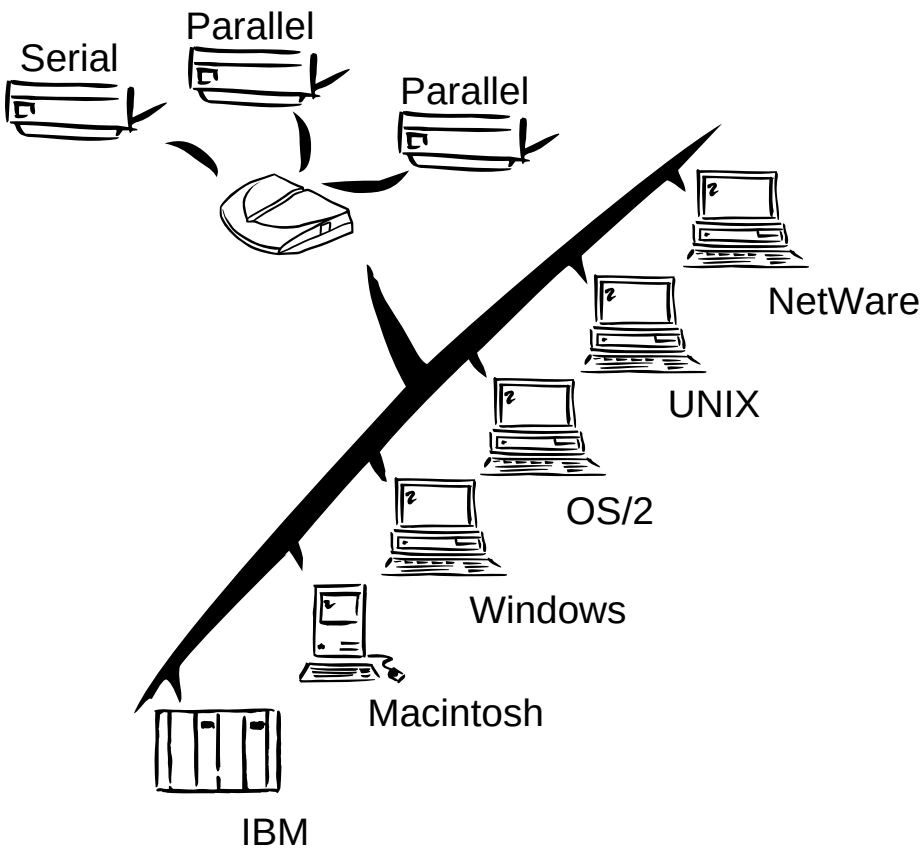
AXIS Network Print Server Technical Reference



AXIS COMMUNICATIONS

Lund - Boston - Tokyo - Hong Kong

PREFACE

Thank you for purchasing an AXIS Network Print Server. Our goal in developing this product is to enable you to connect your printers anywhere in your network, allowing all network users access to shared printer resources.

ABOUT AXIS

Axis Communications, founded in 1984, is one of the world's fastest growing companies in the CD-ROM server, network print server and printer interface market. The head quarters are located in Lund, Sweden, with subsidiaries in Boston, Tokyo, and Hong Kong.

Axis Communications has a distributor network operating in more than 60 countries world-wide, marketing three product lines:

Network CD-ROM Servers

Multiprotocol CD-ROM servers provide a flexible and cost-efficient solution for sharing CD-ROMs across the network. They are available in Ethernet and Token Ring versions, with or without a built in drive option.

Network Print Servers

These intelligent Ethernet and Token Ring print servers support a wide range of LAN protocols. The AXIS NPS 530, 532, 550, AXIS 150, 152, AXIS 560, and 570 are Ethernet print servers, while the AXIS NPS 630, 632, 650, AXIS 660, and 670 are Token Ring print servers.

IBM Mainframe and S/3x – AS/400 Printer Interfaces

These products include a wide range of plug-in interfaces and free standing box products such as the Cobra+ and the AFP IPDS-to-PostScript converter.

ABOUT THIS MANUAL

This manual contains a detailed technical description of the Axis print servers and how to use them in network printing environment. If you are not familiar with the basic functions of your Axis print server, please refer to the User's Manual for each product respectively.

The Technical Reference is divided into four major parts:

- An introduction to networks in general, and the Ethernet and Token Ring networks in particular - Sections 1 and 2.
- A general introduction to the Axis print server family and their internal functions - Sections 3 and 4.
- How to set up and use the Axis print servers for network printing, and printing related tasks - Sections 5 to 9.
- A description of the Axis print server parameters and how to edit them - Sections 10 and 11.

There is also a section on how to pin-point and solve problems that might occur during the installation and operation of the Axis print server.

Every care has been taken in the preparation of this manual; if you detect any inaccuracies or omissions, please inform us at our address - See “How To Contact Axis” on page 280. Axis Communications AB cannot be held responsible for any technical or typographical errors and reserves the right to make changes to the product and manuals without prior notice.

EMISSION NOTICES

USA

This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart B of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference. Shielded cables should be used with this unit to ensure compliance with the Class A limits.

CE

Europe

This digital equipment fulfils the requirements for radiated emission according to limit B of EN55022/1987, and the requirements for immunity according to EN50082-1/1992 residential, commercial, and light industry. (Compliance is not valid for unshielded network and printer cables.)

TRADEMARK ACKNOWLEDGEMENTS

AIX, Apple, AppleTalk, DEC, DOS, Ethernet, EtherTalk, Hewlett-Packard, HP, IBM, LAN Manager, LAN Server, Lexmark, Macintosh, Microsoft, MVS, Novell, Novell NetWare, OS/2, OS/400, PostScript, PS/2, SCO, SunOS, TokenTalk, Ultrix, Unix, VM, VMS, VSE, Windows, are registered trademarks of the respective holders.

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SECTION 1

INTRODUCTION TO LOCAL NETWORKS

A *local network* is defined as follows:

> *A local network is a communications network that provides interconnection of a variety of data communicating devices within a small area.*

The need to interconnect equipment within a single building (or group of buildings) has made local networks indispensable for business, government agencies, universities, and other organizations.

Types of Local Networks

There are two basic types of local networks: *circuit switching* and *packet broadcasting*.

Circuit switching The network consists of a central switch to which all devices attach. Two devices communicate by setting up a circuit through the switch. The circuit consists of a path and dedicated resources for transferring data between the two devices. The most familiar example of a circuit-switching network is the *private branch exchange* (PBX), used by common telephone nets.

Packet Broadcasting Devices share a communications network in which a transmission from any device is heard by all other devices. Data to be transmitted are broken up into small blocks, called *packets*. Packets include both user data and control information that indicate the destination of the data. Each packet is sent onto a network and may be received by all other devices on the network. Examples of packet broadcasting networks are *Ethernet* and *Token Ring*.

The key to packet broadcasting is the use of a transmission medium shared by a number of devices. An early example of this is the *multi-drop line*. The multi-drop line is used for communication between one primary station (a host computer) and a number of secondary stations (terminals and printers). For local networks, peer communication among a number of cooperating devices is required. This type of network is referred to as a ***local area network* (LAN)** and has the following key characteristics:

- A transmission medium is shared among the attached devices.
- Transmission is in the form of packets.
- A transmission from any station is received by all other stations hence the term *packet broadcasting*.
- There is no master station – all stations cooperate to assure orderly use of the transmission medium.

LAN Medium Access Techniques

The two most common techniques are CSMA/CD (Carrier Sense Multiple Access with Collision Detection) and Token Passing. The main commercial applications of these techniques are Ethernet and Token Ring respectively.

Ethernet

The majority of installed LANs are based on Ethernet, which is a passive bus network that utilizes CSMA/CD. The system was developed in 1976 by Metcalfe and Boggs of Xerox. (The name Ethernet derives from the conception that space contained a mysterious 'ether' medium without which light could not propagate. We now know that this ether medium does not exist in space).

The basic function of Ethernet is quite simple:

1. If the medium is idle, transmit.
2. If the medium is busy, listen continuously until idle, then transmit immediately.

This method is very effective at light loads, but the risk of collisions (two stations trying to transmit at the same time) increases rapidly with higher loads. This introduces the need for the CD (collision detection) part of CSMA/CD:

3. If a collision is detected during transmission, immediately cease transmitting the frame, and transmit a brief jamming signal to assure that all stations know that there has been a collision.
4. Wait a random amount of time (with the mean value increasing exponentially at each retry), then attempt to transmit again according to step 1 above.

Token Ring

Token Ring is the oldest ring control technique, originally proposed in 1969 by Olof Söderblom. It is based on the use of a small frame (*token*) that circulates around the ring when all stations are idle. This is the basic function of a Token Ring network:

1. Before a station can transmit data, it must wait until a token passes by. The station then seizes the token and appends the fields needed to construct a frame.
2. There is now no token on the ring, so all other stations wishing to transmit must wait.
3. The receiving station copies the data addressed to it, and generates a receipt.
4. When the frame has completed the round trip, the sending station removes the frame and generates a free token.
5. An important implication of this technique is the inefficiency under light loads due to the fact that a station must wait for the token before it can transmit. Under heavy loads, however, it becomes relatively more efficient since no collisions occur.

SECTION 2

ETHERNET AND TOKEN RING NETWORKS

This section describes the physical properties of the Ethernet and Token Ring networks, and the different communications protocols used.

Ethernet Media

Until recently Ethernet has always been a 10 Mbit/s base band network (that's what the '10base' stands for in the descriptions below). There is now also a 100 Mbit/s Ethernet, but since the great majority of Ethernet networks are 10 Mbit/s, the 100 Mbit/s system is not included in this technical reference. However, there are at present three cabling methods in use:

Thick-wire Ethernet (10base5)

This is the original 'yellow cable' Ethernet (the specifications, among many other things actually specify the colour of the cable!). It is a thick coaxial cable (the 5 in its name refers to the conductor spacing) to which devices are attached by mounting a Transceiver on the cable itself, called a MAU (Media Attachment Unit). A needle protruding from the MAU makes a connection to the inner core. The connection between the MAU and the Ethernet device is made using a 15-pin DSUB, the interface being known as an AUI (Attachment Unit Interface) connector. Today this type of Ethernet is mostly used for backbones.

Thin-wire Ethernet (10base2)

Until not too long ago, this was the most used cabling type. It is a thin 50 ohm coaxial cable, sometimes referred to as 'Cheapernet' (the 2 in its name refers to the conductor spacing). The connection to different Ethernet devices is done using 'T' connectors to tap into the network; the actual connector is a BNC type.

Twisted-pair Ethernet (10baseT)

Today, this is the most common cabling method for new installations. It is the cheapest of the three cabling methods, and since the network cable does not have to pass by each device, it is more reliable than the coaxial methods when using 10baseT. Each device has its own cable, connected to a so-called hub, which can dynamically disconnect a particular cable if there appears to be an error which would disrupt the entire network. The physical connector is an RJ-45 type connector, which is similar to standard phone plugs.

The twisted-pair cable (the T in its name refers to Twisted-pair) may be shielded (STP) or unshielded (UTP). Shielded cables are required in Germany, and some other countries, due to EMC (Electro Magnetic Compatibility) reasons.

Ethernet Frame Formats

Data is sent in frames, also called packets, on an Ethernet network. A frame contains the information regarding the frame itself, in addition to the data sent by the user. There are four different frame types on Ethernet networks; Ethernet II, IEEE 802.3, IEEE 802.3, and SNAP.

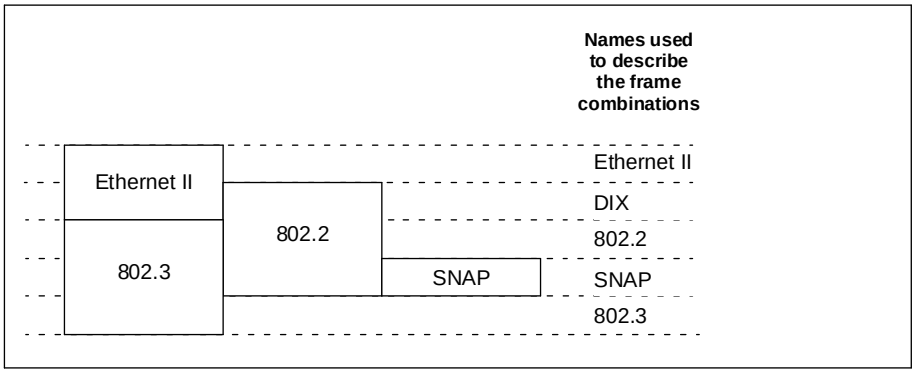


Figure 2-1 Ethernet Frame Formats

The diagram illustrates how the frame types may be encapsulated in other frames to produce the MAC layer protocols used by LANs. For example when Ethernet II is encapsulated in an 802.2 frame it is known as DIX.

Axis print servers have automatic detection of, and adaption to, all frame types simultaneously. However you can selectively disable the detection of frame types for some of the network protocols used by the print server - see the parameter list in SECTION 11, page 137.

Ethernet Address

Each Ethernet station has a unique address consisting of 12 hexadecimal digits. The Axis print server Ethernet address (same as the serial number) consists of two parts:

- The first 6 digits are always **00:40:8C**, indicating Axis as the manufacturer.
- The remaining 6 digits are a running number unique for each Axis Ethernet print server.

The Ethernet address is coded into the Axis print server hardware, but you may change it to a Locally Administrated Address (LAA) as described on page 149.

Token Ring Media

Token Ring is either a 4 Mbit/s or 16 Mbit/s base band network. The units on a Token Ring network are connected in a ring topology, meaning that the ‘last’ unit is connected to the ‘first’ unit completing a closed loop where the token can circulate. However, the ring topology is only signalwise and in practices not visible, since the units are generally connected to a central MAU (Multistation Access Unit) forming a physical star topology.

The Token Ring MAU (not to be confused with the Ethernet MAU, see *Ethernet Media* (page 9)) can be either passive or active. A passive MAU is simply a switch board with a number of connectors accessing the small ring inside. An active MAU has, in addition, signal conditioners to allow for longer cables, and sometimes one or more Token Ring stations for ring monitoring purposes.

Token Ring networks use two main types of cabling, STP and UTP:

Shielded Twisted-Pair (STP)

The STP, or Media Type 1, is the cable system defined by the original Token Ring specification. It allows for more units and longer cabling distances than UTP, but is more expensive and more difficult to handle. The most common STP cabling is the IBM Cabling System.

The STP cable is connected to the Token Ring unit with a 9-pin D-sub connector, and to the MAU with an IBM Cabling System connector.

Unshielded Twisted-Pair (UTP)

This is the cabling system used in most installations today. The cable is cheaper and easier to handle than STP, but is more limited in terms of the number of units and cabling distances. For UTP cabling, category 3, 4, or 5 may be used. Category 5 is recommended for new installations.

The UTP cable connectors are standard phone plugs (RJ-45).

Token Ring Frame Formats

Data is sent in frames, also called packets, on a Token Ring network. A frame contains the information regarding the frame itself, in addition to the data sent by the user. There are three different frame types on Token Ring networks, IEEE 802.5, IEEE 802.2, and SNAP.

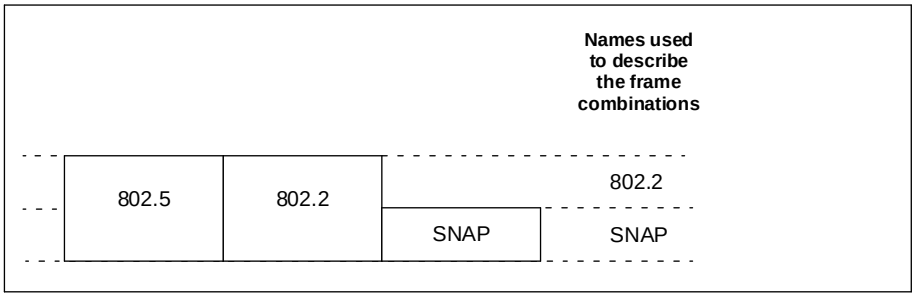


Figure 2-2 Token RIng Frame Formats

The diagram illustrates how the frame types may be encapsulated in other frames to produce the MAC layer protocols used by Token Ring LANs. For example when an 802.5 frame is encapsulated in an 802.2 frame it is known as 802.2.

Axis print servers have automatic detection of, and adaption to, all frame types simultaneously. However you can selectively disable the detection of frame types for some of the network protocols used by the print server - see the parameter list in SECTION 11, page 137.

Token Ring Node Address

Each Token Ring station has a unique address consisting of 12 hexadecimal digits. The Axis print server Node address (same as the serial number) consists of two parts:

- The first 6 digits are always **00:02:31**, indicating Axis as the manufacturer.
- The remaining 6 digits are a running number unique for each Axis Token Ring print server.

The Node address is coded into the Axis print server hardware, but you may change it to a Locally Administrated Address (LAA) as described on page 149.

Repeaters

A repeater is a signal amplifier and does not affect the logical network where it is connected. It is used for connecting two network segments, and it can also connect different types of Ethernet or Token Ring attachments together.

If you use 10base2, 10base5, STP or UTP media, repeaters are used if the cable length exceeds the specified.

For 10BaseT the hubs are normally placed at reasonable distances from the network devices, and repeaters are not used.

The use of a repeater does not require any adjustment to the Axis network print server parameters.

Bridges

A bridge connects two segments of a network but only passing information that is intended to travel from one segment to the other. Traffic passing between addresses within one segment will not reach the other segment. Typically one replaces a repeater with a bridge when it is necessary to separate network segments because of heavy load, security, or other reasons. It can also be used for converting from Ethernet to Token Ring, or for tunnelling one packet type into another. Typically the set-up of a bridge is minimal - it configures itself by listening to the traffic.

The use of a bridge in an Ethernet network does not require any adjustment to the Axis network print server parameters. For Token Ring networks, there is a parameter controlling the source routing mode that in rare cases may need adjustment, as described on page 151.

Routers

A router is a device for off-loading the traffic between networks. It separates two or more logical networks (which have separate network addresses), and only passes the traffic it is set up to pass between the networks. The main difference between bridges and routers is that routers control the paths of the network traffic.

There is also a device called *brouter*, which combines the functions of a bridge and a router.

The Axis print servers automatically sense when the traffic is coming via a router. However, the automatic router sensing is not a standard feature in all network environments. If you experience problems with routed traffic, you may specify a default router and a net mask in the Axis print server configuration.

Network Protocols

This section provides an overview of the different protocols used for network communications. Let's start with a definition of the term protocol:

A protocol is a set of rules governing the communication and exchange of data between devices in a communications system.

Communication over a network is far more complex than for example the serial communication between a computer and a printer (where the RS-232 is a common protocol). To make things a bit easier for us, the International Standards Organization (ISO) has defined the **OSI** (Open Systems Interconnection) model, where the network communication is divided into seven layers. The table below describes the function of each layer:

The OSI model layers

Layer	Function	Description
7	APPLICATION	The top layer (i.e. closest to the user) provides services to the user such as file server protocol and network management.
6	PRESENTATION	Performs transformations on data to provide a standardized application interface and common communication services. Examples are encryption, text compression, and reformatting.
5	SESSION	Provides the control structure for communication between applications; establishes, manages, and terminates connections between cooperating applications.
4	TRANSPORT	Provides reliable and transparent transfer of data between end points, end-to-end error recovery, and flow control.
3	NETWORK	Provides upper layers with independence from the data transmission and switching technologies used to connect systems. Responsible for establishing, maintaining, and terminating connections (X.25, layer 3).
2	DATA LINK	Provides for the reliable transfer of data across the physical link, sends blocks of data (frames) with the necessary synchronization, error control, and flow control (HDLC, SDLC, BiSync).
1	PHYSICAL	Concerned with transmission of unstructured bit stream over the physical link; involves such parameters as signal voltage swing and bit duration; deals with mechanical, electrical, and procedural characteristics to establish, maintain, and deactivate the physical link (RS-232, RS-449, X.21).

NetWare

The following protocols make up the NetWare implementation of the OSI model:

The IPX Protocol IPX (Internetwork Packet Exchange) is the NetWare network protocol. It corresponds to the IP and UDP protocols in the TCP/IP environment (see below).

The NCP Protocol NCP (NetWare Core Protocols) is the NetWare protocol covering the presentation, session, and transport layers in the OSI model. The Axis print server must support NCP in order to manage local printing using PSERVER - See "NetWare" on page 35.

The SPX Protocol SPX (Sequenced Packet Exchange) is the normal NetWare transport layer protocol. An Axis print server must support SPX in order to manage remote printing using RPRINTER or NPRINTER - See "NetWare" on page 35.

Windows, LAN Server/LAN Manager

The following protocols make up the Windows, LAN Server/LAN Manager implementation of the OSI model:

The NetBIOS Interface

NetBIOS (Network Basic Input/Output System) is the LAN Server/LAN Manager session level protocol.

Applications can communicate using either *sessions* or *datagrams*. Sessions provides reliable data transfer, while datagram communication (handled by the *data link* layer) provides no guarantee of delivery.

The NetBEUI Protocol

NetBEUI (NetBIOS Extended User Interface) is the LAN Server/LAN Manager protocol covering the transport and network layers in the OSI model. It is optimized for high performance in smaller LANs or LAN segments. The NetBEUI protocol is not routable.

The LLC Protocol

LLC (Logical Link Control) is the LAN Server/LAN Manager data link layer protocol. The *Connectionless Service* (IEEE 802.2 type 1) provides no guarantee of delivery, while the *Connection-oriented Service* (IEEE 802.2 type 2) provides reliable data transfer.

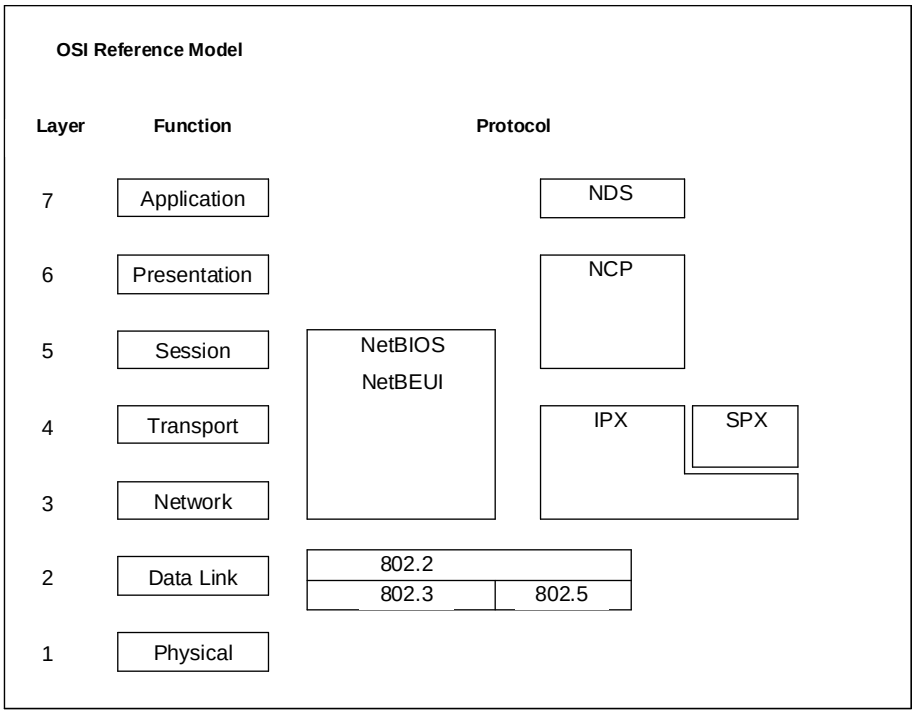


Figure 2-3 OSI model implementation in the NetWare and LAN Server/LAN Manager environments

TCP/IP

The TCP/IP environment embraces a wide range of different protocols, generally referred to as the *TCP/IP protocol suite*. When a system is claimed to have *TCP/IP support*, this should be read as the system supports most, but not necessarily all, of the TCP/IP protocol suite.

The diagram below illustrates a typical OSI model implementation in the TCP/IP environment:

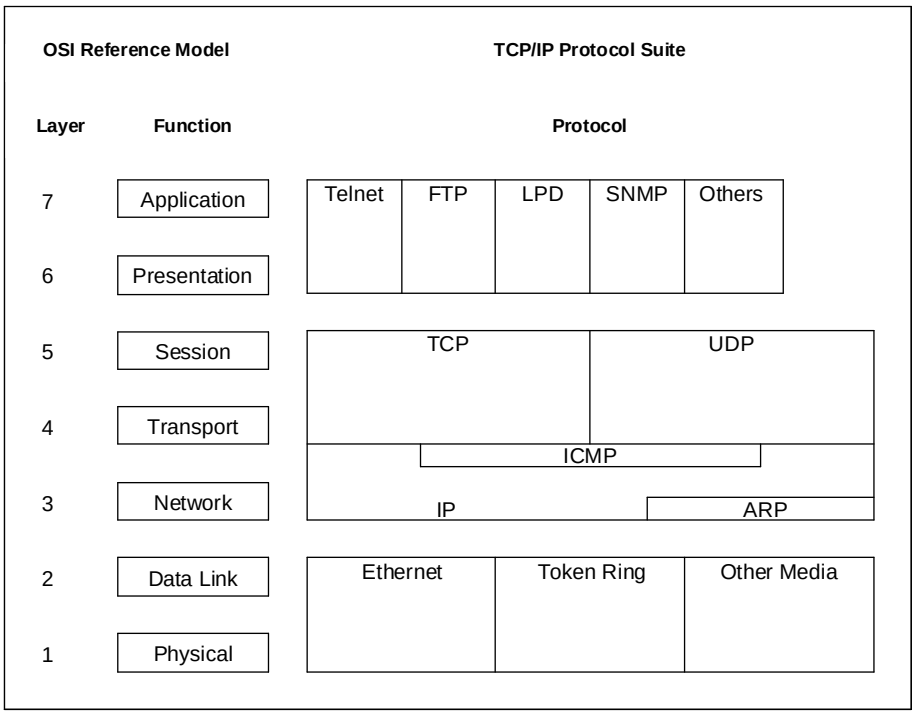


Figure 2-4 OSI model implementation in the TCP/IP environment

The Telnet Protocol Telnet is a protocol for terminal emulation (typically VT100 or 3270 traffic) over a TCP/IP network. It does not handle the emulation itself – this is done by the application program (on most systems called 'telnet' – just to add to the general confusion!). The telnet protocol also includes printing functionality, generally referred to as *Reverse Telnet*.

The FTP Protocol FTP (File Transfer Protocol) is a generic application level protocol used for file exchange over the network. It is designed to run in interactive mode, is fairly easy to use, and it is part of any existing TCP/IP system - or at least all those that we have encountered.

The SNMP Protocol SNMP (Simple Network Management Protocol) is an application for network management, e.g. verifying traffic and planning of traffic load. See also *NETWORK MANAGEMENT UNDER SNMP* (page 124).

The LPD Protocol

LPD (Line Printer Daemon) is an application level protocol used for remote printing. Its primary use is to send print data from one host to another. Two applications using LPD are *lpr* and *lpq*.

The BOOTP Protocol

BOOTP (Bootstrap Protocol) is an application level protocol used for reading operating environment parameters (such as the Internet address) at power-up.

The PROS Protocol

PROS (Patrik & Ricard Operating System) is an Axis proprietary application level protocol, more printer oriented than the standard TCP/IP applications. In particular, it supports bi-directional printing, featuring automatic logging of printer status and feedback. PROS uses the TCP protocol for transport, which it accesses via *Sockets* (Berkeley networking support).

The UNIX systems supported by Axis print servers are shown by the table on page 72

The PROS source code can be up-loaded from the Axis print server via *ftp*.

The TCP Protocol

TCP (Transmission Control Protocol) is the most important transport level protocol, used by the Telnet and FTP application protocols. It is more advanced than UDP (see below), in particular, it has end-to-end error recovery that ensures that data safely arrives at the destination.

The UDP Protocol

UDP (User Datagram Protocol) is the other transport level protocol, used by Axis print servers for SNMP and BOOTP only. Unlike TCP, UDP does not provide end-to-end error recovery, and is therefore not classified as a reliable protocol. In practice, UDP works fine for small networks, while the increased need for error recovery makes TCP necessary in larger networks.

The IP Protocol

IP (Internet Protocol) represents the network layer in the OSI model. It is primarily responsible for connecting devices over the network using the *Internet Address*.

The ICMP Protocol

ICMP (Internet Control Message Protocol) cooperates with IP in the network layer to control multiple network routing and similar tasks. It manifests itself to the user in the form of the *ping* command, which is used to check IP communication.

The ARP Protocol

ARP (Address Resolution Protocol) is a low level transport layer protocol. Its purpose is to map IP (Internet) to Ethernet addresses.

The RARP Protocol

RARP (Reverse Address Resolution Protocol) is a low level transport layer protocol. Its purpose is to read the Internet address at power-up.

Apple EtherTalk

The following protocols make up the Apple EtherTalk implementation of the OSI model:

The PAP Protocol PAP (Printer Access Protocol) is an application layer protocol for print data management. It compares to LPD in the TCP/IP protocol suite.

The ATP Protocol ATP (AppleTalk Transaction Protocol) is a session and transport layer protocol, corresponding to TCP in the TCP/IP protocol suite.

The DDP Protocol DDP (Datagram Delivery Protocol) is a network layer protocol, comparable to IP in the TCP/IP protocol suite.

The RTMP Protocol RTMP (Routing Table Maintenance Protocol) is a network layer protocol responsible for routing information management. Together with ZIP and AEP (see below), it makes up the Apple equivalent to ICMP in the TCP/IP protocol suite.

The ZIP Protocol ZIP (Zone Information Protocol), is a protocol that handles the AppleTalk Zone function. A zone is a segment of users forming a sub net of the Ethernet network. Zone management is primarily used to organize long lists of entities.

The AEP Protocol AEP (Apple Echo Protocol) is a protocol for verifying communication, similar to *ping* in the TCP/IP suite ICMP protocol.

The AARP Protocol AARP (AppleTalk Address Resolution Protocol) is a network layer protocol performing the same functions as ARP in the TCP/IP protocol suite.

System Network Architecture (SNA)

Introduction

The SNA support enables printing from mainframes and mini computers using native protocols and data streams. All protocol and data stream conversion is made in the Axis 570/670 print server, resulting in higher performance, reliability, and better control.

The host will see the Axis 570/670 as a LAN-attached control unit, as will be described in more detail.

Nomenclature and shortforms

- **SNA:** Systems Network Architecture
- **LU:** Logical Unit
- **PU:** Physical Unit
- **NAU:** Network Accessible Unit (PU or LU)
- **LU-x:** LU type x
- **LU #x:** LU address

Node type will be used instead of PU type, as a T2.1 node does not contain a PU.

SNA Protocols

SNA is really a set of different protocols, where each set is distinguished through PU (node) types, and LU types. Different devices use different types of SNA. SNA can be roughly mapped to the OSI model, but as SNA was designed before OSI, there is no one-to-one mapping.

Layer	Function	
1	Transaction Services	Provides application services such as distributed database access and document interchange.
2	Presentation Services	Formats data for different presentation media and coordinates the sharing of resources.
3	Data Flow Control	Synchronizes data flow, correlates exchanges of data, and groups related data into units.
4	Transmission Control	Paces data exchanges to match processing capacity and enciphers data if security is needed.
5	Path Control	Routes data between source and destination and controls data traffic in the network.
6	Data Link Control	Transmits data between adjacent nodes.
7	Physical Control	Connects adjacent nodes physically and electrically.

Figure 2-5 The SNA implementation

When discussing SNA it is easier and more appropriate to talk about node and LU types. The following tables show the different node and LU types within SNA. *Bold type indicate the SNA protocols supported by Axis 570/670 products.*

SNA Node Types

The following node types are defined in SNA:

Node type 1 (PU-1)	Used by 5250 terminal controllers like the IBM 5294 and IBM 5394. LU types 4 and 7 can be used with PU-1.
Node type 2.0 (PU-2)	**Used by 3270 cluster controllers like the IBM 3274 and the IBM 3174. LU types 1,** 2, **3,** and 6.2 (dependent) **can be used with PU-2.**
Node type 2.1 (T2.1)	Used by PCs, workstations, intelligent controllers, etc. Serves as a base for APPN (Advanced Peer-to-Peer Networking). LU type 6.2 (independent) can be used with T2.1.
Node type 4 (PU-4)	Used by communications controllers like the 3745. Can handle any defined LU type.
Node type 5 (PU-5)	Used by host nodes (mainframes). Can handle any defined LU type.

T2.1 is available in different flavours: Low-Entry Networking Node (LEN node), End Node (EN) and Network Node (NN). APPN is IBM's follow-up to SNA. The main difference between APPN and traditional sub-area type SNA is that all nodes are equal (peer-to-peer network) and traditional SNA is hierarchical in nature: PU-5 and PU-4 devices control all other devices in the network. APPN has the same purpose as TCP/IP, but is in no way compatible.

The node types typically implemented by peripheral devices are either PU-1, PU-2 or T2.1. PU-1 must be encapsulated in T2.1/LU-6.2 to be transported over a LAN. PU-2 and T2.1 are typically transported over IEEE 802.2 LLC, in the case of LANs.

SNA LU Types

The following LU types are defined in SNA:

LU type 1 (LU-1)	**Used by 3270 printers supporting the SCS and IPDS data streams**
LU type 2 (LU-2)	Used by 3270 terminals
LU type 3 (LU-3)	**Used by 3270 printers supporting the 3270 data stream**
LU type 4 (LU-4)	Used by 5250 printers supporting the SCS or IPDS data streams
LU type 6.2 (LU-6.2)	Used by host nodes (including AS/400), PCs, workstations, as well as other devices (including some IPDS printers).
LU type 7 (LU-7)	Used by 5250 terminals

Note that all printers used with mainframes today support both LU-1 and LU-3, with or without support for IPDS.

SECTION 3

AXIS PRINT SERVERS – INTRODUCTION

This section gives a brief overview of the Axis network print server family. If you are unfamiliar with your Axis print server and its functions, we recommend that you also browse through the User's Manual to get a general idea of its functions.

The Axis network print servers are multi-protocol stand-alone network print servers for the Ethernet or Token Ring environment. Depending on model, the protocol support is different, see below. A common feature however is the simultaneous handling of all the supported protocols. Axis print servers make it possible to connect your printers anywhere in an Ethernet or Token Ring network, allowing all network users access to shared printer resources.

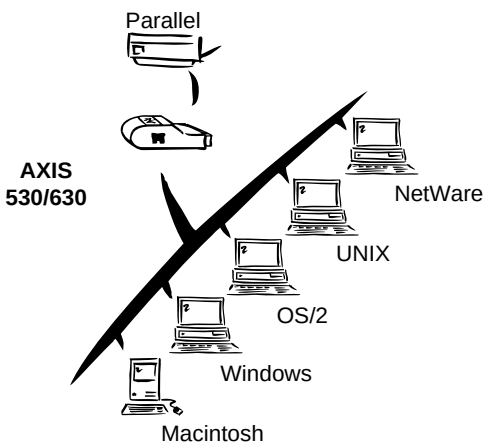
Because of their powerful built-in features they are extremely user-friendly to install and use.

The NPS 530/630

The NPS 530/630 are pocket-sized plug-in network print servers for the Ethernet and Token Ring networks respectively, that plugs directly info the printers parallel (Centronics) port. The NPS 530 connection is via a twisted pair (10baseT), while the NPS 532 uses a thin wire (10base2) cable. Otherwise the NPS 530 and the NPS 532 are functionally equivalent.

The NPS 630 connects to the network via an UTP (Media Type 3) Token Ring cable and NPS 632 via an STP (Media Type 1) Token Ring cable.

The supported network environments are NetWare, LAN Server/LAN Manager, Windows, TCP/IP, and Apple EtherTalk (NPS 530 only). For NPS 530, TCP/IP and Apple EtherTalk are available as upgrades (software keys) from your dealer.

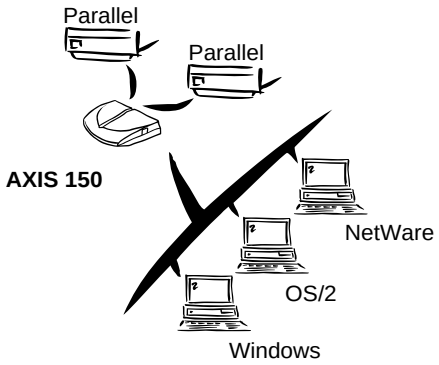


NPS 530/630	
NetWare	X
NetBIOS/NetBEUI	X
TCP/IP	X
Apple EtherTalk (NPS 530 only)	X
IBM SNA	
Logical Printers	X
Parallel Printer Ports	1
Serial Printer Ports	0

The AXIS 150/152

The AXIS 150/152 is optimized for the PC based LANs of today's smaller or departmentalized networks. It supports the most popular versions of network operating systems simultaneously: NetWare, Windows NT, Windows for Workgroups, Windows 95, and LAN Server/LAN Manager.

The AXIS 152 is functionally equivalent to the AXIS 150. The only difference is that the AXIS 150 connects to the network via a 10 base T Ethernet cable (RJ-45 connector), while the AXIS 152 connects via a thin wire (10base2) Ethernet cable.



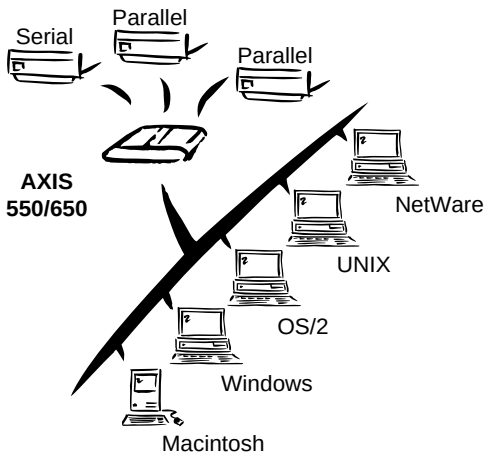
AXIS 150/152	
NetWare	X
NetBIOS/NetBEUI	X
TCP/IP	
Apple EtherTalk	
IBM SNA	
Logical Printers	
Parallel Printer Ports	2
Serial Printer Ports	0

The NPS 550/650

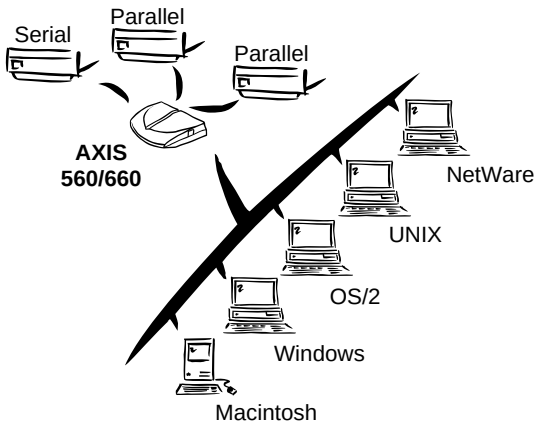
Whether you are running UNIX systems, Macs, PCs or OS/2s, the AXIS NPS 550/650 print server connects your printers directly to your Ethernet/Token Ring network. Its multiprotocol support lets you print from NetWare, Unix, Windows NT, Windows for Workgroups, Windows 95, LAN Server/LAN Manager and Apple EtherTalk (550 only) simultaneously.

The NPS 550/650 is replaced by AXIS 560/660.

NPS 550/650	
NetWare	X
NetBIOS/NetBEUI	X
TCP/IP	X
Apple EtherTalk (NPS 550 only)	X
IBM SNA	
Logical Printers	X
Parallel Printer Ports	2
Serial Printer Ports	1



The AXIS 560/660



The AXIS 560 is a stand alone network print server for the Ethernet environment. It has two high-speed parallel printer ports and one serial printer port, and connects to the network via a twisted-pair (10baseT) or a thin-wire (10base2) Ethernet cable.

AXIS 560/660	
NetWare	x
NetBIOS/NetBEUI	x
TCP/IP	x
Apple EtherTalk (Axis 560 only)	x
IBM SNA	
Logical Printers	x
Parallel Printer Ports	2
Serial Printer Ports	1

The AXIS 660 is identical to the AXIS 560 except it is designed for the Token Ring environment and connects to the network via an STP (Media Type 1) or a UTP (Media Type 3) cable.

The supported network environments are NetWare, LAN Server/ LAN Manager, Windows, TCP/IP and Apple EtherTalk (AXIS 560 only).

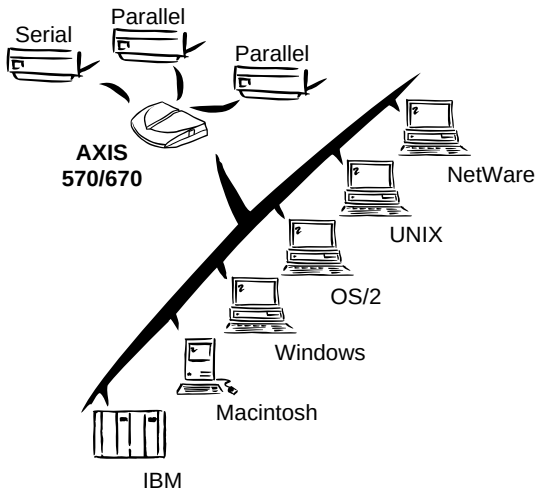
The AXIS 570/670

The AXIS 570 is a stand alone network print server for the Ethernet environment. It has two high speed parallel printer ports and one serial port, and connects to the network via a twisted pair (10baseT), or a thin wire (10base2) Ethernet cable.

The AXIS 670 is functionally equivalent to the AXIS 570 but is designed for the Token Ring environment. Connection to the network is via an STP (Media Type 1) or a UTP (Media Type 3) cable.

The supported network environments are IBM Mainframe, AS/400, NetWare, LAN Server/ LAN Manager, Windows, TCP/IP, and Apple EtherTalk (AXIS 570 only). This means that users connected to a mainframe or AS/400 can share a printer with LAN connected users.

The SNA support enables printing from mainframes and mini computers using native protocols and data streams. All protocol and data stream conversion is made in the AXIS 570/670 print server, resulting in higher performance, reliability, and better control. The host will see the AXIS 570/670 as a LAN-attached control unit, as will be described in more detail in the following chapters.

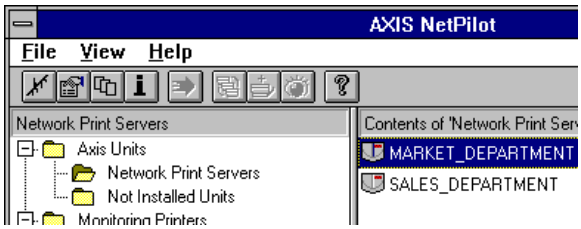


AXIS 570/670	
NetWare	X
NetBIOS/NetBEUI	X
TCP/IP	X
Apple EtherTalk (Axis 570 only)	X
IBM SNA	X
Logical Printers	X
Parallel Printer Ports	2
Serial Printer Ports	1

Axis Utility Software

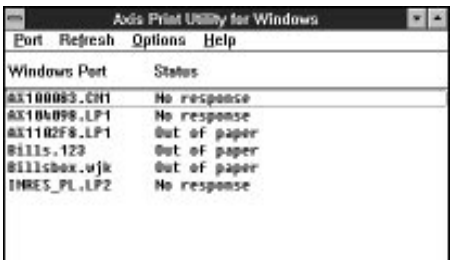
Installation of the Axis network print servers and their integration into the network is done using the Axis software; AXIS NetPilot, AXIS Print Utility for Windows, AXIS Print Utility for OS/2, AXIS Installer for NetWare for and *axinstall* for Unix environments.

AXIS NetPilot



The AXIS NetPilot software supplied with the Axis print servers makes the job of installation and configuration quick and convenient. AXIS NetPilot runs on Windows platforms and provides an installation Wizard so that the print servers are rapidly put to use. It also provides user friendly facilities to tune the configuration.

AXIS Print Utility for Windows or OS/2



The Axis Print Utility for Windows or OS/2 are dual purpose applications for network printing in a Windows or OS/2 environment. The functions performed are:

- Install and maintain Axis Print Server printer ports as Windows/OS/2 printer ports.
- Capture and monitor print jobs directed to Axis Print Servers

Axis Print Utility can run in both Peer-to-Peer and Client-Server mode.

axinstall for Unix

Installation of an Axis Print Server from a Unix workstation is carried out using the auto installation script *axinstall* which is resident in the print server. The installation procedure simply involves fetching the *axinstall* script using FTP and then executing the script; the script guides you step by step through the installation.

More than 20 different Unix variants are supported by *axinstall*. If the Unix system is not recognized a generic system is proposed.

AXCFG Print Server Configuration Utility

This utility is supplied with the NPS series. It is a menu-driven package that fetches the parameter values held in the print server, and then allows you to edit and download them. It will run under DOS or Windows on a PC.

Axis Installer for NetWare

This allows you to install the AXIS 150/152 into the NetWare environment - it runs under Windows with a NetWare client installed. It allows you to configure NetWare by adding new print queues and connecting them to one of the printers attached to the AXIS 150/152 print server.

SECTION 4

THEORY OF OPERATION

This section contains a technical description of the internal structure of the Axis Network Print Servers, and the basic data and control flow. It is not necessary to read this in order to use the print server functions and features (they are all described from the user's point of view in the following sections), but the information given here should serve as a guide to understanding the relations and interactions between the different functions within the print server.

The block diagram below is a general schematic overview of the Axis print servers, from the network attachment on the left to the printers on the right. This diagram may include functions that are not present in your print server. You should consult your data sheet or user's manual to ascertain which functions are present in your print server.

The individual operations will be shown in more detail later in this section.

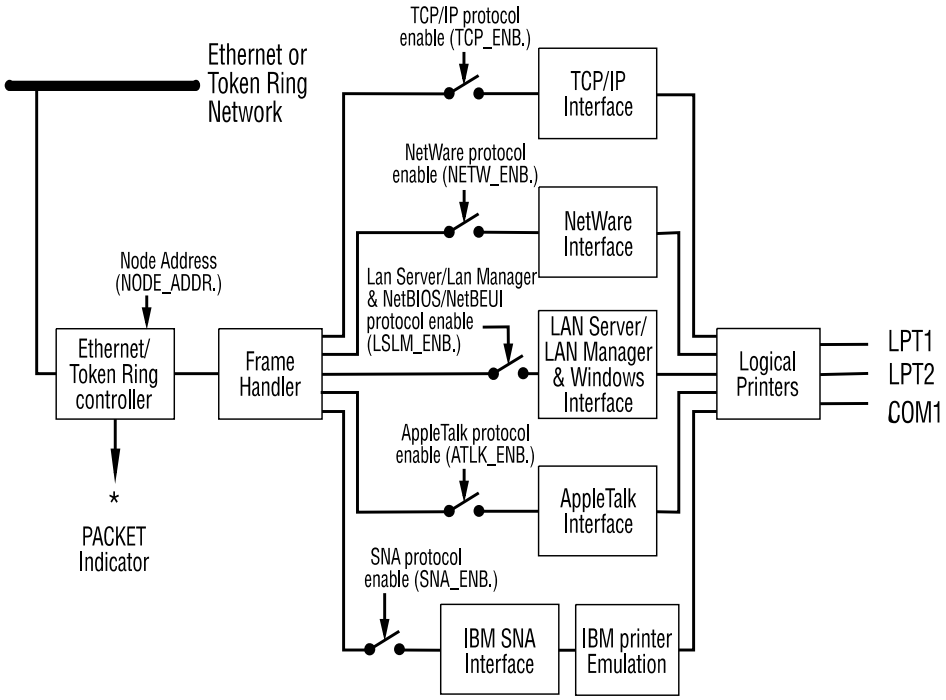


Figure 4-1 The Axis Network Print Server – a schematic overview

The following conventions apply to all diagrams in this section:

- The data flow is bi-directional unless otherwise indicated.
- Most of the control inputs are parameters (e.g. 'NetWare protocol enable' NETW_ENB enables or disables the *NetWare Interface*).
- Switches indicate the possibility to select a function block via the parameters held in the *config* file.

Note: There is no logical printer support in NetWare for the NDS compatible series of print servers, e.g. AXIS 560/660 and AXIS 570/670.

The Ethernet/Token Ring Controller

The Ethernet/Token Ring controller handles the receiving and transmitting of frames on the Ethernet or Token Ring media. Together with the Frame Handler, it represents the two lowest layers (the physical layer and the data link layer) of the OSI model. It is controlled by the *Node Address* parameter (NODE_ADDR.) and in the case of Token Ring print servers also by the *Source Routing Mode* parameter (S_ROUTE.).

The Frame Handler

The frame handler is responsible for passing frames (data packets) between the Ethernet or Token Ring controller and the protocol interfaces. The actions of the frame handler require no special considerations since the detection, transmission, and encapsulation of frames is fully automatic. However it is possible to switch off the print server's response to one or more frame types by altering the appropriate parameters, for example see the NetWare frame type parameters on page 167.

There are special conditions under which you may wish to disable the print servers response to particular frame types. For example if your network has multiple sections with different frame types on some of the sections, then it could happen that the print server will log onto the wrong network section and adapt to a frame type not compatible with the intended network section.

The NetWare Interface

The main function of the NetWare interface is to unpack the print data in the received frames and pass it on to the *Logical Printers* block. It also packs data returned from the Logical Printers (e.g. printer status) into the proper frame format and passes it back to the frame handler.

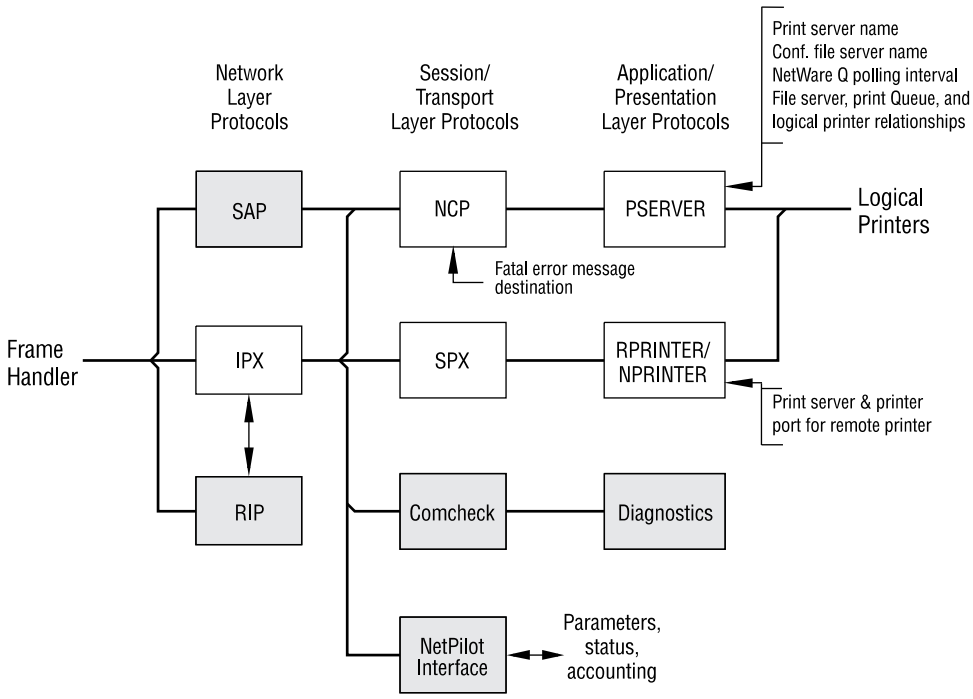


Figure 4-2 The NetWare Interface

The shaded boxes are those protocols not directly involved in the printing process. Refer to *ETHERNET AND TOKEN RING NETWORKS* (page 9) for details on the OSI model and the protocols.

The *NetPilot Interface* communicates with the AXIS NetPilot configuration utility, see also *PARAMETER EDITING* (page 131).

Printing in the NetWare environment is discussed in *NETWORK PRINTING*: *NetWare* (page 35).

The LAN Server/LAN Manager and Windows Interface

The main function of the LAN Server/LAN Manager interface is to unpack the print data in the received frames and pass it on to the *Logical Printers* block. It also packs data returned from the Logical Printers (e.g. printer status) into the proper frame format and passes it back to the frame handler.

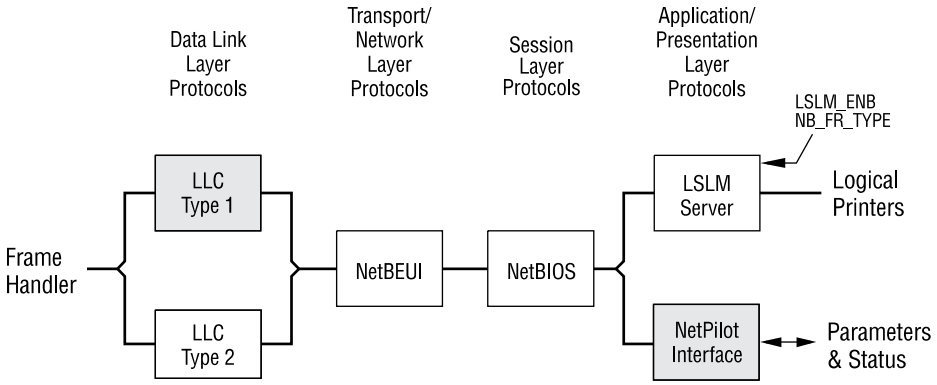


Figure 4-3 The LAN Server/LAN Manager Interface

The shaded boxes are those protocols not directly involved in the printing process. Refer to *ETHERNET AND TOKEN RING NETWORKS* (page 9) for details on the OSI model and the protocols.

The *NetPilot Interface* communicates with the AXIS NetPilot configuration utility, see also *PARAMETER EDITING* (page 131).

Printing in the LAN Server/LAN Manager environment is discussed in *NETWORK PRINTING*: *Windows, LAN Server/LAN Manager* (page 43).

The TCP/IP Interface

The main function of the TCP/IP interface is to unpack the print data in the received frames and pass it on to the *Logical Printers* block. It also packs data returned from the Logical Printers (e.g. printer status) into the proper frame format and passes it back to the frame handler.

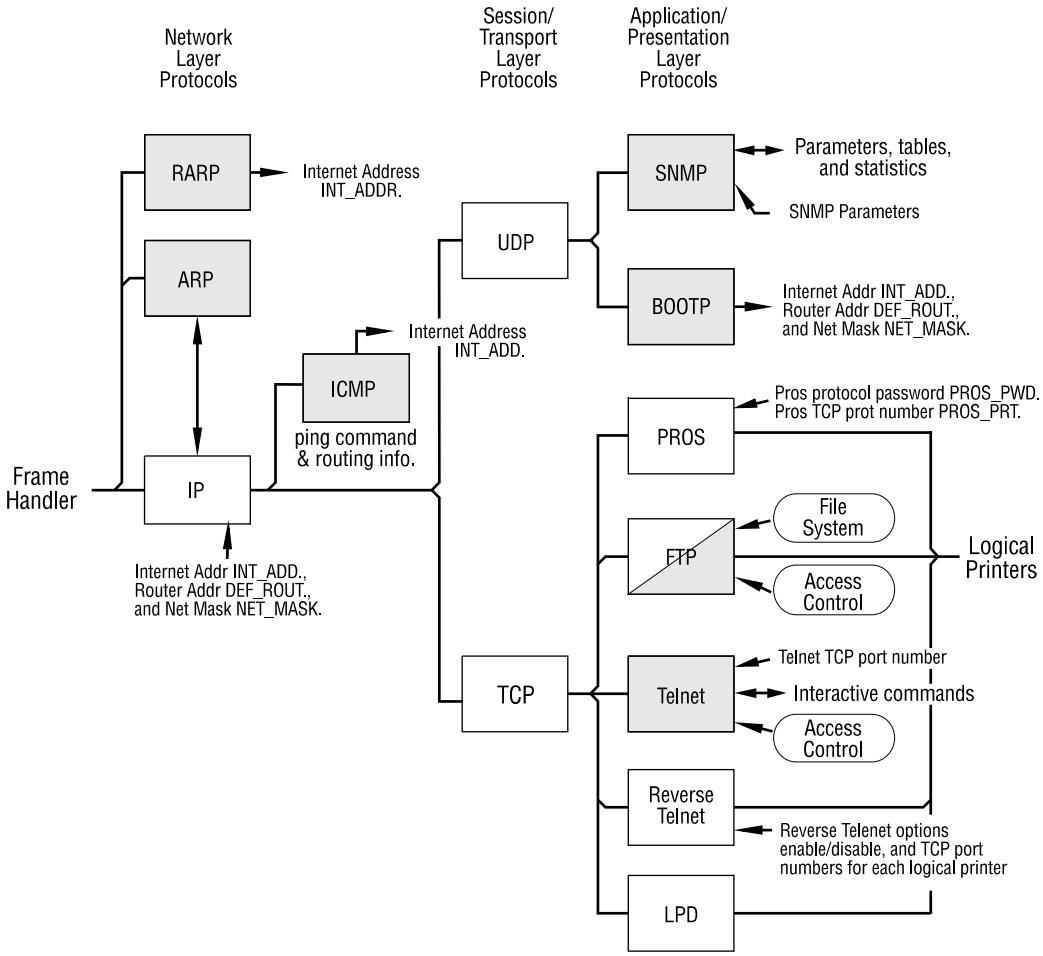


Figure 4-4 The TCP/IP Interface

The shaded boxes are those protocols not directly involved in the printing process. Refer to *SECTION 2 - ETHERNET AND TOKEN RING NETWORKS: TCP/IP* (page 16) for details on the OSI model and the protocols.

The *ARP* block is responsible for mapping IP (Internet) addresses to network (Ethernet or Token Ring) addresses. The *RARP* and *BOOTP* blocks are mainly used for setting the Internet Address and setting up a default router and net mask. See *NETWORK PRINTING*: *TCP/IP* (page 45) for details.

SNMP is used for network management, see *NETWORK MANAGEMENT UNDER SNMP* (page 124).

Access Control is the log-in procedure for FTP and Telnet, see *Access Control* (page 115). *File System* is the Axis print server file system, see *The File System* (page 119).

Printing in the TCP/IP environment is discussed in *Network Printing*: *TCP/IP* (page 45).

The AppleTalk Interface

The main function of the AppleTalk interface is to unpack the print data in the received frames and pass it on to the *Logical Printers* block. It also packs data returned from the Logical Printers (e.g. printer status and printer reverse data) into the proper frame format and passes it back to the frame handler.

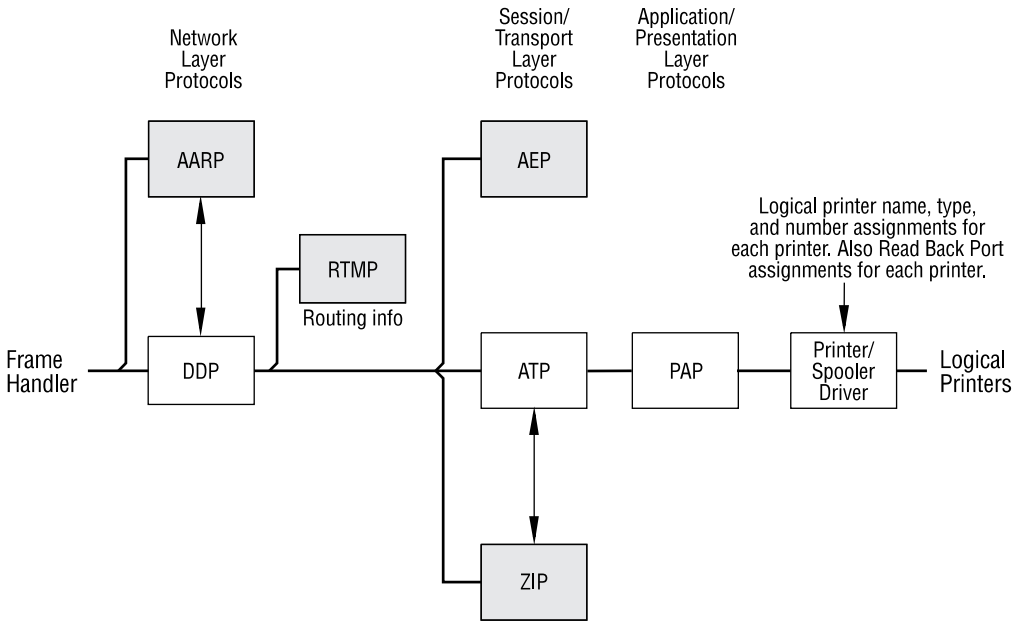


Figure 4-5 The AppleTalk Interface

Refer to *Ethernet and Token Ring Networks: Apple EtherTalk* (page 18) for details on the OSI model and the protocols.

The Printer/Spooler Driver is the interface to the Apple Macintosh printing environment, see *Network Printing: Apple EtherTalk* (page 76). The shaded boxes are those protocols not directly involved in the printing process.

Printing in the Apple EtherTalk environment is discussed in *Network Printing: Apple EtherTalk* (page 76).

The SNA Interface

The SNA Interface emulates a LAN attached 3270-type controller (PU-2) with eight logical units, LU1–LU8. The LUs are defined as 3270 printers. Print jobs complying to LU-1 SCS and LU-3 3270 data stream will be accepted and converted to the selected ASCII printer command language (PCL5, PCL4, IBM Proprinter, Epson FX or Epson LQ), before being sent to a certain AXIS 570/670 physical port. The AXIS 570/670 also has a USER printer driver that gives you the possibility to specify the ASCII commands to be sent to your printer.

Data Flow Chart

The basic data flow is illustrated in the following block diagram. The protocol conversion is described below.

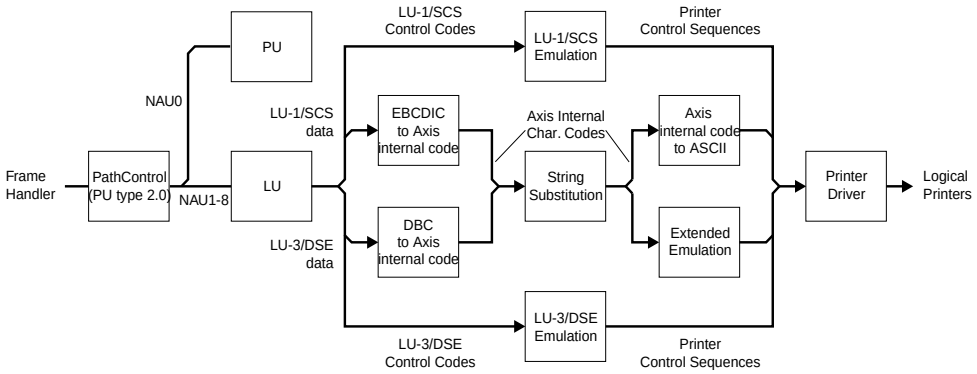


Figure 4-6 AXIS 570/670 IBM SNA interface Flow Chart

As soon as a buffer of data is received, the AXIS 570/670 starts processing the data. The data takes different paths depending on the current mode, LU-1/SCS or LU-3/DSE.

Character and Control Code Formats

The following Character and Control Code formats are used by the AXIS 570/670:

- **EBCDIC** (Extended Binary Coded Decimal Interchange Code): This is the character representation format used by LU-1/SCS mode. The codes are in the range $40 - $FE, and depend on the *System Language* used by the IBM system. See character tables, page 238 - page 253.
- **DBC** (Device Buffer Code): This is the character representation format used by LU-3/DSE mode. The codes are in the range $08 - $BF, and are not language dependent.
- **AIC** (Axis Internal Code): This is the AXIS 570/670 internal character representation format. The codes are in the range $0000 - 02FF (divided into three pages), and are not language dependent. Page one contains the most common characters, where the codes $20 - $FF equals the PC 850 ASCII symbol set (see below). See character tables, page 254 - page 256.

- **ASCII** (American Standard Code for Information Interchange): This is the character representation format used by standard printers. The codes are in the range $20 - $FF, and depend on the *Symbol Set* used by the printer. The AXIS 570/670 supports 5 pre-defined symbol sets: PC 850, Roman 8, PC 437, ECMA-94 (Latin-1), and US ASCII.

