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Printer MIB v2
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Abstract

This document provides definitions of models and manageable objects for printing environments. The objects included in this MIB apply to physical, as well as logical entities within a printing device. This MIB definition makes explicit references to the Host Resources MIB (RFC 2790 [28]), as well as the Interfaces Group of MIB-II (RFC 1213 [14]).

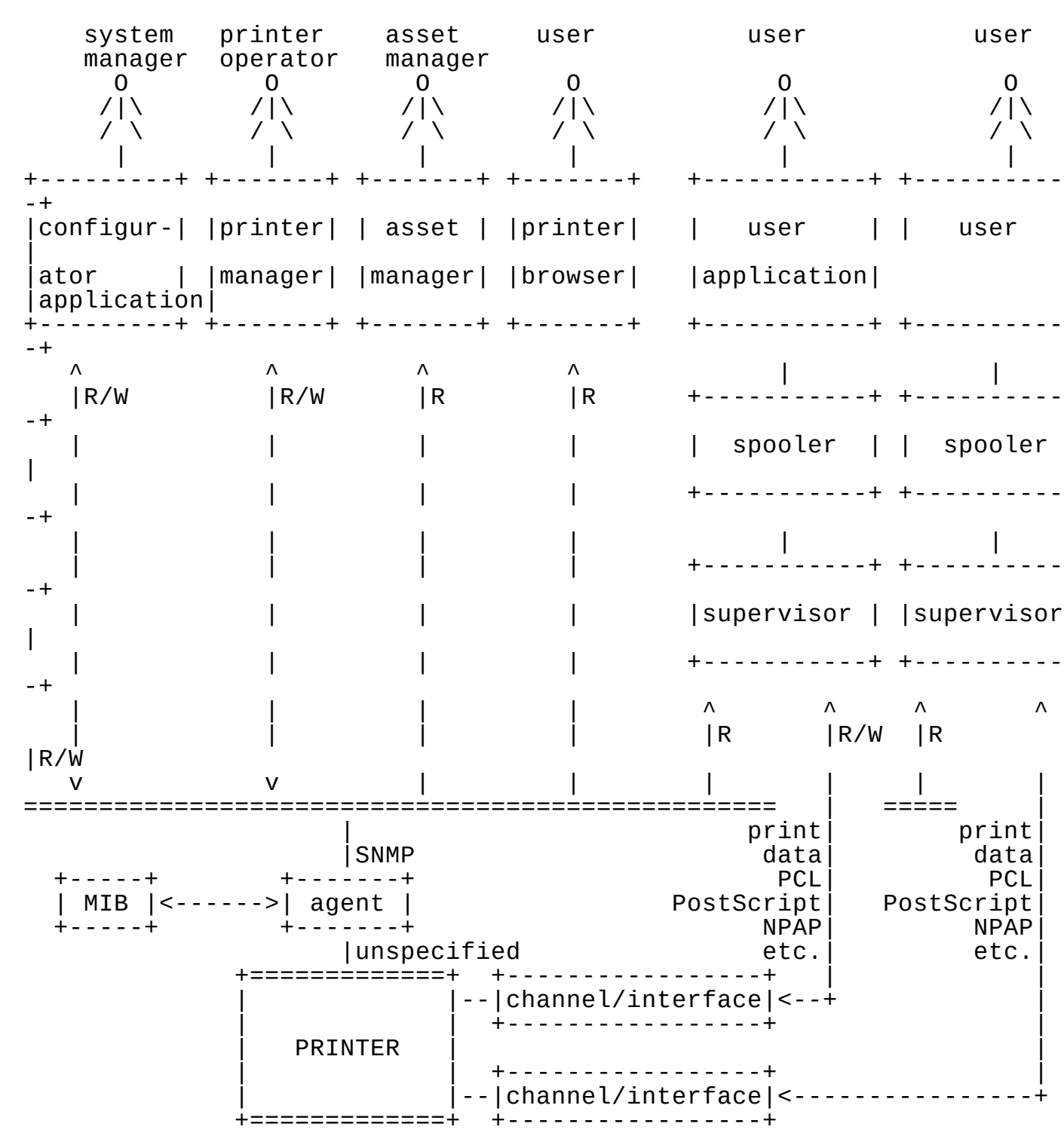
Table of Contents

1. Introduction

1.1 Network Printing Environment

The management of producing a printed document, in any computer environment, is a complex subject. Basically, the task can be divided into two overlapping pieces, the management of printing and the management of the printer. Printing encompasses the entire process of producing a printed document from generation of the file to be printed, selection of a printer, choosing printing properties, routing, queuing, resource management, scheduling, and final printing including notifying the user. Most of the printing process is outside the scope of the model presented here; only the management of the printer is covered.

Figure 1 - One Printer's View of the Network



1.2 Printer Device Overview

A printer is the physical device that takes media from an input source, produces marks on that media according to some page description or page control language and puts the result in some

output destination, possibly with finishing applied. Printers are complex devices that consume supplies, produce waste and may have mechanical problems. In the management of the physical device the description, status and alert information concerning the printer and its various subparts has to be made available to the management application so that it can be reported to the end user, key operators for the replenishment of supplies or the repair or maintenance of the device. The information needed in the management of the physical printer and the management of a printing job overlap highly and many of the tasks in each management area require the same or similar information.

1.3 Categories of Printer Information

Information about printers is classified into three basic categories: descriptions, status and alerts.

1.3.1 Descriptions

Descriptions convey information about the configuration and capabilities of the printer and its various sub-units. This information is largely static information and does not generally change during the operation of the system but may change as the printer is repaired, reconfigured or upgraded. The descriptions are one part of the visible state of the printer where state means the condition of being of the printer at any point in time.

1.3.2 Status

Status is the information regarding the current operating state of the printer and its various sub-units. Status is the rest of the visible state of the printer. As an example of the use of status, a management application must be able to determine if the various sub-units are ready to print or are in some state that prevents printing or may prevent printing in the future.

1.3.3 Alerts

An Alert is the representation of a reportable event in the printer. An event is a change in the state of the printer. Some of those state changes are of interest to a management application and are therefore reportable. Typically, these are the events that affect the printer's ability to print. Alerts usually occur asynchronously to the operation of the computer system(s) to which the printer is attached. For convenience below, "alert" will be used for both the event caused by a change in the printer's state and for the representation of that event.

Alerts can be classified into two basic categories, critical and non-critical. A critical alert is one that is triggered by entry into a state in which the printer is stopped and printing can not continue until the condition that caused the critical alert is eliminated. "Out of paper", "toner empty" and "output bin full" are examples of critical alerts. Non-critical alerts are triggered

by those events that enter a state in which printing is not stopped. Such a non-critical state may, at some future time, lead to a state in which printing may be stopped. Examples of these kinds of non-critical alerts are "input media low", "toner low" and "output bin nearly full". Or, a non-critical alert may simply provide information, such as signaling a configuration changed in the printer.

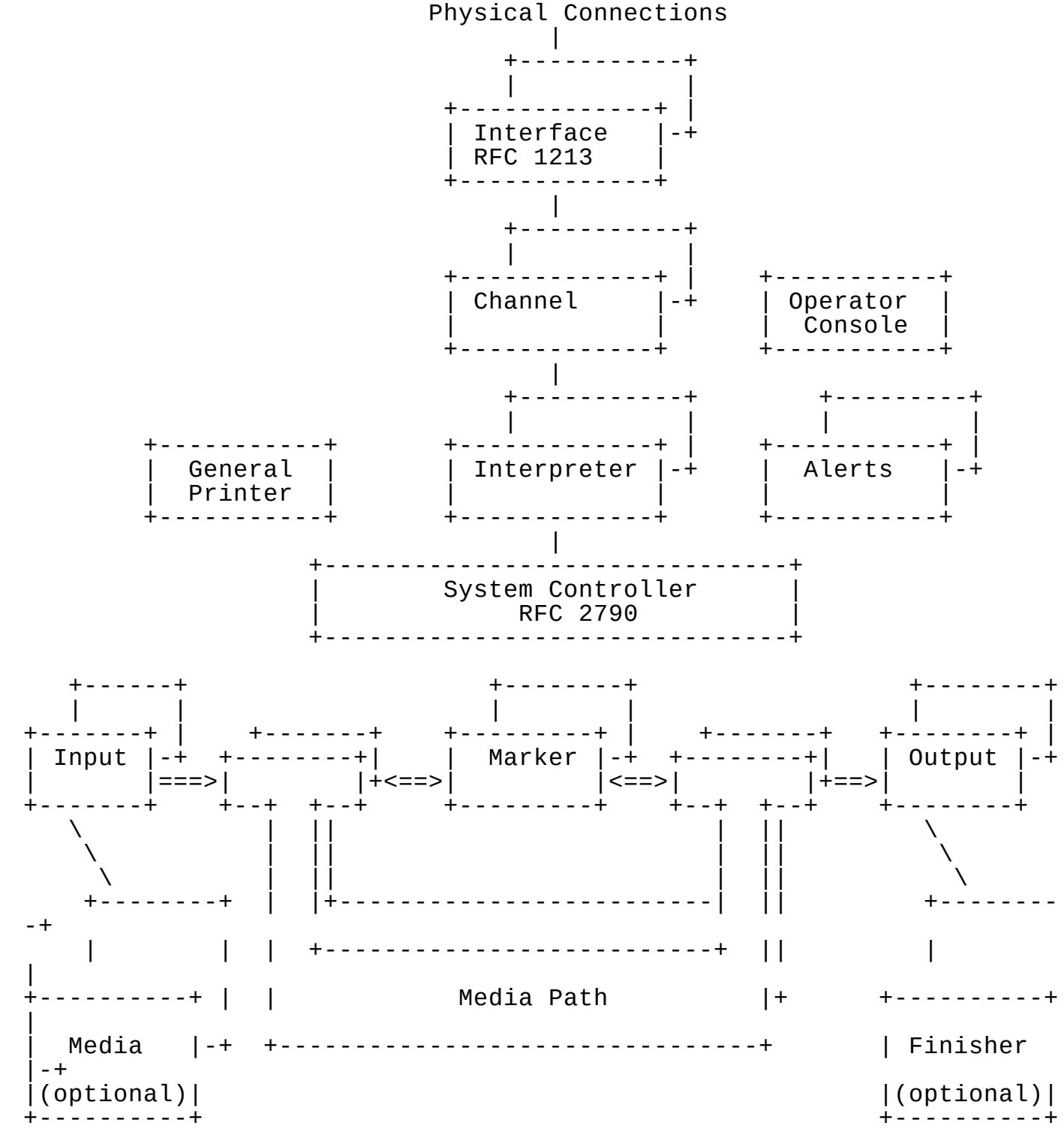
Description, status and alert information about the printer can be thought of as a database describing the printer. The management application for a printer will want to view the printer data base differently depending on how and for what purposes the information in the database is needed.

2. Printer Model

In order to accomplish the management of the printer, an abstract model of the printer is needed to represent the sub-units from which the printer is composed. A printer can be described as consisting of 13 types of sub-units. It is important to note that the sub-units of a printer do not necessarily relate directly to any physically identifiable mechanism. Sub-units can also be a set of definable logical processes, such as interpreters for page description languages or command processors that set various operating modes of the printer.

Figure 2 shows a block diagram of the printer and its basic 13 sub-units.

Figure 2 - Printer Block Diagram



2.1 Overview of the Printer Model

The model has three basic parts: (1) the flow of a print file into an interpreter and onto the marker, (2) the flow of media through

the marker and (3) the auxiliary sub-units that control and facilitate the two prior flows. The flow of the print data comes through a physical connection on which some form of transport protocol stack is running. The data provided by the transport protocol (interface) appears on a channel, which is the input to an interpreter. The interpreter converts the print data into a form suitable for marking on the media.

The media resides in Input sub-units from which the media is selected and then transported via a Media Path first to a Marking sub-unit and then onto an Output sub-unit with (optionally) some finishing operations being performed. The auxiliary sub-units facilitate control of the printer, inquiry/control of the operator panel, reporting of alerts and the adaptation of the printer to various natural languages and characters sets. All the software sub-units run on the System Controller that represents the processor, memory and storage systems of the Printer. Each of the sub-units is discussed in more detail below.

All of the sub-units other than the Alerts report only state information, either a description or a status. The Alerts sub-unit reports event information.

2.2 Printer Sub-Units

A printer is composed of 13 types of sub-units, called groups. The following sections describe the different types of sub-units.

2.2.1 General Printer

The general printer sub-unit is responsible for the overall control and status of the printer. There is exactly one general printer sub-unit in a printer. The General Printer Group in the model represents the general printer sub-unit. In addition to the providing the status of the whole printer and allowing the printer to be reset, this Group provides information on the status of the packaging of the printer, in particular, the covers. The general printer sub-unit is usually implemented on the system controller.

2.2.1.1 International Considerations

The localization portion of the general printer sub-unit is responsible for identifying the natural language, country, and character set in which certain character strings are expressed in this MIB.

There may be one or more localizations supported per printer. The available localizations are specified in the Localization table. Localization SHOULD only be performed on string objects which are named 'xxxDescription' (sub-unit descriptions) or 'prtConsoleDisplayBufferText' (local console text).

The agent SHALL return all other character strings in coded character sets in which code positions 0-127 (decimal) are US-

ASCII [6]. The agent SHOULD return all other character strings in the UTF-8 (RFC 2279 [21]) transform of ISO 10646 [8], to conform with the IETF Policy on Character Sets and Languages (RFC 2277 / BCP 18 [19]). Control codes (code positions 0-31 and 127 decimal) SHALL NOT be used unless specifically required in the DESCRIPTION of an object.

The character set portion of the general printer Localization table is responsible for identifying the possible character sets for the operator console, and network management requests for display objects. There may be one or more character sets per printer. Default coded character sets for interpreter unit and output octets are described in the interpreter sub-unit by prtInterpreterDefaultCharSetIn and prtInterpreterDefaultCharSetOut. These input/output character sets may be overridden by commands in the interpreter language itself.

2.2.2 Inputs

Input sub-units are mechanisms that feed media to be marked on into the printer. A printer contains one or more input sub-units. The Input Group in the model represents these. The model does not distinguish fixed input bins from removable trays, except to report when a removable tray has been removed.

There are as many input sub-units as there are distinctly selectable input "addresses". For example, if one tray has both a manual and auto feeding option, then this is two input sub-units if these two sources can be (must be) separately selected. However, the above would be considered one input sub-unit if putting a sheet in the manual feed slot overrides feeding from the contents of the tray. In the second case there is no way to separately select or address the manual feed slot.

2.2.3 Media

An input sub-unit can hold one or more instances of the media on which marking is to be done. Typically, there is a large set of possible media that can be associated with an input. The Media Group is an extension of the Input Group, which represents media in an input sub-unit. The Media Group only describes the current contents of each input and not the possible content of the input sub-unit.

2.2.4 Outputs

Output sub-units are mechanisms that receive media that has been marked on. A printer contains one or more output mechanisms. The Output Group in the model represents these. The model does not distinguish fixed output bins from removable output bins, except to report when a removable bin has been removed.

There are as many output sub-units as there are distinctly selectable output "addresses". Output sub-units can be addressed

in two different ways: (1) as a set of "mailboxes" which are addressed by a specific mailbox selector such as a bin number or a bin name, or (2) as a set of "slots" into which multiple copies are collated. Sometimes both modes of using the output sub-units can be used on the same printer. All that is important from the viewpoint of the model is that the output units can be separately selected.

2.2.5 Finishers

A finisher is a sub-unit that performs some operations on the media other than marking. The Finisher Group in the model represents the finisher sub-units. Some examples of finishing processes are stapling, punching, binding, inserting, or folding. Finishing processes may have supplies associated with the process. Stapling, binding, and punching are examples of processes that have supplies. A printer may have more than one finishing sub-unit and each finishing sub-unit may be associated with one or more output sub-units. Finishers are not described in this MIB.

The model does not specify the exact interaction and sequencing between an output device and its associated finisher. It depends on the type of finishing process and the exact implementation of the printer system. This standard allows for the logical association of a finishing process with an output device but does not put any restrictions on the exact sequence or interaction with the associated output device. The output and finisher sub-units may or may not be separate identifiable physical mechanisms depending on the exact implementation of a printer. In addition, a single output device may be associated with multiple finishing sub-units and a single finishing sub-unit may be associated with multiple output devices.

2.2.6 Markers

A marker is the mechanism that produces marks on the print media. The Marker Group in the model represents the marker sub-units and their associated supplies. A printer can contain one or more marking mechanisms. Some examples of multiple marker sub-units are a printer with separate markers for normal and magnetic ink or an imagesetter that can output to both a proofing device and final film. Each marking device can have its own set of characteristics associated with it, such as marking technology and resolution.

In this model the marker sub-unit is viewed as very generalized and encompasses all aspects of a marking process. For example, in a xerographic process, the marking process as well as the fusing process would be included in the generalized concept of the marker. With the generalized concept of a marking process, the concept of multiple marking supplies associated with a single marking sub-unit results. For example, in the xerographic process, there is not only a supply of toner, but there can also be other supplies such as a fuser supply (e.g., fuser oil) that can be consumed and replaced separately. In addition there can be

multiple supplies of toner for a single marker device, as in a color process.

2.2.7 Media Paths

The media paths encompass the mechanisms in the printer that move the media through the printer and connect all other media related sub-units: inputs, outputs, markers and finishers. A printer contains one or more media paths. The Media Path Group in the model represents these. The Media Path group has some objects that apply to all paths plus a table of the separate media paths.

In general, the design of the media paths determines the maximum speed of the printer as well as the maximum media size that the printer can handle. Media paths are complex mechanisms and can contain many different identifiable sub-mechanisms such as media movement devices, media buffers, duplex units and interlocks. Not all of the various sub-mechanisms reside on every media path. For example, one media path may provide printing only on one surface of the media (a simplex path) and another media path may have a sub-mechanism that turns the media over and feeds it a second time through the marker sub-unit (a duplex path). The duplex path may even have a buffer sub-mechanism that allows multiple copies of the obverse side to be held before the reverse side of all the copies is marked.

2.2.8 System Controller

The System Controller is the sub-unit upon which the software components of the Printer run. The Host Resources MIB represents the System Controller in the model. This MIB allows for the specification of the processor(s), memory, disk storage, file system and other underlying sub-mechanisms of the printer. The controller can range from simple single processor systems to multiprocessor systems. In addition, controllers can have a full range of resources such as hard disks. The printer is modeled to have one system controller even though it may have more than one processor and multiple other resources associated with it.

2.2.9 Interfaces

An interface is the communications port and associated protocols that are responsible for the transport of data to the printer. A printer has one or more interface sub-units. The interfaces are represented by the Interfaces Group of MIB-II (RFC 1213 [14]). Some examples of interfaces are serial ports (with little or no protocol) and Ethernet ports on which one might run Internet IP, Novell IPX, etc.

2.2.10 Print Job Delivery Channels

The print job delivery channel sub-units identify the independent sources of print data (here print data is the information that is used to construct printed pages and may have both data and control

aspects). A printer may have one or more channels. The channel sub-units are represented by the Print Job Delivery Channel Group in the Model. The electronic path typically identifies each channel and service protocol used to deliver print data to the printer. A channel sub-unit may be independently enabled (allowing print data to flow) or disabled (stopping the flow of print data). It has a current Control Language that can be used to specify which interpreter is to be used for the print data and to query and change environment variables used by the interpreters (and SNMP). There is also a default interpreter that is to be used if an interpreter is not explicitly specified using the Control Language. Print Job Delivery Channel sub-units can, and usually are, based on an underlying interface.

2.2.11 Interpreters

The interpreter sub-units are responsible for the conversion of a description of intended print instances into images that are to be marked on the media. A printer may have one or more interpreters. The Interpreter Group in the Model represents the interpreter sub-units. Each interpreter is generally implemented with software running on the System Controller sub-unit. The Interpreter Table has one entry per interpreter where the interpreters include both Page Description Language (PDL) Interpreters and Control Language Interpreters.

2.2.12 Console

Many printers have a console on the printer, the operator console that is used to display and modify the state of the printer. The console can be as simple as a few indicators and switches or as complicated as full screen displays and keyboards. There can be at most one such console. The Console Group in the model represents this console sub-unit. Although most of the information displayed there is also available in the state of the printer as represented by the various Groups, it is useful to be able to query and modify the operator console remotely. For example, a management application might like to display to its user the current message on the operator console of the remote printer or the management application user might like to modify the current message on the operators console of the remote printer. As another example, one might have a remote application that puts up a pseudo console on a workstation screen. Since the rules by which the printer state is mapped onto the console and vice versa are not standardized, it is not possible to reproduce the console state or the action of console buttons and menus. Therefore, the Console Group provides access to the console. The operator console is usually implemented on the system controller with additional hardware for input and display.

2.2.13 Alerts

The alert sub-unit is responsible for detecting reportable events, making an entry in the alert table and, if and only if the event

is a critical event, initiating a trap. The exception to this rule is when the "alertRemovalofBinaryChangeEntry" trap is generated. The alert sub-unit is represented by the Alerts Group and, in particular, the Alert Table. This table contains information on the severity, sub-unit, and detailed location within the sub-unit, alert code and description of each critical alert that is currently active within the printer. Each reportable event causes an entry to be made in the Alert Table.

2.2.13.1 Status and Alerts

Summary information about the state of the printer is reported at three separate levels: (1) The status of the printer as a whole is reported in the Host Resources MIB, (2) The status of various sub-units is reported in the principle table of the Group that represents the sub-unit, and (3) Alert codes are reported in the Alert Table.

2.2.13.2 Overall Printer Status

Of the many states a printer can be in, certain states are more "interesting" because of the distinct actions they are likely to provoke in the administrator. These states may be applied to the printer as a whole, or to a particular sub-unit of the printer. These named states are:

Non Critical Alert Active - For the printer this means that one or more sub-units have a non-critical alert active. For a sub-unit, this means that the sub-unit has a non-critical alert active.

Critical Alert Active - For the printer this means that one or more sub-units have a critical alert active. For a sub-unit, this means that the sub-unit has a critical alert active.

Unavailable - The printer or sub-unit is unavailable for use (this is the same as "broken" or "down" in other terminology). A trained service person is typically necessary to make it available.

Moving on-line or off-line - The printer is either off-line, in the process of moving off-line or moving back on-line. For example, on printers with motorized hoppers, reloading paper involves a transition to off-line to open the paper bin, filling the hopper and, finally, a transition back to on-line as the paper bin is repositioned for printing.

Standby - The printer or sub-unit is not immediately available but can accept new instructions.

Available - The printer or subunit is functioning normally.

Idle - The printer or subunit is immediately available.

Active - The printer or subunit is performing its primary

function.

Busy - The printer or subunit is performing a function (not necessarily its primary function) and is not immediately available for its primary function.

The Host Resources MIB (RFC 2790 [28]) provides three status objects that can be used to describe the status of a printer: (1) hrDeviceStatus in the entry in the hrDeviceTable; (2) hrPrinterStatus in the hrPrinterTable; and (3) hrPrinterDetectedErrorState in the hrPrinterTable. These objects describe many of the states that a printer can be in. The following table shows how the values of the three printer-related objects in the Host Resources MIB relate to the states named above:

Printer Status	hrDeviceStatus	hrPrinterStatus	hrPrinterDetected-ErrorState
Idle	running(2)	idle(3)	none set
Busy/ Active	running(2)	printing(4)	
Non Critical Alert Active	warning(3)	idle(3) or printing(4)	could be: lowPaper, lowToner, or serviceRequested
Critical Alert Active	down(5)	other(1)	could be: jammed, noPaper, noToner, coverOpen, or serviceRequested
Unavailable	down(5)	other(1)	
Moving off-line	warning(3)	idle(3) or printing(4)	offline
Off-line	down(5)	other(1)	offline
Moving on-line	down(5)	warmup(5)	
Standby	running(2)	other(1)	

These named states are only a subset of the possible states - they are not an exhaustive list of the possible states. Nevertheless, several things should be noted. When using these states, it is not possible to detect when both critical and non-critical alerts are pending - if both are pending, the Critical Alert Active state will prevail. In addition, a printer in the Standby state will be represented in the Host Resources MIB with a device status of running(2) and a printer status of other(1), a set of states that don't uniquely distinguish this important printer state.

Detailed status per sub-unit is reported in the sub-unit status fields.

2.2.13.2.1 Host Resources MIB Printer Status

For completeness, the definitions of the Printer Status objects of the Host Resources MIB (RFC 2790 [28])are given below:

```
hrDeviceStatus OBJECT-TYPE
    SYNTAX  INTEGER {
                unknown(1),
                running(2),
                warning(3),
                testing(4),
                down(5)
            }
    ACCESS  read-only
    STATUS  mandatory
    DESCRIPTION
     "The current operational state of the device
     described by this row of the table.  A value
     unknown(1) indicates that the current state of the
     device is unknown.  running(2) indicates that the
     device is up and running and that no unusual error
     conditions are known.  The warning(3) state
     indicates that agent has been informed of an
     unusual error condition by the operational software
     (e.g., a disk device driver) but that the device
     is still 'operational'.  An example would be high
     number of soft errors on a disk.  A value of
     testing(4), indicates that the device is not
     available for use because it is in the testing
     state.  The state of down(5) is used only when
     the agent has been informed that the device is
     not available for any use."
    ::= { hrDeviceEntry 5 }

hrPrinterStatus OBJECT-TYPE
    SYNTAX INTEGER {
              other(1),
              unknown(2),
              idle(3),
              printing(4),
              warmup(5)
            }
    ACCESS  read-only
    STATUS  mandatory
    DESCRIPTION
     "The current status of this printer device.  When in the
     idle(3), printing(4), or warmup(5) state, the
corresponding
      hrDeviceStatus should be running(2) or warning(3).  When
in
      the unknown(2) state, the corresponding hrDeviceStatus
```

```
      should
           be unknown(1)."
          ::= { hrPrinterEntry 1 }

      hrPrinterDetectedErrorState OBJECT-TYPE
          SYNTAX OCTET STRING (0..128)
          ACCESS read-only
          STATUS mandatory
          DESCRIPTION
           "This object represents any error conditions detected by
      the
           printer.  The error conditions are encoded as an OCTET
      STRING
           with the following definitions:

           Condition          Bit #

           lowPaper             0
           noPaper              1
           lowToner             2
           noToner              3
           doorOpen             4
           jammed               5
           offline              6
           serviceRequested     7

           inputTrayMissing     8
           outputTrayMissing    9
           markerSupplyMissing 10
           outputNearFull      11
           outputFull          12
           inputTrayEmpty      13
           overduePreventMaint 14

           Bit # 15 is not assigned.
           If multiple conditions are currently detected and the
           hrDeviceStatus would not otherwise be unknown(1) or
           testing(4), the hrDeviceStatus shall correspond to the
      worst
           state of those indicated, where down(5) is worse than
           warning(3), which is worse than running(2).

           Bits are numbered starting with the most significant bit
      of
           the first byte being bit 0, the least significant bit of
      the
           first byte being bit 7, the most significant bit of the
           second byte being bit 8, and so on.  A one bit encodes
      that
           the condition was detected, while a zero bit encodes that
      the
           condition was not detected.

           This object is useful for alerting an operator to specific
```

warning or error conditions that may occur, especially those
requiring human intervention."
::= { hrPrinterEntry 2 }

2.2.13.2.2 Sub-unit Status

Sub-unit status is reported in the entries of the principle table in the Group that represents the sub-unit. For sub-units that report a status, there is a status column in the table and the value of this column is always an integer formed in the following way.

