



## Connecting American PrintWare Products with an IBM/AS400

American PrintWare products receive the input data stream from one of three sources. These are Windows NT print queues, Novel print queues or files. Connection to an AS400 involves establishing a communications path between one of these sources and the AS400 data stream. To be useful that communications path should be automatic and must only do minimal conditioning of the data stream.

Several different underlying communications methods can be used to support the desired connection. The networking model and physical connections used in a particular company or location dictate the approach that best suits a particular application. The most common approach in AS400 connections is to use a Windows NT print queue as the input for the American PrintWare product. This paper discusses this solution and ways in which it can be implemented.

Given this approach the problem breaks down into two parts. First, how do we get the AS400 printing system to appropriately condition the data stream and next, how to get it delivered from the AS400 to the Windows NT system. These steps are essentially independent and therefore will be addressed separately.

### AS400 Print Data Stream Conditioning

The AS400 printing system was designed to interpret the print data stream and to condition it for a particular printer. The default capability includes the ability to condition text based data streams for line based character mode printers and included some minor support for PCL and Postscript data streams well. The Xerox XES and DJDE/Meta or LCDS data streams are not supported. Attempts to format these data streams for a line printer generally result in irreversible alteration of the information necessary to properly render the information is not lost or altered. Fortunately the AS400 provides a mechanism to control this operation. This mechanism is the Workstation Customization (WSCST) object. The process involves creating a logical printer definition on the AS400 that uses AS400 based workstation customization (as opposed to remote controller emulation) and appropriately configuring the WSCST object for that printer definition. The process is outlined below and is fully described in the AS400 Advanced Series Workstation Customization Programming manual, par number SC41-3605-01.

```
Retrieve Work Station  
Customization Object  
(RTVWSCST)  
  
Change Customization Source  
(STRSEU)  
  
Create Work Station  
Customization Object  
(CRTWSCST)  
  
Specify Customization Object  
In Device Descriptions  
(CHGDEVPRT)  
  
Vary on the Device  
(VRYCFG)  
  
Start Printer Writer  
(STRPRTWTR)
```

We wish to create a simple workstation customization object and so the first two steps may not be necessary. You can simply create the object rather than retrieving an existing one. Once we have created it however, it will be necessary to follow all of the steps.

The WSCST object we wish to create is a very simple one and is shown below.

```
:WSCST   DEVCLASS=TRANSFORM.
:TRNSFRMTBL.
:CARRTN
  DATA = 'OD'X.
:FORMFEED
  DATA = 'OC'X.
:LINEFEED
  DATA = 'OA'X.
:SPACE
  DATA = '20'X.
:EWSCST.
```

## Delivering the Data to the Windows NT Print Queue

The most common approach for transporting the print data stream to the Windows NT host of the American PrintWare product is TCP/IP printing. The logical print device on the AS400 is specified as TCP/IP device using the TCP/IP printing protocols (LPR/LPD). On the Windows NT system a printer is defined which is connected to an American PrintWare port. The name of the printer can be anything you specify but, for ease of working with the AS400 should be limited in length and should not contain spaces. On the AS400 you configure the TCP/IP properties of your printer so that the IP address is the address of the Windows NT system and the printer or queue name is the name you assigned on the AS400. Finally you must assure that the TCP/IP print server is installed and started on the Windows NT system. Once this is complete, the AS400 will transform the data, including translating it from EBCDIC to ASCII, and will transmit it to the NT using the TCP/IP based LPR/LPD printing protocols. Windows NT will place the data stream in an NT print Queue and will spool the data the American Printware port. The American Printware port passes the data to your American Printware product.

If you do not wish or are unable to use TCP/IP printing several other options are available. These all require a means of receiving the data and passing it to the Windows NT print queue that is attached to the American PrintWare product.

If you are using a TCP/IP connection to the AS400 the simplest approach is to use a terminal emulation program such as RUMBA, NetSoft for AS400, or Microsoft SNA Server/Workstation which are capable of emulating a 5250 terminal across the network. Each of these products can emulate printers or multiple printers and can pass the data stream to a Windows NT printer. Once the data is passed to the printer, the process is the same as Discussed above. You **must**, however, configure each of these products so that it uses the host print transform. The method for doing this varies with each of the products and will not be discussed here. It is, however, **critical** that this be done. If it is not the product will attempt to transform the data stream using its own internal rules based on the type of printer driver you have installed for the printer on the Windows NT system. This will again cause irrecoverable destruction of the data stream.

If you are using some other kind of link such as TWINAX, COAX or SDLC link, the process is essentially identical to the that in the previous paragraph. In this case, however, you must have an appropriate adapter card installed in the Windows NT computer. This adapter card provides the physical link to your AS400.

Then you must install printer or workstation emulation software, just as in the previous paragraph, except that it now manages the session across the adapter and physical link you have installed. In this case the input data stream in either ASCII or EBSDIC and so this will not be a problem.

## Summary

To summarize, American PrintWare products always use the AS400 Host Print transform method of connecting a printer. TCP/IKP connections from the AS400 to the Windows NT system supporting your American Printware product is the most commonly used and involves only software provided by American PrintWare or that which comes with Windows NT. Use of other protocols requires at the least protocol management software on the NT and may require a physical medium adapter (TWINAX, COAX, SDLC). This additional software must be correctly configured to use the AS400 Host Print Transform.

## Configuring AS400 / Rumba connection.

American PrintWare recommends the use of Rumba software to manage the connection with an AS400 using a coax adapter. Rumba uses an APPC connection over the coax for all terminal and printer sessions. The AS400 must be configured to allow virtual APPC devices and a virtual APPC device must exist. The easiest way to do this is to allow RUMBA to set up the device. It will do so if the AS400 is configured to allow this to occur. To do this use the WRKSYSVAL command to access system values. Set the value of QAUTOCFG to 1. Set the value of QAUTOVRT to a value greater than the number of devices on the system. This will allow Rumba to configure a virtual device when it connects. The device it will try to create by default uses the name of the NT computer as its base. Thus you must assure that no current devices have this name. Normally Rumba forms the name by appending \_S1 to the computer name. However it may use the computer name only with a number appended. So if you assure that no other AS400 device has a name starting with the computer name of NT then there will be no conflict.

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