  Control Codes are in the range $00 - $1F, and do not depend on the symbol set. The codes used by AXIS 570/670 are $0A (Line Feed), $0C (Form Feed), $0D (Carriage Return), and $1B (the Escape Character). See character tables, page 257 - page 261.

LU-1/SCS Data Processing

The data is separated into SCS Control Codes ($00 - $3F), and EBCDIC Character Codes ($40 - $FE).

The control codes are passed through the *LU-1/SCS Emulation*, which translates them into printer control sequences.

The EBCDIC character codes are translated into *Axis Internal Code* (AIC) by the *EBCDIC to Axis Internal Code* block for further processing. This block also performs the basic page formatting – line breaks are inserted according to the *Maximum Print Position* (MPP), and page breaks are inserted according to the *Maximum Page Length* (MPL).

LU-3/DSE Data Processing

The data is separated into LU-3/DSE Control Codes ($00 - $07), and DBC Character Codes ($08 - $BF).

The control codes are passed through the *LU-3/DSE Emulation*, which translates them into printer control sequences.

The DBC character codes are translated into *Axis Internal Code* (AIC) by the *DBC to Axis Internal Code* block for further processing. This block also performs the basic page formatting – line breaks are inserted according to the *Maximum Print Position* (MPP), and page breaks are inserted according to the *Maximum Page Length* (MPL).

String Substitutions

The String Substitution function searches the data stream for specified sequences of characters, and replaces them with other sequences. See “String Substitutions” on page 93.

Axis Internal Code to ASCII Character Translation

This block translates the Axis Internal Code character codes to ASCII character codes according to the current symbol set.

Extended Emulation

The Extended Emulation block processes all non-IBM function references in the data stream, such as *Hex Transparency*, *Configuration Commands*, and *Function Calls.* See “The Extended Emulation Control Command” on page 85.

Printer Driver

The Printer Driver transfers the data to the logical printer.

Logical Printers

For details of how the Logical printer function operates refer to SECTION 7 - *LOGICAL PRINTERS* (page 100)

SECTION 5

NETWORK PRINTING

This section covers topics concerning network printing in general, and printing using the Axis print servers in particular. It is organized according to each of the network protocols as follows:

- NetWare
- Windows, LAN Server/LAN Manager
- TCP/IP
- Apple EtherTalk
- SNA

NetWare

NetWare printing

When a user wishes to print a document the workstation print driver produces the print data and passes it via the network to a print queue on a file server. A print server on the file server monitors the print queues and sends the print jobs to the printer:

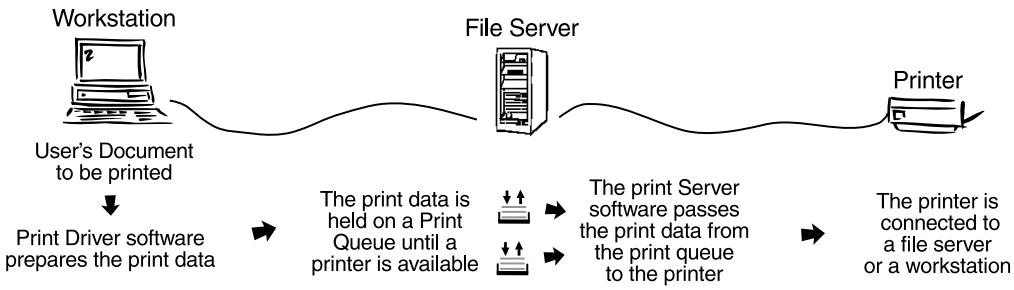


Figure 5-1 Overview of NetWare printing

The following discussion deals with the different ways that print servers, print queues and printers can be organized in the NetWare environment, and especially how the Axis Network Print Server can be integrated into a NetWare network.

Printer location

The location of the printer is an important issue because it influences the efficiency of both the network and the people using the network. For example if a busy printer is connected to a workstation it will slow down the operation of the workstation because of the time taken to service the printer.

In a NetWare environment the printers may be located as follows:

A **Local Printer** connected to a File Server (or workstation) that is running NetWare PSERVER software.

A **Remote Printer** connected to a workstation that is running either NetWare's NPRINTER or RPRINTER software.

A **Network Printer** connected through a network print server. The use of an Axis network print server will release work load from NetWare File Servers and/or Workstations, and at the same time allow the convenient siting of printers anywhere on the NetWare network.

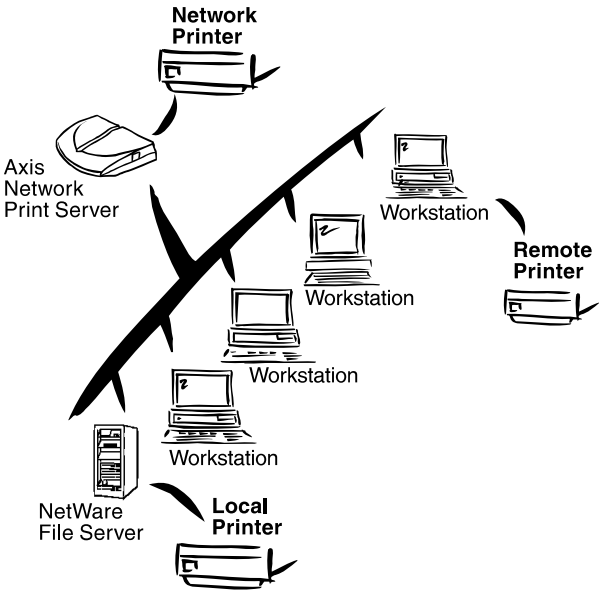


Figure 5-2 Printer locations in a NetWare Environment

Print Servers and Print queues

In the simplest setup each print queue on the network has a single printer connected to it. The illustration shows that the printers connected to LPT1 and LPT2 are connected to two separate queues, A and B. This is the way that printer ports and queues are represented in the NetPilot Modify NetWare window.

But if a printer is found to be overloaded with print jobs it is possible to connect two or more printers to the same queue. The print server then selects the next available printer for each print job in the queue.

On the other hand if a printer is under-used, it is possible to have multiple print queues connected to it. Each queue may be given a different level of priority so that the print server will search the queues for print jobs from the highest priority queue down to the lowest priority queue.

The print server can send jobs to multiple printers at the same time as servicing multiple queues. The illustration on the right shows both queue A and B connected to the printers on LPT1 and LPT2.

The Axis network print servers can be configured to work in any of these ways except that queue priorities are not supported.

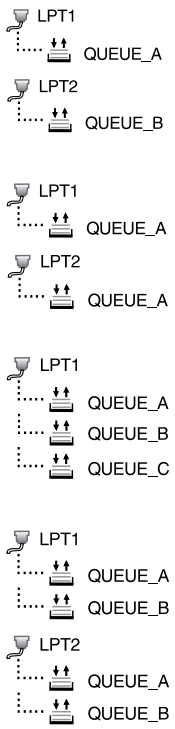


Figure 5-3 Print queue to printer relationships

NDS & Non-NDS Axis Network Print Servers

Since the introduction of NetWare 4.x, Axis print servers have been designed to operate within NetWare's Network Directory Services (NDS). But those print servers designed before the release of NetWare 4.x cannot use NDS facilities unless they have had their firmware updated.

If you want to take advantage of the superior facilities of NDS, you should firstly determine whether your print server is NDS compatible or not.

This is the NDS compatibility situation at the time of publishing this technical reference:

Print Server Model	Firmware Version	NDS Compatible?
AXIS 150/152	4.25	No
NPS 530/532	5.02	No
NPS 630/632	5.02	No
NPS 550/650	5.02	No
AXIS 560/660	5.10	Yes
AXIS 570/670	5.14	Yes

Axis has a policy of continuous advancement of the print server firmware, and as such work is being done to produce firmware updates for NDS compatibility. However this may not be possible for all of the older models. Your dealer will be able to advise you if there has been a firmware update produced for your print server, or you can check the Axis on-line service, see APPENDIX E *Axis on-line service* (page 280).

Because of the introduction of new versions of NetWare it is inevitable that there are differences in the print server configuration procedures. However by using AXIS NetPilot configuration software, these differences are easy to handle because of the software's ability to detect which version of NetWare is being used and which type of print server is being configured.

If your print server is not NDS compatible you can use it with NetWare 4.x by using the bindery emulation provided within NetWare 4.x. See "Login method for 'Non-NDS' Axis Print Servers on NetWare 4.x" on page 40.

AXIS NetPilot

Whether your print server is NDS compatible or not, the best way to install and configure it on all NetWare versions is by using AXIS NetPilot.

AXIS NetPilot will automatically detect which type of print server and which version of NetWare is being used, and offer the appropriate options.

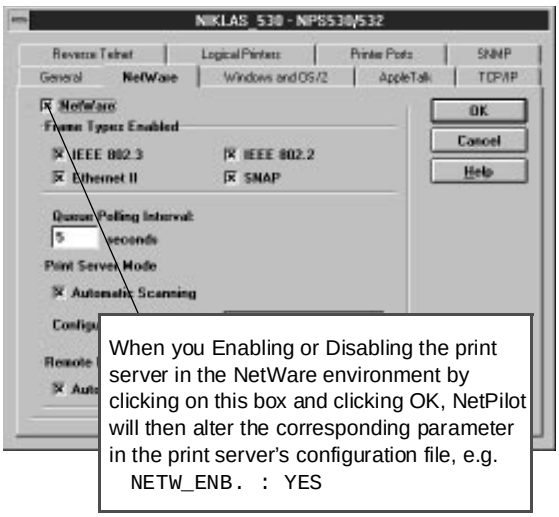


Figure 5-4 Parameter editing using AXIS NetPilot

The operation of each print server is governed by its parameter values which are stored in a configuration file in the print server. However by using NetPilot to configure your print server you don't have to be concerned about the configuration file, and the syntax of its parameters.

To change the print server parameters with NetPilot you alter the options on the property pages which are in the form of Windows dialogs (see figure 5-4). NetPilot then converts the contents of the property pages into the appropriate entries in the print server configuration file.

AXIS NetPilot not only makes it easy for you to configure the print server parameters but it can also be used to modify the Network environments. For example, figure 5-5 on the next page, shows NetPilot being used to add and connect print queues in NetWare. NetPilot will alter the settings in the NetWare file server, and at the same time enter the details into the print server parameters.

Details of the Parameters held in the configuration file are provided on page 165, this will be of use to you if you are not able to use AXIS NetPilot.

Login methods for 'Non-NDS' Axis Print Servers

When the print server is being powered up it will need to login to one or more file servers. There are a number of ways that this login can be carried out, depending upon whether the Axis print server is NDS compatible or not, and where the queue to printer relationships are held:

- Automatic Login Procedure
- Parameter Controlled Login Procedure
- Configuration File Server Login Procedure

The Automatic Login Procedure ('Non-NDS' Print Servers)

This is the default login procedure for 'Non-NDS' Axis print servers. At start up the print server logs in to every file server on the network; in this way the print server gathers information about the print queue to printer connections.

Q: Are there any circumstances when I should disable the automatic login procedure?

A: Yes; if you have a large network this login method may take too long. In this case you should consider using another login methods.

Q: How do I switch the automatic login on and off?

A: Simply click the *Automatic Scanning* box (under *Print Server Mode* and/or *Remote Printer Mode*) as illustrated in the NetWare property page shown in figure 5-6.

The Parameter Controlled Login Procedure ('Non-NDS' Print Servers)

With this method the Axis print server holds the queue to printer information in its login parameters. There are 16 of these parameters, so up to 16 sets of queue to printer details can be held. Each parameter holds the name of a file server, a print queue and a logical printer.

Q: How do I enter details into these login parameters?

A: NetPilot does it for you. When you use the Modify Network Environments window (see figure 5-5) to alter print queue connections, NetPilot uses this information to update the login parameter details.

Q: How do I enable or disable the parameter controlled login method?

A: You don't! The print server will always use the information in its login parameters, even if other login methods have been enabled. If more than 16 queues are to be serviced then one of the other login methods must also be used.

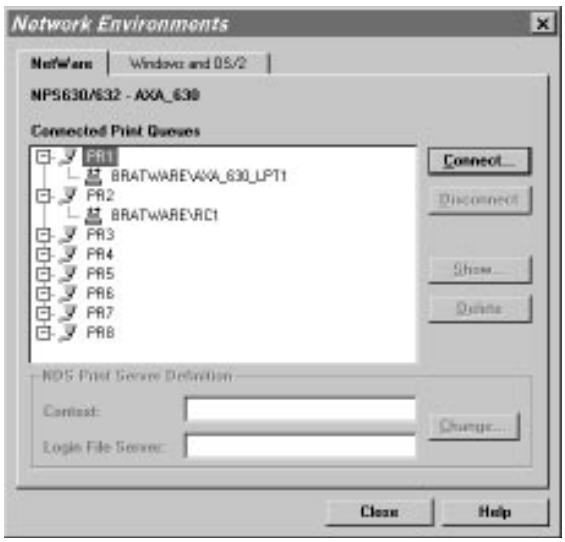


Figure 5-5 Using NetPilot to inspect the queue to logical printer connections.

The Configuration File Server Login Procedure ('Non-NDS' Print Servers)

When this method is used the print server gets its queue to printer information from a designated file server (known as the Configuration File Server, see the NetWare property page, figure 5-6)

When the Axis print server is powered-up it logs in to the configuration file server named in its CONFSERV parameter, and reads the queue and printer information.

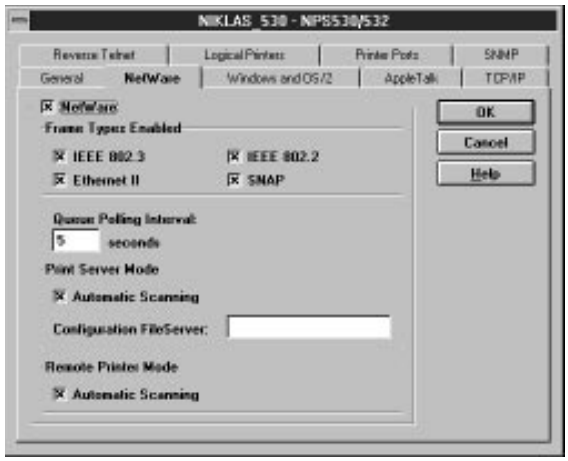


Figure 5-6 - AXIS NetPilot's NetWare Property Page

Q: When should I use the Configuration File Server login method?

A: When you have more than 16 print queues - don't bother to enter a configuration file server name if you have 16 or less print queues. This is because as you assign queue to printer connections, NetPilot automatically records the details in the login parameters, so entering the configuration file server name as well is not necessary.

Q: How do I switch on the Configuration File Server login method?

A: Simply enter the file server name in the *Configuration File Server* box on the NetWare Property Page - see figure 5-6. Make sure that the queues from 17 onwards are located on this file server.

Login method for 'Non-NDS' Axis Print Servers on NetWare 4.x

Non-NDS print servers can only operate in NetWare 4.x systems if the contexts that holds the print queues and print server objects have bindery emulation switched on. To do this you will have to use one of the NetWare utilities, PCONSOLE or NetWare Administrator - refer to your NetWare documentation.

Once you have done this, NetPilot can be used in the normal way to setup the print server login methods as described above.

Login method for NDS compatible Print Servers

NDS compatible Axis print servers use one login method for NetWare 4.x and another for NetWare 2.x/3.x.

NDS compatible print server login procedure for NetWare 4.x

Because NetWare 4.x has a distributed database it is only necessary to define one file server to the print server. All file servers with physical queues will then automatically be found and logged into. Therefore only a single parameter is needed; this parameter holds the file server name and the context for the print server's object in the NDS tree.

These details must be entered in the Modify Network Environments page, an example of which is shown in figure 5-7. The names are put in the boxes seen under the heading: *NDS Print Server Definition*, in the lower part of the screen.

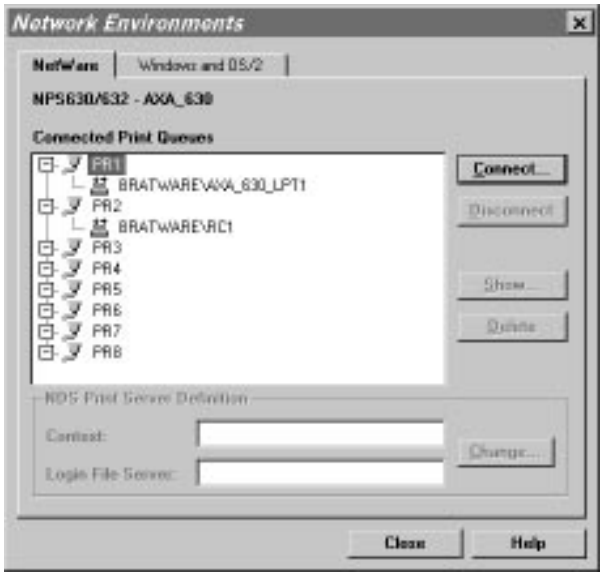


Figure 5-7 Print queue connections in NetWare NDS

Login procedure for NDS compatible print servers on NetWare 2.x or 3.x

The login procedure used is similar to the parameter controlled login used by a 'Non-NDS' print server. There is a set of 16 parameters (PSERVER_BINDERY1 to 16) which hold the names of any file servers with print queues connected to the print server.

When the print server starts up it logs in to each of the file servers named in these parameters, and extracts information from the file servers about queues that are to be serviced, and also the printer ports that are to be used. Please note that there is no support for logical printers on NDS compatible print servers when working within NetWare; the queues are linked directly to the physical ports.

Print Server and Remote Printer Operating Modes

In print server mode the Axis unit behaves in the same way as a NetWare print server. The Axis unit fetches print jobs from the queues and passes them to the printers that are connected to its own ports. In this mode the Axis print server is taking the place of the PSERVER software and printer driver software on the file server, therefore removing some of the workload from the file server.

In remote printer mode an Axis unit port is connected to a NetWare print server. The Axis unit is taking the place of the NPRINTER (or RPRINTER) software and printer driver software running on the workstation. This method of operation is used in place of a printer connected to a workstation, thereby preventing the workstation from being interrupted whenever print data is being handled from the network.

Any of the Axis network print server ports can be operated in both print server mode and remote printer mode at the same time. You select the operating mode when you connect print queues to a port, as shown below.

Connecting Print Queues to Axis print servers

The print queue connections are made in AXIS NetPilot by first selecting the relevant port, and then clicking the *Connect*... button - see figure 5-7 above. The *Connect NetWare Print Queues* dialog (shown on the right, figure 5-8) is then used to select a print queue from the NetWare Print Queue list shown in the window.

Figure 5-8 AXIS NetPilot's Print Queue Setup Page

The Print Queues shown in the window will be those held on the resource selected in the box at the top of the screen. This may be a file server in a NetWare 2.x or 3.x environment, or a location in the NDS tree for NetWare 4.x.

Having chosen the print queue that is to be connected to the printer port, you should then select either Print Server Mode or Remote Printer Mode. In the case of Remote Printer Mode you must also select the NetWare print server that the port will be connected to.

Creating Print Queues

In the case of 'Non-NDS' Axis print servers you can link the queue to one of the logical printers by using **!n** in the name, where **n** = the logical printer number, e.g. SALESDEPTQ!2. See "LOGICAL PRINTERS" on page 100. The default is logical printer 1 connected to LPT1.

Print Methods

There are two different methods in NetWare to transfer a print job to a queue. CAPTURE is the best choice when you want to print on a network printer from your applications. NPRINT requires the additional step of creating a print file, but offers you the choice between local and network printing at all times since it doesn't occupy a local printer port.

The CAPTURE program is used to capture output destined for a local printer and redirect to a network print queue. When the CAPTURE command is issued, NETX (or whichever shell you use) modifies DOS so that it lets the shell monitor the printer port you are capturing. Any print data sent to that port by DOS or an application program is intercepted and sent to the queue you named in the CAPTURE command.

If you later decide to stop capturing, issue the ENDCAP command. The shell stops monitoring the printer port, and local printing resumes.

NPRINT is a replacement for (and an improvement on) the DOS PRINT command. Use NPRINT when you want to print an existing file on a network printer.

The table below shows a summary of the CAPTURE and NPRINT parameters:

Parameter	Short	Values	Default	CAPTURE	NPRINT
Show	SH	None	None	Yes	No
Job=*JobName*	J=	Any PRINTCON job configuration	Default job	Yes	Yes
Queue=*QueueName*	Q=	Any valid print queue name	Queue for Spooler 0	Yes	Yes
Server=*ServerName*	S=	Any valid file server name	Default server	Yes	Yes
Local=*n*	L=	1, 2, or 3	1	Yes	No
Form=*FormName* (or =*n*)	F=	Any valid form name or number	0	Yes	Yes
Create=*Path*	CR=	File name including path	None	Yes	No
Copies=*n*	C=	1-999	1	Yes	Yes
Timeout=*n*	TI=	0-1000	8	Yes	No
Autoendcap	A	None	On	Yes	No
No Autoendcap	NA	None	Off	Yes	No
Keep	K	None	Off	Yes	No
Tabs=*n*	T=	0-18	8	Yes	Yes
No Tabs	NT	None	Off	Yes	Yes
Banner=*BannerName*	B=	Any string up to 12 characters	LST:	Yes	Yes
Name=*Name*	NAM=	Any string up to 12 characters	Username	Yes	Yes
No Banner	NB	None	Off	Yes	Yes
Form Feed	FF	None	On	Yes	Yes
No Form Feed	NFF	None	Off	Yes	Yes
Notify	NOTI	None	Off	Yes	Yes
No Notify	NNOTI	None	On	Yes	Yes
Domain=*DomainName*	DO=	Any valid NNS domain name	None	Yes	Yes
Delete	D	None	Off	No	Yes

Example:

```
CAPTURE /L=1 /Q=DESKTOP /TI=30 /NT /NB /FF /NOTI
```

This command captures LPT1 print jobs and sends them to the queue DESKTOP with a 30 seconds time-out, no tab expansion, no banner page, appends a Form Feed, and notifies when the printout is completed.

Windows, LAN Server/LAN Manager

The process of printing through a print server from within a LAN Server/LAN Manager environment is managed by the AXIS Print Utility for OS/2. The AXIS Print Utility for Windows manages the same process under a Windows environment. Both utilities are delivered with your print server. Refer to the User's Manual for instructions on how to install and use these utilities.

The Axis print utilities are used to install the print servers on your network, and also to show detailed information about each individual Axis print server port.

Under the AXIS Print Utility for OS/2, each Axis print server port is displayed as a print queue and has a pipe name, e.g. \PIPE\AX110086_LP1. Print queue destinations are referred to as *devices* in OS/2 version 1.x, and as *ports* in version 2.x and 3.x (Warp). The Axis print server ports may be assigned as print queue destinations by following the standard procedures under OS/2. These procedures are identical for LAN Server/LAN Manager, but differs between OS/2 version 1.x and versions 2.x and 3.x (Warp).

Print jobs can be sent indirectly through the file server from any MS-DOS, Windows or OS/2 application. They can also be cancelled, held, etc., using standard procedures.

It is also possible to print directly from a workstation, given that it is running the AXIS Print Utility for Windows or OS/2 software.

The following parameters control printing in this environment:

- **LAN Server/LAN Manager Protocol Enabled (LSLM_ENB.)**
  This parameter switches the print server LAN Server/LAN Manager support on and off. The default setting is YES. Changing to NO will disable the LAN Server/LAN Manager support, and the printer ports will not appear in the AXIS Print Utility list.
- **Printer 1 Name (LPRINT_1.)**
  This parameter specifies the name of the first network printer. The default name is set to AX<nnnnnn>.LP1, where <nnnnnn> are the last six digits of the Axis print server serial number. This may be changed to any name not exceeding 16 characters. The Printer 2 through Printer 8 names are specified by parameters: LPRINT_2. to LPRINT_8.
- **Printer 1 Logical Printer (LLOGIC_1.)**
  This parameter specifies the logical printer assigned to Printer 1. The default setting is PR1. The Printer 2 through Printer 8 logical printers are specified by parameters: LLOGIC_2. to LLOGIC_8.

Printing from IBM Hosts

The Axis print servers support printing from IBM hosts provided that the appropriate software is installed on the server handling the host protocol (typically SNA) and the IBM printer data streams. Examples of supported products are:

- IBM Communications Manager
- IBM PC Support
- IBM/Pennant PSF/2

Both IBM Communications Manager and IBM PC Support use standard OS/2 printer drivers. Consequently, these products are able to generate almost any printer data stream. PSF/2 enables distributed AFP printing but is limited to PCL and PPDS printers, since it uses internal printer drivers.

Both PC Support and PSF/2 rely on Communications Manager for the host communication.

TCP/IP

Printing with the Axis print server in the TCP/IP environment can be done in either interactive or integrated mode.

In *Interactive Mode* the Axis print server will appears as a host into which you may login. Printing is performed as a host-to-host file transfer that uses FTP or Reverse Telnet. The only preparation required is installing the print server on your network, which includes finding a free Internet address and down-loading it to the print server.

When operating in *Integrated Mode*, the Axis print server is integrated into the host printer spooler and therefore, the printer (or printers) will appear as directly connected to the spooler. The installation procedure is initially the same as for the interactive mode, but will additionally require that the print server is fully integrated into your host spooler system. This may be performed either automatically or manually, whereby automatic integration is done by running the *axinstall* script, as described in the User's Manual.

axinstall The axinstall script is stored in the print server and is used to install it into the Unix environment. Once the print server is installed into the Unix environment the parameters can be down-loaded into a workstation, edited, and then loaded back into the print server.

Due to the large number of hosts, Unix variation and print method combinations, there will always be instances where *axinstall* will fail. For these cases, the following pages contain guidelines for manual integration.

We recommend that you start by trying *axinstall*. However, should you experience any problems during the integration, or if the test printout at the end of *axinstall* fails, then the integration of the print server should be performed manually. The current version of *axinstall* when this technical reference was produced was 1.8.

You can get a free *axinstall* update, or find out what the latest version number is, by visiting the Axis on-line service. Refer to *How To Contact Axis* (page 280).

The installation and integration procedures are described individually for each type of UNIX system (BSD, System V and IBM AIX) in this section. The installation procedure is the same regardless of the print method, but you will have to select a print method before carrying out the integration.

Printing from BSD-Type UNIX Systems

The following print methods are available for BSD-type systems (Sun-OS, Ultrix, etc.). Use the table below to select the print method that is best fitted for your printing requirements. Detailed integration procedures are given for each method on the following pages.

Print Method	Advantages	Limitations
LPD	Easy to set up – add a remote printer to */etc/printcap* using the *rm* and *rp* fields.	No printer status logging. *printcap* capabilities are not available. *lpr* options (e.g. multiple copies) are not available.
FTP	Uses industry standard network software on the host.	No printer status logging. May conflict with other input or output filter. Does not allow both input and output filter.
PROS A	The communication with the Axis print server is logged to a log file, including printer status and feedback. Easy to integrate – the print server appears as a device to the system. All *printcap* options available, including input/output filters.	A C compiler is required to build the PROS drivers. A daemon must be active for each printer attached to the print server.
PROS B	The communication with the Axis print server is logged to a log file, including printer status and feedback. All *printcap* options available, including input or output filter.	A C compiler is required to build the PROS drivers. May conflict with other input or output filter. Does not allow both input and output filter.
Reverse Telnet	Easy to set up if Reverse Telnet drivers are already installed.	No printer status logging. Drivers are not supplied with the print server. Existing drivers may be slow.

The Printcap File

BSD-type systems use the *printcap* file (printer capability data base) for describing printers. The spooling system accesses the printcap file every time it is used, allowing dynamic addition and deletion of printers. Each entry in the data base describes one printer, and contains a number of fields separated by colons.

The first field is the abbreviation and the full name of the printer, separated by a '|' character. The following fields contain printer capabilities, see the table below.

Entries may continue onto multiple lines by giving a '\' as the last character of a line.

The table below summarizes the most common printer capabilities. For a complete list, please refer to the printcap description in your Unix documentation.

Parameter	Type	Default	Description
ff=*FormFeedStr*	String	\f	Specifies the Form Feed string.
if=*InputFilter*	String	NULL	Specifies an input filter. Print data passes through this filter before it is written to the spool directory.
lf=*ErrorLogFile*	String	NULL	Species the file where error reports are logged. If this field is omitted, errors are logged to /usr/adm/lpd-errs.
lp=*filename*	String	/dev/lp	Specifies the file or device to which print data will be sent.
mx=*MaxFileSize*	Numeric	1000	Specifies the maximum file size in BUFSIZ blocks (generally 1 kbyte). Larger files will be truncated. mx=0 allows unlimited file sizes.
of=*OutputFilter*	String	NULL	Specifies an output filter. Print data passes through this filter at print-time.
rm=*RemoteMachine*	String	NULL	Specifies a remote machine. Used by LPD as the print server host name (alias).
rp=*RemotePrinter*	String	NULL	Specifies a printer at a remote machine. Used by LPD to specify an print server logical printer.
sd=*SpoolDirectory*	String	/usr/spool/lpd	Specifies the spool directory where print jobs are buffered.
sh	Boolean	FALSE	Suppress header page. If omitted, the spooler will insert a header page before each print job.

Notes on the LPD Print Method

The LPD protocol was developed as a remote print method for Berkeley type UNIX hosts. It was primarily intended for transmission of print jobs between hosts rather than to a print server. Due to the design of the LPD protocol, there will be some limitations when printing via a print server as explained below.

LPD operates by a few commands and the transfer of two files – the control file, and the data file. The control file contains information such as user ID, number of copies, banner page information, and system specific information. The data file contains the raw print data.

When the print data reaches its destination host for interpretation using the printcap file, it is normally intended to be printed locally. But, in the case of remote printing (i.e. using a print server), the LPD daemon often transmits data to the remote host in reversed order; first the data file, then the control file.

If the remote host is a workstation or a mainframe, the reversed order poses no problems; the actual printing will not start until both files are received and processed. However, for a print server with it's limited data storage capabilities, the reversed order represents a major problem. Adding a hard disk or more memory is one possible solution, but today's large print jobs with hundreds of kilobytes per page would generate unnecessary delays when the printing cannot start until all data is transferred. There would also be a size limitation of the print jobs depending on the amount of installed memory.

The Axis solution is to process the control file after the print job is done, thus eliminating the delays and file size limitations. The drawback is that the banner page will be printed after the print job itself, and that functions like multiple copies and filters will not be supported. If you can do without these functions, the LPD print method is recommended due to the simple integration procedure, otherwise choose one of the other print methods.

Installation

Regardless of the printing mode you intend to use, the first step is to install the Axis print server on your host. Please note that the installation and integration procedures require that you have *root* privileges on the system.

Start with assigning an Internet Address and a host name (alias) to the print server by adding the following line to your system host table (*/etc/hosts*):

Example:

```
192.36.253.96          salesdept
```

(192.36.253.96 and salesdept are examples only)

DO NOT use the default or example Internet address when installing your print server. Always consult your network manager before assigning an Internet Address.

If applicable, update your alias name data bases (Yellow Pages, YP/NIS), typically by the commands **cd /var/yp** and **make**.

The next step is to down-load the Internet Address to the print server. This can be done in three ways, using either the *arp*, *rarp*, or *bootp* method.

Setting the Internet Address using arp

Enter the following commands to set the Internet Address. The alias (*salesdept*) must match the one assigned above, and the Ethernet Address (here 00:40:8c:10:00:86) should equal the serial number of your print server:

```
arp -s salesdept 00:40:8c:10:00:86 temp
ping salesdept
```

(salesdept and 00:40:8c:10:00:86 are examples only)

The host should respond '*salesdept is alive'* or something similar to indicate that communication is established.

Notes:

1. The syntax of the *arp* command is system dependent. Consult your host's reference manual (or use the **man arp** command) if you're uncertain about the proper syntax.

2. If you need to run the *arp* command again, the print server *must* be restarted (power-off/power-on) before it can accept a new Internet Address.
3. If *rarp* or *bootp* is running on your network and the print server is present in */etc/ethers*, it is *not* possible to change the Internet Address using the *arp* command.
4. The print server and the host must be on the same logical network segment (not separated by a router).

Setting the Internet Address using rarp

The *rarp* method sets the Internet address automatically every time the Axis print server is powered on. The main advantage with this is that you don't have to down-load the Internet address individually to each print server as when using the *arp* method.

This is how it works: The print server broadcasts a request to a *rarp* daemon at power-up. If the daemon is active, and a matching entry is found in the *Ethernet Address Table*, the daemon down-loads the Internet address to the print server. If the daemon isn't active or the table entry isn't found, the Internet address remains unchanged.

Follow these steps to use the *rarp* method:

1. Update your host table (*/etc/hosts*) as described earlier.
2. Edit the Ethernet Address table on your host (typically the file */etc/ethers*) by appending the following line:

```
00:40:8c:10:00:86  salesdept
```

(salesdept and 00:40:8c:10:00:86 are examples only)

3. Start the rarp daemon (if it isn't already running) by the command **rarpd -a** (this is system dependent, consult your system documentation).
4. Restart the print server to down-load the Internet address.

Setting the Internet Address using bootp

The *bootp* method is similar to *rarp* but gives two additional advantages:

- The network configuration data for the entire network can be in one place which makes it easy to maintain.
- In addition to the Internet address, the default router address and the net mask are down-loaded to the print server automatically every time it is powered on.

This is how it works: The print server broadcasts a request containing its Ethernet address to a *bootp* daemon at power-up. If the daemon is active, and a matching entry is found in the *Boot Table*, the daemon down-loads the Internet address, default router address and net mask to the print server. If the daemon isn't active or the table entry isn't found, the Internet address, default router address and net mask remains unchanged.

Follow these steps to use the *bootp* method:

1. Update your host table (*/etc/hosts*) as described earlier.
2. Edit (or create) the boot table on your host (typically the file */etc/bootptab*) by appending the following entry:

```
salesdept:ht=ether:vm=rfc1048:ha=00408c100086:\
   :ip=192.36.253.96:sm=255.255.255.0:\
   :gw=192.36.253.254
```

(salesdept and the ha, ip, sm, and gw fields are examples only)

- *ht=* is the Hardware Type field. Set this to *ether* for Ethernet, or *tr* for Token Ring.
- *vm=* is the Vendor Magic field, specifying *bootp* report format. Should typically be *rfc1048*.
- *ha=* is the Hardware Address field. Set this to the Ethernet address or Token Ring node address of your print server.
- *ip=* is the Internet Address field. Set this to the Internet address of your print server.
- *sm=* is the Subnet Mask field. Set this to the net mask value for your network.
- *gw=* is the Gateway field. Set this to your default router address.

3. Start the *bootp* daemon (if it isn't already running) by the command **bootpd** (this is system dependent, consult your system documentation).
4. Restart the print server to down-load the Internet address, default router address and net mask.

Integration for LPD Printing

This is the recommended print method for BSD-type systems. It is easy to set up, but is also fairly limited. The drawbacks are that printcap capabilities other than *rm*, *rp*, and *sd* are not supported, neither are *lpr* options such as multiple copies available.

Automatic Integration (LPD Printing)

Run the *axinstall* script and follow the instructions on the screen. Choose **LPD** at the Print Method prompt.

If *axinstall* fails to provide a satisfactory integration for any reason, then follow the manual integration method shown below. The current version of *axinstall* when this technical reference was produced was 1.8. You can get a free *axinstall* update, or find out what the latest version number is, by visiting the Axis on-line service, refer to *How To Contact Axis* (page 280).

Manual Integration (LPD Printing)

1. Add the following line to your printcap file:

```
sales_1|AXIS 560 LPT1 at salesdept:lp=:rm=salesdept:\
:rp=pr1:sd=/usr/spool/sales_1
```

- *sales_1* is the short name for the printer
- *AXIS 560 LPT1 at salesdept* is the full printer name
- *lp=* doesn't do anything, but is required by some systems
- *rm=salesdept* is the host name (alias) of your print server
- *rp=pr1* specifies the logical printer for sales_1
- *sd=/usr/spool/sales_1* is the spool directory

2. Create a spooling directory by the command **mkdir /usr/spool/sales_1**.

Test Printout (LPD Printing)

Print the file *test* using the *lpr* command:

```
lpr -Psales_1 test
```

Integration of additional printers (LPD Printing)

Repeat the integration process (automatically or manually) for each additional printer attached to your print server. Each printer must have its own printcap entry as well as a unique name and spool directory.

Integration for FTP Printing

The FTP print method is a bit more complex to set up than LPD, but offers more printing options. This is the method to choose if you intend to use printcap capabilities not available through LPD, but don't need the additional features offered by PROS (such as printer status logging).

Automatic Integration (FTP Printing)

Run the *axinstall* script and follow the instructions on the screen. Choose **FTP** at the Print Method prompt.

If *axinstall* fails to provide a satisfactory integration for any reason, then follow the manual integration method shown below. The current version of *axinstall* when this technical reference was produced was 1.8. You can get a free *axinstall* update, or find out what the latest version number is, by visiting the Axis on-line service, refer to *How To Contact Axis* (page 280).

Note: The automatic integration only provides basic printing functions (no banner page, etc.). To get full control over the printcap capabilities, edit the printcap file after the automatic integration or use the manual integration.

Manual Integration (FTP Printing)

1. Login to the Axis print server using FTP, and up-load the files *ftp_bsd* and *printcap.ftp* from the *bsd* directory.
2. Copy *ftp_bsd* to *ftp_bsd-sales_1*.
3. Edit *ftp_bsd-sales_1* as described in the file header. This is where you specify the Internet Address, Logical Printer, FTP path, user name and password.
4. Move the modified file to the directory where you keep your printer filters, and make it executable by the command **chmod +x ftp_bsd-sales_1**.
5. Create a error log file by the command **touch /usr/adm/sales_1-log**.
6. Create a spool directory by the commands **cd /usr/spool** and **mkdir sales_1**.
7. Create a printer spooler dummy file by the command **touch sales_1/null**.
8. Edit *printcap.ftp* as described in the file header (see example below). This is the point where you should tailor the printer capabilities to meet your specific needs.
9. Append the new printcap entry by the command **cat printcap.ftp >> /etc/printcap**.

Example: This is what the new printcap entry might look like:

```
sales_1|AXIS 560 LPT1 at salesdept:\
       :lp=/usr/spool/sales_1/null:\
       :ff=\r\f:sh:lf=/usr/adm/sales_1-log:\
       :of=/usr/local/lib/ftp_bsd-sales_1:\
       :sd=/usr/spool/sales_1
```

It is not allowed to use input filters with the FTP print method. However, you may combine the *ftp_bsd* filter with your own output filter by taking the following steps:

1. Create a script called *newfilter* containing the lines below in the */usr/local/lib* directory (or wherever you keep your printer filters).

   ```
   #!/bin/sh
   /usr/local/lib/myfilter | /usr/local/lib/ftp_bsd-sales_1
   ```

2. Make the script executable by the command **chmod +x newfilter**.
3. Replace **ftp_bsd-sales_1** with **newfilter** in the output filter (of) field of your new printcap entry.

Test Printout (FTP Printing)

Print the file *test* using the *lpr* command:

```
lpr -Psales_1 test
```

Integration of additional printers (FTP Printing)

Repeat the integration process (automatically or manually) for each additional printer attached to your print server. Each printer must have its own printcap entry and output filter as well as a unique name and spool directory.

Example:

These are the two new printcap entries required when integrating two printers at the *salesdept* print server:

```
sales_1|AXIS 560 LPT1 at salesdept:\
       :lp=/usr/spool/sales_1/null:\
       :ff=\r\f:sh:lf=/usr/adm/sales_1-log:\
       :of=/usr/local/lib/ftp_bsd-sales_1:\
       :sd=/usr/spool/sales_1
sales_2|AXIS 560 LPT2 at salesdept:\
       :lp=/usr/spool/sales_2/null:\
       :ff=\r\f:sh:lf=/usr/adm/sales_2-log:\
       :of=/usr/local/lib/ftp_bsd-sales_2:\
       :sd=/usr/spool/sales_2
```

Integration for PROS A Printing

PROS A is the most powerful print method, featuring full support of the printcap capabilities as well as automatic logging of printer status and feedback. It is fairly easy to integrate since the print server appears as a device (Named Pipe) to the system. The drawbacks are that you must run a PROS daemon for each printer, and you also need a C compiler on your host to make the PROS daemon.

If you don't have a C compiler, use the FTP method described above. If you have a compiler, but don't want to run daemons on your system, use the almost as powerful PROS B method.

Automatic Integration (PROS A Printing)

Run the *axinstall* script and follow the instructions on the screen. Choose **PROS A** at the Print Method prompt.

If *axinstall* fails to provide a satisfactory integration for any reason, then follow the manual integration method shown below. The current version of *axinstall* when this technical reference was produced was 1.8. You can get a free *axinstall* update, or find out what the latest version number is, by visiting the Axis on-line service, refer to *How To Contact Axis* (page 280).

Note: The automatic integration only provides basic printing functions (no banner page, etc.). To get full control over the printcap capabilities, edit the *printcap* file after the automatic integration or use the manual integration.

Manual Integration (PROS A Printing)

1. Create and move to a directory for the print server daemon using the commands **mkdir /usr/local/lib/axis** and **cd /usr/local/lib/axis**.
2. Login to the print server using FTP and up-load the files *makefile* and *prosd.c* from the *npipe* directory.
3. Edit the *makefile* to fit your system requirements as described in the file header.
4. Use **make** to compile the PROS daemon.
5. Create a named pipe for the printer by the command **mknod /dev/salesdept.pr1 p**, where *salesdept* is the alias for the print server, and *pr1* is the logical printer.
6. To make the daemon start automatically when booting up your host, add the following statement to one of the system start-up files (e.g. */etc/rc.local*):

```
/usr/local/lib/axis/prosd myhost /dev/salesdept.pr1 salesdept
pr1 netprinter 2> /usr/adm/salesdept_pr1_log 1>&2 &
```

   If you want to store the printer feedback data in a separate file, use this statement:

```
/usr/local/lib/axis/prosd myhost /dev/salesdept.pr1 salesdept
pr1 netprinter 2> /usr/adm/salesdept_pr1_log 1>>
/usr/adm/salesdept_pr1_pfb &
```

   - */usr/local/lib/axis/prosd* is the path and file name of the PROS daemon
   - *myhost* is the name of the host where you are doing the integration
   - */dev/salesdept.pr1* is the path and file name of the named pipe
   - *salesdept* is the name of your print server
   - *pr1* is the logical printer to be used
   - *netprinter* is the PROS protocol password
   - */usr/adm/salesdept_pr1_log* is the path and file name of the error log file
   - */usr/adm/salesdept_pr1_pfb* is the path and file name of the printer readback data file.
7. Start the Bourne shell, if you're not already there, by the command **sh**.
8. Start a daemon by the command **nohup** followed by one of the statements given at step 6 above.
9. Create a spooler directory by the command **mkdir /usr/spool/sales_1**.

10. Add a printcap entry for the printer to */etc/printcap*. All printcap capabilities are available, including both input and output filters. The printcap entry should contain at least the following fields:

```
sales_1|AXIS 560 LPT1 at salesdept:\
       :lp=/dev/salesdept.pr1:\
       :sd=/usr/spool/sales_1
```

Note: Ultrix systems may require an output filter to work properly. If you are not using a filter, there is a straight-through dummy filter called *xf* that can be used by adding a **:of=xf:** field to the printcap entry.

Test Printout (PROS A Printing)

Test the PROS daemon by printing the file *test* using the *cat* command:

```
cat test > /dev/salesdept.pr1
```

If the daemon works, print the file through the spooler using *lpr*:

```
lpr -Psales_1 test
```

Integration of additional printers (PROS A Printing)

Repeat the integration process (automatically or manually) for each additional printer attached to your print server. Each printer must have its own daemon, printcap entry, a unique name and spool directory. If you integrate manually, note that the first three steps (i.e. compiling the PROS daemon) need only to be done once.

Integration for PROS B Printing

PROS B uses an output filter rather than a daemon. The integration procedure is therefore similar to FTP, with the additional step of compiling the PROS drivers. It retains all the features of PROS A except the simultaneous use of both input and output filters.

If you don't have a C compiler, use the FTP method described above.

Automatic Integration (PROS B Printing)

Run the *axinstall* script and follow the instructions on the screen. Choose **PROS B** at the Print Method prompt.

If *axinstall* fails to provide a satisfactory integration for any reason, then follow the manual integration method shown below. The current version of *axinstall* when this technical reference was produced was 1.8. You can get a free *axinstall* update, or find out what the latest version number is, by visiting the Axis on-line service, refer to *How To Contact Axis* (page 280).

Note: The automatic integration only provides basic printing functions (no banner page, etc.). To get full control over the *printcap* capabilities, edit the *printcap* file after the automatic integration or use the manual integration.

Manual Integration (PROS B Printing)

1. Create a work directory by the command **mkdir /usr/local/lib/axis**.

2. Login to the print server using FTP and up-load the files *makepros*, *prosbsd.c*, and *printcap.pro* from the *bsd* directory to the work directory.
3. Edit the file *makepros* as described in the file header. This is where you specify the name of the host to integrate the printer on, the alias for your print server, the logical printer to use, output filter name, and printer feedback data destination.
4. Compile the executable *prosbsd* filter by the command **sh makepros**.
5. Rename *prosbsd* to *prosbsd-sales_1* and move it the directory where you keep your printer filters by the command. **cp prosbsd /usr/local/lib/prosbsd-sales_1**.
6. Create a error log file by the command **touch /usr/adm/sales_1-log**.
7. Create a spool directory by the commands **cd /usr/spool** and **mkdir sales_1**.
8. Create a printer spooler dummy file by the command **touch sales_1/null**.
9. Edit *printcap.pro* as described in the file header (see example below). This is the point where you should tailor the printer capabilities to meet your specific needs.
10. Append the printcap entry by the command **cat printcap.pro >> /etc/printcap**.

Example: This is what the new printcap entry might look like:

```
sales_1|AXIS 560 LPT1 at salesdept:\
       :lp=/usr/spool/sales_1/null:\
       :ff=\r\f:sh:lf=/usr/adm/sales_1-log:\
       :of=/usr/local/lib/prosbsd-sales_1:\
       :sd=/usr/spool/sales_1
```

It is not allowed to use both input and output filters with the PROS B print method. However, you may combine the prosbsd filter with your own output filter by taking the following steps:

1. Create a script called *newfilter* containing the lines below in the */usr/local/lib* directory (or wherever you keep your printer filters).

```
#!/bin/sh
/usr/local/lib/myfilter | /usr/local/lib/prosbsd-sales_1
```

2. Make the script executable by the command **chmod +x newfilter**.
3. Replace **prosbsd-sales_1** with **newfilter** in the output filter (of) field of your new printcap entry.

Using the PROS driver as Input Filter

We recommend you to use the PROS driver as output filter since this enables banner pages and Form Feeds between jobs to be processed by the spooler. If you don't require these functions, you may install prosbsd as an input filter by replacing the **:of=** field by an **:if=** field in the printcap entries. The main reason for using input filters is that the user ID appears in the accounting list.

Test Printout

Test the PROS driver by printing the file *test* using the *cat* command:

```
cat test | /usr/local/lib/prosbsd-sales_1
```

If the driver works, print the file through the spooler using *lpr*:

```
lpr -Psales_1 test
```

Integration of Additional Printers (PROS B Printing)

Repeat the integration process (automatically or manually) for each additional printer attached to your print server. Each printer must have its own printcap entry and output filter as well as a unique name and spool directory.

Example: These are the two new printcap entries required when integrating two printers at the *salesdept* print server:

```
sales_1|AXIS 560 LPT1 at salesdept:\
       :lp=/usr/spool/sales_1/null:\
       :ff=\r\f:sh:lf=/usr/adm/sales_1-log:\
       :of=/usr/local/lib/prosbsd-sales_1:\
       :sd=/usr/spool/sales_1
sales_2|AXIS 560 LPT2 at salesdept:\
       :lp=/usr/spool/sales_2/null:\
       :ff=\r\f:sh:lf=/usr/adm/sales_2-log:\
       :of=/usr/local/lib/prosbsd-sales_2:\
       :sd=/usr/spool/sales_2
```

Printing from System V UNIX Systems

The following print methods are available for System V systems (Solaris, HP-UX, SCO UNIX, Interactive UNIX, etc.). Use the table below to select the print method that is best fitted for your printing requirements. Detailed integration procedures are given for each method on the following pages.

Print Method	Advantages	Limitations
FTP	Uses industry standard network software on the host.	No printer status logging. No filters or interface programs can be used.
PROS A	The communication with the Axis print server is logged to a log file, including printer status and feedback. Easy to integrate – the print server appears as a device to the system. Any filters and interface programs can be used.	A C compiler is required to build the PROS drivers. A daemon must be active for each printer attached to the print server.
PROS B	Fatal errors are mailed to the user that initiated the print job.	A C compiler is required to build the PROS drivers. No filters or interface programs can be used.
LPD	Easy to set up.	No printer status logging. lp options are not available. No filters or interface programs can be used. Not available on all System V UNIX systems.
Reverse Telnet	Easy to set up if Reverse Telnet drivers are already installed.	No printer status logging. Drivers are not supplied with the print server. Existing drivers may be slow.

Installation

Regardless of the printing mode you intend to use, the first step is to install the Axis print server on your host. Please note that the installation and integration procedures require that you have *root* privileges on the system.

Start with assigning an Internet Address and a host name (alias) to the print server by adding the following line to your system host table (*/etc/hosts*):

```
192.36.253.96          salesdept
```

(192.36.253.96 and salesdept are examples only)

DO NOT use the default or example Internet address when installing your print server. Always consult your network manager before assigning an Internet Address.

If applicable, update your alias name data bases (Yellow Pages, YP/NIS), typically by the commands **cd /var/yp** and **make**.

The next step is to down-load the Internet Address to the print server. This can be done in three ways, using either the *arp*, *rarp*, or *bootp* method.

Setting the Internet Address using arp

Enter the following commands to set the Internet Address. The alias (*salesdept*) must match the one assigned above, and the Ethernet Address (here 00:40:8c:10:00:86) should equal the serial number of your print server:

```
arp -s salesdept 00:40:8c:10:00:86 temp
ping salesdept
```

(salesdept and 00:40:8c:10:00:86 are examples only)

The host should respond *salesdept is alive* or something similar to indicate that communication is established.

Notes:

1. The syntax of the *arp* command is system dependent. Consult your host's reference manual (or use the **man arp** command) if you're uncertain about the proper syntax.
2. If you need to run the *arp* command again, the print server *must* be restarted (power-off/power-on) before it can accept a new Internet Address.
3. If *rarp* or *bootp* is running on your network and the print server is present in */etc/ethers*, it is *not* possible to change the Internet Address using the *arp* command.
4. The print server and the host must be on the same logical network segment (not separated by a router).

Setting the Internet Address using rarp

The *rarp* method sets the Internet address automatically every time the print server is powered on. The main advantage with this is that you don't have to down-load the Internet address individually to each print server as when using the *arp* method.

This is how it works: The print server broadcasts a request to a *rarp* daemon at power-up. If the daemon is active, and a matching entry is found in the *Ethernet Address Table*, the daemon down-loads the Internet address to the print server. If the daemon isn't active or the table entry isn't found, the Internet address remains unchanged.

Follow these steps to use the *rarp* method:

1. Update your host table (*/etc/hosts*) as described earlier.
2. Edit the Ethernet Address table on your host (typically the file */etc/ethers*) by appending the following line:

```
00:40:8c:10:00:86  salesdept
```

(salesdept and 00:40:8c:10:00:86 are examples only)

3. Update your alias name data bases (Yellow Pages, YP/NIS), typically by the commands **cd /var/yp** and **make**.
4. Start the rarp daemon (if it isn't already running) by the command **rarpd -a** (this is system dependent, consult your system documentation).
5. Restart the print server to down-load the Internet address.

Setting the Internet Address using bootp

The *bootp* method is similar to *rarp* but gives two additional advantages:

- The network configuration data for the entire network can be in one place which makes it easy to maintain.
- The Internet address, the default router address, and the net mask are down-loaded to the print server automatically every time it is powered on.

This is how it works: The print server broadcasts a request containing its Ethernet address to a *bootp* daemon at power-up. If the daemon is active, and a matching entry is found in the *Boot Table*, the daemon down-loads the Internet address, default router address and net mask to the print server. If the daemon isn't active or the table entry isn't found, the Internet address, default router address and net mask remains unchanged.

Follow these steps to use the *bootp* method:

1. Update your host table (*/etc/hosts*) as described earlier.
2. Edit (or create) the boot table on your host (typically the file */etc/bootptab*) by appending the following entry:

```
salesdept:ht=ether:vm=rfc1048:ha=00408c100086:\
   :ip=192.36.253.96:sm=255.255.255.0:\
   :gw=192.36.253.254
```

(salesdept and the ha, ip, sm, and gw fields are examples only)

   - *ht=* is the Hardware Type field. Set this to *ether* for Ethernet, or *tr* for Token Ring.
   - *vm=* is the Vendor Magic field, specifying *bootp* report format. Should typically be *rfc1048*.
   - *ha=* is the Hardware Address field. Set this to the Ethernet address or Token Ring node address of your print server.
   - *ip=* is the Internet Address field. Set this to the Internet address of your print server.
   - *sm=* is the Subnet Mask field. Set this to the net mask value for your network.
   - *gw=* is the Gateway field. Set this to your default router address.
3. Start the *bootp* daemon (if it isn't already running) by the command **bootpd** (this is system dependent, consult your system documentation).
4. Restart the print server to down-load the Internet address, default router address and net mask.

Integration for LPD Printing

This is the recommended print method for System V systems where available, otherwise FTP is recommended. While it is easy to set up it is also rather limited. The drawbacks are that *lp* options, such as multiple copies, are not supported.

Automatic Integration (LPD Printing)

Run the *axinstall* script and follow the instructions on the screen. Choose **LPD** at the Print Method prompt.

If *axinstall* fails to provide a satisfactory integration for any reason, then follow the manual integration method shown below. The current version of *axinstall* when this technical reference was produced was 1.8. You can get a free *axinstall* update, or find out what the latest version number is, by visiting the Axis on-line service, refer to *How To Contact Axis* (page 280).

Notes: LPD is not available on all System V systems.

Manual Integration (LPD Printing)

1. Enter the Bourne shell by the commands **sh**, **SHELL=/bin/sh,** and **export SHELL**.
2. Login to the print server using FTP, and up-load the file *ftp_sysv* from the *sysv* directory to the interface program directory.
3. Turn off the LP printer service by the command **/usr/lib/lpshut**.
4. Create a new system printer by the command **/usr/lib/lpadmin -p sales_1 -s salesdept!pr1 -l "any"**, where *sales_1* is the name of the new printer, and *salesdept* is the host name of your print server, *pr1* specifies the logical printer for *sales_1*.
5. Restart the LP printer service by the command **/usr/lib/lpsched**.
6. Enable requests for print jobs on the new printer by the command **/usr/lib/accept sales_1**, and enable the printer by **/usr/bin/enable sales_1**.
7. Exit the Bourne shell by **exit**.

Test Printout (LPD Printing)

Print the file through the spooler using lp:

```
lp -d sales_1 test
```

Integration of additional printers (LPD Printing)

Repeat the integration process (automatically or manually) for each additional printer attached to your Axis print server. Each printer must have its own interface program as well as a unique name.

Integration for FTP Printing

This is the recommended print method for System V systems if LPD is not available. It does not require a C compiler and BSD socket-type networking supports as the PROS methods do, but has the drawback of not supporting status logging and filters or interface programs.

Automatic Integration (FTP Printing)

Run the *axinstall* script and follow the instructions on the screen. Choose **FTP** at the Print Method prompt.

If *axinstall* fails to provide a satisfactory integration for any reason, then follow the manual integration method shown below. The current version of *axinstall* when this technical reference was produced was 1.8. You can get a free *axinstall* update, or find out what the latest version number is, by visiting the Axis on-line service, refer to *How To Contact Axis* (page 280).

Note: There is no real reason to integrate manually for FTP unless you want to modify the interface program in some way. We recommend that you start with automatic integration, and turn to manual only if *axinstall* for some reason fails.

Manual Integration (FTP Printing)

1. Create a directory to keep the print server interface programs by the command **mkdir /usr/local/lib/axis**.
2. Login to the print server using FTP, and up-load the file *ftp_sysv* from the *sysv* directory to the interface program directory.
3. Copy *ftp_sysv* to *ftp_sysv-sales_1*.

4. Edit *ftp_sysv-sales_1* as described in the file header. This is where you specify the Internet Address, Logical Printer, FTP path, user name and password.
5. Make the modified file executable by the command **chmod +x ftp_sysv-sales_1**.
6. Enter the Bourne shell (if not already there) by the commands **sh**, **SHELL=/bin/sh,** and **export SHELL**.
7. Turn off the LP printer service by the command **/usr/lib/lpshut**.
8. Create a new system printer by the command **/usr/lib/lpadmin -p sales_1 -i ftp_sysv-sales_1 -v /dev/null**, where *sales_1* is the name of the new printer.
9. Restart the LP printer service by the command **/usr/lib/lpsched**.
10. Enable requests for print jobs on the new printer by the command **/usr/lib/accept sales_1**, and enable the printer by **/usr/bin/enable sales_1**.
11. Exit the Bourne shell by **exit**.

Test Printout

Start by printing the file *test* using the interface program:

```
ftp_sysv-sales_1 x x x 1 x test
```

The ‘x’ characters represent parameters required by the system. They must be present, but the values are ignored. The ‘1’ is the number of copies.

If the interface program works, print the file through the spooler using *lp*:

```
lp -d sales_1 test
```

Integration of Additional Printers (FTP Printing)

Repeat the integration process (automatically or manually) for each additional printer attached to your print server. Each printer must have its own interface program as well as a unique name.

Integration for PROS A Printing

PROS A is the most powerful print method, featuring automatic logging of printer status and feedback as well as allowing you to use any existing filters or interface programs. It is fairly easy to integrate since the print server appears as a device (Named Pipe) to the system. The drawbacks are that you must run a PROS daemon for each printer, and you also need a C compiler on your host to make the PROS daemon.

If you don’t have a C compiler, use the FTP method described above. If you have a compiler, but don’t want to run daemons on your system, use the almost-as-powerful PROS B method.

Automatic Integration (PROS A Printing)

Run the axinstall script and follow the instructions on the screen. Choose **PROS A** at the Print Method prompt.

If *axinstall* fails to provide a satisfactory integration for any reason, then follow the manual integration method shown below. The current version of *axinstall* when this technical reference was produced was 1.8. You can get a free *axinstall* update, or find out what the latest version number is, by visiting the Axis on-line service, refer to *How To Contact Axis* (page 280).

Note: There is generally no real reason to integrate manually for PROS A. We recommend that you start with automatic integration, and turn to manual only if you experience problems with *axinstall*.

Manual Integration (PROS A Printing)

1. Create and move to a directory for the print server daemon using the commands **mkdir /usr/local/lib/axis** and **cd /usr/local/lib/axis**.
2. Login to the print server using FTP and up-load the files *makefile* and *prosd.c* from the *npipe* directory.
3. Edit *makefile* according to the instructions in the file header. (Some System V systems require L1_OPTIONS and L2_OPTIONS modifications, which is one of the reason that *axinstall* might fail).
4. Use **make** to compile the PROS daemon.
5. Create a named pipe for the printer by the command **mknod /dev/salesdept.pr1 p**, where *salesdept* is the alias for the print server, and *pr1* is the logical printer.
6. Make the pipe accessible from lp only by the commands **chown lp /dev/salesdept.pr1** and **chmod 600 /dev/salesdept.pr1**.
7. To make the daemon start automatically when booting up your host, add the following statement to one of the system start-up files (e.g. */etc/inittab*):

Note: Some systems recreate */etc/inittab* at boot-time. To make sure that your added statement are not lost, you should also put the statements in a file named */etc/conf/init.d/axis-init*. (Any file name will do, as long as it is placed in the *init.d* directory).

If you prefer to start the daemon manually, skip to step 9 below.

```
axis::respawn:/usr/local/lib/axis/prosd myhost
/dev/salesdept.pr1 salesdept pr1 netprinter 2>
/usr/adm/salesdept_pr1_log 1>&2
```

If you want to store the printer feedback data in a separate file, use this statement:

```
axis::respawn:/usr/local/lib/axis/prosd myhost
/dev/salesdept.pr1 salesdept pr1 netprinter 2>
/usr/adm/salesdept_pr1_log 1>> /usr/adm/salesdept_pr1_pfb
```

- */usr/local/lib/axis/prosd* is the path and file name of the PROS daemon
- *myhost* is the name of the host where you are doing the integration
- */dev/salesdept.pr1* is the path and file name of the named pipe
- *salesdept* is the name of your print server
- *pr1* is the logical printer to be used
- *netprinter* is the PROS protocol password
- */usr/adm/salesdept_pr1_log* is the path and file name of the error log file
- */usr/adm/salesdept_pr1_pfb* is the path and file name of the printer read-back data file.

8. Start the daemon by the command **telinit q**.
9. Enter the Bourne shell (if not already there) by the commands **sh**, **SHELL=/bin/sh,** and **export SHELL**.

10. If you did not start the daemon automatically according to steps 7-8 above, start it now by the command **nohup** followed by one of the statements given at step 7 (leave out the *axis::respawn:* part, and append a '&' character to make the daemon run in the background).
11. Turn off the LP printer service by the command **/usr/lib/lpshut**.
12. Create a new system printer by the command **/usr/lib/lpadmin -p sales_1 -m standard -v /dev/salesdept.pr1**, where *sales_1* is the name of the new printer and *salesdept.pr1* is the daemon. You may use any interface program by replacing *standard* with the name of the interface program.
13. Restart the LP printer service by the command **/usr/lib/lpsched**.
14. Enable requests for print jobs on the new printer by the command **/usr/lib/accept sales_1**, and enable the printer by **/usr/bin/enable sales_1**.
15. Exit the Bourne shell by **exit**.

Test Printout (PROS A Printing)

Test the PROS daemon by printing the file *test* using the *cat* command:

```
cat test > /dev/salesdept.pr1
```

If the daemon works, print the file through the spooler using *lpr*:

```
lp -d sales_1 test
```

Integration of Additional Printers (PROS A Printing)

Repeat the integration process (automatically or manually) for each additional printer attached to your print server. Each printer must have its own daemon and system printer entry. Also, each *inittab* entry must have a unique label ('axis' in the previous examples).

If you integrate manually, note that the first four steps (i.e. compiling the PROS daemon) need only to be done once.

Stopping the PROS Daemon

Should you ever want to stop a PROS daemon running on your system, this must be done in different ways depending on how the daemon was started.

- If the daemon was started automatically (steps 7-8 above), you should stop it by replacing *respawn* with *off* in the inittab entry, and then run **telinit q** to initialize the new inittab settings.
- If the daemon was started manually (step 10 above), first find out the daemon's process number by the command **ps -elf | grep prosd**, then stop the daemon by the command **kill -9** <process number>.

Integration for PROS B Printing

PROS B uses an interface program rather than a daemon. The integration procedure is therefore similar to FTP, with the additional step of compiling the PROS drivers. It retains all the features of PROS A, and has the additional benefit that the user will be notified by mail when a fatal error occurs.

If you don't have a C compiler, use the FTP method described above.

Automatic Integration (PROS B Printing)

Run the *axinstall* script and follow the instructions on the screen. Choose **PROS B** at the Print Method prompt.

If *axinstall* fails to provide a satisfactory integration for any reason, then follow the manual integration method shown below. The current version of *axinstall* when this technical reference was produced was 1.8. You can get a free *axinstall* update, or find out what the latest version number is, by visiting the Axis on-line service, refer to *How To Contact Axis* (page 280).

Note: There is no real reason to integrate manually for PROS B unless you want to modify the interface program in some way. We recommend that you start with automatic integration, and turn to manual only if *axinstall* for some reason fails.