The SubUnitStatus is an integer that is the sum of 5 distinct values, Availability, Non-Critical, Critical, On-line, and Transitioning. These values are:

	value	
Availability		
Available and Idle	0	000'b
Available and Standby	2	010'b
Available and Active	4	100'b
Available and Busy	6	110'b
Unavailable and OnRequest	1	001'b
Unavailable because Broken	3	011'b
Unknown	5	101'b
Non-Critical		
No Non-Critical Alerts	0	
Non-Critical Alerts	8	
Critical		
No Critical Alerts	0	
Critical Alerts	16	
On-Line		
State is On-Line	0	
State is Off-Line	32	
Transitioning		
At intended state	0	
Transitioning to intended state	64	

For example, an input (tray) that jammed on the next to the last page may show a status of 27 (unavailable because broken (3) + a critical state (16), jammed, and a noncritical state (8), low paper).

2.2.13.3 Alert Tables

The Alert Group consists of a single table in which all active alerts are represented. This section provides an overview of the table and a description of how it is managed. The basic content of the alert table is the severity (critical or non-critical) of the alert, the Group and entry where a state change caused the alert, additional information about the alert (a more detailed location, an alert code, and a description), and an indication of the level of training needed to service the alert.

The Alert Table contains some information that is redundant, for example that an event has occurred, and some information that is only represented in the Alert Table, for example the additional information. A single table was used because a single entry in a group could cause more than one alert, for example paper jams in more than one place in a media path. Associating the additional information with the entry in the affected group would only allow one report where associating the additional information with the alert makes multiple reports possible. Every time an alert occurs in the printer, the printer makes one or more entries into the Alert Table. The printer determines if an event is to be classified as critical or non-critical. If the severity of the Alert is "critical", the printer sends a trap or event notification to the host indicating that the table has changed. Whether or not a trap is sent, the management application is expected to poll the printer on a regular basis and to read and parse the table to determine what conditions have changed, in order to provide reliable information to the management application user.

2.2.13.4 Alert Table Management

The alert tables are sparsely populated tables. This means the tables will only contain entries of the alerts that are currently active and the number of rows, or entries in the table will be dynamic. More than one event can be added or removed from the event tables at a time depending on the implementation of the printer.

There are basically two kinds of events that produce alerts: binary change events and unary change events. Binary change events come in pairs: the leading edge event and the trailing edge event. The leading edge event enters a state from which there is only one exit; for example, going from running to stopped with a paper jam. The only exit from this state is fixing the paper jam and it is clear when that is accomplished. The trailing edge event exits the state that was entered by the leading edge event. In the example above, fixing the paper jam is the trailing edge event.

It is relatively straightforward to manage binary change events in the Alert Table. Only the leading edge event makes an entry in the alert table. This entry persists in the Alert Table until the trailing edge event occurs at which point this event is signaled by the removal of the leading edge event entry in the Alert Table. That is, a trailing edge event does not create an entry; it

removes the corresponding leading edge event. Removing the leading edge entry may cause the unary change event "alertRemovalofBinaryChangeEntry" to be added to the table. With binary change events it is possible to compute the maximum number that can occur at the same time and construct an Alert Table that would hold that many events. There would be no possibility of table overflow and no information about outstanding events would be lost.

Unfortunately, there are some events that are not binary changes. This other category of event, the unary change event, is illustrated by the configuration change event. With this kind of event the state of the machine has changed, but to a state which is (often) just as valid as the state that was left and from which no return is necessary. For example, an operator may change the paper that is in the primary input source from letter to legal. At some time in the future the paper may be changed back to letter, but it might be changed to executive instead. This is where the problem occurs. It is not obvious how long to keep unary change event entries in the Alert Table. If they were never removed, the Alert Table would continue to grow indefinitely.

The agent needs to have an algorithm implemented for the management of the alert table, especially in the face of combinations of binary and unary alerts that would overflow the storage capacity of the table. When the table is full and new alerts need to be added, old alerts must be removed. An alert to be deleted should be chosen using the following rules:

1. Find a non-critical unary alert and delete it. If there are multiple non-critical unary alerts, it is suggested that the oldest one is chosen. If there are no non-critical unary alerts, then,

2. Find a non-critical binary alert and delete it. If there are multiple non-critical binary alerts, it is suggested that the oldest one is chosen. If there are no non-critical binary alerts, then,

3. Find a critical (binary) alert and delete it. If there are multiple critical alerts, it is suggested that the oldest one be chosen. Agent implementers are encouraged to provide at least enough storage space for the maximum number of critical alerts that could occur simultaneously. Note that all critical alerts are binary.

In the event that a critical binary alert must be managed out of the alert table; when space allows and the alert condition still exists, the alert must be re-added to the alert table even if there was no subsequent transition into the associated state. It is recommended that this be done for non-critical binary alerts as well. Note that the new alert entry will not have the same index as the original entry that was moved out of the table.

Note that because the Alert Index is a monotonically increasing integer there will be gaps in the values in the table when an alert is deleted. The management application may want to re-acquire the Printer state and check for state changes that it did not observe in the Alert Table if such gaps are detected.

2.3 Read-Write Objects

Some objects in the printer MIB reflect the existence or amount of a given resource within the printer. Some examples of such resources are the size and number of sheets in a paper tray or the existence of certain output options. Some printers have automatic sensors for these resources. Most printers lack sensors for every property of every resource. The management application is allowed to write into objects that hold descriptive or existence values for printers that cannot sense these values. The ability to change the value of a read-write object may depend on the implementation of the agent. Many objects in the MIB are given read-write access, but a printer implementation might only permit a management application to change the value if the printer can not sense the value itself. Note that even though some objects explicitly state the behavior of conditional ability to change values, any read-write object may act this way.

Generally, an object is given read-write access in the Printer MIB specification if:

1. The object involves installation of a resource that some printers cannot themselves detect. Therefore, external means are needed to inform the printer of the installation. (Here external means include using the operator console, or remote management application) and

2. The printer will behave differently if the installation of the resource is reported than the printer would if the installation were not reported; that is, the object is not to be used as a place to put information not used by the printer, i.e., not a "sticky-note". Another way of saying this is that the printer believes that information given it and acts as if the information were true. For example, on a printer that cannot sense the size, if one paper size is loaded, but another size is set into the paper size object, then the printer will use the size that was set as its current paper size in its imaging and paper handling.

3. The printer may get hints that it may not know about the existence or properties of certain resources. For example, a paper tray may be removed and re-inserted. When this removal and insertion happens, the printer may either assume that a property, such as the size of paper in the tray, has not changed or the printer may change the value of the associated object to "unknown", as might be done for the amount of paper in the tray. As long as the printer acts according to the value in the object either strategy is acceptable.

4. It is an implementation-specific matter as to whether or not MIB object values are persistent across power cycles or cold starts. It is particularly important that the values of the prtMarkerLifeCount object persist throughout the lifetime of the printer. Therefore, if the value of any MIB object persists across power cycles, then the prtMarkerLifeCount object must also persist.

2.4 Enumerations

Enumerations (enums) are sets of symbolic values defined for use with one or more objects. Some common enumeration sets are assigned a symbolic data type name (textual convention). These enumerations are listed at the beginning of this specification.

2.4.1 Registering Additional Enumerated Values

This working group has defined several types of enumerations. These enumerations differ in the method employed to control the addition of new enumerations. Throughout this document, references to "enumeration (n)", where n can be 1, 2 or 3 can be found in the various tables. The definitions of these types of enumerations are:

enumeration (1) All the values are defined in this Printer MIB specification. Additional enumerated values require a revision to this specification. Type 1 enumerations are typically used where changes to the enumeration are either unlikely or will have a significant impact on the structure of the MIB or implementation of the MIB in management applications.

Some criteria that suggest using a type 1 enumeration are:

a) the set of values in the enumeration is thought to be known, e.g., faceUp and faceDown

b) the enumeration defines a set of units of measure which must be understood by a management application to be able to correctly display the value of an object that measurement unit controls; and

c) the enumeration is tied to the structure of the MIB or the model on which the MIB is based, e.g., the prtAlertGroup enumeration is tied to the OIDs for the related tables.

enumeration (2) An initial set of values are defined in the Printer MIB specification. This working group reviews and registers additional enumerated values that pertain to printers and this MIB. The initial versions of the MIB will contain the values registered so far. After the MIB is approved, this working group will register additional values through IANA as appropriate. The current set of approved values should always be obtained from the IANA registry. Type 2 enumerations are typically used where it is important to insure consistent usage of the enumeration values; that is, to insure that the same entity does not get two different

enumerations values, or two different entities do not get the same enum value.

enumeration (3) An initial set of values are defined in the Printer MIB specification. Additional enumerated values are registered without working group review. The initial versions of the MIB will contain the values registered so far. After the MIB is approved, anyone may register additional values through IANA without approval. The current set of approved values may be obtained from the IANA registry. Type 3 enumerations are used for enumerations that can be extended without any controls; an example is the prtMarkerSuppliesType, which can be extended as needed by any manufacturer to describe the supplies required by a new printer.

3. Groups from other MIB Specifications

This section identifies the groups from other MIBs that shall be supported to supplement and complete a printer MIB implementation. The section also describes some of the less obvious characteristics of the Printer MIB structure that are related to the inclusion of these other MIB groups.

3.1 System Group

All objects in the system group of MIB-II (RFC 1213 [14]) shall be implemented; however, as described in paragraph 3.4, implementers should carefully consider what constitutes the "system".

3.2 System Controller

The storage and device groups of the Host Resources MIB (RFC 2790 [28]) shall be implemented to support the printer(s) system controller, and any supporting devices. If deemed appropriate by the implementer, other groups of the Host Resources MIB (System, Running Software, Running Software Performance, and Installed Software) may be implemented.
Because of the structure of the Host Resources MIB, the devices constituting the system controller are at the same level as the printer.

3.3 Interface Group objects

All objects in the Interfaces Group of MIB-II (RFC 1213 [14]) shall be implemented for all print information interfaces to the printer, including non-network interfaces.

3.3.1 Interface Types

The interfaces group of RFC 1213 [14] contains only a partial list of interface types that can be specified in the "ifType" object. For a complete list of interface types, refer to the IANA registry at "ftp://ftp.isi.edu/mib/ianaiftype.mib"

3.4 Implications involved with using external MIB groups

In structuring the Printer MIB, it is inconvenient to follow the hierarchical structure implicit in the printer block diagram. There are two reasons for this:

1. Figure 2 suggests that the printer interface to the network be through the interfaces group. It is generally required that this network node is supported by an implementation of RFC 1213 [14]. However, the network node may support one printer or several printers. Further, the SNMP agent may be within the "system controller" (the printer controller board), or the SNMP agent may be within a device completely external to the printer system controller. Therefore, the relationship between the MIB-II defined network node, the agent implementing the Printer and Host Resources MIB, and the functional printer itself may not be consistent with the structure suggested in figure 2.

2. In many cases, the printer controller is a generic computing device (PC or other standalone computer) containing many of the resources of a standard host computer. This includes devices such as memory, interfaces, network, and printer. The Host Resources MIB has well-developed structures for such devices. However, the Host Resources MIB only deals with devices associated with a single "host", and it considers the printer to be a part of this host on the same level as memory, processor, and other devices considered part of the "System Controller" of the printer.

Therefore, it was convenient to conceive of a "host" associated with the SNMP agent and with the network node by which the agent and ultimately the printer(s) communicate with the network. All host-resource devices communicating through this network node are considered part of the host and are supported by implementation of the Host Resources MIB Device and Storage group.

Another consideration is that, not only are the printer and the host resource devices constituting the System Controller of the printer at the same level, but if there are multiple printers, these printers and the Host Resource devices constituting these printers are all at the same level, whether the devices are dedicated to one printer or shared. The functional hierarchy implicit in the printer block diagram is therefore flattened with respect to host resource devices.

3.4.1 Host Resource MIB Device Group

For each instance of a host resource device, the following attributes exist:

hrDeviceIndex, hrDeviceType, hrDeviceDescr, hrDeviceID, hrDeviceStatus, and hrDeviceErrors.

The Device Description, Device ID and Device Status listed in this table identify and characterize a printer. The hrDevice index for

each printer is included as an indexing value for almost all variables in the Printer MIB. In the case of multiple printers, the printer MIB appears as a composite MIB for all printers considered part of this "host". Each table of the printer MIB that includes hrDeviceIndex as an index will contain the variables for each printer.

Non-printer devices listed in the table are associated with one or more listed printer devices by the prtDeviceRefTable in the printer MIB. This table, as most in the printer MIB, is indexed by hrDeviceIndex; but unlike most of the other tables where the devices of interest are printers, the devices of interest for this table are non-printer devices. The only accessible object for each row in this table is the device number of the printer device that is associated with the indexed non-printer device. The table includes a second index, prtDeviceRefSeqNumber, which allows a listed device to be associated with multiple printer devices.

For example, a fully integrated printer may contain, as part of its system controller, hrDeviceProcessor, hrDeviceNetwork, hrDeviceDiskStorage, hrDeviceParallelPort, hrDeviceSerialPort, hrDeviceVolatileMemory and hrDeviceNonVolatileMemory.

Ideally, these must all be listed as devices in the virtual host, along with the printer (hrDevicePrinter) itself. Therefore, in this example, eight devices would be included with hrDeviceIndex values of "1 - 8". Since there is but one printer, the prtDeviceRefTable in the printer MIB would contain seven entries, each with a value identifying the printer hrDeviceIndex. Because there is only one printer, devices are not shared and the prtDeviceRefSeqNumber index is (1) in all cases.

Further, the Host Resource MIB defines device specific tables to be supported for certain devices. These devices, and the primary significance of the additional table(s) are:

hrProcessorTable: identification and significant characteristics of processor.

hrNetworkTable: correlates a network device to a MIB-II ifIndex key
hrPrinterTable and hrPrinterErrorTable: the mechanism communicating the status of each printer.

hrDiskStorageTable: identifies disk access, media type and capacity.

hrPartitionTable: identifies "partitions" on long term storage devices.

hrFSTable: identifies local file system type, characteristics and parameters.

3.4.2 Host Resource Storage Group

Program and data storage exist both as physical devices in the Host Resource Device Table, and as logical storage areas supported in the Host Resource Storage Group. Logical storage is listed and assigned an index in the hrStorageTable. Storage is correlated to specific printers by the prtStorageRefTable in the Printer MIB. This table is indexed by hrStorageIndex. The only accessible object for each row in this table is the device number of the printer device that is associated with the indexed storage. The table includes a second index, prtStorageRefSeqNumber, which allows logical storage to be associated with multiple printer devices.

3.4.3 MIB-II Interface Group

The interfaces by which the printer receives print data are identified within the Interfaces table of MIB-II (RFC 1213 [14]). In the case of multiple printers, the network interface for the “host” as well as all of the interfaces for all printers is listed in this table. The interfaces may also be listed as devices in the Host Resource Device Table. Network Port devices are identified by MIB-II "ifIndex" objects to correlate them back to the MIB-II interface table; no such provision exists for "serial" and "parallel" ports. Interfaces listed in the Host Resource device table may be correlated to specific printers in the "host" by the prtDeviceRefTable in the printer MIB; this may be useful if there are multiple printers. The "ifIndex" is also used to identify the interface associated with each channel in the Printer MIB "Print Job Delivery Channel" group. Therefore, specific interfaces are also correlated back to specific printers via the "channels" mechanism.

4. Differences from Previous Version

This draft supercedes and replaces RFC 1759. The following changes are included here.

- Minor editorial corrections and changes.

- Updated Coded Character Set description and IANA registration process.

- Change hrPrinterDetectedErrorState "coverOpen" (bit 4) to "doorOpen" per RFC 2790.

- Added second octet of hrPrinterDetectedErrorState as partially described and assigned in the updated Host Resources MIB (RFC 2790).

- Remove fixed association of hrDeviceStatus (warning/down) from hrPrinterDetetctedErrorState per RFC 2790.

- Instead of showing bit 15 as "not assigned" in the quote from

RFC 2790 in the hrPrinterDetectedErrorState object, removed that from the tabular form and added it as a sentence, because the RFC doesn't show bit 15 in the tabular form.

- Clarfied the international considerations.

- Added prtChannelInformation to the Channel Group textual-conventions on a per channel basis to clarify the channel description and enhance interoperability.

- Deprecated some obsolete channel types.

- Extended the Alert Table and PrtMarkerSuppliesSupplyUnit textual conventions to include values from the Finisher MIB.

- Clarify alerts based on unary vs. binary change events.

- Added (optional) unary change event alertRemovalOfBinaryChangeEntry(1801).

- Establish a convention for contact information for prtGeneralCurrentOperator and prtGeneralServicePerson.

- Added prtAuxiliarySheetStartupPage PresentOnOff

- Added prtAuxiliarySheetBannerPage PresentOnOff

- Added prtGeneralPrinterName OCTET STRING

- Added prtGeneralSerialNumber OCTET STRING

- Added prtInputNextIndex Integer32

- Added the Input Switching Group

- Added prtAlertCriticalEvents Counter32

- Added prtAlertAllEvents Counter32

- Updated PrtAlertCode enums including generic alert codes.

- Deprecated the use of alert codes doorOpen(501) and doorClosed(502), in favor of coverOpened(3) and coverClosed(4).

- Added the PrtConsoleDisableTC and PrtMarkerAddressabilityUnitTC textual conventions, and changed the PrtConsoleDisable and PrtMarkerAddressabilityUnit objects' syntax to use those TCs, and changed the PrtGeneralEntry and PrtMarkerColorantEntry SEQUENCEs to reflect the new syntax.

- Added 'IANA Considerations' and 'Internationalization Considerations' as top level sections, per IETF guidelines.

- Updated Security and Copyright sections.

- Updated references.

- Added Appendix E - Overall Printer Status Table.

- Updated participant and contact information.

