

# MFP

## TT-20228

**TECHNICAL  
TIP**

Models: MX-C311/MX-C401/MX-B401  
MX-2300N/MX-2600N/MX-2700N/MX-3100N  
MX-3500N/MX-3501N/MX-4100N/MX-4101N/MX-4501N/MX-5001N  
MX-5500N/MX-6200N/MX-6201N/MX-7000N/MX-7001N  
MX-M283N/MX-M363N/MX-M453N/MX-M503N/MX-M623N/MX-M753N  
MX-M350N/MX-M450N/MX-M550N/MX-M620N/MX-M700N  
MX-M850/MX-M950/MX-M1100

**Priority:** Medium

**Date:** January 2011

**Subject:** Printing from AS/400 with User Number Authentication

**Description:** This document shows how an AS/400 can be used to print to a Sharp MFP when user number authentication is enabled on the MFP.

**Details:** Follow the steps shown on the following pages to send print jobs with user number authentication to the Sharp MFP from an AS/400.

The IBM AS/400 can print to the Sharp MFP with User Number Authentication using these instructions.

- The AS/400 must not send the print jobs in IPDS format.

These instructions can be used as a training tool for a Sharp technician and could also be provided to the AS/400 administrator for use as a guide when installing a Sharp MFP.

## User Number Authentication Sent with an AS400 Print Job

To allow printing from the **IBM AS400** when user number authentication is enabled on the **Sharp** MFP, follow the steps below. This requires a user account as well as an authority group be created on the MFP for use for printing from the **AS400**. This method will allow the **AS400** to authenticate to the MFP for printing only and will delete unauthenticated print jobs from all **Windows** users.

After setting up an account for the **AS400** to use to authenticate to the MFP, an experienced **AS400** administrator must modify a **Work Station Customizing Object (WSCST)** to add authentication credentials to the print data stream.

### Setting Up the Sharp MFP for Authentication

1. Browse to the web page of the **Sharp** MFP. If authentication has already been enabled, login as the administrator (login name “**admin**”, password “**admin**” all lower case if the default password has not been changed.) Note that the login name is always “**admin**” even if the password has been changed.

**SHARP**  
MX-4501N

Login

Login(P)

Login Name: admin (Up to 255 characters)

Password: ..... (1-32 digits)

Authenticate to: Following the User Information

Log-in as the user who has the authority to display the page that requires the administrator authority.

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Login(P)

If authentication has not yet been enabled, press the login button in the upper right hand corner of the web page. When the following screen appears, enter the administrator’s password (default “**admin**” all lower case).

**SHARP**  
MX-4501N

Login

Login(P) Cancel(C)

Authority: admin

Login Name: Administrator

Password: ..... (5-32 digits)

Log-in as the user who has the authority to display the page that requires the administrator authority.

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Login(P) Cancel(C)

2. A new authority group must be created for use with the new account for the **AS400** to limit it to black and white printing only. This authority group will be applied to the properties of the account for the **AS400** when it is created in a later step. After logging in, click on the **User Control** menu item and then click on the **“Authority Group List”**. When the following screen appears, click on the **“Add”** button to create a new authority group.

The screenshot shows the SHARP MX-4501N web interface. On the left is a sidebar menu with items like 'Top Page', 'Status', 'Address Book', 'Document Operations', 'Job Programs', 'User Control' (expanded), 'User List', 'Default Settings', 'Page Limit Group List', 'Authority Group List' (selected), 'Favorite Open Job Group List', 'User Count', 'System Settings', 'Application Settings', and 'Operation Manual Download'. The main content area is titled 'Authority Group List' and includes a 'Login(P)' and 'Help(I)' button in the top right. Below the title is an 'Update(R)' button. The 'Default Group List' section shows 'Group Name' with options 'Admin', 'User', and 'Guest'. The 'Group List' section has a table with columns 'No.' and 'Group Name', currently showing 'Not Set'. Below the table are 'Select All(S)' and 'Clear Checked(Z)' buttons. A red box highlights the 'Add(Y)' button. At the bottom, there are buttons for 'Return to the Defaults' (Return to the Administrator Authority(Q), Return to the User Authority(C), Return to the Guest Authority(D)) and an 'Update(R)' button. A 'Back to the Top on This Page' link is also present.

