHKXL1AUT
```

This command executes Excel-erator's authorization verification function to determine whether and how the product is authorized for use.

Example 2:

```
CHKXL1AUT MSGQ(QSYSOPR)
```

This command executes Excel-erator's authorization verification function to determine whether and how the product is authorized for use. If the product is not permanently authorized for use a failure message is sent to the system operator's message queue.

Copy To Excel (CPYTOEXCEL)

Where allowed to run: All environments (*ALL)

Threading: No

The Copy To Excel (CPYTOEXCEL) command converts an i5/OS database file into an Excel spreadsheet which is stored in i5/OS's Integrated File System.

Parameters

Keyword	Description	Choices	Notes
FROMFILE	From file	<i>Qualified object name</i>	Required,
	Qualifier 1: From file	<i>Name</i>	Positional 1
	Qualifier 2: Library	<i>Name, *LIBL, *CURLIB</i>	
TOOBJ	Object	<i>Character value, *FILE, *FILELIB, *MBR, *TEXT, *MBRCDAT, *MBRCCYY, *MBRCYY, *MBRCMM, *MBRCDD, *MBRCTIM, *MBRGDAT, *MBRGYY, *MBRGY, *MBRGMM, *MBRGDD, *MBRGTIM</i>	Required, Positional 2
FROMMBR	From member	<i>Name, *FIRST, *LAST</i>	Optional, Positional 3
COLHDG	Column headings	<i>*FLDNAM, *ALIAS, *COLHDG, *COLHD1, *NONE, *FLDNAMBLD, *ALIASBLD, *COLHDGBLD, *COLHD1BLD</i>	Optional, Positional 4
FIELD	Field	Single values: <i>*ALL</i> Other values (up to 256 repetitions): <i>Name</i>	Optional
TRANSFORM	Transform	<i>*BIFF8, *CSVUTF8, *CSVUTF8M, *CSVRFC, *BIFF4</i>	Optional
SHEETNAME	Sheet name	<i>Character value, *FILE, *FILELIB, *MBR, *TEXT, *MBRCDAT, *MBRCCYY, *MBRCYY, *MBRCMM, *MBRCDD, *MBRCTIM, *MBRGDAT, *MBRGYY, *MBRGY, *MBRGMM, *MBRGDD, *MBRGTIM</i>	Optional
SHEETTITLE	Sheet title	Single values: <i>*NONE</i> Other values (up to 5 repetitions): <i>Character value</i>	Optional
ADDWS	Add worksheet	Single values: <i>*NONE</i> Other values (up to 31 repetitions): <i>Element list</i>	Optional
	Element 1: From file	<i>Qualified object name</i>	
	Qualifier 1: From file	<i>Name</i>	
	Qualifier 2: Library	<i>Name, *LIBL, *CURLIB</i>	
	Element 2: From member	<i>Name, *FIRST, *LAST</i>	
	Element 3: Field	Single values: <i>*ALL</i> Other values (up to 256 repetitions): <i>Name</i>	
Element 4: Sheet name	<i>Character value, *FILE, *FILELIB, *MBR, *TEXT, *MBRCDAT, *MBRCCYY, *MBRCYY, *MBRCMM, *MBRCDD, *MBRCTIM, *MBRGDAT, *MBRGYY, *MBRGY, *MBRGMM, *MBRGDD, *MBRGTIM</i>		
Element 5: Sheet title	Single values: <i>*NONE</i> Other values (up to 5 repetitions): <i>Character value</i>		
PRTHEADER	Print header	<i>Character value, *RCDTEXT, *MBRTEXT, *FILTEXT, *NONE</i>	Optional
PRTFOOTER	Print footer	<i>Character value, *RCDTEXT, *MBRTEXT, *FILTEXT, *NONE</i>	Optional
FONT	Font typeface	<i>Character value, *ARIAL, *COURIER</i>	Optional
COMMENT	Cell comments	Single values: <i>*NONE</i> Other values (up to 32 repetitions): <i>Element list</i>	Optional
	Element 1: Column	1-256, <u>A</u> , B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z, AA, AB, AC, AD, AE, AF, AG, AH, AI, AJ, AK, AL, AM, AN, AO, AP, AQ, AR, AS, AT, AU, AV, AW, AX, AY, AZ, BA, BB, BC, BD, BE, BF, BG, BH, BI, BJ, BK, BL, BM, BN, BO, BP, BQ, BR, BS, BT, BU, BV, BW, BX, BY, BZ, CA, CB, CC, CD, CE, CF, CG, CH, CI, CJ, CK, CL, CM, CN, CO, CP, CQ, CR, CS, CT, CU, CV, CW, CX, CY, CZ, DA, DB, DC, DD, DE, DF, DG, DH, DI, DJ, DK, DL, DM, DN, DO, DP, DQ, DR, DS, DT, DU, DV, DW, DX, DY, DZ, EA, EB, EC, ED, EE, EF, EG, EH, EI, EJ, EK, EL, EM, EN, EO, EP, EQ, ER, ES, ET, EU, EV, EW, EX, EY, EZ, FA, FB, FC, FD, FE, FF, FG, FH, FI, FJ, FK, FL, FM, FN, FO, FP, FQ, FR, FS, FT, FU, FV, FW, FX, FY, FZ, GA, GB, GC, GD, GE, GF, GG, GH, GI, GJ, GK, GL, GM, GN, GO, GP, GQ, GR, GS, GT, GU, GV, GW, GX, GY, GZ, HA, HB, HC, HD, HE, HF, HG, HH, HI, HJ, HK, HL, HM, HN, HO, HP, HQ, HR, HS, HT, HU, HV, HW, HX, HY, HZ, IA, IB, IC, ID, IE, IF, IG, IH, II, IJ, IK, IL, IM, IN, IO, IP, IQ, IR, IS, IT, IU, IV	
	Element 2: Row	1-65536, <u>1</u>	

	Element 3: Text	<i>Character value</i>	
TRGCCSID	Target coded character set id	1-65533, 1252	Optional
SRCCSID	Source coded character set id	1-65533, *KBDTYPE , *SYSVAL, *JOBDFI	Optional
REPLACE	Replace PC file data	*NO, *YES , Y, N	Optional
DTAAUT	Data authorities	*ALL , *NONE, *RWX, *RX, *RW, *WX, *R, *W, *X, *EXCLUDE, *INHERIT	Optional
CRTDIR	Create directories	*NO , *YES, Y, N	Optional
OWNER	Owner	<i>Name</i> , *CURSRPRF	Optional
OBJATR	Object attribute	Single values: *NONE Other values (up to 2 repetitions): <i>Element list</i>	Optional
	Element 1: Attribute	*DISKSTGOPT	
	Element 2: Value	*NORMAL , *MINIMIZE, *DYNAMIC	
FILESHARE	File sharing	<i>Element list</i>	Optional
	Element 1: Password to open	<i>Character value</i>	
	Element 2: Password to modify	<i>Character value</i>	
	Element 3: Read-only recommended	*YES, *NO , Y, N	
COLHDGFM	Column heading format	Single values: *DEFAULT Other values: <i>Element list</i>	Optional
	Element 1: Alignment-Horizontal	*GENERAL , *TYPE, *LEFT, *CENTER, *RIGHT, *FILL, *JUSTIFY, *CENTERSEL, 0, 1, 2, 3, 4, 5, 6, 8	
	Element 2: Border-Top line style	*NONE , *THIN, *MEDIUM, *DASHED, *DOTTED, *THICK, *DOUBLE, *HAIR, 0, 1, 2, 3, 4, 5, 6, 7	
	Element 3: Border-Left line style	*NONE , *THIN, *MEDIUM, *DASHED, *DOTTED, *THICK, *DOUBLE, *HAIR, 0, 1, 2, 3, 4, 5, 6, 7	
	Element 4: Border-Bottom line style	*NONE , *THIN, *MEDIUM, *DASHED, *DOTTED, *THICK, *DOUBLE, *HAIR, 0, 1, 2, 3, 4, 5, 6, 7	
	Element 5: Border-Right line style	*NONE , *THIN, *MEDIUM, *DASHED, *DOTTED, *THICK, *DOUBLE, *HAIR, 0, 1, 2, 3, 4, 5, 6, 7	
	Element 6: Border-Top line color	*SYSTEM , *BLACK, *WHITE, *RED, *BRIGHTGREEN, *BLUE, *YELLOW, *PINK, *TURQUOISE, *DARKRED, *GREEN, *DARKBLUE, *DARKYELLOW, *VIOLET, *TEAL, *GRAY25, *GRAY50, *COLOR1, *COLOR2, *COLOR3, *COLOR4, *COLOR5, *COLOR6, *COLOR7, *COLOR8, *COLOR9, *COLOR10, *COLOR11, *COLOR12, *COLOR13, *COLOR14, *COLOR15, *COLOR16, 32767, 8, 9, 10, 11, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23	
	Element 7: Border-Left line color	*SYSTEM , *BLACK, *WHITE, *RED, *BRIGHTGREEN, *BLUE, *YELLOW, *PINK, *TURQUOISE, *DARKRED, *GREEN, *DARKBLUE, *DARKYELLOW, *VIOLET, *TEAL, *GRAY25, *GRAY50, *COLOR1, *COLOR2, *COLOR3, *COLOR4, *COLOR5, *COLOR6, *COLOR7, *COLOR8, *COLOR9, *COLOR10, *COLOR11, *COLOR12, *COLOR13, *COLOR14, *COLOR15, *COLOR16, 32767, 8, 9, 10, 11, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23	
	Element 8: Border-Bottom line color	*SYSTEM , *BLACK, *WHITE, *RED, *BRIGHTGREEN, *BLUE, *YELLOW, *PINK, *TURQUOISE, *DARKRED, *GREEN, *DARKBLUE, *DARKYELLOW, *VIOLET, *TEAL, *GRAY25, *GRAY50, *COLOR1, *COLOR2, *COLOR3, *COLOR4, *COLOR5, *COLOR6, *COLOR7, *COLOR8, *COLOR9, *COLOR10, *COLOR11, *COLOR12, *COLOR13, *COLOR14, *COLOR15, *COLOR16, 32767, 8, 9, 10, 11, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23	
	Element 9: Border-Right line color	*SYSTEM , *BLACK, *WHITE, *RED, *BRIGHTGREEN, *BLUE, *YELLOW, *PINK, *TURQUOISE, *DARKRED, *GREEN, *DARKBLUE, *DARKYELLOW, *VIOLET, *TEAL, *GRAY25, *GRAY50, *COLOR1, *COLOR2, *COLOR3, *COLOR4, *COLOR5, *COLOR6, *COLOR7, *COLOR8, *COLOR9, *COLOR10, *COLOR11, *COLOR12, *COLOR13, *COLOR14, *COLOR15, *COLOR16, 32767, 8, 9, 10, 11, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23	
	Element 10: Patterns-Type	*NONE , *SOLID, *GRAY75, *GRAY50, *GRAY25, *GRAY12, *GRAY6, *STRIPEH50, *STRIPEH25, *STRIPEV50, *STRIPEV25, *STRIPED50, *STRIPED25, *STRIPEDR50, *STRIPEDR25, *HATCHD75, *HATCHD50, *HATCHD38, *HATCHH38, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18	
	Element 11: Patterns-Foreground color	*AUTOMATIC , *BLACK, *WHITE, *RED, *BRIGHTGREEN, *BLUE, *YELLOW, *PINK, *TURQUOISE, *DARKRED, *GREEN, *DARKBLUE, *DARKYELLOW, *VIOLET, *TEAL, *GRAY25, *GRAY50, *COLOR1, *COLOR2, *COLOR3, *COLOR4, *COLOR5, *COLOR6, *COLOR7, *COLOR8, *COLOR9, *COLOR10, *COLOR11, *COLOR12, *COLOR13, *COLOR14, *COLOR15, *COLOR16, 24, 8, 9, 10, 11, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23	
	Element 12: Patterns-Background	*AUTOMATIC , *BLACK, *WHITE, *RED, *BRIGHTGREEN, *BLUE,	

	color	*YELLOW, *PINK, *TURQUOISE, *DARKRED, *GREEN, *DARKBLUE, *DARKYELLOW, *VIOLET, *TEAL, *GRAY25, *GRAY50, *COLOR1, *COLOR2, *COLOR3, *COLOR4, *COLOR5, *COLOR6, *COLOR7, *COLOR8, *COLOR9, *COLOR10, *COLOR11, *COLOR12, *COLOR13, *COLOR14, *COLOR15, *COLOR16, 25, 8, 9, 10, 11, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23	
	Element 13: Protection-Locked	*YES, *NO, 0, 1	
PALETTE	Color palette	Values (up to 16 repetitions): <i>Element list</i>	Optional
	Element 1: Color to replace	*BLACK, *WHITE, *RED, *BRIGHTGREEN, *BLUE, *YELLOW, *PINK, *TURQUOISE, *DARKRED, *GREEN, *DARKBLUE, *DARKYELLOW, *VIOLET, *TEAL, *GRAY25, *GRAY50	
	Element 2: Red component	0-255	
	Element 3: Green component	0-255	
	Element 4: Blue component	0-255	

From file (FROMFILE)

Specifies the database file to copy. CHAR(10), CHAR(10).

This is a required parameter.

Qualifier 1: From file

name Specify the name of the file.

Qualifier 2: Library

***LIBL** All libraries in the thread's library list are searched.

***CURLIB** Use the current library for the job. If no library is specified as the current library for the job, QGPL is used.

name Specify the name of the library.

Object (TOOBJ)

Specifies the path name of the object (PC file) to create.

For more information on specifying path names, see *Programming > Control language > CL concepts > i5/OS objects > Object naming rules* topic in the IBM i Information Center at <http://www.iseries.ibm.com/infocenter>.
CHAR(5000)

This is a required parameter.

path name Specify up to 5000 characters of path name. For example to create a file with name abc.txt in a directory with name mydirectory, specify '/mydirectory/abc.txt'

Excel-erator provides several special values that can be used to construct dynamic object (PC file) names. When the special values are found, the associated data is blank trimmed and substituted into the path specified when it is processed. If the data associated with a special value is blank, "BLANK" is substituted. If the data associated with a special value contains characters not allowed in an object name, question marks (?) for example, the name will be invalid and the command will fail. The special values must be delimited by an underscore ('_') a period ('.') a slash ('/' or '\') or another special value (which starts with '*').

The transform related special values are:

***TRNEXT** Transform dependant file extension CHAR(3).

- XLS for *BIFF8 or *BIFF4.
- csv for *CSVUTF8, *CSVUTF8M or *CSVRFC.

The member related special values are:

***FILE** File name CHAR(10).
***FILELIB** Library containing the file CHAR(10).
***MBR** Member name CHAR(10).
***TEXT** Member Text 'description' CHAR(50).
***MBRCDAT** Date the member was created CHAR(7) CYYMMDD.

*MBRCCYY	CYY portion of *MBRCDAT CHAR(3).
*MBRCYY	YY portion of *MBRCDAT CHAR(2).
*MBRCMM	MM portion of *MBRCDAT CHAR(2).
*MBRCDD	DD portion of *MBRCDAT CHAR(2).
*MBRCTIM	Time the member was created CHAR(6) HHMMSS.
*MBRGDAT	Date the member was changed CHAR(7) CYYMMDD.
*MBRGYY	CYY portion of *MBRGDAT CHAR(3).
*MBRGYY	YY portion of *MBRGDAT CHAR(2).
*MBRGMM	MM portion of *MBRGDAT CHAR(2).
*MBRGDD	DD portion of *MBRGDAT CHAR(2).
*MBRGTIM	Time the member was changed CHAR(6) HHMMSS.

From member (FROMBR)

Specifies the name of the member to copy. CHAR(10).

*FIRST	The first member in the database from-file is processed.
*LAST	The last member in the database from-file is processed.
<i>name</i>	Specify the name of the database from-file member to process.

Column headings (COLHDG)

Specifies the column headings generated. CHAR(10)

*FLDNAM	The file's field names are used as column headings.
*ALIAS	The file's field aliases are used as column headings.
*COLHDG	The file's field column headings are used as column headings.
*COLHD1	The file's field column headings are used as column headings. A heading with multiple lines is text wrapped into a single cell.
*NONE	No column headings are included.
*FLDNAMBLD	The file's field names are used as column headings. The column headings are bold.
*ALIASBLD	The file's field aliases are used as column headings. The column headings are bold.
*COLHDGBLD	The file's field column headings are used as column headings. The column headings are bold.
*COLHD1BLD	The file's field column headings are used as column headings. A heading with multiple lines is text wrapped into a single cell. The column headings are bold.

Field (FIELD)

Specifies the list of fields to include in the spreadsheet. CHAR(10)

Single values

*ALL	All fields in the database file are included in the spreadsheet in the order they appear in the file.
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Other values (up to 256 repetitions)

<i>name</i>	Specify the list of field names to be included in the spreadsheet. The fields appear in the spreadsheet in the order specified, duplicates are allowed.
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Transform (TRANSFORM)

Specifies the target format to which the data is transformed. CHAR(10).

*BIFF8	Microsoft's Binary Interchange File Format Version 8, the format used by Excel version 8.0 (Excel 97/98), Excel 9.0 (Excel 2000/2001), Excel 10.0 (Excel XP/v.X) and Excel 11.0 (Excel 2003/2004).
*BIFF4	Microsoft's Binary Interchange File Format Version 4, the format used by Excel version 4.0 (Excel 4.0). Note: *BIFF4 is include for compatibility reasons and its use is not recommended in preference to *BIFF8
*CSVUTF8	Comma Separated Values (CSV) format. Data is converted to UTF-8.

- *CSVUTF8M** Comma Separated Values (CSV) format. Data is converted to UTF-8 and Byte Order Mark xEFBBBF is inserted at the start of the file.
- *CSVRFC** Comma Separated Values (CSV) format. Data is converted to US-ASCII in strict compliance with *RFC4180 Common Format and MIME Type for Comma-Separated Values (CSV) Files*

Sheet name (SHEETNAME)

Specifies the name of the worksheet. CHAR(32)

Note: *BIFF4 does not support this value and it is ignored when TRANSFORM(*BIFF4) is specified.

- *MBR** The member name is the sheet name.
- character value** Specify up to 32 characters enclosed in apostrophes.

Excel-erator provides several special values that can be used to construct dynamic sheet names. When the special values are found, the associated data is blank trimmed and substituted into the name specified when it is processed. If the data associated with a special value is blank, "BLANK" is substituted. The special values must be delimited by an underscore (_) a period (.) or another special value (which starts with '*'). The result is trimmed if the length is exceeded.

- *FILE** File name CHAR(10).
- *FILELIB** Library containing the file CHAR(10).
- *MBR** Member name CHAR(10).
- *TEXT** Member Text 'description' CHAR(50).
- *MBRCDAT** Date the member was created CHAR(7) CYYMMDD.
- *MBRCCYY** CYY portion of *MBRCDAT CHAR(3).
- *MBRCYY** YY portion of *MBRCDAT CHAR(2).
- *MBRCMM** MM portion of *MBRCDAT CHAR(2).
- *MBRCDD** DD portion of *MBRCDAT CHAR(2).
- *MBRCTIM** Time the member was created CHAR(6) HHMMSS.
- *MBRGDAT** Date the member was changed CHAR(7) CYYMMDD.
- *MBRGYY** CYY portion of *MBRGDAT CHAR(3).
- *MBRGYY** YY portion of *MBRGDAT CHAR(2).
- *MBRGMM** MM portion of *MBRGDAT CHAR(2).
- *MBRGDD** DD portion of *MBRGDAT CHAR(2).
- *MBRGTIM** Time the member was changed CHAR(6) HHMMSS.

Sheet title (SHEETTITLE)

Specifies the title of the worksheet. CHAR(80)

Note: *BIFF4 does not support this value and it is ignored when TRANSFORM(*BIFF4) is specified.

Single values

- *NONE** Title lines are not included in the sheet.

Other values (up to 5 repetitions)

- character value** Specify up to 80 characters enclosed in apostrophes.

Add worksheet (ADDWS)

Specifies one or more worksheets to add to the generated spreadsheet by specifying the database file, member name, and list of fields used as source to add. CHAR(10), CHAR(10), CHAR(10) CHAR(10)

This is a required parameter.

Single values

- *NONE** No additional worksheets are included.

Element 1: From file

The name and library of a database file.

Qualifier 1: From file	<i>name</i>	Specify the name of the file.
Qualifier 2: Library	*LIBL	All libraries in the thread's library list are searched.
	*CURLIB	Use the current library for the job. If no library is specified as the current library for the job, QGPL is used.
	<i>name</i>	Specify the name of the library.

Element 2: From member

*FIRST	The first member in the database from-file is processed.
*LAST	The last member in the database from-file is processed.
<i>name</i>	Specify the name of the database from-file member to process.

Element 3: Field

Single values	*ALL	All fields in the database file are included in the spreadsheet in the order they appear in the file.
Other values	<i>name</i>	Specify the list of field names to be included in the spreadsheet. The fields appear in the spreadsheet in the order specified, duplicates are allowed.

Element 5: Sheet name

Specifies the name of the worksheet. CHAR(32)

Note: *BIFF4 does not support this value and it is ignored when TRANSFORM(*BIFF4) is specified.

*MBR	The member name is the sheet name.
<i>character value</i>	Specify up to 32 characters enclosed in apostrophes.

Excel-erator provides several special values that can be used to construct dynamic sheet names. When the special values are found, the associated data is blank trimmed and substituted into the name specified when it is processed. If the data associated with a special value is blank, "BLANK" is substituted. The special values must be delimited by an underscore (_) a period (.) or another special value (which starts with '*'). The result is trimmed if the length is exceeded.

*FILE	File name CHAR(10).
*FILELIB	Library containing the file CHAR(10).
*MBR	Member name CHAR(10).
*TEXT	Member Text 'description' CHAR(50).
*MBRCDAT	Date the member was created CHAR(7) CYYMMDD.
*MBRCCYY	CYY portion of *MBRCDAT CHAR(3).
*MBRCYY	YY portion of *MBRCDAT CHAR(2).
*MBRCMM	MM portion of *MBRCDAT CHAR(2).
*MBRCDD	DD portion of *MBRCDAT CHAR(2).
*MBRCTIM	Time the member was created CHAR(6) HHMMSS.
*MBRGDAT	Date the member was changed CHAR(7) CYYMMDD.
*MBRGYY	CYY portion of *MBRGDAT CHAR(3).
*MBRGYY	YY portion of *MBRGDAT CHAR(2).
*MBRGMM	MM portion of *MBRGDAT CHAR(2).