5. The Printer MIB

```
Printer-MIB DEFINITIONS ::= BEGIN

IMPORTS
    MODULE-IDENTITY, OBJECT-TYPE, Counter32, Integer32, TimeTicks,
        NOTIFICATION-TYPE, OBJECT-IDENTITY, mib-2 FROM SNMPv2-SMI
    TEXTUAL-CONVENTION, DisplayString FROM SNMPv2-TC
    MODULE-COMPLIANCE, OBJECT-GROUP FROM SNMPv2-CONF
    hrDeviceIndex, hrStorageIndex FROM HOST-RESOURCES-MIB;

printmib MODULE-IDENTITY
    LAST-UPDATED "0008090000Z"  -- 2-digit year, 20xx
    ORGANIZATION "IETF Printer MIB Working Group"
    CONTACT-INFO
        "Harry Lewis
        IBM Corporation.
        6300 Diagonal Hwy
        Boulder, CO 80301
        harryl@us.ibm.com"
    DESCRIPTION
        "The MIB module for management of printers."
    ::= { mib-2 43 }

-- Textual conventions for this MIB module
--
-- Generic unspecific textual conventions
--

PrtMediaUnitTC ::= TEXTUAL-CONVENTION
    -- This is a type 1 enumeration.
    STATUS    current
    DESCRIPTION
        "Units of measure for media dimensions."
    SYNTAX    INTEGER {
                  tenThousandthsOfInches(3),  -- .0001
                  micrometers(4)
                  }

PrtCapacityUnitTC ::= TEXTUAL-CONVENTION
    -- This is a type 1 enumeration.
    STATUS    current
    DESCRIPTION
        "Units of measure for media capacity."
    SYNTAX    INTEGER {
                  other(1),
                  unknown(2),
```

```
                    tenThousandthsOfInches(3),  -- .0001
                    micrometers(4),
                    sheets(8),
                    feet(16),
                    meters(17),
                  -- Values for Finisher MIB
                    items(18),
                    percent(19)
                    }

PrtPrintOrientationTC ::= TEXTUAL-CONVENTION
    -- This value is a type 1 enumeration.
    STATUS    current
    DESCRIPTION
        "A generic representation for printing orientation on a
'page'."
    SYNTAX    INTEGER {
                    other(1),
                    portrait(3),
                    landscape(4)
                    }

PrtCoverStatusTC ::= TEXTUAL-CONVENTION
    -- This is a type 2 enumeration.
    STATUS    current
    DESCRIPTION
        "Values for encoding the state of a particular cover or
access
        panel on the printer case or enclosure."
    SYNTAX    INTEGER {
                    other(1),
                    coverOpen(3),
                    coverClosed(4),
                    interlockOpen(5),
                    interlockClosed(6)
                    }

PrtSubUnitStatusTC ::= TEXTUAL-CONVENTION
    -- This is a type 1 enumeration.
    STATUS    current
    DESCRIPTION
        "Status of a printer sub-unit.

        The SubUnitStatus is an integer that is the sum of 5 distinct
        values, Availability, Non-Critical, Critical, On-line, and
        Transitioning. These values are:

        Availability                          Value

            Available and Idle                 0       000'b
            Available and Standby              2       010'b
            Available and Active               4       100'b
            Available and Busy                 6       110'b
            Unavailable and OnRequest          1       001'b
```

```
            Unavailable because Broken          3       011'b
            Unknown                             5       101'b

        Non-Critical
            No Non-Critical Alerts              0
            Non-Critical Alerts                 8

        Critical

            No Critical Alerts                  0
            Critical Alerts                    16

        On-Line

            State is On-Line                    0
            State is Off-Line                  32

        Transitioning

            At intended state                   0
            Transitioning to intended state    64"

    SYNTAX    INTEGER (0..126)

PresentOnOff ::= TEXTUAL-CONVENTION
    -- This is a type 1 enumeration.
    STATUS    current
    DESCRIPTION
        "Presence and configuration of a device or feature."
    SYNTAX    INTEGER {
                  other(1),
                  on(3),
                  off(4),
                  notPresent(5)
                  }

CodedCharSet ::= TEXTUAL-CONVENTION
    -- This is a type 3 enumeration.
    STATUS    current
    DESCRIPTION
        "A coded character set value that specifies both a set of
        characters that may be used and an encoding (as one or more
        octets) that is used to represent the characters in the set.
        These values are to be used to identify the encoding employed
        for strings in the MIB where this is not fixed by the MIB.

        Some objects that allow a choice of coded character set are:
the
        prtLocalizationCharacterSet object in the LocalizationTable
and
        prtInterpreterDefaultCharSetIn. The
        prtGeneralCurrentLocalization and prtConsoleLocalization
objects
        in turn contain the index in the LocalizationTable of the
```

```
        current localization (country, language, and coded character
        set) of the 'description' objects and the console,
respectively.

        The current list of character sets and their enumerated
values
        used to reference them are contained in the IANA Character
Set
        registry.  The enum value is indicated by the MIBenum entry
in
        the registry.  The enum symbol is indicated by the Alias that
        starts with 'cs' for character set.

        The IANA character sets registry is [4].
        To add a new character set to the IANA Registry, see RFC 2278
        or BCP 19 [20]."

    SYNTAX    INTEGER {
                  other(1)    -- used if the designated coded
                              -- character set is not currently
                              -- registered by IANA

    -- See [4] for registered character sets and
    -- use the MIBenum integer value.
                  }

--
-- General Group textual-conventions
--

PrtGeneralResetTC ::= TEXTUAL-CONVENTION
    -- This value is a type 3 enumeration.
    STATUS    current
    DESCRIPTION
        "Values for reading and writing the prtGeneralReset object.

    If a device does not have NVRAM, the device shall none the less
    respond to a SET with the value resetToNVRAM(5) with some sort of
    warm reset that resets the device to some implementation-defined
    state that is preferably under control of the system
administrator
    by some means outside the scope of this MIB specification."

    SYNTAX    INTEGER {
                  notResetting(3),
                  powerCycleReset(4), -- Cold Start
                  resetToNVRAM(5), -- Warm Start
                  resetToFactoryDefaults(6) -- Reset contents of
                                            -- NVRAM to factory
                                            -- defaults
                  }

--
-- Channel Group textual-conventions
```

```
--

PrtChannelStateTC ::= TEXTUAL-CONVENTION
    -- This value is a type 1 enumeration.
    STATUS    current
    DESCRIPTION
        "The state of this print job delivery channel. The value
        determine whether control information and print data is
allowed
        through this channel."
    SYNTAX    INTEGER {
                  other(1),
                  printDataAccepted(3),
                  noDataAccepted(4)
                  }

PrtChannelTypeTC ::= TEXTUAL-CONVENTION
    --  This is a type 2 enumeration.
    STATUS    current
    DESCRIPTION
        "This enumeration indicates the type of channel that is
        receiving jobs."
    SYNTAX    INTEGER {
                  other(1),
                  chSerialPort(3),
                  chParallelPort(4),
                  chIEEE1284Port(5),
                  chSCSIPort(6),
                  chAppleTalkPAP(7),
                      -- AppleTalk Printer
                      -- Access Protocol (PAP)
                      --
                      -- prtChannelInformation entry:
                      --
                      -- Printer Name
                      --   Keyword:      Name
                      --   Syntax:       Name
                      --   Status:       Optional
                      --   Multiplicity: Single
                      --   Description:  The name of the printer
within
                      --   the AppleTalk naming scope
                  chLPDServer(8),
                      -- prtChannelInformation entry:
                      --
                      -- Printer queue name
                      --   Keyword:      Queue
                      --   Syntax:       Name
                      --   Status:       Mandatory
                      --   Multiplicity: Single
                      --   Description: queue name as
                      --                defined in RFC 1179 [12].
                  chNetwareRPrinter(9),
                      -- Novell, Inc.
```

```
                        -- For each entry of this type, the
                        -- prtChannelInformation must have a pair of
                        -- keywords. For Netware 3.x channels this must
                        -- be a (PServer, Printer) pair. For Netware
4.x
                        -- channels and for IntranetWare channels this
                        -- must be a (NDSTree, NDSPrinter) pair.
                        --
                        -- prtChannelInformation entries:

                        -- Print Server Name
                        --   Keyword:      PServer
                        --   Syntax:       Name
                        --   Status:       Mandatory
                        --   Multiplicity: Single
                        --   Description:  The Pserver's SAP name
                        --
                        -- Printer Number
                        --   Keyword:      Printer
                        --   Syntax:       Integer
                        --   Status:       Mandatory
                        --   Multiplicity: Single
                        --   Description:  The printer number
                        --
                        -- NDSTree
                        --   Keyword:      NDSTree
                        --   Syntax:       Name
                        --   Multiplicity: Single
                        --   Description:  The tree's SAP name
                        --
                        -- NDS Printer object
                        --   Keyword:      NDSPrinter
                        --   Syntax:       Text (Unicode)
                        --   Status:       Mandatory
                        --   Multiplicity: Single
                        --   Description:  The fully qualified
                        --                 name of the Printer
                        --
                        -- In the Netware 3.x environment, the
                        -- client checks the Bindery object
                        -- representing the named PServer. The
                        -- client then checks for queues which
                        -- are associated with the numbered
                        -- printer. In the 4.x and IntraNetware
                        -- environment, the client looks up the
                        -- queues which are associated with the
                        -- NDS Printer Object in the named Tree.
                        -- Depending on client access rights to
                        -- those queues, the client submits jobs
                        -- to the appropriate queue.
                    chNetwarePServer(10),
                        -- Novell,Inc.
                        -- For each entry of this type, the
                        -- prtChannelInformation must have a pair
```

```
                        -- of keywords. For Netware 3.x channels
                        -- this must be a (Server, PServer) pair.
                        -- For Netware 4.x and IntranetWare
                        -- channels, this must be a
                        -- (NDSTree, NDSPServer) pair.
                        --
                        -- prtChannelInformation entries:
                        --
                        -- Server Name
                        --   Keyword:      Server
                        --   Syntax:       Name
                        --   Status:       Mandatory
                        --   Multiplicity: Single
                        --   Description:  The SAP name of the
                        --       server for which the PServer is
defined.
                        --
                        -- PServer
                        --   Keyword:      PServer
                        --   Syntax:       Name
                        --   Status:       Mandatory
                        --   Multiplicity: Single
                        --   Description:  The bindery name of
                        --                 the PServer
                        --
                        -- NDS Tree
                        --   Keyword:      NDSTree
                        --   Syntax:       Name
                        --   Status:       Mandatory
                        --   Multiplicity: Single
                        --   Description:  The NDS Tree name
                        --
                        -- PServer
                        --   Keyword:      NDSPServer
                        --   Syntax:       Text (Unicode)
                        --   Status:       Mandatory
                        --   Multiplicity: Single
                        --   Description:  The fully qualified
                        --     name of the PServer object in the tree.
                        --
                        -- In the 3.x environment, the client
                        -- checks the bindery object
                        -- representing the named PServer on the
                        -- named Server. In the 4.x and
                        -- IntranetWare environment,
                        -- the client checks the NDS object
                        -- representing the named PServer in the
                        -- named Tree. In either case, the
                        -- client then checks for all queues
                        -- associated with the Pserver object.
                        -- Depending on client access rights
                        -- to those queues, the client submits
                        -- jobs to the appropriate queue.
                    chPort9100(11),
```

```
                    -- DEPRECATED
                    -- (see chPortTCP – 37; chBidirPortTCP – 38)
                chAppSocket(12),
                    -- A bi-directional, LPD-like,
                    -- protocol using 9101 for
                    -- control and 9100 for data.
                    -- Adobe Systems, Inc.
                chFTP(13),          -- RFC 959 [11]
                chTFTP(14),         -- RFC 1350 [13]
                chDLCLLCPort(15),
                chIBM3270(16),      -- IBM Coax
                chIBM5250(17),      -- IBM Twinax
                chFax(18),
                chIEEE1394(19),
                chTransport1(20),
                    -- TCP port 35, see reserved TCP port list
                    -- in RFC 1700 [15] or current "Assigned
                    -- Numbers" files. This RFC should also be
                    -- referenced for other channel
                    -- enumerations utilizing TCP port
                    -- numbers 0 through 1024.
                chCPAP(21),       -- TCP port 170
                    -- Digital Equipment Corp.
                chDCERemoteProcCall(22), -- OSF
                    -- DEPRECATED
                chONCRemoteProcCall(23), -- SUN Microsystems
                    -- DEPRECATED
                chOLE(24),          -- Microsoft
                    -- DEPRECATED
                chNamedPipe(25),
                chPCPrint(26),    -- Banyan
                chServerMessageBlock(27),
                    -- File/Print sharing protocol used by
                    -- various network operating systems
                    -- from IBM 3Com, Microsoft and others
                    --
                    -- prtChannelInformation entry:
                    --
                    -- Service Name
                    --   Keyword:      Name
                    --   Syntax:       Name
                    --   Status:       Optional
                    --   Multiplicity: Single
                    --   Description:  The service name of
                    --                 the printer
                chPSM(28),        -- Printing Systems
                    -- Manager, IBM
                chDLLAPI(29), -- Microsoft
                    -- DEPRECATED
                chVxDAPI(30), -- Microsoft
                    -- DEPRECATED
                chSystemObjectManager(31), -- IBM
                chDECLAT(32),
                    -- Digital Equipment Corp.
```

```
                    --
                    -- prtChannelInformation entries:
                    --
                    -- Port Name
                    --   Keyword:      Port
                    --   Syntax:       Name
                    --   Status:       Conditionally
                    --                 Mandatory
                    --                 (see note below)
                    --   Multiplicity: Single
                    --   Description:  LAT port name
                    --
                    -- Service Name
                    --   Keyword:      Service
                    --   Syntax:       Name
                    --   Status:       Conditionally
                    --                 Mandatory
                    --   Multiplicity: Single
                    --   Description:  LAT service name
                    --
                    -- The LAT channel may be
                    -- identified by either a port or
                    -- service, so either a
                    -- Port or Service entry must be
                    -- specified, but not both.
                chNPAP(33),
                chUSB(34),    -- Universal Serial Bus
                chIRDA(35),   -- Infrared Data Assoc. Prot.
                chPrintXChange(36), -- PrintXChange Protocol
                chPortTCP(37),
                    -- A unidirectional "raw" TCP
                    -- channel that uses an administratively
                    -- assigned TCP port address.
                    --
                    -- prtChannelInformation entry:
                    --
                    -- Port Number
                    --   Keyword:      Port
                    --   Syntax:       decimal number
                    --   Status:       Mandatory
                    --   Multiplicity: Single
                    --   Description:  TCP port number
                chBidirPortTCP(38),
                    -- A bi-directional version of chPortTCP
                    --
                    -- prtChannelInformation entries:
                    -- (See chPortTCP)
                chUNPP(39),
                    -- Universal Network Printing
                    -- Protocol(UNPP). A bi-directional,
                    -- multiport network printing
                    -- application protocol available on
                    -- multiple transport protocols.
                    -- Underscore, Inc.
```

```
                        -- Contact: info@underscore.com
                    chAppleTalkADSP(40),
                        -- AppleTalk Data Stream Protocol.
                        -- ADSP is part of the AppleTalk
                        -- suite of protocols.
                        -- It is a symmetric, connection-
                        -- oriented protocol that makes
                        -- possible the establishment
                        -- and maintenance of full-duplex
                        -- streams of data bytes between
                        -- two sockets in an AppleTalk
                        -- internet.
                        -- See [5].
                    chPortSPX(41),
                        -- Sequenced Packet Exchange (SPX)
                        -- socket.
                        -- Novell, Inc. Similar to TCP, a
                        -- bi-directional data pipe using
                        -- Novell SPX as a transport.
                        --
                        -- prtChannelInformation entries:
                        --
                        -- Network Number
                        --   Keyword:      Net
                        --   Syntax:       HexString
                        --   Status:       Mandatory
                        --   Multiplicity: Single
                        --   Description:  The network number
                        --
                        -- Node Number
                        --   Keyword:      Node
                        --   Syntax:       HexString
                        --   Status:       Mandatory
                        --   Multiplicity: Single
                        --   Description:  The node number
                        --
                        -- Socket Number
                        --   Keyword:      Socket
                        --   Syntax:       HexString
                        --   Status:       Mandatory
                        --   Multiplicity: Single
                        --   Description:  The SPX socket number
                        --
                        -- There must be exactly one "Net" and
                        -- one "Node" and one "Socket" entry. A
                        -- HexString is a binary value
                        -- represented as a string of
                        -- ASCII characters using hexadecimal
                        -- notation.
                    chPortHTTP(42),
                        -- Hypertext Transfer Protocol. See RFC 1945
[16]
                        -- and RFC 2616 [27].
                    chNDPS(43),
```

```
                        -- Novell, Inc.
                        --
                        -- prtChannelInformation entry:
                        --
                        -- Printer Agent Name
                        --   Keyword:      PA
                        --   Syntax:       Name
                        --   Status:       Mandatory
                        --   Multiplicity: Single
                        --   Description:  The NDPS Printer
                        --                 Agent Name
                    chIPP(44)
                        -- Internet Printing Protocol (IPP),
                        -- (IPP/1.0 - see RFC 2565 [23] and RFC 2566
                        -- [24]), also applies to all future versions
                        -- of IPP.
                        --
                        -- IPP Printer URI
                        --   Keyword:      URI
                        --   Syntax:       URI (Unicode UTF-8 per
                        --                 RFC 2396 [22])
                        --   Status:       Mandatory
                        --   Multiplicity: Single
                        --   Default:      not applicable
                        --   Description:  URI of this IPP Printer
within
                        --     the Internet naming scope.  Unicode
                        --     UTF-8 RFC 2279 [21] string with
                        --     hexadecimal escapes for any non-ASCII
                        --     characters (per RFC 2396 [22]).
                        --   Conformance: An IPP Printer shall list all
                        --     IPP URI it supports (one per IPP Channel
                        --     entry). If a URI contains the 'http:'
                        --     scheme it MUST have an explicit port.
                        --   See: RFC 2279 [21], RFC 2396 [22], RFC
2565
                        --     [23], RFC 2566 [24].
                        --
                        -- IPP Printer Client Authentication
                        --   Keyword:      Auth
                        --   Syntax:       Keyword
                        --   Status:       Optional
                        --   Multiplicity: Single
                        --   Default:      'none'
                        --   Description:  A client authentication
                        --     mechanism supported for this IPP Printer
                        --     URI:
                        --       'none'
                        --         no client authentication mechanism
                        --       'requesting-user-name'
                        --         authenticated user in 'requesting-
                        --         user-name'
                        --       'basic'
                        --         authenticated user via HTTP Basic
```

```
                        --         mechanism
                        --       'digest'
                        --         authenticated user via HTTP Digest
                        --         mechanism
                        --       'certificate'
                        --         authenticated user via certificate
                        --         mechanism
                        --   Conformance: An IPP Printer should list
all
                        --     IPP client authentication mechanisms it
                        --     supports (one per IPP Channel entry).
                        --     See: [2] and [3].
                        --
                        -- IPP Printer Security
                        --   Keyword:      Security
                        --   Syntax:       Keyword
                        --   Status:       Optional
                        --   Multiplicity: Single
                        --   Default:      'none'
                        --   Description:  A security mechanism
supported
                        --     for this IPP Printer URI:
                        --     'none'
                        --       no security mechanism
                        --     'ssl3'
                        --       SSL3 secure communications channel
                        --       protocol
                        --     'tls'
                        --       TLS secure communications channel
                        --       protocol
                        --   Conformance: An IPP Printer should list
all
                        --     IPP security mechanisms it supports
                        --     (one per IPP Channel entry).
                        --   See: RFC 2246 [18], RFC 2566 [24], [2].
                        --
                        -- IPP Printer Protocol Version
                        --   Keyword:      Version
                        --   Syntax:       Keyword
                        --   Status:       Optional
                        --   Multiplicity: Multiple
                        --   Default:      '1.0'
                        --   Description:  All of the IPP protocol
                        --     versions (major.minor) supported for
this
                        --     IPP Printer URI:
                        --     '1.0'
                        --       IPP/1.0 conforming Printer
                        --     '1.1'
                        --       IPP/1.1 conforming Printer
                        --   Conformance:  An IPP Printer should list
all
                        --     IPP versions it supports (all listed in
                        --     each IPP Channel entry). An IPP Client
```

```
                        --     should select the highest numbered
                        --     version that the client supports for use
                        --     in all IPP Requests (for optimum
                        --     interworking).
                        --   See: RFC 2566 [24], [2].
}
--
-- Interpreter Group textual conventions
--

PrtInterpreterLangFamilyTC ::= TEXTUAL-CONVENTION
    -- This value is a type 2 enumeration.
    STATUS    current
    DESCRIPTION
        "This enumeration indicates the type of interpreter that is
        receiving jobs."
    SYNTAX    INTEGER {
        other(1),
        unknown(2),
        langPCL(3),           -- PCL.  Starting with PCL version 5,
                              -- HP-GL/2 is included as part of the
                              -- PCL language.
                              -- PCL and HP-GL/2 are registered
                              -- trademarks of Hewlett-Packard
                              -- Company.
        langHPGL(4),          -- Hewlett-Packard Graphics Language.
                              -- HP-GL is a registered trademark of
                              -- Hewlett-Packard Company.
        langPJL(5),           -- Peripheral Job Language. Appears in
                              -- the data stream between data intended
                              -- for a page description language.
                              -- Hewlett-Packard Co.
        langPS(6),            -- PostScript (tm) Language
                              -- Postscript - a trademark of Adobe
                              -- Systems Incorporated which may be
                              -- registered in certain jurisdictions
        langIPDS(7),          -- Intelligent Printer Data Stream
                              -- Bi-directional print data stream for
                              -- documents consisting of data objects
                              -- (text, image, graphics, bar codes),
                              -- resources (fonts, overlays) and page,
                              -- form and finishing instructions.
                              -- Facilitates system level device
                              -- control, document tracking and error
                              -- recovery throughout the print
                              -- process.
                              -- IBM Corporation.
        langPPDS(8),          -- IBM Personal Printer Data Stream.
                              -- Originally called IBM ASCII, the name
                              -- was changed to PPDS when the Laser
                              -- Printer was introduced in 1989.
                              -- Lexmark International, Inc.
        langEscapeP(9),       -- Epson Corp.
        langEpson(10),
```

```
 1          langDDIF(11),         -- Digital Document Interchange Format
 2                                -- Digital Equipment Corp., Maynard MA
 3          langInterpress(12),
 4                                -- Xerox Corp.
 5          langISO6429(13),      -- ISO 6429.  Control functions for
 6                                -- Coded Character Sets (has ASCII
 7                                -- control characters, plus additional
 8                                -- controls for
 9                                -- character imaging devices.)
10          langLineData(14),     -- line-data:  Lines of data as
11                                -- separate ASCII or EBCDIC records
12                                -- and containing no control functions
13                                -- (no CR, LF, HT, FF, etc.)
14                                -- For use with traditional line
15                                -- printers.  May use CR and/or LF to
16                                -- delimit lines, instead of records.
17                                -- See ISO 10175 Document Printing
18                                -- Application (DPA) [7].
19          langMODCA(15),        -- Mixed Object Document Content
20                                -- Architecture
21                                -- Definitions that allow the
22                                -- composition, interchange, and
23                                -- presentation of final form
24                                -- documents as a collection of data
25                                -- objects (text, image, graphics, bar
26                                -- codes), resources (fonts, overlays)
27                                -- and page, form and finishing
28                                -- instructions.
29                                -- IBM Corporation.
30          langREGIS(16),        -- Remote Graphics Instruction Set,
31                                -- Digital Equipment Corp., Maynard MA
32          langSCS(17),          -- SNA Character String
33                                -- Bi-directional print data stream for
34                                -- SNA LU-1 mode of communication.
35                                -- IBM
36          langSPDL(18),         -- ISO 10180 Standard Page Description
37                                -- Language
38                                -- ISO Standard
39          langTEK4014(19),      -- Tektronix Corp.
40          langPDS(20),
41          langIGP(21),          -- Printronix Corp.
42          langCodeV(22),        -- Magnum Code-V, Image and printer
43                                -- control language used to control
44                                -- impact/dot-matrix printers.
45                                -- QMS, Inc., Mobile AL
46          langDSCDSE(23),       -- DSC-DSE:  Data Stream Compatible and
47                                -- Emulation Bi-directional print data
48                                -- stream for non-SNA (DSC) and SNA LU-3
49                                -- 3270 controller (DSE) communications
50                                -- IBM
51          langWPS(24),          -- Windows Printing System, Resource
52                                -- based command/data stream used by
53                                -- Microsoft At Work Peripherals.
54                                -- Developed by the Microsoft
```

```
                                -- Corporation.
        langLN03(25),           -- Early DEC-PPL3, Digital Equipment
                                -- Corp.
        langCCITT(26),
        langQUIC(27),           -- QUIC (Quality Information Code), Page
                                -- Description Language for laser
                                -- printers. Included graphics, printer
                                -- control capability and emulation of
                                -- other well-known printer.
                                -- QMS, Inc.
        langCPAP(28),           -- Common Printer Access Protocol
                                -- Digital Equipment Corp.
        langDecPPL(29),         -- Digital ANSI-Compliant Printing
                                -- Protocol
                                -- (DEC-PPL)
                                -- Digital Equipment Corp.
        langSimpleText(30),
                                -- simple-text:  character coded data,
                                -- including NUL, CR , LF, HT, and FF
                                -- control characters.  See ISO 10175
                                -- Document Printing Application (DPA)
[7].
        langNPAP(31),           -- Network Printer Alliance Protocol
                                -- (NPAP). This protocol has been
                                -- superseded by the IEEE 1284.1 TIPSI
                                -- Std (ref. LangTIPSI(49)).
        langDOC(32),            -- Document Option Commands, Appears in
                                -- the data stream between data
                                -- intended for a page description.
                                -- QMS, Inc.
        langimPress(33),        -- imPRESS, Page description language
                                -- originally developed for the
                                -- ImageServer product line. A binary
                                -- language providing representations
                                -- of text, simple graphics, and some
                                -- large forms (simple
                                -- bit-map and CCITT group 3/4
                                -- encoded).The
                                -- language was intended to be sent over
                                -- an 8-bit channel and supported early
                                -- document preparation languages (e.g.,
                                -- TeX and TROFF).
                                -- QMS, Inc.
        langPinwriter(34),
                                -- 24 wire dot matrix printer  for
                                -- USA, Europe, and Asia except
                                -- Japan.
                                -- More widely used in Germany, and
                                -- some Asian countries than in US.
                                -- NEC
        langNPDL(35),           -- Page printer  for Japanese market.
                                -- NEC
        langNEC201PL(36),       -- Serial printer language used in
                                -- the Japanese market.
```

```
                                -- NEC
        langAutomatic(37),
                                -- Automatic PDL sensing.  Automatic
                                -- sensing of the interpreter
                                -- language family by the printer
                                -- examining the document content.
                                -- Which actual interpreter language
                                -- families are sensed depends on
                                -- the printer implementation.
        langPages(38),          -- Page printer Advanced Graphic
                                -- Escape Set
                                -- IBM Japan