3. When the screen on the next page appears, type in the **“Group Name”** (as an example **“Print\_OK”**) and select the **“Guest”** authority group from the drop down box to use as a template for the new group’s properties. As this group is only for the **AS400** to use for printing, set all functions except for **“Printing”** and **“Common Functions”** to **“Prohibited”**. To allow the **AS400** to print in black only, ensure that **“Color Mode Approval Setting”** for **“Black & White”** is set to **“Allowed”** and **“Full Color”** to **“Prohibited”** under the **“Printer”** function.

SHARP

MX-4501N

User Name: Administrator Logout(L)

Help(I)

Submit(U)

Cancel(C)

Group Name:

Print\_OK (Up to 32 characters)

Select the Group Name to be the Registration Model:

Guest

Switch to Tab Mode

Copy

Color Mode Approval Setting:

Black & White: Prohibited

Full Color: Prohibited

2 Color: Prohibited

Single Color: Prohibited

Special Modes Usage: Prohibited

Printer

Color Mode Approval Setting:

Black & White: Allowed

Full Color: Prohibited

FTP Pull Print: Prohibited

USB Memory Direct Print: Prohibited

Image Send

Approval Settings for Each Mode:

E-mail: Prohibited

FTP: Prohibited

Desktop: Prohibited

Network Folder: Prohibited

USB Memory: Prohibited

PC Scan: Prohibited

Internet Fax Send: Prohibited

PC-I-Fax Send: Prohibited

Color Scan: Prohibited

Special Modes Usage: Prohibited

- Click on the “**Submit**” button after all of the desired functions have been configured for this authority group.

SHARP

MX-4501N

User Name: Administrator Logout(L)

Help(I)

Submit(U)

Cancel(C)

Group Name:

Print\_OK (Up to 32 characters)

Select the Group Name to be the Registration Model:

Guest

Switch to Tab Mode

Copy

- Click on the “**User Control**” menu item to expand it and then click on the “**Default Settings**” item. Make sure that the “**User Authentication**” drop down selection is set to “**Enable**”. Click on the “**Authenticate a User by User Number Only**” radio button and ensure that the check box for “**Disabling of Printing by Invalid User**” is checked on. Click on the “**Submit**” button when all information has been entered in correctly.

**SHARP**  
MX-4501N

User Name: Administrator Logout(L) Help(?)

**Default Settings**  
Submit(U) Update(R)

Top Page  
Status  
Address Book  
Document Operations  
Job Programs  
User Control  
User List  
Default Settings  
Page Limit Group List  
Authority Group List  
Favorite Operation Group List  
User Count  
System Settings  
Network Settings  
Application Settings  
E-mail Alert and Status  
Storage Backup  
Device Cloning  
Job Log  
Security Settings

User Authentication: **Enable**  
Authentication Method Setting:  
☐ Authenticate a User by Login Name and Password  
☐ Authenticate a User by Login Name, Password and E-mail Address  
☒ **Authenticate a User by User Number Only**

Device Account Mode Setting: ☐ Device Account Mode  
Login User: Not Set  
User Selection(C)

Actions when the Limit of Pages for Output Jobs:  
☐ Job is Completed even when the Limit of Pages is Reached  
☒ **Job is Stopped when the Limit of Pages is Reached**

The Number of User Name Displayed Setting on Operational Panel: 8  
☐ A Warning when Login Fails  
☒ **Disabling of Printing by Invalid User**

Default Network Authentication Server Setting: Not Set

User Information Print: User List  
Print(D)

Release the Lock on Machine Operation Panel: Execute(J)

Submit(U) Update(R) Back to the Top on This Page ▲

- If enabling authentication for the first time, you must log back into the web page with the login name of “**admin**” with the current password (default “**admin**” all lower case) for the administrator account.

**SHARP**  
MX-4501N

**Login**  
Login(P)

Login Name: admin (Up to 255 characters)  
Password: ..... (1-32 digits)  
Authenticate to: Following the User Information

Log-in as the user who has the authority to display the page that requires the administrator authority.

Login(P) Back to the Top on This Page ▲

- Next, click on the “**User Control**” menu to expand it and then click on the “**User List**” menu item. Click on the “**Add**” button to create an account for the **AS400** to use.