*MBRGDD	DD portion of *MBRGDAT CHAR(2).
*MBRGTIM	Time the member was changed CHAR(6) HHMMSS.

Element 6: Sheet title

Specifies the title of the worksheet. CHAR(80)

Note: *BIFF4 does not support this value and it is ignored when TRANSFORM(*BIFF4) is specified.

Single values	*NONE	Title lines are not included in the sheet.
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Other values **character value** Specify up to 80 characters enclosed in apostrophes.

Print header (PRTHEADER)

Specifies the print header placed in the spreadsheet. CHAR(50)

***NONE** No print header is included in the file.
***RCDTEXT** The record text is used as the print header.
***MBRTEXT** The member text is used as the print header.
***FILTEXT** The file text is used as the print header.
character value Enter the value to use as the print header.

Print footer (PRTFOOTER)

Specifies the print footer placed in the spreadsheet. CHAR(50)

***NONE** No print footer is included in the file.
***RCDTEXT** The record text is used as the print footer.
***MBRTEXT** The member text is used as the print footer.
***FILTEXT** The file text is used as the print footer.
character value Enter the value to use as the print footer.

Font typeface (FONT)

Specifies the font name placed into the file. The font specified must be available on the PC that is running Excel. CHAR(32).

***ARIAL** Font Arial is used.
***COURIER** Font Courier New, a fixed pitch font, is used.
character value The name of the font to use.

Cell comments (COMMENT)

Specifies cell comments, consisting of a cell's coordinate column/row and the comment text, that are added to the generated spreadsheet. A comment can be added to a cell even if it does not contain data. INT(4) (where A=1, B=2, etc.), INT(4) CHAR(2048)

Single values

***NONE** No comments are added to the spreadsheet.

Element 1: Column

cell-column The column of the cell that receives the comment. You can use either a letter or number designation.

Element 2: Row

cell-row The row of the cell that receives the comment.

Element 3: Text

character value Enter the text that is to appear in the comment.

Target coded character set id (TRGCCSID)

Specifies the ASCII coded character set identifier (CCSID) that is used to map character data in the generated spreadsheet. INT(4)

Note: Only *BIFF4 supports this value and it is ignored unless TRANSFORM(*BIFF4) is specified.

1252 The default Windows coded character set identifier is used.

integer Specify the coded character set identifier to use.

Source coded character set id (SRCCSID)

Specifies the coded character set identifier (CCSID) used to create the spreadsheet. INT(4)

Note: Only *BIFF4 supports this value and it is ignored unless TRANSFORM(*BIFF4) is specified.

*KBDTYPE	The system determines the coded character set identifier value from the QKBDTYPE system value.
*SYSVAL	The system determines the coded character set identifier value from the QCHRID system value.
*JOBDFI	The system uses the current job's default coded character set identifier.
<i>integer</i>	Specify the coded character set identifier to use.

Replace PC file data (REPLACE)

Specifies whether or not data in the PC file should be replaced if the object already exists. If the object does not exist, it is created. CHAR(1)

*YES	Data in an existing object is replaced.
*NO	Data in an existing object is not replaced and an error is generated.

Data authorities (DTAAUT)

Specifies the *PUBLIC data authorities assign to the created PC file. CHAR(10)

*ALL	The *PUBLIC is given *RWX authority to perform all operations on the object except those limited to the owner or controlled by object existence, object management, object alter, and object reference authority. The *PUBLIC can change the object and perform basic functions on the object. *RWX authority provides object operational authority and all the data authorities.
*NONE	The *PUBLIC does not have any of the data authorities to the object.
*RWX	The *PUBLIC is given *RWX authority to perform all operations on the object except those limited to the owner or controlled by object existence, object management, object alter, and object reference authority. The *PUBLIC can change the object and perform basic functions on the object. *RWX authority provides object operational authority and all the data authorities.
*RX	The *PUBLIC is given *RX authority to perform basic operations on the object, such as run a program or display the contents of a file. The user is prevented from changing the object. *RX authority provides object operational authority and read and execute authorities.
*RW	The *PUBLIC is given *RW authority to view the contents of an object and change the contents of an object. *RW authority provides object operational authority and data read, add, update, and delete authorities.
*WX	The *PUBLIC is given *WX authority to change the contents of an object and run a program or search a library or directory. *WX authority provides object operational authority and data add, update, delete, and execute authorities.
*R	The *PUBLIC is given *R authority to view the contents of an object. *R authority provides object operational authority and data read authority.
*W	The *PUBLIC is given *W authority to change the contents of an object. *W authority provides object operational authority and data add, update, and delete authorities.
*X	The *PUBLIC is given *X authority to run a program or search a library or directory. *X authority provides object operational authority and data execute authority.
*EXCLUDE	Exclude authority prevents the *PUBLIC from accessing the object.
*INHERIT	The *PUBLIC and other authorities to the object are copied as follows. The owner, primary group, and public data and object authorities (*R, *W, *X, *OBJEXIST, *OBJMGT, *OBJALTER, and *OBJREF) are copied from the parent directory's owner, primary group, and public data and object authorities. In addition, the private authorities (if any) and authorization list (if any) are copied from the parent directory. If the new file has a different owner than the parent directory and the new file's owner has a private authority in the parent directory, that private authority is not copied from the parent directory. The authority for the owner of the new file is copied from the owner of the parent directory.

Create directories (CRTDIR)

Specifies whether or not directories in the object name should be created if they do not exist. CHAR(1)

*NO	Directories are not created.
*YES	Directories are created.

Owner (OWNER)

Specifies the user profile that is the owner of the newly created object. CHAR(10)

*CURUSRPRF	The object is owned by the current effective user of the current job or thread.
name	Specify the user profile that is the owner of the newly created object. If the current effective user does not have *ADD data authority to the user profile, or if the profile does not exist, ownership of the object is determined in the same manner as *CURUSRPRF.

Object attribute (OBJATR)

Specifies additional attributes for the generated file and is similar in function to the CHGATR command. Each attribute is specified as an attribute/value pair. If an attribute is specified more than once, the last one wins. INT(4)

*NONE	No additional attributes are specified.
*DISKSTGOPT	Determines how auxiliary storage is allocated by the system for the object. This attribute can only be specified for byte stream files in the Root (/), QOpenSys and User-defined file systems. This attribute will be ignored for *TYPE1 byte stream files. Valid values are: <ul style="list-style-type: none"> *NORMAL The auxiliary storage will be allocated normally. That is, as additional auxiliary storage is required, it will be allocated in logically sized extents to accommodate the current space requirement, and anticipated future requirements, while minimizing the number of disk I/O operations. If the *DISKSTGOPT attribute has not been specified for an object, this value is the default. *MINIMIZE The auxiliary storage will be allocated to minimize the space used by the object. That is, as additional auxiliary storage is required, it will be allocated in small sized extents to accommodate the current space requirement. Accessing an object composed of many small extents may increase the number of disk I/O operations for that object. *DYNAMIC The system will dynamically determine the optimum auxiliary storage allocation for the object, balancing space used versus disk I/O operations. For example, if a file has many small extents, yet is frequently being read and written, then future auxiliary storage allocations will be larger extents to minimize the number of disk I/O operations. Or, if a file is frequently truncated, then future auxiliary storage allocations will be small extents to minimize the space used. Additionally, information will be maintained on the byte stream file sizes for this system and its activity. This file size information will also be used to help determine the optimum auxiliary storage allocations for this object as it relates to the other objects sizes.

File sharing (FILESHARE)

Specifies how the generated spreadsheet is secured. Each element corresponds to an Excel setting accessible from the "Save As" dialog. The limitations, and resulting encryption strength vary significantly between *BIFF8 and *BIFF4 and are documented separately.

For *BIFF8

Element 1: Password to open

character value	Specifies the case sensitive password required to open and decrypt the file. If a password is not specified, the file is not encrypted and can be opened by anyone. CHAR(15)
	Any character, including DBCS, can be included in the password. The spreadsheet is encrypted using the RC4 algorithm.

Element 2: Password to modify

character value	Specifies the case sensitive password required to update the file. If a password is specified and someone changes the file without the password, that person can save the file only by giving it a different name. If a password is not specified, the file can be updated by anyone. This password does not cause the file to be encrypted. CHAR(15)
	Excel-erator restricts this password to a-z, A-Z, 0-9, the space character and symbols !"#%&'()*+,-

./;,<=>?@[^_`{}~. That is the ascii code points from x20-x7E which map directly to UTF8 and the the base plane of unicode. With this restriction the password can be typed by virtually any recipient, without knowing the details of their keyboard or code page of their machine.

Note: The security of Password to modify is notoriously weak.

Element 3: Read-only recommended

- *NO** No recommendation given. CHAR(1) value 'N'.
- *YES** Specifies that users get a read-only (read-only: A setting that allows a file to be read or copied but not changed or saved.) recommendation when they open the file. This does not prevent users from opening the file as read-write so that they can edit and save changes. CHAR(1) value 'Y'.

For *BIFF4

*BIFF4 security is notoriously insecure and may not be suitable for all environments. Password crackers are freely available.

While not a requirement, for best results use a password that contains only characters a-z, A-Z, 0-9, the space character and symbols !"#%&'()*+,-./;,<=>?@[^_`{}~. This insures compatibility with Excel Macintosh edition, for example.

Element 1: Password to open

- character value** Specifies the case sensitive password required to open and decrypt the file. If a password is not specified, the file is not encrypted and can be opened by anyone. CHAR(15)

Element 2: Password to modify

- character value** Specifies the case sensitive password required to update the file. If a password is specified and someone changes the file without the password, that person can save the file only by giving it a different name. If a password is not specified, the file can be updated by anyone. This password does not cause the file to be encrypted. CHAR(15)

Element 3: Read-only recommended

- *NO** No recommendation given. CHAR(1) value 'N'.
- *YES** Specifies that users get a read-only (read-only: A setting that allows a file to be read or copied but not changed or saved.) recommendation when they open the file. This does not prevent users from opening the file as read-write so that they can edit and save changes. CHAR(1) value 'Y'.

Column heading format (COLHDGFMT)

Specifies formatting applied to the cells containing column headings. Each element corresponds to an Excel setting accessible by selecting Format > Cells. The values that each element accepts have their usual Excel meanings with one exception: "Alignment-Horizontal" accepts a *TYPE special value which is not available in Excel. When *TYPE is specified, the column headings of character fields are given *LEFT horizontal alignment while the column headings of numeric fields are given *RIGHT horizontal alignment. See Excel's help for additional information. Each element is INT(2).

Single values

- *DEFAULT** Default values are used.

Element 1: Alignment-Horizontal INT(2)

Specifies alignment of text within cells.

- *GENERAL** Cells are given Excel's "General" alignment.
- *TYPE** Alignment is determined by the field's data type: right for numeric fields, left for character fields.
- *LEFT** Cells are given Excel's "Left" alignment.
- *CENTER** Cells are given Excel's "Center" alignment.
- *RIGHT** Cells are given Excel's "Right" alignment.
- *FILL** Cells are given Excel's "Fill" alignment.
- *JUSTIFY** Cells are given Excel's "Justify" alignment.

***CENTERSEL** Cells are given Excel's "Center Across Selection" alignment.

Elements 2-5: Border-Line styles. INT(2)

Specify the Top/Left/Bottom/Right border line styles.

*NONE	Line is removed.
*THIN	Line is thin.
*MEDIUM	Line is medium.
*DASHED	Line is dashed.
*DOTTED	Line is dotted.
*THICK	Line is thick.
*DOUBLE	Line is doubled.
*HAIR	Line is hair.

Elements 6-9: Border-Line colors. INT(2)

Specify the Top/Left/Bottom/Right border line colors.

*SYSTEM	System default color.
*BLACK	Same as *COLOR1. Red=0, Green=0, Blue=0
*WHITE	Same as *COLOR2. Red=255, Green=255, Blue=255
*RED	Same as *COLOR3. Red=255, Green=0, Blue=0
*BRIGHTGREEN	Same as *COLOR4. Red=0, Green=255, Blue=0
*BLUE	Same as *COLOR5. Red=0, Green=0, Blue=255
*YELLOW	Same as *COLOR6. Red=255, Green=255, Blue=0
*PINK	Same as *COLOR7. Red=255, Green=0, Blue=255
*TURQUOISE	Same as *COLOR8. Red=0, Green=255, Blue=255
*DARKRED	Same as *COLOR9. Red=128, Green=0, Blue=0
*GREEN	Same as *COLOR10. Red=0, Green=128, Blue=0
*DARKBLUE	Same as *COLOR11. Red=0, Green=0, Blue=128
*DARKYELLOW	Same as *COLOR12. Red=128, Green=128, Blue=0
*VIOLET	Same as *COLOR13. Red=128, Green=0, Blue=128
*TEAL	Same as *COLOR14. Red=0, Green=128, Blue=128
*GRAY25	Same as *COLOR15. Red=192, Green=192, Blue=192
*GRAY50	Same as *COLOR16. Red=128, Green=128, Blue=128

Element 10: Patterns-Type INT(2)

Specifies the pattern to apply.

*NONE	No pattern is used.
*SOLID	Excel's "Solid" pattern.
*GRAY75	Excel's "75% Gray" pattern.
*GRAY50	Excel's "50% Gray" pattern.
*GRAY25	Excel's "25% Gray" pattern.
*GRAY12	Excel's "12.5% Gray" pattern.
*GRAY6	Excel's "6.25% Gray" pattern.
*STRIPEH50	Excel's "Horizontal Stripe" pattern.
*STRIPEH25	Excel's "Thin Horizontal Stripe" pattern.
*STRIPEV50	Excel's "Vertical Stripe" pattern.
*STRIPEV25	Excel's "Thin Vertical Stripe" pattern.
*STRIPED50	Excel's "Diagonal Stripe" pattern.
*STRIPED25	Excel's "Thin Diagonal Stripe" pattern.
*STRIPEDR50	Excel's "Reverse Diagonal Stripe" pattern.
*STRIPEDR25	Excel's "Thin Reverse Diagonal Stripe" pattern.
*HATCHD75	Excel's "Thick Diagonal Crosshatch" pattern.
*HATCHD50	Excel's "Diagonal Crosshatch" pattern.
*HATCHD38	Excel's "Thin Diagonal Crosshatch" pattern.

***HATCHH38** Excel's "Thin Horizontal Crosshatch" pattern.

Element 11-12: Patterns-Colors INT(2)

Specify the foreground and background pattern colors.

*AUTOMATIC	System default color.
*BLACK	Same as *COLOR1. Red=0, Green=0, Blue=0
*WHITE	Same as *COLOR2. Red=255, Green=255, Blue=255
*RED	Same as *COLOR3. Red=255, Green=0, Blue=0
*BRIGHTGREEN	Same as *COLOR4. Red=0, Green=255, Blue=0
*BLUE	Same as *COLOR5. Red=0, Green=0, Blue=255
*YELLOW	Same as *COLOR6. Red=255, Green=255, Blue=0
*PINK	Same as *COLOR7. Red=255, Green=0, Blue=255
*TURQUOISE	Same as *COLOR8. Red=0, Green=255, Blue=255
*DARKRED	Same as *COLOR9. Red=128, Green=0, Blue=0
*GREEN	Same as *COLOR10. Red=0, Green=128, Blue=0
*DARKBLUE	Same as *COLOR11. Red=0, Green=0, Blue=128
*DARKYELLOW	Same as *COLOR12. Red=128, Green=128, Blue=0
*VIOLET	Same as *COLOR13. Red=128, Green=0, Blue=128
*TEAL	Same as *COLOR14. Red=0, Green=128, Blue=128
*GRAY25	Same as *COLOR15. Red=192, Green=192, Blue=192
*GRAY50	Same as *COLOR16. Red=128, Green=128, Blue=128

Element 13: Protection-Locked INT(2)

Specifies if the cells are locked. Locking cells or hiding formulas has no effect unless the worksheet is protected.

*YES	Cells are locked.
*NO	Cells are not locked.

Color palette (PALETTE)

Specifies replacements for the default colors included in the spreadsheet's palette. The color palette is made up of the specification for sixteen colors, numbered 1 through 16, and assigned names such as *BLACK, *RED, etc. Each color in turn is made up of the specification for the amount of red, green, and blue (RGB) components that make up the color. The amount is a number between 0 and 255. The larger the amount, the more of the component present. You can determine the RGB values for a specific color using Excel's Tools > Options > Color > Custom tab. INT(2), INT(2), INT(2) repeated 16 times.

You specify a replacement for a default color by specifying its name and the new RGB values to use. If a color is modified then all references to the color's name, used in other parameters, are also modified. For example if color *BLACK is changed to (255 106 0), color *BLACK becomes orange and all parameters that specify *BLACK will produce this orange.

Element 1: Color to replace

color-name Specify the name to modify, example *BLACK.

Element 2: Red component

integer Specify the red RGB component.

Element 3: Green component

integer Specify the green RGB component.

Element 4: Blue component

integer Specify the blue RGB component.

Examples

Example 1:

```
CPYTOEXCEL FROMFILE (CUSTOMER) TOOBJ ('/Excel/*FILE.XLS')
          CRTDIR (*YES)
```

This command converts file "CUSTOMER" into an Excel spreadsheet with the name "CUSTOMER.XLS". The spreadsheet is placed in the "Excel" directory which is created if it does not exist.

Example 2:

```
CPYTOEXCEL FROMFILE (INVOICE)
          TOOBJ ('/QNTC/NT1/C/ardept/invoice.*MBRCDAT.xls')
```

This command converts file "INVOICE" into an Excel spreadsheet with the name "INVOICE.cymmdd.XLS" (where the from member's creation date is substituted for cymmdd). The spreadsheet is placed on a Windows system with the name "NT1" in subdirectory "ardept" of the "C" share.

Error messages

Parameter dependencies

XL17003	When ADDWS() is specified, TRANSFORM(*BIFF8) must be specified.
XL17004	When SHEETNAME() is specified TRANSFORM(*BIFF8) must be specified.
XL17005	When SHEETTITLE() is specified TRANSFORM(*BIFF8) must be specified.
XL17006	When TRANSFORM(*BIFF4) is specified COLHDG(*COLHD1) and COLHDG(*COLHD1BLD) can not be specified.

Display Mail Log (DSPMAILLOG)

Where allowed to run: All environments (*ALL)

Threadsafe: No

The Display Mail Log (DSPMAILLOG) command shows the system mail log (journal QZMF). The mail log contains information about the processing of mail.

Note: Mail journaling must be turned on. Only journal receivers in the current chain are searched.

Parameters

Keyword	Description	Choices	Notes
PERIOD	Time period	<i>Element list</i>	Optional, Positional 1
	Element 1: Starting time and date	<i>Element list</i>	
	Element 1: Starting time	<i>Time, *AVAIL</i>	
	Element 2: Starting date	<i>Date, *CURRENT, *BEGIN</i>	
	Element 2: Ending time and date	<i>Element list</i>	
	Element 1: Ending time	<i>Time, *AVAIL</i>	
	Element 2: Ending date	<i>Date, *CURRENT, *END</i>	
OUTPUT	Output	<i>_, *PRINT</i>	Optional, Positional 2

Time period (PERIOD)

Specifies the period of time for which the logged message data is shown. This parameter contains two lists of two elements each.

Element 1: Starting time and date

Element 1: Starting time One of the following specifies the starting time from which entries are shown. Entries logged before this time on the Starting date are not shown.

***AVAIL**
time

All data that is available for the specified date is shown.

Specify the start time from which data for the specified date is shown. The time is specified in 24-hour format and can be specified with or without a time separator:

- Without a time separator, specify 4 or 6 digits (hhmm or hhmmss) where hh = hours, mm = minutes, and ss = seconds. Hours, minutes and seconds must each be 2 digits; use leading zeros if necessary.
- With a time separator, specify 5 or 8 digits where the time separator specified for your job is used to separate the hours, minutes, and seconds.

Element 2: Starting date One of the following specifies the starting date from which entries are shown. Entries logged before this date are not shown.

***CURRENT**
***BEGIN**
date

The current date is used.

The data from the beginning of the log is shown.

Specify the start date from which data is shown. The date must be specified in the job date format.

Element 2: Ending time and date

Element 1: Ending time One of the following specifies the ending time to which entries are shown. Entries logged after this time on the Ending date are not shown.

***AVAIL**
time

All data that is available for the specified date is shown.

Specify the end time to which data for the specified date is shown. See start-date for the formats in which time can be entered.

Element 2: Ending date One of the following specifies the ending date to which entries are shown. Entries logged after this date are not shown.

***CURRENT**
***END**
date

The current date is used.

The data to the end of the log is shown.

Specify the end date to which data is shown. The date must be specified in the job date format.

Output (OUTPUT)

Specifies whether the output from the command is shown at the requesting display station or printed with the job's spooled output.

<code>*</code>	Output requested by an interactive job is shown on the display. Output requested by a batch job is printed with the job's spooled output.
<code>*PRINT</code>	The output is printed with the job's spooled output.

Examples

Example 1:

```
DSPMAILLOG
```

The mail log entries for today are displayed on the screen.

Example 2:

```
DSPMAILLOG PERIOD ( (*AVAIL *BEGIN) (*AVAIL *END) )  
              OUTPUT ( *PRINT )
```

All available mail log entries in the current journal receiver chain are printed.

Restart/Purge Local Mail (INZLOCAL)

Where allowed to run: All environments (*ALL)

Threadsafe: No

The Restart/Purge Local Mail (INZLOCAL) command ends and restarts i5/OS mail components. This may be required to clear problems or to make configuration changes immediately effective.

Parameters

Keyword	Description	Choices	Notes
SMTP	Restart SMTP server	<u>*YES</u> , *NO, Y, N	Optional, Positional 1
SMTTPURGE	Clear SMTP during restart	<u>*NO</u> , *YES, Y, N	Optional, Positional 2
MSF	Restart MSF server	<u>*YES</u> , *NO, Y, N	Optional, Positional 3
MSFPURGE	Clear MSF during restart	<u>*NO</u> , *YES, Y, N	Optional, Positional 4

Restart SMTP server (SMTP)

Specifies the whether or not the SMTP server is restarted.

- *YES The SMTP server is first ended then started.
- *NO The command does not restart the SMTP server.

Clear SMTP during restart (SMTTPURGE)

Specifies the whether or not the SMTP server is purged during the restart.

Note: Clear means that i5/OS generated SMTP mail will be deleted. If you aren't sure, select *NO.

- *NO Existing messages are not cleared.
- *YES Existing messages are cleared.

Restart MSF server (MSF)

Specifies the whether or not the MSF server is restarted.

- *YES The MSF server is first ended then started.
- *NO The command does not restart the MSF server.

Clear MSF during restart (MSFPURGE)

Specifies the whether or not the MSF server is cleared during the restart.

Note: Clear means that mail server framework distributions (emails) will be deleted from this system. If you aren't sure, select *NO.

- *NO The MSF is not cleared.
- *YES The MSF is cleared.

Examples

Example 1:

```
INZLOCAL
```

This command restarts the SMTP server and Mail Server Framework jobs.

Example 2:

```
INZLOCAL      SMTPPURGE (*YES) MSFPURGE (*YES)
```

This command restarts the SMTP server and Mail Server Framework jobs after purging all data they contain.

Error messages**Parameter dependencies**

MSU7012	SMTP cannot be cleared unless it is also restarted.
MSU7013	MSF cannot be cleared unless it is also restarted.

Ping SMTP Mail Server (PINGMAIL)

Where allowed to run: All environments (*ALL)

Threadsafe: No

The Ping SMTP Mail Server (PINGMAIL) command establishes an SMTP connection with a remote system to insure it will process email from the local System i.

The detailed send and receive data from the connection is recorded in the joblog and can be view using the Display Job Log (DSPJOBLOG) command.

Parameters

Keyword	Description	Choices	Notes
RMTSYS	Remote system	Character value, *INTNETADR	Required, Positional 1
SMTPNAME	To SMTP name (email address)	Character value, *NONE	Optional
SMTPNAME2	From SMTP name (email address)	Character value, *SMTPNAME	Optional
AUTHUSRNAM	Authentication username	Character value, *NONE	Optional
AUTHPWD	Authentication password	Character value	Optional
PORT	Port	0-65534, 25	Optional
INTNETADR	Remote internet address	Character value	Optional

Remote system (RMTSYS)

Specifies the remote system name of the host with which the Ping SMTP Mail Server operation takes place. To be successful, the name must be valid, and the remote system must be able to communicate with the local system.

This is a required parameter.

***INTNETADR** The INTNETADR parameter is used.
character value Specify the remote system name to use.

To SMTP name (email address) (SMTPNAME)

Specifies an email address to verify with the remote host. A short email message is sent to the address. The message is inserted directly into the mail router under test, bypassing all of i5/OS's mail machinery. This makes it is easier to determine if a mail delivery problem is most likely caused by the mail router or by i5/OS's configuration.

***NONE** An email address is not specified.
character value Specify the email address to use.

From SMTP name (email address) (SMTPNAME2)

Specifies the from email address included in the test message.

***SMTPNAME** The To SMTP name (email address) is used as the From SMTP name (email address).
character value Specify the email address to use.

Authentication username (AUTHUSRNAM)

Specifies the user name used to authenticate with the remote system.

***NONE** Authentication is not performed.
character value Specify the user name to send to the remote system for authentication.

Authentication password (AUTHPWD)

Specifies the password used to authenticate with the remote system.

character value Specify the password to send to the remote system for authentication.

Port (PORT)

Specifies the port on which the remote system is listening.

25 Use the well-known port 25 for SMTP.

integer Specify any port in the range of 1 to 65534 on which the remote system is listening for SMTP connections.

Remote internet address (INTNETADR)

Specifies the remote internet address. The internet address is specified in the form `nnn.nnn.nnn.nnn`, where `nnn` is a decimal number ranging from 0 through 255. An internet address is not valid if it has a value of all binary ones or all binary zeros for the network identifier (ID) portion or the host ID portion of the address. If the internet address is entered from a command line, the address must be enclosed in apostrophes.

character-value Specify the internet address of the remote system. If the internet address is entered from a command line, the address must be enclosed in apostrophes.

Examples

Example 1:

```
PINGMAIL RMTSYS(system2.widget.com)
```

This command tests `system2` in the `widget.com` domain to insure that it will process email.

Example 2:

```
PINGMAIL RMTSYS(*INTNETADR INTNETADR('168.243.199.2'))
```

This command tests the system at IP address `168.243.199.2` to insure that it will process email.

Error messages

Parameter dependencies

MSU7009 When `*INTNETADR` is specified Remote internet address must be specified.

MSU7010 `RMTSYS(*INTNETADR)` required when `INTNETADR` is specified.

Send File Excel (SNDFEXCEL)

Where allowed to run: All environments (*ALL)

Threading: No

The Send File Excel (SNDFEXCEL) command converts one or more i5/OS database files into Excel spreadsheets which are then sent as an email to recipients.

Parameters

Keyword	Description	Choices	Notes
SNDF	File specifications	Values (up to 32 repetitions): <i>Element list</i>	Required, Positional 1
	Element 1: From file	<i>Qualified object name</i>	
	Qualifier 1: From file	<i>Name</i>	
	Qualifier 2: Library	<i>Name, *LIBL, *CURLIB</i>	
	Element 2: Attachment file name	<i>Character value, *FILE, *TRNEXT, *APPEND, *FILE, *FILELIB, *TRNEXT, *MBR, *TEXT, *MBRCDAT, *MBRCCYY, *MBRCYY, *MBRCMM, *MBRCDD, *MBRCTIM, *MBRGDAT, *MBRGCYY, *MBRGYY, *MBRGMM, *MBRGDD, *MBRGTIM</i>	
	Element 3: From member	<i>Name, *FIRST, *LAST</i>	
	Element 4: Field	Single values: <i>*ALL</i> Other values (up to 256 repetitions): <i>Name</i>	
Element 5: Sheet name	<i>Character value, *FILE, *FILELIB, *MBR, *TEXT, *MBRCDAT, *MBRCCYY, *MBRCYY, *MBRCMM, *MBRCDD, *MBRCTIM, *MBRGDAT, *MBRGCYY, *MBRGYY, *MBRGMM, *MBRGDD, *MBRGTIM</i>		
Element 6: Sheet title	Single values: <i>*NONE</i> Other values (up to 5 repetitions): <i>Character value</i>		
TO	To (recipient)	Single values: <i>*CURRENT, *NONE</i> Other values (up to 300 repetitions): <i>Element list</i>	Optional, Positional 2
	Element 1:	<i>Character value</i>	
SUBJECT	Subject	<i>Character value, *DEFAULT, *NONE</i>	Optional, Positional 3
COLHDG	Column headings	<i>*FLDNAM, *ALIAS, *COLHDG, *COLHD1, *NONE, *FLDNAMBLD, *ALIASBLD, *COLHDGBLD, *COLHD1BLD</i>	Optional
TRANSFORM	Transform	<i>*BIFF8, *CSVUTF8, *CSVUTF8M, *CSVRFC, *BIFF4</i>	Optional
PRTHEADER	Print header	<i>Character value, *RCDEXT, *MBRTEXT, *FILTEXT, *NONE</i>	Optional
PRTFOOTER	Print footer	<i>Character value, *RCDEXT, *MBRTEXT, *FILTEXT, *NONE</i>	Optional
FONT	Font typeface	<i>Character value, *ARIAL, *COURIER</i>	Optional
COMMENT	Cell comments	Single values: <i>*NONE</i> Other values (up to 32 repetitions): <i>Element list</i>	Optional
	Element 1: Column	1-256, <u>A</u> , B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z, AA, AB, AC, AD, AE, AF, AG, AH, AI, AJ, AK, AL, AM, AN, AO, AP, AQ, AR, AS, AT, AU, AV, AW, AX, AY, AZ, BA, BB, BC, BD, BE, BF, BG, BH, BI, BJ, BK, BL, BM, BN, BO, BP, BQ, BR, BS, BT, BU, BV, BW, BX, BY, BZ, CA, CB, CC, CD, CE, CF, CG, CH, CI, CJ, CK, CL, CM, CN, CO, CP, CQ, CR, CS, CT, CU, CV, CW, CX, CY, CZ, DA, DB, DC, DD, DE, DF, DG, DH, DI, DJ, DK, DL, DM, DN, DO, DP, DQ, DR, DS, DT, DU, DV, DW, DX, DY, DZ, EA, EB, EC, ED, EE, EF, EG, EH, EI, EJ, EK, EL, EM, EN, EO, EP, EQ, ER, ES, ET, EU, EV, EW, EX, EY, EZ, FA, FB, FC, FD, FE, FF, FG, FH, FI, FJ, FK, FL, FM, FN, FO, FP, FQ, FR, FS, FT, FU, FV, FW, FX, FY, FZ, GA, GB, GC, GD, GE, GF, GG, GH, GI, GJ, GK, GL, GM, GN, GO, GP, GQ, GR, GS, GT, GU, GV, GW, GX, GY, GZ, HA, HB, HC, HD, HE, HF, HG, HH, HI, HJ, HK, HL, HM, HN, HO, HP, HQ, HR, HS, HT, HU, HV, HW, HX, HY, HZ, IA, IB, IC, ID, IE, IF, IG, IH, II, IJ, IK, IL, IM, IN, IO, IP, IQ, IR, IS, IT, IU, IV	
	Element 2: Row	1-65536, <u>1</u>	
	Element 3: Text	<i>Character value</i>	
MSG	Message	<i>Character value, *DEFAULT, *NONE</i>	Optional
CC	Cc (carbon copy)	Single values: <i>*NONE</i> Other values (up to 300 repetitions): <i>Element list</i>	Optional
	Element 1:	<i>Character value, *CURRENT, *USRID</i>	
BCC	Bcc (blind carbon copy)	Single values: <i>*NONE</i> Other values (up to 300 repetitions): <i>Element list</i>	Optional
	Element 1:	<i>Character value, *CURRENT, *USRID</i>	

FROM	From (originator)	<i>Character value</i> , *CURRENT	Optional
CFMDEL	Confirmation of delivery	*NO , *YES, *OBS, Y, N, O	Optional
REPLYTO	Reply to	Single values: *NONE Other values (up to 300 repetitions): <i>Element list</i>	Optional
	Element 1:	<i>Character value</i> , *CURRENT, *USRID	
INCOBJ	Include object	Single values: *NONE Other values (up to 64 repetitions): <i>Element list</i>	Optional
	Element 1: Name	<i>Path name</i>	
	Element 2: Send as	*NOTE, *ATTACH , *TEXTPLAIN, *TEXTHTML, *ATTACHPDF, *ATTACHPS	
CHRENC	Character encoding of mail	*UTF8 , *ISO88591, *ISO88592, *ISO88595, *ISO88596, *ISO88597, *ISO88598, *ISO88599, *BIG5, 1208, 819, 912, 915, 1089, 813, 916, 920, 950	Optional
TRGCCSID	Target coded character set id	1-65533, 1252	Optional
SRCCSID	Source coded character set id	1-65533, *KBDTYPE , *SYSVAL, *JOBDFIT	Optional
FILESHARE	File sharing	<i>Element list</i>	Optional
	Element 1: Password to open	<i>Character value</i>	
	Element 2: Password to modify	<i>Character value</i>	
	Element 3: Read-only recommended	*YES, *NO , Y, N	
COLHDGFM	Column heading format	Single values: *DEFAULT Other values: <i>Element list</i>	Optional
	Element 1: Alignment-Horizontal	*GENERAL , *TYPE, *LEFT, *CENTER, *RIGHT, *FILL, *JUSTIFY, *CENTERSEL, 0, 1, 2, 3, 4, 5, 6, 8	
	Element 2: Border-Top line style	*NONE , *THIN, *MEDIUM, *DASHED, *DOTTED, *THICK, *DOUBLE, *HAIR, 0, 1, 2, 3, 4, 5, 6, 7	
	Element 3: Border-Left line style	*NONE , *THIN, *MEDIUM, *DASHED, *DOTTED, *THICK, *DOUBLE, *HAIR, 0, 1, 2, 3, 4, 5, 6, 7	
	Element 4: Border-Bottom line style	*NONE , *THIN, *MEDIUM, *DASHED, *DOTTED, *THICK, *DOUBLE, *HAIR, 0, 1, 2, 3, 4, 5, 6, 7	
	Element 5: Border-Right line style	*NONE , *THIN, *MEDIUM, *DASHED, *DOTTED, *THICK, *DOUBLE, *HAIR, 0, 1, 2, 3, 4, 5, 6, 7	
	Element 6: Border-Top line color	*SYSTEM , *BLACK, *WHITE, *RED, *BRIGHTGREEN, *BLUE, *YELLOW, *PINK, *TURQUOISE, *DARKRED, *GREEN, *DARKBLUE, *DARKYELLOW, *VIOLET, *TEAL, *GRAY25, *GRAY50, *COLOR1, *COLOR2, *COLOR3, *COLOR4, *COLOR5, *COLOR6, *COLOR7, *COLOR8, *COLOR9, *COLOR10, *COLOR11, *COLOR12, *COLOR13, *COLOR14, *COLOR15, *COLOR16, 32767, 8, 9, 10, 11, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23	
	Element 7: Border-Left line color	*SYSTEM , *BLACK, *WHITE, *RED, *BRIGHTGREEN, *BLUE, *YELLOW, *PINK, *TURQUOISE, *DARKRED, *GREEN, *DARKBLUE, *DARKYELLOW, *VIOLET, *TEAL, *GRAY25, *GRAY50, *COLOR1, *COLOR2, *COLOR3, *COLOR4, *COLOR5, *COLOR6, *COLOR7, *COLOR8, *COLOR9, *COLOR10, *COLOR11, *COLOR12, *COLOR13, *COLOR14, *COLOR15, *COLOR16, 32767, 8, 9, 10, 11, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23	
	Element 8: Border-Bottom line color	*SYSTEM , *BLACK, *WHITE, *RED, *BRIGHTGREEN, *BLUE, *YELLOW, *PINK, *TURQUOISE, *DARKRED, *GREEN, *DARKBLUE, *DARKYELLOW, *VIOLET, *TEAL, *GRAY25, *GRAY50, *COLOR1, *COLOR2, *COLOR3, *COLOR4, *COLOR5, *COLOR6, *COLOR7, *COLOR8, *COLOR9, *COLOR10, *COLOR11, *COLOR12, *COLOR13, *COLOR14, *COLOR15, *COLOR16, 32767, 8, 9, 10, 11, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23	
	Element 9: Border-Right line color	*SYSTEM , *BLACK, *WHITE, *RED, *BRIGHTGREEN, *BLUE, *YELLOW, *PINK, *TURQUOISE, *DARKRED, *GREEN, *DARKBLUE, *DARKYELLOW, *VIOLET, *TEAL, *GRAY25, *GRAY50, *COLOR1, *COLOR2, *COLOR3, *COLOR4, *COLOR5, *COLOR6, *COLOR7, *COLOR8, *COLOR9, *COLOR10, *COLOR11, *COLOR12, *COLOR13, *COLOR14, *COLOR15, *COLOR16, 32767, 8, 9, 10, 11, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23	
	Element 10: Patterns-Type	*NONE , *SOLID, *GRAY75, *GRAY50, *GRAY25, *GRAY12, *GRAY6, *STRIPEH50, *STRIPEH25, *STRIPEV50, *STRIPEV25, *STRIPED50, *STRIPED25, *STRIPEDR50, *STRIPEDR25, *HATCHD75, *HATCHD50, *HATCHD38, *HATCHH38, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18	
Element 11: Patterns-Foreground color	*AUTOMATIC , *BLACK, *WHITE, *RED, *BRIGHTGREEN, *BLUE, *YELLOW, *PINK, *TURQUOISE, *DARKRED, *GREEN, *DARKBLUE, *DARKYELLOW, *VIOLET, *TEAL, *GRAY25, *GRAY50, *COLOR1, *COLOR2, *COLOR3, *COLOR4, *COLOR5, *COLOR6, *COLOR7, *COLOR8, *COLOR9, *COLOR10, *COLOR11,		

		*COLOR12, *COLOR13, *COLOR14, *COLOR15, *COLOR16, 24, 8, 9, 10, 11, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23	
	Element 12: Patterns-Background color	* AUTOMATIC , *BLACK, *WHITE, *RED, *BRIGHTGREEN, *BLUE, *YELLOW, *PINK, *TURQUOISE, *DARKRED, *GREEN, *DARKBLUE, *DARKYELLOW, *VIOLET, *TEAL, *GRAY25, *GRAY50, *COLOR1, *COLOR2, *COLOR3, *COLOR4, *COLOR5, *COLOR6, *COLOR7, *COLOR8, *COLOR9, *COLOR10, *COLOR11, *COLOR12, *COLOR13, *COLOR14, *COLOR15, *COLOR16, 25, 8, 9, 10, 11, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23	
	Element 13: Protection-Locked	* YES , *NO, 0, 1	
PALETTE	Color palette	Values (up to 16 repetitions): <i>Element list</i>	Optional
	Element 1: Color to replace	*BLACK, *WHITE, *RED, *BRIGHTGREEN, *BLUE, *YELLOW, *PINK, *TURQUOISE, *DARKRED, *GREEN, *DARKBLUE, *DARKYELLOW, *VIOLET, *TEAL, *GRAY25, *GRAY50	
	Element 2: Red component	0-255	
	Element 3: Green component	0-255	
	Element 4: Blue component	0-255	
SGNKEY	Signing key	Single values: * DEFAULT , *NONE Other values: <i>Element list</i>	Optional
	Element 1: Application ID	<i>Character value</i>	
TOUSRID	To (distribution list)	Single values: * NONE Other values: <i>Element list</i>	Optional
	Element 1: User ID	<i>Character value</i>	
	Element 2: Address	<i>Character value</i>	

File specifications (SNDF)

Specifies one or more database files that are sent, the attachment file name for each file as it appears in the e-mail, the member name to be sent for each file, and the list of fields to be included for each file. CHAR(10), CHAR(10), CHAR(32), CHAR(10), CHAR(10), CHAR(80)

This is a required parameter.

Element 1: From file

The name and library of a database file.

Qualifier 1: From file	name	Specify the name of the file.
Qualifier 2: Library	* LIBL	All libraries in the thread's library list are searched.
	* CURLIB	Use the current library for the job. If no library is specified as the current library for the job, QGPL is used.
	name	Specify the name of the library.

Element 2: Attachment file name

* FILE.*TRNEXT	The name is made up of the database file name with an extension based on the transform specified.
* APPEND	The database file does not result in a separate Excel spreadsheet. Instead, a worksheet is generated and appended (added to) the preceding Excel spreadsheet.

Note: When this value is used, it must be the only value entered in the command element.

name Specify the name of the attached file.

Excel-erator provides several special values that can be used to construct dynamic object (PC file) names. When the special values are found, the associated data is blank trimmed and substituted into the path specified when it is processed. If the data associated with a special value is blank, "BLANK" is substituted. If the data associated with a special value contains characters not allowed in a object name, question marks (?) for example, the name will be invalid and the command will fail. The special values must be delimited by an underscore ('_') a period (.) a slash (/) or a backslash (\) or another special value (which starts with '*').

The transform related special values are:

* TRNEXT	Transform dependant file extension CHAR(3).
	<ul style="list-style-type: none"> XLS for *BIFF8 or *BIFF4. csv for *CSVUTF8, *CSVUTF8M or *CSVRFC.

The member related special values are:

*FILE	File name CHAR(10).
*FILELIB	Library containing the file CHAR(10).
*MBR	Member name CHAR(10).
*TEXT	Member Text 'description' CHAR(50).
*MBRCDAT	Date the member was created CHAR(7) CYYMMDD.
*MBRCCYY	CYY portion of *MBRCDAT CHAR(3).
*MBRCYY	YY portion of *MBRCDAT CHAR(2).
*MBRCMM	MM portion of *MBRCDAT CHAR(2).
*MBRCDD	DD portion of *MBRCDAT CHAR(2).
*MBRCTIM	Time the member was created CHAR(6) HHMMSS.
*MBRGDAT	Date the member was changed CHAR(7) CYYMMDD.
*MBRGYY	CYY portion of *MBRGDAT CHAR(3).
*MBRGYY	YY portion of *MBRGDAT CHAR(2).
*MBRGMM	MM portion of *MBRGDAT CHAR(2).
*MBRGDD	DD portion of *MBRGDAT CHAR(2).
*MBRGTIM	Time the member was changed CHAR(6) HHMMSS.

Element 3: From member

*FIRST	The first member in the database from-file is processed.
*LAST	The last member in the database from-file is processed.
name	Specify the name of the database from-file member to process.

Element 4: Field

Single values	*ALL	All fields in the database file are included in the spreadsheet in the order they appear in the file.
Other values	name	Specify the list of field names to be included in the spreadsheet. The fields appear in the spreadsheet in the order specified, duplicates are allowed.

Element 5: Sheet name

Specifies the name of the worksheet. CHAR(32)

Note: *BIFF4 does not support this value and it is ignored when TRANSFORM(*BIFF4) is specified.

*MBR	The member name is the sheet name.
character value	Specify up to 32 characters enclosed in apostrophes.

Excel-erator provides several special values that can be used to construct dynamic sheet names. When the special values are found, the associated data is blank trimmed and substituted into the name specified when it is processed. If the data associated with a special value is blank, "BLANK" is substituted. The special values must be delimited by an underscore (_) a period (.) or another special value (which starts with '*'). The result is trimmed if the length is exceeded.

*FILE	File name CHAR(10).
*FILELIB	Library containing the file CHAR(10).
*MBR	Member name CHAR(10).
*TEXT	Member Text 'description' CHAR(50).
*MBRCDAT	Date the member was created CHAR(7) CYYMMDD.
*MBRCCYY	CYY portion of *MBRCDAT CHAR(3).
*MBRCYY	YY portion of *MBRCDAT CHAR(2).
*MBRCMM	MM portion of *MBRCDAT CHAR(2).
*MBRCDD	DD portion of *MBRCDAT CHAR(2).
*MBRCTIM	Time the member was created CHAR(6) HHMMSS.
*MBRGDAT	Date the member was changed CHAR(7) CYYMMDD.
*MBRGYY	CYY portion of *MBRGDAT CHAR(3).
*MBRGYY	YY portion of *MBRGDAT CHAR(2).
*MBRGMM	MM portion of *MBRGDAT CHAR(2).

***MBRGDD** DD portion of *MBRGDAT CHAR(2).
***MBRGTIM** Time the member was changed CHAR(6) HHMMSS.

Element 6: Sheet title

Specifies the title of the worksheet. CHAR(80)

Single values ***NONE** Title lines are not included in the sheet.

Note: *BIFF4 does not support this value and it is ignored when TRANSFORM(*BIFF4) is specified.

Other values **character value** Specify up to 80 characters enclosed in apostrophes.

To (recipient) (TO)

Specifies the e-mail address(es) to which the generated e-mail is sent. Up to 300 addresses can be specified. CHAR(128)

Single values

***CURRENT** The email address stored in the directory entry associated with the user running the command is used.

***NONE** An email address is not specified.

Other values (up to 300 repetitions)

character value Specify the email address of the recipient.

Subject (SUBJECT)

Specifies the subject for the generated e-mail. CHAR(60)

***DEFAULT** The subject of the e-mail is generated from the file specification.

***NONE** No subject is included in the email.

character value Specify the subject of the email.

Column headings (COLHDG)

Specifies the column headings generated. CHAR(10)

***FLDNAM** The file's field names are used as column headings.

***ALIAS** The file's field aliases are used as column headings.

***COLHDG** The file's field column headings are used as column headings.

***COLHD1** The file's field column headings are used as column headings. A heading with multiple lines is text wrapped into a single cell.

***NONE** No column headings are included.

***FLDNAMBLD** The file's field names are used as column headings. The column headings are bold.

***ALIASBLD** The file's field aliases are used as column headings. The column headings are bold.

***COLHDGBLD** The file's field column headings are used as column headings. The column headings are bold.

***COLHD1BLD** The file's field column headings are used as column headings. A heading with multiple lines is text wrapped into a single cell. The column headings are bold.

Transform (TRANSFORM)

Specifies the target format to which the data is transformed. CHAR(10).

***BIFF8** Microsoft's Binary Interchange File Format Version 8, the format used by Excel version 8.0 (Excel 97/98), Excel 9.0 (Excel 2000/2001), Excel 10.0 (Excel XP/v.X) and Excel 11.0 (Excel 2003/2004).

***BIFF4** Microsoft's Binary Interchange File Format Version 4, the format used by Excel version 4.0 (Excel 4.0).

Note: *BIFF4 is include for compatibility reasons and its use is not recommended in preference to *BIFF8

***CSVUTF8** Comma Separated Values (CSV) format. Data is converted to UTF-8.

*CSVUTF8M	Comma Separated Values (CSV) format. Data is converted to UTF-8 and Byte Order Mark xEFBBBF is inserted at the start of the file.
*CSVRFC	Comma Separated Values (CSV) format. Data is converted to US-ASCII in strict compliance with <i>RFC4180 Common Format and MIME Type for Comma-Separated Values (CSV) Files</i>

Print header (PRTHEADER)

Specifies the print header placed in the spreadsheet. CHAR(50)

*NONE	No print header is included in the file.
*RCDFTEXT	The record text is used as the print header.
*MBRTEXT	The member text is used as the print header.
*FILTEXT	The file text is used as the print header.
character value	Enter the value to use as the print header.

Print footer (PRTFOOTER)

Specifies the print footer placed in the spreadsheet. CHAR(50)

*NONE	No print footer is included in the file.
*RCDFTEXT	The record text is used as the print footer.
*MBRTEXT	The member text is used as the print footer.
*FILTEXT	The file text is used as the print footer.
character value	Enter the value to use as the print footer.

Font typeface (FONT)

Specifies the font name placed into the file. The font specified must be available on the PC that is running Excel. CHAR(32).

*ARIAL	Font Arial is used.
*COURIER	Font Courier New, a fixed pitch font, is used.
character value	The name of the font to use.

Cell comments (COMMENT)

Specifies cell comments, consisting of a cell's coordinate column/row and the comment text, that are added to the generated spreadsheet. A comment can be added to a cell even if it does not contain data. INT(4) (where A=1, B=2, etc.), INT(4) CHAR(2048)

Single values

*NONE	No comments are added to the spreadsheet.
--------------	---

Element 1: Column

cell-column	The column of the cell that receives the comment. You can use either a letter or number designation.
--------------------	--

Element 2: Row

cell-row	The row of the cell that receives the comment.
-----------------	--

Element 3: Text

character value	Enter the text that is to appear in the comment.
------------------------	--

Message (MSG)

Specifies a message to include in the generated e-mail. CHAR(2048)