Manual Integration (PROS B Printing)

1. Create a work directory by the command **mkdir /usr/local/lib/axis**.
2. Login to the print server using FTP and up-load the files *makepros* and *prossysv.c* from the *sysv* directory to the work directory.
3. Edit the file *makepros* as described in the file header. This is where you specify the name of the host to integrate the printer on, the alias for your print server (*salesdept*), the logical printer to use (*pr1*), interface program name (*prossysv-sales_1*), and printer feedback data destination. (Some System V systems require L1_OPTIONS and L2_OPTIONS modifications, which is one of the reasons that *axinstall* might fail)
4. Compile the executable *prossysv-sales_1* program by the command **sh makepros**.
5. Enter the Bourne shell (if not already there) by the commands **sh**, **SHELL=/bin/sh,** and **export SHELL**.
6. Turn off the LP printer service by the command **/usr/lib/lpshut**.
7. Create a new system printer by the command **/usr/lib/lpadmin -p sales_1 -i prossysv-sales_1 -v /dev/null**, where *sales_1* is the name of the new printer and *prossysv-sales_1* is the interface program. If you want to write printer feedback data to a file, replace */dev/null* with a path and file name.
8. Restart the LP printer service by the command **/usr/lib/lpsched**.
9. Enable requests for print jobs on the new printer by the command **/usr/lib/accept sales_1**, and enable the printer by **/usr/bin/enable sales_1**.
10. Exit the Bourne shell by **exit**.

Test Printout (PROS B Printing)

Start by printing the file *test* using the interface program:

```
prossysv-sales_1 x x x 1 x test
```

The ‘x’ characters represent parameters required by the system. They must be present, but the values are ignored. The ‘1’ is the number of copies.

If the interface program works, print the file through the spooler using *lp*:

```
lp -d sales_1 test
```

Integration of Additional Printers (PROS B Printing)

Repeat the integration process (automatically or manually) for each additional printer attached to your print server. Each printer must have its own interface program as well as a unique name.

Printing from IBM AIX Systems

The following print methods are available for IBM AIX systems (RS/6000). Use the table below to select the print method that is best fitted for your printing requirements. Detailed integration procedures are given for each method on the following pages.

Print Method	Advantages	Limitations
LPD	Easy to set up – just install the Axis print server as a remote queue in SMIT.	No printer status logging. Spooler features such as banner pages, filters, or multiple copies are not available.
FTP	Uses industry standard network software on the host.	No printer status logging.
PROS	The communication with the print server is logged to a log file, including printer status and feedback. Status information can be mailed back to the user.	A C compiler is required to build the PROS drivers.

Installation

Regardless of the printing mode you intend to use, the first step is to install the print server on your host. Please note that the installation and integration procedures require that you have *root* privileges on the system.

Start with assigning an Internet Address and a host name (alias) to the print server by adding the following line to your system host table (*/etc/hosts*):

```
192.36.253.96          salesdept
```

(192.36.253.96 and salesdept are examples only)

DO NOT use the default or example Internet address when installing your print server. Always consult your network manager before assigning an Internet Address.

If applicable, update your alias name data bases (Yellow Pages, YP/NIS), typically by the commands **cd /var/yp** and **make**.

The next step is to down-load the Internet Address to the print server. This can be done in three ways, using either the *arp*, *rarp*, or *bootp* method.

Setting the Internet Address using arp

Enter the following commands to set the Internet Address. The *ether* argument applies to Ethernet only. The Token Ring equivalent is *802.5*. The alias (*salesdept*) must match the one assigned above, and the Ethernet Address (Node Address for Token Ring), here 00:40:8c:10:00:86, should equal the serial number of your print server:

```
arp -s ether salesdept 00:40:8c:10:00:86 temp
ping salesdept
```

(salesdept and 00:40:8c:10:00:86 are examples only)

The host should respond *salesdept is alive* or something similar to indicate that communication is established.

Notes:

1. The syntax of the *arp* command is system dependent. Consult your host's reference manual (or use the **man arp** command) if you're uncertain about the proper syntax.
2. If you need to run the *arp* command again, the print server *must* be restarted (power-off/power-on) before it can accept a new Internet Address.
3. If *rarp* or *bootp* is running on your network and the print server is present in */etc/ethers*, it is *not* possible to change the Internet Address using the *arp* command.
4. The print server and the host must be on the same logical network segment (not separated by a router).

Setting the Internet Address using rarp

The *rarp* method sets the Internet address automatically every time the print server is powered on. The main advantage with this is that you don't have to down-load the Internet address individually to each print server as when using the *arp* method.

This is how it works: The print server broadcasts a request to a *rarp* daemon at power-up. If the daemon is active, and a matching entry is found in the *Ethernet Address Table*, the daemon down-loads the Internet address to the print server. If the daemon isn't active or the table entry isn't found, the Internet address remains unchanged.

Follow these steps to use the *rarp* method:

1. Update your host table (*/etc/hosts*) as described earlier.
2. Edit the Ethernet Address table on your host (typically the file */etc/ethers*) by appending the following line:

```
00:40:8c:10:00:86  salesdept
```

(salesdept and 00:40:8c:10:00:86 are examples only)

3. Update your alias name data bases (Yellow Pages, YP/NIS), typically by the commands **cd /var/yp** and **make**.
4. Start the rarp daemon (if it isn't already running) by the command **rarpd -a** (this is system dependent, consult your system documentation).
5. Restart the print server to down-load the Internet address.

Setting the Internet Address using bootp

The *bootp* method is similar to *rarp* but gives two additional advantages:

- The network configuration data for the entire network can be in one place which makes it easy to maintain.
- The Internet address, the default router address, and the net mask are down-loaded to the print server automatically every time it is powered on.

This is how it works: The print server broadcasts a request containing its Ethernet address to a *bootp* daemon at power-up. If the daemon is active, and a matching entry is found in the *Boot Table*, the daemon down-loads the Internet address, default router address and net mask to the print server. If the daemon isn't active or the table entry isn't found, the Internet address, default router address and net mask remains unchanged.

Follow these steps to use the *bootp* method:

1. Update your host table (*/etc/hosts*) as described earlier.

2. Edit (or create) the boot table on your host (typically the file */etc/bootptab*) by appending the following entry:

```
salesdept:ht=ether:vm=rfc1048:ha=00408c100086:\
   :ip=192.36.253.96:sm=255.255.255.0:\
   :gw=192.36.253.254
```

(salesdept and the ha, ip, sm, and gw fields are examples only)

- *ht=* is the Hardware Type field. Set this to *ether* for Ethernet, or *tr* for Token Ring.
- *vm=* is the Vendor Magic field, specifying *bootp* report format. Should typically be *rfc1048*.
- *ha=* is the Hardware Address field. Set this to the Ethernet address or Token Ring node address of your print server.
- *ip=* is the Internet Address field. Set this to the Internet address of your print server.
- *sm=* is the Subnet Mask field. Set this to the net mask value for your network.
- *gw=* is the Gateway field. Set this to your default router address.

3. Start the *bootp* daemon (if it isn't already running) by the command **bootpd** (this is system dependent, consult your system documentation).
4. Restart the print server to down-load the Internet address, default router address and net mask.

Integration for LPD Printing

The LPD print method is easy to set up, but provides neither status logging nor spooler features.

Automatic Integration (LPD Printing)

Run the *axinstall* script and follow the instructions on the screen. Choose **LPD** at the Print Method prompt.

If *axinstall* fails to provide a satisfactory integration for any reason, then follow the manual integration method shown below. The current version of *axinstall* when this technical reference was produced was 1.8. You can get a free *axinstall* update, or find out what the latest version number is, by visiting the Axis on-line service, refer to *How To Contact Axis* (page 280).

Manual Integration (LPD Printing)

1. Set up a queue and a spooler device for the print server using SMIT. Enter the command **smit mkrque** and fill in the following fields (user entries in bold):

```
NAME of queue to add                  salesrq_1
DESTINATION HOST for remote jobs      salesdept
... SHORT FORM FILTER ...             /usr/lpd/bsdshort
... LONG FORM FILTER ...              /usr/lpd/bsdlong
Name of QUEUE on remote printer       pr1
NAME of device to add                 sales_1
```

- *salesrq_1* is the name of the new queue
- *salesdept* is the host name (alias) of your print server
- *pr1* specifies the logical printer for sales_1
- *sales_1* is the name of the new device

2. Press <*Enter*> to accept the new entries, and exit SMIT.

Test Printout (LPD Printing)

Print the file *test* using the *qprt* command:

```
qprt -Psales_1 test
```

Integration of Additional Printers (LPD Printing)

Repeat the integration process for each additional printer attached to your print server. Each printer must have its own queue and device name.

Integration for FTP Printing

The FTP print method is a bit more complex to set up than LPD, but offers more printing options. This is the method to choose if you don't have access to a C compiler, or if you don't need the additional features offered by PROS (such as printer status and feedback logging).

Automatic Integration (FTP Printing)

Run the *axinstall* script and follow the instructions on the screen. Choose **FTP** at the Print Method prompt.

If *axinstall* fails to provide a satisfactory integration for any reason, then follow the manual integration method shown below. The current version of *axinstall* when this technical reference was produced was 1.8. You can get a free *axinstall* update, or find out what the latest version number is, by visiting the Axis on-line service, refer to *How To Contact Axis* (page 280).

Manual Integration (FTP Printing)

1. Create and move to a directory for the print server programs using the commands **mkdir /usr/lpd/axis** and **cd /usr/lpd/axis**.
2. Login to the print server using FTP and up-load the back-end program *ftp_piobe* from the *aix* directory.
3. Copy *ftp_piobe* to *ftp_piobe-sales_1*.
4. Edit *ftp_piobe-sales_1* as described in the file header. This is where you specify the Internet Address, Logical Printer, FTP path, user name and password.
5. Make the back-end program executable by **chmod +x ftp_piobe-sales_1**.
6. Set up a virtual printer using SMIT. Enter the command **smit mkvirprt** and answer the questions an the screen (user entries in bold):

   Select *Printer or plotter attached to the host.*

   At the *Device* prompt, type **null**.

   Select a printer type. If in doubt, select *ASCII printer.*

   Select header and trailer options (**n** for none, **a** for each file, **g** for each job).

   Enter the print queue name: **sales_1**.

   At the default queue prompt, type **y** if you want *sales_1* as default, otherwise **n**.
7. Set up the back-end program using SMIT once again. Enter the command **smit chquedev** and follow the instructions on the screen.

8. Select the printer queue assigned above (*sales_1*), and the device *null*.
9. You are now presented with a screen of options – the only one you have to change is the *BACKEND PROGRAM pathname* entry. Type **/usr/lpd/axis/ftp_piobe-sales_1**.
10. Press <*Enter*> to accept the new entries, and exit SMIT.

Test Printout (FTP Printing)

Print the file *test* using the *qprt* command:

```
qprt -Psales_1 test
```

Integration of additional printers (FTP Printing)

Repeat the integration process for each additional printer attached to your print server. Each printer must have its own back-end program and a unique name.

Integration for PROS Printing

PROS is the most powerful print method, offering printer status and feedback logging either to a file or as mail back to the user. The integration procedure is similar to FTP, with the additional step of compiling the PROS drivers.

If you don't have a C compiler, use the FTP method described above.

Automatic Integration (PROS Printing)

Run the *axinstall* script and follow the instructions on the screen. Choose **PROS B** at the Print Method prompt.

If *axinstall* fails to provide a satisfactory integration for any reason, then follow the manual integration method shown below. The current version of *axinstall* when this technical reference was produced was 1.8. You can get a free *axinstall* update, or find out what the latest version number is, by visiting the Axis on-line service, refer to *How To Contact Axis* (page 280).

Manual Integration (PROS Printing)

1. Create and move to a directory for the print server programs using the commands **mkdir /usr/lpd/axis** and **cd /usr/lpd/axis**.
2. Login to the print server using FTP and up-load the files *makefile*, *prosaix.c*, and *pros_piobe* from the *aix* directory.
3. Compile the executable file *prosaix* by the command **make**.
4. Copy *pros_piobe* to *pros_piobe-sales_1*.
5. Edit *pros_piobe-sales_1* as described in the file header. This is where you specify the Internet Address, Logical Printer, PROS path, user name and password.
6. Make the back-end program executable by **chmod +x pros_piobe-sales_1**.
7. Set up a virtual printer using SMIT. Enter the command **smit mkvirprt** and answer the questions an the screen (user entries in bold):

   Select *Printer or plotter attached to the host.*

   At the *Device* prompt, type **null**.

   Select a printer type. If in doubt, select *ASCII printer.*

   Select header and trailer options (**n** for none, **a** for each file, **g** for each job).

Enter the print queue name: **sales_1**.

At the default queue prompt, type **y** if you want *sales_1* as default, otherwise **n**.

8. Set up the back-end program using SMIT once again. Enter the command **smit chquedev** and follow the instructions on the screen.
9. Select the printer queue assigned above (*sales_1*), and the device *null*.
10. You are now presented with a screen of options – the only one you have to change is the *BACKEND PROGRAM pathname* entry. Type **/usr/lpd/axis/pros_piobe-sales_1**.
11. Press <*Enter*> to accept the new entries, and exit SMIT.

Test Printout (PROS Printing)

Print the file *test* using the *qprt* command:

```
qprt -Psales_1 test
```

Integration of additional printers (PROS Printing)

Repeat the integration process for each additional printer attached to your print server. Each printer must have its own back-end program and a unique name.

Printing from Other UNIX Systems

The automatic integration script *axinstall* supports a wide range of different UNIX systems. When *axinstall* is started, it tries to recognize your system by looking for certain files that are specific for different systems. The following UNIX systems can currently be automatically detected:

System	LPD	FTP	PROS A	PROS B
BSD Systems:				
• BSD 4.2, 4.3, 4.4	x	x	x	x
• SunOS 4 (Solaris 1.x)	x	x	x	x
• DEC ULTRIX	x	x	x	x
• Free BSD 2.x	x	x	x	x
System V systems:				
• System V R3, R4	(*)	x	x	x
• AT&T	(*)	x	x	x
• Interactive	(*)	x	x	x
• SCO V3	(*)	x	x	x
• Sun OS 5 (Solaris 2.x)	x	x		x
• HP-UX V9	x	x	x	x
• IBM AIX V3 and V4	x	x		x
• Silicon Graphics IRIX	(**)	x	x	x
• BULL (BOS, AIX)	(*)	x	x	x

(*) =Does not exist in the system

(**) =Optional to install

For more unusual UNIX systems, there is no automatic integration. However, since most UNIX systems resemble either BSD or System V, you should be able to integrate your print server manually. You will need a working knowledge about your system to manage various peculiarities as indicated by the SINIX example below.

In most cases, the FTP print method can be used. Up-load the files */bsd/ftp_bsd* and */sysv/ftp_sysv* and study the file headers. See also the manual integration instructions for FTP printing on BSD (page 51) and System V systems (page 60).

If your system has BSD socket-type networking support, you can also consider the PROS B print method. Up-load the file */bsd/prosbsd* and study the file header. See also the manual integration instructions for PROS B printing on BSD systems (page 54).

Integration Example: HP 9000

HP 9000 is supported by *axinstall*, so you may use the automatic installation procedure. Alternatively, you can configure the Axis print server as an HP JetDirect card, which is a standard print server selection on the HP 9000 system. This is a simple and straight-forward procedure, but with the limitation that only one printer can be attached to the print server.

Start with installing the print server on the host as described on page 57. Then proceed with the integration:

Manual Integration (HP 9000)

This procedure involves editing the print server *config* file. If you are unfamiliar with this, consult Section 9 – *Parameter Editing, TCP/IP* before continuing.

1. Login to the print server using FTP, and up-load the *config* file by the command **get config**.
2. Exit FTP, and edit the *config* file. Modify parameters *Reverse Telnet Options Enabled* and *Reverse Telnet port number for pr1* as below:

```
RTN_OPT  : NO
RTEL_PR1 : 9100
```

3. Login again, and down-load the modified *config* file to the print server by the command **put config CONFIG**.
4. Restart the print server by the command **get hardreset**, which will also close the FTP session.

Test Printout (HP 9000)

Print the file *test* using the *lpr* command:

```
lpr -Psales_1 test
```

Integration Example: SINIX

The SINIX system is a derivate of the AT&T System V UNIX operating system. The problem here is that the spooler is not compatible with the standard System V spooler.

However, unlike the standard System V spooler, there is a network connection feature originally used to connect printers attached to Siemens-Nixdorf TACLAN Terminal Servers to the spooler via the LAN. This method uses TCP/IP Reverse Telnet for communication, which is supported by the print server.

As always, the first step is to install the Axis print server on the host as described on page 57. Then proceed with the integration:

Manual Integration (SINIX)

This procedure involves editing the print server config file. If you are unfamiliar with this, consult Section 9 – *Parameter Editing, TCP/IP* before continuing.

1. Login to the print server using FTP, and up-load the *config* file by the command **get config**.
2. Exit FTP, and edit the *config* file. Modify the parameters for the Reverse Telnet port numbers for pr1 through pr8, as below:

```
RTEL_PR1 : 9001
RTEL_PR2 : 9002
RTEL_PR3 : 9003
RTEL_PR4 : 9004
RTEL_PR5 : 9005
RTEL_PR6 : 9006
RTEL_PR7 : 9007
RTEL_PR8 : 9008
```

3. Login again, and down-load the modified *config* file to the print server by the command **put config CONFIG**.

4. Restart the print server by the command **get hardreset**, which will also close the FTP session.
5. Edit the file */usr/spool/spooler/CONFIG*, which is the SINIX spooler configuration file. Add the following lines:
   - Add a printer definition by the following line:

   sales_1 '/opt/etc/interface -addr=salesdept -port=9001' /dev/null

   - Set up a printer group by adding the following line to the *printer groups* section:

   sales_1 (sales_1) 'Printer attached to AXIS print server'

   - Include the printer in the *administrator* section by adding **sales_1** to any one of the administrator lines.
6. Exit the editor, and convert the *CONFIG* file to binary format (CONFIG.bin) by the command **digest**.
7. Restart the printer queue daemon by the command **lpr -rr**.

Test Printout (SINIX)

Print the file *test* using the *lpr* command:

```
lpr -dru=sales_1 test
```

Integration of Additional Printers (SINIX)

Repeat the integration process for each additional printer attached to your print server. Each printer must have its own printer definition and group entry as well as a unique name.

Notes:

1. You may use any back-end program instead of *interface*, e.g. *lphplj* for HP LaserJet printers.
2. It is not necessary to use different Reverse Telnet port numbers for different print servers. Since the servers have unique Internet addresses, there will be no conflict.

Printing from IBM MVS Systems

Use the FTP method to print from an MVS mainframe. Up-load the sample JCL script */mvs/jcl_ex* from the Axis print server and follow the instructions in the file header.

Printing from MS-DOS Systems

Printing from MS-DOS systems is done by redirecting printer output using e.g. PREDIR from FTP Software. PREDIR is supplied with the PC/TCP package from version 2.05 patch level III. It uses the LPD protocol to transfer print jobs.

Up-load the file */pctcp/pc_tcp.cfg* from the print server and follow the instructions.

Apple EtherTalk

The Axis print server makes it possible to connect any PostScript printer to an Ethernet network running AppleTalk. By default, the print server will present itself to the network as LaserWriter printers named *AXIS<nnnnnn>_LPT<x>*, where <nnnnnn> are the last six digits of the print server serial number, and <x> is the number of the printer (serial ports have the name *AXIS<nnnnnn>_COM<x>*). These printers will appear in the Macintosh *Chooser* menu together with the locally attached printers, if any.

The following parameters control printing in the AppleTalk environment:

- **AppleTalk Protocol Enabled (ATLK_ENB.)**
  This parameter switches the print server AppleTalk support on and off. The default setting is YES. Changing to NO will disable the AppleTalk support, and no network printers will appear in the Chooser menu.
- **AppleTalk Zone (ATK_ZONE.)**
  This parameter specifies the AppleTalk zone for the print server printers. The default setting is <empty>, which will place the printers in the default zone as defined on the Apple Internet Router. You may change this to any valid zone name not exceeding 32 characters. If your network has only one zone, leave this parameter empty.
- **HP Zoner Enabled (ZONER_EN.)**
  This parameter switches the print server support for the HP Zoner utility (and compatible products) on and off. The default setting is YES, which enables HP Zoner users to move printers between AppleTalk zones. To disable this possibility, change the parameter setting to NO.
- **Binary Transfer Enabled (BINARY.)**
  This parameter switches the print server support for printing in binary mode on and off. The default setting is NO. If your printer supports the Adobe Binary Communication Protocol, large bitmapped images will print much faster with this parameter set to YES.
- **Printer 1 Name (APRINT_1.)**
  This parameter specifies the name of the first network printer. The default name is AXIS<nnnnnn>_LPT1. You may change this to any name not exceeding 32 characters. Other Printers have identical parameters except the number in the parameter name is changed appropriately.
- **Printer 1 Type (ATYPE_1.)**
  This parameter specifies the type of the first network printer. The default type is LaserWriter. You may change this to any valid printer type not exceeding 32 characters, but this requires that a driver for that type is installed. Leaving this field empty will prevent Printer 1 from appearing in the Chooser menu. Other Printers have identical parameters except the number in the parameter name is changed appropriately.
- **Printer 1 Logical Printer (ALOGIC_1.)**
  This parameter specifies the logical printer assigned to Printer 1. The default setting is PR1. Other Printers have identical parameters except the number in the parameter name is changed appropriately.

Print Methods

Printing in the Macintosh environment is a bi-directional operation – the printer receives print jobs, and returns information about available fonts, available memory, and printing progress back to the Mac. The print server can be configured for two different print methods – *Spooler Mode* and *Printer Mode*. Spooler mode is the default setting.

Spooler Mode

In spooler mode, print data is only sent in one direction between the print server and the printer. No reverse data is read from the printer. This means that when the print server acts as a standard LaserWriter printer, it simulates printer responses itself and sends them back to the printer driver on the Macintosh host.

In order to guarantee correct printouts, the print server by default does not report any printer resident PostScript fonts. This means that all fonts are down-loaded with each print job, which can be time-consuming. If your printer contains the standard PostScript fonts of the Adobe 35N set (which is true for all US and European LaserWriters), you can avoid down-loading of these fonts by changing the following parameter:

- **PostScript Font Set (ATK_FONT.)**
  This parameter specifies which PostScript fonts that should be reported as resident in the attached printer. The default setting is DEFAULT, meaning that no fonts are resident. You may change this to 35N to avoid down-loading the standard PostScript fonts. Set the parameter to ALL to tell the print server that all the fonts are resident in the printer and therefore no fonts are to be downloaded.

Printer Mode

In printer mode reverse data is read from the printer and sent to the Macintosh host. This method ensures that the correct responses are given to the Macintosh host. This requires a serial printer, or a printer that accepts print data through the parallel port and returns printer responses through the serial interface.

There is no explicit parameter for selecting printer mode – the mode is determined by the Read-Back Port parameter for each logical printer. This is detailed for PR1 below, but it also applies to each of the other logical printers:

- **PR1 Read-Back Port (PR1_IN.)**
  This parameter specifies the port to be used for read back from the printer connected to port PR1. The default setting is NONE, meaning that bi-directional printing is disabled and the AppleTalk printer assigned to PR1 will therefore operate in spooler mode. Changing to COM1 configures the serial port as the read-back data input, and the print server then runs in printer mode.

SNA

The AXIS 570/670 print servers make it possible to print to any ASCII printer from IBM mainframe and midrange systems. The IBM data streams are converted to the ASCII printer language appropriate for the printer. In addition an extended emulation mode gives access to all the features of the printer and also provides functions such as bar code printing, string substitution and font selection. The extended emulation mode is described in SECTION 6, page 85.

IBM Host Communication

The following parameters control host communication in the SNA environment:

- **SNA Protocol Enabled (SNA_ENB.)**
  This parameter switches the print server SNA support on and off. The default setting is YES. Changing to NO will disable the SNA support.
- **Automatic Link Establishment (AUTODIAL.)**
  This parameter controls whether the print server will automatically try to establish the link when the print server is switched on or if communication is lost.
- **Link Establishment Retry Time (DIALTIME.)**
  This parameter determines the time in seconds between link establishment retries.
- **Host (destination) MAC Address (HOSTADDR.)**
  Set this to a specific host or gateway MAC address if you experience that more than the desired host establishes a link to the print server, or if you do not want data with broadcast address to be sent during link establishment.
- **Host Service Access Point (HOST_SAP.)**
  Host LLC SAP value.
- **Node Service Access Point (NODE_SAP.)**
  Node (print server) LLC SAP value.
- **Node Identifier (NODE_ID.)**
  Node ID (IDBLK/IDNUM value).
- **Job Separation Time-out (JOB_TIME.)**
  Determines the time in seconds after a completed print job until SNA releases the logical printer port to another protocol.
- **Intervention Required Time-out (IR_TIME.)**
  Intervention Required (IR) status is sent to the host when printer has been off-line for this amount of time. Note that error status from the printer (paper end, etc.) always has IR time of 1 minute.
- **Bracket Protocol End Job (BR_END_JOB.)**
  This parameter controls if the current print job should be terminated when a “End Bracket” is indicated in an SNA packet.

IBM Printer Emulation

The AXIS 570/670 can emulate a number of IBM printers. The following parameters control the characteristics of the printer emulation:

- **System Language (SYSL.)**
  This parameter selects the system language to be used.
- **IBM Printer Emulation (PREMUL.)**
  This parameter selects the IBM printer that is to be emulated

Page Format and Computer Output Reduction

There are a number of options that control the appearance of the printed pages. You may set up the number of lines on a page, the number of characters on a printed line, line density, characters per inch, and left and top margins. Please refer to “IBM Page Format”, page 197 in SECTION 11, for a description of the parameters that control these options.

In addition, there are options to automatically print in portrait or landscape mode depending on the length and width of the page to be printed. If the printed area is too large for the paper size, Computer Output Reduction, COR can automatically shrink the printout to fit the paper if you are using a laser printer. The following parameters control the automatic orientation and COR:

- **Automatic Orientation (AUTORI.)**
  Automatic orientation is by default enabled. The AXIS 570/670 will calculate the page size, and if it fits the paper it will print the page in portrait or landscape orientation. If the page size is to large for the paper, the page will be printed using COR and the orientation selected for the current paper bin.
- **Line Density Scale Factor (LDSF.)**
  The line density scale factor determines how much the line density is reduced in portrait-, landscape- and COR mode.
- **Bin n Orientation and paper size (BIN1.–BIN6.)**
  These parameters control the page orientation and paper sizes for the input paper bins. If the orientation is set to COR, computer output reduction will be used when printing. COR printouts require a laser printer and have the following characteristics:
- Landscape orientation.
- Vertically compressed to 70%
- Horizontally compressed by using a font with higher character density (see also “Fonts” in section 11.
- Top and left margins of 0.5" by default.

There are also IBM 3270 options that control the appearance of coloured text, the conversion of lower case to upper case characters, automatic insertion of linefeeds at the end of lines and pages and so on. Please refer to “IBM 3270 Options” in section 11 for a detailed description.

IBM Printer Driver

The printer driver is responsible for translating the print formatting information, for example line feeds or paper bin selections, to the proper control sequences for the attached printer. There is also a parameter specifying the character set used by the printer.

- **Printer Driver (PRDRIVER.)**
  The AXIS 570/670 has six pre-defined printer drivers for different printers. The generic printer driver supports most printers, but offers only basic printing capabilities. More advanced functions can be utilised with PCL5, PCL4, IBM Proprinter, Epson LQ or Epson FX compatible printers by using the appropriate printer driver. To tailor the printer driver to your needs, the User printer driver can be selected to allow manual editing of all printer control sequences.

There is a large number of parameters storing the various printer control sequences. Please refer to “IBM Printer Driver”, page 216 in SECTION 11, for a complete listing. When a printer driver other than “USER” is selected, all the IBM Printer Driver parameters are set to the default values for that driver. If you wish to assign new sequences to the parameters, you must first select the “USER” IBM Printer Driver.

- **Symbol Set (SBSET.)**
  Specifies the symbol set used by the printer.

Host set-up - VTAM (MVS, VM, VSE)

This section shows how to establish communication between an AXIS 570/670 and a mainframe attached directly to LAN through a LAN-to-host gateway. The examples below are based on samples given in “VTAM Customization” (IBM part no: SC23-0112). To set-up your host you will typically have to do the following:

1. Create a Logon-mode entry for your AXIS 570/670:

```
*
* For application output of LU-1 SNA Character Stream (SCS)
*
       TITLE ‘SCS670’
SCS670 MODEENT   LOGMODE=SCS670,
                 FMPROF=X’03’,TSPROF=X’03’,
                 PRIPROT=X’B1’,SECPROT=X’B0’,COMPROT=X’3080’,
                 RUSIZES=X’8585’,
                 PSERVIC=X’014000010000000001000000’,
                 PSNDPAC=X’03’,SRCVPAC=X’03’
```

or:

```
*
* For application output of LU-3 3270 Data Stream (3270DS)
*
       TITLE ‘DSC670’
DSC670 MODEENT   LOGMODE=DSC670,
                 FMPROF=X’03’,TSPROF=X’03’,
                 PRIPROT=X’B1’,SECPROT=X’90’,COMPROT=X’3080’,
                 RUSIZES=X’8585’,
                 PSERVIC=X’030000000000185018507F00’,
                 PSNDPAC=X’03’,SRCVPAC=X’03’
```

2. Create switched major node definitions (PU, PATH, and LU):

```
* PU definition, LAN-to-host gateway
* E07nnnnn is the node ID set in AXIS 570/670.
*
PU6701  PU        ADDR=04,
                  PUTYPE=2,
                  IDBLK=E07,
                  IDNUM=nnnnn,
                  MAXPATH=1,
                  SSCPFM=USSSCS,
                  USSTAB=USSMAST,
                  VPACING=(0)
*
* Path definition
* xxxxxxxxxxxx is the 12 last digits of the MAC
* address of the AXIS 570/670
*
PA6701  PATH      DIALNO=0104xxxxxxxxxxx,
                  GID=1,
                  PID=1,
                  GRPNM=ggggggg
*
* LU definitions. Use either LU6701 or LU6703
*
* LU type 1 (SCS)
*
LU6701  LU        LOCADDR=1,
                  DLOGMOD=SCS670,
                  VPACING=7,
                  PACING=3
*
* LU type 3 (3270DS)
*
LU6703  LU        LOCADDR=1,
                  DLOGMOD=DSC670,
                  VPACING=7,
                  PACING=3
```

or:

```
*
* PU definition for 9370. PATH is not used.
* E07nnnnn is the node ID set in AXIS 570/670.
* xxxxxxxx is the 8 last digits of the MAC address of
* the AXIS 570/670.
*
PU6701  PU        IDBLK=E07,
                  IDNUM=nnnnn,
                  MACADDR=xxxxxxxxxxx,
                  SAPADDR=04
```

In the PU definition, `IDNUM` should be set to the five last digits of the AXIS 570/670 node address, NODE_ADDR. In the path definition, the last twelve digits of PATHDIALNO should be set to the AXIS 570/670 Ethernet or Node address. Also, you must supply a valid GRPNM.

In the LU definition, LOCADDR directs the printout to the printer ports of the AXIS 570/670. The first eight LU:s passes the printout through Logical Printer 1-8. Logical Printer 5-8 filters the data stream before printing and cannot be used with SNA printing unless the filter is disabled.

3. Verify the communication by sending a print job to the printer.

Host set-up OS/400

This section show how to establish communication between an AXIS 570/670 and an AS/400.

1. Set up a line description for the Ethernet or Token Ring adapter of the AS/400.
2. Create a controller description. The values that should be entered are in **bold** type. The **underlined** values must be entered exactly as shown.

```
Create Ctl Desc (Remote WS) (CRTCTLRWS)

 Type choices, press Enter.

 Controller description . . . . . > CTL670         Name
 Controller type  . . . . . . . . > 3174           3174, 3274, 5251, 5294...
 Controller model . . . . . . . . > 0              0, 1, 0001, 2, 0002, 12, 0012
 Link type  . . . . . . . . . . . > *LAN           *IDLC, *LAN, *NONE, *SDLC...
 Online at IPL  . . . . . . . . .   *YES           *YES, *NO
 Switched line list . . . . . . . > ssssssss       Name
               + for more values
 Maximum frame size . . . . . .    *LINKTYPE       265-1994, 256, 261, 265...
 Exchange identifier  . . . . .                    00100000-FFFFFFFF
 Initial connection . . . . . .    *DIAL           *DIAL, *ANS
 Dial initiation  . . . . . . .    *LINKTYPE       *LINKTYPE, *IMMED, *DELAY
 LAN remote adapter address . . .  xxxxxxxxxxxx    000000000001-FFFFFFFFFFFF
 Text 'description' . . . . . .    'Controller for AXIS 570/670'

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

The LAN remote adapter address (`xxxxxxxxxxxx`) should be set to the AXIS 570/670 Node address. Switched line list (`ssssssss`) should be set to the Line description name of the Ethernet or Token Ring network in use.

3. Create a printer description. Attached Controller should have the same name as the Controller Description above.

```
Create Device Desc (Printer) (CRTDEVPRT)

 Type choices, press Enter.

 Device description . . . . . > PRT670        Name
 Device class . . . . . . . . > *RMT          *LCL, *RMT, *VRT, *SNPT
 Device type  . . . . . . . . > 3287          3287, 3812, 4019, 4201...
 Device model . . . . . . . . > 0             0, 1, 2, 3, 4, 10, 13, 200...
 Local location address . . . > 01            00-FE
 Online at IPL  . . . . . . .   *YES          *YES, *NO
 Attached controller  . . . . > CTL670        Name
 Separator program  . . . . .   *NONE         Name, *NONE
   Library  . . . . . . . . .                 Name, *LIBL, *CURLIB
 Printer error message  . . .   *INQ          *INQ, *INFO
 Message queue  . . . . . . .   QSYSOPR       Name, QSYSOPR
   Library  . . . . . . . . .     *LIBL       Name, *LIBL, *CURLIB
 Application type . . . . . .   *NONE         *NONE, *NRF, *DEVINIT...
 Text 'description' . . . . .   'Printer for AXIS 570/670'

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

Local location address directs the printout to the printer ports of the AXIS 570/670. The first eight LU:s passes the printout through Logical Printer 1-8. Logical Printer 5-8 filters the data stream before printing and cannot be used with SNA printing unless the filter is disabled. Local location address 01 cannot be used with older versions of OS/400. Please note that using address 02 will direct the printout to logical printer 2 and by default to the LPT2 printer port.

A writer and a print queue with the same name as the printer description will be automatically created.

4. “Vary on” the printer.
5. Start the writer
6. Verify the communication by sending a print job to the printer

Gateway Configuration

Some hints specific to SNA gateways are given below.

- AXIS 570/670 appears to a gateway as a downstream PU (DSPU), with eight LU:s, 1 to 8.
- Only gateways that communicate with DSPUs using SNA over LLC type 2 are currently supported.
- There are basically two types of gateways that the AXIS 570/670 can be attached to: pass-through gateways and concentrator gateways, as described below.

Devices attached downstream to a pass-thru gateway will be completely visible to the host. In other words, each downstream PU will have a PU definition on the host. Examples of pass-through gateways are IBM 3745 Communications Controller, IBM 3174 Establishment Controller, IBM 3172 LAN Interconnect Controller, etc.

You need to set up at least one PU and LU definition for each AXIS 570/670 on the host, as described in the VTAM section.

When attaching an AXIS 570/670 to a remote pass-through gateway, you need to set the mapping of SDLC or sub-channel address to MAC address in the gateway.

A concentrator gateway will typically behave as one PU (or a few PUs) to the host, even though a number of PUs may be available downstream. If it is an SDLC or channel attached gateway, typically only one SDLC or sub-channel address will be used. Examples of concentrator gateways are: IBM Communications Manager/2 (OS/2), Novell NetWare for SAA (NetWare 3.x or 4.x), Microsoft SNA Server (Windows NT) etc.

When an AXIS 570/670 is attached to this type of gateway, you can map the chosen AXIS 570/670 LU to any host LU you like. This way, several print servers may be accessed through the same gateway.

Pooling of LU:s may not be used for AXIS 570/670.

SECTION 6

IBM EXTENDED EMULATION MODE

NOTE: This section only applies to Axis Network Print Servers that operate in the SNA protocol environment, i.e. AXIS 570 and AXIS 670.

The Extended Emulation mode provides access to functions that are not available in normal IBM printer emulation. Those functions are:

- Configuration Mode
- Hex Transparency
- User Defined Strings
- String Substitutions
- Bar Codes
- Font Selection.

The Extended Emulation functions are accessed by inserting special commands in your documents. This section describes these commands and their associated functions.

The Extended Emulation Control Command

This command is used to enable/disable the features offered by Extended Emulation. The Extended Emulation is controlled by inserting the Extended Emulation Control Sequence (EECS) with a trailing plus or minus sign into your document:

`%AXIS+`	*(Enable Extended Emulation, and*
`%AXIS-`	*Disable Extended Emulation.)*

If required, the default control sequence (%AXIS) can be changed, either by setting up the Extended Emulation Control Sequence parameter (EECS), or using AXIS NetPilot.

These commands will only change the emulation mode temporarily, i.e. the default mode will be restored at the next power on. To enable or disable the extended emulation permanently, see the examples given in *Configuration Mode* (page 86).

The Extended Emulation is enabled by default. You can generally leave it enabled even if you do not use any Extended Emulation Functions. The only time you need to disable it is when Extended Emulation commands appears in the data stream, and you want them printed as normal text rather than being interpreted as commands.

When evaluating or testing files in the Extended Emulation mode, it can be useful to set the Warning Switch parameter (WARN) to 'ON' for debugging purposes. See Warning Switch, page 207 and also APPENDIX B, page 266, SNA Printing Error Messages.

IMPORTANT: All Extended Emulation commands and parameter values are case sensitive.

The Extended Emulation Data Format

When accessing Extended Emulation functions, the following format should be used for entering data.

- Use **$** or ¤ to precede hexadecimal values.
- Use either apostrophes ' or double quotes " around text strings. If apostrophes are leading and following a text string, double quotes may be used within the string, and vice versa.
- Hexadecimal values referring to Axis Internal Code (AIC), such as the Transparency Lead-In Sequence, are in the range $000 to $2FF. See AIC character tables, page 254 to page 256.
- Do not use proportional or typografic fonts in the Extended Emulation Mode.
- Use spaces instead of tabs to avoid positioning problems.

Syntax descriptions

In the syntax descriptions on the following pages, the following special characters are used:

<>	*Indicates that you must supply a value or a command etc. Do not enter the brackets in your file.*
[]	*Indicates that the enclosed commands etc. are optional.*

Configuration Mode

The Configuration Mode provides a way to configure your Axis 570/670 from your IBM system.

IBM Printing Parameters

The parameters that control the IBM printing characteristics of the AXIS 570/670 can be accessed by inserting the Configuration Control Command with a trailing plus or minus sign into your document. Furthermore, if a password has been set up to restrict access to the AXIS 570/670 settings, the password must be given after the first Configuration Control Command:

`%CONFIG+ <password> ;`	*Enter Configuration Mode.*
`%CONFIG-`	*Exit Configuration Mode.*

The Configuration Mode is only available when the Extended Emulation Mode is enabled. Any configuration commands received outside extended emulation will be printed as normal text.

Other Parameters

All other AXIS 570/670 parameters can also be set up in Configuration Mode. In order to maintain backward compatibility with other Axis products and to prevent accidental changes to vital parameters the command pair %CONFIG++ and %CONFIG-- must be used to bracket configuration commands effecting these parameters.

Syntax:

```
%CONFIG+ <password> ;
[<IBM Printing Configuration Command>;] [ (Comment) ]
[<IBM Printing Configuration Command>;]
%CONFIG++
[<Configuration Command>;] [ (Comment) ]
[<Configuration Command>;]
%CONFIG--
%CONFIG-
```

- A Configuration Command sets or modifies an Axis 570/670 parameter, see SECTION 11 page 137, for a complete description of parameters. The IBM Printing Parameters are clearly marked in the listing.
- Comments enclosed within brackets may be inserted anywhere between the CONFIG+ and CONFIG- commands.
- The current print position is always maintained while in configuration mode. Spaces and control codes (New Line, Form Feed, etc.) as well as comments are ignored.
- Any other data received while in configuration mode will cause an Illegal Command error. See also Error Messages, APPENDIX B, page 266.
- The settings and commands will not become effective until the %CONFIG- command is entered. Some settings concerning the entire page, such as orientation and bin selection will not become effective until the following page break.
- The purpose of the Configuration Mode is to perform a basic configuration and initialize all settings of the Axis 570/670. To make temporary changes, such as font selection for a single document, it is recommended to use the Function Mode, see page 90.

The following examples demonstrate how to enable and disable the Extended Emulation permanently. The command XEMUL is described on page 207.

Example 1 – Enable Extended Emulation permanently

The commands below perform the following functions line-by-line: (1) Enable Extended Emulation, (2) enter Configuration Mode, (3) Set Extended Emulation enabled as default, (4) save the configuration, (5) exit Configuration Mode.

```
1: %AXIS+
2: %CONFIG+ pass ;
3: XEMUL = ON;
4: SAVE;
5: %CONFIG-
```

Example 2 – Disable Extended Emulation permanently

The commands below perform the following functions line-by-line: (1) Enable Extended Emulation, (2) enter Configuration Mode, (3) Set Extended Emulation disabled as default, (4) save the configuration, (5) exit Configuration Mode, (6) exit Extended Emulation Mode.

```
1: %AXIS+
2: %CONFIG+ pass ;
3: XEMUL = OFF;
4: SAVE;
5: %CONFIG-
6: %AXIS-
```

Hex Transparency

The transparency (pass-through) function allows you to send data to the printer without any conversion. Typical applications are ASCII printer commands not supported by the IBM system, and down-loaded fonts.

It is controlled by a pair of control sequences: The Transparency Lead-In Sequence (TLIS) and the Transparency Trailer Sequence (TTRS).

Syntax:

```
<TLIS> <##> [<##> … <##>] <TTRS>
<TLIS> " <chars> " <TTRS>
```

- **TLIS** is the Transparency Lead-In Sequence. The default sequence is the percent and less-than symbols (%<).
- ## represents an ASCII character code given as two hexadecimal digits (00-FF).
- **chars** represents a string of ASCII characters.
- **TTRS** is the Transparency Trailer Sequence. The default sequence is the greater-than and percent symbols (>%).
- Hex numbers and ASCII strings may be separated by spaces, commas, or Line Feeds. These separators will not be printed.

Note: Hex Transparency requires that Extended Emulation is activated

Examples:

The following command (<ESC>&a8L) sets the printer‘s left margin to column 8:

```
%<1B 26 61 38 4C>%
```

You may mix hex codes with quoted ASCII text for better readability:

```
%<1B,"&a8L">%
```

The comma after *1B* is optional, as are the spaces between the hex codes in the first example.

Although it is allowed to move the printable characters of a printer control command outside the transparency sequence (e.g. %<1B>%&a8L), we strongly recommend you to keep the complete command inside as in the examples above. The reason is that if a line break generated by the system should occur within a printer control command, that command would be corrupted.

Keeping the command inside the transparency sequence is safe, since all control codes occurring between the transparency lead-in and trailer sequences are suppressed.

Notes:

1. Printer control commands sent by hex transparency may interfere with system commands. In particular, avoid changing any page formatting (LPI, CPI, etc.) when Automatic Orientation is active.
2. Printable characters other than hex digits (0-F) and quoted text will immediately terminate a transparency sequence. See also Error Messages, APPENDIX B, page 266.
3. All characters (including TLIS, TTRS, and separators) in transparency sequences will increase the position counter, even if the actual print position is unchanged.

Single Byte Transparency

The Single Byte Transparency function passes through one byte of data to the printer. It is activated by a control sequence (SBTS), which is available in Extended Emulation Mode. SBTS is empty by default. It must be programmed before single byte transparency can be used.

Syntax:

```
<SBTS> <##>
```

- **SBTS** is the Single Byte Transparency Sequence.
- ## represents two hexadecimal digits.

Example:

The standard application is to generate the ASCII Escape character. An example is if you want to set the printer's left margin to column 8 by sending the printer command (<ESC>&a8L). Assuming that SBTS is defined as the "logical not" (¬), the sequence 1B will generate the ASCII Escape character. The following sequence will generate the printer command:

```
¬1B&a8L
```

The Single Byte Transparency is included to maintain compatibility with existing host applications. For new applications, the normal Hex Transparency is recommended.

Redefinition of the Transparency Sequences

If your documents are written for other protocol converters, you will have to redefine the lead-in and trailer sequences before printing through the Axis 570/670. Some other Axis products use the sequences ‘%%’ and ‘%’. The following configuration file can be used:

```
%CONFIG+ pass ;
TLIS = "%%";
TTRS = "%";
SAVE;
%CONFIG-
```

Before using the Single Byte Transparency, The Single Byte Transparency Sequence (SBTS) must be programmed. To set the lead-in character to the logical not symbol (¬), use the following example:

```
%CONFIG+ pass ;
SBTS = "¬";
SAVE;
%CONFIG-
```

The sequences can alternatively be specified in hexadecimal notation. The hexadecimal codes are taken from the Axis Internal Code, Page 0 table in APPENDIX A, page 237 ($25 is the percent sign, and $AA is the logical not).

```
%CONFIG+ pass ;
TLIS = $25,$25;
TTRS = $25;
SBTS = $AA;
SAVE;
%CONFIG-
```

Function Mode

The Function Mode feature allows you to redefine and activate Axis 570/670 functions such as User Defined Strings, font selections, and printer control sequences. A Function Mode sequence begins with a Function Lead-In Sequence (FLIS) followed by a function call, and ends with a semi-colon.

Syntax:

```
<FLIS> <FN> <ARG> [, ARG] ;
<FLIS> <PCS> ;
```

- **FLIS** is the Function Mode Lead-In Sequence. The default sequence is the percent and slash symbols (%/).
- **FN** is a function identifier. The AXIS 570/670 has built-in functions for user definable strings, font selection and bar codes as will be described later in this section. The function identifiers, UDS, FONT, and BAR are used to invoke the functions.
- **ARG** is a function argument.
- **PCS** is a Printer Control Sequence, such as FFS for Form Feed Sequence etc. See section 11, the Parameter list for available Printer Control Sequences.

Function Mode requires that Extended Emulation is activated

Examples:

```
%/FONT 11;%/UDS 5;
```

This will select the font FGID 11, and print the User Defined String no. 5.

```
%/GRNS;Print in green%/BLKS;
```

The Green Color Sequence is activated to print in green, and then black is restored (this of course requires a color printer).

Redefinition of the Function Lead-In Sequence

Normally, there is no need to redefine the Function Mode sequences. However, if you want to use the default sequence, %/, in your printed document, the Function Mode sequences can be redefined in the same way as the Transparency sequences. The following configuration file changes the sequence to '&!':

```
%CONFIG+ pass ;
FLIS = "&!";
SAVE;
%CONFIG-
```

IMPORTANT: Make sure that FLIS and TLIS are different. You should always be careful when redefining any sequences in order to avoid conflicts.

User Defined Strings

The User Definable Strings are a set of 256 programmable sequences. The UDS are useful for storing long sequences, such as printer function sequences, within the Axis 570/670. Each sequence can be activated by inserting a short control command in your documents. A UDS may contain both printer language commands and text. The total length of all UDS is limited by the available non-volatile memory. Its standard size is 2kB.

Syntax, programming:

```
UDS <number> = [<sequence>] ;
```

- **number** is the UDS number in the range 0 - 255 (decimal) or $00 - $FF (hexadecimal). Space characters between UDS and number are ignored.
- **sequence** is the UDS contents, given as hexadecimal byte values or quoted ASCII characters. If sequence is omitted, the specified UDS will be deleted.

Programming can only be done in Configuration Mode

Syntax, retrieving:

```
<FLIS> UDS <number> ;
```

- **FLIS** is the Function Mode Lead-In Sequence. The default sequence is the percent and slash symbols (%/).
- **number** is the UDS number in the range 0 - 255 (decimal) or $00 - $FF (hexadecimal). Space characters between UDS and number are ignored.

Syntax, deleting:

```
UDS = DEL ;
```

- This will delete all User Defined Strings. To delete a single UDS, see the programming syntax above.

Deleting can only be done in Configuration Mode

Application Example: Automatic Letter Heads

Use the UDS function to create automatic letter heads by programming some PCL macro control commands:

```
%CONFIG+ pass ;
UDS 0 = $1B,"&f0Y";
UDS 1 = $1B,"&f0X";
UDS 2 = $1B,"&f1X";
UDS 3 = $1B,"&f4X";
UDS 4 = $1B,"&f5X";
UDS 5 = $1B,"&f8X";
SAVE;
%CONFIG-
```

The first sequence (UDS 0) is the ‘Define macro ID 0’ command (<ESC>&f0Y). The following (UDS 1 - 5) are: ‘Start macro definition’, ‘Stop macro definition’, ‘Enable macro for automatic overlay’, ‘Disable automatic overlay’, and ‘Delete macro’.

You may now use the UDS references to use macro control in your document:

```
1: %/UDS 0;%/ UDS 1;{include macro definition here}%/UDS 2;
2: %/UDS 3;
3: {your document using automatic overlay}
4: %/UDS 4;
5: {reminder of document without automatic overlay}
6: %/UDS 5;
```

- The first line assigns a zero as the current macro ID number, and records anything between the curly brackets as macro #0.
- The second line enables the current macro for automatic overlay, meaning that the recorded macro will be printed on every page until disabled.
- The fourth line disables the automatic overlay. The overlay still remains in the printer, and can be activated again by %/UDS 3;.
- The sixth line deletes the current macro from the printer’s memory.

For further details, see the ‘Macro Control’ section of your printer’s manual.

String Substitutions

The String Substitution function searches the output data stream for specified sequences of AIC characters (Match Strings), and substitutes them with other sequences (Substitute Strings). Up to 128 pairs of Match/Substitute Strings may be defined.

String substitutions take place after the character and control code conversion, but before the Extended Emulation. This means that IBM Control Codes cannot be substituted, but Extended Emulation sequences can.

Syntax, programming:

```
MSTR <number> = [<sequence>] ;
SSTR <number> = [<sequence>] ;
```

- **MSTR** indicates a Match String, and **SSTR** is the Substitute String.
- **number** is the Match/Substitute String number in the range 0 - 127 (decimal) or $00 - $7F (hexadecimal). Space characters between MSTR/SSTR and number are ignored.
- **sequence** is the Match/Substitute String contents, given as hexadecimal byte values or quoted ASCII characters. If sequence is omitted, the specified Match/Substitute String will be deleted.

Programming can only be done in Configuration Mode

Syntax, deleting:

```
MSTR = DEL ;
SSTR = DEL ;
```

- This will delete all Match and Substitute Strings. To delete a single Match/ Substitute String, see the programming syntax above.

Deleting can only be done in Configuration Mode

IMPORTANT:

- The position counter is always incremented by the number of characters in the Match String. If you are substituting text strings, and the Substitute String is longer than the Match String, the current print line may be truncated.
- The substitution takes place as soon as a Match String is found in the data stream. This means that if you have to Match Strings ‘ABC’ and ‘ABCD’, the latter string will never be detected.

Application Example: Printer Replacement

If your documents contain embedded printer control commands, you will have to modify these commands if the printer is replaced. Instead of changing your documents, you can let the Axis 570/670 substitute the commands at run-time.

The commands below will configure the Axis 570/670 to substitute IBM Proprinter commands for start and stop underlining (<ESC>-1 and <ESC>-0)with the corresponding PCL commands (<ESC>&dD and <ESC>&d@):

```
%CONFIG+ pass;
MSTR 0 = "%<1B2D31>%";
SSTR 0 = "%<1B266444>%";
MSTR 1 = "%<1B2D30>%";
SSTR 1 = "%<1B266440>%";
SAVE;
%CONFIG-
```

The example above assumes that your documents use the Axis 570/670 default transparency lead-in an trailer sequences. If other sequences are used (e.g. %% and %), modify the example as shown below:

```
%CONFIG+ pass;
MSTR 0 = "%%1B2D31%";
SSTR 0 = "%<1B266444>%";
MSTR 1 = "%%1B2D30%";
SSTR 1 = "%<1B266440>%";
SAVE;
%CONFIG-
```

Application Example: Character Replacement

String Substitutions can be used to replace specific characters. The example below replaces the dollar sign with the international currency sign (¤), and the logical not (¬) with the escape character:

```
%CONFIG+ pass;
MSTR 0 = "$";
SSTR 0 = $CF;
MSTR 1 = $AA;
SSTR 1 = "%<1B>%";
SAVE;
%CONFIG-
```

Bar Codes

The bar code function gives you easy access to a range of standard bar code types resident in the AXIS 570/670. Bar codes can only be printed on PCL printers.

Before the bar codes can be printed, a bar code format has to be defined. This format sets the type and size of the bar code to be printed. Up to 16 such formats can be predefined. The definitions are made by setting up the BAR parameter.

Syntax, programming:

```
BAR <number>=<type>,<width>,<height>,<text mode>,
<check mode>;
```

- **number** is the bar code definition number in the range 0–15. This number is used to refer to the definition when printing the bar code.
- **type** is the predefined bar code type. Valid values are:

Value	Description	Value	Description
CODE39	Code 39	**CODE128**	Code 128
UPCA	UPC version A	**INT2OF5**	2 of 5 Interleaved
EAN8	EAN-8	**CODEBAR**	Codebar matrix
EAN13	EAN-13		

- **width** is the bar code module width in 1/1000 inch. Valid range is 1 to 1000. The default value is 12.
- **height** is the bar code element height in 1/24 inch. Valid range is 1 to 500. The default value is 12.
- **text mode** selects if human readable text is printed under the bar code or not. ‘YES’ or ‘ON’ will turn on text, ‘NO’ or ‘OFF’ will turn off text. The default mode is ‘ON’.

  Bar Code types UPCA, EAN8 and EAN13 use the font specified for FGID 3 (OCR-B). Other Bar Code types use the font specified for FGID 19 (OCR-A).

  Many printers do not support OCR fonts as standard. If no extra fonts are installed in the printer, the text will be printed with Courier typeface.

  You can also modify the Font Definition table for the Bar Code fonts as per all other fonts. Refer to page 98 for more information.
- **check mode** selects if a check digit will be generated or not. ‘YES’ or ‘ON’ will generate a check digit, ‘NO’ or ‘OFF’ will not generate a check digit. The default mode is ‘ON’. The check digit will always be generated for bar code types UPCA, EAN8 and EAN13, regardless of the setting of **check mode**.

  The check digit will always be generated for Bar Code types UPCA, EAN8 and EAN13 regardless of the setting of check mode.

The Bar Code definitions can be permanently saved by using the command:

```
SAVE;
```

Programming can only be done in Configuration Mode

Syntax, retrieving:

```
<FLIS>BAR<number>,<sequence>;
```

- **FLIS** is the Function Lead-In Sequence. The default sequence is the percent and slash symbols (%/).
- **number** is the Bar Code definition number in the range 0 - 15 (decimal) or $00 - $0F (hexadecimal). Space characters between BAR and number are ignored.
- **sequence** is the text to be printed. It can be specified within double quotes (") or apostrophes ('). Text can also be specified as decimal or hexadecimal values using Axis Internal Codes (AIC).

  When using Code 128 unprintable characters and functions can be reached by using AIC according to the tables below.

  Unprintable characters in Code 128 can be reached by using AIC:

Character	AIC	Character	AIC
NUL	$00	DLE	$10
SOH	$01	DC1	$11
STX	$02	DC2	$12
ETX	$03	DC3	$13
EOT	$04	DC4	$14
ENQ	$05	NAK	$15
ACK	$06	SYN	$16
BEL	$07	ETB	$17
BS	$08	CAN	$18
HT	$09	EM	$19
LF	$0A	SUB	$1A
VT	$0B	ESC	$1B
FF	$0C	FS	$1C
CR	$0D	GS	$1D
SO	$0E	RS	$1E
SI	$0F	US	$1F

  Function codes in Code 128 can be reached by using AIC:

Function	AIC
FNC 1	$F1
FNC 2	$FD
FNC 3	$FC
FNC 4	$EF

Syntax, deleting:

```
BAR=DEL;
```

This will delete all Bar Code definitions.

Deleting can only be done in Configuration Mode

Application Example

Configure Bar Codes of type EAN-8 with different heights:

Note that the check digit is always generated in EAN-8 and therefore not specified here.

```
%CONFIG+ pass;
BAR0=EAN8,12,4,ON;
BAR1=EAN8,12,8,ON;
%CONFIG-
```

Print Bar Codes defined in the example above. After one Bar Code is printed, the current position will be the same as before it was printed. Just put in spaces or empty lines in your document to make room for the Bar Codes.

```
%/BAR0,'0123456'; %/BAR1,"0123456";
```

Two Bar Codes with different heights will now be printed on the same line:

Redefine the height of Bar Code definition 0:

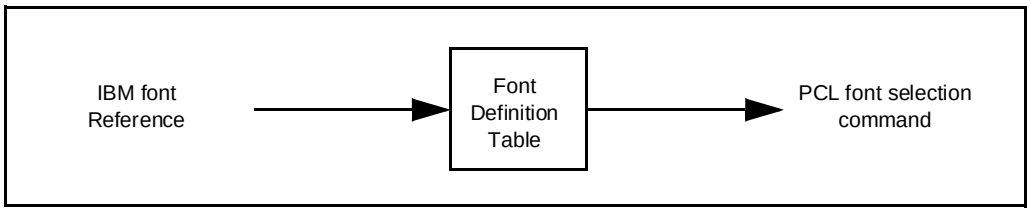
```
%CONFIG+
BAR0=,,20;
%CONFIG-
```

Resulting printout:

Font Selection

Fonts can be indirectly selected by the IBM system using pitch selection (CPI). In order to gain full access to the fonts the AXIS 570/670 offers an alternative font selection command. Please note that matrix printers only support a few fonts.

The AXIS 570/670 does not contain any fonts. What it does is to take an IBM font reference, and translate it into a font selection command that can be used with the selected printer (PCL4, PCL5, IBM Proprinter, Epson Fx or Epson LQ). The translation is controlled by the Font Definition Table:



By default, the AXIS 570/670 Font Definition Table contains the following font definitions:

FGID	Pitch(CPI)	IBM Font Name	PCL font name
11	10	Courier 10	Courier
86	12	Prestige Elite	Courier
204	13.3	Gothic Text 13	Letter Gothic
230	15	Gothic Text 15	Letter Gothic
244	5	Courier 5	Courier
252	17.1	Courier 17	Courier
281	20	Gothic Text 20	Letter Gothic
290	26.7	Gothic Text 27	Letter Gothic

The Font Selection command makes it possible to select and modify any of the above font definitions. A font is specified by an Font Global IDentifier (FGID) number, and an optional Point Size parameter.

Syntax:

```
<FLIS> FONT <FGID> [,<PS>] ;
```

- **FLIS** is the Function Mode Lead-In Sequence. The default sequence is the percent and slash symbols (%/).
- **FGID** is the Font Global Identifier. The valid range is 0 - 65535 (decimal) or $0000-$FFFF (hexadecimal). Space characters between FONT and FGID are ignored.
- **PS** is the Point Size, specified in 1/10 points. Fixed pitch fonts are not scalable. If a Point Size is specified, it will be used to compress or expand the character spacing. (`%/FONT 11,105;` will compress the 10 CPI font to 10.5 CPI without changing the size of the characters). If omitted, the default size is 10 points.

Font selection requires that Extended Emulation is activated

IMPORTANT: Function Mode font selections may cause conflicts with font setting commands from the system. Selecting a large font may cause truncated lines and incorrect page breaks.

Example:

The following example shows how to select the 10 CPI Courier (fixed pitch) font.

```
%/FONT 11;This is 10 CPI Courier
```

Resulting printout:

```
  This is 10 CPI Courier
```

SECTION 7

LOGICAL PRINTERS

One of the most powerful features of the Axis print server is the Logical Printer concept (The AXIS 150/152 models do not support logical printers). A logical printer is an advanced device driver acting as an interface between the network and the physical printer. The Axis print servers have eight logical printers that, together with the multiple protocol support, provides excellent printing flexibility. Each logical printer can be individually configured and connected to one of the physical printer ports. The figure below illustrates the logical printer concept:

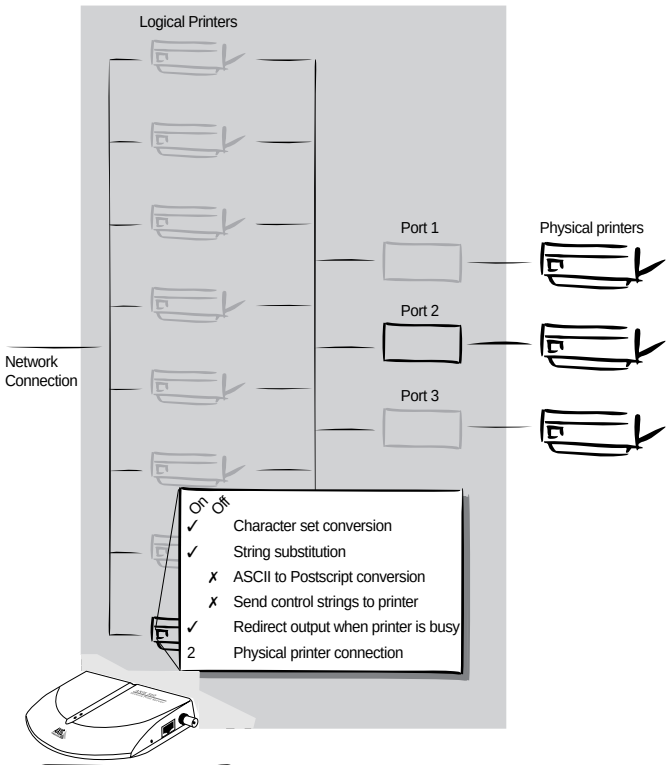


Figure 7-1 Logical Printers – schematic overview

CAUTION: If you are using the IBM Printer Emulation facilities of the AXIS 570 or AXIS 670 you should be aware that the Logical Printers operate on the print data after the emulation module. Thus some of the Logical Printer operations, such as the string substitution, could interfere with IBM Printer Emulation. However, the only default settings in the Logical Printers that will cause problems with emulation, are in Logical Printers 5 to 8 which add a carriage return to each line feed passing to the printer.

AXIS NetPilot Logical Printer Property Page

Throughout this section there are references to the alterations that can be made to the *config* file to configure the logical printers. The easy way to make changes to the *config* file is to use the AXIS NetPilot configuration utility.

If you need assistance in using NetPilot then you should use the online Help facility provided with the program. A brief summary is provided below to get you started.

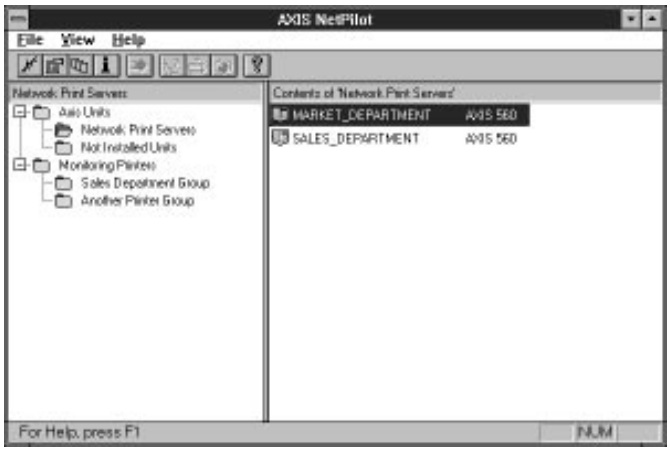


Figure 7-2 AXIS NetPilot Main Window

On entering AXIS Netpilot you are presented with a window showing you the print servers on the network.

Select the print server whose logical printers you wish to configure.

Next click the Properties button.