SHARP MX-4501N

User Name: Administrator Logout(L) Help(H)

User List

Update(R)

Default User List

User Name	No.
Administrator	1
User	2
Other User	3

User List Index: All Users

Display Items: 10

User Name ▲ ▼	No. ▲ ▼
<input type="checkbox"/> Frank	7
<input type="checkbox"/> Lance	4
<input type="checkbox"/> bob	6
<input type="checkbox"/> ken	8
<input type="checkbox"/> mark	2
<input type="checkbox"/> malaku	1

Total User: 6

Previous(P) 1 / 1 Next(N)

Select All(S) Clear Checked(Z)

Delete(D) Add(Y) Delete All Users(D)

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- Type in a short name (in this example, “**AS400**”) in the “**User Name**” field and enter in a unique account code in the “**User Number**” field for this user. In this case, the user number is “**123456**”. **NOTE:** Be sure to record the account code as it will not be displayed on the web page. For the “**Authority Group**” select the new group authority that you just created from the drop down list (“**Print\_OK**” in this example). All other fields are optional. Click on the “**Submit**” button to create the new user.

SHARP MX-4501N

User Name: Administrator Logout(L) Help(H)

User Registration

Submit(U) Cancel(C)

User Name (Required): AS 400 (Up to 32 characters)

Initial (Optional): (Up to 10 characters)

Index (Required): User 1

User Number (Required): ..... (5-8 digits)

E-mail Address: (Up to 64 characters)

Global Address Search (R)

Pages Limit Group: Unlimited

Authority Group: Print\_OK

Favorite Operation Group: Following the System Settings

My Folder

My Folder: ☐ Change My Folder

☒ Select from List

Create Folder

Folder Name (Required): (Up to 28 characters)

Initial (Optional): (Up to 10 characters)

Password: (5-8 digits)

Submit(U) Cancel(C)

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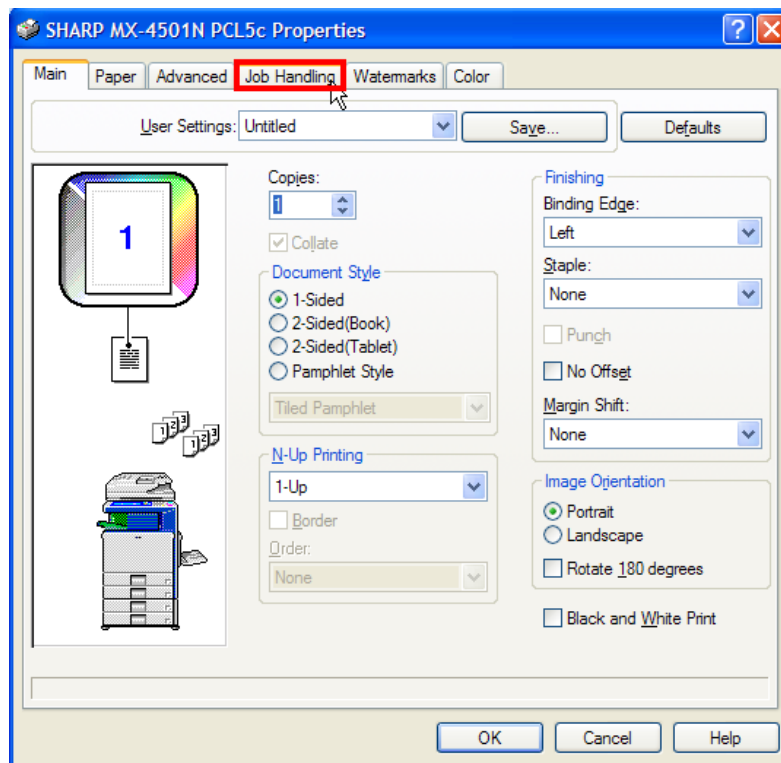
- Next, click on the “**System Settings**” menu item to expand it and then click on “**Printer Conditions Settings**”. Select “**B/W**” from the “**Color Mode**” drop down box. This will ensure that only black and white prints can be made by the **AS400** account. Note that this will not have an effect on **Windows** users as the color mode is determined by the MFP print driver. Click on the “**Submit**” button to change the default color mode to black and white.

The screenshot shows the SHARP MX-4501N Printer Condition Settings web interface. The user is logged in as Administrator. The 'System Settings' menu is expanded, and 'Printer Condition Settings' is selected. The 'Color Mode' dropdown is set to 'BW'. The 'Submit(U)' button is highlighted.