Line breaks can be added by placing hex value X'0D25' in the data. See manual section "Adding Line Breaks To The Message" for coding details.

- *DEFAULT** The message in the e-mail is generated from the file specification.
- *NONE** This parameter does not place a message in the email.
- character value** Specify the message placed in the email.

Cc (carbon copy) (CC)

Specifies the e-mail address(es) to which a copy is sent. Up to 300 addresses can be specified. CHAR(128)

Single values

- *NONE** An email address is not specified.

Other values (up to 300 repetitions)

- *CURRENT** The email address stored in the directory entry associated with the user running the command is used.
- *USRID** Specify the directory entry or distribution list that supplies the email address(es). The correct form is: *USRID:NAME:ADDRESS where NAME is either a directory entry's "User ID" or a distribution list's "List ID" and where ADDRESS is either a directory entry's "Address" or a distribution list's "List ID qualifier". The parameter allows lower case data, however this value must be specified all UPPER CASE.
- character value** Specify the email address to receive a copy.

Bcc (blind carbon copy) (BCC)

Specifies the e-mail address(es) to which a blind copy is sent. Up to 300 addresses can be specified. CHAR(128)

Single values

- *NONE** An email address is not specified.

Other values (up to 300 repetitions)

- *CURRENT** The email address stored in the directory entry associated with the user running the command is used.
- *USRID** Specify the directory entry or distribution list that supplies the email address(es). The correct form is: *USRID:NAME:ADDRESS where NAME is either a directory entry's "User ID" or a distribution list's "List ID" and where ADDRESS is either a directory entry's "Address" or a distribution list's "List ID qualifier". The parameter allows lower case data, however this value must be specified all UPPER CASE.
- character value** Specify the email address to receive a blind copy.

From (originator) (FROM)

Specifies the email address that appears as the From on the generated the email. You can use this to control the address used when the recipient replies to the email.

Note: One or more of the special values for this parameter access the system distribution directory to determine an email address based on the implied user profile. If the user profile does not have a directory entry (I.e. the user has not been enrolled), the user name is used to construct an email address. If the user has been enrolled but an email address has not been specified on the directory entry, the user id and address are used to construct an email address. In either case the constructed address, in all likelihood, is not a valid email address. The email will deliver but recipient replies will be lost (bounce).

- *CURRENT** The email address stored in the directory entry associated with the user running the command is used.
- character value** Specify the email address of the originator.

Confirmation of delivery (CFMDEL)

Specifies whether a request for a read receipt is sent with the message. Message recipients can choose whether or not to send receipts. If the message recipient agrees to send a read receipt, the receipt will be sent when the message is opened.

*NO	Confirmation of delivery is not requested.
*YES	Confirmation of delivery is requested.
*OBS	Confirmation of delivery is requested as with *YES but the obsolete non-standard "Return-Receipt-To" header field is also included in the message. Some mail user/transport agents understand the obsolete field but don't understand the standard "Disposition-Notification-To" supplied by *YES.

Reply to (REPLYTO)

Specifies the e-mail address(es) to which replies should be sent when replies should go to an address other than the From (originator) (FROM) parameter or to multiple addresses. Up to 300 addresses can be specified. CHAR(128)

Single values

*NONE	Replies are directed to the address the email is from.
--------------	--

Other values (up to 300 repetitions)

*CURRENT	The email address stored in the directory entry associated with the user running the command is used.
*USRID	Specify the directory entry or distribution list that supplies the email address(es). The correct form is: *USRID:NAME:ADDRESS where NAME is either a directory entry's "User ID" or a distribution list's "List ID" and where ADDRESS is either a directory entry's "Address" or a distribution list's "List ID qualifier". The parameter allows lower case data, however this value must be specified all UPPER CASE.
character value	Specify the email address to which replies should be directed.

Include object (INCOBJ)

Specifies the path name of an additional object (stream file) to include in the generated e-mail message. For example a stream file containing standard terms and conditions can be included as an additional attachment. A maximum of 64 path names can be specified.

For more information on specifying path names, see *Programming > Control language > CL concepts > i5/OS objects > Object naming rules* topic in the IBM i Information Center at [http://www.iseries.ibm.com/infocenter.CHAR\(5000](http://www.iseries.ibm.com/infocenter.CHAR(5000)

Single values

*NONE	No objects are sent.
--------------	----------------------

Element 1: Name

path name	Specify an object path name.
------------------	------------------------------

Element 2: Send as

*ATTACH	Send the object as an attached file using MIME and specifying "application/octet-stream".
*TEXTPLAIN	Copy the object into the body of the mail message specifying content type text/plain. Note: Some servers disregard this request and form an attachment from the message in all cases. Some servers disregard this request for the second and subsequent body parts. If this is the case, try MSG(*NONE).
*TEXTHTML	Copy the object into the body of the mail message specifying content type text/html. Note: Some servers disregard this request and form an attachment from the message in all cases. Some servers disregard this request for the second and subsequent body parts. If this is the case, try MSG(*NONE).
*ATTACHPDF	Send the object as an attached file using MIME and specifying "application/pdf". Use this value if the attached file contains Adobe's Portable Document Format (pdf) data.
*ATTACHPS	Send the object as an attached file using MIME and specifying "application/postscript". Use this value if the attached file contains postscript data.
*NOTE	Same as *TEXTPLAIN which is preferred.

Character encoding of mail (CHRENC)

Specifies the character set used to create the email and MIME headers (the transfer encoding).

*UTF8	Unicode 8 bit transfer encoding (1208).
*ISO88591	ISO-8859-1 Latin 1 Western European "8-bit ASCII" (819).
*ISO88592	ISO-8859-2 ROECE Latin 2 Eastern European (912).
*ISO88595	ISO-8859-5 Cyrillic (915).
*ISO88596	ISO-8859-6 Arabic (1089).
*ISO88597	ISO-8859-7 Greek (813).
*ISO88598	ISO-8859-8 Hebrew (916).
*ISO88599	ISO-8859-9 Latin 9 other Latin-using languages (920).
*BIG5	Traditional Chinese, Taiwan Industry Standard PC Data Mixed for Big5 (950).

Target coded character set id (TRGCCSID)

Specifies the ASCII coded character set identifier (CCSID) that is used to map character data In the generated file. INT(4)

Note: Only *BIFF4 supports this value and it is ignored unless TRANSFORM(*BIFF4) is specified.

1252	The default Windows coded character set identifier is used.
integer	Specify the coded character set identifier to use.

Source coded character set id (SRCCSID)

Specifies the coded character set identifier (CCSID) used to create the file. INT(4)

Note: Only *BIFF4 supports this value and it is ignored unless TRANSFORM(*BIFF4) is specified.

*KBDTYPE	The system determines the coded character set identifier value from the QKBDTYPE system value.
*SYSVAL	The system determines the coded character set identifier value from the QCHRID system value.
*JOBDFT	The system uses the current job's default coded character set identifier.
integer	Specify the coded character set identifier to use.

File sharing (FILESHARE)

Specifies how the generated spreadsheet is secured. Each element corresponds to an Excel setting accessible from the "Save As" dialog. The limitations, and resulting encryption strength vary significantly between *BIFF8 and *BIFF4 and are documented separately.

For *BIFF8

Element 1: Password to open

character value	Specifies the case sensitive password required to open and decrypt the file. If a password is not specified, the file is not encrypted and can be opened by anyone. CHAR(15)
	Any character, including DBCS, can be included in the password. The spreadsheet is encrypted using the RC4 algorithm.

Element 2: Password to modify

character value	Specifies the case sensitive password required to update the file. If a password is specified and someone changes the file without the password, that person can save the file only by giving it a different name. If a password is not specified, the file can be updated by anyone. This password does not cause the file to be encrypted. CHAR(15)
	Excel-erator restricts this password to a-z, A-Z, 0-9, the space character and symbols !"#%&'()*+,-./:;<=>@[\\]^_`{ }~. That is the ascii code points from x20-x7E which map directly to UTF8 and the the base plane of unicode. With this restriction the password can be typed by virtually any recipient, without knowing the details of their keyboard or code page of their machine.
	Note: The security of Password to modify is notoriously weak.

Element 3: Read-only recommended

*NO	No recommendation given. CHAR(1) value 'N'.
------------	---

***YES** Specifies that users get a read-only (read-only: A setting that allows a file to be read or copied but not changed or saved.) recommendation when they open the file. This does not prevent users from opening the file as read-write so that they can edit and save changes. CHAR(1) value 'Y'.

For *BIFF4

*BIFF4 security is notoriously insecure and may not be suitable for all environments. Password crackers are freely available.

While not a requirement, for best results use a password that contains only characters a-z, A-Z, 0-9, the space character and symbols !"#%&'()*+,-./:;<=>?@[\\]^_`{|}~. This insures compatibility with Excel Macintosh edition, for example.

Element 1: Password to open

character value Specifies the case sensitive password required to open and decrypt the file. If a password is not specified, the file is not encrypted and can be opened by anyone. CHAR(15)

Element 2: Password to modify

character value Specifies the case sensitive password required to update the file. If a password is specified and someone changes the file without the password, that person can save the file only by giving it a different name. If a password is not specified, the file can be updated by anyone. This password does not cause the file to be encrypted. CHAR(15)

Element 3: Read-only recommended

***NO** No recommendation given. CHAR(1) value 'N'.

***YES** Specifies that users get a read-only (read-only: A setting that allows a file to be read or copied but not changed or saved.) recommendation when they open the file. This does not prevent users from opening the file as read-write so that they can edit and save changes. CHAR(1) value 'Y'.

Column heading format (COLHDGFMT)

Specifies formatting applied to the cells containing column headings. Each element corresponds to an Excel setting accessible by selecting Format > Cells. The values that each element accepts have their usual Excel meanings with one exception: "Alignment-Horizontal" accepts a *TYPE special value which is not available in Excel. When *TYPE is specified, the column headings of character fields are given *LEFT horizontal alignment while the column headings of numeric fields are given *RIGHT horizontal alignment. See Excel's help for additional information. Each element is INT(2).

Single values

***DEFAULT** Default values are used.

Element 1: Alignment-Horizontal INT(2)

Specifies alignment of text within cells.

***GENERAL** Cells are given Excel's "General" alignment.

***TYPE** Alignment is determined by the field's data type: right for numeric fields, left for character fields.

***LEFT** Cells are given Excel's "Left" alignment.

***CENTER** Cells are given Excel's "Center" alignment.

***RIGHT** Cells are given Excel's "Right" alignment.

***FILL** Cells are given Excel's "Fill" alignment.

***JUSTIFY** Cells are given Excel's "Justify" alignment.

***CENTERSEL** Cells are given Excel's "Center Across Selection" alignment.

Elements 2-5: Border-Line styles. INT(2)

Specify the Top/Left/Bottom/Right border line styles.

***NONE** Line is removed.

***THIN** Line is thin.

***MEDIUM** Line is medium.

*DASHED	Line is dashed.
*DOTTED	Line is dotted.
*THICK	Line is thick.
*DOUBLE	Line is doubled.
*HAIR	Line is hair.

Elements 6-9: Border-Line colors. INT(2)

Specify the Top/Left/Bottom/Right border line colors.

*SYSTEM	System default color.
*BLACK	Same as *COLOR1. Red=0, Green=0, Blue=0
*WHITE	Same as *COLOR2. Red=255, Green=255, Blue=255
*RED	Same as *COLOR3. Red=255, Green=0, Blue=0
*BRIGHTGREEN	Same as *COLOR4. Red=0, Green=255, Blue=0
*BLUE	Same as *COLOR5. Red=0, Green=0, Blue=255
*YELLOW	Same as *COLOR6. Red=255, Green=255, Blue=0
*PINK	Same as *COLOR7. Red=255, Green=0, Blue=255
*TURQUOISE	Same as *COLOR8. Red=0, Green=255, Blue=255
*DARKRED	Same as *COLOR9. Red=128, Green=0, Blue=0
*GREEN	Same as *COLOR10. Red=0, Green=128, Blue=0
*DARKBLUE	Same as *COLOR11. Red=0, Green=0, Blue=128
*DARKYELLOW	Same as *COLOR12. Red=128, Green=128, Blue=0
*VIOLET	Same as *COLOR13. Red=128, Green=0, Blue=128
*TEAL	Same as *COLOR14. Red=0, Green=128, Blue=128
*GRAY25	Same as *COLOR15. Red=192, Green=192, Blue=192
*GRAY50	Same as *COLOR16. Red=128, Green=128, Blue=128

Element 10: Patterns-Type INT(2)

Specifies the pattern to apply.

*NONE	No pattern is used.
*SOLID	Excel's "Solid" pattern.
*GRAY75	Excel's "75% Gray" pattern.
*GRAY50	Excel's "50% Gray" pattern.
*GRAY25	Excel's "25% Gray" pattern.
*GRAY12	Excel's "12.5% Gray" pattern.
*GRAY6	Excel's "6.25% Gray" pattern.
*STRIPEH50	Excel's "Horizontal Stripe" pattern.
*STRIPEH25	Excel's "Thin Horizontal Stripe" pattern.
*STRIPEV50	Excel's "Vertical Stripe" pattern.
*STRIPEV25	Excel's "Thin Vertical Stripe" pattern.
*STRIPED50	Excel's "Diagonal Stripe" pattern.
*STRIPED25	Excel's "Thin Diagonal Stripe" pattern.
*STRIPEDR50	Excel's "Reverse Diagonal Stripe" pattern.
*STRIPEDR25	Excel's "Thin Reverse Diagonal Stripe" pattern.
*HATCHD75	Excel's "Thick Diagonal Crosshatch" pattern.
*HATCHD50	Excel's "Diagonal Crosshatch" pattern.
*HATCHD38	Excel's "Thin Diagonal Crosshatch" pattern.
*HATCHH38	Excel's "Thin Horizontal Crosshatch" pattern.

Element 11-12: Patterns-Colors INT(2)

Specify the foreground and background pattern colors.

*AUTOMATIC	System default color.
*BLACK	Same as *COLOR1. Red=0, Green=0, Blue=0
*WHITE	Same as *COLOR2. Red=255, Green=255, Blue=255

*RED	Same as *COLOR3. Red=255, Green=0, Blue=0
*BRIGHTGREEN	Same as *COLOR4. Red=0, Green=255, Blue=0
*BLUE	Same as *COLOR5. Red=0, Green=0, Blue=255
*YELLOW	Same as *COLOR6. Red=255, Green=255, Blue=0
*PINK	Same as *COLOR7. Red=255, Green=0, Blue=255
*TURQUOISE	Same as *COLOR8. Red=0, Green=255, Blue=255
*DARKRED	Same as *COLOR9. Red=128, Green=0, Blue=0
*GREEN	Same as *COLOR10. Red=0, Green=128, Blue=0
*DARKBLUE	Same as *COLOR11. Red=0, Green=0, Blue=128
*DARKYELLOW	Same as *COLOR12. Red=128, Green=128, Blue=0
*VIOLET	Same as *COLOR13. Red=128, Green=0, Blue=128
*TEAL	Same as *COLOR14. Red=0, Green=128, Blue=128
*GRAY25	Same as *COLOR15. Red=192, Green=192, Blue=192
*GRAY50	Same as *COLOR16. Red=128, Green=128, Blue=128

Element 13: Protection-Locked INT(2)

Specifies if the cells are locked. Locking cells or hiding formulas has no effect unless the worksheet is protected.

*YES	Cells are locked.
*NO	Cells are not locked.

Color palette (PALETTE)

Specifies replacements for the default colors included in the spreadsheet's palette. The color palette is made up of the specification for sixteen colors, numbered 1 through 16, and assigned names such as *BLACK, *RED, etc. Each color in turn is made up of the specification for the amount of red, green, and blue (RGB) components that make up the color. The amount is a number between 0 and 255. The larger the amount, the more of the component present. You can determine the RGB values for a specific color using Excel's Tools > Options > Color > Custom tab. INT(2), INT(2), INT(2) repeated 16 times.

You specify a replacement for a default color by specifying its name and the new RGB values to use. If a color is modified then all references to the color's name, used in other parameters, are also modified. For example if color *BLACK is changed to (255 106 0), color *BLACK becomes orange and all parameters that specify *BLACK will produce this orange.

Element 1: Color to replace

color-name Specify the name to modify, example *BLACK.

Element 2: Red component

integer Specify the red RGB component.

Element 3: Green component

integer Specify the green RGB component.

Element 4: Blue component

integer Specify the blue RGB component.

Signing key (SGNKEY)

Specifies the digital certificate used to sign the email.

The signature included with the email allows the recipient to validate the identity of the sender and provides additional assurance that the email has not been tampered with after it is signed.

A certificate is referenced by specifying the name (Application ID) of an object signing application created using i5/OS's Digital Certificate Manager.

*DEFAULT	The certificate previously entered using the CHGXL1DFT command is used.
*NONE	No signing operation is performed.
application-id	Specify the application identifier to use in the signing operation.

To (distribution list) (TOUSRID)

Note: If this parameter is specified and the To (recipient) (TO) parameter is not specified, the entered value overrides the default value of the To (recipient) (TO) parameter.

Specifies the Distribution list or network user to receive the email. CHAR(8), CHAR(8)

Single values

*NONE	A network user or distribution list is not specified.
--------------	---

Element 1: User ID

character value	Specify the user ID (DEN) of the network user. CHAR(8)
------------------------	--

Element 2: Address

character value	Specify the address (DGN) of the network user. CHAR(8)
------------------------	--

Examples

Example 1:

```
SNDFEXCEL  SNDF ((CUSTOMER)) TO ((billg@acme.com))
```

This command converts file "CUSTOMER" into an Excel spreadsheet with the name "CUSTOMER.XLS". The spreadsheet is sent as an email attachment to billg@acme.com.

Example 2:

```
SNDFEXCEL  SNDF ((INVOICE) (CUSTOMER))
            TO ((billg@acme.com))
```

This command converts files "INVOICE" and "CUSTOMER" into separate Excel spreadsheets with the names INVOICE.XLS and CUSTOMER.XLS respectively. These are sent as attachments to an email sent to billg@acme.com.

Error messages

Parameter dependencies

XL17001	A To (recipient) or a To (distribution list) must be specified.
XL17002	A To (recipient) or a To (distribution list) can be specified, but not both.
XL17006	When TRANSFORM(*BIFF4) is specified COLHDG(*COLHD1) and COLHDG(*COLHD1BLD) can not be specified.

Verify/Set Up Local SMTP (VFYLOCAL)

Where allowed to run: All environments (*ALL)

Threadsafe: No

The Verify/Set Up Local SMTP (VFYLOCAL) command verifies or sets up SMTP on the local system.

Parameters

Keyword	Description	Choices	Notes
SETUP	Make changes to system	<u>*NO</u> , *YES, Y, N	Optional, Positional 1

Make changes to system (SETUP)

Specifies the whether or not the command makes changes to the system.

- *NO** The command does not make changes to the local system.
- *YES** The command makes changes to the local system.

Examples

Example 1:

```
VFYLOCAL    SETUP (*NO)
```

This command verifies that SMTP is set up correctly on the local system.

Example 2:

```
VFYLOCAL    SETUP (*YES)
```

This command sets up SMTP on the local system.

Verify/Set Up Mail Router (VFYROUTER)

Where allowed to run: All environments (*ALL)

Threadsafe: No

The Verify/Set Up Mail Router (VFYROUTER) command verifies or sets up the a remote mail router for use by the local system.

Parameters

Keyword	Description	Choices	Notes
RMTSYS	Remote system	Character value, *ROUTER , *INTNETADR	Optional, Positional 1
INTNETADR	Remote internet address	Character value, *RMTSYS , *ROUTER	Optional, Positional 2
SETUP	Make changes to system	*YES, *NO , Y, N	Optional, Positional 3

Remote system (RMTSYS)

Specifies the remote system name of the host with which the Verify/Set Up Mail Router operation takes place. To be successful, the name must be valid, and the remote system must be able to communicate with the local system.

- *ROUTER** The name of the configured SMTP mail router is used.
- *INTNETADR** The INTNETADR parameter is used.
- character value** Specify the remote system name to use.

Remote internet address (INTNETADR)

Specifies the remote internet address. The internet address is specified in the form nnn.nnn.nnn.nnn, where nnn is a decimal number ranging from 0 through 255. An internet address is not valid if it has a value of all binary ones or all binary zeros for the network identifier (ID) portion or the host ID portion of the address. If the internet address is entered from a command line, the address must be enclosed in apostrophes.

- *RMTSYS** The internet address of the specified remote system is used.
- *ROUTER** The internet address of the configured SMTP mail router is used.
- character value** Specify the internet address to use.

Make changes to system (SETUP)

Specifies the whether or not the command makes changes to the system.

- *NO** The command does not make changes to the local system.
- *YES** The command makes changes to the local system.

Examples

Example 1:

```
VFYROUTER RMTSYS (*ROUTER) SETUP (*NO)
```

Command verifies that the currently configured mail router is set up and operating correctly.

Example 2:

```
VFYROUTER RMTSYS (sys1.widget.com)
           INTNETADR (192.168.1.2) SETUP (*YES)
```

This command sets up sys1.widget.com at address 192.168.1.2 as the mail router for this System i.

Error messages

Parameter dependencies

MSU7011 RMTSYS(*INTNETADR) and INTNETADR(*RMTSYS) are mutually exclusive.

Chapter 8 Trouble-Shooting

What's In This Chapter

This chapter provides information and procedures useful for correcting or reporting Excel-erator problems. The chapter:

- Describes general trouble-shooting.
- Describes software installation problems.
- Describes Excel file problems.
- Describes general mail delivery problems.
- Describes MSF specific delivery problems.
- Describes SMTP specific delivery problems.

General Trouble-Shooting

If a command from Excel-erator fails to run to completion or if the results you receive are different than those expected, perform these items:

- Check the messages in your job log:
 1. Run the DSPJOBLOG command.
 2. Press F10 to display detailed messages.
 3. Locate the messages related to the error.
 4. Place your cursor on each message in turn and press F1.
 5. Take any corrective actions suggested by the messages.
- Download the current cumulative PTF package from www.gumbo.com.
- Check the bottom of the PTF page at www.gumbo.com for IBM PTFs that may be required.
- Review the detailed trouble shooting procedures in this chapter for solutions related to your problem.

If you are unable to correct the problem, prepare a problem report and contact your service provider.

Software Installation Problems

This sections describes problems, causes, and solutions specific to software installation.

- Installation Generates "Directory not registered. (C G)"

Symptom	During installation inquiry message id CPA3DE4 "Directory not registered. (C G)" is issued.
Cause	i5/OS has lost the relationship between the product and the directory and hence the message.
Solution	You can safely take a "G" to this message. You will receive the message 3 times.

- Installation Fails

Symptom	Installation fails and diagnostic message id CPF9898 "Unable to clear old release. Is the software being used?." appears in the job log. Or, when the installation verification option is run, verification fails with diagnostic message id CPD0C2E appearing in the job log.
Cause	This usually arises from attempting to install a new release over an old release while objects in the old release are in use.
Solution	End the jobs that are holding locks on (using) objects from the old release and perform the installation again.

- Installation Fails or Installation Verification Fails

Symptom	Installation or installation verification fails and messages in the job log do not help in recovering.
Cause	The software is not installed correctly or the installation is damaged. This can be caused for a variety of reasons including renaming of libraries, directories, or objects that make up the product.
Solution	<p>Get the system to a stable, consistent state completely removing the product then re-install the product by performing the following:</p> <ol style="list-style-type: none"> Delete the licensed program by running: <pre>DLTLICPGM LICPGM(2A55XL1) RLS(*ALL) OPTION(*ALL)</pre> <p>Note: It is okay if this fails with diagnostic CPD3D91 "Product 2A55XL1 option *ALL release *ALL not installed."</p> Delete the product's library by running: <pre>DLTLIB LIB(XLERATOR)</pre> <p>Note: It is okay if this fails with escape CPF2110 "Library XLERATOR not found."</p> Delete the product's directories by running: <pre>RMVDIR DIR('/Gumbo/ProdData/2A55XL1/doc') RMVLNK(*YES) RMVDIR DIR('/Gumbo/ProdData/2A55XL1/tmp') RMVLNK(*YES) RMVDIR DIR('/Gumbo/ProdData/2A55XL1') RMVLNK(*YES)</pre> <p>Note: It is okay if these fail with escape CPFA0A9 "Object not found. ...". But if any fail because a directory is not empty, delete the contents using WRKLNK.</p> <p>If there are no other GUMBO products installed:</p> <pre>RMVDIR DIR('/Gumbo/ProdData') RMVDIR DIR('/Gumbo')</pre> Rebuild i5/OS's internal licensed program information by running: <pre>CALL PGM(QSYS/QSZRECOV)</pre> <p>Note: This takes several minutes depending on machine size.</p> Install the product according to the instructions in the Installation chapter. Enter your authorization code.

XLS File Problems

This sections describes problems, causes, and solutions specific to Excel Format (XLS) files.

- Large Character Fields Are Truncated

Symptom	The file is generated and displays without error however some large character fields are truncated.
Cause	BIFF4 imposes a 255 byte limit on the length of character fields.
Solution	Switch to BIFF8 which lifts the limit on field size.

General Mail Delivery Problems

This sections describes common problems, causes, and solutions for general mail delivery problems. They are listed roughly in the order in which you should proceed. During general mail delivery trouble shooting you should send tests to yourself. Once this works properly, you can move on.

The bulk of the entries in this section are derived from trouble shooting performed by or with customers and in some sense presume that you have an "average" installation. The "average" installation is an System i connected to a LAN with the post office (a.k.a. mail router) on a LAN attached PC running Exchange, Notes or GroupWise with or without a connection to the internet at large. At the "average" installation this is the first application to generate email from the System i. Some of the entries in this section may not apply to your situation.

- Source Of Problem Is Unknown

Symptom	The send operation runs to completion but no mail arrives.
Cause	The problem may be with the mail router or with i5/OS, but the source is unknown.

Solution Run PINGMAIL to generate a test message to your email address and directly deliver it to the mail router by passing i5/OS's mail machinery entirely:

Note: Substitute the name of your mail router for the value "mail_router" and substitute your email address for the value "you@domain.com" in the following command.