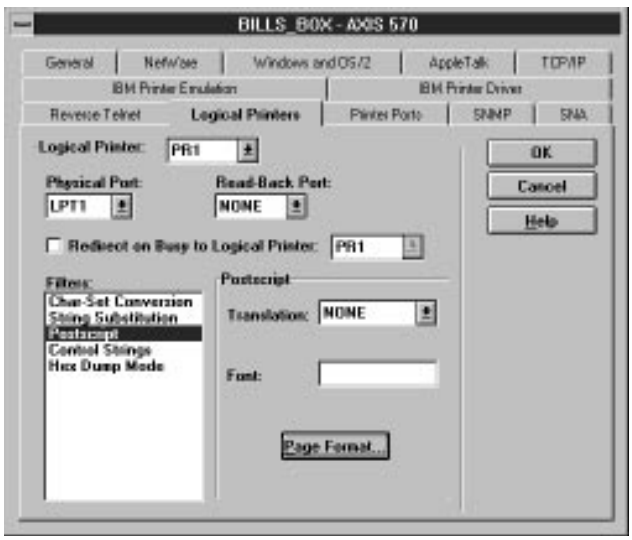


Figure 7-3 AXIS NetPilot Logical Printer Property Page

Select the Logical Printers tab and you will see the screen shown on the left.

This allows you to choose a logical printer, PR1 to PR8, at the top of the page and then alter any of the settings associated with that logical printer.

Press F1 at any time to get help on the operation that you are carrying out.

As you can see above, the use of NetPilot does away with dealing with abbreviated parameter names and the syntax used by the *config* file. Instead you work within a friendly windows environment, and when you change a value on the property page and click OK, that value is entered in to the *config* file automatically by NetPilot.

Logical Printers - Theory of Operation

The Logical Printers block processes print data from the NetWare (not valid for print servers with NDS support), NetBIOS/NetBEUI, TCP/IP, AppleTalk, and SNA interfaces and passes it on to the physical printers. The data processing is handled by five filters (*Character Set Conversion* through *Hex Dump Mode*).

The diagram below shows the first of eight logical printers (PR1). All logical printers are identical except from the fact that they have individual sets of parameters governing the function, see *THE PARAMETER LIST* (page 137).

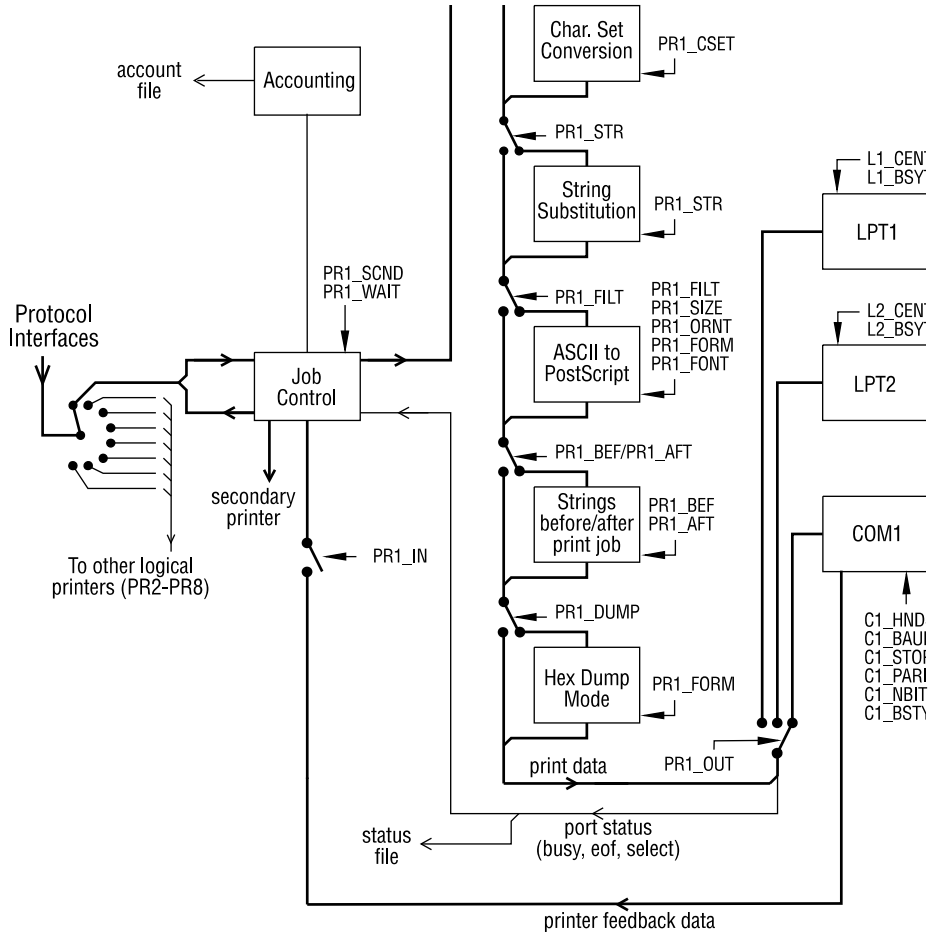


Figure 7-4 *The Logical Printers – PR1*

The eight-position switch represents the selection of a logical printer (PR1 - PR8). This selection is done in different ways depending on the protocol used, see *Network Printing*, page 35.

The *Job Control* block handles the data flow – outbound print data and inbound port status, printer feedback data, and accounting information. The *status* and *account* files are discussed in *FTP and Telnet*, page 115.

The filters *Character Set Conversion* through *Hex Dump Mode* perform the print data processing. The functions of each filter is described on the following pages. The filters process data sequentially in the order indicated by the diagram above.

The *LPT1*, *LPT2* and *COM1* blocks represent the printer ports, where LPT1 and LPT2 are parallel (Centronics) and COM1 is serial. The printer port configuration depends on the type of print server. The configuration shown would be correct for a three port print server (e.g. the AXIS 560), while the pocket servers NPS 530, 532, 630 and 632 have only one printer port (LPT1).

The switches represent the data flow control. As an example, the ASCII-to-PostScript filter is invoked both by Printer Language Translation parameter ('PR1_FILT') and by the filter itself (when set to AUTO_PS).

Note that the switches are not shown in their factory default position.

Physical Printer Port

You can connect from one to three printers to your Axis print server depending on which model you have - refer to the table below.

Physical Printer Ports available in each model:

	NPS 530/532 and NPS 630/632	NPS 550/650	AXIS 560/660	AXIS 570/670
Parallel ports	1	2	2	2
Serial ports	0	1	1	1

Each logical printer may be assigned to any one of the Axis print server's physical printer ports. The factory default configuration is:

Physical Printer Ports:

Logical Printer	NPS 530/532 and NPS 630/632	NPS 550/650	AXIS 560/660	AXIS 570/670
PR1	LPT1	LPT1	LPT1	LPT1
PR2	LPT1	LPT2	LPT2	LPT2
PR3	LPT1	COM1	COM1	COM1
PR4	LPT1	COM1	COM1	COM1
PR5	LPT1	LPT1	LPT1	LPT1
PR6	LPT1	LPT2	LPT2	LPT2
PR7	LPT1	COM1	COM1	COM1
PR8	LPT1	COM1	COM1	COM1

The parameters below control the physical printer ports - they can be setup by using one of the methods described in *PARAMETER EDITING* (page 131).
For full details on these parameters refer to SECTION 11 - *THE PARAMETER LIST* (page 137).

- **PR1 Physical Printer Port (PR1_OUT) (PRINTER1MENU)**
  This parameter specifies which port logical printer PR1 is attached to. PR2 through PR8 ports are specified by parameters **PR2_OUT** to **PR8_OUT.** The default port assignments are shown in the table above. Refer to Figure 7-3 to see how to set this parameter using NetPilot.

- **LPT1 Centronics Interface Timing (L1_CENTR) (OUTPUTMENU)**
  This parameter controls the transfer rate for the LPT1 port. The default setting is *STNDRD* (standard Centronics timing). If your printer supports high-speed communication, you may change to *FAST* or *HISPEED* for higher performance. The slower *IBM_PC* setting is intended for older printers that don't support the standard Centronics timing.

- **LPT1 Busy Status Time-Out (L1_BSYTM) (OUTPUTMENU)**
  This parameter specifies the waiting time before a printer busy status is reported for LPT1. The default time-out is 60 seconds.

- **COM1 Handshake Protocol (C1_HNDSH) (OUTPUTMENU)**
  This parameter specifies the handshake protocol used by COM1. Both hardware (Ready/Busy) and software (XON/XOFF) protocols are supported. The default setting is *BOTH* protocols enabled. *Make sure that this parameter matches your printer set-up.*

- **COM1 Baud Rate (C1_BAUDR) (OUTPUTMENU)**
  This parameter specifies the baud rate for COM1. All standard baud rates from 300 to 115,200 baud are supported. The default setting is 9600 baud. *Make sure that this parameter matches your printer set-up.*
- **COM1 Stop Bits (C1_STOPB) (OUTPUTMENU)**
  This parameter specifies the number of stop bits for COM1. One or two stop bits may be used, where two is the default. *Make sure that this parameter matches your printer set-up.*
- **COM1 Parity (C1_PARIT) (OUTPUTMENU)**
  This parameter specifies the parity check for COM1. None, odd, or even parity may be used, where *NONE* is the default. *Make sure that this parameter matches your printer set-up.*
- **COM1 Word Length (C1_NBITS) (OUTPUTMENU)**
  This parameter specifies the word length for COM1. Seven or eight bits may be used, where eight is the default. *Make sure that this parameter matches your printer set-up.*
- **COM1 Busy Status Time-Out (C1_BSYTM) (OUTPUTMENU)**
  This parameter specifies the waiting time before a printer busy status is reported for COM1. The default time-out is 60 seconds.
- **LPT2 Centronics Interface Timing (L2_CENTR) (OUTPUTMENU)**
  This parameter controls the transfer rate for the LPT2 port, see also parameter L1_CENTR above.
- **LPT2 Busy Status Time-Out (L2_BSYTM) (OUTPUTMENU)**
  This parameter specifies the waiting time before a printer busy status is reported for LPT2. The default time-out is 60 seconds.

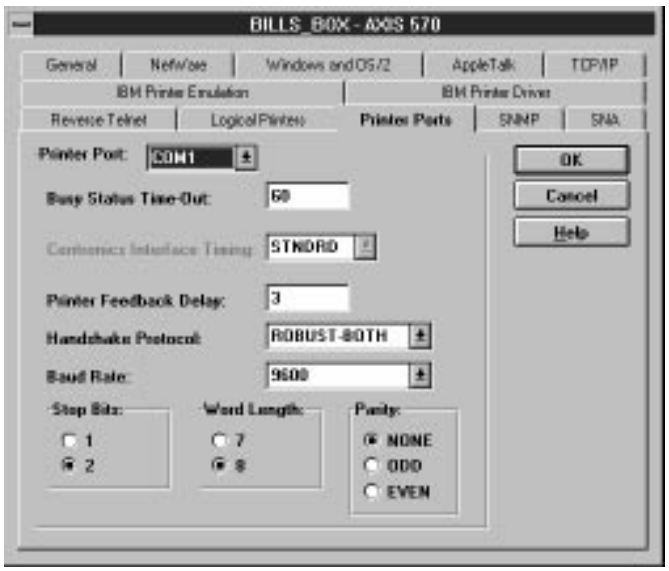


Figure 7-5 AXIS NetPilot Printer Ports Property Page

All of the printer port parameters shown on the previous pages can easily be setup with AXIS NetPilot.

After selecting the print server to be configured, you click the Properties button on the tool bar and then select Printer Ports, as shown on the left in figure 7-4.

Action at Printer Busy

If the printer attached to the addressed logical printer is busy when a print job arrives, a busy status is reported to the host after the amount of time specified by parameters L1_BSYTM, L2_BSYTM and C1_BSYTM (see above). If you have more than one printer attached to your Axis print server, you may optionally specify a secondary printer to which print jobs can be redirected.

The following parameters control the action at printer busy for each logical printer (only PR1 is shown here):

- **PR1 Secondary Printer (PR1_SCND) (PRINTER1 MENU)**
  This parameter specifies a secondary logical printer for PR1. The default setting is *PR1* (no redirection).
- **PR1 Wait on Busy (PR1_WAIT) (PRINTER1 MENU)**
  This parameter specifies if a busy status should be returned to the host. The default setting is *YES* (no attempt to use the secondary printer is made). When set to *NO*, the printout is redirected to the logical printer specified by parameter PR1_SCND. If this printer is busy as well, a busy status is returned to the host.

Example: These parameters can be setup using the NetPilot option *'Redirect on Busy to Logical Printer:'* on the Logical Printers Property Page (see Figure 7-3 on page 101). Alternatively you can edit the *config* file as shown in the example below. In this example the PR1 print jobs are redirected to PR3 when the printer assigned to PR1 is busy:

```
PR1_OUT  : LPT1
PR1_SCND : PR3
PR1_WAIT : NO
PR3_OUT  : LPT2
```

Notes:

1. The secondary logical printer must be assigned to a different printer port than the primary logical printer.
2. Logical printer redirection cannot be nested. If the printer assigned to PR3 in the example above is also busy, the print job will be held waiting even if PR3 is further redirected.
3. The primary and secondary printers should have the same properties (Character Set Conversion, String Substitutions, etc.) to avoid corrupted printouts from the secondary printer.

Printer Information Read-Back

The AXIS 550/650, AXIS 560/660 and the AXIS 570/670 all support bi-directional printing with outgoing print data on either of the parallel ports (LPT1 or LPT2), and incoming printer feedback data on the serial port (COM1). Reading back the printer feedback information is handled differently depending on the protocol used. The illustration below shows the principle for simple bi-directional printing using COM1 port only:

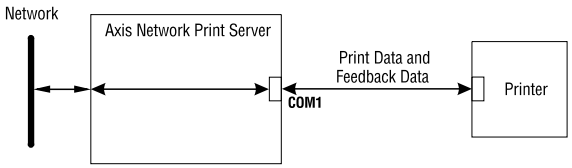


Figure 7-6 *Bi-directional Printing using COM1 port only.*

It is also possible to use a special arrangement where print data is sent to the printer on one of the parallel ports and feedback data is returned on the serial port:

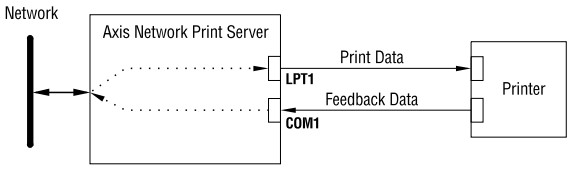


Figure 7-7 *Bi-directional Printing using two ports.*

Using the PROS and AppleTalk Protocols

Both the PROS and AppleTalk protocols supports automatic read-back of printer information. This function is controlled by the following parameters:

- **COM1 Printer Feedback Delay (C1_READT) (OUTPUT MENU)**
  This parameter specifies how long the Axis print server should wait for COM1 printer feedback data after the printout is completed. The default time-out is 3 seconds.
- **PR1 Read-Back Port (PR1_IN) (PRINTER1 MENU)**
  This parameter specifies a printer port for read-back data. The default setting is *NONE* (the read-back option is disabled). Change to COM1 to assign the serial printer ports as feedback input. The PR2 through PR8 read-back ports are specified by parameters **PR2_IN** to **PR8_IN** respectively.

If you are using AXIS NetPilot to setup these parameters the COM1 printer feedback delay setting is found on the Printer Port Property Page (see Figure 7-5 on page 105), and the Read-back port settings are on the Logical Printer Property Page (see Figure 7-3 on page 101).

Character Set Conversion

A common problem in a multiple host environment is that different hosts use different ASCII character sets. As a result, language specific characters (such as å ü ô ñ) are sometimes printed incorrectly.

The Axis print server solution to this problem is to invoke a character set conversion filter in a logical printer, and then assign this logical printer to the host causing the problem.

The character set conversion function is individually configurable for each logical printer (see Figure 7-3 on page 101):

- **PR1 Character Set Conversion (PR1_CSET) (PRINTER1MENU)**
  This parameter specifies a character set conversion filter for PR1. The default setting is *NONE* (no character set conversion). The selectable filters are shown in the table below. The PR2 through PR8 filters are specified by parameters **PR2_CSET** to **PR8_CSET** respectively.

Conversion	Description
NONE	No conversion (true binary transfer). This is the default setting.
ISO>IBM	Convert ISO 8859-2 ASCII codes to IBM PC Set 2.
7UK>IBM	Convert 7-bit UK English ASCII codes to IBM PC Set 2.
7SW>IBM	Convert 7-bit Swedish ASCII codes to IBM PC Set 2.
7GE>IBM	Convert 7-bit German ASCII codes to IBM PC Set 2.
7FR>IBM	Convert 7-bit French ASCII codes to IBM PC Set 2.
7ND>IBM	Convert 7-bit Norwegian/Danish ASCII codes to IBM PC Set 2.
DEC>IBM	Convert DEC codes to IBM PC Set 2.

Example: Your network contains three hosts using the character sets IBM PC Set 2, ISO 8859-2, and DEC. In order to direct their print jobs to the same printer (in this case LPT1), you should assign each host to a separate logical printer, and install character set conversion filters. Edit the following entries in your *config* file:

```
PR1_OUT  : LPT1
PR1_CSET : NONE
PR2_OUT  : LPT1
PR2_CSET : ISO>IBM
PR3_OUT  : LPT1
PR3_CSET : DEC>IBM
```

The logical printer PR1 prints data transparently without conversion, PR2 converts ISO 8859-2 data to IBM PC Set 2, and PR3 converts DEC data to IBM PC Set 2. This will produce correct printouts for all language specific characters.

Using any of the character set conversion filters requires that your printer is set up for IBM PC Set 2. If this for some reason is impractical, there is an alternative method using *Strings Before and After Print Jobs*, see page 109.

Note: If none of the character set conversion filters match your requirements, you may use the *String Substitution* function (see page 110) to translate specific characters.

Strings Before and After Print Jobs

These string functions are used to insert data (plain text or printer control commands) before and after each print job. The strings are specified individually for each logical printer:

- **PR1 String Before Print Job (PR1_BEF)** **(PRINTER1 MENU)**
  This parameter specifies a sequence of data to be inserted before each PR1 print job. The default setting is <empty>. The PR2 through PR8 strings are specified by parameters **PR2_BEF** to **PR8_BEF** respectively.
- **PR1 String After Print Job (PR1_AFT)** **(PRINTER1 MENU)**
  This parameter specifies a sequence of data to be appended after each PR1 print job. The default setting is <empty>. The PR2 through PR8 strings are specified by parameters **PR2_AFT** to **PR8_AFT** respectively.

Notes:

1. The strings must be entered as hexadecimal byte values.
2. The maximum length of each string is 255 bytes.
3. The string may continue onto multiple lines.
4. Spaces between the byte values are not required, but improve readability.

Example 1: Assume that the logical printer PR5 is configured as a PostScript printer. To append the PostScript End of File character (ctrl-D, hex 04) after each print job, edit the following entry in your *config* file:

```
PR5_AFT   : 04
```

Example 2: You have a HP LaserJet printer with dual input bins, and want to print on pre-printed forms when using the logical printer PR4. The standard forms are taken from bin 1, and the pre-printed forms are taken from bin 2. The strings before and after print jobs should then contain commands to select bin 2 ($^{E}_{C}$&l4H) and bin 1 ($^{E}_{C}$&l1H) respectively. Edit the following entries in your *config* file:

```
PR4_BEF   : 1B 26 6C 34 48
PR4_AFT   : 1B 26 6C 31 48
```

Example 3: Your network hosts use the character sets PC-850 and ISO 8859-2, and your printer is set up for PC-850. You can not use the character set conversion filters since the filter output is always in PC Set 2. The solution is to direct the ISO 8859-2 print jobs to PR2, and use the PR2 before and after strings to switch character sets in the printer. Edit the following entries in your *config* file:

```
PR2_BEF   : 1B 28 32 4E
PR2_AFT   : 1B 28 31 32 55
```

These strings are PCL commands used by HP LaserJet printers. The first, $^{E}_{C}$(2N, selects ISO 8859-2 before a PR2 print job, and the second, $^{E}_{C}$(12U, restores the PC-850 character set after the print job.

Example 4: A common task is to replace the UNIX New Line (hex 0A) with an ASCII New Line (hex 0D 0A). The standard method is to use *String Substitutions* (see Example 1, next page), but this can sometimes cause problems when printing graphics. An alternative method is to make the printer take care of the UNIX New Line translation by sending a control command before the print job. For HP LaserJet printers, make the following changes to your *config* file:

```
PR2_BEF   : 1B 26 6B 32 47
PR2_AFT   : 1B 26 6B 30 47
```

These strings are PCL commands used by HP LaserJet printers. The first, $^{E}_{C}$&k2G, makes the printer replace UNIX New Lines with ASCII New Lines, and the second, $^{E}_{C}$&k0G, restores the standard New Line interpretation.

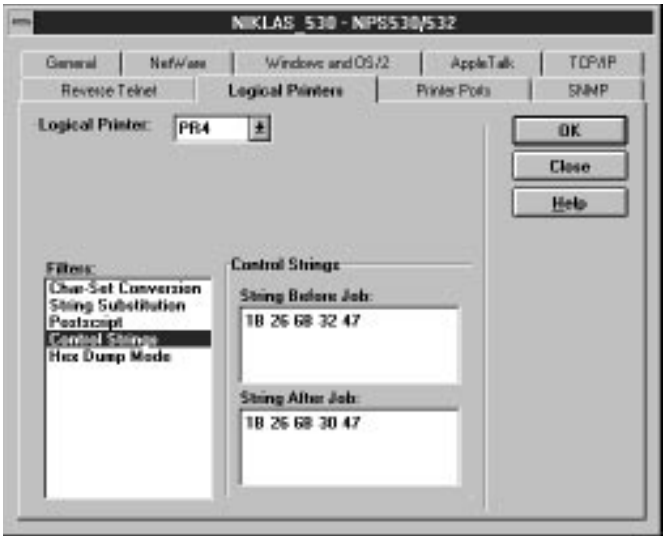


Figure 7-8 Using AXIS NetPilot to enter Control Strings

Figure 7-8 shows how NetPilot is used to enter the control strings given in Example 4 above. In this case logical printer number 4 is being used - other logical printers can be selected using the drop down list at the top of the property page.

String Substitutions

The string substitution function performs search-and-replace operations on the print data. The primary application is to replace printer control commands. Up to 20 string substitutions may be specified individually for each logical printer:

- **PR1 String Substitutions (PR1_STR) (PRINTER1MENU)**
  This parameter specifies a number of search-and-replace operations for the PR1 print data. The default setting is <empty> for PR1 through PR4, and UNIX New Line to ASCII New Line *(see Example 1 below)* for PR5 through PR8. The PR2 through PR8 strings are specified by parameters **PR2_STR** to **PR8_STR.** respectively.

Notes: 1. The strings must be entered as hexadecimal byte values.

2. Each search and replace sub string must be preceded by a count byte indicating the string length excluding the count byte.
3. Up to 20 search-and-replace sub string pairs may be specified for each logical printer.
4. The maximum length of each string is 255 bytes.
5. The string may continue onto multiple lines.
6. Spaces between the byte values are not required, but improve readability.

Example 1: To replace the UNIX New Line (hex 0A) with an ASCII NewLine (hex 0D 0A) for logical printer PR1, edit the following entry in your *config* file (or use the NetPilot logical printer property page, see Figure 7-8):

```
PR1_STR  : 01 0A 02 0D 0A
```

'01' is the match sub string count byte (length of the match string), '0A' is the match sub string, '02' is the substitute count byte, and '0D 0A' is the substitute sub string. All occurrences of '0A' in the print data will now be replaced by '0D 0A'. This is the default setting for logical printers PR5 through PR8.

String Substitutions may cause problems when printing graphics. If you experience corrupted graphics printouts when using the New Line replacement, use the method described in Example 4 on the previous page.

Example 2: To replace the UNIX New Line (hex 0A) with an ASCII NewLine (hex 0D 0A), and the printer command $^{E}_{C}$G1 (hex 1B 47 31) with $^{E}_{C}$Y (hex 1B 59) for logical printer PR2, edit the following entry in your *config* file:

```
PR2_STR  : 01 0A 02 0D 0A 03 1B 47 31 02 1B 59
           ↑     ↑        ↑           ↑
```

The arrows above point to the sub string count bytes.

Note: Extensive use of string substitutions may decrease the throughput rate of Axis print servers.

PostScript Functions

The Axis print server can translate standard ASCII print data into PostScript format. This makes it possible to print both ASCII and PostScript data on a PostScript printer without having to switch language in the printer. The PostScript functions are controlled by a number of parameters as described below.

ASCII to PostScript Conversion

This function is activated by invoking a filter that converts ASCII data into PostScript format. The filter can be configured individually for each logical printer:

- **PR1 Printer Language Translation (PR1_FILT) (PRINTER1MENU)**
  This parameter specifies printer language translation mode for PR1 print data. The PR2 through PR8 strings are specified by parameters **PR2_FILT** to **PR8_FILT** respectively.

Conversion	Description
NONE	No conversion (true binary transfer). This is the default setting.
POSTSCR	Print data is always converted to PostScript format.
AUTO_PS	Non-PostScript data is converted, PostScript data remains unchanged.

The table below shows the recommended conversion settings for different print data formats and printer modes:

Print Data Format	Printer Mode	Recommended Conversion
ASCII	ASCII	**NONE**
PostScript	ASCII	Not applicable
Mixed	ASCII	Not applicable
ASCII	PostScript	**POSTSCR**
PostScript	PostScript	**NONE**
Mixed	PostScript	**AUTO_PS**
ASCII	Auto-Switching	**NONE**
PostScript	Auto-Switching	**NONE**
Mixed	Auto-Switching	**NONE**

Example: The following entries in your *config* file will activate pass-through (no filter) for PR1, ASCII to PostScript conversion for PR2. On PR3 the incoming data will be searched, ASCII data will be converted to PostScript, PostScript data will pass-through without conversion:

```
PR1_FILT : NONE
PR2_FILT : POSTSCR
PR3_FILT : AUTO_PS
```

Use this configuration when print jobs directed to PR1 are already in PostScript format, print jobs directed to PR2 are in ASCII format and direct print jobs to PR3 when you are not sure if it is ASCII or PostScript format.

PostScript Page Size

When the ASCII to PostScript filter is invoked, the PostScript page size is specified by a parameter. The page size may be set individually for each logical printer:

- **PR1 PostScript Page Size (PR1_SIZE) (PRINTER1MENU)**
  This parameter specifies the PostScript page size for PR1 print data. The PR2 through PR8 page sizes are specified by parameters **PR2_SIZE** to **PR8_SIZE** respectively.

Page Size	Description
A4	A4 size paper (European), 210 × 297 mm. This is the default setting.
LETTER	Letter size paper (US), 8.5 × 11 inches.
LEGAL	Legal size paper (US), 8.5 × 14 inches.
EXECUT	Executive size paper (US), 7.25 × 10.5 inches.

Note: This parameter has no function when ASCII to PostScript Conversion is set to NONE.

PostScript Page Orientation

When the ASCII to PostScript filter is invoked, the PostScript page orientation is specified by a parameter. The page orientation may be set individually for each logical printer:

- **PR1 PostScript Page Orientation (PR1_ORNT) (PRINTER1MENU)**
  This parameter specifies the PostScript page orientation for PR1 print data. The PR2 through PR8 page orientations are specified by parameters **PR2_ORNT** to **PR8_ORNT** respectively.

Orientation	Description
PORTR	Portrait orientation. This is the default setting.
LANDS	Landscape orientation (rotated 90°).
R_PORTR	Reverse portrait orientation (rotated 180°).
R_LANDS	Reverse landscape orientation (rotated 270°).

Note: This parameter has no function when ASCII to PostScript Conversion is set to NONE.

PostScript Page Format

When the ASCII to PostScript filter is invoked, the PostScript page format is specified by a parameter. The page format may be set individually for each logical printer:

- **PR1 PostScript Page Format (PR1_FORM) (PRINTER1MENU)**
  This parameter specifies the PostScript page format (maximum page length, maximum print position, characters per inch, lines per inch, left margin, and top margin) for PR1 print data. The PR2 through PR8 page formats are specified by parameters **PR2_FORM** to **PR8_FORM** respectively.

See *The Parameter List*, page 188, for a detailed description of this parameter.

Note: This parameter affects the page length in hex dump mode (see below), otherwise it has no function when the ASCII to PostScript Conversion is set to NONE.

PostScript Font

You may specify a PostScript font to be used when the ASCII to PostScript filter is active. The specified font must be available in the attached PostScript printer. An invalid font name may cause a PostScript error and terminate the printout.

- **PR1 PostScript Font (PR1_FONT) (PRINTER1MENU)**
  This parameter specifies the PostScript font for PR1 print data. The PR2 through PR8 PostScript fonts are specified by parameters **PR2_FONT** to **PR8_FONT** respectively.

If no font name is specified, Courier (fixed pitch) will be used.

Note: This parameter has no function when ASCII to PostScript Conversion is set to NONE.

Example: The following entry in your *config* file will select the Helvetica proportional font as the PR2 PostScript font:

```
PR2_FONT : Helvetica
```

All of the PostScript Function parameters can be easily setup via NetPilot:

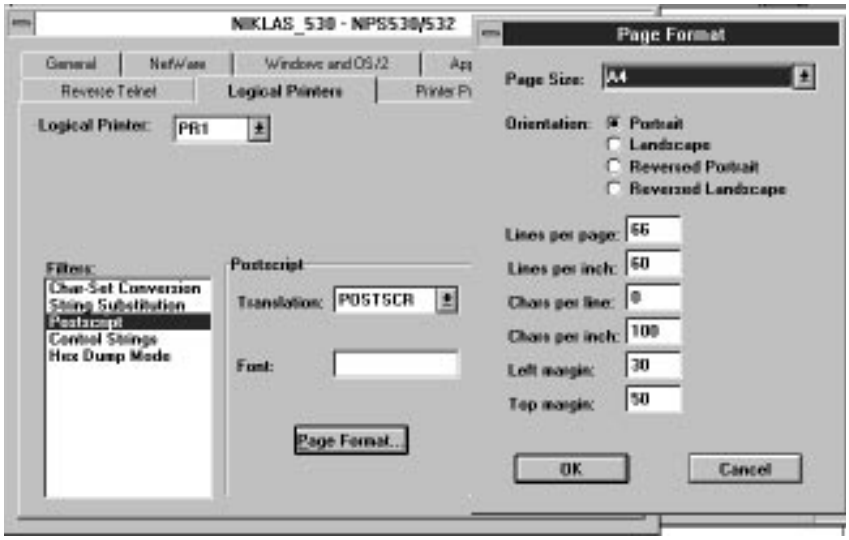


Figure 7-9 Using AXIS NetPilot to enter PostScript Page Format Parameters.
Click '**Page Format...**' on the Property Page to access the dialog shown above.

Hex Dump Mode

When hex dump mode is activated, the print data will be printed as hexadecimal byte values rather than characters. Printer control commands are also printed as byte values, and have therefore no effect on the printer. This function is used for debugging corrupted or missing printouts, see also *Solving Problems*, page 231. The hex dump mode is invoked individually for each logical printer (see Figure 7-3 on page 101):

- **PR1 Hex Dump Mode (PR1_DUMP) (PRINTER1MENU)**
  This parameter specifies whether or not PR1 print data should be printed as hexadecimal byte values. The default setting is NO. The PR2 through PR8 PostScript fonts are specified by parameters **PR2_DUMP** to **PR8_DUMP** respectively.

Note: The page length for hex dump printouts is determined by the *Maximum Page Length* setting of the *PostScript Page Format* parameter, i.e. parameter **PR1_FORM** sets the page length for hex dumps through PR1, parameter **PR2_FORM** sets the page length for hex dumps through PR2, etc.

Below is a short example of a hex dump printout:

```
AXIS 560 Printer Server V5.10 Jan 25 1996

00000  23 21 2F 62 69 6E 2F 73 68 0D 0A 65 63  #!/bin/sh--#--ec
00010  68 6F 20 2D 6E 20 07 0D 0A               ho -n ------
```

SECTION 8

FTP AND TELNET

This section describes how to log in to the Axis print server, the file system, and how to print interactively using FTP. The print server appears as a host with its own file system on your network. To log in, enter the command **ftp <hostname>** or **telnet <hostname>** (the hostname is assumed to be *salesdept* in this section).

Access Control

When you log in to the Axis print server, you will be prompted for a *user ID* and a *password*.

You must log in as *root* to have full access to the file system (all users may up-load files, but only root is allowed to edit the parameter list).

The flow chart on the next page shows the log-in procedure. The following notes explain the different options in more detail:

- If the *Root Password* (parameter ROOT_PWD) is empty, all users will have root privileges and the password prompt is bypassed.
- If you log in as *root*, you will be prompted for the root password. If the password is correct (according to parameter ROOT_PWD) you will get root privileges, otherwise access is denied.
- If you log in using Telnet as any other user, you will get restricted (non-root) access, see *Telnet Log-In* (page 120). In the case of FTP, access depends on the *User Authority and Printer Access* (parameter USERS). If this parameter is empty, you will get restricted (non-root) access as described in *FTP Log-In* (page 117).
- If *USER* parameter contains authority properties (see *The Parameter List*, page 137 for a description on this parameter), an authority check is made. If your user ID and password is valid, you will get restricted (non-root) access as described in the *FTP Log-In* section below, otherwise access is denied.

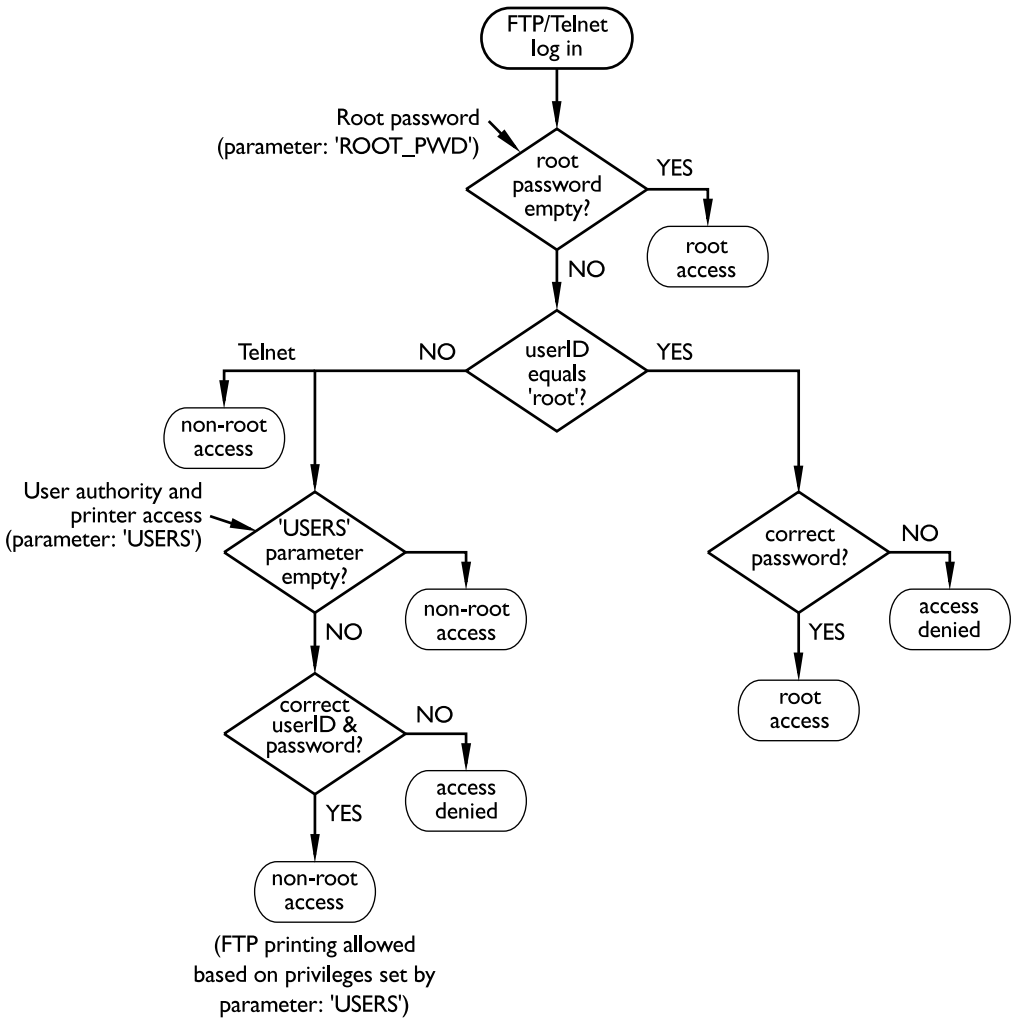


Figure 8-1 *Axis Network Print Server Access Control*

FTP Log-In

Use the command **ftp salesdept** to log in to the print server (assuming that *salesdept* is the host name for your print server). Below is a sample AXIS 560 FTP session that demonstrates how to print the *config* file:

```
> ftp salesdept
Connected to salesdept.
220 AXIS 560 FTP Printer Server V5.10 Nov 24 1995 ready.
Userid for logging in on salesdept (matsl)? root
331 User name ok, need password
Password for logging is as root on salesdept? pass      (not visible)
230 User logged in
ftp:salesdept> get config
local file (default config):
Transferred 37241 bytes in 7 seconds (42561 bits/sec, 5320
bytes/sec)
226 Transfer complete.
ftp:salesdept> put config pr1
Transferred 37255 bytes in 1 seconds (298040 bits/sec, 37255
bytes/sec)
226 Transfer complete.
ftp:salesdept> bye
>
```

Note: If you have an NPS 530 or 532 without the TCP/IP upgrade, you can up-load the *config* file but not print it using the *put config pr1* command. You can always print the *config* file using the TEST button:

Press and hold the TEST button until the indicator starts to flash, release the button, then press it twice.

FTP Commands

The following commands are available under FTP (this file can be viewed by **remotehelp**, and you can also up-load it to your workstation by **get help**):

```
214 - AXIS 560 FTP Printer Server.
 The following commands are supported.
  remotehelp      print this list
  ls              directory list
  dir             directory list, full format
  cd  <path>      change directory to <path>
  pwd             print working directory
  get config      get parameter file from AXIS 560
  get defaults    get default parameter list for AXIS 560
  get softreset   protocol restart of AXIS 560
  get hardreset   reboot of AXIS 560
  get status      get printer status file from AXIS 560
  get account     get account file from AXIS 560
  get <file>      get <file> from AXIS 560
  put flash       update AXIS 560 software
  put config      transfer parameter file to AXIS 560
  put CONFIG      transfer parameter file to AXIS 560, store
                  permanently
  put <file> prx  printout of <file> on logical printer x,
                  x = 1..8
  open            open ftp connection to AXIS 560
  user            log in on AXIS 560
  close           close ftp connection to AXIS 560
  quit            as close, then exit ftp
```

These commands apply to the AXIS 560. The NPS 530 and 532 do not support the put <file> prx command unless the TCP/IP upgrade is installed.

The File System

Below is an extract from the Axis print server file system:

account	The accounting file, see page 121.
aix/	A directory containing files used in the integration process for IBM AIX systems, see page 66.
ftp_piobe	The back-end program for FTP printing.
makefile	The makefile for creating the PROS driver.
pros_piobe	The back-end program for PROS printing.
prosaix.c	The source code for the PROS driver.
axinstall	The automatic integration script, see page 45.
bsd/	A directory containing files used in the integration process for BSD-type UNIX systems, see page 46.
ftp_bsd	An output filter template for FTP printing.
makepros	The makefile for creating the PROS B driver.
printcap.ftp	A printcap entry template for FTP printing.
printcap.lpd	A printcap entry template for LPD printing.
printcap.pro	A printcap entry template for PROS printing.
prosbsd.c	The source code for the PROS B driver.
config	The parameter list containing the current configuration. See page 133 on how to edit this file.
defaults	A parameter list file containing the factory default settings for all parameters except the Internet address.
help	A text file with help on FTP commands, see page 117.
mvs/	A directory containing files used in the integration process for IBM MVS systems, see page 75.
jcl_ex	A sample JCL script for FTP printing.
npipe/	A directory containing files used for creating a PROS daemon, see page 53 (BSD) and page 62 (System V).
makefile	The makefile for creating the PROS daemon.
prosd.c	The source code for the PROS daemon.
pctcp/	A directory containing files used for printing from MS-DOS systems, see page 75.
pc_tcp.cfg	A PC/TCP configuration file template.
prX (X = 1..8)	*pr1 through pr8* are logical printer output devices (write-only) used for interactive FTP printing. The example on page 117 shows how to print the *read.me* file to a logical printer device (pr1) using the *put* command.
snmp/	A directory containing SNMP related files, see page 124.
axis.mib	The AXIS MIB.
status	*status* is the status file, also described later in this section.
sysv/	A directory containing files used in the integration process for System V UNIX systems, see page 57.
ftp_sysv	An interface program template for FTP printing.
makepros	The makefile for creating the PROS B driver.
prossysv.c	The source code for the PROS B driver.

Access Privileges

You can always read and up-load files from the Axis print server regardless of your user privileges. There are two areas that require special privileges:

Editing the parameter list

Editing the parameter list involves down-loading of a modified *config* file, and this requires *root* privileges. If you try to down-load the *config* file as non-root, the command will be ignored and the messages 'transfer failed' and '530 Not logged in for put of config' will be displayed.

Interactive printing

The printer access privileges as non-root user are determined by *User Authority and Printer Access* (parameter 'USERS'). When this parameter is empty, all users have unrestricted printer access. If the parameter 'USERS' contains authority properties, no users other than the ones specified will have printing privileges. (An authority properties' entry consists of a user id, password, and an access code specifying which logical printers the user may access. See *The Parameter List*, page 137 for further details).

Telnet Log-In

Use the command **telnet salesdept** to log in to the Axis print server (assuming that *salesdept* is the host name for your print server). Below is a sample Telnet session that demonstrates the *help* command:

```
> telnet salesdept
Trying 192.36.253.96 ...
Connected to salesdept.
Escape character is '^]'.

AXIS 560 TELNET Printer Server V5.10 Nov 24 1995

AXIS 560 network login: root
Password:  pass    (not visible)

AXIS 560 TELNET Printer Server V5.10 Nov 24 1995

Root> help
Commands may be abbreviated:
logout       logout from TELNET
version      print current software version
help         print this list
status       show current printing status
account      show current account file
softreset    protocol restart of the print server
hardreset    reboot of the print server
defaults     set default parameters in the print server
Root> logout
Goodbye!
Connection closed by foreign host.
>
```

These commands apply to all Axis Network Print Servers except AXIS 150/152.

Access Privileges

If you log in as non-root, you will only have access to the *status* and *account* files. It is not possible to reset the print server, set factory defaults, or read the *com1* file. These restrictions are reflected by the help command:

```
Telnet> help
Commands may be abbreviated:
logout        logout from TELNET
version       print current software version
help          print this list
status        show current printing status
account       show current account file
Telnet> logout
```

Note that the prompt is *Telnet>* instead of *Root>* for non-root users.

Accounting

The accounting file contains data concerning the last ten print jobs. It specifies an internal job number, the user that initiated the job, the protocol and logical printer that was used, current status (Completed, Offline, or Printing), number of bytes printed, elapsed time and off-line time. The accounting file can be accessed by TCP/IP using FTP or Telnet, or alternatively the printing account can be inspected by using AXIS NetPilot - See “AXIS NetPilot” on page 25.

To read the *account* file using FTP, up-load the file to your workstation by the command **get account** (see *FTP Commands* (page 118)). You can then view the file using a text editor.

If you don't need a local copy of the accounting file, a quicker way of viewing the account information is the Telnet **account** command shown below:

```
> telnet salesdept
Trying 192.36.253.96 ...
Connected to salesdept.
Escape character is '^]'.

AXIS 560 TELNET Printer Server V5.10 Nov 24 1995

AXIS 560 network login: root
Password:  pass    (not visible)

AXIS 560 TELNET Printer Server V5.10 Nov 24 1995

Root> account
Current account file:
JOB       USER    PROT     LPR  S   BYTES    ETIME   OTIME

 1        thomas  FTP      pr2  C   1885     2       0
 2        bengt   LPD      pr1  C   23074    4       0
 3        RICARD  NETWARE  pr2  C   43004    5       0
 4        MacUser APPLE    pr1  C   6717     2       0
 5        thomas  FTP      pr2  C   36955    3       0
 6        patrik  PROS     pr5  P   832081   9       0
Root>
```

- *JOB* is the job number; the last ten print jobs are listed.
- *USER* is the user ID that initiated the print job.
- *PROT* is the protocol used for the print job.
- *LPR* is the logical printer used for the print job
- *S* is the status of the print job (Completed, Off-line, or Printing).
- *BYTES* is the number of bytes printed.
- *ETIME* and *OTIME* is the elapsed time and off-line time for the print job.

Status Logging

The *status* file shows which printer port the logical printers are assigned to, and their current status. It can be accessed by TCP/IP using FTP or Telnet, or alternatively the printer status can be monitored by using AXIS NetPilot - See "AXIS NetPilot" on page 25.

To read the *status* file using FTP, up-load the file to your workstation by the command **get status** (see *FTP Commands* (page 118)). You can then view the file using a text editor.

If you don't need a local copy of the status file, a quicker way of viewing the status information is the Telnet **status** command shown below:

```
> telnet salesdept
Trying 192.36.253.96 ...
Connected to salesdept.
Escape character is '^]'.

AXIS 560 TELNET Printer Server V5.10 Nov 24 1995

AXIS 560 network login: root
Password:  pass    (not visible)

AXIS 560 TELNET Printer Server V5.10 Nov 24 1995

Root> status
Current printout status:
Printer   Port   Status     Bytes printed  Comments
pr1       LPT1   Occupied                  Ready
pr2       LPT2   Available                 Busy   Out of paper
pr3       COM1   Available                 Busy
pr4       COM1   Available                 Busy
pr5       LPT1   Printing    20916         Ready
pr6       LPT2   Available                 Busy   Out of paper
pr7       COM1   Available                 Busy
pr8       COM1   Available                 Busy

Root>
```

- *Printer* is the logical printer number (pr1 - pr8).
- *Port* is the printer port assigned to the logical printer. The pocket-sized print servers (NPS 530/532/630/632) have only one port (LPT1).
- *Status* reflects the printer port status for each logical printer. *Available* means that the port is ready to receive a print job, *Printing* means that the port is currently in use, and *Occupied* means that the port is currently used by one of the other logical printers.
- *Bytes printed* shows the number of bytes sent to the printer.
- *Comments* reflect the current printer status for each logical printer. *Ready* means that the printer is ready to receive print data, and *Busy* means that the printer is out of paper, off-line, or not connected. The out of paper and off-line conditions are shown in the comments field, see example above. Note that out of paper is the normal condition for a parallel port (LPT1 or LPT2) with no printer connected to it. The serial port (COM1) may appear either ready or busy when no printer is connected.

Note: The 'Bytes printed' number may differ between the status and accounting files. The accounting file reflects the number of bytes received from the network (before any filters have been invoked), and the status file shows the number of bytes sent to the printer.

SECTION 9

NETWORK MANAGEMENT UNDER SNMP

This section deals with network management concerning the Axis network print server under the SNMP protocol (Simple Network Management Protocol). SNMP actually refers to a set of standards for network management, including a protocol, a data base structure specification, and a set of data objects.

The Axis print server SNMP implementation runs under the UDP protocol in the TCP/IP environment.

The actual management is handled by a NMS (Network Management Station) software running on a host on your network. The NMS software communicates with network devices by the means of messages, which are references to one or more *objects*. An object can be a question or an instruction to a device, or an alarm triggered by a specific event. Objects are contained in data bases called MIBs (Management Information Base), where MIB-II is a standard data base.

The Axis print servers support all relevant parts of MIB-II. They also include a private enterprise MIB (the Axis MIB described later in this section) that gives additional functionality in the following areas:

- Configuration of the Axis print server from within the NMS software
- Monitoring of print server print jobs
- Alarms at error conditions

System Requirements

The following requirements must be fulfilled in order to make full use of the Axis print server SNMP support:

- An NMS software that allows you to install private enterprise MIBs.
- A host that supports FTP

Follow these steps to add the Axis MIB to your NMS software:

1. Log in to the print server using FTP as described in *FTP and Telnet: FTP Log-In* (page 117).
2. Up-load the MIB file */snmp/axis.mib* to the FTP host.
3. Install the Axis MIB according to instructions in your NMS software documentation.

The Axis MIB

The AXIS MIB contains a large number of objects which may be categorised as follows:

- Printer status and unit administration objects - used for monitoring print server print jobs and storing parameter changes permanently.
- Menu objects - used for viewing and changing the Axis print server configuration from the NMS program. See *The Parameter List*, page 137.
- Trap objects - used for alarms at various error conditions.

The tables below lists all the Axis MIB objects with brief descriptions. For technical details, you can view the MIB file (*axis.mib*) with any text editor.

Important:

Some Axis MIB objects only applies to certain print servers. A reference to such an object will result in a NO SUCH OBJECT error code from other print servers. For example, the *tcpKey* object (see *TCP/IP Menu Objects* below) applies to the NPS 530 and 532 only.

Port Status Objects

The following objects are related to the Axis print server printer port status.

Object	Description
portNumber	The total number of ports
portIndex	The index referencing a port
portDescr	The port descriptor, name and type
portOnLine	The port's On-Line status
portBusy	The port's Busy status
portEndOfForms	The port's End-of-Forms status
portFault	The port's Fault status
portOutputBytes	The number of bytes sent out on the port during a printout in progress or the last printout
portInputBytes	The number of bytes received on the port during a printout in progress or the last printout
portPrintouts	The number of printouts started on the port
portAvailable	If the port is assigned for a printout
portIsInput	If the port is assigned as an input port (bidirectional)

Unit Administration Objects

The following objects are related to Axis print server administration tasks.

Object	Description
adminUnitStatus	The print server operational status (also used to restart the unit)
adminConfigStatus	The print server configuration status (read or change configuration)
adminOldIntAddr	The Internet Address at power-on or before change by RARP, BOOTP or 'arp -s'

Config Menu Objects

The following objects are related to the CONFIG MENU parameters in the parameter list. The parameter names are enclosed in brackets.

Object	Description
ethAddr	Node Address (NODE_ADDR)
rootPwd	Root Password (ROOT_PWD)
users	User Authority and Printer Access (USERS)

TCP/IP Menu Objects

The following objects are related to the TCP/IP MENU parameters in the parameter list. The parameter names are enclosed in brackets. The *tcpKey* object applies to NPS 530/532 only. All other print servers will respond with a NO SUCH OBJECT error code when this object is referenced.

Object	Description
intAddr	Internet Address (INT_ADDR)
defRout	Default Router Address (DEF_ROUT)
netMask	Net Mask (NET_MASK)
tcpEnb	TCP/IP Protocol Enabled (TCP_ENB)
tcpKey	TCP/IP Protocol Key (TCP_KEY)
prosPwd	PROS Protocol Password (PROS_PWD)
prosPrt	PROS TCP Port Number (PROS_PRT)
lpdBanner	LPD Banner Page Enabled (LPD_BANN)
rtnOpt	Reverse Telnet Options Enabled (RTN_OPT)
rTelPr1	PR1 TCP Port Number (RTEL_PR1)
rTelPr2	PR2 TCP Port Number (RTEL_PR2)
rTelPr3	PR3 TCP Port Number (RTEL_PR3)
rTelPr4	PR4 TCP Port Number (RTEL_PR4)
rTelPr5	PR5 TCP Port Number (RTEL_PR5)
rTelPr6	PR6 TCP Port Number (RTEL_PR6)
rTelPr7	PR7 TCP Port Number (RTEL_PR7)
rTelPr8	PR8 TCP Port Number (RTEL_PR8)
bootpEnb	BOOTP Protocol Enabled (BOOTP_ENB)
rarpEnb	RARP Protocol Enabled (RARP_ENB)

SNMP Menu Objects

The following objects are related to the SNMP MENU parameters in the parameter list. The parameter names are enclosed in brackets.

Object	Description
readCommunity	Read-Only Community Name (READ_COM)
writeCommunity	Read-Write Community Name (WRT_COM)
trapAddress	SNMP Trap Internet Address (TRAPADDR)
trapCommunity	SNMP Trap Community Name (TRAP_COM)
enableAuthenTraps	Authentication Failure Traps (SNMP_AUT) = MIB-II *snmpEnableAuthenTraps*
enablePrinterTraps	Printer Traps (TRAP_PRT)

NetWare Menu Objects

The following objects are related to the NETWARE MENU parameters in the parameter list. The parameter names are enclosed in brackets.

Object	Description
netwEnb	NetWare Protocol Enabled (NETW_ENB)
psName	Print Server Name (PS_NAME)
confServ	Configuration File Server Name (CONFSERV)
psPoll	NetWare Queue Polling Interval (PS_POLL)
autoScan	Automatic File Server Login (AUTO_SCAN)
fr-802-3	IEEE 802.3 Frame Type Enabled (FR_802_3)
fr-eth-2	Ethernet II Frame Type Enabled (FR_ETH_2)
fr-802-2	IEEE 802.2 Frame Type Enabled (FR_802_2)
fr-snap	SNAP Frame Type Enabled (FR_SNAP)
login1	Print Server Queue Attachment 1 (LOGIN1)
login2	Print Server Queue Attachment 2 (LOGIN2)
login3	Print Server Queue Attachment 3 (LOGIN3)
login4	Print Server Queue Attachment 4 (LOGIN4)
login5	Print Server Queue Attachment 5 (LOGIN5)
login6	Print Server Queue Attachment 6 (LOGIN6)
login7	Print Server Queue Attachment 7 (LOGIN7)
login8	Print Server Queue Attachment 8 (LOGIN8)
login9	Print Server Queue Attachment 9 (LOGIN9)
login10	Print Server Queue Attachment 10 (LOGIN10)
login11	Print Server Queue Attachment 11 (LOGIN11)
login12	Print Server Queue Attachment 12 (LOGIN12)
login13	Print Server Queue Attachment 13 (LOGIN13)
login14	Print Server Queue Attachment 14 (LOGIN14)
login15	Print Server Queue Attachment 15 (LOGIN15)
login16	Print Server Queue Attachment 16 (LOGIN16)
rprinter1	Remote Printer Attachment 1 (RPRINT1)
rprinter2	Remote Printer Attachment 2 (RPRINT2)
rprinter3	Remote Printer Attachment 3 (RPRINT3)
rprinter4	Remote Printer Attachment 4 (RPRINT4)
rprinter5	Remote Printer Attachment 5 (RPRINT5)
rprinter6	Remote Printer Attachment 6 (RPRINT6)
rprinter7	Remote Printer Attachment 7 (RPRINT7)
rprinter8	Remote Printer Attachment 8 (RPRINT8)

LAN Server/LAN Manager Menu Objects

The following objects are related to the LAN SERVER/LAN MANAGER MENU parameters in the parameter list. The parameter names are enclosed in brackets.

Object	Description
lslmEnb	LAN Server/LAN Manager Protocol Enabled (LSLM_ENB)
lslmFrameType	NetBios Frame Type Selection (NB_FR_TYPE)
lPrint1	Printer 1 Name (LPRINT_1)
lLogic1	Printer 1 Logical Printer (LLOGIC_1)
lPrint2	Printer 2 Name (LPRINT_2)
lLogic2	Printer 2 Logical Printer (LLOGIC_2)
lPrint3	Printer 3 Name (LPRINT_3)
lLogic3	Printer 3 Logical Printer (LLOGIC_3)
lPrint4	Printer 4 Name (LPRINT_4)
lLogic4	Printer 4 Logical Printer (LLOGIC_4)
lPrint5	Printer 5 Name (LPRINT_5)
lLogic5	Printer 5 Logical Printer (LLOGIC_5)
lPrint6	Printer 6 Name (LPRINT_6)
lLogic6	Printer 6 Logical Printer (LLOGIC_6)
lPrint7	Printer 7 Name (LPRINT_7)
lLogic7	Printer 7 Logical Printer (LLOGIC_7)
lPrint8	Printer 8 Name (LPRINT_8)
lLogic8	Printer 8 Logical Printer (LLOGIC_8)

AppleTalk Menu Objects

The following objects are related to the APPLETALK MENU parameters in the parameter list. The parameter names are enclosed in brackets. The *atlkKey* object applies to NPS 530/532 only. All other print servers will respond with a NO SUCH OBJECT error code when this object is referenced. The aPrint3, aType3, and aLogic3 objects do not apply to the NPS 530/532.

Object	Description
atlkEnb	AppleTalk Protocol Enabled (ATLK_ENB)
atlkKey	AppleTalk Protocol Key (ATLK_KEY)
atlkZone	AppleTalk Zone (ATLK_ZONE)
atlkHPZoner	HP Zoner Enabled (ZONER_EN)
atlkFont	PostScript Font Set (ATK_FONT)
atlkBinary	Binary Transfer Enabled (BINARY)
aPrint1	Printer 1 Name (APRINT_1)
aType1	Printer 1 Type (ATYPE_1)
aLogic1	Printer 1 Logical Printer (ALOGIC_1)
aPrint2	Printer 2 Name (APRINT_2)
aType2	Printer 2 Type (ATYPE_2)
aLogic2	Printer 2 Logical Printer (ALOGIC_2)
aPrint3	Printer 3 Name (APRINT_3)
aType3	Printer 3 Type (ATYPE_3)
aLogic3	Printer 3 Logical Printer (ALOGIC_3)

Logical Printer Menu Objects

The following objects are related to the PRINTER1 MENU through PRINTER8 MENU parameters in the parameter list. The parameter names are enclosed in brackets. Note that the eight printer menus are combined into one object group, where the individual logical printers are referenced by an index.

This group contains a number of objects that only applies to certain print servers. Other print servers will respond with a NO SUCH OBJECT error code when any of those objects are referenced.

Object	Description
logPrNumber	The total number of logical printers
logPrIndex	The index referencing a logical printer (1-8)
logPrOut	PR1 Physical Printer Port (PR1_OUT)
logPrScnd	PR1 Secondary Printer (PR1_SCND)
logPrWait	PR1 Wait on Busy (PR1_WAIT)
logPrIn	PR1 Read-Back Port (PR1_IN)
logPrBef	PR1 String Before Print Job (PR1_BEF)
logPrStr	PR1 String Substitutions (PR1_STR)
logPrCset	PR1 Character Set Conversion (PR1_CSET)
logPrFilt	PR1 Printer Language Translation (PR1_FILT)
logPrAft	PR1 String After Print Job (PR1_AFT)
logPrDump	PR1 Hex Dump Mode (PR1_DUMP)
logPrSize	PR1 PostScript Page Size (PR1_SIZE)
logPrOrnt	PR1 PostScript Page Orientation (PR1_ORNT)
logPrForm	PR1 PostScript Page Format (PR1_FORM)
logPrFont	PR1 PostScript Font (PR1_FONT)

Output Menu Objects

The following objects are related to the OUTPUT MENU parameters in the parameter list. The parameter names are enclosed in brackets. This group contains a number of objects that only applies to certain print servers. Other print servers will respond with a NO SUCH OBJECT error code when any of those objects are referenced.

Object	Description
centrLPT1	LPT1 Centronics Interface Timing (L1_CENTR)
bsyTimLPT1	LPT1 Busy Status Time-Out (L1_BSYTM)
readTimCOM1	COM1 Printer Feedback Delay (C1_READT)
handshCOM1	COM1 Handshake Protocol (C1_HNDSH)
baudrCOM1	COM1 Baud Rate (C1_BAUDR)
stopBitsCOM1	COM1 Stop Bits (C1_STOPB)
parityCOM1	COM1 Parity (C1_PARIT)
noBitsCOM1	COM1 Word Length (C1_NBITS)
bsyTimCOM1	COM1 Busy Status Time-Out (C1_BSYTM)
centrLPT2	LPT2 Centronics Interface Timing (L2_CENTR)
bsyTimLPT2	LPT2 Busy Status Time-Out (L2_BSYTM)

Panel Menu Objects

The following objects are related to the PANEL MENU parameters in the parameter list. The parameter names are enclosed in brackets.

Object	Description
defOut	Internal Printout Destination (DEF_OUT)

Netware NDS Menu Objects

The following objects are related to the NETWARE MENU parameters for products supporting NDS. The parameter names are enclosed in brackets.

Object	Description
Nds-netwEnb	NetWare Protocol Enabled (NETW_ENB)
nds-psName	Print Server Name (PS_NAME)
jobCheckDelay	Print Server Queue Polling Interval (JOB_CHECK_DELAY)

confCheckDelay	Interval between Automatic Configuration Checks (CONF_CHECK_DELAY)
nds-fr-802-3	IEEE 802.3 Frame Type Enabled (FR_802_3)
nds-fr-eth-2	Ethernet II Frame Type Enabled (FR_ETH_2)
nds-fr-802-2	IEEE 802.2 Frame Type Enabled (FR_802_2)
nds-fr-snap	SNAP Frame Type Enabled (FR_SNAP)
pserverNDS	File Server and Name of Print Server (PSERVER_NDS)
pserverBindery1	Bindery File Server Name 1 (PSERVER_BINDERY1)
pserverBindery2	Bindery File Server Name 2 (PSERVER_BINDERY2)
pserverBindery3	Bindery File Server Name 3 (PSERVER_BINDERY3)
pserverBindery4	Bindery File Server Name 4 (PSERVER_BINDERY4)
pserverBindery5	Bindery File Server Name 5 (PSERVER_BINDERY5)
pserverBindery6	Bindery File Server Name 6 (PSERVER_BINDERY6)
pserverBindery7	Bindery File Server Name 7 (PSERVER_BINDERY7)
pserverBindery8	Bindery File Server Name 8 (PSERVER_BINDERY8)
pserverBindery9	Bindery File Server Name 9 (PSERVER_BINDERY9)
pserverBindery10	Bindery File Server Name 10 (PSERVER_BINDERY10)
pserverBindery11	Bindery File Server Name 11 (PSERVER_BINDERY11)
pserverBindery12	Bindery File Server Name 12 (PSERVER_BINDERY12)
pserverBindery13	Bindery File Server Name 13 (PSERVER_BINDERY13)
pserverBindery14	Bindery File Server Name 14 (PSERVER_BINDERY14)
pserverBindery15	Bindery File Server Name 15 (PSERVER_BINDERY15)
pserverBindery16	Bindery File Server Name 16 (PSERVER_BINDERY16)
nprinter1	Remote Printer Attachment 1 (NPRINTER1)
nprinter2	Remote Printer Attachment 2 (NPRINTER2)
nprinter3	Remote Printer Attachment 3 (NPRINTER3)
nprinter4	Remote Printer Attachment 4 (NPRINTER4)
nprinter5	Remote Printer Attachment 5 (NPRINTER5)
nprinter6	Remote Printer Attachment 6 (NPRINTER6)
nprinter7	Remote Printer Attachment 7 (NPRINTER7)
nprinter8	Remote Printer Attachment 8 (NPRINTER8)

Standard Trap Objects

The following objects are related to standard SNMP traps.

Object	Description
coldStart	The sending device is reinitializing itself (its configuration may be altered)
authenticationFailure	The sending device received a message that is not properly authenticated

Private Enterprise Trap Objects

The following objects are related to AXIS private enterprise SNMP traps.

Object	Description
trapPrinter	A printer error has occurred
trapNewIPaddr	The IP address has been changed by RARP, BOOTP or an 'arp -s'

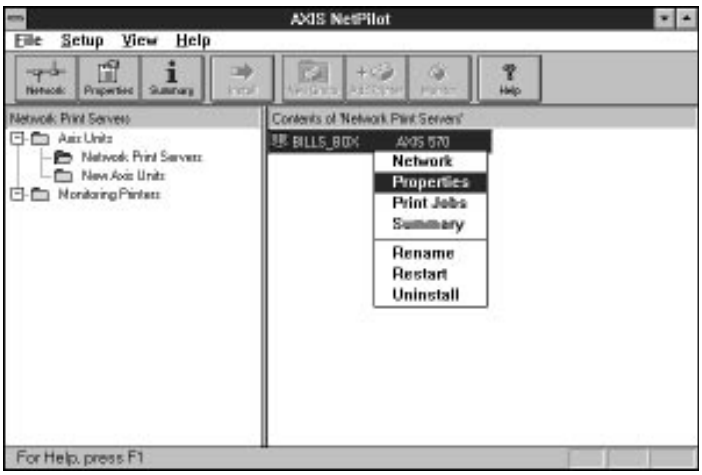
SECTION 10

PARAMETER EDITING

The Axis Network Print Server owes its versatility to the fact that its operation is governed by a set of parameters that can be altered to suit a wide range of network situations. These parameters are stored within the Axis Network Print Server and can be changed by several methods depending on the operating environment in use.