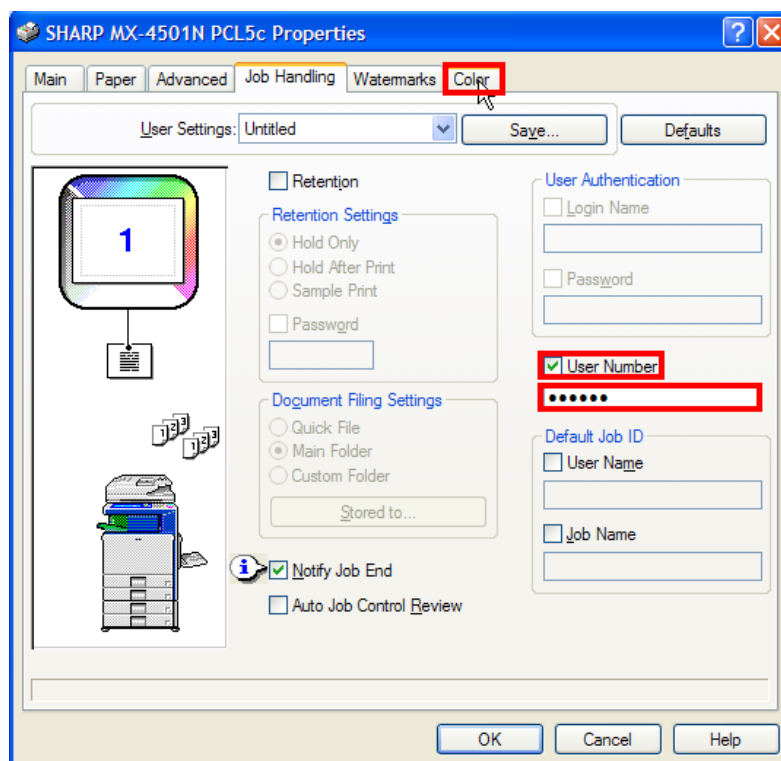
- To test the account settings, open an application such as **Microsoft Word** on a **Windows** workstation, and create a file with small amount of text. From the application file menu, select “**Print**”. When the application print dialog box opens, select the appropriate print driver for the target MFP in the drop down box and then click on the “**Properties**” button.

The screenshot shows the Windows Print dialog box. The printer selected is 'SHARP MX-450 1N PCL5c'. The 'Properties' button is highlighted.

11. When the print driver dialog box opens, click on the “**Job Handling**” tab.

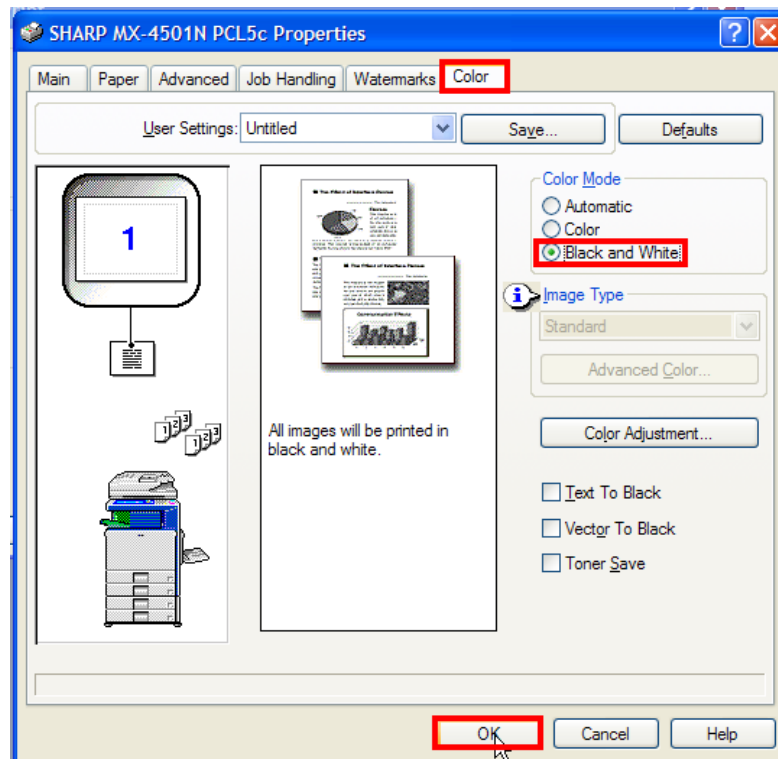


12. Under the “**User Authentication**” area, click on the check box for “**User Number**” and fill in the account code created for the AS400 (in this example, it is set to “123456”). Note that the actual number is not displayed in the print driver.