        langLIPS(39),           -- LBP Image Processing System
        langTIFF(40),           -- Tagged Image File Format (Aldus)
        langDiagnostic(41),
                                -- A hex dump of the input to the
                                -- interpreter
        langPSPrinter(42),
                               -- The PostScript Language used for
                                -- control (with any PDLs)
                                -- Adobe Systems Incorporated
        langCaPSL(43),          -- Canon Print Systems Language
        langEXCL(44),           -- Extended Command Language
                                -- Talaris Systems Inc.
        langLCDS(45),           -- Line Conditioned Data Stream
                                -- Xerox Corporation
        langXES(46),            -- Xerox Escape Sequences
                                -- Xerox Corporation
        langPCLXL(47),          -- Printer Control Language. Extended
                                -- language features for printing, and
                                -- printer control.
                                -- Hewlett-Packard Co.
        langART(48),            -- Advanced Rendering Tools (ART).
                                -- Page Description language
                                -- originally developed for the Laser
                                -- Press printers.
                                -- Technical reference manual: "ART IV
                                -- Reference Manual", No F33M.
                                -- Fuji Xerox Co., Ltd.
        langTIPSI(49),          -- Transport Independent Printer
                                -- System Interface (ref. IEEE Std.
                                -- 1284.1)
        langPrescribe(50),
                                -- Page description and printer
                                -- control language. It can be
                                -- described with ordinary ASCII
                                -- Technical reference manual:
                                -- "PRESCRIBE II Programming Manual"
        langLinePrinter(51),
                                -- A simple-text character stream which
                                -- supports the control codes LF, VT,
                                -- FF, and plus Centronics or
                                -- Dataproducts Vertical Format Unit
                                -- (VFU) language is commonly used on
```

```
                                -- many older model line and matrix
                                -- printers.
        langIDP(52),            -- Imaging Device Protocol
                                -- Apple Computer.
        langXJCL(53),           -- Xerox Job Control Language (JCL).
                                -- A Job Control language originally
                                -- developed for the LaserPress printers
                                -- and is capable of switching PDLs.
                                -- Technical reference manual:
                                -- "ART IV Reference Manual", No F33M.
                                -- Fuji Xerox Co., Ltd.
        langPDF(54),            -- Adobe Portable Document Format
                                -- Adobe Systems, Inc.
        langRPDL(55),           -- Ricoh Page Description Language for
                                -- printers.
                                -- Technical manual "RPDL command
                                -- reference" No.307029
                                -- RICOH, Co. LTD
        langIntermecIPL(56),
                                -- Intermec Printer Language for label
                                -- printers.
                                -- Technical Manual: "IPL Programmers
                                -- Reference Manual"
                                -- Intermec Corporation
        langUBIFingerprint(57),
                                -- An intelligent basic-like programming
                                -- language for label printers.
                                -- Reference Manual: "UBI Fingerprint
                                -- 7.1", No. 1-960434-00
                                -- United Barcode Industries
        langUBIDirectProtocol(58),
                                -- An intelligent control language for
                                -- label printers.
                                -- Programmers guide: " UBI Direct
                                -- Protocol", No. 1-960419-00
                                -- United Barcode Industries
        langFujitsu(59)
                        -- Fujitsu Printer Language
                        -- Reference Manual:
                        -- "FM Printer Sequence" No. 80HP-0770
                        -- FUJITSU LIMITED
        }

--
-- Input/Output Group Textual Conventions
--

PrtInputTypeTC ::= TEXTUAL-CONVENTION
    -- This is a type 2 enumeration.
    STATUS    current
    DESCRIPTION
        "The type of technology (discriminated primarily according to
        feeder mechanism type) employed by a specific component or
        components."
```

```
    SYNTAX    INTEGER {
                  other(1),
                  unknown(2),
                  sheetFeedAutoRemovableTray(3),
                  sheetFeedAutoNonRemovableTray(4),
                  sheetFeedManual(5),
                  continuousRoll(6),
                  continuousFanFold(7)
                  }

PrtOutputTypeTC ::= TEXTUAL-CONVENTION
    -- This is a type 2 enumeration.
    STATUS    current
    DESCRIPTION
        "The Type of technology supported by this output sub-unit."
    SYNTAX    INTEGER {
                  other(1),
                  unknown(2),
                  removableBin(3),
                  unRemovableBin(4),
                  continuousRollDevice(5),
                  mailBox(6),
                  continuousFanFold(7)
                  }

PrtOutputStackingOrderTC ::= TEXTUAL-CONVENTION
    -- This is a type 1 enumeration.
    STATUS    current
    DESCRIPTION
        "The current state of the stacking order for the associated
        output sub-unit. 'firstToLast' means that as pages are
output,
        the front of the next page is placed against the back of the
        previous page. 'lastToFirst' means that as pages are output,
the
        back of the next page is placed against the front of the
        previous page."
    SYNTAX    INTEGER {
                  unknown(2),
                  firstToLast(3),
                  lastToFirst(4)
                  }

PrtOutputPageDeliveryOrientationTC ::= TEXTUAL-CONVENTION
    -- This is a type 1 enumeration.
    STATUS    current
    DESCRIPTION
        "The reading surface that will be 'up' when pages are
delivered
        to the associated output sub-unit. Values are Face-Up and
Face
        Down (Note: interpretation of these values is, in general,
        context-dependent based on locale; presentation of these
values
```

```
        to an end-user should be normalized to the expectations of
the
        user."
    SYNTAX    INTEGER {
                  faceUp(3),
                  faceDown(4)
                  }

--
-- Marker Group Textual Conventions
--

PrtMarkerMarkTechTC ::= TEXTUAL-CONVENTION
    -- This value is a type 2 enumeration.
    STATUS    current
    DESCRIPTION
        "The type of marking technology used for this marking sub-
unit"
    SYNTAX    INTEGER {
                  other(1),
                  unknown(2),
                  electrophotographicLED(3),
                  electrophotographicLaser(4),
                  electrophotographicOther(5),
                  impactMovingHeadDotMatrix9pin(6),
                  impactMovingHeadDotMatrix24pin(7),
                  impactMovingHeadDotMatrixOther(8),
                  impactMovingHeadFullyFormed(9),
                  impactBand(10),
                  impactOther(11),
                  inkjetAqueous(12),
                  inkjetSolid(13),
                  inkjetOther(14),
                  pen(15),
                  thermalTransfer(16),
                  thermalSensitive(17),
                  thermalDiffusion(18),
                  thermalOther(19),
                  electroerosion(20),
                  electrostatic(21),
                  photographicMicrofiche(22),
                  photographicImagesetter(23),
                  photographicOther(24),
                  ionDeposition(25),
                  eBeam(26),
                  typesetter(27)
                  }

PrtMarkerCounterUnitTC ::= TEXTUAL-CONVENTION
    -- This value is a type 1 enumeration.
    STATUS    current
    DESCRIPTION
        "The unit that will be used by the printer when reporting
        counter values for this marking sub-unit.  The
```

```
        time units of measure are provided for a device like a
        strip recorder that does not or cannot track the physical
        dimensions of the media and does not use characters,
        lines or sheets."

    SYNTAX    INTEGER {
                  tenThousandthsOfInches(3),  -- .0001
                  micrometers(4),
                  characters(5),
                  lines(6),
                  impressions(7),
                  sheets(8),
                  dotRow(9),
                  hours(11),
                  feet(16),
                  meters(17)
                  }

PrtMarkerSuppliesTypeTC ::= TEXTUAL-CONVENTION
    -- This value is a type 3 enumeration.
    STATUS    current
    DESCRIPTION
        "The type of this supply."
    SYNTAX    INTEGER {
                  other(1),
                  unknown(2),
                  toner(3),
                  wasteToner(4),
                  ink(5),
                  inkCartridge(6),
                  inkRibbon(7),
                  wasteInk(8),
                  opc(9), -- photo conductor
                  developer(10),
                  fuserOil(11),
                  solidWax(12),
                  ribbonWax(13),
                  wasteWax(14),
                  fuser(15),
                  coronaWire(16),
                  fuserOilWick(17),
                  cleanerUnit(18),
                  fuserCleaningPad(19),
                  transferUnit(20),
                  tonerCartridge(21),
                  fuserOiler(22),
                -- Values for Finisher MIB
                  water(23),
                  wasteWater(24),
                  glueWaterAdditive(25),
                  wastePaper(26),
                  bindingSupply(27),
                  bandingSupply(28),
                  stitchingWire(29),
```

```
                    shrinkWrap(30),
                    paperWrap(31),
                    staples(32),
                    inserts(33),
                    covers(34)
                  -- End of values for Finisher MIB
                    }

PrtMarkerSuppliesSupplyUnitTC ::= TEXTUAL-CONVENTION
    -- This value is a type 1 enumeration.
    STATUS    current
    DESCRIPTION
        "Unit of this marker supply container/receptacle."
    SYNTAX    INTEGER {
                    other(1),
                    unknown(2),
                    tenThousandthsOfInches(3),  -- .0001
                    micrometers(4),
                    impressions(7),
                    sheets(8),
                    hours(11),
                    thousandthsOfOunces(12),
                    tenthsOfGrams(13),
                    hundrethsOfFluidOunces(14),
                    tenthsOfMilliliters(15),
                    feet(16),
                    meters(17),
                  -- Values for Finisher MIB
                    items(18),    -- e.g. number of staples
                    percent(19)
                    }

PrtMarkerSuppliesClassTC ::= TEXTUAL-CONVENTION
    -- This value is a type 1 enumeration.
    STATUS    current
    DESCRIPTION
        "Indicates whether this supply entity represents a supply
        that is consumed or a receptacle that is filled."
    SYNTAX    INTEGER {
                    other(1),
                    supplyThatIsConsumed(3),
                    receptacleThatIsFilled(4)
                    }

PrtMarkerColorantRoleTC ::= TEXTUAL-CONVENTION
    -- This value is a type 1 enumeration.
    STATUS    current
    DESCRIPTION
        "The role played by this colorant."
    SYNTAX    INTEGER { --  Colorant Role
                    other(1),
                    process(3),
                    spot(4)
                    }
```

```
 1
 2  PrtMarkerAddressabilityUnitTC ::= TEXTUAL-CONVENTION
 3      -- This value is a type 1 enumeration.
 4      STATUS    current
 5      DESCRIPTION
 6          "The unit of measure of distances, as applied to the marker's
 7          resolution."
 8      SYNTAX    INTEGER {
 9                    tenThousandthsOfInches(3), -- .0001
10                    micrometers(4)
11                    }
12
13  --
14  -- Media Path Textual Conventions
15  --
16
17  PrtMediaPathMaxSpeedPrintUnitTC ::= TEXTUAL-CONVENTION
18      -- This value is a type 1 enumeration.
19      STATUS    current
20      DESCRIPTION
21          "The unit of measure used in specifying the speed of all
22          media paths in the printer."
23      SYNTAX    INTEGER {
24                    tenThousandthsOfInchesPerHour(3),-- .0001/hour
25                    micrometersPerHour(4),
26                    charactersPerHour(5),
27                    linesPerHour(6),
28                    impressionsPerHour(7),
29                    sheetsPerHour(8),
30                    dotRowPerHour(9),
31                    feetPerHour(16),
32                    metersPerHour(17)
33                   }
34
35  PrtMediaPathTypeTC ::= TEXTUAL-CONVENTION
36      -- This value is a type 2 enumeration.
37      STATUS    current
38      DESCRIPTION
39          "The type of the media path for this media path."
40      SYNTAX    INTEGER {
41                    other(1),
42                    unknown(2),
43                    longEdgeBindingDuplex(3),
44                    shortEdgeBindingDuplex(4),
45                    simplex(5)
46                   }
47
48  --
49  -- Interpreter Group Textual Conventions
50  --
51
52  PrtInterpreterTwoWayTC ::= TEXTUAL-CONVENTION
53      -- This is a type 1 enumeration.
54      STATUS    current
```

```
    DESCRIPTION
        "Indicates whether or not this interpreter returns
information
        back to the host."
    SYNTAX    INTEGER {
                  yes(3),
                  no(4)
                  }

--
-- Console Group Textual Conventions
--

PrtConsoleColorTC ::= TEXTUAL-CONVENTION
    -- This value is a type 2 enumeration.
    STATUS     current
    DESCRIPTION
        "The color of this light."
    SYNTAX    INTEGER {
                  other(1),
                  unknown(2),
                  white(3),
                  red(4),
                  green(5),
                  blue(6),
                  cyan(7),
                  magenta(8),
                  yellow(9),
                  orange(10)
                  }

PrtConsoleDisableTC ::= TEXTUAL-CONVENTION
    -- This value is a type 2 enumeration.
    STATUS     current
    DESCRIPTION
        "This value indicates whether or not input is accepted from
        the operator console.  A value of 'operatorConsoleEnabled'
        indicates that input is accepted from the console, and a
value
        of 'operatorConsoleDisabled' indicates that input is not
        accepted from the console.  The other values indicate that
        limited input is accepted from the console, and the
limitations
        are product specific. Limitations are generally less
restrictive
        for operatorConsoleEnabledLevel1 than for
        operatorConsoleEnabledLeve2, which is less restrictive than
        operatorConsoleEnabledLevel3."
    SYNTAX    INTEGER {
                  operatorConsoleEnabled(3),
                  operatorConsoleDisabled(4),
                  operatorConsoleEnabledLevel1(5),
                  operatorConsoleEnabledLevel2(6),
                  operatorConsoleEnabledLevel3(7)
```

```
                }

--
-- Alert Group Textual Conventions
--

PrtAlertSeverityLevelTC ::= TEXTUAL-CONVENTION
    -- This value is a type 1 enumeration.
    STATUS    current
    DESCRIPTION
        "The level of severity of this alert table entry.  The
printer
        determines the severity level assigned to each entry in the
        table. A critical alert is binary by nature and definition. A
        warning is defined to be a non-critical alert. The original
and
        most common warning is unary. The binary warning was added
later
        and given a more distinguished name."
    SYNTAX    INTEGER {
                  other(1),
                  critical(3),
                  warning(4),
                  warningBinaryChangeEvent(5)
                  }

PrtAlertTrainingLevelTC ::= TEXTUAL-CONVENTION
    -- This value is a type 2 enumeration.
    STATUS    current
    DESCRIPTION
        "The level of training required to handle this alert, if
human
        intervention is required. The noInterventionRequired value
        should be used if the event does not require any human
        intervention. The training level is an enumeration that is
        determined and assigned by the printer manufacturer based on
the
        information or the training required to handle this alert.
The
        printer will break alerts into these different training
levels.
        It is the responsibility of the management application in the
        system to determine how a particular alert is handled and how
        and to whom that alert is routed.  The following are the four
        training levels of alerts:

        Field Service - Alerts that typically require advanced
            training and technical knowledge of the printer and its
sub
            units. An example of a technical person would be a
            manufacturer's Field Service representative, or other
person
            formally trained by the manufacturer or similar
            representative.
```

```
        Trained - Alerts that require an intermediate or moderate
level
            of knowledge of the printer and its sub-units. A typical
            examples of alerts that a trained operator can handle is
            replacing toner cartridges.
        Untrained -     Alerts that can be fixed without prior
            training either because the action to correct the alert
is
            obvious or the printer can help the untrained person fix
the
            problem. A typical example of such an alert is reloading
            paper trays and emptying output bins on a low end
printer.
        Management -    Alerts that have to do with overall operation
of
            and configuration of the printer. Examples of management
            events are configuration change of sub-units."
    SYNTAX    INTEGER {
                  other(1),
                  unknown(2),
                  untrained(3),
                  trained(4),
                  fieldService(5),
                  management(6),
                  noInterventionRequired(7)
                 }

PrtAlertGroupTC ::= TEXTUAL-CONVENTION
    -- This value is a type 1 enumeration for values in the range
    -- 1 to 29.
    -- Values of 30 and greater are type 2 enumerations and are
    -- for use in other MIBs that augment tables in the Printer
    -- MIB. Therefore, other MIBs may assign alert codes of 30 or
    -- higher to use the alert table from the Printer MIB without
    -- requiring revising and re-publishing this document.
    STATUS    current
    DESCRIPTION
        "The type of sub-unit within the printer model that this
alert
        is related.  Input, output, and markers are examples of
printer
        model groups, i.e., examples of types of sub-units. Wherever
        possible, these enumerations match the sub-identifier that
        identifies the relevant table in the printer MIB.

        NOTE: Alert type codes have been added for the host resources
        MIB storage table and device table. These additional types
are
        for situations in which the printer's storage and device
objects
        must generate alerts (and possibly traps for critical
alerts)."
    SYNTAX    INTEGER {
                  other(1),
```

```
                    hostResourcesMIBStorageTable(3),
                    hostResourcesMIBDeviceTable(4),
                    generalPrinter(5),
                    cover(6),
                    localization(7),
                    input(8),
                    output(9),
                    marker(10),
                    markerSupplies(11),
                    markerColorant(12),
                    mediaPath(13),
                    channel(14),
                    interpreter(15),
                    consoleDisplayBuffer(16),
                    consoleLights(17),
                    alert(18),
                  -- Values for Finisher MIB
                    finDevice(30),
                    finSupply(31),
                    finSupplyMediaInput(32),
                    finAttributeTable(33)
                  -- End of values for Finisher MIB
                    }

PrtAlertCodeTC ::= TEXTUAL-CONVENTION
    -- This value is a type 2 enumeration.
    STATUS    current
    DESCRIPTION
        "The code that describes the type of alert for this entry in
the
        table. Binary change event alerts describe states of the
subunit
        while unary change event alerts describe a single event. The
        same alert code can be used for a binary change event or a
unary
        change event, depending on implementation. Also, the same
alert
        code can be used to indicate a critical or a non-critical
        (warning) alert, depending on implementation. The value of
        prtAlertSeverityLevel specifies binary vs. unary and critical
        vs. non-critical for each event for the implementation.

        While there are some specific codes for many subunits, the
        generic codes should be used for most subunit alerts. The
        network management station can then query the subunit
specified
        by prtAlertGroup to determine further subunit status and
other
        subunit information.

        An agent shall not add two entries to the alert table for the
        same event, one containing a generic event code and the other
        containing a specific event code; the agent shall add only
one
```

```
 1          entry in the alert table for each event; either generic
 2          (preferred) or specific, not both.
 3
 4          Implementation of the unary change event
 5          alertRemovalOfBinaryChangeEntry(1801) is optional. When
 6          implemented, this alert code shall indicate to network
 7          management stations that the trailing edge of a binary change
 8          event has occurred and the corresponding alert entry has been
 9          removed from the alert table. As with all events, the
10          alertRemovalOfBinaryChangeEntry(1801) alert shall be placed
11  at
12          the end of the alert table. Such an alert table entry shall
13          specify the following information:
14
15          prtAlertSeverityLevel    warningUnaryChangeEvent(4)
16          prtAlertTrainingLevel    noInterventionRequired(7)
17          prtAlertGroup            alert(18)
18          prtAlertGroupIndex       the index of the row in the
19                                   alert table of the binary
20                                   change event that this event
21                                   has removed.
22          prtAlertLocation         unknown (-2)
23          prtAlertCode
24  alertRemovalOfBinaryChangeEntry(1801)
25          prtAlertDescription      <description or null string>
26          prtAlertTime             the value of sysUpTime at
27                                   the time of the removal of the
28                                   binary change event from the
29                                   alert table.
30
31          Optionally, the agent may generate a trap coincident with
32          removing the binary change event and placing the unary change
33          event alertRemovalOfBinaryChangeEntry(1801) in the alert
34  table.
35          For such a trap, the prtAlertIndex sent with the above trap
36          parameters shall be the index of the
37          alertRemovalOfBinaryChangeEvent row that was added to the
38          prtAlertTable; not the index of the row that was removed from
39          the prtAlertTable."
40      SYNTAX    INTEGER {
41                    other(1),
42                        -- an event that is not represented
43                        -- by one of the alert codes
44                        -- specified below.
45                    unknown(2),
46                        -- The following generic codes are common to
47                        -- multiple groups. The NMS may
48                        -- examine the prtAlertGroup object to
49  determine
50                        -- what group to query for further information.
51                    coverOpen(3),
52                    coverClosed(4),
53                    interlockOpen(5),
54                    interlockClosed(6),
```

```
                    configurationChange(7),
                    jam(8),
                    subunitMissing(9),
                        -- The subunit tray, bin, etc.
                        -- has been removed.
                    subunitLifeAlmostOver(10),
                    subunitLifeOver(11),
                    subunitAlmostEmpty(12),
                    subunitEmpty(13),
                    subunitAlmostFull(14),
                    subunitFull(15),
                    subunitNearLimit(16),
                    subunitAtLimit(17),
                    subunitOpened(18),
                    subunitClosed(19),
                    subunitTurnedOn(20),
                    subunitTurnedOff(21),
                    subunitOffline(22),
                    subunitPowerSaver(23),
                    subunitWarmingUp(24),
                    subunitAdded(25),
                    subunitRemoved(26),
                    subunitResourceAdded(27),
                    subunitResourceRemoved(28),
                    subunitRecoverableFailure(29),
                    subunitUnrecoverableFailure(30),
                    subunitRecoverableStorageError(31),
                    subunitUnrecoverableStorageError(32),
                    subunitMotorFailure(33),
                    subunitMemoryExhausted(34),
                    subunitUnderTemperature(35),
                    subunitOverTemperature(36),
                    subunitTimingFailure(37),
                    subunitThermistorFailure(38),
                  -- general Printer group
                    doorOpen(501),    -- DEPRECATED
                                      -- Use coverOpened(3)
                    doorClosed(502),  -- DEPRECATED
                                      -- Use coverClosed(4)
                    powerUp(503),
                    powerDown(504),
                    printerNMSReset(505),
                        -- The printer has been reset by some
                        -- network management station(NMS)
                        -- writing into 'prtGeneralReset'.
                    printerManualReset(506),
                        -- The printer has been reset manually.
                    printerReadyToPrint(507),
                        -- The printer is ready to print. (i.e.,
                        -- not warming up, not in power save
                        -- state, not adjusting print quality,
                        -- etc.).

                  -- Input Group
```

```
                    inputMediaTrayMissing(801),
                    inputMediaSizeChange(802),
                    inputMediaWeightChange(803),
                    inputMediaTypeChange(804),
                    inputMediaColorChange(805),
                    inputMediaFormPartsChange(806),
                    inputMediaSupplyLow(807),
                    inputMediaSupplyEmpty(808),
                    inputMediaChangeRequest(809),
                        -- An interpreter has detected that a
                        -- different medium is need in this input
                        -- tray subunit. The prtAlertDescription may
                        -- be used to convey a human readable
                        -- description of the medium required to
                        -- satisfy the request.
                    inputManualInputRequest(810),
                        -- An interpreter has detected that manual
                        -- input is required in this subunit. The
                        -- prtAlertDescription may be used to convey
                        -- a human readable description of the medium
                        -- required to satisfy the request.
                    inputTrayPositionFailure(811),
                        -- The input tray failed to position correctly.
                    inputTrayElevationFailure(812),
                    inputCannotFeedSizeSelected(813),
                  -- Output Group
                    outputMediaTrayMissing(901),
                    outputMediaTrayAlmostFull(902),
                    outputMediaTrayFull(903),
                    outputMailboxSelectFailure(904),
                  -- Marker group
                    markerFuserUnderTemperature(1001),
                    markerFuserOverTemperature(1002),
                    markerFuserTimingFailure(1003),
                    markerFuserThermistorFailure(1004),
                    markerAdjustingPrintQuality(1005),
                  -- Marker Supplies group
                    markerTonerEmpty(1101),
                    markerInkEmpty(1102),
                    markerPrintRibbonEmpty(1103),
                    markerTonerAlmostEmpty(1104),
                    markerInkAlmostEmpty(1105),
                    markerPrintRibbonAlmostEmpty(1106),
                    markerWasteTonerReceptacleAlmostFull(1107),
                    markerWasteInkReceptacleAlmostFull(1108),
                    markerWasteTonerReceptacleFull(1109),
                    markerWasteInkReceptacleFull(1110),
                    markerOpcLifeAlmostOver(1111),
                    markerOpcLifeOver(1112),
                    markerDeveloperAlmostEmpty(1113),
                    markerDeveloperEmpty(1114),
                    markerTonerCartridgeMissing(1115),
                  -- Media Path Device Group
                    mediaPathMediaTrayMissing(1301),
```

```
                    mediaPathMediaTrayAlmostFull(1302),
                    mediaPathMediaTrayFull(1303),
                    mediaPathcannotDuplexMediaSelected(1304),
                  -- Interpreter Group
                    interpreterMemoryIncrease(1501),
                    interpreterMemoryDecrease(1502),
                    interpreterCartridgeAdded(1503),
                    interpreterCartridgeDeleted(1504),
                    interpreterResourceAdded(1505),
                    interpreterResourceDeleted(1506),
                    interpreterResourceUnavailable(1507),
                    interpreterComplexPageEncountered(1509),
                        -- The interpreter has encountered a page
                      -- that is too complex for the resources that
                      -- are available.
                  -- Alert Group
                    alertRemovalOfBinaryChangeEntry(1801)
                        -- A binary change event entry has been
                        -- removed from the alert table. This unary
                        -- change alert table entry is added to the
                        -- end of the alert table.
                    }

-- The General Printer Group
--
-- The general printer sub-unit is responsible for the overall
-- control and status of the printer.  There is exactly one
-- general printer sub-unit in a printer.
--
-- Implementation of every object in this group is mandatory.

prtGeneral OBJECT IDENTIFIER ::= { printmib 5 }

prtGeneralTable OBJECT-TYPE
    SYNTAX     SEQUENCE OF PrtGeneralEntry
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
        "A table of general information per printer.
        Objects in this table are defined in various
        places in the MIB, nearby the groups to
        which they apply.  They are all defined
        here to minimize the number of tables that would
        otherwise need to exist."
    ::= { prtGeneral 1 }

prtGeneralEntry OBJECT-TYPE
    SYNTAX     PrtGeneralEntry
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
        "An entry exists in this table for each device entry in the
host
        resources MIB device table with a device type of 'printer'"
```

```
    INDEX    { hrDeviceIndex }
    ::= { prtGeneralTable 1 }

PrtGeneralEntry ::= SEQUENCE {
    -- Note that not all of the objects in this sequence are in
    -- the general printer group. The group to which an
    -- object belongs is tagged with a label "General", "Input"
    -- "Output", etc. after each entry in the following sequence.
    --
    prtGeneralConfigChanges         Counter32, -- General
    prtGeneralCurrentLocalization   Integer32, -- General
    prtGeneralReset                 PrtGeneralResetTC,
                                               -- General
    prtGeneralCurrentOperator       OCTET STRING,
                                               -- Responsible Party
    prtGeneralServicePerson         OCTET STRING,
                                               -- Responsible Party
    prtInputDefaultIndex            Integer32, -- Input
    prtOutputDefaultIndex           Integer32, -- Output
    prtMarkerDefaultIndex           Integer32, -- Marker
    prtMediaPathDefaultIndex        Integer32, -- Media Path
    prtConsoleLocalization          Integer32, -- Console
    prtConsoleNumberOfDisplayLines  Integer32, -- Console
    prtConsoleNumberOfDisplayChars  Integer32, -- Console
    prtConsoleDisable               PrtConsoleDisableTC,
                                               -- Console,
    prtAuxiliarySheetStartupPage    PresentOnOff,
                                               -- AuxiliarySheet
    prtAuxiliarySheetBannerPage     PresentOnOff,
                                               -- AuxiliarySheet,
    prtGeneralPrinterName           OCTET STRING,
                                               -- General
    prtGeneralSerialNumber          OCTET STRING,
                                               -- General
    prtAlertCriticalEvents          Counter32, -- Alert
    prtAlertAllEvents               Counter32  -- Alert
    }

prtGeneralConfigChanges OBJECT-TYPE
    SYNTAX     Counter32
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "Counts configuration changes within the printer. A
        configuration change is defined to be an action that results
in
        a change to any MIB object other than those that reflect
status
        or level, or those that act as counters or gauges. In
addition,
        any action that results in a row being added or deleted from
any
        table in the Printer MIB is considered a configuration
change.
```

```
 1          Such changes will often affect the capability of the printer
 2  to
 3          service certain types of print jobs. Management applications
 4  may
 5          cache infrequently changed configuration information about
 6  sub
 7          units within the printer. This object should be incremented
 8          whenever the agent wishes to notify management applications
 9  that
10          any cached configuration information for this device is to be
11          considered 'stale'. At this point, the management application
12          should flush any configuration information cached about this
13          device and fetch new configuration information.
14
15          The following are examples of actions that would cause the
16          prtGeneralConfigChanges object to be incremented:
17
18          - Adding an output bin
19          - Changing the media in a sensing input tray
20          - Changing the value of prtInputMediaType
21
22          Note that the prtGeneralConfigChanges counter would not be
23          incremented when an input tray is removed, or the level of an
24          input device changes."
25
26      ::= { prtGeneralEntry 1 }
27
28  prtGeneralCurrentLocalization OBJECT-TYPE
29      SYNTAX     Integer32 (1..65535)
30      MAX-ACCESS read-write
31      STATUS     current
32      DESCRIPTION
33          "The value of the prtLocalizationIndex corresponding to the
34          current language, country, and character set to be used for
35          localized string values that are identified as being
36  dependent
37          on the value of this object.  Note that this object does not
38          apply to localized strings in the prtConsole group or to any
39          object that is not explicitly identified as being localized
40          according to prtGeneralCurrentLocalization."
41      ::= { prtGeneralEntry 2 }
42
43  prtGeneralReset OBJECT-TYPE
44      -- This value is a type 3 enumeration.
45      SYNTAX     PrtGeneralResetTC
46      MAX-ACCESS read-write
47      STATUS     current
48      DESCRIPTION
49          "Setting this value to 'powerCycleReset', 'resetToNVRAM', or
50          'resetToFactoryDefaults' will result in the resetting of the
51          printer.  When read, this object will always have the value