AXIS NetPilot

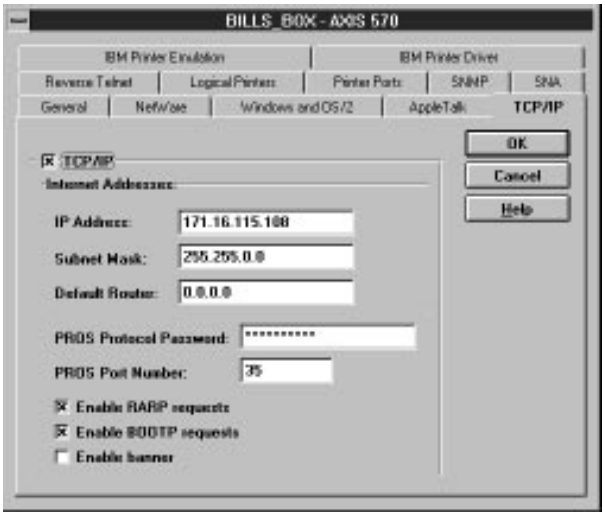
AXIS NetPilot is a Windows program that provides the most comprehensive and user friendly way to alter the print server configuration; it replaces AXCFG and Axis Installer for NetWare. AXIS NetPilot can be used with all print servers with a software version 5.00 or later. The NetPilot main window shows all the Axis print servers on the network in graphical form which allows easy identification and selection. There are also facilities for monitoring status of the print servers.



A Wizard is provided for rapid installation of print servers. This carries out all the basic parameter setting and network integration necessary to make the print server operational.

Following the installation, the parameters can be altered at any time via the property pages.

AXIS NetPilot can also be used to alter network environments, for example print queues can be set up and attached within the NetWare environment. Alternatively the NetWare network environment can be changed using PCONSOLE



ftp Once the print server is installed into the Unix environment, i.e. the IP address is set, the parameters can be down-loaded into a workstation, edited, and then loaded back into the print server using ftp.

Extended emulation Once communication with an IBM host has been established, all the parameters can be edited by printing a file containing special configuration commands. This method applies only to the print servers using the SNA protocol, e.g. the AXIS 570/670.

NetWare, Windows and LAN Server/LAN Manager

On the disk supplied with your print server you will find the AXIS NetPilot Configuration Utility, which is a Windows application that allows you to install and configure your print server, as described above. It contains an installation Wizard and extensive on-line help to guide you through parameter editing. It is an excellent tool for tailoring your printing environment.

Follow the instructions in the *read.me* file, which is also found on the supplied disk, to install AXIS NetPilot.

TCP/IP

The parameter list is stored in the file *config* located in the root directory of the Axis print server. Modifying the parameter list comprises the steps of up-loading, editing, and down-loading/saving the *config* file. Follow the instructions below:

1. Log in to the print server by the command **ftp salesdept**. Enter **root** at the *user id* prompt and **pass** at the *password* prompt.
2. Up-load the parameter list by the command **get config**.
   Optionally print the parameter list by the command **put config pr1**.
3. Log out from the print server using the command **bye**, **quit** or **exit** depending on your FTP version.
4. Edit the parameter list using a text editor, e.g. **vi config**.
5. Log in again according to step 1.
6. Down-load the parameter list and save it permanently by the command **put config CONFIG**. The second argument (*CONFIG*) must be entered as capitals in order to save settings permanently.
7. Restart the print server by the command **get hardreset**.
8. Log out from the print server.

Notes:

1. The command *get config* creates a local copy of the parameter list in your current directory. If you want to create a copy at a different location use the command **get config /usr/mydir/myfile**.
2. The command *put config CONFIG* down-loads the local copy named *config* from your current directory. If you want to down-load the copy in */usr/mydir/myfile*, use the command **put /usr/mydir/myfile CONFIG**.

This is an extract from the *config* file, showing the beginning of the parameter list:

```
AXIS 560 Printer Server V5.10 Nov 24 1994

Parameter settings:

---  CONFIG MENU
NODE_ADDR.     : 00 40 8C 01 05 70
ROOT_PWD.      : pass
USERS.         :

---  TCP/IP MENU
INT_ADDR.      : 192 36 253 80
DEF_ROUT.      : 0 0 0 0
NET_MASK.      : 0 0 0 0
ROOT_PWD.      : pass
USERS.         :
PROS_PWD.      : netprinter
PROS_PRT.      : 35
TFTP_ENB.      : NO
TN_PORT.       : 23
RTN_OPT.       : YES
```

Each line beginning with a parameter name immediately followed by a period is interpreted as a *parameter entry*. All other lines are considered as comments, which are ignored by the print server.

Parameter entry syntax:

<name>. : <value>

- *name* is the parameter name. It must be immediately followed by a period (**.**).
- *value* is the parameter value; either of numerical, enumerated, boolean, hexadecimal string, or text string type. It must be preceded by a colon (:). Refer to Section 10 for the syntax of the individual parameters.

Syntax control:

The parameter list syntax check of the print server is fairly limited – type mismatches (such as setting the internet address to YES) will be detected, but no validity or range check is performed on the parameter values.

If a syntax error is detected during the down-load operation, the following error message will be displayed:

```
Illegal value:<name>.
```

When this happens, all parameters preceding the faulty parameter entry will be updated, and the rest of the parameter entries (including the faulty one) will be ignored.

Programming Hints

It is not necessary to down-load the complete parameter list. You can create customized files for different purposes, where each file contains only the parameters needed for a specific task.

Example:

You have a number of already configured print servers on your network, and want to change to letter page size without changing any other parameters.

Create a file *letter* containing the following lines:

```
File: letter
 Change page size to LETTER for PR1 - PR3

 PR1_SIZE. : LETTER
 PR2_SIZE. : LETTER
 PR3_SIZE. : LETTER
```

Log in to each print server and down-load the file by the command **put letter CONFIG**. This will update the page size for PR1, PR2 and PR3 without affecting any other parameter settings.

If you have a large number of print servers installed, you may want to automate the process. This is done by creating a script that performs the following tasks:

1. Get the first host name from your system host table (*/etc/hosts*).
2. Log in to the host
3. Find out whether it is an print server. If not, skip to step 5.
4. Down-load the file *letter*.
5. Log out.

6. Get the next host name from the system host table. If there are no more entries, exit the script.
7. Loop to step 2.

Factory Defaults

There are two ways of restoring the print server to factory default settings: the Telnet *defaults* command, and the FTP file transfer method.

To use the Telnet *defaults* command, follow these steps:

1. Log in to the print server by the command **telnet salesdept**. Enter **root** at the *user id* prompt and **pass** at the *password* prompt.
2. Restore the parameters by the command **defaults**.
3. Restart *salesdept* by the command **hardreset** (this will also close the Telnet session).

To use the FTP file transfer method, follow these steps:

1. Log in to the print server by the command **ftp salesdept**. Enter **root** at the *user id* prompt as **pass** at the *password* prompt.
2. Up-load the default parameter list by the command **get defaults**.
3. Down-load the parameter list and save it permanently by the command **put defaults CONFIG**.
4. Restart *salesdept* by the command **get hardreset** (this will also close the FTP session).

You can also reset the print server to the factory defaults by using the TEST button. This procedure involves firstly switching the print server off and on. Unplug the power cord to switch off the print server .

1. Switch off the print server .
2. Press and hold the TEST button while you switch on the print server. Keep the TEST button pressed for at least 20 seconds until the Network indicator flashes with one second intervals.
3. Release the TEST button and wait at least five seconds (five indicator flashes).
4. Press and hold the TEST button for at least five seconds until the Network indicator remains constantly lit.

The print server is now reset to factory default settings. Restart the print server by switching it off and on.

Note The Internet and Node addresses (parameters INT_ADDR and NODE_ADDR) remain unchanged, but all other parameters are reset.

Apple EtherTalk

In an EtherTalk-only environment you will need a Macintosh utility that supports *ftp* (e.g. MacTCP) to access the *config* file from a Macintosh. Proceed as described for TCP/IP above.

If you have a NetWare, LAN Server/LAN Manager or UNIX host in your network, we recommend that you configure the print server from that host instead.

SNA

This section only applies to print servers using the SNA protocol, e.g. the AXIS 570/670.

Once communication with an IBM host has been established, all the parameters can be edited by printing a file containing special configuration commands. To start the configuration, the command `%CONFIG+` is entered in the file. To protect your settings, a password must be provided. By default, the password is `pass`. When all parameters are set, the command `SAVE` is used to store the parameters permanently. The command `%CONFIG-` leaves the configuration mode and resumes normal printing. The syntax for the file to print is:

```
%CONFIG+ <password>;
IBM_PRINTING_PARAMETER_NAME = VALUE;
SAVE;
%CONFIG-
```

In order to maintain backward compatibility and increase security, most parameters that are not related to the IBM printing operation have to be preceded by the `%CONFIG++` command. When all parameters are set, enter `%CONFIG--`. The IBM printing parameters requiring only a `%CONFIG+` are marked in the parameter listing on the following pages.

```
%CONFIG+ <password>;
IBM_PRINTING_PARAMETER_NAME = VALUE;
%CONFIG++
PARAMETER_NAME = VALUE;
%CONFIG--
SAVE;
%CONFIG-
```

Example: Select the PCL5 printer driver and disable the NetWare protocol:

```
%CONFIG+ pass;   (If you have not changed the default
PRBANK = PCL5;   password (pass), the password is optional.)
%CONFIG++
NETW_ENB = NO;
%CONFIG--
SAVE;
%CONFIG-
```

Note: For parameters requiring more than one value, the values should be separated using a comma.

SECTION 11

THE PARAMETER LIST

This section contains an overview (the first six pages) and a complete description of all Axis network print server parameters. Each parameter contains a string or a value that the print server uses to determine how it should behave towards the printers and the network.

These parameters are held in the *config* file in the Axis print server. They can be edited from your workstation as described in *SECTION 10* - Parameter Editing, page 131.

The listings contains the parameters used in all the Axis print servers. You should use the small table alongside each parameter to determine if it is appropriate to your print server.

Some parameters have different values for different print servers; these are indicated in the detailed description part of this parameter listing.

Important: Most parameters will take effect in the print server for the next incoming print job after being changed. Some parameters however requires the print server to be restarted to make the new settings take effect.

For print server software versions 5.00 and higher, the following parameters requires restart:

- NODE_ADDR. in the CONFIG MENU
- S_ROUTE. in the CONFIG MENU
- NCP_BURST_MODE. in the NETWARE MENU
- NB_FR_TYPE. in the LAN SERVER/LAN MANAGER MENU
- All parameters in the SNA MENU

For print server software versions older than 5.00, the parameters marked with ‘†’ require that the configuration is saved and the NPS print server is restarted to take effect.

Parameter Overview

CONFIG MENU

150 152	530 532	630 632	550 650	560 660	570 670
x	x	x	x	x	x

	Parameter	Factory default	Description	Page
†	NODE_ADDR.	: 00 40 8C 10 00 86	Node Address	149
	ROOT_PWD.	: ROOT	Root Password	150
	USERS.	:	User Authority and Printer Access	150
†	S_ROUTE.	: AUTO	Token Ring Source Routing Mode - Token Ring models only	151

SNA MENU

150 152	530 532	630 632	550 650	560 660	570 670
					x

	Parameter	Factory default	Description	Page
†	SNA_ENB.	: YES	SNA Protocol Enabled	152
†	AUTODIAL.	: NO	Automatic Link Establishment	152
†	DIALTIME.	: 20	Link Establishment Retry Time	153
†	HOSTADDR.	: FF FF FF FF FF FF	Host (destination) MAC Address	153
†	HOST_SAP.	: $4	Host Service Access Point	154
†	NODE_SAP.	: $4	Node Service Access Point	154
†	NODE_ID.	: E0 70 00 86	Node Identifier	155
†	JOB_TIME.	: 3	Job Separation Time-out	155
†	IR_TIME.	: 10	Intervention Required Time-out	156
†	BP_END_JOB.	: YES	Bracket Protocol End Job	156

TCP/IP MENU

150 152	530 532	630 632	550 650	560 660	570 670
	x	x	x	x	x

	Parameter	Factory default	Description	Page
†	INT_ADDR.	: 192 36 253 80	Internet Address	157
†	DEF_ROUT.	: 0 0 0 0	Default Router Address	157
†	NET_MASK.	: 0 0 0 0	Net Mask	157
†	TCP_ENB.	: YES	TCP/IP Protocol Enabled	158
†	TCP_KEY.	:	TCP/IP Protocol Key - NPS 530/532/630/632 only	158
	PROS_PWD.	: netprinter	PROS Protocol Password	159
	PROS_PRT.	: 35	PROS TCP Port Number	159
†	LPD_BANN.	: YES	LPD Banner Page Enabled	159
	BOOTP_ENB.	: YES	BOOTP Protocol Enabled	160
†	RARP_ENB.	: YES	RARP Protocol Enabled	160
	RTN_OPT.	: YES	Reverse Telnet Options Enabled	160
†	RTEL_PR1.	: 0	PR1 TCP Port Number	161
†	RTEL_PR2.	: 0	PR2 TCP Port Number	161
†	RTEL_PR3.	: 0	PR3 TCP Port Number	161
†	RTEL_PR4.	: 0	PR4 TCP Port Number	161
†	RTEL_PR5.	: 0	PR5 TCP Port Number	161
†	RTEL_PR6.	: 0	PR6 TCP Port Number	161
†	RTEL_PR7.	: 0	PR7 TCP Port Number	161
†	RTEL_PR8.	: 0	PR8 TCP Port Number	161

150 152	530 532	630 632	550 650	560 660	570 670
	x	x	x	x	x

SNMP MENU

Parameter	Factory default	Description	Page
READ_COM.	: public	Read-Only Community Name	162
WRT_COM.	: pass	Read-Write Community Name	162
TRAPADDR.	: 0 0 0 0	SNMP Trap Internet Address	162
TRAP_COM.	: public	SNMP Trap Community Name	163
SYS_CONT.	:	System Contact	163
SYS_NAME.	:	System Name	163
SYS_LOC.	:	System Location	164
SNMP_AUT.	: DISABLED	Authentication Failure Traps	164
TRAP_PRT.	: DISABLED	Printer Traps	164

These parameters apply to print servers:

150 152	530 532	630 632	550 650	560 660	570 670
x	x	x	x		

NETWARE MENU for non-NDS print servers (NetWare 2.x and 3.x)

	Parameter	Factory default	Description	Page
†	NETW_ENB.	: YES	NetWare Protocol Enabled	165
†	PS_NAME.	: AXIS100086	Print Server Name	165
†	CONFSERV.	:	Configuration File Server Name	165
†	PS_POLL.	: 15	NetWare Queue Polling Interval	166
†	AUTO_SCAN.	: BOTH	Automatic File Server Login	167
†	FR_802_3.	: YES	IEEE 802.3 Frame Type Enabled	167
†	FR_ETH_2.	: YES	Ethernet II Frame Type Enabled	168
†	FR_802_2.	: YES	IEEE 802.2 Frame Type Enabled	168
†	FR_SNAP .	: YES	SNAP Frame Type Enabled	168
†	LOGIN1.	:	Print Server Queue Attachment 1	169
†	LOGIN2.	:	Print Server Queue Attachment 2	169
†	LOGIN3.	:	Print Server Queue Attachment 3	169
†	LOGIN4.	:	Print Server Queue Attachment 4	169
†	LOGIN5.	:	Print Server Queue Attachment 5	169
†	LOGIN6.	:	Print Server Queue Attachment 6	169
†	LOGIN7.	:	Print Server Queue Attachment 7	169
†	LOGIN8.	:	Print Server Queue Attachment 8	169
†	LOGIN9.	:	Print Server Queue Attachment 9	169
†	LOGIN10.	:	Print Server Queue Attachment 10	169
†	LOGIN11.	:	Print Server Queue Attachment 11	169
†	LOGIN12.	:	Print Server Queue Attachment 12	169
†	LOGIN13.	:	Print Server Queue Attachment 13	169
†	LOGIN14.	:	Print Server Queue Attachment 14	169
†	LOGIN15.	:	Print Server Queue Attachment 15	169
†	LOGIN16.	:	Print Server Queue Attachment 16	169
†	RPRINT1.	:	Remote Printer Attachment 1	170
†	RPRINT2.	:	Remote Printer Attachment 2	170
†	RPRINT3.	:	Remote Printer Attachment 3	170
†	RPRINT4.	:	Remote Printer Attachment 4	170
†	RPRINT5.	:	Remote Printer Attachment 5	170
†	RPRINT6.	:	Remote Printer Attachment 6	170
†	RPRINT7.	:	Remote Printer Attachment 7	170
†	RPRINT8.	:	Remote Printer Attachment 8	170

150 152	530 532	630 632	550 650	560 660	570 670
				x	x

NETWARE MENU for print servers with NDS (NetWare 4.x)

	Parameter	Factory default	Description	Page
†	NETW_ENB.	: YES	NetWare Protocol Enabled	165
†	PS_NAME.	: AXIS100086	Print Server Name	165
†	JOB_CHECK_DELAY.	: 5	Print Server Queue Polling Interval	165
†	CONF_CHECK_DELAY.	: 300	Interval between Automatic Configuration Checks	166
†	FR_802_3.	: YES	IEEE 802.3 Frame Type Enabled	167
†	FR_ETH_2.	: YES	Ethernet II Frame Type Enabled	168
†	FR_802_2.	: YES	IEEE 802.2 Frame Type Enabled	168
†	FR_SNAP.	: YES	SNAP Frame Type Enabled	168
†	NCP_BURST_MODE.	: YES	NCP Data Transfer Burst Mode	168
†	PSERVER_NDS.	:	File Server and Name of Print Server	168
†	PSERVER_BINDERY1.	:	Bindery File Server Name 1	169
†	PSERVER_BINDERY2.	:	Bindery File Server Name 2	169
†	PSERVER_BINDERY3.	:	Bindery File Server Name 3	169
†	PSERVER_BINDERY4.	:	Bindery File Server Name 4	169
†	PSERVER_BINDERY5.	:	Bindery File Server Name 5	169
†	PSERVER_BINDERY6.	:	Bindery File Server Name 6	169
†	PSERVER_BINDERY7.	:	Bindery File Server Name 7	169
†	PSERVER_BINDERY8.	:	Bindery File Server Name 8	169
†	PSERVER_BINDERY9.	:	Bindery File Server Name 9	169
†	PSERVER_BINDERY10.	:	Bindery File Server Name 10	169
†	PSERVER_BINDERY11.	:	Bindery File Server Name 11	169
†	PSERVER_BINDERY12.	:	Bindery File Server Name 12	169
†	PSERVER_BINDERY13.	:	Bindery File Server Name 13	169
†	PSERVER_BINDERY14.	:	Bindery File Server Name 14	169
†	PSERVER_BINDERY15.	:	Bindery File Server Name 15	169
†	PSERVER_BINDERY16.	:	Bindery File Server Name 16	169
†	NPRINTER1.	:	Remote Printer Attachment 1	170
†	NPRINTER2.	:	Remote Printer Attachment 2	170
†	NPRINTER3.	:	Remote Printer Attachment 3	170
†	NPRINTER4.	:	Remote Printer Attachment 4	170
†	NPRINTER5.	:	Remote Printer Attachment 5	170
†	NPRINTER6.	:	Remote Printer Attachment 6	170
†	NPRINTER7.	:	Remote Printer Attachment 7	170
†	NPRINTER8.	:	Remote Printer Attachment 8	170

150 152	530 532	630 632	550 650	560 660	570 670
x	see note		x	x	x

LAN SERVER/LAN MANAGER MENU

Parameters marked with '§' do not apply to the NPS 530/532 & 630/632

Default values depend upon the print server model - see detailed parameter list

	Parameter	Factory default	Description	Page
†	LSLM_ENB.	: YES	LAN Server/LAN Manager Protocol Enabled	173
†	NB_FR_TYPE.	: FR_AUTO	NetBEUI Frame Type	173
†	LPRINT_1.	: AX100086.LP1	Printer 1 Name	173
†	LLOGIC_1.	: PR1	Printer 1 Logical Printer	174
†	LPRINT_2.	: AX100086.LP2	Printer 2 Name	173
†	LLOGIC_2.	: PR2	Printer 2 Logical Printer	174
†	LPRINT_3.	: AX100086.CM1	Printer 3 Name	173
†	LLOGIC_3.	: PR3	Printer 3 Logical Printer	174
†	LPRINT_4.	:	Printer 4 Name	173
†	LLOGIC_4.	: PR4	Printer 4 Logical Printer	174
†§	LPRINT_5.	:	Printer 5 Name	173
†§	LLOGIC_5.	: PR5	Printer 5 Logical Printer	174
†§	LPRINT_6.	:	Printer 6 Name	173
†§	LLOGIC_6.	: PR6	Printer 6 Logical Printer	174
†§	LPRINT_7.	:	Printer 7 Name	173
†§	LLOGIC_7.	: PR7	Printer 7 Logical Printer	174
†§	LPRINT_8.	:	Printer 8 Name	173
†§	LLOGIC_8.	: PR8	Printer 8 Logical Printer	174

150 152	530 532	550	560	570
	x	x	x	x

APPLETALK MENU (Not applicable to Token Ring print servers)

Parameters marked with '§' do not apply to the NPS 530/532

	Parameter	Factory default	Description	Page
†	ATLK_ENB.	: YES	AppleTalk Protocol Enabled	175
†	ATLK_KEY.	:	AppleTalk Protocol Key - NPS 530/532 only	175
†	ATK_ZONE.	:	AppleTalk Zone	176
†	ZONER_EN.	: YES	HP Zoner Enabled	176
†	ATK_FONT.	: DEFAULT	PostScript Font Set	176
†	BINARY.	: NO	Binary Tranfer Enabled	177
†	APRINT_1.	: AXIS100086_LPT1	Printer 1 Name	177
†	ATYPE_1.	: LaserWriter	Printer 1 Type	178
†	ALOGIC_1.	: PR1	Printer 1 Logical Printer	179
†	APRINT_2.	: AXIS100086_LPT2	Printer 2 Name	177
†	ATYPE_2.	: LaserWriter	Printer 2 Type	178
†	ALOGIC_2.	: PR2	Printer 2 Logical Printer	179
†§	APRINT_3.	: AXIS100086_COM1	Printer 3 Name	177
†§	ATYPE_3.	: LaserWriter	Printer 3 Type	178
†§	ALOGIC_3.	: PR3	Printer 3 Logical Printer	179

PRINTER1 MENU

150 152	530 532	630 632	550 650	560 660	570 670
	see note		x	x	x

Parameters marked with '§' do not apply to the NPS 530/532 & NPS 630/632

	Parameter	Factory default	Description	Page
§	PR1_OUT.	: LPT1	PR1 Physical Printer Port	180
§	PR1_SCND.	: PR1	PR1 Secondary Printer	180
	PR1_WAIT.	: YES	PR1 Wait on Busy	181
§	PR1_IN.	: NONE	PR1 Read-Back Port	182
	PR1_BEF.	:	PR1 String Before Print Job	182
	PR1_STR.	:	PR1 String Substitutions	183
	PR1_CSET	: NONE	PR1 Character Set Conversion	184
	PR1_FILT.	: NONE	PR1 Printer Language Translation	184
	PR1_AFT.	:	PR1 String After Print Job	185
	PR1_DUMP.	: NO	PR1 Hex Dump Mode	185
	PR1_SIZE.	: A4	PR1 PostScript Page Size	186
	PR1_ORNT.	: PORTR	PR1 PostScript Page Orientation	187
	PR1_FORM.	: 66 0 100 60 30 50	PR1 PostScript Page Format	188
	PR1_FONT.	:	PR1 PostScript Font	189

PRINTER2 MENU

150 152	530 532	630 632	550 650	560 660	570 670
	see note		x	x	x

Parameters marked with '§' do not apply to the NPS 530/532 & NPS 630/632

	Parameter	Factory default	Description	Page
§	PR2_OUT.	: LPT2	PR2 Physical Printer Port	180
§	PR2_SCND.	: PR2	PR2 Secondary Printer	180
	PR2_WAIT.	: YES	PR2 Wait on Busy	181
§	PR2_IN .	: NONE	PR2 Read-Back Port	182
	PR2_BEF.	:	PR2 String Before Print Job	182
	PR2_STR.	:	PR2 String Substitutions	183
	PR2_CSET.	: NONE	PR2 Character Set Conversion	184
	PR2_FILT.	: NONE	PR2 Printer Language Translation	184
	PR2_AFT.	:	PR2 String After Print Job	185
	PR2_DUMP.	: NO	PR2 Hex Dump Mode	185
	PR2_SIZE.	: A4	PR2 PostScript Page Size	186
	PR2_ORNT.	: PORTR	PR2 PostScript Page Orientation	187
	PR2_FORM.	: 66 0 100 60 30 50	PR2 PostScript Page Format	188
	PR2_FONT.	:	PR2 PostScript Font	189

150 152	530 532	630 632	550 650	560 660	570 670
	see note		x	x	x

PRINTER3 MENU

Parameters marked with '§' do not apply to the NPS 530/532 & NPS 630/632

	Parameter	Factory default	Description	Page
§	PR3_OUT.	: COM1	PR3 Physical Printer Port	180
§	PR3_SCND.	: PR3	PR3 Secondary Printer	180
	PR3_WAIT.	: YES	PR3 Wait on Busy	181
§	PR3_IN.	: NONE	PR3 Read-Back Port	182
	PR3_BEF.	:	PR3 String Before Print Job	182
	PR3_STR.	:	PR3 String Substitutions	183
	PR3_CSET.	: NONE	PR3 Character Set Conversion	184
	PR3_FILT.	: NONE	PR3 Printer Language Translation	184
	PR3_AFT.	:	PR3 String After Print Job	185
	PR3_DUMP.	: NO	PR3 Hex Dump Mode	185
	PR3_SIZE.	: A4	PR3 PostScript Page Size	186
	PR3_ORNT.	: PORTR	PR3 PostScript Page Orientation	187
	PR3_FORM.	: 66 0 100 60 30 50	PR3 PostScript Page Format	188
	PR3_FONT.	:	PR3 PostScript Font	189

150 152	530 532	630 632	550 650	560 660	570 670
	see note		x	x	x

PRINTER4 MENU

Parameters marked with '§' do not apply to the NPS 530/532 & NPS 630/632

	Parameter	Factory default	Description	Page
§	PR4_OUT.	: COM1	PR4 Physical Printer Port	180
§	PR4_SCND.	: PR4	PR4 Secondary Printer	180
	PR4_WAIT.	: YES	PR4 Wait on Busy	181
§	PR4_IN.	: NONE	PR4 Read-Back Port	182
	PR4_BEF.	:	PR4 String Before Print Job	182
	PR4_STR.	:	PR4 String Substitutions	183
	PR4_CSET.	: NONE	PR4 Character Set Conversion	184
	PR4_FILT.	: NONE	PR4 Printer Language Translation	184
	PR4_AFT.	:	PR4 String After Print Job	185
	PR4_DUMP.	: NO	PR4 Hex Dump Mode	185
	PR4_SIZE.	: A4	PR4 PostScript Page Size	186
	PR4_ORNT.	: PORTR	PR4 PostScript Page Orientation	187
	PR4_FORM.	: 66 0 100 60 30 50	PR4 PostScript Page Format	188
	PR4_FONT.	:	PR4 PostScript Font	189

150 152	530 532	630 632	550 650	560 660	570 670
	see note		x	x	x

PRINTER5 MENU

Parameters marked with '§' do not apply to the NPS 530/532 & NPS 630/632

	Parameter	Factory default	Description	Page
§	PR5_OUT.	: LPT1	PR5 Physical Printer Port	180
§	PR5_SCND.	: PR5	PR5 Secondary Printer	180
	PR5_WAIT	: YES	PR5 Wait on Busy	181
§	PR5_IN.	: NONE	PR5 Read-Back Port	182
	PR5_BEF.	:	PR5 String Before Print Job	182
	PR5_STR.	: 010A020D0A	PR5 String Substitutions	183
	PR5_CSET.	: NONE	PR5 Character Set Conversion	184
	PR5_FILT.	: NONE	PR5 Printer Language Translation	184
	PR5_AFT.	:	PR5 String After Print Job	185
	PR5_DUMP.	: NO	PR5 Hex Dump Mode	185
	PR5_SIZE.	: A4	PR5 PostScript Page Size	186
	PR5_ORNT.	: PORTR	PR5 PostScript Page Orientation	187
	PR5_FORM.	: 66 0 100 60 30 50	PR5 PostScript Page Format	188
	PR5_FONT.	:	PR5 PostScript Font	189

150 152	530 532	630 632	550 650	560 660	570 670
	see note		x	x	x

PRINTER6 MENU

Parameters marked with '§' do not apply to the NPS 530/532 & NPS 630/632

	Parameter	Factory default	Description	Page
§	PR6_OUT.	: LPT2	PR6 Physical Printer Port	180
§	PR6_SCND.	: PR6	PR6 Secondary Printer	180
	PR6_WAIT.	: YES	PR6 Wait on Busy	181
§	PR6_IN.	: NONE	PR6 Read-Back Port	182
	PR6_BEF.	:	PR6 String Before Print Job	182
	PR6_STR.	: 010A020D0A	PR6 String Substitutions	183
	PR6_CSET.	: NONE	PR6 Character Set Conversion	184
	PR6_FILT.	: NONE	PR6 Printer Language Translation	184
	PR6_AFT.	:	PR6 String After Print Job	185
	PR6_DUMP.	: NO	PR6 Hex Dump Mode	185
	PR6_SIZE.	: A4	PR6 PostScript Page Size	186
	PR6_ORNT.	: PORTR	PR6 PostScript Page Orientation	187
	PR6_FORM.	: 66 0 100 60 30 50	PR6 PostScript Page Format	188
	PR6_FONT.	:	PR6 PostScript Font	189

150 152	530 532	630 632	550 650	560 660	570 670
	see note		x	x	x

PRINTER7 MENU

Parameters marked with '§' do not apply to the NPS 530/532 & NPS 630/632

	Parameter		Factory default	Description	Page
§	PR7_OUT.	:	COM1	PR7 Physical Printer Port	180
§	PR7_SCND.	:	PR7	PR7 Secondary Printer	180
	PR7_WAIT.	:	YES	PR7 Wait on Busy	181
§	PR7_IN.	:	NONE	PR7 Read-Back Port	182
	PR7_BEF.	:		PR7 String Before Print Job	182
	PR7_STR.	:	010A020D0A	PR7 String Substitutions	183
	PR7_CSET.	:	NONE	PR7 Character Set Conversion	184
	PR7_FILT.	:	NONE	PR7 Printer Language Translation	184
	PR7_AFT.	:		PR7 String After Print Job	185
	PR7_DUMP.	:	NO	PR7 Hex Dump Mode	185
	PR7_SIZE.	:	A4	PR7 PostScript Page Size	186
	PR7_ORNT.	:	PORTR	PR7 PostScript Page Orientation	187
	PR7_FORM.	:	66 0 100 60 30 50	PR7 PostScript Page Format	188
	PR7_FONT.	:		PR7 PostScript Font	189

150 152	530 532	630 632	550 650	560 660	570 670
	see note		x	x	x

PRINTER8 MENU

Parameters marked with '§' do not apply to the NPS 530/532 & NPS 630/632

	Parameter		Factory default	Description	Page
§	PR8_OUT.	:	COM1	PR8 Physical Printer Port	180
§	PR8_SCND.	:	PR8	PR8 Secondary Printer	180
	PR8_WAIT.	:	YES	PR8 Wait on Busy	181
§	PR8_IN.	:	NONE	PR8 Read-Back Port	182
	PR8_BEF.	:		PR8 String Before Print Job	182
	PR8_STR.	:	010A020D0A	PR8 String Substitutions	183
	PR8_CSET.	:	NONE	PR8 Character Set Conversion	184
	PR8_FILT.	:	NONE	PR8 Printer Language Translation	184
	PR8_AFT.	:		PR8 String After Print Job	185
	PR8_DUMP.	:	NO	PR8 Hex Dump Mode	185
	PR8_SIZE.	:	A4	PR8 PostScript Page Size	186
	PR8_ORNT.	:	PORTR	PR8 PostScript Page Orientation	187
	PR8_FORM.	:	66 0 100 60 30 50	PR8 PostScript Page Format	188
	PR8_FONT.	:		PR8 PostScript Font	189

OUTPUT MENU

150 152	530 532	630 632	550 650	560 660	570 670
see note			x	x	x

Notes: AXIS 150/152: No COM1 parameters.
NPS 530/532 & 630/632: LPT1 parameters only.

	Parameter	Factory default	Description	Page
†	L1_CENTR.	: STNDRD	LPT1 Centronics Interface Timing	190
	L1_BSYTM.	: 60	LPT1 Busy Status Time-Out	190
	C1_READT.	: 3	COM1 Printer Feedback Delay	191
†	C1_HNDSH.	: ROBUST-BOTH	COM1 Handshake Protocol	191
†	C1_BAUDR.	: 9600	COM1 Baud Rate	192
†	C1_STOPB.	: 2	COM1 Stop Bits	192
†	C1_PARIT.	: NONE	COM1 Parity	192
†	C1_NBITS.	: 8	COM1 Word Length	193
	C1_BSYTM.	: 60	COM1 Busy Status Time-Out	193
†	L2_CENTR.	: STNDRD	LPT2 Centronics Interface Timing	193
	L2_BSYTM.	: 60	LPT2 Busy Status Time-Out	194

PANEL MENU

150 152	530 532	630 632	550 650	560 660	570 670
x	x	x	x	see note	

The parameter marked with '§' does not apply to the AXIS 560/660 and AXIS 570/670.

	Parameter	Factory default	Description	Page
	DEF_OUT.	: PR1	Internal Printout Destination	195
§	LOCK_KEY.	: NO	Lock Test Button	195

IBM BASIC CONFIGURATION

150 152	530 532	630 632	550 650	560 660	570 670
					x

Parameter	Factory default	Description	Page
SYSL.	: 37 (37,260,273,274,275, 277,278,280,281,282,284, 285,286,287,288,289,293, 500,871,297,361,892,893)	System Language	196
PREMUL.	: 3816 (3287,3268,3262, 4214,4224,4230, 3812,3816S,3816)	IBM Printer Emulation	196

IBM PAGE FORMAT

150 152	530 532	630 632	550 650	560 660	570 670
					x

Parameter	Factory default	Description	Page
MPL.	: 66, ENA	Maximum Page Length	197
MPP.	: 132, ENA	Maximum Print Position	198
LPI.	: 6 (3,4,6,8)	Lines Per Inch	198
CPI.	: 10 (5,10,12,15,17)	Characters Per Inch	199
AUTORI.	: YES (YES,NO)	Automatic Orientation	199
LM.	: 0, 0, 48	Left Margin (Portrait-, Landscape- and COR-mode)	200
TM.	: 26, 26, 74	Top Margin (Portrait-, Landscape- and COR-mode)	200
LDSF.	: 94, 94, 70	Line Density Scale Factor (Portrait-, Landscape- and COR-mode)	201
DEFBIN.	: BIN1 (BIN1, BIN2, BIN3, BIN4, BIN5, BIN6)	Default Input Bin	201
BIN1.	: COR, LETTER, 0, 0	Bin 1 Orientation and Paper Size	202
BIN2.	: COR, LETTER, 0, 0	Bin 2 Orientation and Paper Size	203
BIN3.	: COR, LETTER, 0, 0	Bin 3 Orientation and Paper Size	203
BIN4.	: COR, LETTER, 0, 0	Bin 4 Orientation and Paper Size	203
BIN5.	: COR, LETTER, 0, 0	Bin 5 Orientation and Paper Size	203
BIN6.	: COR, LETTER, 0, 0	Bin 6 Orientation and Paper Size	204
SIMBF.	: YES	Simulate Boldface	204

FONTS

150 152	530 532	630 632	550 650	560 660	570 670
					x

Parameter	Factory default	Description	Page
CPI5.	: 244, 204	5 CPI FGID Definition (Portrait-/Landscape- and COR-mode)	204
CPI10.	: 11, 204	10 CPI FGID Definition (Portrait-/Landscape- and COR-mode)	205
CPI12.	: 86, 230	12 CPI FGID Definition (Portrait-/Landscape- and COR-mode)	205
CPI15.	: 230, 281	15 CPI FGID Definition (Portrait-/Landscape- and COR-mode)	206
CPI17.	: 252, 290	17 CPI FGID Definition (Portrait-/Landscape- and COR-mode)	206

IBM EXTENDED EMULATION

150 152	530 532	630 632	550 650	560 660	570 670
					x

Parameter	Factory default	Description	Page
XEMUL.	: YES	Extended Emulation Status	207
WARN.	: NO	Warning Switch.	207
SSUBST.	: YES	Extended Emulation String Substitution	208
SBTS.	:	Single Byte Transparency Sequence	208
TLIS.	: 025 03C	Transparency Lead-in Sequence	209
TTRS.	: 03E 025	Transparency Trailer Sequence	209
FLIS.	: 025 02F	Function Mode Lead-in Sequence	210
EECS.	: 025 041 058 049 053	Extended Emulation Mode Control Sequence	210
COBXEM.	: SETALL (OFF, SETESC, SETALL)	Cobra Extended Emulation Mode	211
CCLIS.	: 025 050	Cobra Config Lead-in Sequence	211

IBM JOB CONTROL

150 152	530 532	630 632	550 650	560 660	570 670
					x

Parameter	Factory default	Description	Page
SOJS.	:	Start of Job Sequence	212
EOJS.	:	End of Job Sequence	212

IBM 3270 OPTIONS

150 152	530 532	630 632	550 650	560 660	570 670
					x

Parameter	Factory default	Description	Page
CASE.	: DUAL (DUAL, MONO)	Case	212
BASCOL.	: BLACK, ENA	Base Color	213
XSTRN.	: 0	Extended SCS Transparency	213
AUTNL.	: 1	Automatic New Line at MPP+1	214
ADDNL.	: 1	Additional New Line at MPP+1	214
FFWPB.	: 0	Form Feed within Print Buffer	214
FFEOPB.	: 1	Form Feed at End of Print Buffer	215
NULSUP.	: 0	Null Supression	215
FFCPOS.	: 0	Form Feed Command Position	215
AFEOPB.	: 0	Auto Func after End of Print Buffer	216

IBM PRINTER DRIVER

150 152	530 532	630 632	550 650	560 660	570 670
					x

Parameter	Factory default	Description	Page
PRDRIVER.	: GENERIC (USER, GENERIC, PCL4, PCL5,IBM_PRO, EPSON_FX, EPSON_LQ)	Printer Bank Selection	216
BACKSPS.	: 08	Backspace Sequence	217
CRS.	: 0D	Carrige Return Sequence	217
LFS.	: 0A	Line Feed Sequence	217
NLS.	: 0D 0A	New Line Sequence	218
FFS.	: 0C	Form Feed Sequence	218
BLKS.	:	Black Color Sequence	219
GRNS.	:	Green Color Sequence	219
BLUS.	:	Blue Color Sequence	220
REDS.	:	Red Color Sequence	220
MAGS.	:	Magenta Color Sequence	221
CYNS.	:	Cyan Color Sequence	221
YELS.	:	Yellow Color Sequence	222
BIN1S.	:	Bin 1 Select Sequence	222
BIN2S.	:	Bin 2 Select Sequence	223
BIN3S.	:	Bin 3 Select Sequence	223
BIN4S.	:	Bin 4 Select Sequence	224
BIN5S.	:	Bin 5 Select Sequence	224
BIN6S.	:	Bin 6 Select Sequence	225
CSIZS.	:	Custom Size Sequence	225
JOGS.	:	Jog Sequence	226
SBSET.	: PC850 (PC850, ROMAN8, PC437, ECMA94, USASCII)	Symbol Set	226
FONT.		Font definitions: FGID, CSSF, SBSET, Spacing, Pitch, Height, Style, Stroke, Typeface, String.	227 to 229

Detailed Parameter Descriptions

NODE_ADDR Node Address CONFIG MENU

150 152	530 532	630 632	550 650	560 660	570 670
x	x	x	x	x	x

This parameter specifies the Node Address for the Axis print server. Each print server is preconfigured with a unique Node Address (identical to the serial number). You may change this to a *Locally Administrated Address* (LAA).

Always consult your network manager before changing this parameter.

Syntax: **NODE_ADDR. : <n> <n> <n> <n> <n> <n>**

- *n* is a hexadecimal number in the range 00 - FF

Notes:

1. *Ethernet only:* A Locally Administrated Address must begin with a hexadecimal number in the range 02, 06, 0A, 0E, 12, 16, 1A, 1E, ..., F2, F6, FA, FE (binary xxxx xx10). No restrictions apply to the five remaining numbers.
2. *Token Ring only:* A Locally Administrated Address must begin with a hexadecimal number in the range 40, 50, 60, 70, 41, 51, 61, 71, ..., 4F, 5F, 6F, 7F (binary 01xx xxxx). No restrictions apply to the five remaining numbers.
3. If an invalid LAA is entered, the current Node Address remains unchanged.
4. The preconfigured Node Address can be restored by entering an all-zero address (or the serial number), see example below.

Examples:

```
NODE_ADDR. : 00 40 8C 10 00 86
```
(sample preconfigured Node Address, Ethernet)

```
NODE_ADDR. : 00 02 31 48 00 61
```
(sample preconfigured Node Address, Token Ring)

```
NODE_ADDR. : 4A CF 08 74 04 D0
```
(sample Locally Administrated Address, Ethernet)

```
NODE_ADDR. : 4B CF 08 74 04 D0
```
(sample Locally Administrated Address, Token Ring)

```
NODE_ADDR. : 00 00 00 00 00 00
```
(restoring the preconfigured Ethernet Address)

Important: *Save the configuration and restart the print server after changing this parameter.*

ROOT_PWD Root Password CONFIG MENU

150 152	530 532	630 632	550 650	560 660	570 670
x	x	x	x	x	x

This is the root password, which must be given before you can modify the *config* file in ftp. If the root password is empty, there will be no log in password check for any user.

Syntax: **ROOT_PWD. : <any sequence>**

- The password may contain any characters, and may be up to 255 characters long.
- The default password is *pass*.
- When the *config* file is up-loaded using FTP as a non-root user, this parameter entry will be omitted.

Example:

```
ROOT_PWD. : pass
```

USERS User Authority and Printer Access CONFIG MENU

150 152	530 532	630 632	550 650	560 660	570 670
	x	x	x	x	x

This string parameter sets the authority properties for any number of users. It is only valid for FTP log in; access using other protocols is not governed by this parameter. A name, a password, and an access code may be provided for each user.

If this parameter is empty, no authority check is made (anyone may use any logical printer).

Syntax: **USERS. : u:<user_1>:p:<pswd1>:a:<ac1>[:u:<user_n>:p:<pswd_n>:a:<ac_n>]**

- *user_1* is the name of the first user. Any number of users may be specified.
- *pswd_1* is the password for *user_1*. If the password is omitted, no password is required for this user.
- *ac_1* is the access code (see table below) specifying which logical printers *user_1* may use. If the access code is omitted, all logical printers may be accessed.

The access code is bit-weighted as follows:

Bit 0 (hex 01): access to PR1	Bit 4 (hex 10): access to PR5
Bit 1 (hex 02): access to PR2	Bit 5 (hex 20): access to PR6
Bit 2 (hex 04): access to PR3	Bit 6 (hex 40): access to PR7
Bit 3 (hex 08): access to PR4	Bit 7 (hex 80): access to PR8

Example:

```
USERS. : u:sales:p:xyz:a:39:u:test:p:abc:u:anonymous:a:12
```

This means that the user **sales** with password **xyz** has access to the logical printers PR1, PR4, PR5, and PR6, the user **test** with password **abc** has access to all logical printers, and the user **anonymous** (no password required) has access to logical printers PR2 and PR5.

Note: *Root access is set by* **ROOT_PWD**, *and may not be set or altered by this parameter.*

S_ROUTE Token Ring Source Routing Mode CONFIG MENU

150 152	530 532	630 632	550 650	560 660	570 670
		x	see note		

This parameter specifies the type of source routing broadcast information in outgoing frames. It is used when the print server needs to send data (such as status information) to another Token Ring station that is not present in the *source routing table.*

The print server maintains a source routing table of up to 16 stations, where an entry is kept for 20 seconds. If the receiving station is found in this table, the source routing information is taken from there.

Always consult your network manager before changing this parameter.

Note: Applies to Token Ring models only.

Syntax: **S_ROUTE. : <Mode>**

MODE	Description
OFF	No source routing information. This is useful in strictly 'transparent bridge' environments, or when using old equipment that does not support source routing.
SINGLE	Single route broadcast mode. This is useful where there are no 'transparent bridges', and a spanning tree protocol is successfully used by the Token Ring bridges.
ALL	All routes broadcast mode. Use this mode when the spanning tree offers an unsatisfactory route, or when a spanning tree is not constructed.
AUTO	Cycle OFF-SINGLE-ALL modes. This is the default setting, and is useful in most environments. However, under certain circumstances (such as extremely heavy network load, network source routing policies, etc.) you might need to switch to one of the settings above.

Example:

```
S_ROUTE.    : AUTO
```

Important: *Save the configuration and restart the print server after changing this parameter.*

SNA_ENABLE SNA Protocol Enabled SNA MENU

This parameter is used to switch the SNA support on and off.

150 152	530 532	630 632	550 650	560 660	570 670
					x

Syntax: **SNA_ENB. : <Status>**

Status	Description
* **YES**	SNA protocol is enabled.
NO	SNA protocol is disabled.

Example:

```
SNA_ENB. : YES
```

Important: Save the configuration and restart the print server after changing this parameter.

AUTODIAL Automatic Link Establishment SNA MENU

Controls whether the print server will automatically try to establish the link if communication is lost.

150 152	530 532	630 632	550 650	560 660	570 670
					x

Syntax: **AUTODIAL. : <Status>**

Status	Description
ON	Automatic link establishment.
* **OFF**	Host initiated link establishment.

Note: Set AUTODIAL ‘Off’ if your host makes continuous link establishment retries on its own.

Example:

```
AUTODIAL. : ON
```

Important: Save the configuration and restart the print server after changing this parameter.

DIALTIME Link Establishment Retry Time SNA MENU

150 152	530 532	630 632	550 650	560 660	570 670
					x

Determines the time in seconds between link establishment retries. Only active if AUTODIAL is set 'On'.

Syntax: **DIALTIME. : <Delay>**

Delay	Description
*** 60**	Default time in seconds between link establishment retries
1-1000	Time in seconds between link establishment retries.

Note: To avoid network congestion, the DIALTIME delay period must be sufficiently long delay. This is specially important if HOSTADDR is set to FFFFFFFFFFFF, as a broadcast will then be sent for each retry.

Example: To select a 2 minutes (120 seconds) delay between link establishment retries:

```
DIALTIME. : 120
```

Important: Save the configuration and restart the print server after changing this parameter.

HOSTADDR Host MAC Address SNA MENU

150 152	530 532	630 632	550 650	560 660	570 670
					x

Host (destination) MAC address.

Syntax: **HOSTADDR. : <Address>**

Address	Description
*** FFFFFFFFFFFF**	Any host will be accepted. If AUTODIAL is set to ON, link establishment will be made using a broadcast message.
<any other MAC address>	Only a host with this MAC address will be accepted

Note: Set this to a specific hosts MAC address if you experience that more than the desired host establishes a link to the print server, or you don't want data with broadcast address be sent during link establishment.

Example: To hook up to e.g. a 3174 pass-through gateway with MAC address 400031740001:

```
HOSTADDR. : 400031740001
```

Important: Save the configuration and restart the print server after changing this parameter.

HOST_SAP Host Service Access Point SNA MENU

Host LLC SAP value.

150 152	530 532	630 632	550 650	560 660	570 670
					x

Syntax: **HOST_SAP. : <Value>**

Value	Description
*** 4**	Default Host LLC SAP value
4,8,12, etc	Host LLC SAP value from 4 and upwards in steps of 4.

Note: It is unlikely that you need to change this value. Be careful not to use a SAP value that is used by any standard protocol.

Example: To change the Host SAP to 8:

```
HOST_SAP. : 8
```

Important: Save the configuration and restart the print server after changing this parameter.

NODE_SAP Node Service Access Point SNA MENU

Node (print server) LLC SAP value.

150 152	530 532	630 632	550 650	560 660	570 670
					x

Syntax: **NODE_SAP. : <Value>**

Value	Description
*** 4**	Default Node LLC SAP value
4,8,12, etc	Node LLC SAP value from 4 and upwards in steps of 4.

Note: It is unlikely that you need to change this value. Be careful not to use a SAP value that is used by any standard protocol.

Syntax:Example: To change the Node SAP to 12:

```
NODE_SAP. : 12
```

Important: Save the configuration and restart the print server after changing this parameter.

NODE_ID Node Identifier SNA MENU

150 152	530 532	630 632	550 650	560 660	570 670
					x

Node ID (IDBLK/IDNUM value).

Syntax: **NODE_ID. : <Value>**

Value	Description
* **E07xxxxx**	'xxxxx' are the last 5 digits of the product serial number (and the MAC address). IDBLK 'E07' is registered at IBM for use only by Axis.
<any other 8 digit hex value>	Desired node ID

Note: Change the Node ID only if the default value is the same as another device's Node ID or if a SNA gateway requires the node to have the same Node ID as the gateway itself.

Example: To set the Node ID to IDBLK 017 and IDNUM 00001:

```
NODE_ID. : 01 70 00 00 01
```

Important: Save the configuration and restart the print server after changing this parameter.

JOB_TIME Job Separation Time-out SNA MENU

150 152	530 532	630 632	550 650	560 660	570 670
					x

Determines the time in seconds before SNA will release the logical printer port following a completed print job. Only after SNA has released the port can it be used by another protocol.

Syntax: **JOB_TIME. : <Value>**

Value	Description
0	Job separation is shut off (logical printer port will not be released)
* **3**	Default time in seconds
1-1000	time in seconds

Note: Increase this value if your print jobs appear "copped-up". This is likely to be caused by slow print job scheduling on the host, or possibly a slow host-tp-gateway link.

Example: To change the job separation time-out to 1 minute (60 seconds):

```
JOB_TIME. : 60
```

Important: Save the configuration and restart the print server after changing this parameter.

IR_TIME Intervention Required Time-out SNA MENU

150 152	530 532	630 632	550 650	560 660	570 670
					x

Intervention Required (IR) status is sent to the host when “printer off-line” prevails for longer than the amount of time defined by this parameter. Note that an error status from the printer (“paper end”, etc.) always has IR time of 1 minute.

Syntax: **IR_TIME. : <Value>**

Value	Description
0	IR is shut off (including for printer error status)
*** 10**	Default time in minutes
1-1000	time in minutes

Note: If you have a plotter attached to the print server the default time of 10 minutes might be too short. On the other hand, you may wish to decrease this value if you want a more prompt response to off-line conditions.

Example: To change the Intervention Required time to 30 minutes for e.g. a plotter:

```
IR_TIME. : 30
```

Important: Save the configuration and restart the print server after changing this parameter.

BP_END_JOB Bracket Protocol End Job SNA MENU

150 152	530 532	630 632	550 650	560 660	570 670
					x

This parameter controls if the current print job should be terminated when a "End Bracket" is indicated in a SNA packet.

Syntax: **BP_END_JOB. : <Status>**

Status	Description
*** YES**	End Bracket terminates print job
NO	End Bracket ignored

Example: To disable Bracket Protocol End Job:

```
BP_END_JOB. : NO
```

Important: Save the configuration and restart the print server after changing this parameter.

INT_ADDR Internet Address TCP/IP MENU

150 152	530 532	630 632	550 650	560 660	570 670
	x	x	x	x	x

This specifies the Internet Address for the AXIS network print server.

Always consult your network manager before changing this parameter.

Syntax: **001. INT_ADDR. : <n> <n> <n> <n>**

- *n* is a decimal number in the range 0 - 255

Example:

```
INT_ADDR. : 192 36 253 80
```

DEF_ROUT Default Router Address TCP/IP MENU

150 152	530 532	630 632	550 650	560 660	570 670
	x	x	x	x	x

This parameter specifies the Internet address for the default router. All traffic directed outside the local network (according to the net mask) is sent to the default router. Any re-routing (via other routers) is done automatically.

The default 0.0.0.0 indicates that no default router is set.

Syntax: **DEF_ROUT. : <n> <n> <n> <n>**

- *n* is a decimal number in the range 0 - 255

Example:

```
DEF_ROUT. : 0 0 0 0
```

NET_MASK Net Mask TCP/IP MENU

150 152	530 532	630 632	550 650	560 660	570 670
	x	x	x	x	x

This parameter specifies the net mask used to determine when the traffic should be sent via a router.

For example, the normal class C network mask is 255.255.255.0.

The default 0.0.0.0 indicates that automatic router sensing is used.

Syntax: **NET_MASK. : <n> <n> <n> <n>**

- *n* is a decimal number in the range 0 - 255

Example:

```
NET_MASK. : 0 0 0 0
```

TCP_ENB TCP/IP Protocol Enabled TCP/IP MENU

This parameter is used to switch the TCP/IP support on and off.

150 152	530 532	630 632	550 650	560 660	570 670
	x	x	x	x	x

Syntax: **TCP_ENB. : <Status>**

Status	Description
* YES	TCP/IP protocol is enabled.
NO	TCP/IP protocol is disabled.

Notes:

1. This parameter is set to 'NO' in NPS 530/532. It is automatically changed to 'YES' when you upgrade to TPC/IP protocol support, see '**TCP_KEY**' below.
2. A limited FTP file transfer is possible even if TCP/IP is disabled. You can copy files to and from your print server, but printing is not possible.

Example:

```
TCP_ENB. : YES
```

TCP_KEY TCP/IP Protocol Key TCP/IP MENU

Enter the TCP/IP software key into this parameter when upgrading your NPS 530 or 532 to TCP/IP protocol support.

150 152	530 532	630 632	550 650	560 660	570 670
	x				

Syntax: **TCP_KEY. : <Key>**

Key	Description
<nnnnnn>	TCP/IP protocol support is available.
* <empty>	TCP/IP protocol support is not available.

Notes:

1. '**TCP_ENB**' will automatically be set to 'YES' when the correct software key has been provided. You can change this parameter later if you want to disable the TCP/IP protocol.
2. If you enter an incorrect software key, the parameter will remain unchanged. You must restart the print server before trying again.
3. In order to prevent accidental loss of software keys, it is not possible to edit this parameter further once the correct key has been entered.
4. This parameter is not affected by a factory defaults setting or software revision upgrade.

Example:

```
TCP_KEY. : 6A31FC
```

PROS_PWD PROS Protocol Password TCP/IP MENU

150 152	530 532	630 632	550 650	560 660	570 670
	x	x	x	x	x

This is the password for the PROS protocol. If you change the default password, you must also change the password entry in the corresponding PROS driver on the host.

Syntax: **PROS_PWD. : <any sequence>**

- The password may contain any characters, and may be up to 255 characters long.
- The default password is *netprinter*.

Example:

```
PROS_PWD. : netprinter
```

PROS_PRT PROS TCP Port Number TCP/IP MENU

150 152	530 532	630 632	550 650	560 660	570 670
	x	x	x	x	x

TCP port number for the PROS printing protocol. Port 35 is by convention reserved for TCP/IP Printer Servers. If you change this parameter, you must also change the Port Number entry in the corresponding PROS driver on the host.

Syntax: **PROS_PRT. : <Port Number>**

Port Number	Description
0 - 65535	PROS TCP port number.
***** **35**	Factory default value.

Example:

```
PROS_PRT. : 35
```

LPD_BANN LPD Banner Page Enabled TCP/IP MENU

150 152	530 532	630 632	550 650	560 660	570 670
	x	x	x	x	x

Syntax: **LPD_BANN. : <Status>**

Status	Description
***** **YES**	LPD Banner Page enabled *(default)*.
NO	LPD Banner Page disabled.

Example:

```
LDP_BANN. : YES
```

BOOTP_ENB BOOTP Protocol Enabled TCP/IP MENU

150 152	530 532	630 632	550 650	560 660	570 670
	x	x	x	x	x

Syntax: **BOOTP_ENB. : <Status>**

Status	Description
*** YES**	BOOTP Protocol enabled *(default)*.
NO	BOOTP Protocol disabled.

Example:

```
BOOTP_ENB. : YES
```

RARP_ENB RARP Protocol Enabled TCP/IP MENU

150 152	530 532	630 632	550 650	560 660	570 670
	x	x	x	x	x

Syntax: **RARP_ENB. : <Status>**

Status	Description
*** YES**	RARP Protocol enabled *(default)*.
NO	RARP Protocol disabled.

Example:

```
RARP_ENB. : YES
```

RTN_OPT Reverse Telnet Options Enabled TCP/IP MENU

150 152	530 532	630 632	550 650	560 660	570 670
	x	x	x	x	x

This parameter specifies the type of Reverse Telnet emulation. When set to NO, the protocol used is actually not Telnet – the port behaves like a raw TCP port. This option provides compatibility with e.g. the Hewlett-Packard JetDirect drivers using TCP port 9100 (‘**RTEL_PR1**’ - ‘**RTEL_PR8**’ below for Reverse Telnet TCP ports).

Syntax: **RTN_OPT. : <Status>**

Status	Description
*** YES**	Telnet IAC codes are interpreted *(default)*.
NO	True binary transfer.

Example:

```
RTN_OPT. : YES
```

RTEL_PR1 PR1 TCP Port Number TCP/IP MENU

150 152	530 532	630 632	550 650	560 660	570 670
	x	x	x	x	x

This parameter specifies which Reverse Telnet port logical printer 1 is attached to. See also 'RTN_OPT' for Reverse Telnet options.

Syntax: **RTEL_PR1. : <Port>**

Port	Description
1 - 65535	Reverse telnet port number.
*** 0**	Reversed telnet for PR1 is disabled *(default).*

Example:

```
601. RTEL_PR1 : 0
```

Related parameters: The corresponding parameters for the logical printers PR2 through PR8, are shown below with their default settings:

```
RTEL_PR1. : 0
RTEL_PR2. : 0
RTEL_PR3. : 0
RTEL_PR4. : 0
RTEL_PR5. : 0
RTEL_PR6. : 0
RTEL_PR7. : 0
```

READ_COM Read-Only Community Name SNMP MENU

150 152	530 532	630 632	550 650	560 660	570 670
	x	x	x	x	x

This parameter specifies the community that has read-only access to all supported SNMP objects except *writeCommunity*, *trapCommunity* and *rootPwd*. It corresponds to the *readCommunity* SNMP object.

Syntax: **READ_COM. : <any sequence>**

Notes:
1. The community name may contain any characters, and may be up to 254 characters long.
2. The default read-only community name is *public*.

Example:
```
READ_COM. : public
```

WRT_COM Read-Write Community Name SNMP MENU

150 152	530 532	630 632	550 650	560 660	570 670
	x	x	x	x	x

This parameter specifies the community that has read-write access to all supported SNMP objects except read-only objects. It corresponds to the *writeCommunity* SNMP object.

Syntax: **WRT_COM. : <any sequence>**

Notes:
1. The community name may contain any characters, and may be up to 254 characters long.
2. The default read-write community name is *pass.*

Example:
```
WRT_COM. : pass
```

TRAPADDR SNMP Trap Internet Address SNMP MENU

150 152	530 532	630 632	550 650	560 660	570 670
	x	x	x	x	x

This specifies the Internet Address which SNMP traps are sent to. It corresponds to the *trapAddress* SNMP object. If no address is specified, all SNMP traps are disabled.

Syntax: **TRAPADDR. : <n> <n> <n> <n>**

Notes:
1. *n* is a decimal number in the range 0 - 255
2. The default address is 0 0 0 0 (SNMP traps are disabled)

Example:
```
TRAPADDR. : 192 36 253 210
```

TRAP_COM SNMP Trap Community Name SNMP MENU

150 152	530 532	630 632	550 650	560 660	570 670
	x	x	x	x	x

This parameter specifies the community for all generated SNMP traps. It corresponds to the *trapCommunity* SNMP object.

Syntax: **TRAP_COM. : <any sequence>**

Notes:
1. The community name may contain any characters, and may be up to 254 characters long.
2. The default trap community name is *public*.

Example:
```
TRAP_COM. : public
```

SYS_CONT System Contact SNMP MENU

150 152	530 532	630 632	550 650	560 660	570 670
	x	x	x	x	x

This parameter contains a plain text string that may be used to show the name of the system (the print server) contact person. It corresponds to the *sysContact* MIB-II SNMP object. See also '**SYS_NAME**' and '**SYS_LOC**'.

Syntax: **SYS_CONT. : <any sequence>**

Notes:
1. The text sequence may contain any characters, and may be up to 254 characters long.
2. The default sequence is <*empty*>.

Example:
```
SYS_CONT. : Jane Doe, System Manager
```

SYS_NAME System Name SNMP MENU

150 152	530 532	630 632	550 650	560 660	570 670
	x	x	x	x	x

This parameter contains a plain text string that may be used to show the name of the system (the print server). It corresponds to the *sysName* MIB-II SNMP object.

Syntax: **SYS_NAME. : <any sequence>**

Notes:
1. The text sequence may contain any characters, and may be up to 254 characters long.
2. The default sequence is <*empty*>.

Example:
```
SYS_NAME. : Jane Doe's NPS 532
```

SYS_LOC System Location SNMP MENU

150 152	530 532	630 632	550 650	560 660	570 670
	x	x	x	x	x

This parameter contains a plain text string that may be used to show the location of the system (the print server). It corresponds to the *sysLocation* MIB-II SNMP object.

Syntax: **SYS_LOC. : <any sequence>**

Notes:
1. The text sequence may contain any characters, and may be up to 254 characters long.
2. The default sequence is <*empty*>.

Example:
```
SYS_LOC. : Jane Doe's office
```

SNMP_AUT Authentication Failure Traps SNMP MENU

150 152	530 532	630 632	550 650	560 660	570 670
	x	x	x	x	x

This parameter enables/disables SNMP authentication failure traps. It corresponds to the *enableAuthenTraps* (Axis MIB) and *snmpEnableAuthenTraps* (MIB-II) SNMP objects.

Syntax: **SNMP_AUT. : <Status>**

Port	Description
* **DISABLE**	Authentication failure traps disabled *(default)*.
ENABLE	Authentication failure traps enabled.

Example:
```
SNMP_AUT. : DISABLE
```

TRAP_PRT Printer Traps SNMP MENU

150 152	530 532	630 632	550 650	560 660	570 670
	x	x	x	x	x

This parameter enables/disables SNMP printer traps. It corresponds to the *enableAuthenTraps* (Axis MIB) and *EnablePrinterTraps* (MIB-II) SNMP objects.

Syntax: **TRAP_PRT. : <Status>**

Port	Description
* **DISABLE**	Printer traps disabled *(default)*.
ENABLE	Printer traps enabled.

Example:
```
TRAP_PRT. : DISABLE
```

NETW_ENB NetWare Protocol Enabled NETWARE MENU

This parameter switches the NetWare support on and off.

150 152	530 532	630 632	550 650	560 660	570 670
x	x	x	x	x	x

Syntax: **NETW_ENB. : <Status>**

Status	Description
*** YES**	NetWare protocol is enabled.
NO	NetWare protocol is disabled.

Example:

```
NETW_ENB. : YES
```

PS_NAME Print Server Name NETWARE MENU

This parameter specifies the Axis print server name used in the standard NetWare configuration (see the User's Manual for your Axis print server).

150 152	530 532	630 632	550 650	560 660	570 670
x	x	x	x	x	x

Syntax: **PS_NAME. : <Name>**

Name	Description
<any seq.>	Any valid print server name.
*** AXIS<nnnnnn>**	The default print server name (*nnnnnn* are the six last digits of the Axis print server serial number).

Example:

```
PS_NAME. : SALESDEPT
```

JOB_CHECK_DELAY Print Server Queue Polling Interval NETWARE MENU

Applies to NDS compatible print servers only.