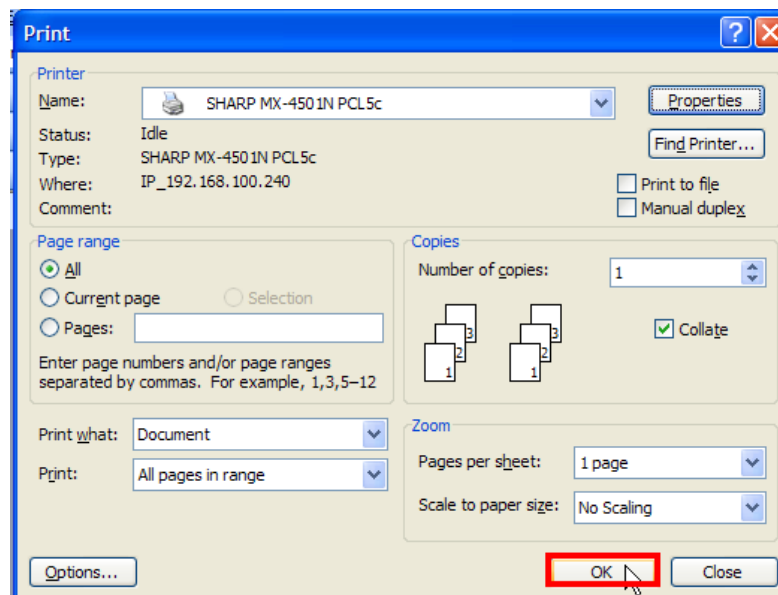




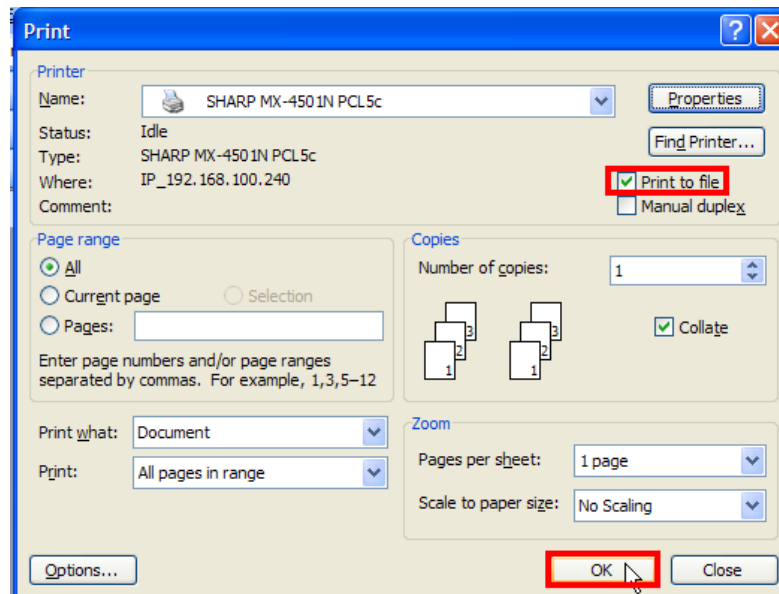
13. Next, click on the “**Color**” tab. Under the “**Color Mode**” area, click on the radio button for “**Black and White**”. Click on the “**OK**” button when done.



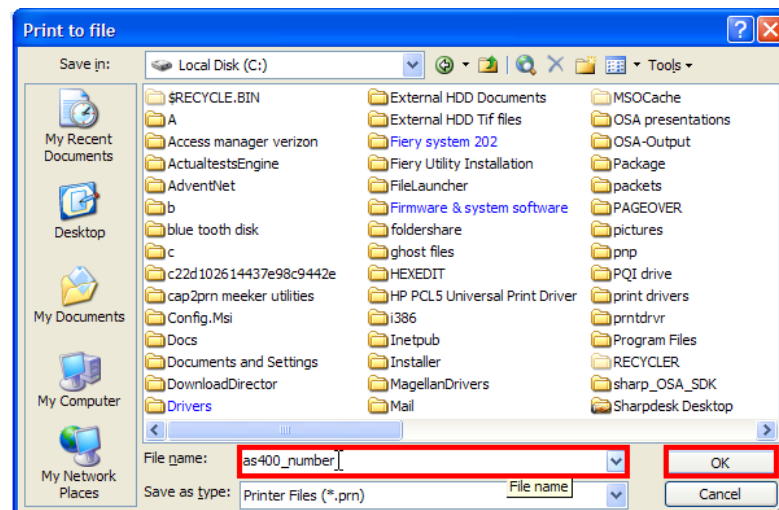
14. Click on the “**OK**” button in the application dialog box and ensure that the job prints out correctly.