52          'notResetting(3)', and a SET of the value 'notResetting'
53  shall
54          have no effect on the printer.  Some of the defined values
```

```
are
        optional.  However, every implementation must support at
least
        the values 'notResetting' and 'resetToNVRAM'."
    ::= { prtGeneralEntry 3 }

-- The Responsible Party group
--
-- This group is optional.  However, to claim conformance to this
-- group, it is necessary to implement every object in the group.

prtGeneralCurrentOperator OBJECT-TYPE
    SYNTAX     OCTET STRING (SIZE(0..127))
    MAX-ACCESS read-write
    STATUS     current
    DESCRIPTION
        "The name of the person who is responsible for operating
        this printer. It is suggested that this string include
        information that would enable other humans to reach the
        operator, such as a phone number. As a convention to
        facilitate automatic notification of the operator by the
        agent or network management station, the phone number,
        fax number or email address should be indicated by the
        URL schemes 'tel:', 'fax:' and 'mailto:', respectively.
        If either the phone, fax, or email information is not
        available, then a line should not be included for this
        information.

        NOTE: For interoperability purposes, it is advisable to
        use email addresses formatted according to RFC 822 [9]
        requirements."
    ::= { prtGeneralEntry 4 }

prtGeneralServicePerson OBJECT-TYPE
    SYNTAX     OCTET STRING (SIZE(0..127))
    MAX-ACCESS read-write
    STATUS     current
    DESCRIPTION
        "The name of the person responsible for servicing this
        printer. It is suggested that this string include
        information that would enable other humans to reach the
        service person, such as a phone number. As a convention
        to facilitate automatic notification of the operator by
        the agent or network management station, the phone
        number, fax number or email address should be indicated
        by the URL schemes 'tel:', 'fax:' and 'mailto:',
        respectively. If either the phone, fax, or email
        information is not available, then a line should not
        be included for this information.

        NOTE: For interoperability purposes, it is advisable to use
        email addresses formatted per RFC 822 [9] requirements."

    ::= { prtGeneralEntry 5 }
```

```
 1
 2  -- Default indexes section
 3  --
 4  -- The following four objects are used to specify the indexes of
 5  -- certain subunits used as defaults during the printing process.
 6
 7  prtInputDefaultIndex OBJECT-TYPE
 8      SYNTAX     Integer32
 9      MAX-ACCESS read-write
10      STATUS     current
11      DESCRIPTION
12          "The value of prtInputIndex corresponding to the default
13  input
14          sub-unit: that is, this object selects the default source of
15          input media.
16
17          This value shall be -1 if there is no default input subunit
18          specified for the printer as a whole.  In this case, the
19  actual
20          default input subunit may be specified by means outside the
21          scope of this MIB, such as by each interpreter in a printer
22  with
23          multiple interpreters."
24
25      ::= { prtGeneralEntry 6 }
26
27  prtOutputDefaultIndex OBJECT-TYPE
28      SYNTAX     Integer32
29      MAX-ACCESS read-write
30      STATUS     current
31      DESCRIPTION
32          "The value of prtOutputIndex corresponding to the default
33  output
34          sub-unit; that is, this object selects the default output
35          destination.
36
37          This value shall be -1 if there is no default output subunit
38          specified for the printer as a whole.  In this case, the
39  actual
40          default output subunit may be specified by means outside the
41          scope of this MIB, such as by each interpreter in a printer
42  with
43          multiple interpreters."
44
45      ::= { prtGeneralEntry 7 }
46
47  prtMarkerDefaultIndex OBJECT-TYPE
48      SYNTAX     Integer32 (1..65535)
49      MAX-ACCESS read-write
50      STATUS     current
51      DESCRIPTION
52          "The value of prtMarkerIndex corresponding to the
53          default marker sub-unit; that is, this object selects the
54          default marker."
```

```
    ::= { prtGeneralEntry 8 }

prtMediaPathDefaultIndex OBJECT-TYPE
    SYNTAX     Integer32 (1..65535)
    MAX-ACCESS read-write
    STATUS     current
    DESCRIPTION
        "The value of prtMediaPathIndex corresponding to
        the default media path; that is, the selection of the
        default media path."
    ::= { prtGeneralEntry 9 }

-- Console general section
--
-- The following four objects describe overall parameters of the
-- printer console subsystem.

prtConsoleLocalization OBJECT-TYPE
    SYNTAX     Integer32 (1..65535)
    MAX-ACCESS read-write
    STATUS     current
    DESCRIPTION
        "The value of the prtLocalizationIndex corresponding to
        the language, country, and character set to be used for the
        console.  This localization applies both to the actual
display
        on the console as well as the encoding of these console
objects
        in management operations."
    ::= { prtGeneralEntry 10 }

prtConsoleNumberOfDisplayLines OBJECT-TYPE
    SYNTAX     Integer32 (0..65535)
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The number of lines on the printer's physical
        display.  This value is 0 if there are no lines on the
        physical display or if there is no physical display"
    ::= { prtGeneralEntry 11 }

prtConsoleNumberOfDisplayChars OBJECT-TYPE
    SYNTAX     Integer32 (0..65535)
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The number of characters per line displayed on the physical
        display. This value is 0 if there are no lines on the
physical
        display or if there is no physical display"
    ::= { prtGeneralEntry 12 }

prtConsoleDisable OBJECT-TYPE
    SYNTAX     PrtConsoleDisableTC
```

```
    MAX-ACCESS read-write
    STATUS     current
    DESCRIPTION
        "This value indicates how input is (or is not) accepted from
        the operator console."
    ::= { prtGeneralEntry 13 }

-- The Auxiliary Sheet Group
--
-- The auxiliary sheet group allows the administrator to control
-- the production of auxiliary sheets by the printer. This group
-- contains only the "prtAuxiliarySheetStartupPage" and
-- "prtAuxiliarySheetBannerPage" objects.
--
-- This group is optional. However, to claim conformance to this
-- group it is necessary to implement every object in the group.

prtAuxiliarySheetStartupPage OBJECT-TYPE
    SYNTAX     PresentOnOff
    MAX-ACCESS read-write
    STATUS     current
    DESCRIPTION
        "Used to enable or disable printing a startup page. If
enabled,
        a startup page will be printed shortly after power-up, when
the
        device is ready. Typical startup pages include test patterns
        and/or printer configuration information."
    ::= { prtGeneralEntry 14 }

prtAuxiliarySheetBannerPage OBJECT-TYPE
    SYNTAX     PresentOnOff
    MAX-ACCESS read-write
    STATUS     current
    DESCRIPTION
        "Used to enable or disable printing banner pages at the
        beginning of jobs. This is a master switch which applies to
all
        jobs, regardless of interpreter."
     ::= { prtGeneralEntry 15 }

-- Administrative section
--
-- The following two objects are used to specify administrative
-- information assigned to the printer.

prtGeneralPrinterName OBJECT-TYPE
    SYNTAX     OCTET STRING (SIZE (0..127))
    MAX-ACCESS read-write
    STATUS     current
    DESCRIPTION
        "An administrator-specified name for this printer. Depending
        upon implementation of this printer, the value of this object
        may or may not be same as the value for the MIB-II 'SysName'
```

```
            object."
        ::= { prtGeneralEntry 16 }

    prtGeneralSerialNumber OBJECT-TYPE
        SYNTAX      OCTET STRING (SIZE (0..255))
        MAX-ACCESS read-write
        STATUS      current
        DESCRIPTION
            "A recorded serial number for this device that indexes some
    type
            device catalog or inventory. This value is usually set by the
            device manufacturer but the MIB supports the option of
    writing
            for this object for site-specific administration of device
            inventory or tracking."
        ::= { prtGeneralEntry 17 }

    -- General alert table section
    --
    -- The following two objects are used to specify counters
    -- associated with the Alert Table.

    prtAlertCriticalEvents OBJECT-TYPE
        SYNTAX      Counter32
        MAX-ACCESS read-only
        STATUS      current
        DESCRIPTION
            "A running counter of the number of critical alert events
    that
            have been recorded in the alert table. The value of this
    object
            is RESET in the event of a power cycle operation (i.e., the
            value is not persistent."
        ::= { prtGeneralEntry 18 }

    prtAlertAllEvents OBJECT-TYPE
        SYNTAX      Counter32
        MAX-ACCESS read-only
        STATUS      current
        DESCRIPTION
            "A running counter of the total number of alert event entries
            (critical and non-critical) that have been recorded in the
    alert
            table"
        ::= { prtGeneralEntry 19 }

    -- The Cover Table
    --
    -- The cover portion of the General print sub-unit describes the
    -- covers and interlocks of the printer.  The Cover Table has an
    -- entry for each cover and interlock.

    prtCover OBJECT IDENTIFIER ::= { printmib 6 }
```

```
prtCoverTable OBJECT-TYPE
    SYNTAX     SEQUENCE OF PrtCoverEntry
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
        "A table of the covers and interlocks of the printer."
    ::= { prtCover 1 }

prtCoverEntry OBJECT-TYPE
    SYNTAX     PrtCoverEntry
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
        "Information about a cover or interlock.
        Entries may exist in the table for each device
        index with a device type of 'printer'."
    INDEX  { hrDeviceIndex, prtCoverIndex }
    ::= { prtCoverTable 1 }

PrtCoverEntry ::= SEQUENCE {
    prtCoverIndex            Integer32,
    prtCoverDescription      OCTET STRING,
    prtCoverStatus           PrtCoverStatusTC
    }

prtCoverIndex OBJECT-TYPE
    SYNTAX     Integer32 (1..65535)
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
        "A unique value used by the printer to identify this Cover
sub
        unit.  Although these values may change due to a major
        reconfiguration of the device (e.g. the addition of new cover
        sub-units to the printer), values are expected to remain
stable
        across successive printer power cycles."
    ::= { prtCoverEntry 1 }

prtCoverDescription OBJECT-TYPE
    SYNTAX     OCTET STRING (SIZE(0..255))
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The manufacturer provided cover sub-mechanism name in the
        localization specified by prtGeneralCurrentLocalization."
    ::= { prtCoverEntry 2 }

prtCoverStatus  OBJECT-TYPE
    --  This value is a type 2 enumeration
    SYNTAX     PrtCoverStatusTC
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
```

```
            "The status of this cover sub-unit."
        ::= { prtCoverEntry 3 }

    -- The Localization Table
    --
    -- The localization portion of the General printer sub-unit is
    -- responsible for identifying the natural language, country, and
    -- character set in which character strings are expressed. There
    -- may be one or more localizations supported per printer. The
    -- available localizations are represented by the Localization
    -- table.

    prtLocalization  OBJECT IDENTIFIER ::= { printmib 7 }

    prtLocalizationTable OBJECT-TYPE
        SYNTAX     SEQUENCE OF PrtLocalizationEntry
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "The available localizations in this printer."
        ::= { prtLocalization 1 }

    prtLocalizationEntry OBJECT-TYPE
        SYNTAX     PrtLocalizationEntry
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "A description of a localization.
            Entries may exist in the table for each device
            index with a device type of 'printer'."
        INDEX  { hrDeviceIndex, prtLocalizationIndex }
        ::= { prtLocalizationTable 1 }

    PrtLocalizationEntry ::= SEQUENCE {
        prtLocalizationIndex          Integer32,
        prtLocalizationLanguage       DisplayString,
        prtLocalizationCountry        DisplayString,
        prtLocalizationCharacterSet   CodedCharSet
        }

    prtLocalizationIndex OBJECT-TYPE
        SYNTAX     Integer32 (1..65535)
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "A unique value used by the printer to identify this
            localization entry.  Although these values may change due to
    a
            major reconfiguration of the device (e.g., the addition of
    new
            localization data to the printer), values are expected to
    remain
            stable across successive printer power cycles."
        ::= { prtLocalizationEntry 1 }
```

```
 1
 2  prtLocalizationLanguage OBJECT-TYPE
 3      SYNTAX     DisplayString (SIZE(0..2))
 4      MAX-ACCESS read-only
 5      STATUS     current
 6      DESCRIPTION
 7          "A two character language code from ISO 639.  Examples en,
 8          ca, fr, de."
 9      ::= { prtLocalizationEntry 2 }
10
11  prtLocalizationCountry OBJECT-TYPE
12      SYNTAX     DisplayString (SIZE(0..2))
13      MAX-ACCESS read-only
14      STATUS     current
15      DESCRIPTION
16          "A two character country code from ISO 3166, a blank string
17  (two
18          space characters) shall indicate that the country is not
19          defined.  Examples: US, GB, FR, DE, ..."
20      ::= { prtLocalizationEntry 3 }
21
22  prtLocalizationCharacterSet OBJECT-TYPE
23      SYNTAX     CodedCharSet
24      MAX-ACCESS read-only
25      STATUS     current
26      DESCRIPTION
27        "The coded character set used for this localization."
28      ::= { prtLocalizationEntry 4 }
29
30  -- The System Resources Tables
31  --
32  -- The Printer MIB makes use of the Host Resources MIB to
33  -- define system resources by referencing the storage
34  -- and device groups of the print group.  In order to
35  -- determine, amongst multiple printers serviced by
36  -- one agent, which printer owns a particular resource,
37  -- the prtStorageRef and prtDeviceRef tables associate
38  -- particular storage and device entries to printers.
39
40  prtStorageRefTable OBJECT-TYPE
41      SYNTAX     SEQUENCE OF PrtStorageRefEntry
42      MAX-ACCESS not-accessible
43      STATUS     current
44      DESCRIPTION
45          ""
46      ::= { prtGeneral 2 }
47
48  prtStorageRefEntry OBJECT-TYPE
49      SYNTAX     PrtStorageRefEntry
50      MAX-ACCESS not-accessible
51      STATUS     current
52      DESCRIPTION
53          "This table will have an entry for each entry in the Host
54          Resources MIB storage table that represents storage
```

```
 1  associated
 2          with a printer managed by this agent."
 3      INDEX      { hrStorageIndex, prtStorageRefSeqNumber }
 4      ::= { prtStorageRefTable 1 }
 5
 6  PrtStorageRefEntry ::= SEQUENCE {
 7      prtStorageRefSeqNumber  Integer32,
 8      prtStorageRefIndex      Integer32
 9      }
10
11  prtStorageRefSeqNumber OBJECT-TYPE
12      SYNTAX     Integer32 (1..65535)
13      MAX-ACCESS not-accessible
14      STATUS     current
15      DESCRIPTION
16          "This value will be unique amongst all entries with a common
17          value of hrStorageIndex. This object allows a storage entry
18  to
19          point to the multiple printer devices with which it is
20          associated."
21      ::= { prtStorageRefEntry 1 }
22
23  prtStorageRefIndex OBJECT-TYPE
24      SYNTAX     Integer32 (1..65535)
25      MAX-ACCESS read-only
26      STATUS     current
27      DESCRIPTION
28          "The value of the hrDeviceIndex of the printer device that
29  this
30          storageEntry is associated with."
31      ::= { prtStorageRefEntry 2 }
32
33  prtDeviceRefTable OBJECT-TYPE
34      SYNTAX     SEQUENCE OF PrtDeviceRefEntry
35      MAX-ACCESS not-accessible
36      STATUS     current
37      DESCRIPTION
38          ""
39      ::= { prtGeneral 3 }
40
41  prtDeviceRefEntry OBJECT-TYPE
42      SYNTAX     PrtDeviceRefEntry
43      MAX-ACCESS not-accessible
44      STATUS     current
45      DESCRIPTION
46          "This table will have an entry for each entry in the Host
47          Resources MIB device table that represents a device
48  associated
49          with a printer managed by this agent."
50      INDEX      { hrDeviceIndex, prtDeviceRefSeqNumber }
51      ::= { prtDeviceRefTable 1 }
52
53  PrtDeviceRefEntry ::= SEQUENCE {
54      prtDeviceRefSeqNumber   Integer32,
```

```
    prtDeviceRefIndex       Integer32
    }

prtDeviceRefSeqNumber OBJECT-TYPE
    SYNTAX     Integer32 (1..65535)
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
        "This value will be unique amongst all entries with a common
        value of hrDeviceIndex. This object allows a device entry to
        point to the multiple printer devices with which it is
        associated."
    ::= { prtDeviceRefEntry 1 }

prtDeviceRefIndex OBJECT-TYPE
    SYNTAX     Integer32 (1..65535)
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The value of the hrDeviceIndex of the printer device that
this
        deviceEntry is associated with."
    ::= { prtDeviceRefEntry 2 }

-- The Input Group
--
-- Input sub-units are managed as a tabular, indexed collection
-- of possible devices capable of providing media for input to
-- the printing process. Input sub-units typically have a
-- location, a type, an identifier, a set of constraints on
-- possible media sizes and potentially other media
-- characteristics, and may be capable of indicating current
-- status or capacity.
--
-- Implementation of every object in this group is mandatory.

prtInput   OBJECT IDENTIFIER ::= { printmib 8 }

prtInputTable OBJECT-TYPE
    SYNTAX     SEQUENCE OF PrtInputEntry
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
        "A table of the devices capable of providing media for input
to
        the printing process."
    ::= { prtInput 2 }

prtInputEntry OBJECT-TYPE
    SYNTAX     PrtInputEntry
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
        "Attributes of a device capable of providing media for input
```

```
to
        the printing process. Entries may exist in the table for each
        device index with a device type of 'printer'."
    INDEX  { hrDeviceIndex, prtInputIndex }
    ::= { prtInputTable 1 }

PrtInputEntry ::= SEQUENCE {
    prtInputIndex                       Integer32,
    prtInputType                        PrtInputTypeTC,
    prtInputDimUnit                     PrtMediaUnitTC,
    prtInputMediaDimFeedDirDeclared     Integer32,
    prtInputMediaDimXFeedDirDeclared    Integer32,
    prtInputMediaDimFeedDirChosen       Integer32,
    prtInputMediaDimXFeedDirChosen      Integer32,
    prtInputCapacityUnit                PrtCapacityUnitTC,
    prtInputMaxCapacity                 Integer32,
    prtInputCurrentLevel                Integer32,
    prtInputStatus                      PrtSubUnitStatusTC,
    prtInputMediaName                   OCTET STRING,
    prtInputName                        OCTET STRING,
    prtInputVendorName                  OCTET STRING,
    prtInputModel                       OCTET STRING,
    prtInputVersion                     OCTET STRING,
    prtInputSerialNumber                OCTET STRING,
    prtInputDescription                 OCTET STRING,
    prtInputSecurity                    PresentOnOff,
    prtInputMediaWeight                 Integer32,
    prtInputMediaType                   OCTET STRING,
    prtInputMediaColor                  OCTET STRING,
    prtInputMediaFormParts              Integer32,
    prtInputMediaLoadTimeout            Integer32,
    prtInputNextIndex                   Integer32
    }

prtInputIndex OBJECT-TYPE
    SYNTAX     Integer32 (1..65535)
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
        "A unique value used by the printer to identify this input
sub
        unit.  Although these values may change due to a major
        reconfiguration of the device (e.g. the addition of n input
sub-
        units to the printer), values are expected to remain stable
        across successive printer power cycles."
    ::= { prtInputEntry 1 }

prtInputType OBJECT-TYPE
    SYNTAX     PrtInputTypeTC
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The type of technology (discriminated primarily according to
```

```
            feeder mechanism type) employed by the input sub-unit.  Note,
            the Optional Input Class provides for a descriptor field to
            further qualify the other choice."
        ::= { prtInputEntry 2 }

    prtInputDimUnit OBJECT-TYPE
        SYNTAX     PrtMediaUnitTC
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The unit of measurement for use calculating and relaying
             dimensional values for this input sub-unit."
        ::= { prtInputEntry 3 }

    prtInputMediaDimFeedDirDeclared OBJECT-TYPE
        SYNTAX     Integer32
        MAX-ACCESS read-write
        STATUS     current
        DESCRIPTION
            "This object provides the value of the declared dimension, in
            the feed direction, of the media that is (or, if empty, was
    or
            will be) in this input sub-unit.  The feed direction is the
            direction in which the media is fed on this sub-unit.  This
            dimension is measured in input sub-unit dimensional units
            (prtInputDimUnit).  If this input sub-unit can reliably sense
            this value, the value is sensed by the printer and may not be
            changed by management requests.  Otherwise, the value may be
            changed. The value (-1) means other and specifically means
    that
            this sub-unit places no restriction on this parameter.

            The value (-2) indicates unknown."
        ::= { prtInputEntry 4 }

    prtInputMediaDimXFeedDirDeclared OBJECT-TYPE
        SYNTAX     Integer32
        MAX-ACCESS read-write
        STATUS     current
        DESCRIPTION
            "This object provides the value of the declared dimension, in
            the cross feed direction, of the media that is (or, if empty,
            was or will be) in this input sub-unit.  The cross  feed
            direction is ninety degrees relative to the feed direction
            associated with this sub-unit. This dimension is measured in
            input sub-unit dimensional units (prtInputDimUnit).  If this
            input sub-unit can reliably sense this value, the value is
            sensed by the printer and may not be changed by management
            requests. Otherwise, the value may be changed. The value (-1)
            means other and specifically means that this sub-unit places
    no
            restriction on this parameter. The value (-2) indicates
            unknown."
        ::= { prtInputEntry 5 }
```

```
 1
 2  prtInputMediaDimFeedDirChosen OBJECT-TYPE
 3      SYNTAX     Integer32
 4      MAX-ACCESS read-only
 5      STATUS     current
 6      DESCRIPTION
 7          "The printer will act as if media of the chosen dimension (in
 8          the feed direction) is present in this input source.  Note
 9  that
10          this value will be used even if the input tray is empty. Feed
11          dimension measurements are taken relative to the feed
12  direction
13          associated with that sub-unit and are in input sub-unit
14          dimensional units (MediaUnit). If the printer supports the
15          declared dimension, the granted dimension is the same as the
16          declared dimension. If not, the granted dimension is set to
17  the
18          closest dimension that the printer supports when the declared
19          dimension is set. The value (-1) means other and specifically
20          indicates that this sub-unit places no restriction on this
21          parameter. The value (-2) indicates unknown."
22      ::= { prtInputEntry 6 }
23
24  prtInputMediaDimXFeedDirChosen OBJECT-TYPE
25      SYNTAX     Integer32
26      MAX-ACCESS read-only
27      STATUS     current
28      DESCRIPTION
29          "The printer will act as if media of the chosen dimension (in
30          the cross feed direction) is present in this input source.
31  Note
32          that this value will be used even if the input tray is empty.
33          The cross feed direction is ninety degrees relative to the
34  feed
35          direction associated with this sub-unit. This dimension is
36          measured in input sub-unit dimensional units (MediaUnit).  If
37          the printer supports the declare dimension, the granted
38          dimension is the same as the declared dimension. If not, the
39          granted dimension is set to the closest dimension that the
40          printer supports when the declared dimension is set. The
41  value
42          (-1) means other and specifically indicates that this sub-
43  unit
44          places no restriction on this parameter.  The value (-2)
45          indicates unknown."
46      ::= { prtInputEntry 7 }
47
48  prtInputCapacityUnit OBJECT-TYPE
49      SYNTAX     PrtCapacityUnitTC
50      MAX-ACCESS read-only
51      STATUS     current
52      DESCRIPTION
53          "The unit of measurement for use in calculating and relaying
54          capacity values for this input sub-unit."
```

```
    ::= { prtInputEntry 8 }

prtInputMaxCapacity OBJECT-TYPE
    SYNTAX     Integer32
    MAX-ACCESS read-write
    STATUS     current
    DESCRIPTION
        "The maximum capacity of the input sub-unit in input sub-unit
        capacity units (PrtCapacityUnitTC).  There is no convention
        associated with the media itself so this value reflects
claimed
        capacity. If this input sub-unit can reliably sense this
value,
        the value is sensed by the printer and may not be changed by
        management requests; otherwise, the value may be written (by
a
        Remote Control Panel or a Management Application). The value
        (-1) means other and specifically indicates that the sub-unit
        places no restrictions on this parameter.  The value (-2)
means
        unknown."
    ::= { prtInputEntry 9 }

prtInputCurrentLevel OBJECT-TYPE
    SYNTAX     Integer32 --    in capacity units
                         --   (PrtCapacityUnitTC).
    MAX-ACCESS read-write
    STATUS     current
    DESCRIPTION
        "The current capacity of the input sub-unit in input sub-unit
        capacity units (PrtCapacityUnitTC). If this input sub-unit
can
        reliably sense this value, the value is sensed by the printer
        and may not be changed by management requests; otherwise, the
        value may be written (by a Remote Control Panel or a
Management
        Application).  The value (-1) means other and specifically
        indicates that the sub-unit places no restrictions on this
        parameter. The value (-2) means unknown. The value (-3) means
        that the printer knows that at least one unit remains."
    ::= { prtInputEntry 10 }

prtInputStatus OBJECT-TYPE
    SYNTAX     PrtSubUnitStatusTC
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The current status of this input sub-unit."
    ::= { prtInputEntry 11 }

prtInputMediaName OBJECT-TYPE
    SYNTAX     OCTET STRING (SIZE(0..63))
    MAX-ACCESS read-write
    STATUS     current
```

```
    DESCRIPTION
        "A description of the media contained in this input sub-unit;
        This description is intended for display to a human operator.
        This description is not processed by the printer.  It is used
to
        provide information not expressible in terms of the other
media
        attributes (e.g. prtInputMediaDimFeedDirChosen,
        prtInputMediaDimXFeedDirChosen, prtInputMediaWeight,
        prtInputMediaType). An example would be 'legal tender bond
        paper'."
    REFERENCE
         "See Appendix C, 'Media Names'."
    ::= { prtInputEntry 12 }

--             INPUT MEASUREMENT
--
--     _______ |               |
--      ^      |               |
--      |      |               |                 |
--      |      |_ _ _ _ _ _ _ _| _______________ |direction
--      |      |               |      ^          v
-- MaxCapacity |    Sheets     |      |
--      |      |     left      | CurrentLevel
--      |      |      in       |      |
--      v      |     tray      |      v
--     _______ +_______________+ _______

-- The Extended Input Group
--
-- This group is optional.  However, to claim conformance to this
-- group, it is necessary to implement every object in the group.

prtInputName OBJECT-TYPE
    SYNTAX     OCTET STRING (SIZE(0..63))
    MAX-ACCESS read-write
    STATUS     current
    DESCRIPTION
        "The name assigned to this input sub-unit."
    ::= { prtInputEntry 13 }

prtInputVendorName OBJECT-TYPE
    SYNTAX     OCTET STRING (SIZE(0..63))
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The vendor name of this input sub-unit."
    ::= { prtInputEntry 14 }

prtInputModel OBJECT-TYPE
    SYNTAX     OCTET STRING (SIZE(0..63))
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
```

```
            "The model name of this input sub-unit."
        ::= { prtInputEntry 15 }

    prtInputVersion OBJECT-TYPE
        SYNTAX     OCTET STRING (SIZE(0..63))
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The version of this input sub-unit."
        ::= { prtInputEntry 16 }

    prtInputSerialNumber OBJECT-TYPE
        SYNTAX     OCTET STRING (SIZE(0..63))
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The serial number assigned to this input sub-unit."
        ::= { prtInputEntry 17 }

    prtInputDescription OBJECT-TYPE
        SYNTAX     OCTET STRING (SIZE(0..255))
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "A free-form text description of this input sub-unit in the
            localization specified by  prtGeneralCurrentLocalization."
        ::= { prtInputEntry 18 }

    prtInputSecurity OBJECT-TYPE
        SYNTAX     PresentOnOff
        MAX-ACCESS read-write
        STATUS     current
        DESCRIPTION
            "Indicates if this input sub-unit has some security
    associated
            with it."
        ::= { prtInputEntry 19 }

    -- The Input Media Group
    --
    -- The Input Media Group supports identification of media
    -- installed or available for use on a printing device.
    -- Medium resources are identified by name, and include a
    -- collection of characteristic attributes that may further be
    -- used for selection and management of them.
    -- The Input Media group consists of a set of optional
    -- "columns" in the Input Table. In this manner, a minimally
    -- conforming implementation may choose to not support reporting
    -- of media resources if it cannot do so.
    --
    -- This group is optional.  However, to claim conformance to this
    -- group, it is necessary to implement every object in the group.

    prtInputMediaWeight  OBJECT-TYPE
```

```
    SYNTAX     Integer32
    MAX-ACCESS read-write
    STATUS     current
    DESCRIPTION
        "The weight of the medium associated with this input sub-unit
in
        grams / per meter squared. The value (-2) means unknown."
    ::= { prtInputEntry 20 }

prtInputMediaType OBJECT-TYPE
    SYNTAX     OCTET STRING (SIZE(0..63))
    MAX-ACCESS read-write
    STATUS     current
    DESCRIPTION
        "The name of the type of medium associated with this input
sub
        unit. This name need not be processed by the printer; it
might
        simply be displayed to an operator. The standardized string
        values from ISO 10175 (DPA) and ISO 10180 (SPDL) are:

        stationery       Separately cut sheets of an opaque
                         material
        transparency     Separately cut sheets of a transparent
                         material
        envelope         Envelopes that can be used for
                         conventional mailing purposes
        envelope-plain   Envelopes that are not preprinted and
                         have no windows
        envelope-window  Envelopes that have windows for
                         addressing purposes
        continuous-long  Continuously connected sheets of an
                         opaque material connected along the
                         long edge
        continuous-short Continuously connected sheets of an
                         opaque material connected along the
                         short edge
        tab-stock        Media with tabs
        multi-part-form  Form medium composed of multiple layers
                         not pre-attached to one another; each
                         sheet may be drawn separately from an
                         input source
        labels           Label stock
        multi-layer      Form medium composed of multiple layers
                         which are pre-attached to one another;
                         e.g., for use with impact printers.

        Implementers may add additional string values. The naming
        conventions in ISO 9070 are recommended in order to avoid
        potential name clashes."
    ::= { prtInputEntry 21 }

prtInputMediaColor OBJECT-TYPE
    SYNTAX     OCTET STRING (SIZE(0..63))
```

```
    MAX-ACCESS read-write
    STATUS     current
    DESCRIPTION
        "The name of the color of the medium associated with
        this input sub-unit using standardized string values
        from ISO 10175 (DPA) and ISO 10180 (SPDL) such as:

        other
        unknown
        white
        pink
        yellow
        buff
        goldenrod
        blue
        green
        transparent

        Implementers may add additional string values. The naming
        conventions in ISO 9070 are recommended in order to avoid
        potential name clashes."
    ::= { prtInputEntry 22 }

prtInputMediaFormParts OBJECT-TYPE
    SYNTAX     Integer32
    MAX-ACCESS read-write
    STATUS     current
    DESCRIPTION
        "The number of parts associated with the medium
        associated with this input sub-unit if the medium is a
        multi-part form.  The value (-1) means other and
        specifically indicates that the device places no
        restrictions on this parameter.  The value (-2) means
        unknown."
    ::= { prtInputEntry 23 }

-- The Input Switching Group
--
-- The input switching group allows the administrator to set the
-- input subunit time-out for the printer and to control the
-- automatic input subunit switching by the printer when an input
-- subunit becomes empty.
--
-- This group is optional. However, to claim conformance to this
-- group, it is required to implement every object in the group.

prtInputMediaLoadTimeout OBJECT-TYPE
   SYNTAX     Integer32
   MAX-ACCESS read-write
   STATUS     current
   DESCRIPTION
        "When the printer is not able to print due to a subunit being
        empty or the requested media must be manually loaded, the
        printer will wait for the duration (in seconds) specified by
```

```
        this object. Upon expiration of the time-out, the printer
will
        take the action specified by prtInputNextIndex.

        The event which causes the printer to enter the waiting state
is
        product specific. If the printer is not waiting for manually
fed
        media, it may switch from an empty subunit to a different
        subunit without waiting for the time-out to expire.

        A value of (-1) implies 'other' or 'infinite' which
translates
        to 'wait forever'. The action which causes printing to
continue
        is product specific. A value of (-2) implies 'unknown'."
    ::= { prtInputEntry 24 }

prtInputNextIndex OBJECT-TYPE
    SYNTAX     Integer32
    MAX-ACCESS read-write
    STATUS     current
    DESCRIPTION
        "The value of prtInputIndex corresponding to the input
subunit
        which will be used when this input subunit is emptied and the
        time-out specified by prtInputMediaLoadTimeout expires. A
value
        of zero(0) indicates that auto input switching will not occur
        when this input subunit is emptied. If the time-out specified
by
        prtInputLoadMediaTimeout expires and this value is zero(0),
the
        job will be aborted. A value of (-1) means other. The value
(-2)
        means 'unknown' and specifically indicates that an
        implementation specific method will determine the next input
        subunit to use at the time this subunit is emptied and the
time
        out expires. The value(-3) means input switching is not
        supported for this subunit."
    ::= { prtInputEntry 25 }

-- The Output Group
--
-- Output sub-units are managed as a tabular, indexed collection
-- of possible devices capable of receiving media delivered from
-- the printing process.  Output sub-units typically have a
-- location, a type, an identifier, a set of constraints on
-- possible media sizes and potentially other characteristics,
-- and may be capable of indicating current status or capacity.
--
-- Implementation of every object in this group is mandatory.