150 152	530 532	630 632	550 650	560 660	570 670
				x	x

This parameter is used to set the interval between the network print server checking the print queues it is serving for new print jobs.

Syntax: **JOB_CHECK_DELAY. : <Interval>**

Interval	Description
1 to 255	Polling interval in seconds. Maximum interval = 255 sec = 4 min. 15 sec.
*** 5**	Factory default value.

Note: A higher value will reduce network load, but increase the time before print jobs are initiated.

Example:

```
JOB_CHECK_DELAY. : 10
```

CONF_CHECK_DELAY — Interval between Automatic Configuration Checks — NETWARE MENU

150 152	530 532	630 632	550 650	560 660	570 670
				x	x

Applies to NDS compatible print servers only.

This parameter is used to set the interval between the network print server checking the configuration held on the file server.

Syntax: **CONF_CHECK_DELAY. : <Interval>**

Interval	Description
1 to 32767	Polling interval in seconds. Maximum interval = 32767 sec. = 9 hr 6 min.
***** **300**	Factory default value.

Example:

```
CONF_CHECK_DELAY. : 45
```

CONFSERV — Configuration File Server Name — NETWARE MENU

150 152	530 532	630 632	550 650	560 660	570 670
x	x	x	x		

Applies to 'Non-NDS' print servers only.

This parameter specifies the file server where queue and printer information should be stored. When a file server is specified, you will also have to run AXIS NetPilot to configure queues and printers (see *SECTION 5 - NETWORK PRINTING*).

Syntax: **CONFSERV. : <Name>**

Name	Description
<any seq.>	Any valid file server name.
***** **<empty>**	The Axis print server will log in to all available file servers at power-up.

Example:

```
CONFSERV. : MAINSERVER
```

PS_POLL — NetWare Queue Polling Interval — NETWARE MENU

150 152	530 532	630 632	550 650	560 660	570 670
x	x	x	x		

Applies to 'Non-NDS' print servers only.

NetWare print jobs are queued at the file server, and print servers poll the queues regularly for pending print jobs. This parameter specifies the polling interval in seconds.

Syntax: **PS_POLL. : <Interval>**

Interval	Description
1 - 60	Polling interval in seconds.
***** **15**	Factory default value.

Note: A higher value will reduce network load, but increase the time before print jobs are initiated.

AUTO_SCAN Automatic File Server Login NETWARE MENU

150 152	530 532	630 632	550 650	560 660	570 670
x	x	x	x		

Applies to 'Non-NDS' print servers only.

This parameter controls the automatic NetWare mode (*Print Server*/*Remote Printer*) login procedures for the print server. By default, the Axis print server will log in automatically using the print server mode to all available file servers on the network.

Syntax: **AUTO_SCAN. : <Mode>**

Destination	Description
OFF	Automatic login procedures are disabled.
PSERVER	Automatic NetWare Print Server Mode login is enabled.
RPRINTER	Automatic NetWare Remote Printer Mode login is enabled.
* **BOTH**	Both automatic login procedures are enabled.

Notes:

1. If this parameter is set to 'OFF', the Axis print server can be accessed from AXIS NetPilot, but it will not log in any file servers or Novell print servers unless one of the following conditions are true:
   - A *Configuration File Server* is specified by the CONFSERV parameter.
   - *Print Server Queue Attachments* are specified by the LOGIN parameters.
   - *Remote Printer Attachments* are specified by the RPRINT parameters.
2. The automatic Print Server Mode login is over-ridden if one of the following conditions are true:
   - A *Configuration File Server* is specified by the CONFSERV parameter.
   - *Print Server Queue Attachments* are specified by the LOGIN parameters.
3. The automatic Remote Printer Mode login is over-ridden if the following condition is true:
   - *Remote Printer Attachments* are specified by the RPRINT parameters.

Example:

```
AUTO_SCAN. : PSERVER
```

FR_802_3 IEEE 802.3 Frame Type Enabled NETWARE MENU

150 152	530 532	630 632	550 650	560 660	570 670
x	x		see note		

This parameter is used to switch the IEEE 802.3 frame type support on and off for NetWare.

Note: This parameter does not apply to the Axis Token Ring printer servers, i.e. NPS 630/632, NPS 650, AXIS 660 and AXIS 670.

Syntax: **FR_802_3. : <Status>**

Status	Description
* **YES**	IEEE 802.3 frame type enabled.
NO	IEEE 802.3 frame type disabled.

Example:

```
FR_802_3. : YES
```

FR_ETH_2 Ethernet II Frame Type Enabled NETWARE MENU

150 152	530 532	630 632	550 650	560 660	570 670
x	x		see note		

This parameter is used to switch the Ethernet II frame type support on and off for NetWare.

Note: This parameter does not apply to the Axis Token Ring printer servers, i.e. NPS 630/632, NPS 650, AXIS 660 and AXIS 670.

Syntax: **FR_ETH_2. : <Status>**

Status	Description
* YES	Ethernet II frame type enabled.
NO	Ethernet II frame type disabled.

Example:

```
FR_ETH_2. : YES
```

FR_802_2 IEEE 802.2 Frame Type Enabled NETWARE MENU

150 152	530 532	630 632	550 650	560 660	570 670
x	x	x	x	x	x

This parameter is used to switch the IEEE 802.2 frame type support on and off for NetWare.

Syntax: **802_2. : <Status>**

Status	Description
* YES	IEEE 802.2 frame type enabled.
NO	IEEE 802.2 frame type disabled.

Example:

```
FR_802_2. : YES
```

FR_SNAP SNAP Frame Type Enabled NETWARE MENU

150 152	530 532	630 632	550 650	560 660	570 670
x	x	x	x	x	x

This parameter is used to switch the SNAP frame type support on and off for NetWare.

Syntax: **FR_SNAP. : <Status>**

Status	Description
* YES	SNAP frame type enabled.
NO	SNAP frame type disabled.

Example:

```
FR_SNAP. : YES
```

NCP_BURST_MODE NCP Data Transfer Burst Mode NETWARE MENU

150 152	530 532	630 632	550 650	560 660	570 670
				x	x

Applies to NDS compatible print servers only.

This parameter enables or disables the very high speed data transfer between the file server and the Axis network print server. It should normally be turned on.

Syntax: **NCP_BURST_MODE. : <Status>.**

	Description
NO	NCP Burst Mode is disabled.
*** YES**	NCP Burst Mode is enabled (Default).

Example:

```
NCP_BURST_MODE. : YES
```

Important: *Save the configuration and restart the print server after changing this parameter*

PSERVER_NDS File Server and Name of Print Server NETWARE MENU

150 152	530 532	630 632	550 650	560 660	570 670
				x	x

Applies to NDS compatible print servers only.

This parameter identifies the Axis print server's object within a container in the directory tree. The context for the print server must be entered in full showing the location of the container by giving the names of the branches from the leaf to the root, as illustrated by the example below. Because NDS uses a distributed database the name of any file server on your network can be used. The Axis print server will use this file server for logging in during start up.

Syntax: **PSERVER_NDS. : <File Server><Axis Print Server Name and Context>**

- *File Server* is any valid file server name.
- *Axis Print Server Name and Context* is the name of the print server whose parameters are being adjusted and its context in the NDS tree.

Example:

```
PSERVER_NDS. : MAINSERVER SALESDEPT.EXPORTS.WIZARDS_JAPAN
```

PSERVER_BINDERY1 Bindery File Server Name NETWARE MENU

150 152	530 532	630 632	550 650	560 660	570 670
				x	x

These parameters are provided so that if the Axis print server is used on a network using NetWare 2.x or NetWare 3.x, the user can specify which file server the unit will login to.

Syntax: **PSERVER_BINDERY1. : <File Server>**

- *File Server* is any valid file server name.

Example:

```
PSERVER_BINDERY1. : SALESSERVER
```

Related parameters: The corresponding parameters for the print queue attachments PSERVER_BINDERY2 through PSERVER_BINDERY16 are shown below:

```
PSERVER_BINDERY2.  :
PSERVER_BINDERY3.  :
PSERVER_BINDERY4.  :
PSERVER_BINDERY5.  :
PSERVER_BINDERY6.  :
PSERVER_BINDERY7.  :
PSERVER_BINDERY8.  :
PSERVER_BINDERY9.  :
PSERVER_BINDERY10. :
PSERVER_BINDERY11. :
PSERVER_BINDERY12. :
PSERVER_BINDERY13. :
PSERVER_BINDERY14. :
PSERVER_BINDERY15. :
PSERVER_BINDERY16. :
```

NPRINTER1 Remote Printer Attachment 1 NETWARE MENU

150 152	530 532	630 632	550 650	560 660	570 670
				x	x

Applies to NDS compatible print servers only.

This parameter is used when the Axis print server is being used in remote printer mode. The NetWare print server name is entered with the printer number (also known as the printer slot).

Syntax: **NPRINTER1. : <NetWare Print Server> <Printer Number>**

- *Print Server* is the NetWare print server (PSERVER.NLM or PSERVER.EXE) for logging in.
- *Printer Number* is one of the 256 printers (0 - 255) configured in NetWare.

Example:

```
NPRINTER1. : ADMIN 12
```

Notes:

1. Only one printer assignment can be made with each RPRINT parameter.

Related parameters: The corresponding parameters for the remote printer attachments NPRINTER2 through NPRINTER8 are shown below:

```
NPRINTER2. :
NPRINTER3. :
NPRINTER4. :
NPRINTER5. :
NPRINTER6. :
NPRINTER7. :
NPRINTER8. :
```

LOGIN1 Print Server Queue Attachment 1 NETWARE MENU

150 152	530 532	630 632	550 650	560 660	570 670
x	x	x	x		

Applies to 'Non-NDS' print servers only.

This parameter specifies an explicit link between a print queue at a specified file server and a logical printer. The Axis print server emulates a NetWare print server when servicing queues specified by the LOGIN parameters.

See *SECTION 5 - NETWORK PRINTING – NetWare*, on how to use the LOGIN parameters.

Syntax: **LOGIN1. : <File Server> <Print Queue> <Logical Printer>**

- *File Server* is any valid file server name.
- *Print Queue* is the name of a print queue at the specified file server.
- *Logical Printer* is one of the logical printers 1 - 8.

Example:

```
LOGIN1. : MAINSERVER SALESQ 1
```

Notes: 1. Only one printer attachment can be made with each LOGIN parameter.

Related parameters: The corresponding parameters for the print queue attachments LOGIN2 through LOGIN16 are shown below:

```
LOGIN2.  :
LOGIN3.  :
LOGIN4.  :
LOGIN5.  :
LOGIN6.  :
LOGIN7.  :
LOGIN8.  :
LOGIN9.  :
LOGIN10. :
LOGIN11. :
LOGIN12. :
LOGIN13. :
LOGIN14. :
LOGIN15. :
LOGIN16. :
```

RPRINT1 Remote Printer Attachment 1 NETWARE MENU

150 152	530 532	630 632	550 650	560 660	570 670
x	x	x	x		

Applies to 'Non-NDS' print servers only.

This parameter specifies a printer number at a NetWare print server to which the Axis print server is attached when working in remote printer mode.

See *SECTION 5 - NETWORK PRINTING – NetWare*, on how to use the RPRINT parameters.

Syntax: **RPRINT1. : <Print Server> <Printer Number> <Logical Printer>**

- *Print Server* is the NetWare print server (PSERVER.NLM or PSERVER.EXE) to log in to.
- *Printer Number* is one of the 16 printers (0 - 15) configured in NetWare.
- *Logical Printer* is one of the logical printers 1 - 8. If not specified, logical printer 1 will be used as default.

Example:

```
RPRINT1. : ADMIN 12 4
```

Notes: 1. Only one printer assignment can be made with each RPRINT parameter.

Related parameters: The corresponding parameters for the remote printer attachments RPRINT2 through RPRINT8 are shown below:

```
RPRINT2. :
RPRINT3. :
RPRINT4. :
RPRINT5. :
RPRINT6. :
RPRINT7. :
RPRINT8. :
```

LSLM_ENB LAN Server/LAN Manager Protocol Enabled LS/LM MENU

150 152	530 532	630 632	550 650	560 660	570 670
x	x	x	x	x	x

This parameter is used to switch the LAN Server/LAN Manager support on and off.

Syntax: **LSLM_ENB. : <Status>**

Status	Description
* **YES**	LAN Server/LAN Manager protocol is enabled.
NO	LAN Server/LAN Manager protocol is disabled.

Example:

```
LSLM_ENB. : YES
```

NB_FR_TYPE NetBEUI Frame Type LS/LM MENU

150 152	530 532	630 632	550 650	560 660	570 670
x	x	x	x	x	x

This parameter is used to set which frame type is to be used. The default setting (FR_AUTO) will cause the print server to scan the network using FR_802_2 and FR_DIX frame types to determine which type is to be used. If you wish to prevent this automatic sequence you can force the print server to use one of the frame types by entering either FR_802_2 or FR_DIX into this parameter.

Syntax: **NB_FR_TYPE. : <Frame Type>**

Frame Type	Description
* **FR_AUTO**	Frame type is set automatically.
FR_802_2	FR 802.2 frame type is used.
FR_DIX	FR DIX frame type is used.

Example:

```
LSLM_ENB. : FR_AUTO
```

Important: *Save the configuration and restart the print server after changing this parameter*

LPRINT_1 Printer 1 Name LS/LM MENU

150 152	530 532	630 632	550 650	560 660	570 670
x	x	x	x	x	x

The print server presents itself as up to eight LAN Server/LAN Manager printers in the LAN Manager printer list. This parameter specifies the name of the first LAN Server/LAN Manager printer.

Syntax: **LPRINT_1. : <Name>**

Name	Description
<any seq.>	Any valid printer name equal to any valid NetBIOS name.
* **AX<nnnnnn>.LP1**	The default printer 1 name.

Notes: 1. *<nnnnnn>* are the six last digits of the print server serial number.

2. The maximum length of the printer name is 16 characters (exceeding characters are truncated).

Examples: The examples below show the printer 1 default settings:

```
LPRINT_1. : AX100086.LP1
```

Related parameters: The corresponding parameters for printer 2 through printer 8 and their default settings are shown below:

```
LPRINT_2. :                    (NPS 530/532/630/632)
LPRINT_2. : AX100086.LP2       (AXIS 150/152, NPS 550/650, AXIS 560/660/570/670)

LPRINT_3. :                    (AXIS 150/152, NPS 530/532/630/632)
LPRINT_3. : AX100086.CM1       (NPS 550/650, AXIS 560/660/570/670)

LPRINT_4. :

LPRINT_5. :          (Does not apply to AXIS 150/152 and NPS 530/532/630/632)

LPRINT_6. :          (Does not apply to AXIS 150/152 and NPS 530/532/630/632)

LPRINT_7. :          (Does not apply to AXIS 150/152 and NPS 530/532/630/632)

LPRINT_8. :          (Does not apply to AXIS 150/152 and NPS 530/532/630/632)
```

LLOGIC_1 Printer 1 Logical Printer LS/LM MENU

150 152	530 532	630 632	550 650	560 660	570 670
x	x	x	x	x	x

This parameter specifies the logical printer attached to the first LAN Server/ LAN Manager printer.

Syntax: **LLOGIC_1. : <Logical Printer>**

Note: <*Logical Printer*> is one of the logical printers ‘PR1’ through ‘PR8’.

Example:

```
LLOGIC_1. : PR1              (AXIS 150/152 default value = LPT1)
```

Related parameters: The corresponding parameters for printer 2 through printer 8 and their default settings are shown below:

```
LLOGIC_2. : PR2              (AXIS 150/152 default value = LPT2)
LLOGIC_3. : PR3              (AXIS 150/152 default value = LPT1)
LLOGIC_4. : PR4              (AXIS 150/152 default value = LPT2)
LLOGIC_5. : PR5       (Does not apply to AXIS 150/152 and NPS 530/532/630/632)
LLOGIC_6. : PR6       (Does not apply to AXIS 150/152 and NPS 530/532/630/632)
LLOGIC_7. : PR7       (Does not apply to AXIS 150/152 and NPS 530/532/630/632)
LLOGIC_8. : PR8       (Does not apply to AXIS 150/152 and NPS 530/532/630/632)
```

ATLK_ENB AppleTalk Protocol Enabled APPLETALK MENU

This parameter is used to switch the AppleTalk support on and off.

150 152	530 532	550	560	570
	x	x	x	x

Syntax: **ATLK_ENB. : <Status>**

Status	Description
* YES	AppleTalk protocol is enabled.
NO	AppleTalk protocol is disabled.

Note: This parameter is set to 'NO' in NPS 530/532. It is automatically changed to 'YES' when you upgrade to AppleTalk protocol support, see *AppleTalk Software Key*.

Example:
```
ATLK_ENB. : YES
```

ATLK_KEY AppleTalk Protocol Key APPLETALK MENU

Enter the AppleTalk software key into this parameter when upgrading your NPS 530 or 532 to AppleTalk protocol support.

150 152	530 532	550	560	570
	x			

Syntax: **ATLK_KEY. : <Key>**

Key	Description
<nnnnnn>	AppleTalk protocol support is available.
* <empty>	AppleTalk protocol support is not available.

Notes:

1. Parameter *AppleTalk Protocol Enabled* will automatically be set to 'YES' when the correct software key has been provided. You can change this parameter later if you want to disable the AppleTalk protocol.
2. If you enter an incorrect software key, the parameter will remain unchanged. You must restart the print server before trying again.
3. In order to prevent accidental loss of software keys, it is not possible to edit this parameter further once the correct key has been entered.
4. This parameter is not affected by a factory defaults setting or software revision upgrade.

Example:
```
ATLK_KEY. : 36A44E
```

ATK_ZONE AppleTalk Zone APPLETALK MENU

150 152	530 532	550	560	570
	x	x	x	x

This parameter specifies the AppleTalk zone. If your network has only one zone, leave this parameter empty.

Syntax: **ATK_ZONE. : <Name>**

Name	Description
*** <any seq.>**	Any valid AppleTalk zone name.
<empty>	The default zone is used *(default)*.

Example:

```
ATK_ZONE. :
```

ZONER_EN HP Zoner Enabled APPLETALK MENU

150 152	530 532	550	560	570
	x	x	x	x

This parameter switches the HP Zoner support on and off.

Syntax: **ZONER_EN. : <Status>**

Status	Description
*** YES**	HP Zoner support is enabled.
NO	HP Zoner support is disabled.

Example:

```
ZONER_EN. : YES
```

ATK_FONT PostScript Font Set APPLETALK MENU

150 152	530 532	550	560	570
	x	x	x	x

This parameter specifies the set fonts resident in the Postscript printer. You may change this parameter to 35N to reduce printing time if your printer contains the Adobe 35N font set (which is true for all US and European PostScript printers).

Syntax: **ATK_FONT. : <Font Set>**

Font Set	Description
*** DEFAULT**	All PostScript fonts are down-loaded to the printer with each print job *(default)*.
35N	Fonts within the Adobe 35N set are assumed to be resident in the printer. The only fonts down-loaded are those not present in the 35N set.
ALL	*LaserWriter 7*: Same function as **35N**. *LaserWriter 8*: All fonts used are assumed to be resident in the printer.

Example:

```
ATK_FONT. : 35N
```

BINARY Binary Transfer Enabled APPLETALK MENU

150 152	530 532	550	560	570
	x	x	x	x

This parameter switches the support for binary print data transfer on and off. If your printer supports binary mode, you may change this parameter to YES to reduce printing time. Binary mode is particularly time saving when printing large bitmapped images.

Important: Make sure that your printer supports binary mode before changing this parameter.

Syntax: **BINARY. : <Status>**

Status	Description
YES	Binary transfer is enabled.
*** NO**	Binary transfer is disabled.

APRINT_1 Printer 1 Name APPLETALK MENU

150 152	530 532	550	560	570
	x	x	x	x

The print server presents itself as up to three AppleTalk printers in the Macintosh *Chooser*. This parameter specifies the name of the first AppleTalk printer.

Syntax: **APRINT_1. : <Name>**

Name	Description
<any seq.>	Any valid printer name.
*** AXIS<nnnnnn>_LPT1**	The default printer 1 name.

Notes:

1. *<nnnnnn>* are the six last digits of the print server serial number.
2. The maximum length of the printer name is 32 characters (exceeding characters are truncated).
3. The printer names must be unique. If the printer name already exists, a *<-nn>* (*nn*=0-99) suffix will be appended. If the resulting name exceeds 32 characters, the original name will be truncated to make room for the suffix.

Examples: The examples below show the printer 1 default settings:

```
APRINT_1. : AXIS110086_LPT1
```

Related parameters: The corresponding parameters for printer 2 and 3 with their default settings are shown below:

```
APRINT_2. : AXIS110086_LPT2
```

```
APRINT_2. : AXIS110086_2                    (NPS 530/532)
```

Does not apply to NPS 530/532

```
APRINT_3. : AXIS110086_COM1
```

ATYPE_1 Printer 1 Type APPLETALK MENU

150 152	530 532	550	560	570
	x	x	x	x

This parameter specifies the type of first AppleTalk printer. It must match the driver name used by the Macintosh printer driver.

Syntax: **ATYPE_1. : <Type>**

Type	Description
<any seq.>	Any valid printer type (must match the type appearing in the *Chooser* menu).
<empty>	This printer will not appear in the *Chooser*.
*** LaserWriter**	Default printer 1 type.

Notes:

1. The maximum length of the printer type is 32 characters (exceeding characters are truncated).
2. To prevent a printer from appearing in the Chooser menu, leave the *Type* parameter empty.

Example:

```
ATYPE_1. : LaserWriter
```

Related parameters: The corresponding parameters for printer 2 through printer 4 and their default settings are shown below:

```
ATYPE_2. : LaserWriter
```

```
ATYPE_2. :                                (NPS 530/532)
```

Does not apply to NPS 530/532

```
ATYPE_3. : LaserWriter
```

ALOGIC_1 Printer 1 Logical Printer APPLETALK MENU

This parameter specifies the logical printer attached to the first AppleTalk printer.

150 152	530 532	550	560	570
	x	x	x	x

Syntax: **ALOGIC_1. : <Logical Printer>**

Note: *<Logical Printer>* is one of the logical printers ‘PR1’ through ‘PR8’, or one of the physical printers: ‘LPT1’, ‘LPT2’ or ‘COM1’. However ‘LPT1’, ‘LPT2’ and ‘COM1’ are not available options in the NPS 530/532

Example:

```
ALOGIC_1. : PR1
```

Related parameters: The corresponding parameters for printer 2 through printer 4 and their default settings are shown below:

```
ALOGIC_2. : PR2
```

Does not apply to NPS 530/532

```
ALOGIC_3. : PR3
```

PR1_OUT PR1 Physical Printer Port PRINTER1 MENU

150 152	530 532	630 632	550 650	560 660	570 670
			x	x	x

This parameter specifies the physical printer port for the logical printer PR1 (Note that several logical printers may use the same physical port).

Syntax: **PR1_OUT. : <Printer Port>**

Printer Port	Description
NONE	PR1 is disabled.
* **LPT1**	PR1 prints to LPT1.
COM1	PR1 prints to COM1.
LPT2	PR1 prints to LPT2.

Example:

```
PR1_OUT. : LPT1
```

Related parameters: The corresponding parameters for the logical printers PR2 through PR8 and their default settings for the multi-port print servers are shown below. In the single port print servers the default setting is LPT1 for all logical printers.

```
PR2_OUT. : LPT2
PR3_OUT. : COM1
PR4_OUT. : COM1
PR5_OUT. : LPT1
PR6_OUT. : LPT2
PR7_OUT. : COM1
PR8_OUT. : COM1
```

PR1_SCND PR1 Secondary Printer PRINTER1 MENU

150 152	530 532	630 632	550 650	560 660	570 670
			x	x	x

This parameter specifies a secondary logical printer for PR1. The secondary printer is used when PR1 is busy, see also **PR1_WAIT**, page 181.

Syntax: **PR1_SCND. : <Destination>**

Destination	Description	Destination	Description
* **PR1**	Print to PR1	**PR7**	Print to PR7
PR2	Print to PR2	**PR8**	Print to PR8
PR3	Print to PR3	**LPT1**	Print to LPT1
PR4	Print to PR4	**LPT2**	Print to LPT2
PR5	Print to PR5	**COM1**	Print to COM1
PR6	Print to PR6		

Example:

```
PR1_SCND. : PR1
```

Related parameters: The corresponding parameters for the logical printers PR2 through PR8 and their default settings are shown below:

```
PR2_SCND. : PR2          (Printer2 Menu)
PR3_SCND. : PR3          (Printer3 Menu)
PR4_SCND. : PR4          (Printer4 Menu)
PR5_SCND. : PR5          (Printer5 Menu)
PR6_SCND. : PR6          (Printer6 Menu)
PR7_SCND. : PR7          (Printer7 Menu)
PR8_SCND. : PR8          (Printer8 Menu)
```

PR1_WAIT PR1 Wait on Busy PRINTER1 MENU

This parameter specifies the action to be taken when PR1 is busy.

150 152	530 532	630 632	550 650	560 660	570 670
	x	x	x	x	x

Syntax: **PR1_WAIT. : <Status>**

Status	Description
*** YES**	The print server returns a BUSY status to the host, and waits until the printer becomes available. No attempt to use the secondary printer is done. See also **PR1_SCND**, page 180.
NO	The print server tries to use the secondary printer. If that one is also busy (or not specified), a BUSY status is returned to the host. Depending on the protocol used, the print job might be lost (see table below).

The table below describes the actions for different protocols when **PR1_WAIT** is set to NO, and both the primary and secondary logical printers are busy:

Protocol	Description
FTP/TFTP	A BUSY message is returned to the user. The print job will not be accepted.
PROS	A BUSY message is returned to the host PROS driver. The print job will be partly or completely lost without notification.
LPD	A *No space to receive file* message is returned to the host. This message can be read by the *lpc stat* command. The host will try to print the job again after a few minutes.
Reverse Telnet	The print job will be partly or completely lost without notification.

Example:

```
PR1_WAIT. : YES
```

Related parameters: The corresponding parameters for the logical printers PR2 through PR8 and their default settings are shown below:

```
PR2_WAIT. : YES          (Printer2 Menu)
PR3_WAIT. : YES          (Printer3 Menu)
PR4_WAIT. : YES          (Printer4 Menu)
PR5_WAIT. : YES          (Printer5 Menu)
PR6_WAIT. : YES          (Printer6 Menu)
PR7_WAIT. : YES          (Printer7 Menu)
PR8_WAIT. : YES          (Printer8 Menu)
```

PR1_IN PR1 Read-Back Port PRINTER1 MENU

150 152	530 532	630 632	550 650	560 660	570 670
			x	x	x

This parameter specifies from which port PR1 printer read-back information should be read. It also governs the AppleTalk print method (spooler mode or printer mode, see page 77).

Syntax: **PR1_IN. : <Port>**

Port	Description
* **NONE**	No read-back data is read. *AppleTalk:* printing in spooler mode.
COM1	Read-back data is read from COM1. *AppleTalk:* printing in printer mode.

Example:

```
PR1_IN. : NONE
```

Related parameters: The corresponding parameters for the logical printers PR2 through PR8 and their default settings are shown below:

```
PR2_IN. : NONE          (Printer2 Menu)
PR3_IN. : NONE          (Printer3 Menu)
PR4_IN. : NONE          (Printer4 Menu)
PR5_IN. : NONE          (Printer5 Menu)
PR6_IN. : NONE          (Printer6 Menu)
PR7_IN. : NONE          (Printer7 Menu)
PR8_IN. : NONE          (Printer8 Menu)
```

PR1_BEF PR1 String Before Print Job PRINTER1 MENU

150 152	530 532	630 632	550 650	560 660	570 670
	x	x	x	x	x

This parameter specifies a sequence to be sent before each PR1 print job. The sequence must be entered as hexadecimal byte values.

Syntax: **085. PR1_BEF : <Hex Bytes>**

Hex Bytes	Description
<any seq.>	Sequence to be sent before each PR1 print job.
* **<empty>**	Nothing is sent before PR1 print jobs.

Example:

```
PR1_BEF. : 1B 26 6C 34 48
```

This HP PCL sequence selects bin 2 as input source.

The spaces between the byte values may be omitted. The sequence may continue on several consecutive lines.

Related parameters: The corresponding parameters for the logical printers PR2 through PR8 and their default settings are shown below:

```
PR2_BEF. :          (Printer2 Menu)
PR3_BEF. :          (Printer3 Menu)
PR4_BEF. :          (Printer4 Menu)
PR5_BEF. :          (Printer5 Menu)
PR6_BEF. :          (Printer6 Menu)
PR7_BEF. :          (Printer7 Menu)
PR8_BEF. :          (Printer8 Menu)
```

PR1_STR PR1 String Substitutions PRINTER1 MENU

150 152	530 532	630 632	550 650	560 660	570 670
	x	x	x	x	x

This parameter specifies up to 20 match string/substitute string pairs for PR1.

Syntax: **PR1_STR. : <Hex Bytes>**

Hex Bytes	Description
<any seq.>	Match/substitute string pairs for PR1 print jobs.
***** **<empty>**	Nothing is substituted for PR1 print jobs.

Match/Substitute sequence syntax:

<count byte> <match string> <count byte> <substitute string>

The count byte range is 01 - FF (1 - 255). The match and substitute strings must be entered as hexadecimal byte values, and may optionally be separated by spaces. The sequence may continue on several consecutive lines.

Example:

```
PR1_STR. : 01 0A 02 0D 0A
```

This sequence replaces all Unix line feeds (hex 0A) with ASCII line feeds (hex 0D 0A).

Related parameters:

The corresponding parameters for the logical printers PR2 through PR8 and their default settings are shown below:

```
PR2_STR. :                      (Printer2 Menu)
PR3_STR. :                      (Printer3 Menu)
PR4_STR. :                      (Printer4 Menu)
PR5_STR. : 01 0A 02 0D 0A       (Printer5 Menu)
PR6_STR. : 01 0A 02 0D 0A       (Printer6 Menu)
PR7_STR. : 01 0A 02 0D 0A       (Printer7 Menu)
PR8_STR. : 01 0A 02 0D 0A       (Printer8 Menu)
```

PR1_CSET PR1 Character Set Conversion PRINTER1 MENU

This parameter specifies the character set conversion for PR1.

150 152	530 532	630 632	550 650	560 660	570 670
	x	x	x	x	x

Syntax: **PR1_CSET. : <Conversion>**

Conversion	Description
* **NONE**	True binary transfer
ISO>IBM	ISO 8859-2 to IBM PC character set 2
7UK>IBM	7 bit UK English ASCII to IBM PC set 2
7SW>IBM	7 bit Swedish ASCII to IBM PC set 2
7GE>IBM	7 bit German ASCII to IBM PC set 2
7FR>IBM	7 bit French ASCII to IBM PC set 2
7ND>IBM	7 bit Norwegian/Danish ASCII to IBM PC set 2
DEC>IBM	DEC to IBM PC character set 2

Example:

```
PR1_CSET. : NONE
```

Related parameters: The corresponding parameters for the logical printers PR2 through PR8 and their default settings are shown below:

```
PR2_CSET. : NONE        (Printer2 Menu)
PR3_CSET. : NONE        (Printer3 Menu)
PR4_CSET. : NONE        (Printer4 Menu)
PR5_CSET. : NONE        (Printer5 Menu)
PR6_CSET. : NONE        (Printer6 Menu)
PR7_CSET. : NONE        (Printer7 Menu)
PR8_CSET. : NONE        (Printer8 Menu)
```

PR1_FILT PR1 Printer Language Translation PRINTER1 MENU

This parameter specifies a filter for printer language translation.

150 152	530 532	630 632	550 650	560 660	570 670
	x	x	x	x	x

Syntax: **PR1_FILT. : <Filter>**

Filter	Description
* **NONE**	No language translation.
POSTSCR	ASCII-to-PostScript translation.
AUTO_PS	Auto-sense ASCII-to-PostScript translation (PostScript data is not translated).

Example:

```
PR1_FILT. : NONE
```

Related parameters: The corresponding parameters for the logical printers PR2 through PR8 and their default settings are shown below:

```
PR2_FILT. : NONE          (Printer2 Menu)
PR3_FILT. : NONE          (Printer3 Menu)
PR4_FILT. : NONE          (Printer4 Menu)
PR5_FILT. : NONE          (Printer5 Menu)
PR6_FILT. : NONE          (Printer6 Menu)
PR7_FILT. : NONE          (Printer7 Menu)
PR8_FILT. : NONE          (Printer8 Menu)
```

PR1_AFT PR1 String After Print Job PRINTER1 MENU

150 152	530 532	630 632	550 650	560 660	570 670
	x	x	x	x	x

This parameter specifies a sequence to be sent after each PR1 print job. The sequence must be entered as hexadecimal byte values.

Syntax: **PR1_AFT. : <Hex Bytes>**

Hex Bytes	Description
<any seq.>	Sequence to be sent after each PR1 print job.
***** **<empty>**	Nothing is sent after PR1 print jobs.

Example:

```
PR1_AFT. : 1B 26 6C 31 48
```

This is a HP PCL sequence that selects bin 1 as paper source after the print job (see also **PRF_BEF**, page 182).

The spaces between the byte values may be omitted. The sequence may continue on several consecutive lines.

Related parameters: The corresponding parameters for the logical printers PR2 through PR8 and their default settings are shown below:

```
PR2_AFT. :          (Printer2 Menu)
PR3_AFT. :          (Printer3 Menu)
PR4_AFT. :          (Printer4 Menu)
PR5_AFT. :          (Printer5 Menu)
PR6_AFT. :          (Printer6 Menu)
PR7_AFT. :          (Printer7 Menu)
PR8_AFT. :          (Printer8 Menu)
```

PR1_DUMP PR1 Hex Dump Mode PRINTER1 MENU

150 152	530 532	630 632	550 650	560 660	570 670
	x	x	x	x	x

This parameter switches hex dump mode on and off.

Syntax: **PR1_DUMP. : <Status>**

Status	Description
YES	Hex Dump Mode. Input data is printed as hexadecimal byte values.
***** **NO**	Normal print mode.

Example:

```
PR1_DUMP. : NO
```

Note: The page length in hex dump mode is determined by **PR1_FORM** (page 188), even if the PostScript filter (**PR1_FILT**, page 184) isn't used.

Related parameters: The corresponding parameters for the logical printers PR2 through PR8 and their default settings are shown below:

```
PR2_DUMP. : NO        (Printer2 Menu)
PR3_DUMP. : NO        (Printer3 Menu)
PR4_DUMP. : NO        (Printer4 Menu)
PR5_DUMP. : NO        (Printer5 Menu)
PR6_DUMP. : NO        (Printer6 Menu)
PR7_DUMP. : NO        (Printer7 Menu)
PR8_DUMP. : NO        (Printer8 Menu)
```

PR1_SIZE PR1 PostScript Page Size PRINTER1 MENU

150 152	530 532	630 632	550 650	560 660	570 670
	x	x	x	x	x

This parameter specifies the PostScript page size. It is used only when the ASCII-to-PostScript translation is active, see **PR1_FILT**, page 184.

Syntax: **PR1_SIZE. : <Page Size>**

Page Size	Description
* **A4**	European size A4, 210 × 297 mm.
LETTER	Letter size paper, 8.5 × 11 inches.
LEGAL	Legal size paper, 8.5 × 14 inches.
EXECUT	Executive size paper, 7.25 × 10.5 inches.

Example:

```
PR1_SIZE. : A4
```

Related parameters: The corresponding parameters for the logical printers PR2 through PR8 and their default settings are shown below:

```
PR2_SIZE. : A4        (Printer2 Menu)
PR3_SIZE. : A4        (Printer3 Menu)
PR4_SIZE. : A4        (Printer4 Menu)
PR5_SIZE. : A4        (Printer5 Menu)
PR6_SIZE. : A4        (Printer6 Menu)
PR7_SIZE. : A4        (Printer7 Menu)
PR8_SIZE. : A4        (Printer8 Menu)
```

PR1_ORNT PR1 PostScript Page Orientation PRINTER1 MENU

150 152	530 532	630 632	550 650	560 660	570 670
	x	x	x	x	x

This parameter specifies the PostScript page orientation. It is used only when the ASCII-to-PostScript translation is active, see **PR1_FILT**, page 184.

Syntax: **PR1_ORNT. : <Orientation>**

Orientation	Description
* **PORTR**	Portrait orientation.
LANDS	Landscape orientation.
R_PORTR	Reversed portrait orientation.
R_LANDS	Reversed landscape orientation.

Example:

```
PR1_ORNT. : PORTR
```

Related parameters: The corresponding parameters for the logical printers PR2 through PR8 and their default settings are shown below:

```
PR2_ORNT : PORTR        (Printer2 Menu)
PR3_ORNT : PORTR        (Printer3 Menu)
PR4_ORNT : PORTR        (Printer4 Menu)
PR5_ORNT : PORTR        (Printer5 Menu)
PR6_ORNT : PORTR        (Printer6 Menu)
PR7_ORNT : PORTR        (Printer7 Menu)
PR8_ORNT : PORTR        (Printer8 Menu)
```

PR1_FORM PR1 PostScript Page Format PRINTER1 MENU

150 152	530 532	630 632	550 650	560 660	570 670
	x	x	x	x	x

This parameter specifies the PostScript page format. It is used only when the ASCII-to-PostScript translation is active, see **PR1_FILT**, page 184.

Syntax: **PR1_FORM : <MPL> <MPP> <CPI> <LPI> <LM> <TM>**

MPL	Description
0 - 255	Maximum Page Length (lines per page).
***** **66**	66 lines per page.

MPP	Description
0 - 255	Maximum Print Position (characters per line).
***** **0**	Don't insert line wraps.

CPI	Description
0 - 255	Characters per inch (measured in tenths of an inch).
***** **100**	10.0 CPI.

LPI	Description
0 - 255	Lines per inch (measured in tenths of an inch).
***** **60**	6.0 CPI.

LM	Description
0 - 255	Left margin (measured in tenths of a millimeter).
***** **30**	3.0 mm left margin.

TM	Description
0 - 255	Top margin (measured in tenths of a millimeter).
***** **50**	5.0 mm top margin.

Example:

```
PR1_FORM. : 66 0 100 60 30 50
```

Note: The MPL value also sets the page length for Hex Dump Mode, see **PR1_DUMP**, page 185.

Related parameters: The corresponding parameters for the logical printers PR2 through PR8 and their default settings are shown below:

```
PR2_FORM. : 66 0 100 60 30 50        (Printer2 Menu)
PR3_FORM. : 66 0 100 60 30 50        (Printer3 Menu)
PR4_FORM. : 66 0 100 60 30 50        (Printer4 Menu)
PR5_FORM. : 66 0 100 60 30 50        (Printer5 Menu)
PR6_FORM. : 66 0 100 60 30 50        (Printer6 Menu)
PR7_FORM. : 66 0 100 60 30 50        (Printer7 Menu)
PR8_FORM. : 66 0 100 60 30 50        (Printer8 Menu)
```

PR1_FONT PR1 PostScript Font PRINTER1 MENU

150 152	530 532	630 632	550 650	560 660	570 670
	x	x	x	x	x

This parameter specifies the name of the PostScript font to be used. It is used only when the ASCII-to-PostScript translation is active, see **PR1_FILT**, page 184.

If no font name is specified, Courier (fixed pitch) will be used. The specified font must be resident in the attached PostScript printer.

Syntax: **PR1_FONT. : <Font>**

Font	Description
<PS Font.>	Any valid PostScript font name.
***** **<empty>**	Courier will be used.

Example:

```
PR1_FONT. : Helvetica
```

Related parameters: The corresponding parameters for the logical printers PR2 through PR8 and their default settings are shown below:

```
PR2_FONT. :          (Printer2 Menu)
PR3_FONT. :          (Printer3 Menu)
PR4_FONT. :          (Printer4 Menu)
PR5_FONT. :          (Printer5 Menu)
PR6_FONT. :          (Printer6 Menu)
PR7_FONT. :          (Printer7 Menu)
PR8_FONT. :          (Printer8 Menu)
```

L1_CENTR LPT1 Centronics Interface Timing OUTPUT MENU

This parameter specifies the Centronics interface timing mode for the LPT1 port.

150 152	530 532	630 632	550 650	560 660	570 670
x	x	x	x	x	x

Syntax: **L1_CENTR. : <Mode>**

Mode	Description
IBM_PC	Low transfer rate.
STNDRD	Standard transfer rate.
FAST	High transfer rate.
* **HISPEED**	High-speed Centronics mode.

Notes:

1. The 'IBM_PC' mode is designed for old, low-speed printers that don't meet the Centronics specifications.
2. 'STNDRD' is the standard Centronics mode. This is the default setting in all print servers.
3. The 'FAST' mode corresponds to the upper limit of the Centronics specifications. Not supported by all printers.
4. The 'HISPEED' mode requires a printer supporting high-speed Centronics communication (such as Hewlett-Packard in *High Speed* mode).

Example:

```
L1_CENTR. : STNDRD
```

L1_BSYTM LPT1 Busy Status Time-Out OUTPUT MENU

This parameter specifies the delay before a printer busy status is reported for LPT1.

150 152	530 532	630 632	550 650	560 660	570 670
x	x	x	x	x	x

Syntax: **L1_BSYTM. : <Delay>**

Delay	Description
0 - 255	Time-out value in seconds.
* **60**	Factory default value.

Example:

```
L1_BSYTM. : 60
```

C1_READT COM1 Printer Feedback Delay OUTPUT MENU

150 152	530 532	630 632	550 650	560 660	570 670
			x	x	x

When a print job is sent to a logical printer set up for bi-directional communication, this parameter specifies the time from the end-of-job until the communication is closed (i.e. no more printer data is returned to the host).

Syntax: **C1_READT. : <Delay>**

Delay	Description
0 - 255	Time-out value in seconds.
***** **3**	Factory default value.

Note: For print servers with software version earlier than 5.00, any printer data received after this delay will be stored in the serial input buffer, and may be retrieved by the FTP *get com1* command or the *COM1* button in the *Advanced* menu of AXCFG.

Example:

```
C1_READT. : 3
```

C1_HNDSH COM1 Handshake Protocol OUTPUT MENU

150 152	530 532	630 632	550 650	560 660	570 670
			x	x	x

This parameter specifies the handshake protocol for the COM1 printer port.

Syntax: **C1_HNDSH. : <Protocol>**

Protocol	Description
NONE	Handshake protocols disabled.
XON/XOFF	XON/XOFF protocol enabled.
ROBUST	XON/XOFF protocol enabled, XON is sent before each print job.
RDY/BSY	Hardware handshake protocol enabled.
BOTH	Both XON/XOFF and hardware handshake enabled.
***** **ROBUST-BOTH**	Same as both, but XON is sent before each print job.

Example:

```
C1_HNDSH. : ROBUST-BOTH
```

C1_BAUDR COM1 Baud Rate OUTPUT MENU

This parameter specifies the baud rate for COM1.

150 152	530 532	630 632	550 650	560 660	570 670
			x	x	x

Syntax: **C1_BAUDR. : <Baud Rate>**

Baud Rate	Description	Baud Rate	Description
300	300 baud	* **9600**	9600 baud
600	600 baud	**19200**	19200 baud
1200	1200 baud	**38400**	38400 baud
2400	2400 baud	**57600**	57600 baud
4800	4800 baud	**115200**	115200 baud

Example:

```
C1_BAUDR. : 9600
```

C1_STOPB COM1 Stop Bits OUTPUT MENU

This parameter specifies the number of stop bits for COM1.

150 152	530 532	630 632	550 650	560 660	570 670
			x	x	x

Syntax: **C1_STOPB. : <Stop Bits>**

Stop Bits	Description
1	One stop bit.
* **2**	Two stop bits *(default)*.

C1_PARIT COM1 Parity OUTPUT MENU

This parameter specifies the parity setting for COM1.

150 152	530 532	630 632	550 650	560 660	570 670
			x	x	x

Syntax: **C1_PARIT. : <Parity>**

Parity	Description
* **NONE**	No parity *(default)*.
ODD	Odd parity.
EVEN	Even parity.

Example:

```
C1_PARIT. : NONE
```

C1_NBITS COM1 Word Length OUTPUT MENU

This parameter specifies the word length (number of bits) for COM1.

150 152	530 532	630 632	550 650	560 660	570 670
			x	x	x

Syntax: **C1_NBITS. : <Word Length>**

Word Length	Description
7	Seven bits word length.
*** 8**	Eight bits word length *(default)*.

Example:
```
C1_NBITS. : 8
```

C1_BSYTM COM1 Busy Status Time-Out OUTPUT MENU

This parameter specifies the delay before a printer busy status is reported for COM1.

150 152	530 532	630 632	550 650	560 660	570 670
			x	x	x

Syntax: **C1_BSYTM. : <Delay>**

Delay	Description
0 - 255	Time-out value in seconds.
*** 60**	Factory default value.

Example:
```
C1_BSYTM. : 60
```

L2_CENTR LPT2 Centronics Interface Timing OUTPUT MENU

This parameter specifies the Centronics interface timing mode for the LPT2 port.

150 152	530 532	630 632	550 650	560 660	570 670
x			x	x	x

Syntax: **L2_CENTR. : <Mode>**

Mode	Description
IBM_PC	Low transfer rate.
STNDRD	Standard transfer rate.
FAST	High transfer rate.
*** HISPEED**	High-speed Centronics mode (not available for AX-5).

Notes:
1. The ‘IBM_PC’ mode is designed for old, low-speed printers that don’t meet the Centronics specifications.
2. ‘STNDRD’ is the standard Centronics mode. This is the default setting in all print servers.

3. The ‘FAST’ mode corresponds to the upper limit of the Centronics specifications. Not supported by all printers.
4. The ‘HISPEED’ mode requires a printer supporting high-speed Centronics communication (such as Hewlett-Packard in *High Speed* mode).

Example:
```
L2_CENTR. : STNDRD
```

L2_BSYTM LPT2 Busy Status Time-Out OUTPUT MENU

This parameter specifies the delay before a printer busy status is reported for LPT2.

150 152	530 532	630 632	550 650	560 660	570 670
x			x	x	x

Syntax: **L2_BSYTM. : <Delay>**

Delay	Description
0 - 255	Time-out value in seconds.
*** 60**	Factory default value.

Example:
```
L2_BSYTM. : 60
```

DEF_OUT Internal Printout Destination PANEL MENU

150 152	530 532	630 632	550 650	560 660	570 670
see note	x	x	x	x	x

This parameter specifies a logical or physical printer to which internal printouts (parameter lists, test printouts, etc.) shall be directed.

If the preferred printer is busy, the printout will be sent to the first available logical printer (logical printers assigned to LPT1 or LPT2 are tried first, then logical printers assigned to COM1).

Syntax: **DEF_OUT. : <Destination>**

Destination	**Description**	Destination	**Description**
* **PR1**	Print to PR1	**PR7**	Print to PR7
PR2	Print to PR2	**PR8**	Print to PR8
PR3	Print to PR3	**LPT1**	Print to LPT1
PR4	Print to PR4	**LPT2**	Print to LPT2
PR5	Print to PR5	**COM1**	Print to COM1
PR6	Print to PR6		

Notes: For print servers not including the logical printers function, the only parameters available will be the physical printer port, e.g. LPT1 and LPT2 in AXIS 150/152.

Example:

```
DEF_OUT. : PR1
```

LOCK_KEY Lock Test Button PANEL MENU

150 152	530 532	630 632	550 650	560 660	570 670
x	x	x	x		

This parameter may be used to lock the front panel test button to prevent unauthorized internal printouts. The test page printout is always available, even if the test button is locked.

Syntax: **LOCK_KEY. : <Status>**

Status	**Description**
YES	The test button is locked.
* **NO**	The test button is unlocked *(default)*.

Example:

```
LOCK_KEY : NO
```

SYSL System Language IBM Basic Configuration

150 152	530 532	630 632	550 650	560 660	570 670
					x

This parameter defines the default code page and language character set.

Syntax: **SYSL. :<Code Page>**

Code Page	Title	Code Page	Title
* **37**	US English (default)	**285**	UK English
	Portuguese Alt,	**286**	Austrian/German Alt
	Canadian Bilingual	**287**	Danish/Norwegian Alt
260	Canadian French	**288**	Finnish/Swedish Alt
273	Austrian/German	**289**	Spanish Alt
274	Belgian	**293**	APL
275	Brazilian	**297**	French/French Azerty
277	Danish/Norwegian	**361**	International Typographic
278	Swedish/Finnish	**500**	International Set 5,
280	Italian		Swiss Bilingual
281	Japanese English	**871**	Icelandic
282	Portuguese	**892**	OCR-A
284	Spanish, Spanish Speaking	**893**	OCR-B

Note: The US English, Portuguese, and Canadian code pages are identical, and are selected by the same code page number (37). This is also true for Spanish and Spanish Speaking (284), and International Set 5 and Swiss Bilingual (500).

Example: To select US english:

```
SYSL. : 37
```

PREMUL IBM Printer Emulation IBM Basic Configuration

150 152	530 532	630 632	550 650	560 660	570 670
					x

This parameter selects the emulated IBM printer. All communication responses and printouts will be according to the selected printer emulation.

Syntax: **PREMUL. : <Printer>**

Printer	Description
3812	IBM 3812 mod 2 (3270 non-IPDS)Page printer emulation
* **3816**	IBM 3816 mod 01A and 01D (3270 non-IPDS) Page printer emulation
3287	IBM 3287 mod 2CMatrix printer emulation
3268	IBM 3268 mod 2C Matrix printer emulation
3262	IBM 3262 mod 3 and 13 Matrix printer emulation
4214	IBM 4214 mod 1 (3270)Matrix printer emulation
4224	IBM 4224 mod 2 (non-IPDS)Matrix printer emulation
4230	IBM 4230 mod 201 (3270)Matrix printer emulation

Note: The IBM 3287 and IBM 3268 emulations do not include support for Programmable Symbols.

Example: To select IBM 3287 mod 2C matrix printer emulation:

```
PREMUL. : 3287
```

MPL Maximum Page Length IBM Page Format

150 152	530 532	630 632	550 650	560 660	570 670
					x

This parameter sets the Maximum Page Length (MPL) in number of lines. An automatic Form Feed will be performed when the specified number of lines have been printed. Optionally, a control switch may be set to disable the automatic Form Feed.

Syntax: **MPL. : <Page Length> [, <Control Switch>]**

Page Length	Description
0 - 255	MPL setting in number of lines.
***** **66**	Factory default value.

Control Switch	Description
***** **ENA**	Enabled. The initial MPL value is set, but is overridden by host command.
DIS	Disabled. The MPL setting is ignored, and no automatic Form Feed will be performed.

Note: The MPL value will be overridden by the SCS SVF command

Examples: To set Maximum Page Length to 48 lines:

```
MPL. : 48
```

To disable auto Form Feed without changing MPL:

```
MPL. : , DIS
```

MPP Maximum Print Position IBM Page Format

150 152	530 532	630 632	550 650	560 660	570 670
					x

This parameter sets the Maximum Print Position (MPP), or page width, in number of characters. An automatic New Line will be performed when MPP has been reached. Optionally, a control switch may be set to disable the automatic New Line.

Syntax: **MPP. : <Page Width> [, <Control Switch>]**

Page Width	Description
0 - 255	MPP setting in number of characters.
***** **32**	Factory default value.

Control Switch	Description
***** **ENA**	Enabled. The initial MPP value is set, but is overridden by host command.
DIS	Disabled. The MPP setting is ignored, and no automatic New Line will be performed.

Note: The MPP value will be overridden by the SCS SHF command.

Examples: To set Maximum Print Position to 132 characters:

```
MPP. : 132
```

Disable auto NL without changing MPP:

```
MPP. : , DIS
```

LPI Lines Per Inch IBM Page Format

150 152	530 532	630 632	550 650	560 660	570 670
					x

This parameter sets the Lines Per Inch (LPI), or line spacing.

Syntax: **LPI. : <Line Spacing>**

Line Spacing	Description
3	3 LPI in portrait and landscape mode (4.29 LPI in COR mode).
4	4 LPI in portrait and landscape mode (5.72 LPI in COR mode).
***** **6**	6 LPI in portrait and landscape mode (8.57 LPI in COR mode).
8	8 LPI in portrait and landscape mode (11.43 LPI in COR mode).

Notes:

1. The LPI value will be overridden by the SCS/SLD command.
2. This parameter emulates a combination of two IBM printer front panel switches: Lines Per Inch and Line Spacing.
3. The line spacing can be adjusted by the LDSF command.

Example: Set 8 Lines Per Inch

```
LPI. : 8
```

CPI Characters Per Inch IBM Page Format

150 152	530 532	630 632	550 650	560 660	570 670
					x

This parameter sets the Characters Per Inch (CPI), or character spacing.

Syntax: **CPI. : <Chr. Spacing>**

Chr. Spacing	Description
5	5 CPI in portrait and landscape mode. (5250/Twinax mode only)
* **10**	10 CPI in portrait and landscape mode (13.3 CPI in COR mode).
12	12 CPI in portrait and landscape mode (15 CPI in COR mode).
15	15 CPI in portrait and landscape mode (20 CPI in COR mode).
17	17 CPI in portrait and landscape mode (27 CPI in COR mode).

Notes:

1. The CPI value will be overridden by the SCS/SPD command.
2. The character spacing can be adjusted (for each font separately) by the FONT command.

Example: Set 15 Characters Per Inch:

```
CPI. : 15
```

AUTORI Automatic Orientation IBM Page Format

150 152	530 532	630 632	550 650	560 660	570 670
					x

This parameter defines if the page orientation is determined by the current page format (automatic) or by the current bin orientation selection. This parameter only works with laser printers

Syntax: **AUTORI. : <Value>**

Value	Description
* **YES**	Use the current page format to determine the page orientation.
NO	Use the current bin orientation selection.

Notes:

1. If Automatic Orientation is selected, the MPL and MPP control switches must all be set to ‘Enabled’ to obtain correct page orientation.
2. This parameter emulates an IBM printer front panel switch: Automatic Print Orientation.

Example: Disable automatic orientation:

```
AUTORI. : NO
```

LM Left Margin IBM Page Format

150 152	530 532	630 632	550 650	560 660	570 670
					x

This parameter sets the Left Margin for portrait, landscape, and reduction orientations relative to the printer's origin.

Syntax: **LM. : <Margin, Portrait> [, <Margin, Landscape> [, <Margin, COR>]]**

Margin	Description
-999 – 999	Left margin in units of 1/100".
*** 0**	Factory default value (portrait and landscape orientations).
*** 48**	Factory default value (COR mode).

Notes:

1. Positive values move the Left Margin to the right relative to the printer's origin, negative values move to the left.
2. Setting an incorrect Left Margin may result in loss of print data at the paper edges.

Examples: Set Left Margin to zero in portrait and landscape, and 0.5" in COR mode:

```
LM. : 0 , 0 , 50
```

Set Left Margin to 0.25" in landscape mode, without changing portrait and COR left margins:

```
LM. : , 25
```

TM Top Margin IBM Page Format

150 152	530 532	630 632	550 650	560 660	570 670
					x

This parameter sets the Top Margin for portrait, landscape, and reduction orientations relative to the printer's origin.

Syntax: **TM. : <Margin, Portrait> [, <Margin, Landscape> [, <Margin, COR>]]**

Margin	Description
-999 – 999	Top margin in units of 1/100".
*** 26**	Factory default value (portrait and landscape orientations).
*** 74**	Factory default value (COR mode).

Notes:

1. Positive values move the Top Margin downwards relative to the printer's origin, negative values move upwards.
2. Setting an incorrect Top Margin may result in loss of print data at the paper edges.
3. If Maximum Page Length is disabled (MPL. : ,DIS), Top Margin setting is ignored.

Examples Set Top Margin to zero in portrait and landscape, and 0.5" in COR mode:

```
TM. : 0 , 0 , 50
```

Set Top Margin to 0.25" in landscape mode, without changing portrait and COR top margins:

```
TM. : , 25
```

LDSF Line Density Scale Factor IBM Page Format

150 152	530 532	630 632	550 650	560 660	570 670
					x

This parameter sets the Line Density Scale Factor for portrait, landscape, and reduction (COR) modes.

Syntax: **LDSF. : <Portrait> [, <Landscape> [, <COR>]]**

Value	Description
0 - 255	Line Density Scale Factor in percent.
*** 94**	Default value for portrait and landscape modes (94% compression).
*** 70**	Default value for reduction (COR) mode (70% compression).

Note: Values below 100 results in compression, and above 100 results in expansion of the current line density.

Examples: Set no scaling in portrait and landscape modes, and 70% compression in COR mode:

```
LDSF. : 100 , 100 , 70
```

Set 95% compression in landscape mode, without changing portrait and COR scale factors:

```
LDSF. : , 95
```

DEFBIN Default Input Bin IBM Page Format

150 152	530 532	630 632	550 650	560 660	570 670
					x

This parameter determines which input bin shall be selected as the default paper source at power-up.

Syntax: **DEFBIN. : <Bin>**

Bin	Description
*** BIN1**	Use Bin 1 as default paper source.
BIN2	Use Bin 2 as default paper source.
BIN3	Use Bin 3 as default paper source.
BIN4	Use Bin 4 (Manual feed) as default paper source.
BIN5	Use Bin 5 (Envelope feeder) as default paper source.
BIN6	Use Bin 6 (Continuous forms) as default paper source.

Notes:

1. When one of the values BIN1 - BIN6 is selected, the corresponding printer control sequence (BIN1S - BIN6S) is sent at power-up.

2. By changing the contents of the BIN1S - BIN6S you can change the result of the DEFBIN command. For example, if you want the bin selection to be controlled by transparency and not by the AXIS NPS, empty the printer control sequences (BIN1S - BIN6S).

Example: Select bin 1 as default paper source:

```
DEFBIN. : BIN1
```

BIN1 Bin 1 Orientation & Paper Size IBM Page Format

This parameter sets the paper size and default print orientation for bin 1.

150 152	530 532	630 632	550 650	560 660	570 670
					x

Syntax: **BIN1. : <ORIENTATION> [, <SIZE> [, <WIDTH> , <LENGTH>]]**

Size	Description
EXEC	7.25 × 10.5 inches
* **LETTER**	8.5 × 11 inches (default for US version)
LEGAL	8.5 × 14 inches
A4	210 × 297 mm
MON	3.8 × 7.5 inches (Monarch envelopes)
C10	4.1 × 9.4 inches (COM-10 envelopes)
DL	4.3 × 8.6 inches (DL envelopes)
CUSTOM	User defined size, width × length in 1/100 inches, the valid range is 0 - 1999. The Custom Size Sequence will also be sent to the printer.

Orientation	Description
* **COR**	Computer Output Reduction (COR) is enabled.
PORT	Use portrait as default print orientation.
LAND	Use landscape as default print orientation.

Notes:
1. An incorrect paper size may result in loss of print data at the paper edges.
2. Width and length arguments are only valid when ‘Custom’ size is selected.

Examples: Select A4 without changing orientation

```
BIN1. : , A4
```

Select letter size with landscape orientation

```
BIN1. : LAND , LETTER
```

Select 8.5" × 12" custom size with COR

```
BIN1. : COR , CUSTOM , 850 , 1200
```

Select portrait without changing size

```
BIN1. : PORT
```

BIN2 Bin 2 Orientation & Paper Size IBM Page Format

150 152	530 532	630 632	550 650	560 660	570 670
					x

This parameter sets the paper size and default print orientation for bin 2. Size and orientation values are the same as for Bin 1.

Syntax: **BIN2. : <ORIENTATION> [, <SIZE> [, <WIDTH> , <LENGTH>]] ;**

- Width and length arguments are only valid when ‘Custom’ size is selected.

BIN3 Bin 3 Orientation & Paper Size IBM Page Format

150 152	530 532	630 632	550 650	560 660	570 670
					x

This parameter sets the paper size and default print orientation for bin 3. Size and orientation values are the same as for bin 1.

Syntax: **BIN3. : <ORIENTATION> [, <SIZE> [, <WIDTH> , <LENGTH>]]**

- Width and length arguments are only valid when ‘Custom’ size is selected.

BIN4 Bin 4 (Manual) Orientation & Paper Size IBM Page Format

150 152	530 532	630 632	550 650	560 660	570 670
					x

This parameter sets the paper size and default print orientation for bin 4 (manual feed). Size and orientation values are the same as for Bin 1.

Syntax: **BIN4. : <ORIENTATION> [, <SIZE> [, <WIDTH> , <LENGTH>]]**

- Width and length arguments are only valid when ‘Custom’ size is selected.

BIN5 Bin 5 (Envelope) Orientation & Paper Size IBM Page Format

150 152	530 532	630 632	550 650	560 660	570 670
					x

This parameter sets the envelope size and default print orientation for bin 5 (Envelope feeder). The default size and orientation values are DL and COR.

Syntax: **BIN5. : <ORIENTATION> [, <SIZE> [, <WIDTH> , <LENGTH>]]**

- Width and length arguments are only valid when ‘Custom’ size is selected.

BIN6 Bin 6 (Continuous) Orientation & Paper Size IBM Page Format

150 152	530 532	630 632	550 650	560 660	570 670
					x

This parameter sets the paper size and default print orientation for bin 6 (continuous forms). Size and orientation values are the same as for Bin 1.

Syntax: **BIN6. : <ORIENTATION> [, <SIZE> [, <WIDTH> , <LENGTH>]]**

Width and length arguments are only valid when 'Custom' size is selected.

SIMBF Simulated Boldface IBM Page Format

150 152	530 532	630 632	550 650	560 660	570 670
					x

This switch controls multiple strike simulation. All horizontal reverse movements on the same line cause horizontal offset.

Syntax: **SIMBF. : <Status>**

Status	Description
NO	Disable multiple strike simulation
*** YES**	Enable multiple strike simulation (default)

Example: Enable multiple strike simulation:

Example:
```
SIMBF. : YES
```

CPI5 5 CPI FGID Definition Fonts

150 152	530 532	630 632	550 650	560 660	570 670
					x

This parameter assigns a pair of fonts to be used as default 5 CPI fonts for normal (portrait/landscape) and reduction (COR) modes.

Fonts are specified by the IBM FGID (Font Global Identifier) number in either decimal or hexadecimal format.

Syntax: **CPI5. : <FGID> [, <COR FGID>]**

FGID (dec)	FGID (hex)	Description
0 - 65535	**$0 - $FFFF**	IBM FGID number
*** 244**	**$00F4**	Default 5 CPI FGID (portrait and landscape)
*** 204**	**$00CC**	Default 5 CPI FGID (COR mode)

Examples: Default 5 CPI FGIDs:

```
CPI5. : 244 , 204
```

Change 5 CPI/COR to 10 pitch Courier:

```
CPI5. : , 11
```

CPI10 10 CPI FGID Definition Fonts

150 152	530 532	630 632	550 650	560 660	570 670
					x

This parameter assigns a pair of fonts to be used as default 10 CPI fonts for normal (portrait/landscape) and reduction (COR) modes. The default COR font is 13.3 CPI Gothic Text.

Fonts are specified by the IBM FGID (Font Global Identifier) number in either decimal or hexadecimal format.

Syntax: **CPI10. : <FGID> [, <COR FGID>]**

FGID (dec)	FGID (hex)	Description
0 - 65535	**$0 - $FFFF**	IBM FGID number
*** 11**	**$000B**	Default 10 CPI FGID (portrait and landscape)
*** 204**	**$00CC**	Default 10 CPI FGID (COR mode)

Examples: Default 10 CPI FGIDs:

```
CPI10. : 11 , 204
```

Change 10 CPI to 13 pitch Gothic Text:

```
CPI10. : 204
```

CPI12 12 CPI FGID Definition Fonts

150 152	530 532	630 632	550 650	560 660	570 670
					x

This parameter assigns a pair of fonts to be used as default 12 CPI fonts for normal (portrait/landscape) and reduction (COR) modes. The default COR font is 15 CPI Gothic Text.

Fonts are specified by the IBM FGID (Font Global Identifier) number in either decimal or hexadecimal format.