15. If the job printed correctly, print the same job again but select “**Print to File**” in the application’s print dialog box before clicking on the “**OK**” button.



16. Save the file in a known directory with a meaningful name for later use. In this example, the file was saved as “**C:\as400\_number.prn**”.



## Creating the Work Station Customizing Object Source Code

**NOTE:** With this procedure, authentication credentials have to be added to a **Work Station Customizing Object (WSCST)** for the printer definition on the **AS400**. For your convenience, a source code file for a **Sharp WSCST** ("**Allsharp.**") that can be modified is included with this document.

To prevent unauthorized print jobs from non **Windows** or **MAC** users, the **Sharp** MFP requires certain **PJL** commands provided by the **Windows** or **MAC** print drivers to print when authentication is enabled. The relevant commands to authenticate with user numbers to allow printing from the **AS400** are:

```
<ESC>%-12345X@PJL SET SPOOLTIME="XXXXXXXXXXXXX"<CR><LF>
@PJL SET ACCOUNTNUMBER="XXXXXX"<CR><LF>
@PJL ENTER LANGUAGE=PCL<CR><LF>
<ESC>E
```

(The <ESC>E above is the **PCL** code to initiate the printer)

In the **IBM AS400** operating system, these statements must be converted from **ASCII** to **HEX** codes in the **WSCST**. When the print job is sent, the **AS400 Host Print Transform** process will convert the **HEX** codes back to **ASCII** to provide the correct authentication statements to the MFP.

Every **PJL** command file must begin with the **UEL (Universal Entry Language)** statement "<ESC>%-12345X" (the "<ESC>" represents the **ASCII** code (27) for the **Escape** key, a non printable character). Each **PJL** command must begin with a "@PJL" statement and be terminated by the non printable **ASCII** codes for a carriage return / line feed pair (13 and 09). When **PJL** commands are used for printer initialization, the printer reset command must contain the **UEL** statement "<ESC>%-12345X" to terminate the command file. **NOTE:** **PJL** commands can vary by specific models so it is important that the appropriate commands for that model be used.

The following example shows the **PJL** commands required for user number authentication as well as determining the correct authentication information to use in the **WSCST**.

17. To determine the precise commands and values used for the **Sharp** MFP you will need to view the print file you created in **Step 16**. At a command prompt at the **Windows** workstation, change to the directory you saved your print file to. Open the file (in this example, "**as400\_number.prn**") with the **DOS "Edit"** program by typing the following at a command prompt:

"Edit as400\_number.prn" and press the enter key.

18. When the “**Edit**” screen opens, you can view all of the **PJL** and **PCL** commands sent by the **Windows** print driver for this particular **Sharp** MFP (an **MX-4501N** in this example). However, only the commands highlighted in yellow below are required for authentication.