```

```
prtOutput  OBJECT IDENTIFIER ::= { printmib 9 }

prtOutputTable OBJECT-TYPE
    SYNTAX     SEQUENCE OF PrtOutputEntry
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
        "A table of the devices capable of receiving media delivered
        from the printing process."
    ::= { prtOutput 2 }

prtOutputEntry OBJECT-TYPE
    SYNTAX     PrtOutputEntry
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
        "Attributes of a device capable of receiving media delivered
        from the printing process. Entries may exist in the table for
        each device index with a device type of 'printer'."
    INDEX  { hrDeviceIndex, prtOutputIndex }
    ::= { prtOutputTable 1 }

PrtOutputEntry ::= SEQUENCE {
    prtOutputIndex                    Integer32,
    prtOutputType                     PrtOutputTypeTC,
    prtOutputCapacityUnit             PrtCapacityUnitTC,
    prtOutputMaxCapacity              Integer32,
    prtOutputRemainingCapacity        Integer32,
    prtOutputStatus                   PrtSubUnitStatusTC,
    prtOutputName                     OCTET STRING,
    prtOutputVendorName               OCTET STRING,
    prtOutputModel                    OCTET STRING,
    prtOutputVersion                  OCTET STRING,
    prtOutputSerialNumber             OCTET STRING,
    prtOutputDescription              OCTET STRING,
    prtOutputSecurity                 PresentOnOff,
    prtOutputDimUnit                  PrtMediaUnitTC,
    prtOutputMaxDimFeedDir            Integer32,
    prtOutputMaxDimXFeedDir           Integer32,
    prtOutputMinDimFeedDir            Integer32,
    prtOutputMinDimXFeedDir           Integer32,
    prtOutputStackingOrder        PrtOutputStackingOrderTC,
    prtOutputPageDeliveryOrientation
                          PrtOutputPageDeliveryOrientationTC,
    prtOutputBursting                 PresentOnOff,
    prtOutputDecollating              PresentOnOff,
    prtOutputPageCollated             PresentOnOff,
    prtOutputOffsetStacking           PresentOnOff
    }

prtOutputIndex OBJECT-TYPE
    SYNTAX     Integer32 (1..65535)
    MAX-ACCESS not-accessible
    STATUS     current
```

```
    DESCRIPTION
        "A unique value used by this printer to identify this
        output sub-unit. Although these values may change due
        to a major reconfiguration of the sub-unit (e.g.  the
        addition of new output devices to the printer), values
        are expected to remain stable across successive printer
        power cycles."
    ::= { prtOutputEntry 1 }

prtOutputType OBJECT-TYPE
    -- This value is a type 2 enumeration
    SYNTAX     PrtOutputTypeTC
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The type of technology supported by this output sub-unit."
    ::= { prtOutputEntry 2 }

prtOutputCapacityUnit OBJECT-TYPE
    SYNTAX     PrtCapacityUnitTC
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The unit of measurement for use in calculating and relaying
        capacity values for this output sub-unit."
    ::= { prtOutputEntry 3 }

prtOutputMaxCapacity OBJECT-TYPE
    SYNTAX     Integer32
    MAX-ACCESS read-write
    STATUS     current
    DESCRIPTION
        "The maximum capacity of this output sub-unit in output sub-
unit
        capacity units (PrtCapacityUnitTC). There is no convention
        associated with the media itself so this value essentially
        reflects claimed capacity. If this output sub-unit can
reliably
        sense this value, the value is sensed by the printer and may
not
        be changed by management requests; otherwise, the value may
be
        written (by a Remote Control Panel or a Management
Application).
        The value (-1) means other and specifically indicates that
the
        sub-unit places no restrictions on this parameter. The value
        (-2) means unknown."
    ::= { prtOutputEntry 4 }

prtOutputRemainingCapacity OBJECT-TYPE
    SYNTAX     Integer32
    MAX-ACCESS read-write
    STATUS     current
```

```
    DESCRIPTION
        "The remaining capacity of the possible output sub-unit
capacity
        in output sub-unit capacity units (PrtCapacityUnitTC)of this
        output sub-unit. If this output sub-unit can reliably sense
this
        value, the value is sensed by the printer and may not be
        modified by management requests; otherwise, the value may be
        written (by a Remote Control Panel or a Management
Application).
        The value (-1) means other and specifically indicates that
the
        sub-unit places no restrictions on this parameter.  The value
        (-2) means unknown.  The value (-3) means that the printer
knows
        that there remains capacity for at least one unit."
    ::= { prtOutputEntry 5 }

prtOutputStatus OBJECT-TYPE
    SYNTAX     PrtSubUnitStatusTC
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The current status of this output sub-unit."
    ::= { prtOutputEntry 6 }

--             OUTPUT MEASUREMENT
--
--    _______  |                | ________
--       ^     |                |     ^
--       |     |                |     |
--       |     |                |RemainingCapacity
-- MaxCapacity|                |     |
--       |     |                |     v           ^
--       |     |_ _ _ _ _ _ _ _ | _______________ |direction
--       |     |    Sheets      |                 |
--       |     |      in        |
--       v     |    Output      |
--    _______  +________________+

-- The Extended Output Group
--
-- This group is optional.  However, to claim conformance to this
-- group, it is necessary to implement every object in the group.

prtOutputName OBJECT-TYPE
    SYNTAX     OCTET STRING (SIZE(0..63))
    MAX-ACCESS read-write
    STATUS     current
    DESCRIPTION
        "The name assigned to this output sub-unit."
    ::= { prtOutputEntry 7 }

prtOutputVendorName OBJECT-TYPE
```

```
    SYNTAX     OCTET STRING (SIZE(0..63))
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The vendor name of this output sub-unit."
    ::= { prtOutputEntry 8 }

prtOutputModel OBJECT-TYPE
    SYNTAX     OCTET STRING (SIZE(0..63))
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The model name assigned to this output sub-unit."
    ::= { prtOutputEntry 9 }

prtOutputVersion OBJECT-TYPE
    SYNTAX     OCTET STRING (SIZE(0..63))
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The version of this output sub-unit."
    ::= { prtOutputEntry 10 }

prtOutputSerialNumber OBJECT-TYPE
    SYNTAX     OCTET STRING (SIZE(0..63))
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The serial number assigned to this output sub-unit."
    ::= { prtOutputEntry 11 }

prtOutputDescription OBJECT-TYPE
    SYNTAX     OCTET STRING (SIZE(0..255))
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "A free-form text description of this output sub-unit in the
        localization specified by prtGeneralCurrentLocalization."
    ::= { prtOutputEntry 12 }

prtOutputSecurity OBJECT-TYPE
    SYNTAX     PresentOnOff
    MAX-ACCESS read-write
    STATUS     current
    DESCRIPTION
        "Indicates if this output sub-unit has some security
associated
        with it and if that security is enabled or not."
    ::= { prtOutputEntry 13 }

-- The Output Dimensions Group
--
-- This group is optional.  However, to claim conformance to this
-- group, it is necessary to implement every object in the group.
```

```
 1
 2  prtOutputDimUnit OBJECT-TYPE
 3      SYNTAX     PrtMediaUnitTC
 4      MAX-ACCESS read-only
 5      STATUS     current
 6      DESCRIPTION
 7          "The unit of measurement for use in calculating and relaying
 8          dimensional values for this output sub-unit."
 9      ::= { prtOutputEntry 14 }
10
11  prtOutputMaxDimFeedDir OBJECT-TYPE
12      SYNTAX     Integer32
13      MAX-ACCESS read-write
14      STATUS     current
15      DESCRIPTION
16          "The maximum dimensions supported by this output sub-unit
17          for measurements taken parallel relative to the feed
18          direction associated with that sub-unit in output
19          sub-unit dimensional units (MediaUnit). If this output
20          sub-unit can reliably sense this value, the value is
21          sensed by the printer and may not be changed with
22          management protocol operations."
23      ::= { prtOutputEntry 15 }
24
25  prtOutputMaxDimXFeedDir OBJECT-TYPE
26      SYNTAX     Integer32
27      MAX-ACCESS read-write
28      STATUS     current
29      DESCRIPTION
30          "The maximum dimensions supported by this output sub-unit
31          for measurements taken ninety degrees relative to the
32          feed direction associated with that sub-unit in output
33          sub-unit dimensional units (MediaUnit). If this output
34          sub-unit can reliably sense this value, the value is
35          sensed by the printer and may not be changed with
36          management protocol operations."
37      ::= { prtOutputEntry 16 }
38
39  prtOutputMinDimFeedDir OBJECT-TYPE
40      SYNTAX     Integer32
41      MAX-ACCESS read-write
42      STATUS     current
43      DESCRIPTION
44          "The minimum dimensions supported by this output sub-unit
45          for measurements taken parallel relative to the feed
46          direction associated with that sub-unit in output
47          sub-unit dimensional units (DimUnit).  If this output
48          sub-unit can reliably sense this value, the value is
49          sensed by the printer and may not be changed with
50          management protocol operations."
51      ::= { prtOutputEntry 17 }
52
53  prtOutputMinDimXFeedDir OBJECT-TYPE
54      SYNTAX     Integer32
```

```
    MAX-ACCESS read-write
    STATUS     current
    DESCRIPTION
        "The minimum dimensions supported by this output sub-unit
        for measurements taken ninety degrees relative to the
        feed direction associated with that sub-unit in output
        sub-unit dimensional units (DimUnit). If this output
        sub-unit can reliably sense this value, the value is
        sensed by the printer and may not be changed with
        management protocol operations."
    ::= { prtOutputEntry 18 }

-- The Output Features Group
--
-- This group is optional.  However, to claim conformance to this
-- group, it is necessary to implement every object in the group.

prtOutputStackingOrder OBJECT-TYPE
    --  This value is a type 1 enumeration
    SYNTAX     PrtOutputStackingOrderTC
    MAX-ACCESS read-write
    STATUS     current
    DESCRIPTION
        "The current state of the stacking order for the
        associated output sub-unit. 'FirstToLast' means
        that as pages are output the front of the next page is
        placed against the back of the previous page.
        'LasttoFirst' means that as pages are output the back
        of the next page is placed against the front of the
        previous page."
    ::= { prtOutputEntry 19 }

prtOutputPageDeliveryOrientation OBJECT-TYPE
    --   This value is a type 1 enumeration
    SYNTAX     PrtOutputPageDeliveryOrientationTC
    MAX-ACCESS read-write
    STATUS     current
    DESCRIPTION
        "The reading surface that will be 'up' when pages are
        delivered to the associated output sub-unit. Values are
        faceUp and faceDown. (Note: interpretation of these
        values is in general context-dependent based on locale;
        presentation of these values to an end-user should be
        normalized to the expectations of the user)."
    ::= { prtOutputEntry 20 }

prtOutputBursting OBJECT-TYPE
    SYNTAX     PresentOnOff
    MAX-ACCESS read-write
    STATUS     current
    DESCRIPTION
        "This object indicates that the outputting sub-unit supports
        bursting, and if so, whether the feature is enabled. Bursting
is
```

```
            the process by which continuous media is separated into
            individual sheets, typically by bursting along pre-formed
            perforations."
        ::= { prtOutputEntry 21 }

    prtOutputDecollating OBJECT-TYPE
        SYNTAX     PresentOnOff
        MAX-ACCESS read-write
        STATUS     current
        DESCRIPTION
            "This object indicates that the output supports decollating,
    and
            if so, whether the feature is enabled. Decollating is the
            process by which the individual parts within a multi-part
    form
            are separated and sorted into separate stacks for each part."
        ::= { prtOutputEntry 22 }

    prtOutputPageCollated OBJECT-TYPE
        SYNTAX     PresentOnOff
        MAX-ACCESS read-write
        STATUS     current
        DESCRIPTION
            "This object indicates that the output sub-unit supports page
            collation, and if so, whether the feature is enabled. See
            glossary for definition of how this document defines
    collation."
        ::= { prtOutputEntry 23 }

    prtOutputOffsetStacking OBJECT-TYPE
        SYNTAX     PresentOnOff
        MAX-ACCESS read-write
        STATUS     current
        DESCRIPTION
            "This object indicates that the output supports offset
    stacking,
            and if so, whether the feature is enabled. See glossary for
    how
            Offset Stacking is defined by this document."
        ::= { prtOutputEntry 24 }

    -- The Marker Group
    --
    -- A marker is the mechanism that produces marks on the print
    -- media. The marker sub-units and their associated supplies are
    -- represented by the Marker Group in the model.  A printer can
    -- contain one or more marking mechanisms.  Some examples of
    -- multiple marker sub-units are: a printer
    -- with separate markers for normal and magnetic ink or an
    -- imagesetter that can output to both a proofing device and
    -- final film. Each marking device can have its own set of
    -- characteristics associated with it, such as marking technology
    -- and resolution.
    --
```

```
-- Implementation of every object in this group is mandatory.

prtMarker OBJECT IDENTIFIER ::= { printmib 10 }

-- The printable area margins as listed below define an area of
-- the print media which is guaranteed to be printable for all
-- combinations of input, media paths, and interpreters for this
-- marker.

prtMarkerTable OBJECT-TYPE
    SYNTAX     SEQUENCE OF PrtMarkerEntry
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
        ""
    ::= { prtMarker 2 }

prtMarkerEntry OBJECT-TYPE
    SYNTAX     PrtMarkerEntry
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
        "Entries may exist in the table for each device index with a
        device type of 'printer'."
    INDEX  { hrDeviceIndex, prtMarkerIndex }
    ::= { prtMarkerTable 1 }

PrtMarkerEntry ::= SEQUENCE {
    prtMarkerIndex                  Integer32,
    prtMarkerMarkTech               PrtMarkerMarkTechTC,
    prtMarkerCounterUnit            PrtMarkerCounterUnitTC,
    prtMarkerLifeCount              Counter32,
    prtMarkerPowerOnCount           Counter32,
    prtMarkerProcessColorants       Integer32,
    prtMarkerSpotColorants          Integer32,
    prtMarkerAddressabilityUnit     PrtMarkerAddressabilityUnitTC,
    prtMarkerAddressabilityFeedDir  Integer32,
    prtMarkerAddressabilityXFeedDir Integer32,
    prtMarkerNorthMargin            Integer32,
    prtMarkerSouthMargin            Integer32,
    prtMarkerWestMargin             Integer32,
    prtMarkerEastMargin             Integer32,
    prtMarkerStatus                 PrtSubUnitStatusTC
    }

prtMarkerIndex OBJECT-TYPE
    SYNTAX     Integer32 (1..65535)
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
        "A unique value used by the printer to identify this marking
        SubUnit.  Although these values may change due to a major
        reconfiguration of the device (e.g. the addition of new
marking
```

```
        sub-units to the printer), values are expected to remain
stable
        across successive printer power cycles."
    ::= { prtMarkerEntry 1 }

prtMarkerMarkTech OBJECT-TYPE
    -- This value is a type 2 enumeration
    SYNTAX     PrtMarkerMarkTechTC
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The type of marking technology used for this marking sub-
unit."
    ::= { prtMarkerEntry 2 }

prtMarkerCounterUnit OBJECT-TYPE
    -- This value is a type 1 enumeration
    SYNTAX     PrtMarkerCounterUnitTC
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The unit that will be used by the printer when reporting
        counter values for this marking sub-unit.  The time units of
        measure are provided for a device like a strip recorder that
        does not or cannot track the physical dimensions of the media
        and does not use characters, lines or sheets."
    ::= { prtMarkerEntry 3 }

prtMarkerLifeCount OBJECT-TYPE
    SYNTAX     Counter32
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The count of the number of units of measure counted during
the
        life of printer using units of measure as specified by
        prtMarkerCounterUnit."
    ::= { prtMarkerEntry 4 }

prtMarkerPowerOnCount OBJECT-TYPE
    SYNTAX     Counter32
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The count of the number of units of measure counted since
the
        equipment was most recently powered on using units of measure
as
        specified by prtMarkerCounterUnit."
    ::= { prtMarkerEntry 5 }

prtMarkerProcessColorants OBJECT-TYPE
    SYNTAX     Integer32 (0..65535)
    MAX-ACCESS read-only
```

```
    STATUS     current
    DESCRIPTION
        "The number of process colors supported by this marker.  A
        process color of 1 implies monochrome.  The value of this
object
        and prtMarkerSpotColorants cannot both be 0.  The value of
        prtMarkerProcessColorants must be 0 or greater."
    ::= { prtMarkerEntry 6 }

prtMarkerSpotColorants OBJECT-TYPE
    SYNTAX     Integer32 (0..65535)
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The number of spot colors supported by this marker. The
value
        of this object and prtMarkerProcessColorants cannot both be
0.
        Must be 0 or greater."
    ::= { prtMarkerEntry 7 }

prtMarkerAddressabilityUnit OBJECT-TYPE
    --   This value is a type 1 enumeration
    SYNTAX     PrtMarkerAddressabilityUnitTC
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The unit of measure of distances, as applied to the marker's
        resolution."
    ::= { prtMarkerEntry 8 }

prtMarkerAddressabilityFeedDir OBJECT-TYPE
    SYNTAX     Integer32
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The maximum number of addressable marking positions in the
feed
        direction per 10000 units of measure specified by
        prtMarkerAddressabilityUnit.  A value of (-1) implies 'other'
or
        'infinite' while a value of (-2) implies 'unknown'."
    ::= { prtMarkerEntry 9 }

prtMarkerAddressabilityXFeedDir OBJECT-TYPE
    SYNTAX     Integer32
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The maximum number of addressable marking positions in the
        cross feed direction in 10000 units of measure specified by
        prtMarkerAddressabilityUnit.  A value of (-1) implies 'other'
or
        'infinite' while a value of (-2) implies 'unknown'."
```

```
    ::= { prtMarkerEntry 10 }

prtMarkerNorthMargin OBJECT-TYPE
    SYNTAX     Integer32
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The margin, in units identified by
prtMarkerAddressabilityUnit,
        from the leading edge of the medium as the medium flows
through
        the marking engine with the side to be imaged facing the
        observer. The leading edge is the North edge and the other
edges
        are defined by the normal compass layout of  directions with
the
        compass facing the observer.  Printing within the area
bounded
        by all four margins is guaranteed for all interpreters.   The
        value (-2) means unknown."
    ::= { prtMarkerEntry 11 }

prtMarkerSouthMargin OBJECT-TYPE
    SYNTAX     Integer32
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The margin from the South edge  (see prtMarkerNorthMargin)
of
        the medium in units identified by
prtMarkerAddressabilityUnit.
        Printing within the area bounded by all four margins  is
        guaranteed for all interpreters. The value (-2) means
unknown."
    ::= { prtMarkerEntry 12 }

prtMarkerWestMargin OBJECT-TYPE
    SYNTAX     Integer32
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The margin from the West edge (see prtMarkerNorthMargin) of
the
        medium in units identified by prtMarkerAddressabilityUnit.
        Printing within the area bounded by all four margins is
        guaranteed for all interpreters. The value (-2) means
unknown."
    ::= { prtMarkerEntry 13 }

prtMarkerEastMargin OBJECT-TYPE
    SYNTAX     Integer32
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
```

```
        "The margin from the East edge (see prtMarkerNorthMargin) of
the
        medium in units identified by prtMarkerAddressabilityUnit.
        Printing within the area bounded by all four margins is
        guaranteed for all interpreters. The value (-2) means
unknown."
    ::= { prtMarkerEntry 14 }

prtMarkerStatus OBJECT-TYPE
    SYNTAX     PrtSubUnitStatusTC
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The current status of this marker sub-unit."
    ::= { prtMarkerEntry 15 }

-- The Marker Supplies Group
--
-- This group is optional.  However, to claim conformance to this
-- group, it is necessary to implement every object in the group.

prtMarkerSupplies OBJECT IDENTIFIER ::= { printmib 11 }

prtMarkerSuppliesTable OBJECT-TYPE
    SYNTAX     SEQUENCE OF PrtMarkerSuppliesEntry
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
        "A table of the marker supplies available on this printer."
    ::= { prtMarkerSupplies 1 }

prtMarkerSuppliesEntry OBJECT-TYPE
    SYNTAX     PrtMarkerSuppliesEntry
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
        "Attributes of a marker supply. Entries may exist in the
table
        for each device index with a device type of 'printer'."
    INDEX  { hrDeviceIndex, prtMarkerSuppliesIndex }
    ::= { prtMarkerSuppliesTable 1 }

PrtMarkerSuppliesEntry ::= SEQUENCE {
    prtMarkerSuppliesIndex          Integer32,
    prtMarkerSuppliesMarkerIndex    Integer32,
    prtMarkerSuppliesColorantIndex  Integer32,
    prtMarkerSuppliesClass          PrtMarkerSuppliesClassTC,
    prtMarkerSuppliesType           PrtMarkerSuppliesTypeTC,
    prtMarkerSuppliesDescription    OCTET STRING,
    prtMarkerSuppliesSupplyUnit    PrtMarkerSuppliesSupplyUnitTC,
    prtMarkerSuppliesMaxCapacity    Integer32,
    prtMarkerSuppliesLevel          Integer32
    }
```

```
prtMarkerSuppliesIndex OBJECT-TYPE
    SYNTAX     Integer32 (1..65535)
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
        "A unique value used by the printer to identify this marker
        supply.  Although these values may change due to a major