Syntax: **CPI12. : <FGID> [, <COR FGID>]**

FGID (dec)	FGID (hex)	Description
0 - 65535	**$0 - $FFFF**	IBM FGID number
*** 86**	**$0056**	Default 12 CPI FGID (portrait and landscape)
*** 230**	**$00E6**	Default 12 CPI FGID (COR mode)

Examples:

Default 12 CPI FGIDs:

Examples:

```
CPI12. :86 , 230
```

Change 12 CPI to 13 pitch Gothic Text:

```
CPI12. :204
```

CPI15 15 CPI FGID Definition Fonts

150 152	530 532	630 632	550 650	560 660	570 670
					x

This parameter assigns a pair of fonts to be used as default 15 CPI fonts for normal (portrait/landscape) and reduction (COR) modes. The default COR font is 20 CPI Gothic Text.

Fonts are specified by the IBM FGID (Font Global Identifier) number in either decimal or hexadecimal format.

Syntax: **CPI15. : <FGID> [, <COR FGID>]**

FGID (dec)	FGID (hex)	Description
0 - 65535	**$0 - $FFFF**	IBM FGID number
*** 230**	**$00E6**	Default 15 CPI FGID (portrait and landscape)
*** 281**	**$0119**	Default 15 CPI FGID (COR mode)

Examples: Default 15 CPI FGIDs:

Examples:
```
CPI15. : 230 , 281
```

Change 15 CPI to 17.1 pitch Courier:

```
CPI15. : 252
```

CPI17 17 CPI FGID Definition Fonts

150 152	530 532	630 632	550 650	560 660	570 670
					x

This parameter assigns a pair of fonts to be used as default 17 CPI fonts for normal (portrait/landscape) and reduction (COR) modes. The default COR font is 27 CPI Gothic Text.

Fonts are specified by the IBM FGID (Font Global Identifier) number in either decimal or hexadecimal format.

Syntax: **17CPI. : <FGID> [, <COR FGID>]**

FGID (dec)	FGID (hex)	Description
0 - 65535	**$0 - $FFFF**	IBM FGID number
*** 252**	**$00FC**	Default 17 CPI FGID (portrait and landscape)
*** 290**	**$0122**	Default 17 CPI FGID (COR mode)

Examples: Default 17 CPI FGIDs:

```
CPI17. : 252 , 290
```

Change 17 CPI to 20 pitch Gothic Text:

```
CPI17. : 281
```

XEMUL Extended Emulation Status IBM Extended Emulation

150 152	530 532	630 632	550 650	560 660	570 670
					x

This parameter sets the initial Extended Emulation status. If enabled, the Extended Emulation is enabled at power-up, thus eliminating the need for the Control Sequence (%AXIS+) in your documents. The Extended Emulation can still be temporarily disabled by the %AXIS- command.

Syntax: **XEMUL. : <Status>**

Status	Description
* **ON**	Extended Emulation is enabled at power-up (default)
OFF	Extended Emulation is disabled at power-up

Example: **Disable Extended Emulation at power-up:**

```
XEMUL. : OFF
```

Important: Save the configuration and restart the print server after changing this parameter.

WARN Warning Switch IBM Extended Emulation

150 152	530 532	630 632	550 650	560 660	570 670
					x

This parameter controls whether warnings should be printed when recoverable error conditions occur. These warnings are described in Section 12.

Syntax: **WARN. : <Status>**

Status	Description
* **OFF**	Disabled. Warnings will be suppressed (default)
ON	Enabled. Warnings will be printed

Example: Print warning messages

```
WARN. : ON
```

SSUBST Extended Emulation String Substitution IBM Extended Emulation

This parameter controls string substitution.

150 152	530 532	630 632	550 650	560 660	570 670
					x

Syntax: **SSUBST. : <Status>**

Status	Description
* YES	String substitution is active
NO	String substitution is disabled

Example: Disable string substitution:

```
SSUBST. : NO
```

SBTS Single Byte TRN Sequence IBM Extended Emulation

This parameter specifies the sequence to activate the Single Byte Transparency function.

150 152	530 532	630 632	550 650	560 660	570 670
					x

Syntax: **SBTS. : " <Sequence> "**

Sequence	Description
<any sequence>	Single Byte TRN Sequence
* <empty>	Single Byte TRN disabled (default)

Notes:

1. It is not recommended to use single byte transparency to send ASCII escape sequences. Use the multi-byte transparency whenever possible.
2. The maximum length of this sequence is 16 characters.

Example: Define Single Byte TRN Sequence:

```
SBTS. : "%" or
SBTS. : 37 or
SBTS. : $25
```

TLIS Transparency Lead-In Sequence IBM Extended Emulation

This parameter specifies the sequence to start a Multi-byte Transparency transfer.

150 152	530 532	630 632	550 650	560 660	570 670
					x

Syntax: **TLIS. : " <Sequence> "**

Sequence	Description
<any sequence>	TRN Lead-In Sequence
***** **%<**	Factory default sequence
<empty>	Multi-Byte TRN disabled

Notes:
1. Both TLIS and TTRS must be defined (non-empty) before multi-byte TRN can be used.
2. The maximum length of this sequence is 16 characters.

Example: Define TRN Lead-In Sequence:

```
TLIS. : "%<" or
TLIS. : 37 , 60 or
TLIS. : $25 , $3C
```

TTRS Transparency Trailer Sequence IBM Extended Emulation

This parameter specifies the sequence to stop a Multi-byte Transparency transfer.

150 152	530 532	630 632	550 650	560 660	570 670
					x

Syntax: **TTRS. : " <Sequence> "**

Sequence	Description
<any sequence>	TRN Trailer Sequence
***** **>%**	Factory default sequence
<empty>	Multi-Byte TRN disabled

Notes:
1. Both TLIS and TTRS must be defined (non-empty) before multi-byte TRN can be used.
2. The maximum length of this sequence is 16 characters.

Example: Define TRN Trailer Sequence:

```
TTRS. : ">%" or
TTRS. : 37 , 62 or
TTRS. : $25 , $3E
```

FLIS Function Mode Lead-In Sequence IBM Extended Emulation

150 152	530 532	630 632	550 650	560 660	570 670
					x

This parameter specifies the sequence to enter Function Mode.

Syntax: **FLIS = " <Sequence> "**

Sequence	Description
<any sequence>	Function Mode Lead-In Sequence
***** **%/**	Factory default sequence
<empty>	Function Mode disabled

Note: **The maximum length of this sequence is 16 characters.**

Example: Define Function Mode Lead-In Sequence:

```
FLIS = "%/" or
FLIS = 37 , 47 or
FLIS = $25 , $2F
```

EECS Control Sequence IBM Extended Emulation

150 152	530 532	630 632	550 650	560 660	570 670
					x

This parameter specifies the Extended Emulation Control Sequence. The default sequence is %AXIS.

A plus sign is always used for entering (and a minus sign for exiting) Extended Emulation mode, regardless of the Control Sequence.

Syntax: **EECS. : " <Sequence> "**

Sequence	Description
<any sequence>	Extended Emulation Control Sequence
***** **%AXIS**	Factory default sequence
<empty>	Extended Emulation control disabled

Notes:

1. If this sequence is empty, it is not possible to enter/exit Extended Emulation mode by printing configuration commands from your IBM host.
2. The maximum length of this sequence is 16 characters.

Example: Define Ext. Emul. Control Sequence:

```
EECS. : "%AXIS" or
EECS. : 37 , 65 , 88 , 73 , 83 or
EECS. : $25 , $41 , $58 , $49 , $53
```

COBXEM Cobra Extended Emulation Mode IBM Extended Emulation

150 152	530 532	630 632	550 650	560 660	570 670
					x

This parameter handles AXIS 570/670 compatibility with the AXIS Cobra range of protocol converters. The parameter controls how the AXIS Cobra 'Enter Extended Emulation Mode' sequence is to be interpreted when encountered in the print data stream. The Cobra 'Enter Extended Emulation Mode' sequence is &&??, followed by three characters that set up the SBTS, TLIS, TTRS and CCLIS parameters as described below:

&&??<Char1><Char2><Char3>

Parameter	New Value (COBXEM=SETALL)	Example: &&??%%P
SBTS	<Char1>	%
TLIS	<Char1><Char2>	%%
TTRS	<Char1>	%
CCLIS	<Char1><Char3>	%P

In order to provide compatibility with other protocol converters, COBXEM can also be set up to make the AXIS 570/670 accept the 'Enter Extended Mode Sequence' with a single trailing character:

&&??<Char1>

Parameter	New Value (COBXEM=SETESC)	Example: &&??#
SBTS	<Char1>	#
TLIS	<Char1>	#
TTRS	<Char1>	#
CCLIS	<Char1>	#

Syntax: **COBXEM. : <Mode>**

Mode	Description
OFF	Axis Cobra compatibility disabled
SETESC	Expect a single character after Enter Extended Emulation Mode Sequence.
* **SETALL**	Expect three characters after Enter Extended Emulation Mode Sequence.

CCLIS Cobra Config Lead-in Sequence IBM Extended Emulation

150 152	530 532	630 632	550 650	560 660	570 670
					x

This parameter defines the lead in sequence for AXIS Cobra compatible configuration of the AXIS 570/670.

Syntax: **CCLIS. : " <Sequence> "**

Sequence	Description
<any sequence>	Extended Emulation Control Sequence
* **%P**	Factory default sequence

Note: The AXIS Cobra uses numbers to specify parameters. Only AXIS Cobra parameters that can be directly translated to one or more AXIS 570/670 parameters can be set up. If you try to set up an AXIS Cobra parameter that has no corresponding AXIS 570/670 parameter a warning message will be printed if the parameter WARN is on.

SOJS Start of Job Sequence IBM Job Control

150 152	530 532	630 632	550 650	560 660	570 670
					x

The start of job sequence is sent to the printer when a print job is received from the IBM host. The sequence can be used to configure the printer if a special set-up is required for IBM print jobs.

Syntax: **SOJS. : " <Sequence> "**

Sequence	Description
<any sequence>	Start of Job Sequence
<empty>	Factory default sequence

EOJS End of Job Sequence IBM Job Control

150 152	530 532	630 632	550 650	560 660	570 670
					x

The End of Job Sequence is sent to the printer after a print job from the IBM host is completed. The sequence can be used to configure the printer if a special set-up is required for IBM print jobs.

Syntax: **EOJS. : " <Sequence> "**

Sequence	Description
<any sequence>	End of Job Sequence
<empty>	Factory default sequence

CASE Case IBM 3270 Options

150 152	530 532	630 632	550 650	560 660	570 670
					x

This switch controls if characters should be printed in mono or dual case.

Syntax: **CASE. : <Mode>**

Mode	Description
* **DUAL**	Print upper and lower case characters (default)
MONO	Convert lower case characters to upper case

Example: Print all characters in upper case:

```
CASE. : MONO
```

Important: Save the configuration and restart the print server after changing this parameter to allow the Control Unit to read the new setting.

BASCOL Base Color IBM 3270 Options

150 152	530 532	630 632	550 650	560 660	570 670
					x

This parameter controls the interpretation of LU-3/DSE base buffer attributes. When Base Color is set to BLACK, all text appearing in green on the display station will be printed in black. Other colors will be printed according to the table below:

Base Buffer Attributes	Base Color: Black	Base Color: Green
Unprotected, Normal	Black	Green
Unprotected, Intensified	Red	Red
Protected, Normal	Blue	Blue
Protected, Intensified	Green	Black

The Base Color parameter has no effect on monochrome printers, unless the color sequences are used for highlighting using underscore or bold type.

Optionally, a control switch may be set to disable color printing (all colors are printed as black).

Syntax: **BASCOL. : <Color> [, <Control Switch>]**

Color	Description
* **BLACK**	Set Base Color to black
GREEN	Set Base Color to green

Control Switch	Description
* **ENA**	Enable Base Color
DIS	Disable Base Color (print all colors in black)

Examples: Set Base Color to green, enabled:

```
BASCOL. : GREEN , ENA
```

Disable color printing:

```
BASCOL. : , DIS
```

XSTRN Extended SCS Transparency IBM 3270 Options

150 152	530 532	630 632	550 650	560 660	570 670
					x

This switch controls whether SCS TRN data should be interpreted as SCS or ASCII character codes.

Hint: Use the ASCII mode to pass through ASCII codes from your application.

Syntax: **XSTRN. : <Status>**

Status	Description
* **0**	SCS Mode. TRN data is translated into ASCII (default)
1	ASCII Mode. TRN data is passed through as is

Example: Set SCS TRN to ASCII mode:

```
XSTRN. : 1
```

AUTNL Automatic New Line at MPP+1 IBM 3270 Options

150 152	530 532	630 632	550 650	560 660	570 670
					x

This switch controls the automatic insertion of a New Line after a Carriage Return at MPP+1.

Syntax: **AUTNL. : <Status>**

Status	Description
0	Do not insert a New Line after CR at MPP+1
*** 1**	Always insert a New Line after CR at MPP+1 (default)

Example: Insert NL after CR at MPP+1:

```
AUTNL. : 1
```

ADDNL Additional New Line at MPP+1 IBM 3270 Options

150 152	530 532	630 632	550 650	560 660	570 670
					x

This switch controls the automatic insertion of a New Line after a New Line at MPP+1.

Syntax: **ADDNL. : <Status>**

Status	Description
0	Do not insert a New Line after NL at MPP+1
*** 1**	Always insert a New Line after NL at MPP+1 (default)

Example: Insert NL after NL at MPP+1:

Example:

```
ADDNL. : 1
```

FFWPB Form Feed within Print Buffer IBM 3270 Options

150 152	530 532	630 632	550 650	560 660	570 670
					x

This switch controls the automatic insertion of a Space character after a Form Feed.

Syntax: **FFWPB. : <Status>**

Status	Description
* 0	Insert a space after Form Feed (default)
1	Do not insert a space after Form Feed

Example: Insert a space after FormFeed:

```
FFWPB. : 1
```

FFEOPB Form Feed at End of Print Buffer IBM 3270 Options

150 152	530 532	630 632	550 650	560 660	570 670
					x

This switch controls the automatic insertion of a New Line after a Print Buffer that ends with a Form Feed.

Syntax: FFEOPB. : <Status>

Status	Description
0	Do not insert a New Line after Form Feed at End of Buffer
***1**	Insert a New Line after Form Feed at End of Buffer(default)

Example: Insert a NL after FF at End of Buffer:

```
FFEOPB. : 1
```

NULSUP Null Suppression IBM 3270 Options

150 152	530 532	630 632	550 650	560 660	570 670
					x

This switch controls the handling of the Null control code.

Syntax: **NULSUP. : <Status>**

Status	Description
***0**	Suppress Nulls in formatted mode(default)
1	Print Nulls as spaces in formatted mode

Example: Suppress Nulls:

```
NULSUP. : 0
```

FFCPOS Form Feed Command Position IBM 3270 Options

150 152	530 532	630 632	550 650	560 660	570 670
					x

This switch controls at which print position the Form Feed parameter is valid.

Syntax: **FFCPOS. : <Status>**

Status	Description
***0**	Form Feed is valid at print position 1 and MPP+1 only(default)
1	Form Feed is valid anywhere it occurs

Example: FF valid at print pos. 1 and MPP+1:

```
FFCPOS. : 0
```

AFEOPB Auto Func after End of Print Buffer IBM 3270 Options

150 152	530 532	630 632	550 650	560 660	570 670
					x

This switch controls the automatic insertion of a New Line or Form Feed at the end of the print buffer.

Syntax: **AFEOPB. : <Status>**

Status	Description
* **0**	A New Line is inserted at End of Print Buffer(default)
1	A Form Feed is inserted unless already in Top of Form position

Example:

Insert a Form Feed unless already at TOF:

```
AFEOPB. : 1
```

PRDRIVER ASCII Printer Driver IBM Printer Driver

150 152	530 532	630 632	550 650	560 660	570 670
					x

This parameter should match the printer type you have connected to your AXIS 570/670.

Syntax: **PRDRIVER. : <Printer>**

Printer	Description
* **GENERIC**	Generic Printer Driver
PCL5	PCL5 printer
PCL4	PCL4 printer
IBM_PRO	IBM Proprinter
EPSON_FX	Epson FX
EPSON_LQ	Epson LQ
USER	Editable Printer Driver.

Note: You must select the USER printer driver before any of the other IBM printer driver parameters listed below can be changed.

Example: Select the USER printer driver before changing any other IBM Printer Driver Parameter:

```
PRDRIVER. : USER
```

BACKSP Backspace Sequence IBM Printer Driver

This sequence is activated in response to a system Backspace command.

150 152	530 532	630 632	550 650	560 660	570 670
					x

Syntax: **BACKSP. : <Sequence>**

Sequence	Description
<any sequence>	Backspace Sequence
08	Factory default sequence

Note: You must select the USER printer driver before this parameter can be changed.

CRS Carriage Return Sequence IBM Printer Driver

This sequence is activated in response to a system Carriage Return command

150 152	530 532	630 632	550 650	560 660	570 670
					x

Syntax: **CRS. : <Sequence>**

Sequence	Description
<any sequence>	Carriage Return Sequence
0D	Factory default sequence

Note: You must select the USER printer driver before this parameter can be changed.

LFS Line Feed Sequence IBM Printer Driver

This sequence is activated in response to a system Line Feed command. If empty, the New Line Sequence, NLS, and space characters will be sent.

150 152	530 532	630 632	550 650	560 660	570 670
					x

Syntax: **LFS. : <Sequence>**

Sequence	Description
<any sequence>	Line Feed Sequence
0A	Generic Printer Driver factory default sequence
0A	PCL4 Printer Driver factory default sequence
0A	PCL5 Printer Driver factory default sequence
<empty>	IBM Proprinter Printer Driver factory default sequence
<empty>	Epson FX Printer Driver factory default sequence
<empty>	Epson LQ Printer Driver factory default sequence

Note: You must select the USER printer driver before this parameter can be changed.

NLS New Line Sequence IBM Printer Driver

This sequence is activated in response to a system New Line command.

150 152	530 532	630 632	550 650	560 660	570 670
					x

Syntax: **NLS. : <Sequence>**

Sequence	Description
<any sequence>	New Line Sequence
0D 0A	Factory default sequence

Note: You must select the USER printer driver before this parameter can be changed.

FFS Form Feed Sequence IBM Printer Driver

This sequence is activated in response to a system Form Feed parameter, and upon completion of the print line specified by Maximum Page Length (MPL).

150 152	530 532	630 632	550 650	560 660	570 670
					x

Syntax: **FFS. : <Sequence>**

Sequence	Description
<any sequence>	Form Feed Sequence
0C	Factory default sequence

Notes: To avoid empty pages generated from the system, you can change the Form Feed Sequence to the sequence for ejecting to next page.

You must select the USER printer driver before this parameter can be changed.

BLKS Black Color Sequence IBM Printer Driver

150 152	530 532	630 632	550 650	560 660	570 670
					x

A Color sequence is activated in response to a system Color selection command. They are all empty by default. To enable color printing, the sequences have to be programmed to suit the connected printer. The examples below show the sequences for a PCL color printer.

Syntax: **BLKS. : <Sequence>**

Sequence	Description
<any sequence>	Black Color Sequence
<empty>	Factory default sequence

Example: PCL Black Color Sequence:

```
BLKS. : $1B , "*v1i1S"
```

Notes: You must select the USER printer driver before this parameter can be changed.

Before using color selection commands with a PCL printer, an initialization string must be sent to the printer. This is most easily done by editing the Power On Sequence. The following sequence enables PCL color printing.

```
PWRONS. : $1B,$45,$1B,"*r0F",$1B,"*v6W",$00,$01,$01,$03,
          $03,$03,$1B,"v7b1i1S"
```

GRNS Green Color Sequence IBM Printer Driver

150 152	530 532	630 632	550 650	560 660	570 670
					x

Syntax: **GRNS. : <Sequence>**

Sequence	Description
<any sequence>	Green Color Sequence
<empty>	Factory default sequence

Example: PCL Green Color Sequence:

```
GRNS. : $1B , "*v7b1i1S"
```

Note: You must select the USER printer driver before this parameter can be changed.

BLUS Blue Color Sequence IBM Printer Driver

150 152	530 532	630 632	550 650	560 660	570 670
					x

Syntax: **BLUS. : <Sequence>**

Sequence	Description
<any sequence>	Blue Color Sequence
<empty>	Factory default sequence

Example: PCL Blue Color Sequence:

```
BLUS. : $1B , "*v7c1i1S"
```

Note: You must select the USER printer driver before this parameter can be changed.

REDS Red Color Sequence IBM Printer Driver

150 152	530 532	630 632	550 650	560 660	570 670
					x

Syntax: **REDS. : <Sequence>**

Sequence	Description
<any sequence>	Red Color Sequence
<empty>	Factory default sequence

Example: PCL Red Color Sequence:

```
REDS. : $1B , "*v7a1i1S"
```

Note: You must select the USER printer driver before this parameter can be changed.

MAGS Magenta Color Sequence IBM Printer Driver

150 152	530 532	630 632	550 650	560 660	570 670
					x

Syntax: **MAGS. : <Sequence>**

Sequence	Description
<any sequence>	Magenta Color Sequence
<empty>	Factory default sequence

Example: PCL Magenta Color Sequence:

```
MAGS. : $1B , "*v7a7c1i1S"
```

Note: You must select the USER printer driver before this parameter can be changed.

CYNS Cyan Color Sequence IBM Printer Driver

150 152	530 532	630 632	550 650	560 660	570 670
					x

Syntax: **CYNS. : <Sequence>**

Sequence	Description
<any sequence>	Cyan Color Sequence
<empty>	Factory default sequence

Example: PCL Cyan Color Sequence:

```
CYNS. : $1B , "*v7b7c1i1S"
```

Note: You must select the USER printer driver before this parameter can be changed.

YELS Yellow Color Sequence IBM Printer Driver

150 152	530 532	630 632	550 650	560 660	570 670
					x

Syntax: **YELS. : <Sequence>**

Sequence	Description
<any sequence>	Yellow Color Sequence
<empty>	Factory default sequence

Example: PCL Yellow Color Sequence:

```
YELS. : $1B , "*v7a7b1i1S"
```

Note: You must select the USER printer driver before this parameter can be changed.

BIN1S Bin 1 Sequence IBM Printer Driver

A Bin Selection sequence is activated in response to a system Bin Selection command.

150 152	530 532	630 632	550 650	560 660	570 670
					x

Syntax: **BIN1S. : <Sequence>**

Sequence	Description
<any sequence>	Bin 1 Sequence
<empty>	Generic Printer Driver factory default sequence
1B 26 6C 31 48	PCL4 Printer Driver factory default sequence
1B 26 6C 31 48	PCL5 Printer Driver factory default sequence
<empty>	IBM Proprinter Printer Driver factory default sequence
<empty>	Epson FX Printer Driver factory default sequence
1B 19 30	Epson LQ Printer Driver factory default sequence

Note: You must select the USER printer driver before this parameter can be changed.

BIN2S Bin 2 Sequence IBM Printer Driver

150 152	530 532	630 632	550 650	560 660	570 670
					x

Syntax: **BIN2S. : <Sequence>**

Sequence	Description
<any sequence>	Bin 2 Sequence
<empty>	Generic Printer Driver factory default sequence
1B 26 6C 34 48	PCL4 Printer Driver factory default sequence
1B 26 6C 34 48	PCL5 Printer Driver factory default sequence
<empty>	IBM Proprinter Printer Driver factory default sequence
<empty>	Epson FX Printer Driver factory default sequence
1B 19 34	Epson LQ Printer Driver factory default sequence

Note: You must select the USER printer driver before this parameter can be changed.

BIN3S Bin 3 Sequence IBM Printer Driver

150 152	530 532	630 632	550 650	560 660	570 670
					x

Syntax: **BIN3S. : <Sequence>**

Sequence	Description
<any sequence>	Bin 3 Sequence
<empty>	Generic Printer Driver factory default sequence
1B 26 6C 31 48	PCL4 Printer Driver factory default sequence
1B 26 6C 31 48	PCL5 Printer Driver factory default sequence
<empty>	IBM Proprinter Printer Driver factory default sequence
<empty>	Epson FX Printer Driver factory default sequence
<empty>	Epson LQ Printer Driver factory default sequence

Note: You must select the USER printer driver before this parameter can be changed.

BIN4S Bin 4 (Manual) Sequence IBM Printer Driver

150 152	530 532	630 632	550 650	560 660	570 670
					x

Syntax: **BIN4S. : <Sequence>**

Sequence	Description
<any sequence>	Bin 4 Sequence
<empty>	Generic Printer Driver factory default sequence
1B 26 6C 32 48	PCL4 Printer Driver factory default sequence
1B 26 6C 32 48	PCL5 Printer Driver factory default sequence
<empty>	IBM Proprinter Printer Driver factory default sequence
<empty>	Epson FX Printer Driver factory default sequence
<empty>	Epson LQ Printer Driver factory default sequence

Note: You must select the USER printer driver before this parameter can be changed.

BIN5S Bin 5 (Envelope) Sequence IBM Printer Driver

150 152	530 532	630 632	550 650	560 660	570 670
					x

Syntax: **BIN5S. : <Sequence>**

Sequence	Description
<any sequence>	Bin 5 Sequence
<empty>	Generic Printer Driver factory default sequence
1B 26 6C 36 48	PCL4 Printer Driver factory default sequence
1B 26 6C 36 48	PCL5 Printer Driver factory default sequence
<empty>	IBM Proprinter Printer Driver factory default sequence
<empty>	Epson FX Printer Driver factory default sequence
<empty>	Epson LQ Printer Driver factory default sequence

Note: You must select the USER printer driver before this parameter can be changed.

BIN6S Bin 6 (Continuous) Sequence IBM Printer Driver

150 152	530 532	630 632	550 650	560 660	570 670
					x

Syntax: **BIN6S. : <Sequence>**

Sequence	Description
<any sequence>	Bin 6 Sequence
<empty>	Generic Printer Driver factory default sequence
1B 26 6C 31 48	PCL4 Printer Driver factory default sequence
1B 26 6C 31 48	PCL5 Printer Driver factory default sequence
<empty>	IBM Proprinter Printer Driver factory default sequence
<empty>	Epson FX Printer Driver factory default sequence
<empty>	Epson LQ Printer Driver factory default sequence

Note: You must select the USER printer driver before this parameter can be changed.

CSIZS Custom Size Sequence IBM Printer Driver

150 152	530 532	630 632	550 650	560 660	570 670
					x

A Custom Size Sequence is sent when Custom is selected for the current Bin Orientation and Page Size. This makes it possible to enter a custom page size sequence if available page sizes are not sufficient.

Syntax: **CSIZS. : <Sequence>**

Sequence	Description
<any sequence>	Custom Size Sequence
<empty>	Factory default sequence

Note: You must select the USER printer driver before this parameter can be changed.

JOGS Jog Sequence IBM Printer Driver

150 152	530 532	630 632	550 650	560 660	570 670
					x

This sequence is sent to the printer to jog the output tray.

Syntax: **JOGS. : <Sequence>**

Sequence	Description
<any sequence>	Jog Sequence
<empty>	Generic Printer Driver factory default sequence
1B 26 6C 31 54	PCL4 Printer Driver factory default sequence
1B 26 6C 31 54	PCL5 Printer Driver factory default sequence
<empty>	IBM Proprinter Printer Driver factory default sequence
<empty>	Epson FX Printer Driver factory default sequence
<empty>	Epson LQ Printer Driver factory default sequence

Note: You must select the USER printer driver before this parameter can be changed.

SBSET Symbol Set IBM Printer Driver

150 152	530 532	630 632	550 650	560 660	570 670
					x

This parameter specifies the default symbol set. See also the symbol set entry in Font Definitions on the following pages.

Syntax: **SBSET. : <Symbol Set>**

Symbol Set	Description	
* **PC850**	Use the PC 850 symbol set (Default for Generic, PCL4 and PCL5 printer drivers)	(8-bit)
ROMAN8	Use the Roman 8 symbol set	(8-bit)
* **PC437**	Use the PC 437 symbol set (Default for IBM Proprinter, Epson FX and Epson FX printer drivers)	(8-bit)
ECMA94	Use the ECMA-94 symbol set	(8-bit)
USASCII	Use the US ASCII symbol set	(7-bit)

Example: Select Roman 8 symbol set

```
SBSET. : ROMAN8
```

Note: You must select the USER printer driver before this parameter can be changed.

FONT Font Definitions IBM Printer Driver

150 152	530 532	630 632	550 650	560 660	570 670
					x

This parameter modifies the font properties for a pre-defined font specified by the IBM FGID (Font Global Identifier) number, or specifies the properties for a new font.

The following characteristics may be defined for each FGID:

- Character Spacing Scale Factor (CSSF)
- Symbol Set (SS)
- Character Spacing (CS)
- Height (HT)
- Style (ST)
- Stroke Weight (SW)
- Typeface (TF)
- Additional control commands (STR), user specified

The font definitions supplied with the AXIS 570/670 are designed to make the printouts match an IBM printer as close as possible. Modifying the definitions may result in corrupted printouts, especially when replacing fixed-spaced fonts with proportional.

Always consult the font section of your printer manual before you modify the font definitions.

Syntax: **FONT. : <FGID> , <CSSF> , <SS> , <CS> , <PT> , <HT> , <ST> , <SW> , <TF> , <STR>**

Example:

```
FONT. : 18 , 98 , PC850 , FIXED , 102 , 0, ITALIC , LIGHT , 3
```

The font definition parameters are described on the following pages.

The complete font definition table is shown in Section 7, Fonts.

FGID (Font Global Identifier) number: This entry specifies the FGID number for the following font characteristics.

FGID	Description
0 - 65535	IBM FGID number (decimal value).
$0 - $FFFF	IBM FGID number (hexadecimal value).

Character Spacing Scale Factor (CSSF): This entry specifies the character spacing relative to the IBM original spacing. Select 100% to maintain the IBM original spacing. See also LDSF (Line Density Scale Factor), Page Format.

CSSF	Description
0 - 255	Character Spacing Scale Factor in percent

FONT Font Definitions (continued) Fonts

150 152	530 532	630 632	550 650	560 660	570 670
					x

Symbol Set (SS): This entry specifies symbol set to be used for the current FGID. If DEFAULT is selected, the symbol set is determined by the SBSET setting. See also SBSET (Symbol Set) and SECTION 5, page 78.

SS	Description	
DEFAULT	Use the default symbol set	
PC850	Use the PC 850 symbol set	(8-bit)
ROMAN8	Use the Roman 8 symbol set	(8-bit)
PC437	Use the PC 437 symbol set	(8-bit)
ECMA94	Use the ECMA-94 symbol set	(8-bit)
USASCII	Use the US ASCII symbol set	(7-bit)

Character Spacing (CS): Selects fixed or proportional character spacing. If NONE is selected, you must include a character spacing selection in the user specified string at the end of the FONT command.

CS	Description
NONE	No selection
FIXED	Use fixed character spacing
PROP	Use proportional character spacing

Pitch (PT): The number of characters per inch. Pitch only applies to fixed-spaced fonts, so select ‘0’ for proportional fonts.

PT	Description
0	No selection
1 - 65535	Pitch value in 10 × characters per inch

Height (HT): Character height or point size. This value is ignored for fixed-spaced fonts. If 0 is specified for a scalable font, the height is determined by the system setting (5250/Twinax page printer emulations only).

HT	Description
0	No selection
1 - 65535	Height in 10 × point size

Style (ST): The style entry specifies the width and structure of the characters. Upright and italic are the only pre-defined styles. If you want to use some other style, e.g. Outline or Shadowed, select NONE and add a style selection in the user specified string at the end of the FONT command.

ST	Description
NONE	No selection
UPRIGHT	Use upright style
ITALIC	Use italic style

FONT Font Definitions (continued) Fonts

150	530	630	550	560	570
152	532	632	650	660	670
					x

Stroke (SW): The Stroke Weight defines the thickness of the strokes that make up the characters. Light, Medium, and Bold are the only pre-defined stroke weights. If you want to use some other stroke, e.g. Semi Light or Extra Black, select NONE and add a stroke selection in the user specified string at the end of the FONT command.

SW	Description
NONE	No selection
LIGHT	Use light stroke
MEDIUM	Use medium stroke
BOLD	Use bold stroke

Typeface (TF): This entry specifies the typeface number for the current FGID. The typeface numbers can be found in your printer manual.

TF	Description
0 - 65535	Typeface number

String (STR): This string can be used for specifying additional font properties as ‘Outline’, ‘Extra Black’, etc. Please refer to your printer manual on the commands for font property settings used with your printer.

STR	Description
<any string>	Additional font property definitions

The different printer drivers selected using the PRDRIVER parameter have the following default font definitions:

PCL4, PCL5:

FGID	CSSF	SBSET	SPACING	PITCH	HEIGHT	STYLE	STROKE	TYPEFACE	STRING
11	98	DEFAULT	FIXED	100	0	UPRIGHT	MEDIUM	4099	
86	98	DEFAULT	FIXED	120	0	UPRIGHT	MEDIUM	4099	
204	98	DEFAULT	FIXED	167	0	UPRIGHT	MEDIUM	4102	
230	98	DEFAULT	FIXED	180	0	UPRIGHT	MEDIUM	4102	
244	98	DEFAULT	FIXED	100	0	UPRIGHT	MEDIUM	4099	
252	98	DEFAULT	FIXED	171	0	UPRIGHT	MEDIUM	4099	
281	98	DEFAULT	FIXED	233	0	UPRIGHT	MEDIUM	4102	
290	98	DEFAULT	FIXED	300	0	UPRIGHT	MEDIUM	4102	

IBM Proprinter:

FGID	CSSF	SBSET	SPACING	PITCH	HEIGHT	STYLE	STROKE	TYP.	STRING
11	100	DEFAULT	FIXED	100	0	UPRIGHT	MEDIUM	0	1B 57 30 12
86	100	DEFAULT	FIXED	120	0	UPRIGHT	MEDIUM	0	1B 57 30 12 1B 3A
204	100	DEFAULT	FIXED	150	0	UPRIGHT	MEDIUM	0	1B 57 30 12 0F
230	100	DEFAULT	FIXED	150	0	UPRIGHT	MEDIUM	0	1B 57 30 12 0F
244	100	DEFAULT	FIXED	50	0	UPRIGHT	MEDIUM	0	1B 57 31 12
252	100	DEFAULT	FIXED	167	0	UPRIGHT	MEDIUM	0	1B 57 30 12 0F
281	100	DEFAULT	FIXED	167	0	UPRIGHT	MEDIUM	0	1B 57 30 12 0F
290	100	DEFAULT	FIXED	167	0	UPRIGHT	MEDIUM	0	1B 57 30 12 0F

Epson FX:

FGID	CSSF	SBSET	SPACING	PITCH	HEIGHT	STYLE	STROKE	TYP.	STRING
11	100	DEFAULT	FIXED	100	0	UPRIGHT	MEDIUM	0	1B 20 00 12 1B 57 30 1B 50
86	100	DEFAULT	FIXED	120	0	UPRIGHT	MEDIUM	0	1B 20 00 12 1B 57 30 1B 4D
204	100	DEFAULT	FIXED	150	0	UPRIGHT	MEDIUM	0	1B 20 00 0F 1B 57 30 1B 50
230	100	DEFAULT	FIXED	150	0	UPRIGHT	MEDIUM	0	1B 20 00 0F 1B 57 30 1B 50
244	100	DEFAULT	FIXED	50	0	UPRIGHT	MEDIUM	0	1B 20 00 12 1B 57 31 1B 50
252	100	DEFAULT	FIXED	167	0	UPRIGHT	MEDIUM	0	1B 20 00 0F 1B 57 30 1B 50
281	100	DEFAULT	FIXED	167	0	UPRIGHT	MEDIUM	0	1B 20 00 0F 1B 57 30 1B 50
290	100	DEFAULT	FIXED	167	0	UPRIGHT	MEDIUM	0	1B 20 00 0F 1B 57 30 1B 50

Epson LQ:

FGID	CSSF	SBSET	SPACING	PITCH	HEIGHT	STYLE	STROKE	TYP.	STRING
11	100	DEFAULT	FIXED	100	0	UPRIGHT	MEDIUM	0	12 1B 57 30 1B 50
86	100	DEFAULT	FIXED	120	0	UPRIGHT	MEDIUM	0	12 1B 57 30 1B 4D
204	100	DEFAULT	FIXED	150	0	UPRIGHT	MEDIUM	0	12 1B 57 30 1B 67
230	100	DEFAULT	FIXED	150	0	UPRIGHT	MEDIUM	0	12 1B 57 30 1B 67
244	100	DEFAULT	FIXED	50	0	UPRIGHT	MEDIUM	0	12 1B 57 31 1B 50
252	100	DEFAULT	FIXED	167	0	UPRIGHT	MEDIUM	0	1B 57 30 1B 50 0F
281	100	DEFAULT	FIXED	167	0	UPRIGHT	MEDIUM	0	1B 57 30 1B 50 0F
290	100	DEFAULT	FIXED	167	0	UPRIGHT	MEDIUM	0	1B 57 30 1B 50 0F

SECTION 12

SOLVING PROBLEMS

This section contains guidelines to help you solve problems that may occur when installing or using your NPS print server. There are two major areas of difficulty:

- **Printer communication**
- **Network communication**

Use the check lists provided under each section to pinpoint the fault. If your problems continue, please contact your dealer or distributor - See “Reporting Problems” on page 235.

Before continuing with the communications trouble-shooting you should make sure that your Axis print server functions properly:

- The POWER indicator should be lit. Make sure that the power adaptor is properly connected and functional.
- One of the indicators (e.g. the NETWORK indicator on the AXIS 560/660 and 570/670).should flash during the power-up self test (this may last for 30 seconds). However, if the indicator continues to flash, an internal error has occurred - See “Error Messages” on page 236. Contact your dealer or distributor.
- The PACKET/NETWORK indicator should flash occasionally to signify the flow of network traffic. Make sure that the NPS print server is properly connected to the network.

  NPS 550 (early models): Make sure that the media type switch (10base2/10baseT) on the back panel is set in the correct position.

  Token Ring Models: Make sure that the RING SPEED switch (4/16 Mbit/s) is set in the correct position.

Printer Communication

Printer communication problems can result in either missing or corrupted printouts.

Missing Printouts

If you don’t get any printouts, you should start verifying the printer communication by printing the print server test page. Press the TEST button on the print server until the STATUS (PACKET/NETWORK) indicator starts to flash. If no printout appears, check the following:

- Make sure that the printer is properly connected and that an Axis cable or a high quality cable is used (AWG#28 with connector equivalent to AMP type, level 2 and gold plated).
- Make sure that the printer is on-line (ready).

For PostScript printers:

- Sending ASCII data to a PostScript printer may result in lost print jobs. You can use the ASCII-to-PostScript filter to convert the format of your print data - See “ASCII to PostScript Conversion” on page 112. Check that the test page prints correctly on both ASCII and PostScript printers.

For parallel printers:

- The Centronics Interface Timing (NetPilot Printer Port Property Page, or if you wish to edit the *config* file directly: L1_CENTR and L2_CENTR parameters) may be set to a value not supported by your printer. Change to a slower mode and restart the print server, then print the test page again.

For serial printers:

- Make sure that the parameters for baud rate, stop bits, parity, word length and handshake protocol match with your printer configuration.

If the test page prints correctly and you still don’t get any network printouts, continue trouble-shooting with *Network Communication* below.

Corrupted Printouts

There are four major types of corrupted printouts:

- **PostScript data is printed:** You cannot print PostScript jobs on an ASCII printer using the Axis print server. Make your host application print in ASCII format, or get a PostScript printer.
- **Characters are missing or garbled:** The Centronics Interface Timing may be set to a value not supported by your printer. In these circumstances, the interface timing parameter will probably need to be set to a slower mode of operation. This may be performed either directly editing the L1_CENTR and L2_CENTR parameters in the *config* file, or by changing the value from within the NetPilot Printer Port property page.
- **‘Staircase’ printouts:** (the second line starts at the end of the first line rather than at the left margin) A UNIX New Line is interpreted as a Line Feed by ASCII printers. You can substitute UNIX New Lines with ASCII New Lines as described in Example 1 on page 111 (this is default for logical printers PR5 - PR8).
- **Language specific characters are printed incorrectly:** This happens when host uses a different character set than your printer. You can cure this by using a character set conversion filter as described on page 108. For SNA printing using the AXIS 570/670, most likely an incorrect System Language has been selected. Select the System Language matching your system configuration. If accents are missing you may be using a Symbol Set that does not support accented characters, such as US ASCII. Change the Symbol Set to PC-850 or some other 8-bit symbol set.

Network Communication

The appropriate trouble shooting procedure for any given communication failure, is dependent upon the type of network environment in which the failure occurred.

NetWare

If NetWare printing fails, check the following:

- Make sure that the print server and the print queue are defined on the file server, that they are linked together, and that the print server is attached to the file server. Use PCONSOLE or NetWare Administrator to verify this. Refer to the NetWare section of your User's Manual for details.
- Use AXIS NetPilot to make sure that the print server parameters concerning NetWare have the correct settings.
- If you have more than one printer connected to the Axis print server, make sure that the printer queue names end with LPT1, LPT2, COM1. If you are using logical printers, that they end with !1, !2, etc. (Only valid for the NPS series, i.e. NPS 530/630 and NPS 550/650).
- If your network contains sections using different frame types, you might have to disable the support for one or more of these types. See the frame type parameters on page 167.

Windows, LAN Server/ LAN Manager

If LAN Server/LAN Manager printing fails, check the following:

- Make sure that there is communication between the Axis print server and the Axis Print Utility. NetBIOS must be activated, and the Requester service must be running.
- Make sure that the Axis print server ports appear in the Axis Print Utility list. Use the Axis Print Utility *Install* option to install the Axis print server.
- Make sure that Axis print server parameters concerning LAN Server/LAN Manager have the correct settings.
- Check the Axis Print Utility *Logfile*.

TCP/IP

If TCP/IP printing fails, start by verifying the communication using either the **ping <unit>** or **telnet <unit>** command, where <*unit*> is the Axis print server Internet address or the alias specified in your host table. If you don't get a positive response from *ping*, or if the *Telnet* login fails, check the following:

- Make sure that you have specified a unique NPS print server Internet address. See the TCP/IP section of your User's Manual and *Network Printing*, page 45, or consult your network manager.
- If you are using an alias instead of the Internet address, make sure that your host table (*/etc/hosts*) and Yellow Pages (YP/NIS) are updated.
- If your network has routers, make sure that the NPS print server is attached to the correct network segment, and that the *Default Router Address* and *Net Mask* parameters are set to proper values.

When communication is established, and printing in integrated mode still doesn't work, the next thing to do is try interactive printing using FTP. Log in to the Axis print server using FTP, and print a file by the **put <file> pr1** command. If this works, the print server might not be properly integrated to the spooler. Verify the integration for your selected print method, see the *Network Printing: TCP/IP* section, page 45 and onward.

Apple EtherTalk

Because of the simple and straight-forward installation in the Apple EtherTalk environment, it is less likely that printing problems occur on the protocol level. There are however some application related areas that can cause problems:

- Enabling binary transfer mode (BINARY parameter) can cause problems in the following cases:
  - Your printer does not support binary mode.
  - Some non-Apple laser printers don't recognize the binary mode query from LaserWriter 8.
- Selecting a specific printer type in your application may cause problems since the Axis print server isn't aware of your printer's capabilities. Change to *Generic Printer* in your application to work around this (this applies to printing in spooler mode only). *See "Apple EtherTalk" on page 76.*

Finally, if you are printing in feedback mode (i.e. using the COM1 port to read back printer information) using a parallel port for print data, make sure to disable the XON/XOFF handshaking. An XON character may cause the printer to switch to serial communication, which has the effect that the printer cannot receive data on the parallel port.

Support available on the WWW

More information can be found under the Support section of the Axis WWW Home Page at **http://www.axis.se/** or **http://www.axisinc.com/**. Both FAQ (Frequently Asked Questions) and forms to fill-out when reporting problems are available. All information and support is free of charge.

Reporting Problems

If you run into problems that you can't solve on your own, it is important that you report the problem to your dealer and distributor. This report should include:

- The model and software revision of your Axis print server
- The type of network attachment you are using
- The operating environment (NetWare, LAN Server/LAN Manager, TCP/IP or Apple EtherTalk)
- A printout of the parameter list (the *config* file)
- A detailed description of the problem
- A description of your network topology (preferably a diagram) including all relevant components such as network segments, routers, bridges, etc.

Additional information for NetWare (when applicable):

- The PCONSOLE version
- The NetWare version
- The AXIS NetPilot version
- The print method (CAPTURE, NPRINT) including all parameters

Additional information for LAN Server/LAN Manager (when applicable):

- The OS/2 version
- The LAN Server/LAN Manager version
- The printer driver and print method
- A printout from the AXIS Print Utility log file (NPSMAN.LOG)

Additional information for TCP/IP (when applicable):

- The host type/types, operating systems, and applications
- The print method (LPD, FTP, PROS, Reverse Telnet, etc.)

Additional information for Apple EtherTalk (when applicable):

- The printer driver type and version
- The print method (spooler mode, printer mode)
- The applications you are trying to print from

Additional information for SNA (when applicable):

- A printout with a description of the errors
- A correct printout (whenever possible)

You may also report problems and get on-line support from the support department at Axis Communications, Sweden. See "Axis on-line service" on page 280.

Error Messages

If the STATUS (PACKET/NETWORK) indicator continues to flash after the power-up self test, an internal error has occurred (with one exception, see below). If you have an NPS 550 or 650, the PACKET/NETWORK and PRINTER indicators show the type of error:

The STATUS indicator flashes, whilst the PACKET/NETWORK indicator is OFF and the PRINTER indicator is ON. This means that a parameter list mismatch has occurred. This is normal when you have upgraded the NPS 550 or 650 software, and doesn't necessarily indicate an error condition.

- Restart the NPS print server. If the message doesn't appear again, the parameter list has been updated according to the default settings of your new software revision.
- If message appears again after restarting, an error has occurred. Contact your dealer or distributor.

If any other error message is displayed (i.e. any PACKET/PRINTER indicator combination other than OFF/ON), contact your dealer or distributor.

NPS 630/632: If the NETWORK indicator continues to flash rapidly after the self test, an incorrect ring speed setting has been detected. Change the RING SPEED switch position and restart the print server.

NPS 650: If the STATUS remains on and the NETWORK indicator continues to flash rapidly after the self test, an incorrect ring speed setting has been detected. Change the RING SPEED switch position and restart the print server.

Printed Messages

Error messages will also be printed on the test page. See *INTERNAL PRINTOUTS* (page 262) on how to print the test page and a list of possible error messages.

APPENDIX A

CHARACTER TABLES

This appendix applies only to the AXIS 570/670. The following character tables are listed:

Notes:

1. The AXIS 570/670 supports a number of seldom used Code Pages not shown here. Please refer to the appropriate IBM documentation for further information.
2. The numbers printed below each character in the tables are the IBM reference number for the character.

Code Page 37

US English
Canadian Bilingual

Hex Digits 1st → 2nd ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	SP010000	& SM030000	- SP100000	ø LO610000	Ø LO620000	° SM190000	µ SM170000	^ SD150000	{ SM110000	} SM140000	\ SM070000	0 ND100000
-1	SP300000	é LE110000	/ SP120000	É LE120000	a LA010000	j LJ010000	~ SD190000	£ SC020000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ä LA170000	ë LE170000	Ä LA180000	Ë LE180000	c LC010000	l LL010000	t LT010000	· SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	à LA130000	è LE130000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e SE010000	n LN010000	v LV010000	§ SM240000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	å LA270000	ï LI170000	Å LA280000	Ï LL120000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X GN010000	7 ND070000
-8	ç LC410000	ì LI130000	Ç LC420000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	` SD130000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	¢ SC040000	! SP020000	¦ SM650000	: SP130000	« SP170000	ª SM210000	¡ SP030000	[SM060000	- SP320000	1 ND011000	2 ND021000	3 ND031000
-B	. SP110000	$ SC030000	, SP080000	# SM010000	» SP180000	º SM200000	¿ SP160000	] SM080000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	@ SM050000	ð LD630000	æ LA510000	Ð LD620000	¯ SM150000	ö LO170000	ü LU170000	Ö LO180000	Ü LU180000
-D	(SP060000	) SP070000	_ SP090000	' SP050000	ý LY110000	¸ SD410000	Ý LY120000	¨ SD170000	ò LO130000	ù LU130000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ LT630000	Æ LA520000	Þ LT640000	´ SD110000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	| SM130000	¬ SM660000	? SP150000	" SP040000	± SA020000	¤ SC010000	® SM630000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	- SP100000

This is the default code page for both 3270/Coax and 5250/Twinax mode.

The shaded areas contain language dependant characters that have different positions for different code pages. Characters in non-shaded areas have the positions for all code pages.

Code Page 256

New Spanish Word Processing International Set 1

Hex Digits 1st → 2nd ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	SP010000	& SM030000	- SP100000	ø LO610000	Ø LO620000	° SM190000	µ SM170000	¢ SC040000	{ SM110000	} SM140000	\ SM070000	0 ND100000
-1	SP300000	é LE110000	/ SP120000	É LE120000	a LA010000	j LJ010000	~ SD190000	£ SC020000	A LA020000	J LJ020000	SP310000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ä LA170000	ë LE170000	Ä LA180000	Ë LE180000	c LC010000	l LL010000	t LT010000	Pts SC060000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	à LA130000	è LE130000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	*f* SC070000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e SE010000	n LN010000	v LV010000	§ SM240000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	å LA270000	ï LI170000	Å LA280000	Ï LL120000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X GN010000	7 ND070000
-8	ç LC410000	ì LI130000	Ç LC420000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	` SD130000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	[SM060000	] SM080000	¦ SM650000	: SP130000	« SP170000	ª SM210000	¡ SP030000	¬ SM660000	- SP320000	1 ND011000	2 ND021000	3 ND031000
-B	. SP110000	$ SC030000	, SP080000	# SM010000	» SP180000	º SM200000	¿ SP160000	| SM130000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	@ SM050000	ð LD630000	æ LA510000	Ð LD620000	¯ SM150000	ö LO170000	ü LU170000	Ö LO180000	Ü LU180000
-D	(SP060000	) SP070000	_ SP090000	' SP050000	ý LY110000	¸ SD410000	Ý LY120000	¨ SD170000	ò LO130000	ù LU130000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ LT630000	Æ LA520000	Þ LT640000	´ SD110000	ó LO110000	ú LU110000	Ó LO120000	Ú LU12000
-F	! SP020000	^ SD150000	? SP150000	" SP040000	± SA020000	¤ SC010000	® SM630000	¯ SM100000	õ LO190000	ÿ LY170000	Õ LO200000	- SP100000

This code page is only available in 5250/Twinax mode.

The shaded areas contain language dependant characters. Their positions differ from the default code page (037 US English).

Code Page 260 — Canadian French

Hex Digits 1st → 2nd ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	SP010000	& SM030000	- SP100000	ø LO610000	Ø LO620000	° SM190000	µ SM170000	¢ SC040000	é LE110000	è LE130000	¸ SD410000	0 ND100000
-1	SP300000	é LE110000	/ SP120000	É LE120000	a LA010000	j LJ010000	¨ SD170000	£ SC020000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ä LA170000	ë LE170000	Ä LA180000	Ë LE180000	c LC010000	l LL010000	t LT010000	· SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	à LA130000	è LE130000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e SE010000	n LN010000	v LV010000	§ SM240000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	å LA270000	ï LI170000	Å LA280000	Ï LL120000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X GN010000	7 ND070000
-8	ç LC410000	ì LI130000	Ç LC420000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	` SD130000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	à LA130000	´ SD110000	ù SU130000	: SP130000	« SP170000	ª SM210000	¡ SP030000	¬ SM360000	- SP320000	1 ND011000	2 ND021000	3 ND031000
-B	. SP110000	$ SC030000	, SP080000	# SM010000	» SP180000	º SM200000	¿ SP160000	| SM130000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	@ SM050000	ð LD630000	æ LA510000	Ð LD620000	¯ SM150000	ö LO170000	ü LU170000	Ö LO180000	Ü LU180000
-D	(SP060000	) SP070000	_ SP090000	' SP050000	ý LY110000	¸ SD410000	Ý LY120000	¨ SD170000	ò LO130000	ù LU130000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ LT630000	Æ LA520000	Þ LT640000	´ SD110000	ó LO110000	ú LU110000	Ó LO120000	Ú LU12000
-F	! SP020000	^ SD150000	? SP150000	" SP040000	± SA020000	¤ SC010000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	- SP100000

This code page is only available in 3270/Coax mode.

The shaded areas contain language dependant characters. Their positions differ from the default code page (037 US English).

Code Page 273 Austrian/German

Hex Digits 1st → 2nd ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	SP010000	& SM030000	- SP100000	ø LO610000	Ø LO620000	° SM190000	µ SM170000	¢ SC040000	ä LA170000	ü LU170000	Ö LO180000	0 ND100000
-1	SP300000	é LE110000	/ SP120000	É LE120000	a LA010000	j LJ010000	ß LS610000	n SC020000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	{ SM110000	ë LE170000	[SM060000	Ë LE180000	c LC010000	l LL010000	t LT010000	· SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	à LA130000	è LE130000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e SE010000	n LN010000	v LV010000	@ SM050000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	å LA270000	ï LI170000	Å LA280000	Ï LL120000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X GN010000	7 ND070000
-8	ç LC410000	ì LI130000	Ç LC420000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ñ LN190000	~ SD190000	Ñ LN200000	` SD130000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	Ä LA180000	Ü LU180000	ö LO170000	: SP130000	« SP170000	ª SM210000	¡ SP030000	¬ SM660000	- SP320000	1 ND011000	2 ND021000	3 ND031000
-B	. SP110000	$ SC030000	, SP080000	# SM010000	» SP180000	º SM200000	¿ SP160000	| SM130000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	§ SM240000	ð LD630000	æ LA510000	Ð LD620000	¯ SM150000	¦ MS650000	} SM140000	\ SM070000	] SM080000
-D	(SP060000	) SP070000	_ SP090000	' SP050000	ý LY110000	¸ SD410000	Ý LY120000	¨ SD170000	ò LO130000	ù LU130000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ LT630000	Æ LA520000	Þ LT640000	´ SD110000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	! SP020000	^ SD150000	? SP150000	" SP040000	± SA020000	¤ SC010000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	- SP100000

The shaded areas contain language dependant characters. Their positions differ from the default code page (037 US English).

Code Page 274 Belgian

Hex Digits 1st → 2nd ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	SP010000	& SM030000	- SP100000	ø LO610000	Ø LO620000	° SM190000	µ SM170000	¢ SC040000	é LE110000	è LE130000	ç LC410000	0 ND100000
-1	SP300000	{ SM110000	/ SP120000	É LE120000	a LA010000	j LJ010000	¨ SD170000	£ SC020000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ä LA170000	ë LE170000	Ä LA180000	Ë LE180000	c LC010000	l LL010000	t LT010000	· SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	@ SM050000	} SM140000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e LE010000	n LN010000	v LV010000	§ SM240000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	å LA270000	ï LI170000	Å LA280000	Ï LL120000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X GN010000	7 ND070000
-8	\ SM070000	ì LI130000	Ç LC420000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	` SD130000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	[SM060000	] SM080000	ù LU130000	: SP130000	« SP170000	ª SM210000	¡ SP030000	¬ SM660000	- SP320000	1 ND011000	2 ND021000	3 ND031000
-B	. SP110000	$ SC030000	, SP080000	# SM010000	» SP180000	º SM200000	¿ SP160000	| SM130000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	à LA130000	ð LD630000	æ LA510000	Ð LD620000	¯ SM150000	ö LO170000	ü LU170000	Ö LO180000	Ü LU180000
-D	(SP060000	) SP070000	_ SP090000	' SP050000	ý LY110000	¸ SD410000	Ý LY120000	~ SD190000	ò LO130000	¦ SM650000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ LT630000	Æ LA520000	Þ LT640000	´ SD110000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	! SP020000	^ SD150000	? SP150000	" SP040000	± SA020000	¤ SC010000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	- SP100000

The shaded areas contain language dependant characters. Their positions differ from the default code page (037 US English)

Code Page 275 Brazilian

Hex Digits 1st → 2nd ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	SP010000	& SM030000	- SP100000	ø LO610000	Ø LO620000	° SM190000	µ SM170000	¢ SC040000	õ LO190000	é LE110000	\ SM070000	0 ND100000
-1	SP300000	} SM140000	/ SP120000	[SM060000	a LA010000	j LJ010000	~ SD190000	£ SC020000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ä LA170000	ë LE170000	Ä LA180000	Ë LE180000	c LC010000	l LL010000	t LT010000	· SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	à LA130000	è LE130000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e SE010000	n LN010000	v LV010000	§ SM240000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	` SD130000	î LI150000	@ SM050000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	å LA270000	ï LI170000	Å LA280000	Ï LL120000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X GN010000	7 ND070000
-8	¦ SM650000	ì LI130000	] SM080000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	ã LA190000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	É LE120000	$ SC030000	ç LC410000	: SP130000	« SP170000	ª SM210000	¡ SP030000	¬ SM660000	- SP320000	1 ND011000	2 ND021000	3 ND031000
-B	. SP110000	Ç LC420000	, SP080000	Õ LO200000	» SP180000	º SM200000	¿ SP160000	| SM130000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	Ã LA200000	ð LD630000	æ LA510000	Ð LD620000	¯ SM150000	ö LO170000	ü LU170000	Ö LO180000	Ü LU180000
-D	(SP060000	) SP070000	_ SP090000	' SP050000	ý LY110000	¸ SD410000	Ý LY120000	¨ SD170000	ò LO130000	ù LU130000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ LT630000	Æ LA520000	Þ LT640000	´ SD110000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	! SP020000	^ SD150000	? SP150000	" SP040000	± SA020000	¤ SC010000	® SM630000	× SA070000	{ SM110000	ÿ LY170000	# SM010000	- SP100000

The shaded areas contain language dependant characters. Their positions differ from the default code page (037 US English).

Code Page 277 — Danish/Norwegian

Hex Digits 1st → 2nd ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	SP010000	& SM030000	- SP100000	¦ SM650000	@ SM050000	° SM190000	µ SM170000	¢ SC040000	æ LA510000	å LA270000	\ SM070000	0 ND100000
-1	SP300000	é LE110000	/ SP120000	É LE120000	a LA010000	j LJ010000	ü LU170000	£ SC020000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ä LA170000	ë LE170000	Ä LA180000	Ë LE180000	c LC010000	l LL010000	t LT010000	· SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	à LA130000	è LE130000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM620000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e SE010000	n LN010000	v LV010000	§ SM240000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	} SM140000	ï LI170000	$ SC030000	Ï LL120000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X GN010000	7 ND070000
-8	ç LC410000	ì LI130000	Ç LC420000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	` SD130000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	# SM010000	¤ SC010000	ø LO610000	: SP130000	« SP170000	ª SM210000	¡ SP030000	¬ SM660000	- SP320000	1 ND011000	2 ND021000	3 ND031000
-B	. SP110000	Å LA280000	, SP080000	Æ LA520000	» SP180000	º SM200000	¿ SP160000	| SM130000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	Ø LO620000	ð LD630000	{ SM110000	Ð LD620000	¯ SM150000	ö LO170000	~ SD190000	Ö LO180000	Ü LU180000
-D	(SP060000	) SP070000	_ SP090000	' SP050000	ý LY110000	¸ SD410000	Ý LY120000	¨ SD170000	ò LO130000	ù LU130000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ LT630000	[SM060000	Þ LT640000	´ SD110000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	! SP020000	^ SD150000	? SP150000	" SP040000	± SA020000	] SM080000	® SM630000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	- SP100000

The shaded areas contain language dependant characters. Their positions differ from the default code page (037 US English).

Code Page 278 — Swedish/Finnish

Hex Digits 1st → 2nd ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	SP010000	& SM030000	- SP100000	ø LO610000	Ø LO620000	° SM190000	µ SM170000	¢ SC040000	ä LA170000	å LA270000	É LE120000	0 ND100000
-1	SP300000	` SD130000	/ SP120000	\ SM070000	a LA010000	j LJ010000	ü LU170000	£ SC020000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	{ SM110000	ë LE170000	# SM010000	Ë LE180000	c LC010000	l LL010000	t LT010000	· SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	à LA130000	è LE130000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e SE010000	n LN010000	v LV010000	[SM060000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	} SM140000	ï LI170000	$ SC030000	Ï LL120000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X GN010000	7 ND070000
-8	ç LC410000	ì LI130000	Ç LC420000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	é LE110000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	§ SM240000	¤ SC010000	ö LO170000	: SP130000	« SP170000	ª SM210000	¡ SP030000	¬ SM660000	- SP320000	1 ND011000	2 ND021000	3 ND031000
-B	. SP110000	Å LA280000	, SP080000	Ä LA180000	» SP180000	º SM200000	¿ SP160000	| SM130000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	Ö LO180000	ð LD630000	æ LA510000	Ð LD620000	¯ SM150000	¦ SM650000	~ SD190000	@ SM050000	Ü LU180000
-D	(SP060000	) SP070000	_ SP090000	' SP050000	ý LY110000	¸ SD410000	Ý LY120000	¨ SD170000	ò LO130000	ù LU130000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ LT630000	Æ LA520000	Þ LT640000	´ SD110000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	! SP020000	^ SD150000	? SP150000	" SP040000	± SA020000	] SM080000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	- SP100000

The shaded areas contain language dependant characters. Their positions differ from the default code page (037 US English).

Code Page 280 — Italian

Hex Digits 1st → 2nd ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	SP010000	& SM030000	- SP100000	ø LO610000	Ø LO620000	[SM060000	µ SM170000	¢ SC040000	à LA130000	è LE130000	ç LC410000	0 ND100000
-1	SP300000	] SM080000	/ SP120000	É LE120000	a LA010000	j LJ010000	ì LI130000	# SM010000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ä LA170000	ë LE170000	Ä LA180000	Ë LE180000	c LC010000	l LL010000	t LT010000	· SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	{ SM110000	} SM140000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e SE010000	n LN010000	v LV010000	@ SM050000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	å LA270000	ï LI170000	Å LA280000	Ï LL120000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X GN010000	7 ND070000
-8	\ SM070000	~ SD190000	Ç LC420000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	ù LU130000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	° SM190000	é LE110000	ò LO130000	: SP130000	« SP170000	ª SM210000	¡ SP030000	¬ SM560000	- SP320000	1 ND011000	2 ND021000	3 ND031000
-B	. SP110000	$ SC030000	, SP080000	£ SC020000	» SP180000	º SM200000	¿ SP160000	| SM130000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	§ SM240000	ð LD630000	æ LA510000	Ð LD620000	¯ SM150000	ö LO170000	ü LU170000	Ö LO180000	Ü LU180000
-D	(SP060000	) SP070000	_ SP090000	' SP050000	ý LY110000	¸ SD410000	Ý LY120000	¨ SD170000	¦ SM550000	` SD130000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ LT630000	Æ LA520000	Þ LT640000	´ SD110000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	! SP020000	^ SD150000	? SP150000	" SP040000	± SA020000	¤ SC010000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	- SP100000

The shaded areas contain language dependant characters. Their positions differ from the default code page (037 US English).

Code Page 281 Japanese English

Hex Digits 1st → 2nd ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	SP010000	& SM030000	- SP100000	ø LO610000	Ø LO620000	° SM190000	µ SM170000	¢ SC040000	{ SM110000	} SM140000	$ SC030000	0 ND100000
-1	SP300000	é LE110000	/ SP120000	É LE120000	a LA010000	j LJ010000	¯ SM150000	[SM060000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	\ SM070000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ä LA170000	ë LE170000	Ä LA180000	Ë LE180000	c LC010000	l LL010000	t LT010000	· SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	à LA130000	è LE130000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e SE010000	n LN010000	v LV010000	§ SM240000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	å LA270000	ï LI170000	Å LA280000	Ï LL120000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X GN010000	7 ND070000
-8	ç LC410000	ì LI130000	Ç LC420000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	` SD130000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	£ SC020000	! SP020000	¦ SM650000	: SP130000	« SP170000	ª SM210000	¡ SP030000	^ SD150000	- SP320000	1 ND011000	2 ND021000	3 ND031000
-B	. SP110000	¥ SC050000	, SP080000	# SM010000	» SP180000	º SM200000	¿ SP160000	] SM080000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	@ SM050000	ð LD630000	æ LA510000	Ð LD620000	~ SD190000	ö LO170000	ü LU170000	Ö LO180000	Ü LU180000
-D	(SP060000	) SP070000	_ SP090000	' SP050000	ý LY110000	¸ SD410000	Ý LY120000	¨ SD170000	ò LO130000	ù LU130000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ LT630000	Æ LA520000	Þ LT640000	´ SD110000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	| SM130000	¬ SM660000	? SP150000	" SP040000	± SA020000	¤ SC010000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	- SP100000

The shaded areas contain language dependant characters. Their positions differ from the default code page (037 US English).