**Please note that in the *DOS Edit* program, the escape key (<ESC>) is represented by a left pointing arrow (←) and the carriage return / line feed pair (<CR><LF>) is not displayed.**

```
File Edit Search View Options Help  
C:\as400_number.prn  
+*~123456**PJL JOB NAME="Untitled - Notepad"  
EPJL SET PCNAME="ILANB084"  
EPJL SET DRIVERNAME="SHARP MX-4501N PCL5c\ei18e"  
EPJL SET JOBNAM="Untitled - Notepad"  
EPJL SET $POOLTIME="Wed, 02 Dec 2009 10:26:14 -0800"  
EPJL SET FILING-OFF  
EPJL SET USERNAME="ghazen"  
EPJL SET NOTIFYJOBEND=OFF  
EPJL SET HOLD-OFF  
EPJL SET QTY=1  
EPJL SET OUTBIN=OPTIONALOUTBIN1  
EPJL SET DUPLEX-OFF  
EPJL SET JOBBOOKLET-OFF  
EPJL SET BINDING=LONGEDGE  
EPJL SET JOBOFSET=ON  
EPJL SET ORIENTATION=PORTRAIT  
EPJL SET REVERSEIMAGE=OFF  
EPJL SET MARGINSHIFT=0  
EPJL SET MEDIATYPE=DEFAULTMEDIATYPE  
EPJL SET INTERLEAVE=OFF  
EPJL SET JOBSTAPLE=STAPLENO  
EPJL SET PUNCH-OFF  
EPJL SET RESOLUTION=600  
EPJL SET PAGEIMAGINFO=ONEUP  
EPJL SET PAGESTAMPINFO=NOME  
EPJL SET PAGEOVERLAYINFO=OFF  
EPJL SET PAGEFITTOPAGEINFO=OFF  
EPJL SET PAGEUPORDERINFO=OFF  
EPJL SET COLORMODE=AUTO  
EPJL SET TANDEM=OFF  
EPJL SET TABSHIFT=0  
EPJL SET GANCING=SINGLE  
EPJL SET HALFTONEENHANCE=OFF  
EPJL SET ECONOMODE=OFF  
EPJL SET RENDERMODEL=CMYK1B  
EPJL SET SOURCEPROFILE=SRGB  
EPJL SET OUTPUTPROFILE=SHA  
EPJL SET SRCCOLORCONU=ON  
EPJL SET NEUTRALGRAY=ON  
EPJL SET ACCOUNTNUMBER="123456"  
EPJL SET DOCUMENTCONTROL=OFF  
EPJL ENTER LANGUAGE=PCL  
+E=*11R+*117H+*112G+*110U<*P1i6c1S+*v6WV +*t3J+*w03W+*&p2i6c2S+*v6WV +*t  
++*****CT JE @ C vut CMc i rfgm.QW GC *gdir  
lnaxp*;GS; 9h prep-Fjg gG I B T [***+U&A&+*DduI+ t p u l|P >>  
n 8 n **n .n |.n 1.n 1.n u.n n.u.n U.n .n .n U.n u.n i.n k.n n 2.>n  
.n 2.n 1.n u.n t.nsu.n |.n 1.n 1.n 2.n <.n u.n v.n t.n <.nu.i+.n 6.i|.n .n 2.>
```

19. The commands required in this case in the **Workstation Customizing Object** for the *AS400* to authenticate to the *Sharp* MFP would be:

```
<ESC>%-12345X@PJL SET SPOOLTIME="Wed. 02 Dec 2009 10:26:14 -0800"<CR><LF>
```

```
@PJL SET ACCOUNTNUMBER="123456"<CR><LF>
```

```
@PJL SET LANGUAGE=PCL<CR><LF>
```

&lt;ESC&gt;E

While not shown in the above screen shot, the print file is terminated by the following command:

<ESC>%-12345X

20. Before these **PJL** commands can be used in a **Work Station Customizing Object** for the **AS400**, they must be translated from **ASCII** encoding to **HEX** codes. A conversion program (**PJL2HEX.XLS**) is included with this document but there are numerous **ASCII** to **HEX** conversion utilities available on the *World Wide Web*. To demonstrate the conversions, the examples used in this document are shown below. The **ASCII** code is shown first and then the corresponding **HEX** code is shown in red directly below each line.

```
<ESC>%-12345X@PJL SET SPOOLTIME="Wed. 02 Dec 2009 10:26:14 -0800"<CR><LF>
1B252D31323334355840504A4C205345542053504F4F4C54494D453D225765642E20
30322044656320323030392031303A32363A3134202D30383030220D0A
@PJL SET ACCOUNTNUMBER="123456"<CR><LF>
40504A4C20534554204143434F554E544E554D4245523D94313233343536940D0A
@PJL SET LANGUAGE=PCL
40504A4C20454E544552204C414E47554147453D50434C0D0A
<ESC>E
1B45
<ESC>%-12345X
1B252D313233343558
```

21. Once the **PJL** and **PCL** statements for authentication have been translated into **HEX** codes, they must be inserted into a **Work Station Customizing Object** source code file in specific areas. The **WSCST** file contains elements referred to as **TAGS** followed by data in **HEX** format to send commands to the printer. **PJL** commands for authentication can only be placed in the data field for the **INITPRT TAG**. The statement to terminate the command file ("**<ESC>%-12345X**") must be placed in the data field for the **RESETPRT TAG**. The data field for **INITPRT** can contain a maximum of 255 characters so only a few **PJL** commands can be included. Further, when using the **AS400 Source Editor Utility**, a maximum line length of only 80 characters (including **TAGS**, spaces, quote marks, etc) can be used. If the line length exceeds 80 characters or the data field exceeds 255 **HEX** characters, the **WSCST** source code will not compile correctly.