        reconfiguration of the device (e.g. the addition of new
marker
        supplies to the printer), values are expected to remain
stable
        across successive power cycles."
    ::= { prtMarkerSuppliesEntry 1 }

prtMarkerSuppliesMarkerIndex OBJECT-TYPE
    SYNTAX     Integer32 (0..65535)
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The value of prtMarkerIndex corresponding to the marking sub
        unit with which this marker supply sub-unit is associated."
    ::= { prtMarkerSuppliesEntry 2 }

prtMarkerSuppliesColorantIndex OBJECT-TYPE
    SYNTAX     Integer32 (0..65535)
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The value of prtMarkerColorantIndex corresponding to the
        colorant with which this marker supply sub-unit is
associated.
        This value shall be 0 if there is no colorant table or if
this
        supply does not depend on a single specified colorant."
    ::= { prtMarkerSuppliesEntry 3 }

prtMarkerSuppliesClass OBJECT-TYPE
    --  This value is a type 1 enumeration
    SYNTAX     PrtMarkerSuppliesClassTC
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "Indicates whether this supply entity represents a supply
that
        is consumed or a receptacle that is filled."
    ::= { prtMarkerSuppliesEntry 4 }

prtMarkerSuppliesType OBJECT-TYPE
    --   This value is a type 3 enumeration
    SYNTAX     PrtMarkerSuppliesTypeTC
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The type of this supply."
```

```
    ::= { prtMarkerSuppliesEntry 5 }

prtMarkerSuppliesDescription OBJECT-TYPE
    SYNTAX     OCTET STRING (SIZE(0..255))
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The description of this supply container/receptacle in the
        localization specified by prtGeneralCurrentLocalization."
    ::= { prtMarkerSuppliesEntry 6 }

prtMarkerSuppliesSupplyUnit OBJECT-TYPE
    -- This value is a type 1 enumeration
    SYNTAX     PrtMarkerSuppliesSupplyUnitTC
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "Unit of measure of this marker supply container/receptacle."
    ::= { prtMarkerSuppliesEntry 7 }

prtMarkerSuppliesMaxCapacity OBJECT-TYPE
    SYNTAX     Integer32
    MAX-ACCESS read-write
    STATUS     current
    DESCRIPTION
        "The maximum capacity of this supply container/receptacle
        expressed in prtMarkerSuppliesSupplyUnit. If this supply
        container/receptacle can reliably sense this value, the value
is
        reported by the printer and is read-only; otherwise, the
value
        may be written (by a Remote Control Panel or a Management
        Application). The value (-1) means other and specifically
        indicates that the sub-unit places no restrictions on this
        parameter. The value (-2) means unknown."
    ::= { prtMarkerSuppliesEntry 8 }

prtMarkerSuppliesLevel OBJECT-TYPE
    SYNTAX     Integer32
    MAX-ACCESS read-write
    STATUS     current
    DESCRIPTION
        "The current level if this supply is a container; remaining
        space if this supply is a receptacle. If this supply
        container/receptacle can reliably sense this value, the value
is
        reported by the printer and is read-only; otherwise, the
value
        may be written (by a Remote Control Panel or a Management
        Application). The value (-1) means other and specifically
        indicates that the sub-unit places no restrictions on this
        parameter. The value (-2) means unknown.  A value of (-3)
means
        that the printer knows that there is some supply/remaining
```

```
            space, respectively."
        ::= { prtMarkerSuppliesEntry 9 }

    -- The Marker Colorant Group
    --
    -- This group is optional.  However, to claim conformance to this
    -- group, it is necessary to implement every object in the group.

    prtMarkerColorant OBJECT IDENTIFIER ::= { printmib 12 }

    prtMarkerColorantTable OBJECT-TYPE
        SYNTAX     SEQUENCE OF PrtMarkerColorantEntry
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "A table of all of the colorants available on the printer."
        ::= { prtMarkerColorant 1 }

    prtMarkerColorantEntry OBJECT-TYPE
        SYNTAX     PrtMarkerColorantEntry
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "Attributes of a colorant available on the printer. Entries
    may
            exist in the table for each device index with a device type
    of
            'printer'."
        INDEX { hrDeviceIndex, prtMarkerColorantIndex }
        ::= { prtMarkerColorantTable 1 }

    PrtMarkerColorantEntry ::= SEQUENCE {
        prtMarkerColorantIndex          Integer32,
        prtMarkerColorantMarkerIndex    Integer32,
        prtMarkerColorantRole           PrtMarkerColorantRoleTC,
        prtMarkerColorantValue          OCTET STRING,
        prtMarkerColorantTonality       Integer32
        }

    prtMarkerColorantIndex OBJECT-TYPE
        SYNTAX     Integer32 (1..65535)
        MAX-ACCESS not-accessible
        STATUS     current
        DESCRIPTION
            "A unique value used by the printer to identify this
    colorant.
            Although these values may change due to a major
    reconfiguration
            of the device (e.g. the addition of new colorants to the
            printer)."
        ::= { prtMarkerColorantEntry 1 }

    prtMarkerColorantMarkerIndex OBJECT-TYPE
        SYNTAX     Integer32 (0..65535)
```

```
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The value of prtMarkerIndex corresponding to the marker sub
        unit with which this colorant entry is associated."
    ::= { prtMarkerColorantEntry 2 }

prtMarkerColorantRole OBJECT-TYPE
    -- This value is a type 1 enumeration
    SYNTAX     PrtMarkerColorantRoleTC
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The role played by this colorant."
    ::= { prtMarkerColorantEntry 3 }

prtMarkerColorantValue OBJECT-TYPE
    SYNTAX     OCTET STRING (SIZE(0..255))
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The name of the color of this colorant using standardized
        string names from ISO 10175 (DPA) and ISO 10180 (SPDL) such
as:
            other
            unknown
            white
            red
            green
            blue
            cyan
            magenta
            yellow
            black
        Implementers may add additional string values. The naming
        conventions in ISO 9070 are recommended in order to avoid
        potential name clashes"
    ::= { prtMarkerColorantEntry 4 }

prtMarkerColorantTonality OBJECT-TYPE
    SYNTAX     Integer32
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The distinct levels of tonality realizable by a marking sub
        unit when using this colorant.  This value does not include
the
        number of levels of tonal difference that an interpreter can
        obtain by techniques such as half toning. This value must be
at
        least 2."
    ::= { prtMarkerColorantEntry 5 }
```

```
-- The Media Path Group
--
-- The media paths encompass the mechanisms in the printer that
-- move the media through the printer and connect all other media
-- related sub-units: inputs, outputs, markers and finishers. A
-- printer contains one or more media paths. These are
-- represented by the Media Path Group in the model. The Media
-- Path group has some attributes that apply to all
-- paths plus a table of the separate media paths.

prtMediaPath OBJECT IDENTIFIER ::= { printmib 13 }

prtMediaPathTable OBJECT-TYPE
    SYNTAX     SEQUENCE OF PrtMediaPathEntry
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
        ""
    ::= { prtMediaPath 4 }

prtMediaPathEntry OBJECT-TYPE
    SYNTAX     PrtMediaPathEntry
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
        "Entries may exist in the table for each device index with a
        device type of 'printer'."
    INDEX  { hrDeviceIndex, prtMediaPathIndex }
    ::= { prtMediaPathTable 1 }

PrtMediaPathEntry ::= SEQUENCE {
    prtMediaPathIndex                Integer32,
    prtMediaPathMaxSpeedPrintUnit
                          PrtMediaPathMaxSpeedPrintUnitTC,
    prtMediaPathMediaSizeUnit        PrtMediaUnitTC,
    prtMediaPathMaxSpeed             Integer32,
    prtMediaPathMaxMediaFeedDir      Integer32,
    prtMediaPathMaxMediaXFeedDir     Integer32,
    prtMediaPathMinMediaFeedDir      Integer32,
    prtMediaPathMinMediaXFeedDir     Integer32,
    prtMediaPathType                 PrtMediaPathTypeTC,
    prtMediaPathDescription          OCTET STRING,
    prtMediaPathStatus               PrtSubUnitStatusTC
    }

prtMediaPathIndex OBJECT-TYPE
    SYNTAX     Integer32 (1..65535)
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
        "A unique value used by the printer to identify this media
path.
        Although these values may change due to a major
reconfiguration
```

```
        of the device (e.g. the addition of new media paths to the
        printer), values are expected to remain stable across
successive
        printer power cycles."
    ::= { prtMediaPathEntry 1 }

prtMediaPathMaxSpeedPrintUnit OBJECT-TYPE
    -- This value is a type 1 enumeration
    SYNTAX PrtMediaPathMaxSpeedPrintUnitTC
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The unit of measure used in specifying the speed of all
media
        paths in the printer."
    ::= { prtMediaPathEntry 2 }

prtMediaPathMediaSizeUnit OBJECT-TYPE
    SYNTAX     PrtMediaUnitTC
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The units of measure of media size for use in calculating
and
        relaying dimensional values for all media paths in the
printer."
    ::= { prtMediaPathEntry 3 }

prtMediaPathMaxSpeed OBJECT-TYPE
    SYNTAX     Integer32
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The maximum printing speed of this media path expressed in
        prtMediaPathMaxSpeedUnit's.  A value of (-1) implies
'other'."
    ::= { prtMediaPathEntry 4 }

prtMediaPathMaxMediaFeedDir OBJECT-TYPE
    SYNTAX     Integer32
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The maximum physical media size in the feed direction of
this
        media path expressed in units of measure specified by
        PrtMediaPathMediaSizeUnit.  A value of (-1) implies
'unlimited'
        a value of (-2) implies 'unknown'"
    ::= { prtMediaPathEntry 5 }

prtMediaPathMaxMediaXFeedDir OBJECT-TYPE
    SYNTAX     Integer32
    MAX-ACCESS read-only
```

```
    STATUS     current
    DESCRIPTION
        "The maximum physical media size across the feed direction of
        this media path expressed in units of measure specified by
        prtMediaPathMediaSizeUnit.  A value of (-2) implies
'unknown'."
    ::= { prtMediaPathEntry 6 }

prtMediaPathMinMediaFeedDir OBJECT-TYPE
    SYNTAX     Integer32
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The minimum physical media size in the feed direction of
this
        media path expressed in units of measure specified by
        prtMediaPathMediaSizeUnit. A value of (-2) implies
'unknown'."
    ::= { prtMediaPathEntry 7 }

prtMediaPathMinMediaXFeedDir OBJECT-TYPE
    SYNTAX     Integer32
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The minimum physical media size across the feed direction of
        this media path expressed in units of measure specified by
        prtMediaPathMediaSizeUnit.  A value of (-2) implies
'unknown'."
    ::= { prtMediaPathEntry 8 }

prtMediaPathType OBJECT-TYPE
    --   This value is a type 2 enumeration
    SYNTAX     PrtMediaPathTypeTC
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The type of the media path for this media path."
    ::= { prtMediaPathEntry 9 }

prtMediaPathDescription OBJECT-TYPE
    SYNTAX     OCTET STRING (SIZE(0..255))
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The manufacturer-provided description of this media path in
the
        localization specified by prtGeneralCurrentLocalization."
    ::= { prtMediaPathEntry 10 }

prtMediaPathStatus OBJECT-TYPE
    SYNTAX     PrtSubUnitStatusTC
    MAX-ACCESS read-only
    STATUS     current
```

```
     DESCRIPTION
          "The current status of this media path."
     ::= { prtMediaPathEntry 11 }

-- The Print Job Delivery Channel Group
--
-- Implementation of every object in this group is mandatory.
--
-- Print Job Delivery Channels are independent sources of print
-- data. Here, print data is the term used for the information
-- that is used to construct printed pages and may have both data
-- and control aspects. The output of a channel is in a form
-- suitable for input to one of the interpreters as a
-- stream. A channel may be independently enabled (allowing
-- print data to flow) or disabled (stopping the flow of
-- print data). A printer may have one or more channels.
--
-- The Print Job Delivery Channel table describes the
-- capabilities of the printer and not what is currently being
-- performed by the printer
--
-- Basically, the print job delivery channel abstraction
-- describes the final processing step of getting the print data
-- to an interpreter. It might include some level of
-- decompression or decoding of print stream data.
-- channel. All of these aspects are hidden in the channel
-- abstraction.
--
-- There are many kinds of print job delivery channels; some of
-- which are based on networks and others which are not. For
-- example, a channel can be a serial (or parallel) connection;
-- it can be a service, such as the UNIX Line Printer Daemon
-- (LPD), offering services over a network connection; or
-- it could be a disk drive into which a floppy disk with
-- the print data is inserted. Each print job delivery channel is
-- identified by the electronic path and/or service protocol
-- used to deliver print data to a print data interpreter.
--
-- Channel example                    Implementation
--
-- serial port channel             bi-directional data channel
-- parallel port channel           often uni-directional channel
-- IEEE 1284 port channel          bi-directional channel
-- SCSI port channel               bi-directional
-- Apple PAP channel               may be based on LocalTalk,
--                                 Ethernet or Tokentalk
-- LPD Server channel              TCP/IP based, port 515
-- Netware Remote Printer          SPX/IPX based channel
-- Netware Print Server            SPX/IPX based channel
--
-- It is easy to note that this is a mixed bag.  There are
-- some physical connections over which no (or very meager)
-- protocols are run (e.g. the serial or old parallel ports)
-- and there are services which often have elaborate
```

```
-- protocols that run over a number of protocol stacks. In
-- the end, what is important is the delivery of print data
-- through the channel.
--
-- The print job delivery channel sub-units are represented by
-- the Print Job Delivery Channel Group in the Model. It has a
-- current print job control language, which can be used to
-- specify which interpreter is to be used for the print data and
-- to query and change environment variables used by the
-- interpreters (and Management Applications). There is also a
-- default interpreter that is to be used if an interpreter is
-- not explicitly specified using the Control Language.

-- The first seven items in the Print Job Delivery Channel Table
-- define the "channel" itself.  A channel typically depends on
-- other protocols and interfaces to provide the data that flows
-- through the channel.
--
-- Control of a print job delivery channel is largely limited to
-- enabling or disabling the entire channel itself. It is likely
-- that more control of the process of accessing print data
-- will be needed over time. Thus, the ChannelType will
-- allow type-specific data to be associated with each
-- channel (using ChannelType specific groups in a fashion
-- analogous to the media specific MIBs that are associated
-- with the IANAIfType in the Interfaces Table). As a first
-- step in this direction, each channel will identify the
-- underlying Interface on which it is based. This is the
-- eighth object in each row of the table.

-- The Print Job Delivery Channel Table
--
-- The prtChannelTable represents the set of input data sources
-- which can provide print data to one or more of the
-- interpreters available on a printer

prtChannel OBJECT IDENTIFIER ::= { printmib 14 }

prtChannelTable OBJECT-TYPE
    SYNTAX     SEQUENCE OF PrtChannelEntry
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
        ""
    ::= { prtChannel 1 }

prtChannelEntry OBJECT-TYPE
    SYNTAX     PrtChannelEntry
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
        "Entries may exist in the table for each device index with a
        device type of 'printer'."
    INDEX  { hrDeviceIndex, prtChannelIndex }
```

```
    ::= { prtChannelTable 1 }

PrtChannelEntry ::= SEQUENCE {
    prtChannelIndex                      Integer32,
    prtChannelType                       PrtChannelTypeTC,
    prtChannelProtocolVersion            OCTET STRING,
    prtChannelCurrentJobCntlLangIndex    Integer32,
    prtChannelDefaultPageDescLangIndex   Integer32,
    prtChannelState                      PrtChannelStateTC,
    prtChannelIfIndex                    Integer32,
    prtChannelStatus                     PrtSubUnitStatusTC,
    prtChannelInformation                OCTET STRING
    }

prtChannelIndex OBJECT-TYPE
    SYNTAX     Integer32 (1..65535)
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
        "A unique value used by the printer to identify this data
        channel.  Although these values may change due to a major
        reconfiguration of the device (e.g. the addition of new data
        channels to the printer), values are expected to remain
stable
        across successive printer power cycles."
    ::= { prtChannelEntry 1 }

prtChannelType OBJECT-TYPE
    SYNTAX     PrtChannelTypeTC
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The type of this print data channel.  This object provides
the
        linkage to ChannelType-specific groups that may
(conceptually)
        extend the prtChannelTable with additional details about that
        channel."
    ::= { prtChannelEntry 2 }

prtChannelProtocolVersion OBJECT-TYPE
    SYNTAX     OCTET STRING (SIZE(0..63))
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The version of the protocol used on this channel.  The
format
        used for version numbering depends on prtChannelType."
    ::= { prtChannelEntry 3 }

prtChannelCurrentJobCntlLangIndex OBJECT-TYPE
    SYNTAX     Integer32
    MAX-ACCESS read-write
    STATUS     current
```

```
    DESCRIPTION
        "The value of prtInterpreterIndex corresponding to the
Control
        Language Interpreter for this channel. This interpreter
defines
        the syntax used for control functions, such as querying or
        changing environment variables and identifying job boundaries
        (e.g. PJL, PostScript, NPAP). A value of zero indicates that
        there is no current Job Control Language Interpreter for this
        channel"
    ::= { prtChannelEntry 4 }

prtChannelDefaultPageDescLangIndex OBJECT-TYPE
    SYNTAX     Integer32
    MAX-ACCESS read-write
    STATUS     current
    DESCRIPTION
        "The value of prtInterpreterIndex corresponding to the Page
        Description Language Interpreter for this channel. This
        interpreter defines the default Page Description Language
        interpreter to be used for the print data unless the Control
        Language is used to select a specific interpreter (e.g., PCL,
        PostScript Language, auto-sense). A value of zero indicates
that
        there is no default page description language interpreter for
        this channel."
    ::= { prtChannelEntry 5 }

prtChannelState OBJECT-TYPE
    -- This value is a type 1 enumeration
    SYNTAX     PrtChannelStateTC
    MAX-ACCESS read-write
    STATUS     current
    DESCRIPTION
        "The state of this print data channel. The value determines
        whether control information and print data is allowed through
        this channel or not."
    ::= { prtChannelEntry 6 }

prtChannelIfIndex OBJECT-TYPE
    SYNTAX     Integer32
    MAX-ACCESS read-write
    STATUS     current
    DESCRIPTION
        "The value of ifIndex in the ifTable; see the interface
section
        of MIB-II (RFC 1213 [14]) which corresponds to this channel.
        When more than one row of the ifTable is relevant, this is
the
        index of the row representing the topmost layer in the
interface
        hierarchy.  A value of zero indicates that no interface is
        associated with this channel."
    ::= { prtChannelEntry 7 }
```

```
 1
 2  prtChannelStatus OBJECT-TYPE
 3      SYNTAX     PrtSubUnitStatusTC
 4      MAX-ACCESS read-only
 5      STATUS     current
 6      DESCRIPTION
 7          "The current status of the channel."
 8      ::= { prtChannelEntry 8 }
 9
10  prtChannelInformation OBJECT-TYPE
11      SYNTAX     OCTET STRING (SIZE (0..255))
12      MAX-ACCESS read-only
13      STATUS     current
14      DESCRIPTION
15          "Auxiliary information to allow a printing application to use
16          the channel for data submission to the printer.  An
17  application
18          capable of using a specific PrtChannelType should be able to
19  use
20          the combined information from the prtChannelInformation and
21          other channel and interface group objects to 'bootstrap' its
22  use
23          of the channel.  prtChannelInformation is not intended to
24          provide a general channel description, nor to provide
25          information that is available once the channel is in use.
26
27          The encoding and interpretation of the prtChannelInformation
28          object is specific to channel type.  The description of each
29          PrtChannelType enum value for which prtChannelInformation is
30          defined specifies the appropriate encoding and
31  interpretation,
32          including interaction with other objects.  For channel types
33          that do not specify a prtChannelInformation value, its value
34          shall be null (0 length).
35
36          When a new PrtChannelType enumeration value is registered,
37  its
38          accompanying description must specify the encoding and
39          interpretation of the prtChannelInformation value for the
40          channel type.  prtChannelInformation semantics for an
41  existing
42          PrtChannelType may be added or amended in the same manner as
43          described in section 2.4.1 for type 2 enumeration values.
44
45          The prtChannelInformation specifies values for a collection
46  of
47          channel attributes, represented as text according to the
48          following rules:
49
50          1. The prtChannelInformation is not affected by localization.
51
52          2. The prtChannelInformation is a list of entries
53  representing
54          the attribute values.  Each entry consists of the following
```