Code Page 282 — Portuguese

Hex Digits 1st → 2nd ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	SP010000	& SM030000	- SP100000	ø LO610000	Ø LO620000	° SM190000	µ SM170000	¢ SC040000	ã LA190000	´ SD110000	Ç LC420000	0 ND100000
-1	SP300000	é LE110000	/ SP120000	É LE120000	a LA010000	j LJ010000	ç LC410000	£ SC020000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ä LA170000	ë LE170000	Ä LA180000	Ë LE180000	c LC010000	l LL010000	t LT010000	· SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	à LA130000	è LE130000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e LE010000	n LN010000	v LV010000	§ SM240000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	{ SM110000	î LI150000	# SM010000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	å LA270000	ï LI170000	Å LA280000	Ï LL120000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X GN010000	7 ND070000
-8	~ SD190000	ì LI130000	\ SM070000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	` SD130000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	[SM060000	] SM080000	õ LO190000	: SP130000	« SP170000	ª SM210000	¡ SP030000	¬ SM360000	- SP320000	1 ND011000	2 ND021000	3 ND031000
-B	. SP110000	$ SC030000	, SP080000	Ã LA200000	» SP180000	º SM200000	¿ SP160000	| SM130000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	Õ LO200000	ð LD630000	æ LA510000	Ð LD620000	¯ SM150000	ö LO170000	ü LU170000	Ö LO180000	Ü LU180000
-D	(SP060000	) SP070000	_ SP090000	' SP050000	ý LY110000	¸ SD410000	Ý LY120000	¨ SD170000	ò LO130000	ù LU130000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ LT630000	Æ LA520000	Þ LT640000	} SM140000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	! SP020000	^ SD150000	? SP150000	" SP040000	± SA020000	¤ SC010000	® SM530000	× SA070000	¦ SM650000	ÿ LY170000	@ SM050000	- SP100000

The shaded areas contain language dependant characters. Their positions differ from the default code page (037 US English).

Code Page 284

Spanish
Spanish Speaking

Hex Digits 1st → 2nd ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	SP010000	& SM030000	- SP100000	ø LO610000	Ø LO620000	° SM190000	µ SM170000	¢ SC040000	{ SM110000	} SM140000	\ SM070000	0 ND100000
-1	SP300000	é LE110000	/ SP120000	É LE120000	a LA010000	j LJ010000	¨ SD170000	£ SC020000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ä LA170000	ë LE170000	Ä LA180000	Ë LE180000	c LC010000	l LL010000	t LT010000	· SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	à LA130000	è LE130000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e SE010000	n LN010000	v LV010000	§ SM240000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	å LA270000	ï LI170000	Å LA280000	Ï LL120000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X GN010000	7 ND070000
-8	ç LC410000	ì LI130000	Ç LC420000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	¦ SM650000	ß LS610000	# SM010000	` SD130000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	[SM060000	] SM080000	ñ LN190000	: SP130000	« SP170000	ª SM210000	¡ SP030000	^ SD150000	- SP320000	1 ND011000	2 ND021000	3 ND031000
-B	. SP110000	$ SC030000	, SP080000	Ñ LN200000	» SP180000	º SM200000	¿ SP160000	! SP020000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	@ SM050000	ð LD630000	æ LA510000	Ð LD620000	¯ SM150000	ö LO170000	ü LU170000	Ö LO180000	Ü LU180000
-D	(SP060000	) SP070000	_ SP090000	' SP050000	ý LY110000	¸ SD410000	Ý LY120000	~ SD190000	ò LO130000	ù LU130000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ LT630000	Æ LA520000	Þ LT640000	´ SD110000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	| SM130000	¬ SM660000	? SP150000	" SP040000	± SA020000	¤ SC010000	® SM630000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	- SP100000

The shaded areas contain language dependant characters. Their positions differ from the default code page (037 US English).

Code Page 285 — UK English

Hex Digits 1st → 2nd ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	SP010000	& SM030000	- SP100000	ø LO610000	Ø LO620000	° SM190000	µ SM170000	¢ SC040000	{ SM110000	} SM140000	\ SM070000	0 ND100000
-1	SP300000	é LE110000	/ SP120000	É LE120000	a LA010000	j LJ010000	¯ SM150000	[SM060000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ä LA170000	ë LE170000	Ä LA180000	Ë LE180000	c LC010000	l LL010000	t LT010000	· SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	à LA130000	è LE130000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e LE010000	n LN010000	v LV010000	§ SM240000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	å LA270000	ï LI170000	Å LA280000	Ï LL120000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X GN010000	7 ND070000
-8	ç LC410000	ì LI130000	Ç LC420000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	` SD130000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	$ SC030000	! SP020000	¦ SM650000	: SP130000	« SP170000	ª SM210000	¡ SP030000	^ SD150000	- SP320000	1 ND011000	2 ND021000	3 ND031000
-B	. SP110000	£ SC020000	, SP080000	# SM010000	» SP180000	º SM200000	¿ SP160000	] SM080000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	@ SM050000	ð LD630000	æ LA510000	Ð LD620000	~ SD190000	ö LO170000	ü LU170000	Ö LO180000	Ü LU180000
-D	(SP060000	) SP070000	_ SP090000	' SP050000	ý LY110000	¸ SD410000	Ý LY120000	¨ SD170000	ò LO130000	ù LU130000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ LT630000	Æ LA520000	Þ LT640000	´ SD110000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	| SM130000	¬ SM660000	? SP150000	" SP040000	± SA020000	¤ SC010000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	- SP100000

The shaded areas contain language dependant characters. Their positions differ from the default code page (037 US English).

Code Page 297 — French

Hex Digits 1st → 2nd ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	SP010000	& SM030000	- SP100000	ø LO610000	Ø LO620000	[SM060000	` SD130000	¢ SC040000	é LE110000	è LE130000	ç LC410000	0 ND100000
-1	SP300000	{ SM110000	/ SP120000	É LE120000	a LA010000	j LJ010000	¨ SD170000	# SM010000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ä LA170000	ë LE170000	Ä LA180000	Ë LE180000	c LC010000	l LL010000	t LT010000	· SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	@ SM050000	} SM140000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e LE010000	n LN010000	v LV010000	] SM080000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	å LA270000	ï LI170000	Å LA280000	Ï LL120000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X GN010000	7 ND070000
-8	\ SM070000	ì LI130000	Ç LC420000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	µ SM170000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	° SM190000	§ SM240000	ù LU130000	: SP130000	« SP170000	ª SM210000	¡ SP030000	¬ SM660000	- SP320000	1 ND011000	2 ND021000	3 ND031000
-B	. SP110000	$ SC030000	, SP080000	£ SC020000	» SP180000	º SM200000	¿ SP160000	| SM130000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	à LA130000	ð LD630000	æ LA510000	Ð LD620000	¯ SM150000	ö LO170000	ü LU170000	Ö LO180000	Ü LU180000
-D	(SP060000	) SP070000	_ SP090000	' SP050000	ý LY110000	¸ SD410000	Ý LY120000	~ SD190000	ò LO130000	¦ SM650000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ LT630000	Æ LA520000	Þ LT640000	´ SD110000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	! SP020000	^ SD150000	? SP150000	" SP040000	± SA020000	¤ SC010000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	- SP100000

The shaded areas contain language dependant characters. Their positions differ from the default code page (037 US English).

Code Page 500

International Set 5, New Swiss French, and Belgian

Hex Digits 1st → 2nd ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	SP010000	& SM030000	- SP100000	ø LO610000	Ø LO620000	° SM190000	µ SM170000	¢ SC040000	{ SM110000	} SM140000	\ SM070000	0 ND100000
-1	SP300000	é LE110000	/ SP120000	É LE120000	a LA010000	j LJ010000	~ SD190000	£ SC020000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ä LA170000	ë LE170000	Ä LA180000	Ë LE180000	c LC010000	l LL010000	t LT010000	· SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	à LA130000	è LE130000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e SE010000	n LN010000	v LV010000	§ SM240000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	å LA270000	ï LI170000	Å LA280000	Ï LL120000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X GN010000	7 ND070000
-8	ç LC410000	ì LI130000	Ç LC420000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	` SD130000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	[SM060000	] SM080000	¦ SM650000	: SP130000	« SP170000	ª SM210000	¡ SP030000	¬ SM660000	- SP320000	1 ND011000	2 ND021000	3 ND031000
-B	. SP110000	$ SC030000	, SP080000	# SM010000	» SP180000	º SM200000	¿ SP160000	| SM130000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	@ SM050000	ð LD630000	æ LA510000	Ð LD620000	¯ SM150000	ö LO170000	ü LU170000	Ö LO180000	Ü LU180000
-D	(SP060000	) SP070000	_ SP090000	' SP050000	ý LY110000	¸ SD410000	Ý LY120000	¨ SD170000	ò LO130000	ù LU130000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ LT630000	Æ LA520000	Þ LT640000	´ SD110000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	! SP020000	^ SD150000	? SP150000	" SP040000	± SA020000	¤ SC010000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	- SP100000

The shaded areas contain language dependant characters. Their positions differ from the default code page (037 US English)

Code Page 871 Icelandic

Hex Digits 1st → 2nd ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	SP010000	& SM030000	- SP100000	ø LO610000	Ø LO620000	° SM190000	µ SM170000	¢ SC040000	þ LT630000	æ LA510000	´ SD110000	0 ND100000
-1	SP300000	é LE110000	/ SP120000	É LE120000	a LA010000	j LJ010000	ö LO170000	£ SC020000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	ä LA170000	ë LE170000	Ä LA180000	Ë LE180000	c LC010000	l LL010000	t LT010000	· SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	à LA130000	è LE130000	À LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e SE010000	n LN010000	v LV010000	§ SM240000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	å LA270000	ï LI170000	Å LA280000	Ï LL120000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X GN010000	7 ND070000
-8	ç LC410000	ì LI130000	Ç LC420000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ñ LN190000	ß LS610000	Ñ LN200000	ð LD630000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	Þ LT640000	Æ LA520000	¦ SM650000	: SP130000	« SP170000	ª SM210000	¡ SP030000	¬ SM660000	- SP320000	1 ND011000	2 ND021000	3 ND031000
-B	. SP110000	$ SC030000	, SP080000	# SM010000	» SP180000	º SM200000	¿ SP160000	| SM130000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA030000	* SM040000	% SM020000	Ð LD620000	` SD130000	} SM140000	@ SM050000	¯ SM150000	~ SD190000	ü LU170000	^ SD150000	Ü LU180000
-D	(SP060000	) SP070000	_ SP090000	' SP050000	ý LY110000	¸ SD410000	Ý LY120000	¨ SD170000	ò LO130000	ù LU130000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	{ SM110000	] SM080000	[SM060000	\ SM070000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	! SP020000	Ö LO180000	? SP150000	" SP040000	± SA020000	¤ SC010000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	- SP100000

The shaded areas contain language dependant characters. Their positions differ from the default code page (037 US English).

Axis Internal Code

Page 0

Hex Digits 1st → 2nd ↓	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	NUL	O KP020000	SP010000	0 ND100000	@ SM050000	P LP020000	` SD130000	p LP010000	Ç LC420000	É LE120000	á LA110000	▒ SF140000	└ SF020000	ð LD630000	Ó LO120000	- SP320000
-1	SP010001	_ KA160000	! SP020000	1 ND010000	A LA020000	Q LQ020000	a LA010000	q LQ010000	ü LU170000	æ LA510000	í LI110000	▓ SF150000	┴ SF070000	Ð LD620000	ß LS610000	± SA020000
-2	SP010002	G KZ220000	" SP040000	2 ND020000	B LB020000	R LR020000	b LB010000	r LR010000	é LE110000	Æ LA520000	ó LO110000	░ SF160000	┬ SF060000	Ê LE160000	Ô LO160000	═ SM100000
-3	SP010003	B KX120000	# SM010000	3 ND030000	C LC020000	S LS020000	c LC010000	s LS010000	â LA150000	ô LO150000	ú LU110000	│ SF110000	├ SF080000	Ë LE180000	Ò LO140000	¾ NF050000
-4	≤ SA520000	[KY020000	$ SC030000	4 ND040000	D LD020000	T LT020000	d LD010000	t LT010000	ä LA170000	ö LO170000	ñ LN190000	┤ SF090000	─ SF100000	È LE140000	õ L1910000	¶ SM250000
-5	≥ SA530000	H KZ020000	% SM020000	5 ND050000	E LE020000	U LU020000	e LE010000	u LU010000	à LA130000	ò LO130000	Ñ LN200000	Á LA120000	┼ SF050000	Í LI610000	Õ LO200000	§ SM240000
-6	≠ SA540000	X KS220000	& SM030000	6 ND060000	F LF020000	V LV020000	f LF010000	v LV010000	å LA270000	û LU150000	ª SM210000	Â LA160000	ã LA190000	Í LI120000	µ GM010000	÷ SA060000
-7	• SM570000	] KE140000	' SP050000	7 ND070000	G LG020000	W LW020000	g LG010000	w LW010000	ç LC410000	ù LU130000	º SM200000	À LA140000	Ã LA200000	Î LI160000	þ LT630000	¸ SD410000
-8	4 ND041000	Y KS160000	(SP060000	8 ND080000	H LH020000	X LX020000	h LH010000	x LX010000	ê LE150000	ÿ LY170000	¿ SP160000	© SM520000	╚ SF380000	Ï LI180000	Þ LT640000	° SM190000
-9	5 ND051000	W KC220000	) SP070000	9 ND090000	I LI020000	Y LY020000	i LI010000	y LY010000	ë LE170000	Ö LO180000	® SM530000	╣ SF230000	╔ SF390000	┘ SF040000	Ú LU120000	¨ SD170000
-A	6 ND061000	‾ –––	* SM040000	: SP130000	J LJ020000	Z LZ020000	j LJ010000	z LZ010000	è LE130000	Ü LU180000	¬ SM660000	║ SF240000	╩ SF400000	┌ SF010000	Û LU160000	· SD630000
-B	7 ND071000	* –––	+ SA010000	; SP140000	K LK020000	[SM060000	k LK010000	{ SM110000	ï LI170000	ø LO610000	½ NF010000	╗ SF250000	╦ SF410000	█ SF610000	Ù LU140000	¹ ND011000
-C	8 ND081000	ˇ SD210000	, SP080000	< SA030000	L LL020000	\ SM070000	l LL010000	| SM130000	î LI150000	£ SC020000	¼ NF040000	╝ SF260000	╠ SF420000	▄ SF570000	ý LY110000	³ ND031000
-D	9 ND091000	o LO011000	- SP100000	= SA040000	M LM020000	] SM080000	m LM010000	} SM140000	ì LI130000	Ø LO620000	¡ SP030000	¢ SC040000	═ SF430000	¦ SM650000	Ý LY120000	² ND021000
-E	0 N1010000	Pts SC060000	. SP110000	> SA050000	N LN020000	^ SD150000	n LN010000	~ SD190000	Ä LA180000	× SA070000	« SP170000	¥ SC050000	╬ SF440000	Ì LI140000	¯ SM150000	■ SM470000
-F	K KL020000	Ø ND100008	/ SP120000	? SP150000	O LO020000	_ SP090000	o LO010000	¦ SM790000	Å LA280000	*f* SC070000	» SP180000	┐ SF030000	¤ SC010000	■ SF600000	´ SD110000	SP300000

This page contains most of the normal characters. The positions $01 - $1F contain special symbols and cyrillic characters. $20 - $FF is identical to the PC-850 symbol set.

Axis Internal Code

Hex Digits 1st → 2nd ↓	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	a KD610000	¨ KC120000	 SP010000	→ SM590000	n KP010000	E KD020000	Ŝ LS160000	ì LE220000	š LS210000	ť LT210000	l SM160000	≟ SF450000	σ GS010000	· SA790000	γ GG010000	υ GU110000
-1	Í KG110000	J KK120000	☺ SS000000	← SM630000	~ KA150000	I KI020000	Ŭ LU240000	È LC220000	Ľ LL220000	à LR110000	n LN630000	╨ SF460000	τ GT010000	√ SA800000	ζ GZ010000	υ GU170000
-2	« KE150000	Ç KU240000	☺ SS010000	↕ SM760000	q KT010000	Ä KJ120000	Ĥ LH160000	Æ LC120000	Ò LN220000	õ LO250000	ª LS420000	╤ SF470000	Φ GF020000	n LN011000	η GE310000	ω GO710000
-3	¯ KL410000	© KG220000	♥ SS020000	! SP330000	f KZ210000	J KK020000	Ĝ LG160000	¡ SD210000	Ø LR220000	û LU250000	¯ SD310000	╥ SF480000	Θ GT620000	Δ GD020000	ϑ GT610000	σ GS610000
-4	° KN110000	} KU150000	♦ SM610000	¶ SM250000	b KV010000	S KU020000	Ĵ LJ160000	Ê LE440000	Œ LS120000	• LT220000	þ LT410000	╙ SF490000	Ω GO320000	Λ GL020000	ι GI010000	υ GU010000
-5	± KC110000	a KB010000	♣ SS040000	§ SM240000	{ KX110000	ċ LC290000	ġ LG290000	Ù LU280000	· SD290000	À LR120000	Þ LT420000	╘ SF500000	δ GD010000	Ξ GX020000	κ GK010000	χ GH010000
-6	¡ KK110000	u KC010000	♠ SS050000	- SM700000	z KY010000	Ċ LC300000	Ġ LG300000	Ï LD220000	¿ LZ290000	Õ LO260000	Pts SC060000	╒ SF510000	∞ SA450000	Π GP020000	λ GL010000	ψ GP610000
-7	Ó KU230000	d KD010000	• SM580000	↕ SM770000	g KZ010000	ħ LH610000	1 LA430000	Å LL120000	2 SD430000	Û LU260000	⌐ SM680000	╥ SF520000	φ GF010000	Ψ GP620000	ν GN010000	ω GO310000
-8	2 KG210000	s KF010000	• SM570001	↑ SM320000	w KS210000	ĉ LC150000	ì LE210000	ĭ LL210000	¯ LZ300008	ã LA230000	╡ SF190000	╫ SF530000	ε GE010000	A GA120000	ξ GX010000	ι GI730000
-9	Z KU220000	c KG010000	O SM750000	 SM330000	| KE130000	ŝ LS150000	è LC210000	ò LN210000	• LZ210000	ğ LG230000	╢ SF200000	╪ SF540000	∩ SA380000	E GE120000	ρ GR010000	υ GU730000
-A	№ SM000000	- KI110000	O SM750002	→ SM310000	x KS150000	u LU230000	æ LC110000	ð LD610000	Ÿ LZ110000	¡ LI300000	╥ SF210000	▌ SF580000	≡ SA480000	H GE720000	α GA110000	Θ GT630000
-B	¡ KD620000	Đ KJ110000	 SM280000	← SM300000	v KC210000	ĥ LH150000	ê LE430000	ø LR210000	• LZ220000	Ã LA240000	╕ SF220000	▌ SF590000	≥ SA530000	I GI120000	ε GE110000	** ---
-C	Á KG120000	i KK010000	 SM290000	< SA420000	y KU210000	ĝ LG150000	ù LU270000	œ LS110000	• LZ120000	Ğ LG240000	╨ SF270000	α GA010000	≤ SA520000	O GO120000	η GE710000	** ---
-D	¢ KE160000	j KL010000	 SM930000	↔ SM780000	^ KU160000	j LJ150000	d̆ LD210000	° SD270000	£ LL620000	, SD230000	╛ SF280000	Γ GG020000	⌠ SS260000	Y GU120000	ι GI170000	** ---
-E	¦ KL420000	k KM010000	 SM910000	 SM600000	B KB020000	Ħ LH620000	å LL110000	3 LL610000	Ñ LN120000	″ SD250000	╞ SF360000	π GP010000	⌡ SS270000	Ω GO720000	ι GI110000	** ---
-F	§ KN120000	l KN010000	¤ SM690000	 SV040000	V KC020000	Ĉ LC160000	¥ LA440000	ñ LN110000	Š LS220000	º LS410000	╟ SF370000	Σ GS020000	≈ SA700000	β GB010000	ο GO110000	** ---

This page contains additional special symbols, greek and cyrillic characters. Positions marked with two asterisks (**) are reserved for future use.

Axis Internal Code

Hex Digits 1st → 2nd ↓	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	∧ SS390000	SO040000	SP010000	’ SP200000	o GO011000	〉 SA190000	⌡ SS230000	SS630000	SO010000	O LQ480000	| SF660000	SL150000	** ———	LA320000	LK420000	LU190000
-1	: SS430000	SO050000	‰ SM560000	“ SP210000	SM731000	SA170000	≅ SA430000	SM670000	_ SD470000	P LP480000	⁄ SL010000	SL160000	** ———	SM940000	LK610000	LU200000
-2	g SS460000	SO060000	- SA000000	” SP220000	SM311000	′ SM500000	SS250000	∂ SA490000	A LA480000	Q LQ480000	⌠ SL020000	SL120000	** ———	LE291000	LL410000	LU810000
-3	L SS480000	SO070000	ij LI510000	„ SP230000	SP121000	″ SA510000	SS240000	~ SA300000	B LB480000	R LR480000	€ SL360000	SL140000	** ———	LE300000	LL420000	LU820000
-4	R SS470000	SO110000	ffi LF570000	1/3 NF180000	SA181000	∪ SA390000	0 ND102000	□ SM450000	C LC480000	S LS480000	n LN012000	SL200000	** ———	LE310000	LL630000	LU430000
-5	H SS580000	SO120000	— SM900000	3/8 NF190000	SA191000	⊂ SA400000	1 ND012000	☒ SM480000	D LD480000	T LT480000	° SL250000	SL040000	** ———	LE320000	LL640000	LU440000
-6	c/o SS640000	ü SO090000	Œ LO520000	5/8 NF200000	SM550000	⊃ SA410000	2 ND022000	SS280000	E LE480000	U LU480000	≠ SL820000	Δ SL330000	SS450000	LG110000	LN410000	LW150000
-7	a/c SS650000	SO100000	Ÿ LY180000	7/8 NF210000	SA360000	⊕ SA550000	3 ND032000	SS290000	F LF480000	V LV480000	SL170000	SL110000	SM620000	LG420000	LN420000	LW160000
-8	◊ SS610000	∧ SM090000	ff LF510000	(SP061000	∴ SA370000	⊗ SA560000	4 ND042000	∝ SA470000	G LG480000	W LW480000	SL180000	SL190000	0 ND101000	LI190000	LN610000	LY150000
-9	. SP111000	Σ SS400000	œ LO510000	+ SA011000	➚ SM950000	″ SM510000	5 ND052000	≅ SA440000	H LH480000	X LX480000	SL090000	◊ SL370000	4 ND041000	LI200000	LN620000	LY160000
-A	, SP081000	** ———	ffl LF590000	¤ SM490000	➘ SM990000	¯ SM640000	6 ND062000	~ SA160000	I LI480000	Y LY480000	SL100000	SL270000	5 ND051000	LI310000	LO310000	SV080000
-B	∈ SA670000	** ———	‡ SM350000	) SP071000	∨ SA320000	⌠ SS200000	7 ND072000	— SO150000	J LJ480000	Z LZ480000	SL240000	ı SL860000	6 ND061000	LI320000	LO320000	SV380000
-C	▷ SM600001	** ———	† SM340000	- SA001000	∧ SA330000	⌡ SS210000	8 ND082000	| SO130000	K LK480000	| | SF630000	SL050000	ε SL870000	7 ND071000	LI430000	LR410000	SV390000
-D	SS670000	** ———	fi LF530000	SA041000	‖ SA340000	⊥ SA780000	9 ND092000	■ SO140000	L LL480000	¯ SF620000	SL070000	[] SL260000	8 ND081000	LI440000	LR420000	SV400000
-E	SS700000	** ———	fl LF550000	SP101000	∠ SA350000	™ SM540000	♦ SS620000	SO020000	M LM480000	| SF640000	SL130000	SL280000	9 ND091000	|J LI520000	LT610000	SV410000
-F	SO030000	** ———	’ SP190000	SA451000	〈 SA180000	⌡ SS220000	∇ SL030000	SO000000	N LN480000	| SF650000	SL210000	∵ SL320000	LA310000	LK410000	LT620000	** ———

This page contains math, APL, and OCR symbols. Positions marked with two asterisks (**) are reserved for future use.

PC-850 ASCII Symbol Set

	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	0	16	32	0 48	@ 64	P 80	` 96	p 112	Ç 128	É 144	á 160	░ 176	└ 192	ð 208	Ó 224	- 240
-1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	ü 129	æ 145	í 161	▓ 177	┴ 193	Đ 209	ß 225	± 241
-2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	é 130	Æ 146	ó 162	▒ 178	┬ 194	Ê 210	Ô 226	‗ 242
-3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	â 131	ô 147	ú 163	│ 179	├ 195	Ë 211	Ò 227	¾ 243
-4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	ä 132	ö 148	ñ 164	┤ 180	─ 196	È 212	õ 228	¶ 244
-5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	à 133	ò 149	Ñ 165	Á 181	┼ 197	I 213	Õ 229	§ 245
-6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	å 134	û 150	ª 166	Â 182	ã 198	Í 214	µ 230	÷ 246
-7	7	23	' 39	7 55	G 71	W 87	g 103	w 119	ç 135	ù 151	º 167	À 183	Ã 199	Î 215	þ 231	¸ 247
-8	8	24	(40	8 56	H 72	X 88	h 104	x 120	ê 136	ÿ 152	¿ 168	© 184	╚ 200	Ï 216	Þ 232	° 248
-9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	ë 137	Ö 153	® 169	╣ 185	╔ 201	┘ 217	Ú 233	¨ 249
-A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Û 234	· 250
-B	11	27	+ 43	; 59	K 75	[91	k 107	{ 123	ï 139	ø 155	½ 171	╗ 187	╦ 203	█ 219	Ù 235	¹ 251
-C	12	28	, 44	< 60	L 76	\ 92	l 108	| 124	î 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	ý 236	³ 252
-D	13	29	- 45	= 61	M 77	] 93	m 109	} 125	ì 141	Ø 157	¡ 173	¢ 189	═ 205	¦ 221	Ý 237	² 253
-E	14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	Ä 142	× 158	« 174	¥ 190	╬ 206	Ì 222	¯ 238	■ 254
-F	15	31	/ 47	? 63	O 79	_ 95	o 111	127	Å 143	ƒ 159	» 175	┐ 191	¤ 207	▀ 223	´ 239	255

Roman-8 ASCII Symbol Set

	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	0	16	32	0 48	@ 64	P 80	‘ 96	p 112	128	144	160	¯ 176	â 192	Å 208	Á 224	Þ 240
-1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	À 161	Ý 177	ê 193	î 209	Ã 225	þ 241
-2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	130	146	Â 162	ý 178	ô 194	Ø 210	ã 226	· 242
-3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	È 163	° 179	û 195	Æ 211	Đ 227	µ 243
-4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	132	148	Ê 164	Ç 180	á 196	å 212	ð 228	¶ 244
-5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	Ë 165	ç 181	é 197	í 213	Í 229	¾ 245
-6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	Î 166	¡ 182	ó 198	ø 214	Ì 230	– 246
-7	7	23	’ 39	7 55	G 71	W 87	g 103	w 119	135	151	Ï 167	Ñ 183	ú 199	æ 215	Ó 231	¼ 247
-8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	´ 168	ñ 184	à 200	Ä 216	Ò 232	½ 248
-9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	` 169	¿ 185	è 201	ì 217	Õ 233	ª 249
-A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	^ 170	¤ 186	ò 202	Ö 218	õ 234	º 250
-B	11	27	+ 43	; 59	K 75	[91	k 107	{ 123	139	155	¨ 171	£ 187	ù 203	Ü 219	Š 235	« 251
-C	12	28	, 44	< 60	L 76	\ 92	l 108	| 124	140	156	~ 172	¥ 188	ä 204	É 220	š 236	■ 252
-D	13	29	- 45	= 61	M 77	] 93	m 109	} 125	141	157	Ù 173	§ 189	ë 205	ï 221	Ú 237	» 253
-E	14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	142	158	Û 174	ƒ 190	ö 206	ß 222	Ÿ 238	± 254
-F	15	31	/ 47	? 63	O 79	_ 95	o 111	▒ 127	143	159	£ 175	¢ 191	ü 207	Ô 223	ÿ 239	255

PC-437 (PC Set 2) ASCII Symbol Set

	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	0	16	32	0 48	@ 64	P 80	` 96	p 112	Ç 128	É 144	á 160	░ 176	└ 192	╨ 208	α 224	≡ 240
-1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	ü 129	æ 145	í 161	▓ 177	┴ 193	╤ 209	β 225	± 241
-2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	é 130	Æ 146	ó 162	▒ 178	┬ 194	╥ 210	Γ 226	≥ 242
-3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	â 131	ô 147	ú 163	│ 179	├ 195	╙ 211	π 227	≤ 243
-4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	ä 132	ö 148	ñ 164	┤ 180	─ 196	╘ 212	Σ 228	⌠ 244
-5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	à 133	ò 149	Ñ 165	╡ 181	┼ 197	╒ 213	σ 229	⌡ 245
-6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	å 134	û 150	ª 166	╢ 182	╞ 198	╓ 214	µ 230	÷ 246
-7	7	23	' 39	7 55	G 71	W 87	g 103	w 119	ç 135	ù 151	º 167	╖ 183	╟ 199	╫ 215	τ 231	≈ 247
-8	8	24	(40	8 56	H 72	X 88	h 104	x 120	ê 136	ÿ 152	¿ 168	╕ 184	╚ 200	╪ 216	Φ 232	° 248
-9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	ë 137	Ö 153	⌐ 169	╣ 185	╔ 201	┘ 217	θ 233	· 249
-A	10	25	* 42	: 58	J 74	Z 90	j 106	z 122	è 138	Ü 154	¬ 170	║ 186	╩ 202	┌ 218	Ω 234	· 250
-B	11	27	+ 43	; 59	K 75	[91	k 107	{ 123	ï 139	¢ 155	½ 171	╗ 187	╦ 203	█ 219	δ 235	√ 251
-C	12	28	, 44	< 60	L 76	\ 92	l 108	| 124	î 140	£ 156	¼ 172	╝ 188	╠ 204	▄ 220	∞ 236	n 252
-D	13	29	- 45	= 61	M 77	] 93	m 109	} 125	ì 141	¥ 157	¡ 173	╜ 189	═ 205	▌ 221	ϕ 237	² 253
-E	14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	Ä 142	Pt 158	« 174	╛ 190	╬ 206	▐ 222	∈ 238	■ 254
-F	15	31	/ 47	? 63	O 79	_ 95	o 111	⌂ 127	Å 143	ƒ 159	» 175	┐ 191	╧ 207	▀ 223	∩ 239	255

ECMA-97 (Latin 1) ASCII Symbol Set

	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	0	16	32	0 48	@ 64	P 80	‘ 96	p 112	128	144	160	° 176	À 192	Ð 208	à 224	ð 240
-1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	¡ 161	± 177	Á 193	Ñ 209	á 225	ñ 241
-2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	130	146	¢ 162	² 178	Â 194	Ò 210	â 226	ò 242
-3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	£ 163	³ 179	Ã 195	Ó 211	ã 227	ó 243
-4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	132	148	¤ 164	´ 180	Ä 196	Ô 212	ä 228	ô 244
-5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	¥ 165	µ 181	Å 197	Õ 213	å 229	õ 245
-6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	¦ 166	¶ 182	Æ 198	Ö 214	æ 230	ö 246
-7	7	23	' 39	7 55	G 71	W 87	g 103	w 119	135	151	§ 167	· 183	Ç 199	× 215	ç 231	÷ 247
-8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	¨ 168	¸ 184	È 200	Ø 216	è 232	ø 248
-9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	© 169	¹ 185	É 201	Ù 217	é 233	ù 249
-A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	ª 170	º 186	Ê 202	Ú 218	ê 234	ú 250
-B	11	27	+ 43	; 59	K 75	[91	k 107	{ 123	139	155	« 171	» 187	Ë 203	Û 219	ë 235	û 251
-C	12	28	, 44	< 60	L 76	\ 92	l 108	| 124	140	156	¬ 172	¼ 188	Ì 204	Ü 220	ì 236	ü 252
-D	13	29	- 45	= 61	M 77	] 93	m 109	} 125	141	157	- 173	½ 189	Í 205	Ý 221	í 237	ý 253
-E	14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	142	158	® 174	¾ 190	Î 206	Þ 222	î 238	þ 254
-F	15	31	/ 47	? 63	O 79	_ 95	o 111	▒ 127	143	159	¯ 175	¿ 191	Ï 207	ß 223	ï 239	ÿ 255

US ASCII (7-bit) ASCII Symbol Set

	0-	1-	2-	3-	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	0	16	32	0 48	@ 64	P 80	‘ 96	p 112	128	144	160	176	192	208	224	240
-1	1	17	! 33	1 49	A 65	Q 81	a 97	q 113	129	145	161	177	193	209	225	241
-2	2	18	" 34	2 50	B 66	R 82	b 98	r 114	130	146	162	178	194	210	226	242
-3	3	19	# 35	3 51	C 67	S 83	c 99	s 115	131	147	163	179	195	211	227	243
-4	4	20	$ 36	4 52	D 68	T 84	d 100	t 116	132	148	164	180	196	212	228	244
-5	5	21	% 37	5 53	E 69	U 85	e 101	u 117	133	149	165	181	197	213	229	245
-6	6	22	& 38	6 54	F 70	V 86	f 102	v 118	134	150	166	182	198	214	230	246
-7	7	23	’ 39	7 55	G 71	W 87	g 103	w 119	135	151	167	183	199	215	231	247
-8	8	24	(40	8 56	H 72	X 88	h 104	x 120	136	152	168	184	200	216	232	248
-9	9	25	) 41	9 57	I 73	Y 89	i 105	y 121	137	153	169	185	201	217	233	249
-A	10	26	* 42	: 58	J 74	Z 90	j 106	z 122	138	154	170	186	202	218	234	250
-B	11	27	+ 43	; 59	K 75	[91	k 107	{ 123	139	155	171	187	203	219	235	251
-C	12	28	, 44	< 60	L 76	\ 92	l 108	| 124	140	156	172	188	204	220	236	252
-D	13	29	- 45	= 61	M 77	] 93	m 109	} 125	141	157	173	189	205	221	237	253
-E	14	30	. 46	> 62	N 78	^ 94	n 110	~ 126	142	158	174	190	206	222	238	254
-F	15	31	/ 47	? 63	O 79	_ 95	o 111	▒ 127	143	159	175	191	207	223	239	255

APPENDIX B

INTERNAL PRINTOUTS

The TEST button of an Axis network print server facilitates the generation of both a test page and parameter list. These reports, that are generated internally within the print server, are output to the LPT1 port.

The Test Page

The test page (sample shown on the following page) shows the software revision and the basic configuration of the print server.

To print the test page simply press the TEST button once.

The Parameter List

The parameter list (or the *config* file) shows the complete print server configuration. See Section 11 (page 137) for a description of the individual parameters.

To print the parameter list, press the TEST button twice.

```
*************************************************************************
** AXIS 560 Printer Server V5.17 Apr 15 1996 S/N: 00408C1A0027          **
**                                                                      **
** AXIS 560 Print server Test Page                                      **
**                                                                      **
** Power-on time: 4 days, 7 hours, 15 minutes.                          **
** Node address: 00:40:8C:1A:00:27                                      **
**                                                                      **
** TCP/IP: enabled                                                      **
** Internet address Default router  Net mask                            **
** 192.168.4.40     192.168.4.1     255.255.255.0                       **
**                                                                      **
** NetWare: enabled                                                     **
** Print server name  NPSMKV-1                                          **
**                                                                      **
** Microsoft Networks and LAN Server/LAN Manager: disabled              **
**  Printer name: AX1A0027.LP1      Port: LPT1                          **
**                AX1A0027.LP2            LPT2                          **
**                AX1A0027.CM1            COM1                          **
**                                                                      **
** Apple EtherTalk: enabled                                             **
** Printer name              Printer type           Port  Mode         **
** AXIS1A0027_LPT1           LaserWriter            LPT1  Spooler      **
** AXIS1A0027_LPT2           LaserWriter            LPT2  Spooler      **
** AXIS1A0027_COM1           LaserWriter            COM1  Spooler      **
**                                                                      **
** For more information, use the TEST button:                           **
** First press the TEST button until STATUS starts flashing, release    **
** the button, then press once to print the PARAMETER LIST.             **
**                                                                      **
** For assistance, contact your local dealer/distributor.               **
** Axis Communications can be contacted at:                             **
**                                                                      **
** North & Central America:       Asia except Japan:                    **
** ------------------------       ------------------                    **
**  Phone: (617) 938-1188          Phone +852 2836 0813                 **
**  Fax:   (617) 938-6161          Fax:  +852 2573 5935                 **
**  email: info@axisinc.com        email: info@axis.com.hk              **
**                                                                      **
** Japan:                         Other countries:                      **
** ------                         ----------------                      **
**  Phone: +81 33663 8801          Phone +46 46 191800                  **
**  Fax:   +81 33663 8802          Fax:  +46 46 136130                  **
**  email: info@axiscom.co.jp      email: info@axis.se                  **
**                                                                      **
** Visit our WWW server at http://www.axis.se                           **
**                                                                      **
*************************************************************************
END OF TEST PAGE
```

Figure 12-1 *The AXIS 560 Test Page*

Error Messages

If the power-up self test fails, an error message is printed.

Example:

```
**
** NVRAM E4 : Updated parameter structure
**
**
```

The following error messages may be printed:

```
** NVRAM E1 : An NVRAM checksum error was detected
```

```
** NVRAM E2 : An NVRAM checksum error was detected
```

These messages does not necessarily indicate a permanent error condition. Restart the print server, and print the test page again. If the error condition remains, contact your dealer/distributor.

```
** NVRAM E3 : NVRAM hardware failure
```

This is a fatal error condition. Contact your dealer/distributor.

```
** NVRAM E4 : Updated parameter structure
```

This message is normal after a print server software upgrade. Restart the print server, and print the test page again. If the message appears again, contact your dealer/distributor.

```
** ETHER E6 : No factory default Ethernet address
```

The Ethernet address has been corrupted. Contact your dealer/distributor.

```
** ERROR E6 : No factory default node address
```

The Token Ring node address has been corrupted. Contact your dealer/distributor.

```
** COMM E8 : Communication hardware failure
```

This is a fatal error condition. Contact your dealer/distributor.

```
** COMM E9 : Wrong Token-Ring speed set
```

An incorrect ring speed setting has been detected. Change the RING SPEED switch position and restart the print server.

```
** EErom Hardware Failure : Size is 0
```

This is a fatal error condition. Contact your dealer/distributor.

```
** EErom Hardware Failure : Read Failure
```

This is a fatal error condition. Contact your dealer/distributor.

```
** Illegal or Invalid Serial Number : Read Failure
```

The parameter storage has been corrupted. Return the unit to your dealer for reconfiguration.

SNA Printing Error Messages

This section applies to the AXIS 570/670 only.

This section deals with errors that may occur when using Extended Emulation functions. The error messages are intended to help you to locate syntax errors in Hex Transparency sequences, Configuration Commands, and Function Mode Commands.

There are two levels of error conditions – unrecoverable (ERROR) and recoverable (WARNING). Both types of messages will be printed as shown below. The warning messages will only be printed if the Warning Switch (WARN) is set to 'ON', see Section 11.

Errors: Unrecoverable conditions will generate an error message, and the current mode (Configuration, Transparency, or Function) will be terminated. The following error conditions may occur:

```
ERROR <E01> TRANSPARENCY: TRAILER SEQUENCE NOT DEFINED
```

The Transparency Trailer Sequence (TTRS) is empty. Hex transparency cannot be used unless both the lead-in and trailer sequences are defined.

```
ERROR <E02> TRANSPARENCY: UNEVEN NUMBER OF HEX DIGITS
```

Hex transparency data must be given as pairs of hexadecimal digits.

```
ERROR <E10> CONFIGURATION: MEMORY OVERFLOW
```

You are exceeding the 16 kbytes reserved for configuration storage. This can happen when saving logos or similar. Remove some of the data and try again.

```
ERROR <E11> CONFIG/FUNCTION: ILLEGAL COMMAND OR FUNCTION
```

An illegal configuration command or function call is found. Make sure that all commands are correctly spelled (see Section 11), and that all comments are enclosed within brackets.

Warnings: Error conditions that are fully or partially recoverable will generate a warning, and printing will continue. The recovery action for each warning is described below:

All warning messages are suppressed unless the Warning Switch (WARN) is set to 'ON', see Section 11.

```
WARNING <W01> TRANSPARENCY: UNEXPECTED TERMINATION
```

A non-numeric character (other than 0-9, A-F) was found within a transparency sequence.

Wrong: `%<1B25TEXT`

Correct: `%<1B25>%TEXT`

Recovery: The transparency data before the non-numeric character will be processed, the character will be printed, and transparency mode will be terminated.

```
WARNING <W02> TRANSPARENCY: MISSING SINGLE BYTE TRN VALUE
```

The Single Byte Transparency Sequence (SBTS) was not followed by a hexadecimal number.

Wrong: `¬TEXT`

Correct: `¬B8TEXT`

Recovery: SBTS as well as the following characters will be printed.

```
WARNING <W10> CONFIG/FUNCTION: MISSING OR TOO MANY PARAMETER
VALUES
```

Too many parameter values for this command.

Wrong: `10CPI=11,11,204;`

Correct: `10CPI=11,204;`

Recovery: The current parameter values remain unchanged, and configuration command processing will continue.

```
WARNING <W11> CONFIG/FUNCTION: PARAMETER VALUE OUT OF RANGE
```

A numeric parameter value is too large (or too small).

Wrong: `MPL=-48;`

Correct: `MPL=48;`

Recovery: The current parameter value remains unchanged, and configuration command processing will continue.

```
WARNING <W12> CONFIG/FUNCTION: PARAMETER TYPE CONFLICT
```

A numeric value is assigned to a non-numeric parameter (or vice versa).

Wrong: `SYSL=PC850;`

Correct: `SYSL=284;`

Recovery: The current remains unchanged, and configuration command processing will continue.

```
WARNING <W13> CONFIG/FUNCTION: ILLEGAL PARAMETER VALUE
```

An unrecognized non-numeric (or numeric list) parameter value is found.

Wrong: `DEFBIN=TRUE; and PREMUL=IBM4214;`

Correct: `DEFBIN=BIN2; and PREMUL=4214;`

Recovery: The current parameter value remains unchanged, and configuration command processing will continue.

```
WARNING <W14> CONFIG/FUNCTION: ILLEGAL SPACE IN COMMAND OR
FUNCTION
```

A space character is found in a configuration command or function call.

Wrong: `DEF BIN=BIN2;` and `%/ UDS2;`

Correct: `DEFBIN=BIN2;` and `%/UDS2;`

Recovery: The current parameter value remains unchanged, and configuration command processing will continue.

```
WARNING <W15> CONFIG/FUNCTION: ILLEGAL EQUAL SIGN
```

A misplaced equal sign is found in a configuration command or function call.

Wrong: `LM=0=0=50;`

Correct: `LM=0,0,50;`

Recovery: The current parameter value remains unchanged, and configuration command processing will continue.

```
WARNING <W16> CONFIG/FUNCTION: MISSING EQUAL SIGN
```

The command ID and the parameter value(s) must be separated by an equal sign.

Wrong: `PREMUL 3816;`

Correct: `PREMUL=3816;`

Recovery: The new parameter value will be accepted, and configuration command processing will continue.

```
WARNING <W17> CONFIG/FUNCTION: ILLEGAL QUOTATION MARK
```

A misplaced quotation mark is found in a configuration command or function call.

Wrong: `BLKS=$1B"*v1i1S";`

Correct: `BLKS=$1B,"*v1i1S";`

Recovery: The current parameter value remains unchanged, and configuration command processing will continue.

```
WARNING <W18> CONFIG/FUNCTION: TOO MANY NESTED COMMENTS
```

Comments may be nested up to 255 levels.

Recovery: Exceeding left brackets are ignored, and configuration command processing will continue.

```
WARNING <W19> CONFIG/FUNCTION: TOO MANY COMMENT TERMINATORS ')
```

'The number of right brackets must match the number of left brackets.

Wrong: `(This is a comment))`

Correct: `(This is a comment)`

Recovery: Exceeding right brackets are ignored, and configuration command processing will continue.

```
WARNING <W20> CONFIG/FUNCTION: MISSING UDS NUMBER
```

A User Defined String number (0 - 255) must be specified.

Wrong: `%/UDS;`

Correct: `%/UDS 12;`

Recovery: The function call is ignored, and configuration command processing will continue.

```
WARNING <W21> CONFIG/FUNCTION: MISSING FONT FGID VALUE
```

This function requires one or more arguments.

Wrong: `%/FONT;` and `FONT ,,,,,,BOLD;`

Correct: `%/FONT 11;` and `FONT 11,,,,,,BOLD;`

Recovery: The function call is ignored, and processing continues.

```
WARNING <W22> CONFIG/FUNCTION: SEQUENCE EXCEEDS 16 CHARACTERS
```

The EECS, SBTS, TLIS, TTRS, and FLIS sequences are limited to maximum 16 characters each.

Wrong: `SBTS="THIS_SEQUENCE_STARTS_TRANSPARENCY";`

Correct: `SBTS="¬";`

Recovery: The current sequence remains unchanged, and configuration command processing will continue.

```
WARNING <W50> FUNCTION: SPECIFIED UDS NUMBER IS EMPTY
```

The specified User Defined String has not been programmed.

Recovery: The function call is ignored, and processing continues.

```
WARNING <W51> FUNCTION: BARCODE TYPE NOT SPECIFIED
```

Attempt to print a Bar Code where the type is not specified.

```
WARNING <W52> FUNCTION: INVALID BAR CODE DATA LENGTH
```

Wrong number of characters for the specified Bar Code type, or number of characters exceeds 40.

```
WARNING <W70> CONFIG: MISSING MSTR OR SSTR NUMBER
```

A Match String/Substitute String number (0 - 127) must be specified.

Wrong: `MSTR=DEL;`

Correct: `MSTR3=DEL;`

Recovery: The current sequence remains unchanged, and configuration command processing will continue.

```
WARNING <W71> CONFIG: MSTR OR SSTR SEQUENCE EXCEEDS 256
CHARACTERS
```

The MSTR and SSTR sequences are limited to maximum 256 characters each.

Recovery: The current sequence remains unchanged, and configuration command processing will continue.

```
WARNING <W200> COBRA EXTENDED EMULATION: UNSUPPORTED OR
INVALID INPUT
```

In AXIS Cobra compatibility mode, only AXIS Cobra parameters that can be directly translated to one or more AXIS 570/670 parameters can be set up. If you try to set up an AXIS Cobra parameter that has no corresponding AXIS 570/670 parameter or if you try to set an invalid value, this warning is printed.

Recovery: The parameter set-up is ignored and configuration command processing will continue.

APPENDIX C

PRINTER CONNECTOR PIN-OUTS

This appendix contains information on the parallel and serial printer connector pin-outs, the parallel port timings for different modes, and a schematic of a standard serial printer cable. The information presented here covers all the Axis network print server products. You should select the information that is appropriate to your print server model.

Parallel Port Pin-Outs

The Axis Network Print Servers parallel ports are either standard female 25-pin D-sub connectors, or in the case of the NPS 530/532 and NPS 630/632 a standard 36 pin male connector that plugs directly into the printer.

25 pin Connector

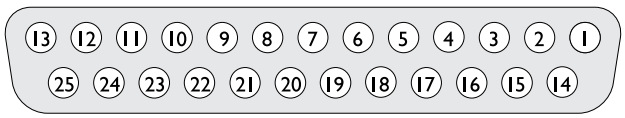


Figure C-1 25 pin connector - as seen from the outside of the print server

The table below shows the pin-out configuration of the parallel printer ports (LPT1 and LPT2) using the 25 pin connector:

Pin no.	Signal	Pin no.	Signal
1	Strobe	10	Acknowledge
2	Data 0	11	Busy
3	Data 1	12	Paper End
4	Data 2	13	Select
5	Data 3	14	Auto Feed
6	Data 4	15	Fault
7	Data 5	16	Init
8	Data 6	17	Select In
9	Data 7	19-25	Ground

Note *Pin 18 is reserved for future use.*

36 pin Connector

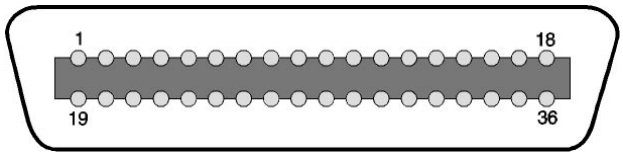


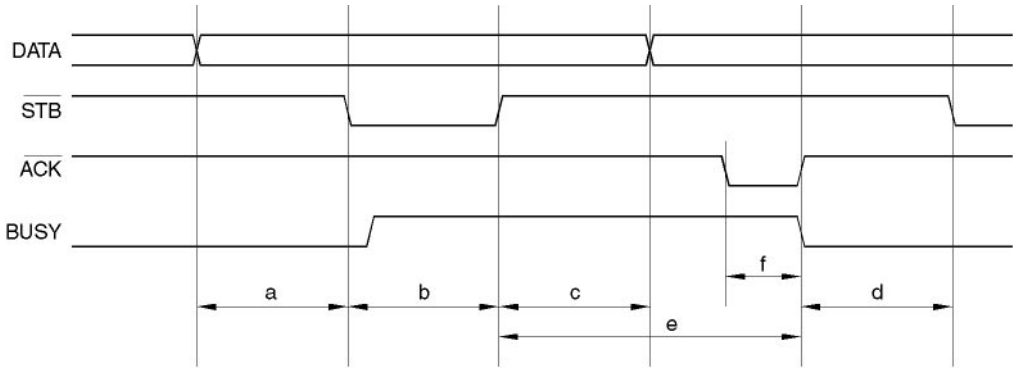
Figure C-2 36 pin connector - as seen from the outside of the print server

The table below shows the pin-out configuration of the parallel printer ports (LPT1 and LPT2) using the 36 pin connector:

Pin no.	Signal	Pin no.	Signal
1	Strobe	12	Paper End
2	Data 0	13	Select
3	Data 1	14	Auto Feed
4	Data 2	15-17	no connection
5	Data 3	18	+5v power in to print server
6	Data 4	19-30	Ground
7	Data 5	31	Initialise printer
8	Data 6	32	Fault signal from printer
9	Data 7	33	Flash load signal
10	Acknowledge	34-35	no connection
11	Busy	36	Select In

Parallel Ports Timing

The diagram below illustrates the Centronics interface timing for the parallel ports LPT1 and LPT2. The table shows the values for the different Centronics modes (IBM PC, Standard, Fast).



Time	Description	IBM PC	Standard	Fastbyte	Hispeed
a	Data Setup (latch enable)	5 µs	1.6 µs	0.5 µs	0.65 µs
b	Strobe Active	5 µs	1.6 µs	0.25 µs	0.65 µs
c	Data Hold	5 µs	3.2 µs	0.25 µs	0.5 µs
d	Data Setup (printer ready)	5 µs	1.6 µs	0.5 µs	0.65 µs
e	Printer Ready after Strobe Inactive	*	*	*	*
f	Acknowledge	Not used	0.2 µs (min.)	0.2 µs (min.)	0.2 µs (min.)

* The 'Printer Ready after Strobe Inactive' time (e) depends on the attached printer.

Serial Port Pin-Outs

The Axis Network Print Server serial port uses a standard male 9-pin D-sub connector as shown below.

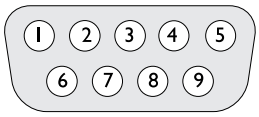


Figure C-3 Serial connector pins as seen from outside the print server

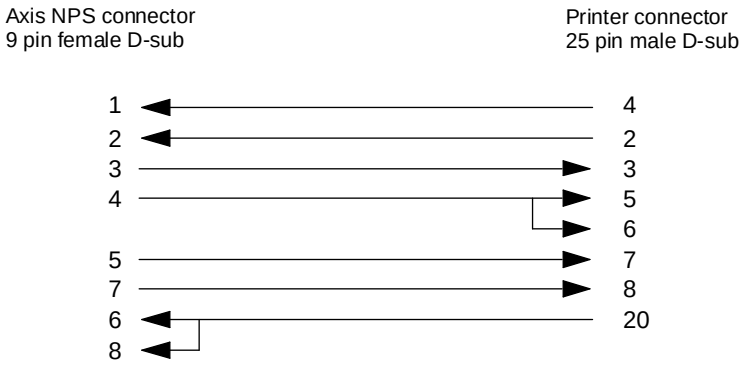
The table below shows the pin-out configuration of the serial printer port (COM1):

Pin no.	Signal
1	Not used
2	Receive Data (RXD)
3	Transmit Data (TXD)
4,7	Request to Send (RTS)
5	Signal Ground (GND)
6	Clear to Send (CTS)
8, 9	Not used

Serial Cable Description

The diagram below shows the standard Axis serial printer cable for the Axis print servers (part no. 13281). It can be used between the print server and most serial printers. Note that the connections to pin 1 and 8 are not actually used by the print server even though the connection in the cable is made.

Some printers require a special printer cable, see your printer documentation.



APPENDIX D

IBM Printing Compatibility Considerations

The AXIS 570/670 is designed to directly replace one of the emulated IBM printers. When replacing other printers or protocol converters, problems will often arise when these products diverge from the IBM specifications.

If the protocol converter to be replaced utilizes non-standard command code interpretation, the printout from the AXIS 570/670 will look different. The only way to solve this problem is to modify the host applications to fit the IBM specifications.

Another area of difficulties is when configuration commands are included in the applications. Since all protocol converter manufacturers use their own configuration method, the applications need to be modified also in this case. (This is a good cause for using configuration files separated from your applications).

However, in most cases it is possible to replace other protocol converters. The AXIS 570/670 can emulate many different hex transparency formats, which is the most common non-IBM function. You can also filter out configuration commands by using the string substitution function.

The following pages show configuration file examples on how to achieve hex transparency compatibility with a number of different protocol converters.

Axis AX-3/AX-7 Cobra and Cobra+

These products use the same Hex Transparency syntax as the AXIS 570/670. However, the lead-in and trailer sequences are different, and the Cobra/Cobra+ Extended Emulation is by default disabled. All Cobra/Cobra+ documents that use hex transparency therefore contain a command (&&??%%P) to activate the Extended Emulation and set up the lead-in and trailer sequences, and another command (&&??000) to disable the Extended Emulation.

The following configuration file can be used to print Cobra/Cobra+ documents with the AXIS 570/670:

```
%CONFIG+ pass;
SBTS = "%";
TLIS = "%%";
TTRS = "%";
MSTR 0 = "&&??%%P";
SSTR 0 = ;
MSTR 1 = "&&??000";
SSTR 1 = ;
SAVE;
%CONFIG-
```

If your Cobra/Cobra+ documents contain configuration sequences, the recommended procedure is the remove them and place them into two separate configuration files (one for Cobra/Cobra+, and one for AXIS 570/670).

However, it is in most cases possible to substitute configuration commands using string substitutions. Assuming your AX-7 Cobra+ document contains the following sequence to set the page length to 66 lines and the pitch to 12 CPI:

```
&&??%%P %P=1,66=4,12=207,10=207,12% &&??000
```

The corresponding AXIS 570/670 sequence should be:

```
%CONFIG+ pass; MPL=66; CPI=12; SAVE; %CONFIG-
```

This substitution can be accomplished by adding the commands indicated below to your configuration file:

```
%CONFIG+ pass;
SBTS = "%";
TLIS = "%%";
TTRS = "%";
MSTR 0 = "&&??%%P";
SSTR 0 = ;
MSTR 1 = "&&??000";
SSTR 1 = ;
add→ MSTR 2 = "%P=1,66=4,12=207,10=207,12%";
add→ SSTR 2 = "%CONFIG+ MPL=66; CPI=12; SAVE; %CONFIG-";
SAVE;
%CONFIG-
```

IMPORTANT: The Match Strings (containing the Cobra/Cobra+ configuration commands) must be typed in *exactly as they appear in the data stream.* An exact match (including space characters, etc.) is required for a substitution to take place.

Agile (6287 Ultra)

The 6287 Ultra uses two different hex transparency methods; the Cent Sign/Dollar Sign method and the Cent Sign/Count Byte method.

Use the following configuration file to emulate the Cent Sign/Dollar Sign method:

```
%CONFIG+ pass;
TLIS = "¢$";
TTRS = ";";
SAVE;
%CONFIG-
```

The Cent Sign/Count byte method cannot be directly emulated by the AXIS 570/670. However, if only a limited number of different Cent Sign/Count byte sequences are used, then the String Substitute function can be used to trap these sequences.

Example:

The sequence '¢011B' is used to generate the ASCII escape character. To emulate this function in the AXIS 570/670, add the marked lines to the configuration file above:

```
%CONFIG+ pass;
TLIS = "¢$";
TTRS = ";";
add→ MSTR 0 = "¢011B";
add→ SSTR 0 = "%<1B>%";
SAVE;
%CONFIG-
```

You must define string substitutions for all different Cent Sign/Count byte sequences that occurs in your applications.

Andrew (Malibu)

This protocol converter uses I-Data transparency formats, see the IDA 3270 below.

Avatar (MainPrint CG)

The MainPrint CG has one hex transparency method, which is similar to the AXIS 570/670 multi-byte transparency. The default lead-in sequence is | ‘ (split vertical bar and backward apostrophe), and the default trailer sequence is $ (dollar sign). Use the following configuration file to emulate the MainPrint CG hex transparency:

```
%CONFIG+ pass;
TLIS = "|`";
TTRS = "$";
SAVE;
%CONFIG-
```

Note: MainPrint CG supports different sequences in LU-1 (SCS) and DSC/DSE modes. This can not be emulated by the AXIS 570/670.

I-Data (IDA 3270)

IDA 3270 uses the same syntax for Single Byte and Multi-Byte transparency as the AXIS 570/670. Assuming that the I-Data Escape Character is set to %, the following configuration file will enable I-Data transparency:

```
%CONFIG+ pass;
SBTS = "%";
TLIS = "%%";
TTRS = "%";
SAVE;
%CONFIG-
```

The I-Data *Define Temporary ESC Character* (&&??%) command may by included in the data stream. This is interpreted as normal text by the AXIS 570/670, so you can use the String Substitution to prevent it from being printed. Add the commands indicated below to your configuration file:

```
%CONFIG+ pass;
SBTS = "%";
TLIS = "%%";
TTRS = "%";
add→ MSTR 0 = "&&??%";
add→ SSTR 0 = ;
SAVE;
%CONFIG-
```

MPI (AT 02 and Rocky)

AT 02 uses %% (two percent signs) both as transparency lead-in and trailer sequences, while Rocky uses #< and >#.

AT 02 configuration file:

```
%CONFIG+ pass;
TLIS = "%%";
TTRS = "%%";
SAVE;
%CONFIG-
```

Rocky configuration file:

```
%CONFIG+ pass;
TLIS = "#<";
TTRS = ">#";
SAVE;
%CONFIG-
```

MPI uses two special sequences, which are also supported by the AXIS 570/670. These are either %%-%% and %%+%% or #<-># and #<+># depending on software versions of MPI AT02 and Rocky. All character and control codes between these sequences are suppressed.

The MPI *Simple Pass Through* function is equal to the AXIS 570/670 Single Byte Transparency.

The MD-GRAPHTEXT Software

MD-GRAFTEXT© is a software package from Maersk Data A/S, offering DCF/SCRIPT users font selection and graphics capabilities.

To print MD-GRAFTEXT applications with the AXIS 570/670, you will have to define the *Single Byte Transparency Sequence* (SBTS) according to the *Escape Character* used by MD-GRAPHTEXT (backward apostrophe, `, by default). You should also disable the *Simulated Boldface* function:

```
%CONFIG+ pass;
SBTS = "`";
SIMBF = NO;
SAVE;
%CONFIG-
```

Note: The AXIS 570/670 configuration can also be made from within MD-GRAFTEXT using the FIRSTL and LASTL entries in PRTGEN. Refer to the MD-GRAFTEXT documentation for further details.

The FormsXpress Software

FormsXpress© is a software package from XPOINT running on IBM AS/400. To print FormsXpress applications with the AXIS 570/670, perform the following steps.

1. Configure the FormsXpress software:

```
9/10/93                    FORMS XPRESS/400                    FX507A02
8:24:52                 Work with Output Queues              CHANGE


Output Queue . . . . . . . . . . . . . PRT010104

Description  . . . . . . . . . . . . . 3812/5219 ON 4019

Printer type . . . . . . . . . . . . . HP         HP = HP-PCL Printers
                                                  IP = IPDS Printers

Model. . . . . . . . . . . . . . . . . 4019       4019, 3812, 3825D, ...

Twinax Controller. . .(HP only). . . . XPT        XPT, GBT, IOC

Duplex capable . . . . . . . . . . . . N          Y=Yes, N=No

Vertex card installed (AFP only) . . . N          Y=Yes, N=No

F3=Exit  F12=Cancel
                                    (C) COPYRIGHT XPOINT CORP.1990, 1989.
```

Bolded parameters in the example above must be set exactly as shown.

2. Configure the AXIS 570/670:

```
%CONFIG+ pass;
SYSL = 37;
SBTS = $AA;
TLIS = $AA,$AA;
TTRS = $24;
WARN = OFF;
%CONFIG-
```

It may be necessary to adjust the printout by using TM, LDSF, LM, CSSF.

APPENDIX E

How To Contact Axis

Technical Support

If you need technical support, please contact your dealer. If they can't help you, they will forward your request to us.

Axis on-line service

Use the Axis on-line service at any time to retrieve electronically distributed items. The material available includes the NPS Print Server Technical Reference, the Adobe Acrobat Reader (required for all Axis on-line documentation), company and product presentations, etc. All items are available on Internet by a WWW browser or FTP file transfer, and on the Axis Bulletin Board.

Internet and World Wide Web

If you are connected to Internet, have a look at the Axis WWW Home Page at **http://www.axis.se/**. You can find information here about the company and our products. You can also down-load on-line manuals, tools such as the Acrobat Reader for different platforms, and the latest versions of the software utilities. You can also get files and information through anonymous FTP: log in to **ftp.axis.se** and go to the /pub/axis directory, or enter **ftp://ftp.axis.se/pub/axis** in your WWW browser.

If you want to receive regular information about new products and product updates by e-mail, send and e-mail to Majordomo@axis.se with SUBSCRIBE AXIS-NEWS in the message body.

The Axis Bulletin Board

The third way to access the Axis archive is through the Axis BBS. You will need a high-speed modem, a VT100 or VT220 terminal emulator, and a Kermit or ZModem compatible software. Dial +46 46 12 06 32 or +46 46 211 94 53 and log in as guest (no password required).

The Axis Offices To contact an Axis office, choose the one nearest to your region:

Europe, Middle East, South America, Africa, Australia

Axis Communications AB
Scheelevägen 16
S-223 70 Lund, Sweden
Phone: +46 46 270 18 00
Fax: +46 46 13 61 30
Email: info@axis.se

North & Central America

Axis Communications Inc.
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Email: info@axisinc.com

Japan

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Fax: +81 3 3663 8802
Email: info@axiscom.co.jp

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