As you can see, the first line of **HEX** code for the **PJL** commands for authentication exceeds 80 characters. This means the line of **HEX** code must be broken into smaller segments following the rules of the **IBM AS400 Source Editor Utility**:

- A. Total line length must not exceed 80 characters.
- B. The total **HEX** data for the **INITPRT TAG** cannot exceed 255 characters.
- C. **HEX** data statements must be enclosed by single quote marks (').
- D. Each data line must be terminated with an "X".
- E. The final line of the **HEX** data field must be terminated by a period (.) following the "X" character.

22. The following screen shows the source code for the “*Allsharp*” Work Station Customizing Object in the *AS400* Source Editor Utility before modification for authenticating by user number. The INITPRT and RESETPRT data is initially set to ‘1B45’ (<ESC>E).

```

Columns . . . :   1  71                Edit                QGPL/QTXTSRC
SEU==>                                ALLSHARP
FMT **   ...+... 1 ...+... 2 ...+... 3 ...+... 4 ...+... 5 ...+... 6 ...+... 7
0037.00   :NOPRTBDR
0038.00   OPTION=BOTTOM
0039.00   ORIENT=LANDSCAPE
0040.00   DATA = 240.
0041.00   :INITPRT
0042.00   DATA = '1B45'X.
0043.00   :RESETPRT
0044.00   DATA = '1B45'X.
0045.00   :BELL
0046.00   DATA = '07'X.
0047.00   :SPACE
0048.00   DATA = '20'X.
0049.00   :CARRTN
0050.00   DATA = '0D'X.
0051.00   :FORMFEED
0052.00   DATA = '0C'X.
0053.00   :LINEFEED

F3=Exit   F4=Prompt   F5=Refresh   F9=Retrieve   F10=Cursor   F11=Toggle
F16=Repeat find   F17=Repeat change   F24=More keys

```

23. This code would have to be modified as shown below to send the authentication information shown in **Step 20**. Note that the modified data follows the rules for the *IBM Source Edit Utility* as shown in **Step 21**.

```

Columns . . . :   1  71                Edit                QGPL/QTXTSRC
SEU==>                                NUMBER
FMT **   ...+... 1 ...+... 2 ...+... 3 ...+... 4 ...+... 5 ...+... 6 ...+... 7
0036.00   DATA = 288.
0037.00   :NOPRTBDR
0038.00   OPTION=BOTTOM
0039.00   ORIENT=LANDSCAPE
0040.00   DATA = 240.
0041.00   :INITPRT
0042.00   DATA = '1B252D31323334355840504A4C20534554'X
0043.00   '2053504F4F4C54494D453D225765642E20'X
0044.00   '30322044656320323030392031303A3236'X
0045.00   '3A3134202D30383030220D0A'X
0046.00   '40504A4C20534554204143434F554E544E'X
0047.00   '554D4245523D94313233343536940D0A'X
0048.00   '40504A4C20454E544552204C414E475541'X
0049.00   '47453D50434C0D0A'X
0050.00   '1B45'X.
0051.00   :RESETPRT
0052.00   DATA = '1B252D313233343558'X.

F3=Exit   F4=Prompt   F5=Refresh   F9=Retrieve   F10=Cursor   F11=Toggle
F16=Repeat find   F17=Repeat change   F24=More keys

```

24. After the “*Allsharp*” source code file is modified, save it with different file name (such as “*Number*”) before compiling it into a **WSCST**. For instructions on transferring source code files such as “*Allsharp*” from a *PC* to the *IBM AS400* and compiling the source code into a **WSCST**, see the attached document “*Transferring WSCST Source Code.PDF*”.
25. For complete instructions on setting up a *Sharp* MFP as an *AS400* print device or remote output queue, see the attached files “*Create LAN attached printer VER 1.1.PDF*” and “*Create remote outque VER 1.1.PDF*”.