```
PINGMAIL RMTSYS(mail_router)
SMTPNAME(you@domain.com)
```

If you receive the test message, the mail router is working correctly and an i5/OS issue is indicated. In particular, if the rest of the entries in this section do not correct the problem, you may have a DNS issue.

If you do not receive the test message then there is a problem with the mail router. You may be able to get an indication of the problem by reviewing the SMTP conversation which appears in your joblog. Run DSPJOBLOG, press F10 and page back for details.

- i5/OS Servers Are Down

Symptom The send operation runs to completion but no mail arrives.

Cause The i5/OS servers responsible for mail delivery may be down, particularly if the System i has been IPLed.

Solution Rerun VFYLOCAL to verify that all local servers are up and running:
VFYLOCAL SETUP(*NO)

If local verification fails, run:
VFYLOCAL SETUP(*YES)

- Mail Router Is Not Processing Mail

Symptom The send operation runs to completion but no mail arrives.

Cause The mail router responsible for mail delivery may be down, or not accepting mail from i5/OS.

Solution Rerun VFYROUTER to verify that the mail router is up and running:
VFYROUTER SETUP(*NO)

If mail router verification fails, run:
VFYROUTER SETUP(*YES)

- Mail Router Refuses Mail with "Funny" Originator Address

Symptom The send operation runs to completion but no mail arrives. Or mail arrives for some users but not all users, for example for all but AOL accounts.

Cause An email address has not been assigned to your directory entry and the mail router doesn't like the "funny" address i5/OS generates for the originator's address.

Solution Assign your email address to your system distribution directory entry: (assume for this example that your "User ID and Address" are "BILLG S1234567" and you "real" email address is "billg@acme.com")
CHGDIRE USRID(BILLG S1234567)
MSFSRVLVL(*SYSMS) PREFADR(*SMTP)
USRDFNFLD((SMTPAUSRID SMTP 'billg')
(SMTPDMN SMTP 'acme.com'))

Note: If the you are a local Domino for i5/OS user substitute MSFSRVLVL(*DOMINO) for MSFSRVLVL(*SYSMS).

- SMTP Servers Require Reinitialization

Symptom The send operation runs to completion but no mail arrives.

Cause i5/OS's SMTP servers may need to reinitialize. This is undocumented but our experience and discussions with i5/OS's SMTP architect confirm this.

Solution Reinitialize i5/OS's SMTP servers:
INZLOCAL SMTP (*YES) SMTPPURGE (*NO)
MSF (*NO) MSFPURGE (*NO)

- SMTP Servers Are Clogged With Junk

Symptom The send operation runs to completion but no mail arrives.
Cause i5/OS's SMTP server may contain dead letters or other junk that it can not deliver. This can be the result of previous attempts to set up mail on the system.

Solution Clean out i5/OS's SMTP server:

Note: Only perform this procedure if you are sure there is no valid deliverable mail in the SMTP server.

Note: This procedure should be required at most once per system during initial set up.

INZLOCAL SMTP (*YES) SMTPPURGE (*YES)
MSF (*YES) MSFPURGE (*YES)

- Mail Server Framework Is Reporting Errors

Symptom The send operation runs to completion but no mail arrives.

Cause i5/OS's Mail Server Framework jobs may be unable to process mail and are reporting errors.

Solution Review job logs for the Mail Server Framework jobs:

1. Work with active jobs by running the following command:
WRKACTJOB
2. Page down to the QSYSWRK subsystem.
3. Locate the job or jobs with the name QMSF and repeat the following steps for each job.
4. Display the job by using option 5 and pressing enter.
5. Display the job log by selecting option 10 and pressing enter.
6. Display detailed messages by pressing F10.
7. You should see a job started (CPF1124) and job submitted (CPI1125) message. If there are no other messages the Mail Server Framework is not reporting errors. (End of procedure).
8. Display detailed information for each additional message by placing your cursor on the message and pressing F1.
9. Take any corrective action specified in the messages.
10. See the MSF Specific Delivery Problems section of this chapter.

- Mail Server Framework Is Ending Abnormally

Symptom The send operation runs to completion but no mail arrives.

Cause i5/OS's Mail Server Framework jobs may be unable to process mail and are ending abnormally.

Solution Review job logs for the Mail Server Framework jobs:

1. Locate job logs for Mail Server Framework jobs that have ended by running the following command:
WRKSPLF SELECT (QMSF)

If there are no spooled output files, the Mail Server Framework is not ending abnormally (end of procedure).
2. Page down to the end of the list of spooled files.
3. Display the date and time of the spooled files by pressing F11. If there are no recent spooled files, the Mail Server Framework is not ending abnormally (end of procedure).
4. For each recent job log repeat the following steps:
5. Display the job log by using option 5 and pressing enter.
6. Review the job log for diagnostic and escape messages.
7. Take any corrective action specified in the messages.
8. See the MSF Specific Delivery Problems section of this chapter.

- SMTP Servers Are Reporting Errors

Symptom The send operation runs to completion but no mail arrives.
Cause i5/OS's SMTP server jobs may be unable to process mail and are reporting errors.
Solution Review job logs for the SMTP server jobs:

1. Work with active jobs by running the following command:
WRKACTJOB
2. Page down to the QSYSWRK subsystem.
3. Locate the 4 SMTP server jobs with names that start with QTSMTMP*. Repeat the following steps for each job.
4. Display the job by using option 5 and pressing enter.
5. Display the job log by selecting option 10 and pressing enter.
6. Display detailed messages by pressing F10.
7. You should see a job started (CPF1124) and job submitted (CPI1125) message. If there are no other messages the Mail Server Framework is not reporting errors. (End of procedure).
8. Display detailed information for each additional message by placing your cursor on the message and pressing F1.
9. Take any corrective action specified in the messages.
10. See the SMTP Specific Problems section of this chapter.

- SMTP Servers Are Ending Abnormally

Symptom The send operation runs to completion but no mail arrives.
Cause i5/OS's SMTP server jobs may be unable to process mail and are ending abnormally.
Solution Review job logs for the SMTP server jobs:

1. Locate job logs for SMTP server jobs that have ended by running the following command:
WRKSPFLF SELECT(QTCP)

If there are no spooled output files, the SMTP server jobs are not ending abnormally (end of procedure).

2. Page down to the end of the list of spooled files.
3. Display the date and time of the spooled files by pressing F11. If there are no recent spooled files, the SMTP server jobs are not ending abnormally (end of procedure).
4. For each recent job log repeat the following steps:
5. Display the job log by using option 5 and pressing enter.
6. Review the job log for diagnostic and escape messages.
7. Take any corrective action specified in the messages.
8. See the SMTP Specific Problems section of this chapter.

MSF Specific Delivery Problems

This sections describes problems, causes, and solutions specific to i5/OS's Mail Server Framework.

- MSF Job Log Contains QTCPTMM/ATTABOX Messages

Symptom A QMSF job is complaining about a directory such as QTCPTMM/ATTABOX.
Cause i5/OS's MSF jobs depend on specific directories in the Integrated File System which are added by installing the TCP/IP Utilities and may have been deleted.
Solution Check the existence of the TCP/IP related directories an reinstall them if they are missing by:

1. Run the WRKLNK command and locate the QTCPTMM directory.
2. Display QTCPTMM's contents using option 5.
3. Verify that subdirectories ATTABOX, ENCODE, MAIL, SMTPBOX and TMP exist.
4. If directories are missing continue with this procedure otherwise end of procedure.
5. Use the DLTLICPGM command to remove the TCP/IP Utilities.
6. Use the RSTLICPGM command to reinstall the TCP/IP Utilities.

- MSF Job Log Contains "System storage threshold exceeded" Message

Symptom A QMSF job complains that "System storage threshold exceeded".

- Cause** i5/OS's MSF jobs stop processing mail when amount of disk space used rises above a set percentage. i5/OS is shipped with this value set to 90%.
- Solution** Either free disk space by deleting unused items or bump the threshold value with this procedure:
1. Run the STRSST command and select option 3 Work with disk units.
 2. Select option 2 Work with disk configuration.
 3. Select option 3 Work with ASP threshold.
 4. Use 1=Select for the appropriate ASP (usually ASP 1).
 5. Press F1=Help to review help for the Change Storage Threshold display.
 6. Change the ASP threshold to 95% or what ever is a comfortable value for your installation.

SMTP Specific Delivery Problems

This sections describes problems, causes, and solutions specific to i5/OS's SMTP servers.

- SMTP Retries Set To Zero

- Symptom** The send operation runs to completion but no mail arrives, or mail arrives for awhile then stops until the next IPL.
- Cause** The mail router is periodically slow or unavailable and i5/OS's SMTP attributes for retries are set too low or set to zero.
- Solution** Increase the retry values to give the mail router more chances at fielding the incoming mail:
1. Prompt the CHGSMTPA command.
 2. Increase the number of retries for the retries by minute parameter.
 3. Increase the number of retries for the retries by day parameter.
 4. Press enter.

- Multiple Garbled Email Messages Arrive

- Symptom** Multiple messages arrive for a send operation and the messages are garbled.
- Cause** i5/OS's SMTP is splitting the messages.
- Solution** Turn off message splitting entirely by changing the POP attributes:
 CHGPOPA MSGSPLIT (*NOMAX)

- Time On Mail Is Incorrect

- Symptom** Mail delivers but contains the wrong time.
- Cause** i5/OS's QTIMZON system value has not been set.
- Solution** See Manual Mail Set Up Steps You May Need To Perform section of the Set Up chapter for instructions to correct this value.

Appendix A Processing Descriptions

What's In This Appendix

This appendix provides detailed descriptions of the processing performed by Excel-erator's mail set up and verification programs. In highly secure environments, it may be against policy to allow third party software to change your system. If this is your situation, you can perform these steps manually. The appendix details:

- Processing Performed During SMTP Verification
- Processing Performed During SMTP Set Up
- Processing Performed During Mail Router Verification
- Processing Performed During Mail Router Set Up

Processing Performed During SMTP Verification

The following verification steps are performed by the Verify/Set Up Local SMTP (VFYLOCAL) command when SETUP(*NO) is specified.

Note: No changes are made to your system during verification.

- Verify that TCP Utilities have been installed on the system.

The system is checked to insure that library QTCP exists. If the library is found then the TCP Connectivity Utilities have been installed on the system.

- Verify that the SMTP distribution queues are present.

The system is checked for the existence of QSMTPQ distribution queue.

- Verify that a host and domain name have been configured for the system.
 - If the host name is blank, verification fails.
 - If the domain name is blank, verification fails.
- Verify that the system distribution directory is searchable.

A search is attempted on the system distribution directory.

- Verify that the i5/OS Mail Server is active.

The system is checked for an active job with the job name QMSF. If one or more QMSF jobs are active then the Mail Server is active.

- Verify that TCP is active.

The system is checked for an active job with the job name QTCPWRK (before V6 JOB QTCP/IP). If job is active then TCP is active.

- Verify that TCP loopback is operating correctly.

The TCP interfaces are searched to locate the *LOOPBACK IP address. The *LOOPBACK interface is started if it is not active and its IP address is PINGed to verify that TCP is operating correctly.

- If the *LOOPBACK interface is not found, verification fails.
- If the *LOOPBACK interface is not active and can not be started, verification fails.
- If the *LOOPBACK interface can not be PINGed, verification fails.

The *LOOPBACK interface is ended if it was started by the verification program.

- Verify that a TCP interface is defined.

The TCP interfaces are searched to locate one or more IP addresses (excluding *LOOPBACK).

- If no interfaces are found, verification fails.
- Verify that active TCP interfaces are reachable.

The TCP interfaces are searched to locate one or more IP addresses (excluding *LOOPBACK). Each interface is contacted (PINGed) to verify the connection.

- If an interface is not active, verification fails.
- If an interface can not be contacted, verification fails.
- Verify that the SMTP server is active.

The system is checked for an active job with the job name QTSMTPSRVR or QTSMTPSRVD. If either job is active then the SMTP server is active.

- Verify that this host's IP address can be reached by SMTP.
 - Retrieve the host and domain names for this system.

If the host name is blank, verification fails.

- Verify TCP/IP connection to the host name.

If the host is contacted, verification is complete and no further processing is performed.

- Verify TCP/IP connection to the host.domain name.

If the host.domain name can not be contacted, verification fails.

- Verify that message splitting has been turned off.

The current setting can not be retrieved so no test is performed and it is assumed that splitting has not been turned off yet.

After all test are completed, a message summarizing the results is issued.

Processing Performed During SMTP Set Up

The following set up work is performed by the Verify/Set Up Local SMTP (VFYLOCAL) command when SETUP(*YES) is specified.

- If the TCP utilities have not been installed on the system.
 - Manual intervention is required to install the utilities. Automatic set up can not perform the installation.
- If QSMTQP distribution queue is not found.

- Create the distribution queue using the Add Distribution Queue command:

```
ADDSTQ      DSTQ(QSMTPQ) RMTLOCNAME(TCPIPLOC)
            DSTQTYPE(*RPDS)
```

- If a host or domain name have not been configured.
 - Manual intervention is required to configure a host and domain name. Use option 12 (Change local domain and host names) of the Configure TCP/IP (CFGTCP) command. Automatic set up can not perform the change.
- If the system distribution directory entry can not be searched.
 - The directory is changed to allow searches using the Change System Directory Attributes command:

```
CHGSYSDIRA  ALWSCH(*YES)
```

- If the i5/OS Mail Server is not active.
 - Start the Mail Server using the STRMSF command:

```
STRMSF
```

- If TCP is not active.
 - Start TCP using the STRTCP command:

```
STRTCP
```

- If TCP loopback is not operating correctly.
 - If missing, *LOOPBACK interface is added using command:

```
ADDTCPIFC  INTNETADR('127.0.0.1') LIND(*LOOPBACK) +
            SUBNETMASK('255.0.0.0') MTU(576)
```

- If loopback PING fails:

Manual intervention is required to correct the problem which is beyond the scope of set up.

- If no TCP interfaces are found.

Manual operation is required to add an interface using the ADDTCPIFC command.

- If a TCP interface can not be contacted.

Manual operation is required to correct the problem. If the interface can not be contacted because it is not active, start the interface using the STRTCPIFC command.

- If the SMTP server is not active.
 - Start the SMTP server using the STRTCPSVR command:

```
STRTCPSVR  SERVER(*SMTP)
```

- If the host's IP address can not be reached by SMTP.

- If system is using a remote name server, set up fails.

Manual operation required. Contact the remote name server's administrator to add this system's host name.

- If multiple TCP interfaces are found, set up fails.

Manual operation required. Add this system's name to i5/OS's host table using the ADDTCPHTE command.

- If no TCP interfaces are found, set up fails.

Manual operation required. Add a TCP interface using the ADDTCPIFC command.

- An entry is added for this host using the Add TCP Host Table Entry command:

```
ADDTCPHTE  INTNETADR(&INTERNET) HOSTNAME((&HOST)) +
           TEXT('Entry Added By Gumbo Auto TCP/IP +
           Config')
```

- If message splitting has not been turned off.
 - Message splitting is turned off

The POP attributes are changed:

```
CHGPOPA    MSGSPLIT (*NOMAX)
```

After all steps are completed, a message summarizing the results is issued.

Processing Performed During Mail Router Verification

The following verification steps are performed by the Verify/Set Up Mail Router (VFYROUTER) command when SETUP(*NO) is specified.

Note: No changes are made to your system during verification.

- Verify that TCP is active.

The system is checked for an active job with the job name QTCPWRK (before V6 JOB QTCPIP). If job is active then TCP is active.

- Resolve system names and internet addresses for command parameters and current mail router.
 - Verify domain name server.

If a domain name server is configured, it is tested to insure that it is responding. If it does not respond, verification fails.

- Retrieve currently configured mail router name and IP
- Resolve internet address parameter.

If a special value was specified, it is resolved. If it can not be resolved, verification fails.

- Resolve remote system parameter.

If a special value was specified, it is resolved. If it can not be resolved, verification fails.

- Edit the resulting names and IPs for conflicts.
 - Edit remote system and internet address IP.

If the IP of the remote system is different than the internet address, verification fails.

- Edit remote system and internet address names.

If the name of the internet address is different than the remote system name, verification fails.

- Edit current mail router and internet address IP.

If the IP of the current mail router is different than the internet address, verification fails.

- Verify that the internet address is responding.

The internet address is PINGed to insure that it is reachable and responding. If it is not, verification fails.

- Verify that the internet address is accepting SMTP mail.

The internet address is tested to insure that it is accepting SMTP mail from this System i. If it is not, verification fails.

- Verify that remote system can be located in the host table.

If a host table entry is required and not present, verification fails.

- Verify that the mail router is configured.

If the remote system is not configured as the mail router, verification fails.

After all test are completed, a message summarizing the results is issued.

Processing Performed During Mail Router Set Up

The following set up work is performed by the Verify/Set Up Mail Router (VFYROUTER) command when SETUP(*YES) is specified.

- If TCP is not active.
 - Start TCP using the STRTCP command:

```
STRTCP
```

- If system name and internet address resolution fails.

- If a domain name server is configured but not responding.

Manual intervention required. Either insure that the configured domain name server is available or remove the domain name server from i5/OS's configuration using option 13 of the CFGTCP menu.

- If the internet address parameter can not be resolved.

Manual intervention required to correct the internet address parameter.

- If the remote system parameter can not be resolved.

Manual intervention required to correct the remote system parameter.

- If the resolved names and IPs for conflicts.

- If the remote system and internet address IPs are different.

Manual intervention required to correct the parameters.

- If the remote system and internet address names are different.

Manual intervention required to correct the parameters.

- If the current mail router and internet address IPs are different.

Manual intervention required. Either correct the parameters or remove the currently configured mail router by running the following command:

```
CHGSMTPA MAILROUTER (*NONE)
```

- If the internet address is not responding.

Manual intervention required. Either correct the internet address or make the system at that address ready.

- If the internet address is not accepting SMTP mail.

Manual intervention required. Either correct the internet address, or contact the system's administrator and request that the system accept SMTP from i5/OS. The words you use to request this differ depending on the software running on the remote system:

- For Microsoft's Exchange Server request that the "Internet Mail Connector" be configured and started.
- For Lotus' cc:Mail request that the "Link to SMTP" be configured and started.
- For all others request that the "SMTP gateway" be configured and started.

- If the remote system can not be located in the host table.

Add an entry using the Add TCP/IP Host Table Entry (ADDTCPHTE) command:

```
ADDTCPHTE INTNETADR(&INTNETADR) HOSTNAME((&RMTSYS)) +
          TEXT('Mail router added by Gumbo +
              automatic configuration')
```

- If the mail router is not configured.

Configure the mail router using the Change SMTP Attributes (CHGSMTPA) command:

```
CHGSMTPA MAILROUTER (&RMTSYS) FIREWALL (*YES)
```

Note: The FIREWALL() parameter is probably misnamed. When set to *YES, it instructs i5/OS to send all email through the mail router. When set to *NO, i5/OS tries to deliver the email directly. If this fails, it gives it to then gives it to the mail router.

After all steps are completed, a message summarizing the results is issued.

Appendix B Notices

Notices

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	Proc.		Prt.	Proc.
-- Serial Number ---	Group	-- Serial Number ---	No.	Count
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

See the Price List for pricing information. The current Price List is available at www.gumbo.com. License price includes one year of maintenance services. Add the amount shown on the price list for each additional year of maintenance services. In Washington state include sales tax (your local rate or 9.5%).

Licenses _____
Maintenance _____
In WA state, add sales tax _____
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Signature _____ Date _____
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Make checks payable to:

GUMBO
Software, Inc.

809 W Howe St
Seattle, WA 98119
United States of America
Phone: (206) 284-5078
Email: support2009@gumbo.com
Web: www.gumbo.com

Rev: 2001/12/21

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