items, in order:

a. A keyword, composed of alphabetic characters (A-Z, a-z) represented by their NVT ASCII [10] codes, that identifies a channel attribute,

b. The NVT ASCII code for an Equals Sign (=) (code 61) to delimit the keyword,

c. A data value encoded using rules specific to the PrtChannelType to with the prtChannelInformation applies which must in no case allow an octet with value 10 (the NVT ASCII Line Feed code),

d. the NVT ASCII code for a Line Feed character (code 10) to delimit the data value.

No other octets shall be present.

Keywords are case-sensitive. Conventionally, keywords are capitalized (including each word of a multi-word keyword) and since they occupy space in the prtChannelInformation, they are kept short.

3. If a channel attribute has multiple values, it is represented by multiple entries with the same keyword, each specifying one value. Otherwise, there shall be at most one entry for each attribute.

4. By default, entries may appear in any order. If there are ordering constraints for particular entries, these must be specified in their definitions.

5. The prtChannelInformation value by default consists of text represented by NVT ASCII graphics character codes. However, other representations may be specified:

a. In cases where the prtChannelInformation value contains information not normally coded in textual form, whatever symbolic representation is conventionally used for the information should be used for encoding the prtChannelInformation value. (For instance, a binary port value might be represented as a decimal number using NVT ASCII codes.)
Such encoding must be specified in the definition of the value.

```
        b. The value may contain textual information in a character
set
        other than NVT ASCII graphics characters.  (For instance, an
        identifier might consist of ISO 10646 text encoded using the
        UTF-8 encoding scheme.) Such a character set and its encoding
        must be specified in the definition of the value.

        6. For each PrtChannelType for which prtChannelInformation
        entries are defined, the descriptive text associated with the
        PrtChannelType enumeration value shall specify the following
        information for each entry:

        Title:        Brief description phrase, e.g.: 'Port name',
                      'Service Name', etc.

        Keyword:      The keyword value, e.g.: 'Port' or 'Service'

        Syntax:       The encoding of the entry value if it cannot be
                      directly represented by NVT ASCII.

        Status:       'Mandatory', 'Optional', or 'Conditionally
                      Mandatory'

        Multiplicity: 'Single' or 'Multiple' to indicate whether the
                      entry may be present multiple times.

        Description:  Description of the use of the entry, other
                      information required to complete the definition
                      (e.g.: ordering constraints, interactions
between
                      entries).

        Applications that interpret prtChannelInformation should
ignore
        unrecognized entries, so they are not affected if new entry
        types are added."

     ::= { prtChannelEntry 9 }

-- The Interpreter Group
--
-- The interpreter sub-units are responsible for the conversion
-- of a description of intended print instances into images that
-- are to be marked on the media. A printer may have one or more
-- interpreters. The interpreter sub-units are represented by the
-- Interpreter Group in the Model. Each interpreter is generally
-- implemented with software running on the System Controller
-- sub-unit. The Interpreter Table has one entry per interpreter
-- where the interpreters include both Page Description Language
-- (PDL) Interpreters and Control Language Interpreters.
--
-- Implementation of every object in this group is mandatory.

prtInterpreter OBJECT IDENTIFIER ::= { printmib 15 }
```

```
--       Interpreter Table
--
-- The prtInterpreterTable is a table representing the
-- interpreters in the printer.  An entry shall be placed in the
-- interpreter table for each interpreter on the printer.

prtInterpreterTable OBJECT-TYPE
    SYNTAX     SEQUENCE OF PrtInterpreterEntry
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
        ""
    ::= { prtInterpreter 1 }

prtInterpreterEntry OBJECT-TYPE
    SYNTAX     PrtInterpreterEntry
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
        "Entries may exist in the table for each device index with a
        device type of 'printer'."
    INDEX  { hrDeviceIndex, prtInterpreterIndex }
    ::= { prtInterpreterTable 1 }

PrtInterpreterEntry ::= SEQUENCE {
    prtInterpreterIndex                Integer32,
    prtInterpreterLangFamily           PrtInterpreterLangFamilyTC,
    prtInterpreterLangLevel            OCTET STRING,
    prtInterpreterLangVersion          OCTET STRING,
    prtInterpreterDescription          OCTET STRING,
    prtInterpreterVersion              OCTET STRING,
    prtInterpreterDefaultOrientation   PrtPrintOrientationTC,
    prtInterpreterFeedAddressability   Integer32,
    prtInterpreterXFeedAddressability  Integer32,
    prtInterpreterDefaultCharSetIn     CodedCharSet,
    prtInterpreterDefaultCharSetOut    CodedCharSet,
    prtInterpreterTwoWay               PrtInterpreterTwoWayTC
    }

prtInterpreterIndex OBJECT-TYPE
    SYNTAX     Integer32 (1..65535)
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
        "A unique value for each PDL or control language for which
there
        exists an interpreter or emulator in the printer. The value
is
        used to identify this interpreter. Although these values may
        change due to a major reconfiguration of the device (e.g. the
        addition of new interpreters to the printer), values are
        expected to remain stable across successive printer power
        cycles."
```

```
    ::= { prtInterpreterEntry 1 }

prtInterpreterLangFamily OBJECT-TYPE
    -- This value is a type 2 enumeration
    SYNTAX     PrtInterpreterLangFamilyTC
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The family name of a Page Description Language (PDL) or
control
        language which this interpreter in the printer can interpret
or
        emulate."
    ::= { prtInterpreterEntry 2 }

prtInterpreterLangLevel OBJECT-TYPE
    SYNTAX     OCTET STRING (SIZE(0..31))
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The level of the language which this interpreter is
        interpreting or emulating.  This might contain a value like
'5e'
        for an interpreter which is emulating level 5e of the PCL
        language. It might contain '2' for an interpreter which is
        emulating level 2 of the PostScript language. Similarly it
might
        contain '2' for an interpreter which is emulating level 2 of
the
        HPGL language."
    ::= { prtInterpreterEntry 3 }

prtInterpreterLangVersion OBJECT-TYPE
    SYNTAX     OCTET STRING (SIZE(0..31))
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The date code or version of the language which this
interpreter
        is interpreting or emulating."
    ::= { prtInterpreterEntry 4 }

prtInterpreterDescription OBJECT-TYPE
    SYNTAX     OCTET STRING (SIZE(0..255))
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "A string to identify this interpreter in the localization
        specified by prtGeneralCurrentLocalization as opposed to the
        language which is being interpreted.  It is anticipated that
        this string will allow manufacturers to unambiguously
identify
        their interpreters."
    ::= { prtInterpreterEntry 5 }
```

```
 1
 2  prtInterpreterVersion OBJECT-TYPE
 3      SYNTAX     OCTET STRING (SIZE(0..31))
 4      MAX-ACCESS read-only
 5      STATUS     current
 6      DESCRIPTION
 7          "The date code, version number, or other product specific
 8          information tied to this interpreter.  This value is
 9  associated
10          with the interpreter, rather than with the version of the
11          language which is being interpreted or emulated."
12      ::= { prtInterpreterEntry 6 }
13
14  prtInterpreterDefaultOrientation OBJECT-TYPE
15      -- This value is a type 1 enumeration
16      SYNTAX     PrtPrintOrientationTC
17      MAX-ACCESS read-write
18      STATUS     current
19      DESCRIPTION
20          "The current orientation default for this interpreter. This
21          value may be overridden for a particular job (e.g., by a
22  command
23          in the input data stream)."
24      ::= { prtInterpreterEntry 7 }
25
26  prtInterpreterFeedAddressability OBJECT-TYPE
27      SYNTAX     Integer32
28      MAX-ACCESS read-only
29      STATUS     current
30      DESCRIPTION
31          "The maximum interpreter addressability in the feed
32          direction in 10000 prtMarkerAddressabilityUnits (see
33          prtMarkerAddressabilityFeedDir ) for this interpreter. The
34  value
35          (-1) means other and specifically indicates that the sub-unit
36          places no restrictions on this parameter."
37      ::= { prtInterpreterEntry 8 }
38
39  prtInterpreterXFeedAddressability OBJECT-TYPE
40      SYNTAX     Integer32
41      MAX-ACCESS read-only
42      STATUS     current
43      DESCRIPTION
44          "The maximum interpreter addressability in the cross feed
45          direction in 10000 prtMarkerAddressabilityUnits (see
46          prtMarkerAddressabilityXFeedDir) for this interpreter. The
47  value
48          (-1) means other and specifically indicates that the sub-unit
49          places no restrictions on this parameter."
50      ::= { prtInterpreterEntry 9 }
51
52  prtInterpreterDefaultCharSetIn OBJECT-TYPE
53      SYNTAX     CodedCharSet
54      MAX-ACCESS read-write
```

```
    STATUS     current
    DESCRIPTION
        "The default coded character set for input octets encountered
        outside a context in which the Page Description Language
        established the interpretation of the octets. (Input octets
are
        presented to the interpreter through a path defined in the
        channel group.) This value shall be (2) if there is no
default."
     ::= { prtInterpreterEntry 10 }

prtInterpreterDefaultCharSetOut OBJECT-TYPE
    SYNTAX     CodedCharSet
    MAX-ACCESS read-write
    STATUS     current
    DESCRIPTION
        "The default character set for data coming from this
interpreter
        through the printer's output channel (i.e. the
'backchannel').
        This value shall be (2) if there is no default."
    ::= { prtInterpreterEntry 11 }

prtInterpreterTwoWay OBJECT-TYPE
    -- This value is a type 1 enumeration
    SYNTAX     PrtInterpreterTwoWayTC
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "Indicates whether or not this interpreter returns
information
        back to the host."
    ::= { prtInterpreterEntry 12 }

-- The Console Group
--
-- Many printers have a console on the printer, the operator
-- console, that is used to display and modify the state of the
-- printer. The console can be as simple as a few indicators and
-- switches or as complicated as full screen displays and
-- keyboards. There can be at most one such console.

-- Implementation of every object in this group is mandatory.

-- The Display Buffer Table

prtConsoleDisplayBuffer OBJECT IDENTIFIER ::= { printmib 16 }

prtConsoleDisplayBufferTable OBJECT-TYPE
    SYNTAX     SEQUENCE OF PrtConsoleDisplayBufferEntry
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
        "Physical display buffer for printer console display or
```

```
 1          operator panel"
 2      ::= { prtConsoleDisplayBuffer 5 }
 3
 4  prtConsoleDisplayBufferEntry OBJECT-TYPE
 5      SYNTAX     PrtConsoleDisplayBufferEntry
 6      MAX-ACCESS not-accessible
 7      STATUS     current
 8      DESCRIPTION
 9          "This table contains one entry for each physical line on
10          the display.  Lines cannot be added or deleted. Entries may
11          exist in the table for each device index with a device type
12  of
13          'printer'."
14      INDEX  { hrDeviceIndex, prtConsoleDisplayBufferIndex }
15      ::= { prtConsoleDisplayBufferTable 1 }
16
17  PrtConsoleDisplayBufferEntry ::= SEQUENCE {
18      prtConsoleDisplayBufferIndex    Integer32,
19      prtConsoleDisplayBufferText     OCTET STRING
20      }
21
22  prtConsoleDisplayBufferIndex OBJECT-TYPE
23      SYNTAX     Integer32 (1..65535)
24      MAX-ACCESS not-accessible
25      STATUS     current
26      DESCRIPTION
27          "A unique value for each console line in the printer. The
28  value
29          is used to identify this console line. Although these values
30  may
31          change due to a major reconfiguration of the device (e.g. the
32          addition of new console lines to the printer). Values are
33          normally expected to remain stable across successive printer
34          power cycles."
35      ::= { prtConsoleDisplayBufferEntry 1 }
36
37  prtConsoleDisplayBufferText OBJECT-TYPE
38      SYNTAX     OCTET STRING (SIZE(0..255))
39      MAX-ACCESS read-write
40      STATUS     current
41      DESCRIPTION
42          "The content of a line in the logical display buffer of
43          the operator's console of the printer.  When a write
44          operation occurs, normally a critical message, to one of
45          the LineText strings, the agent should make that line
46          displayable if a physical display is present.  Writing a zero
47          length string clears the line.  It is an implementation-
48  specific
49          matter as to whether the agent allows a line to be
50  overwritten
51          before it has been cleared. Printer generated strings shall
52  be
53          in the localization specified by prtConsoleLocalization.
54          Management Application generated strings should be localized
```

```
by
        the Management Application."
    ::= { prtConsoleDisplayBufferEntry 2 }

-- The Console Light Table

prtConsoleLights OBJECT IDENTIFIER ::= { printmib 17 }

prtConsoleLightTable OBJECT-TYPE
    SYNTAX     SEQUENCE OF PrtConsoleLightEntry
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
        ""
    ::= { prtConsoleLights 6 }

prtConsoleLightEntry OBJECT-TYPE
    SYNTAX     PrtConsoleLightEntry
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
        "Entries may exist in the table for each device index with a
        device type of 'printer'."
    INDEX  { hrDeviceIndex, prtConsoleLightIndex }
    ::= { prtConsoleLightTable 1 }

PrtConsoleLightEntry ::= SEQUENCE {
    prtConsoleLightIndex            Integer32,
    prtConsoleOnTime                Integer32,
    prtConsoleOffTime               Integer32,
    prtConsoleColor                 PrtConsoleColorTC,
    prtConsoleDescription           OCTET STRING
    }

prtConsoleLightIndex OBJECT-TYPE
    SYNTAX     Integer32 (1..65535)
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
        "A unique value used by the printer to identify this light.
        Although these values may change due to a major
        reconfiguration of the device (e.g. the addition of new
lights
        to the printer). Values are normally expected to remain
stable
        across successive printer power cycles."
    ::= { prtConsoleLightEntry 1 }

prtConsoleOnTime OBJECT-TYPE
    SYNTAX     Integer32
    MAX-ACCESS read-write
    STATUS     current
    DESCRIPTION
        "This object, in conjunction with prtConsoleOffTime, defines
```

```
 1  the
 2          current status of the light.  If both prtConsoleOnTime and
 3          prtConsoleOffTime are non-zero, the lamp is blinking and the
 4          values presented define the on time and off time,
 5  respectively,
 6          in milliseconds. If prtConsoleOnTime is zero and
 7          prtConsoleOffTime is non-zero, the lamp is off. If
 8          prtConsoleOffTime is zero and prtConsoleOnTime is non-zero,
 9  the
10          lamp is on. If both values are zero the lamp is off."
11      ::= { prtConsoleLightEntry 2 }
12
13  prtConsoleOffTime OBJECT-TYPE
14      SYNTAX     Integer32
15      MAX-ACCESS read-write
16      STATUS     current
17      DESCRIPTION
18          "This object, in conjunction with prtConsoleOnTime, defines
19  the
20          current status of the light. If both prtConsoleOnTime and
21          prtConsoleOffTime are non-zero, the lamp is blinking and the
22          values presented define the on time and off time,
23  respectively,
24          in milliseconds. If prtConsoleOnTime is zero and
25          prtConsoleOffTime is non-zero, the lamp is off. If
26          prtConsoleOffTime is zero and prtConsoleOnTime is non-zero,
27  the
28          lamp is on. If both values are zero the lamp is off."
29      ::= { prtConsoleLightEntry 3 }
30
31  prtConsoleColor OBJECT-TYPE
32      -- This value is a type 2 enumeration
33      SYNTAX     PrtConsoleColorTC
34      MAX-ACCESS read-only
35      STATUS     current
36      DESCRIPTION
37          "The color of this light."
38      ::= { prtConsoleLightEntry 4 }
39
40  prtConsoleDescription OBJECT-TYPE
41      SYNTAX     OCTET STRING (SIZE(0..255))
42      MAX-ACCESS read-only
43      STATUS     current
44      DESCRIPTION
45          "The vendor description or label of this light in the
46          localization specified by prtConsoleLocalization."
47      ::= { prtConsoleLightEntry 5 }
48
49  -- The Alerts Group
50  --
51  -- The prtAlertTable lists all the critical and non-critical
52  -- alerts currently active in the printer.  A critical alert is
53  -- one that stops the printer from printing immediately and
54  -- printing can not continue until the critical alert condition
```

```
-- is eliminated.  Non-critical alerts are those items that do
-- not stop printing but may at some future time.
-- The table contains information on the severity, component,
-- detail location within the component, alert code and
-- description of each critical alert that is currently active
-- within the printer.  See 2.2.13 for a more complete
-- description of the alerts table and its management.
--
-- Each parameter in the Trap PDU is a full OID which itself is
-- indexed by the host resources MIB "hrDeviceIndex" object. In
-- order for a management station to obtain the correct
-- "hrDeviceIndex" associated with a particular Trap PDU, the
-- "hrDeviceIndex" value can be extracted from the returned OID
-- value in the Trap PDU when the PDU is received by the
-- Management station.
--
-- Implementation of every object in this group is mandatory.

prtAlert OBJECT IDENTIFIER ::= { printmib 18 }

prtAlertTable OBJECT-TYPE
    SYNTAX     SEQUENCE OF PrtAlertEntry
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
        ""
    ::= { prtAlert 1 }

prtAlertEntry OBJECT-TYPE
    SYNTAX     PrtAlertEntry
    MAX-ACCESS not-accessible
    STATUS     current
    DESCRIPTION
        "Entries may exist in the table for each device
        index with a device type of 'printer'."
    INDEX  { hrDeviceIndex, prtAlertIndex }
    ::= { prtAlertTable 1 }

PrtAlertEntry ::= SEQUENCE {
    prtAlertIndex               Integer32,
    prtAlertSeverityLevel       PrtAlertSeverityLevelTC,
    prtAlertTrainingLevel       PrtAlertTrainingLevelTC,
    prtAlertGroup               PrtAlertGroupTC,
    prtAlertGroupIndex          Integer32,
    prtAlertLocation            Integer32,
    prtAlertCode                PrtAlertCodeTC,
    prtAlertDescription         OCTET STRING,
    prtAlertTime                TimeTicks
    }

prtAlertIndex OBJECT-TYPE
    SYNTAX     Integer32 (1..65535)
    MAX-ACCESS read-only
    STATUS     current
```

```
    DESCRIPTION
        "The index value used to determine which alerts have been
added
        or removed from the alert table. This is an incrementing
integer
        starting from zero every time the printer is reset.  When the
        printer adds an alert to the table, that alert is assigned
the
        next higher integer value from the last item entered into the
        table.  If the index value reaches its maximum value, the
next
        item entered will cause the index value to roll over and
start
        at zero again.  The first event placed in the alert table
after
        a reset of the printer shall have an index value of 1.  NOTE:
        The management application will read the alert table when a
trap
        or event notification occurs or at a periodic rate and then
        parse the table to determine if any new entries were added by
        comparing the last known index value with the current highest
        index value. The management application will then update its
        copy of the alert table.  When the printer discovers that an
        alert is no longer active, the printer shall remove the row
for
        that alert from the table and shall reduce the number of rows
in
        the table.  The printer may add or delete any number of rows
        from the table at any time.  The management station can
detect
        when binary change alerts have been deleted by requesting an
        attribute of each alert, and noting alerts as deleted when
that
        retrieval is not possible."
    ::= { prtAlertEntry 1 }

prtAlertSeverityLevel OBJECT-TYPE
    -- This value is a type 1 enumeration
    SYNTAX     PrtAlertSeverityLevelTC
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The level of severity of this alert table entry.  The
printer
        determines the severity level assigned to each entry into the
        table."
    ::= { prtAlertEntry 2 }

prtAlertTrainingLevel OBJECT-TYPE
    -- This value is a type 2 enumeration
    SYNTAX     PrtAlertTrainingLevelTC
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
```

```
            "See textual convention PrtAlertTrainingLevelTC"
        ::= { prtAlertEntry 3 }

    prtAlertGroup OBJECT-TYPE
        -- This value is a type 1 enumeration
        SYNTAX     PrtAlertGroupTC
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The type of sub-unit within the printer model that this
    alert
            is related. Input, output, and markers are examples of
    printer
            model groups, i.e., examples of types of sub-units. Wherever
            possible, these enumerations match the sub-identifier that
            identifies the relevant table in the printmib."
        ::= { prtAlertEntry 4 }

    prtAlertGroupIndex OBJECT-TYPE
        SYNTAX     Integer32
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "An index of the row within the principle table in the
            group identified by prtAlertGroup that represents the sub-
    unit
            of the printer that caused this alert.  The combination of
    the
            prtAlertGroup and the prtAlertGroupIndex defines exactly
    which
            printer sub-unit caused the alert; for example, Input #3,
    Output
            #2, and Marker #1. Every object in this MIB is indexed with
            hrDeviceIndex and optionally, another index variable.  If
    this
            other index variable is present in the table that generated
    the
            alert, it will be used as the value for this object.
    Otherwise,
            this value shall be -1."
        ::= { prtAlertEntry 5 }

    prtAlertLocation OBJECT-TYPE
        SYNTAX     Integer32
        MAX-ACCESS read-only
        STATUS     current
        DESCRIPTION
            "The sub-unit location that is defined by the printer
            manufacturer to further refine the location of this alert
    within
            the designated sub-unit.  The location is used in conjunction
            with the Group and GroupIndex values; for example, there is
    an
            alert in Input #2 at location number 7. The value (-2)
```

```
indicates
        unknown"
    ::= { prtAlertEntry 6 }

prtAlertCode OBJECT-TYPE
    -- This value is a type 2 enumeration
    SYNTAX     PrtAlertCodeTC
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "See associated textual convention PrtAlertCodeTC"
    ::= { prtAlertEntry 7 }

prtAlertDescription OBJECT-TYPE
    SYNTAX     OCTET STRING (SIZE(0..255))
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "A description of this alert entry in the localization
        specified by prtGeneralCurrentLocalization.  The description
is
        provided by the printer to further elaborate on the
enumerated
        alert or provide information in the case where the code is
        classified as 'other' or 'unknown'.  The printer is required
to
        return a description string but the string may be a null
        string."
    ::= { prtAlertEntry 8 }

prtAlertTime OBJECT-TYPE
    SYNTAX     TimeTicks
    MAX-ACCESS read-only
    STATUS     current
    DESCRIPTION
        "The value of sysUpTime at the time that this alert was
        generated."
    ::= { prtAlertEntry 9 }

printerV1Alert OBJECT-IDENTITY
    STATUS  current
    DESCRIPTION
        "The value of the enterprise-specific OID in an SNMPv1 trap
sent
        signaling a critical event in the prtAlertTable."
    ::= { prtAlert 2 }

printerV2AlertPrefix OBJECT IDENTIFIER ::= { printerV1Alert 0 }

printerV2Alert NOTIFICATION-TYPE
    OBJECTS { prtAlertIndex, prtAlertSeverityLevel, prtAlertGroup,
        prtAlertGroupIndex, prtAlertLocation, prtAlertCode }
    STATUS  current
    DESCRIPTION
```

```
         "This trap is sent whenever a critical event is added to the
         prtAlertTable."
     ::= { printerV2AlertPrefix 1 }

-- Note that the SNMPv2 to SNMPv1 translation rules dictate that
-- the preceding structure will result in SNMPv1 traps of the
-- following form:
--
-- printerAlert TRAP-TYPE
--     ENTERPRISE printerV1Alert
--     VARIABLES { prtAlertIndex, prtAlertSeverityLevel,
--                 prtAlertGroup, prtAlertGroupIndex,
--                 prtAlertLocation, prtAlertCode }
--     DESCRIPTION
--        "This trap is sent whenever a critical event is added
--         to the prtAlertTable."
--     ::= 1

-- Conformance Information

prtMIBConformance OBJECT IDENTIFIER ::= { printmib 2 }

-- compliance statements

prtMIBCompliance MODULE-COMPLIANCE
    STATUS  current
    DESCRIPTION
        "The compliance statement for agents that implement the
        printer MIB."
    MODULE -- this module
    MANDATORY-GROUPS { prtGeneralGroup, prtInputGroup,
                       prtOutputGroup,
                       prtMarkerGroup, prtMediaPathGroup,
                       prtChannelGroup, prtInterpreterGroup,
                       prtConsoleGroup, prtAlertTableGroup }
    OBJECT    prtGeneralReset
    SYNTAX    INTEGER {
                  notResetting(3),
                  resetToNVRAM(5)
                  }
    DESCRIPTION
        "It is conformant to implement just these two states in this
        object.  Any additional states are optional."

    OBJECT    prtGeneralCurrentLocalization
    MIN-ACCESS  read-only
    DESCRIPTION
        "It is conformant to implement this object as read-only"

    OBJECT    prtGeneralCurrentOperator
    MIN-ACCESS  read-only
    DESCRIPTION
        "It is conformant to implement this object as read-only"

```

```
    OBJECT    prtGeneralServicePerson
    MIN-ACCESS  read-only
    DESCRIPTION
        "It is conformant to implement this object as read-only"

    OBJECT    prtAuxiliarySheetStartupPage
    MIN-ACCESS  read-only
    DESCRIPTION
        "It is conformant to implement this object as read-only"

    OBJECT    prtAuxiliarySheetBannerPage
    MIN-ACCESS  read-only
    DESCRIPTION
        "It is conformant to implement this object as read-only"

    OBJECT    prtGeneralPrinterName
    MIN-ACCESS  read-only
    DESCRIPTION
        "It is conformant to implement this object as read-only"

    OBJECT    prtGeneralSerialNumber
    MIN-ACCESS  read-only
    DESCRIPTION
        "It is conformant to implement this object as read-only"

    OBJECT    prtInputDefaultIndex
    MIN-ACCESS  read-only
    DESCRIPTION
        "It is conformant to implement this object as read-only"

    OBJECT    prtInputMediaDimFeedDirDeclared
    MIN-ACCESS  read-only
    DESCRIPTION
        "It is conformant to implement this object as read-only"

    OBJECT    prtInputMaxCapacity
    MIN-ACCESS  read-only
    DESCRIPTION
        "It is conformant to implement this object as read-only"

    OBJECT    prtInputCurrentLevel
    MIN-ACCESS  read-only
    DESCRIPTION
        "It is conformant to implement this object as read-only"

    OBJECT    prtInputMediaName
    MIN-ACCESS  read-only
    DESCRIPTION
        "It is conformant to implement this object as read-only"

    OBJECT    prtInputName
    MIN-ACCESS  read-only
    DESCRIPTION
        "It is conformant to implement this object as read-only"
```

```
 1
 2      OBJECT    prtInputSecurity
 3      MIN-ACCESS  read-only
 4      DESCRIPTION
 5          "It is conformant to implement this object as read-only"
 6
 7      OBJECT    prtInputMediaWeight
 8      MIN-ACCESS  read-only
 9      DESCRIPTION
10          "It is conformant to implement this object as read-only"
11
12      OBJECT    prtInputMediaType
13      MIN-ACCESS  read-only
14      DESCRIPTION
15          "It is conformant to implement this object as read-only"
16
17      OBJECT    prtInputMediaColor
18      MIN-ACCESS  read-only
19      DESCRIPTION
20          "It is conformant to implement this object as read-only"
21
22      OBJECT    prtInputMediaFormParts
23      MIN-ACCESS  read-only
24      DESCRIPTION
25          "It is conformant to implement this object as read-only"
26
27      OBJECT    prtInputMediaLoadTimeout
28      MIN-ACCESS  read-only
29      DESCRIPTION
30          "It is conformant to implement this object as read-only"
31
32      OBJECT    prtInputNextIndex
33      MIN-ACCESS  read-only
34      DESCRIPTION
35           "It is conformant to implement this object as read-only"
36
37      OBJECT    prtOutputDefaultIndex
38      MIN-ACCESS  read-only
39      DESCRIPTION
40          "It is conformant to implement this object as read-only"
41
42      OBJECT    prtOutputMaxCapacity
43      MIN-ACCESS  read-only
44      DESCRIPTION
45          "It is conformant to implement this object as read-only"
46
47      OBJECT    prtOutputRemainingCapacity
48      MIN-ACCESS  read-only
49      DESCRIPTION
50          "It is conformant to implement this object as read-only"
51
52      OBJECT    prtOutputName
53      MIN-ACCESS  read-only
54      DESCRIPTION
```

```
            "It is conformant to implement this object as read-only"

        OBJECT    prtOutputSecurity
        MIN-ACCESS  read-only
        DESCRIPTION
            "It is conformant to implement this object as read-only"

        OBJECT    prtOutputMaxDimFeedDir
        MIN-ACCESS  read-only
        DESCRIPTION
            "It is conformant to implement this object as read-only"

        OBJECT    prtOutputMaxDimXFeedDir
        MIN-ACCESS  read-only
        DESCRIPTION
            "It is conformant to implement this object as read-only"

        OBJECT    prtOutputMinDimFeedDir
        MIN-ACCESS  read-only
        DESCRIPTION
            "It is conformant to implement this object as read-only"

        OBJECT    prtOutputMinDimXFeedDir
        MIN-ACCESS  read-only
        DESCRIPTION
            "It is conformant to implement this object as read-only"

        OBJECT    prtOutputStackingOrder
        MIN-ACCESS  read-only
        DESCRIPTION
            "It is conformant to implement this object as read-only"

        OBJECT    prtOutputPageDeliveryOrientation
        MIN-ACCESS  read-only
        DESCRIPTION
            "It is conformant to implement this object as read-only"

        OBJECT    prtOutputBursting
        MIN-ACCESS  read-only
        DESCRIPTION
            "It is conformant to implement this object as read-only"

        OBJECT    prtOutputDecollating
        MIN-ACCESS  read-only
        DESCRIPTION
            "It is conformant to implement this object as read-only"

        OBJECT    prtOutputPageCollated
        MIN-ACCESS  read-only
        DESCRIPTION
            "It is conformant to implement this object as read-only"

        OBJECT    prtOutputOffsetStacking
        MIN-ACCESS  read-only
```

```
    DESCRIPTION
        "It is conformant to implement this object as read-only"

    OBJECT    prtMarkerDefaultIndex
    MIN-ACCESS  read-only
    DESCRIPTION
        "It is conformant to implement this object as read-only"

    OBJECT    prtMarkerSuppliesMaxCapacity
    MIN-ACCESS  read-only
    DESCRIPTION
        "It is conformant to implement this object as read-only"

    OBJECT    prtMarkerSuppliesLevel
    MIN-ACCESS  read-only
    DESCRIPTION
        "It is conformant to implement this object as read-only"

    OBJECT    prtMediaPathDefaultIndex
    MIN-ACCESS  read-only
    DESCRIPTION
        "It is conformant to implement this object as read-only"

    OBJECT    prtChannelCurrentJobCntlLangIndex
    MIN-ACCESS  read-only
    DESCRIPTION
        "It is conformant to implement this object as read-only"

    OBJECT    prtChannelDefaultPageDescLangIndex
    MIN-ACCESS  read-only
    DESCRIPTION
        "It is conformant to implement this object as read-only"

    OBJECT    prtChannelState
    MIN-ACCESS  read-only
    DESCRIPTION
        "It is conformant to implement this object as read-only"

    OBJECT    prtChannelIfIndex
    MIN-ACCESS  read-only
    DESCRIPTION
        "It is conformant to implement this object as read-only"

    OBJECT    prtInterpreterDefaultOrientation
    MIN-ACCESS  read-only
    DESCRIPTION
        "It is conformant to implement this object as read-only"

    OBJECT    prtInterpreterDefaultCharSetIn
    MIN-ACCESS  read-only
    DESCRIPTION
        "It is conformant to implement this object as read-only"

    OBJECT    prtInterpreterDefaultCharSetOut
```

```
    MIN-ACCESS  read-only
    DESCRIPTION
        "It is conformant to implement this object as read-only"

    OBJECT    prtConsoleLocalization
    MIN-ACCESS  read-only
    DESCRIPTION
        "It is conformant to implement this object as read-only"

    OBJECT    prtConsoleDisable
    MIN-ACCESS  read-only
    DESCRIPTION
        "It is conformant to implement this object as read-only"

    OBJECT    prtConsoleDisplayBufferText
    MIN-ACCESS  read-only
    DESCRIPTION
        "It is conformant to implement this object as read-only"

    OBJECT    prtConsoleOnTime
    MIN-ACCESS  read-only
    DESCRIPTION
        "It is conformant to implement this object as read-only"

    OBJECT    prtConsoleOffTime
    MIN-ACCESS  read-only
    DESCRIPTION
        "It is conformant to implement this object as read-only"

    GROUP    prtResponsiblePartyGroup
    DESCRIPTION
        "This group is unconditionally optional."

    GROUP    prtExtendedInputGroup
    DESCRIPTION
        "This group is unconditionally optional."

    GROUP    prtInputMediaGroup
    DESCRIPTION
        "This group is unconditionally optional."

    GROUP    prtExtendedOutputGroup
    DESCRIPTION
        "This group is unconditionally optional."

    GROUP    prtOutputDimensionsGroup
    DESCRIPTION
        "This group is unconditionally optional."

    GROUP    prtOutputFeaturesGroup
    DESCRIPTION
        "This group is unconditionally optional."

    GROUP    prtMarkerSuppliesGroup
```

```
    DESCRIPTION
        "This group is unconditionally optional."

    GROUP    prtMarkerColorantGroup
    DESCRIPTION
        "This group is unconditionally optional."

    GROUP    prtAuxiliarySheetGroup
    DESCRIPTION
        "This group is unconditionally optional."

    GROUP    prtInputSwitchingGroup
    DESCRIPTION
        "This group is unconditionally optional."

    ::= { prtMIBConformance 1 }

prtMIBGroups    OBJECT IDENTIFIER ::= { prtMIBConformance 2 }

prtGeneralGroup OBJECT-GROUP
    OBJECTS { prtGeneralConfigChanges,
              prtGeneralCurrentLocalization,
              prtGeneralReset, prtCoverDescription,
              prtCoverStatus,
              prtLocalizationLanguage, prtLocalizationCountry,
              prtLocalizationCharacterSet, prtStorageRefIndex,
              prtDeviceRefIndex, prtGeneralPrinterName,
              prtGeneralSerialNumber }
    STATUS  current
    DESCRIPTION
        "The general printer group."
    ::= { prtMIBGroups 1 }

prtResponsiblePartyGroup OBJECT-GROUP
    OBJECTS { prtGeneralCurrentOperator, prtGeneralServicePerson }
    STATUS  current
    DESCRIPTION
        "The responsible party group contains contact information for
        humans responsible for the printer."
    ::= { prtMIBGroups 2 }

prtInputGroup OBJECT-GROUP
    OBJECTS { prtInputDefaultIndex, prtInputType, prtInputDimUnit,
              prtInputMediaDimFeedDirDeclared,
              prtInputMediaDimXFeedDirDeclared,
              prtInputMediaDimFeedDirChosen,
              prtInputMediaDimXFeedDirChosen, prtInputCapacityUnit,
              prtInputMaxCapacity, prtInputCurrentLevel,
prtInputStatus,
              prtInputMediaName }
    STATUS  current
    DESCRIPTION
        "The input group."
    ::= { prtMIBGroups 3 }
```

```
 1
 2  prtExtendedInputGroup OBJECT-GROUP
 3      OBJECTS { prtInputName, prtInputVendorName, prtInputModel,
 4                prtInputVersion, prtInputSerialNumber,
 5                prtInputDescription, prtInputSecurity }
 6      STATUS  current
 7      DESCRIPTION
 8          "The extended input group."
 9      ::= { prtMIBGroups 4 }
10
11  prtInputMediaGroup OBJECT-GROUP
12      OBJECTS { prtInputMediaWeight, prtInputMediaType,
13                prtInputMediaColor, prtInputMediaFormParts }
14      STATUS  current
15      DESCRIPTION
16          "The input media group."
17      ::= { prtMIBGroups 5 }
18
19  prtOutputGroup OBJECT-GROUP
20      OBJECTS { prtOutputDefaultIndex, prtOutputType,
21                prtOutputCapacityUnit, prtOutputMaxCapacity,
22                prtOutputRemainingCapacity,  prtOutputStatus }
23      STATUS  current
24      DESCRIPTION
25          "The output group."
26      ::= { prtMIBGroups 6 }
27
28  prtExtendedOutputGroup OBJECT-GROUP
29      OBJECTS { prtOutputName, prtOutputVendorName, prtOutputModel,
30                prtOutputVersion, prtOutputSerialNumber,
31                prtOutputDescription, prtOutputSecurity }
32      STATUS  current
33      DESCRIPTION
34          "The extended output group."
35      ::= { prtMIBGroups 7 }
36
37  prtOutputDimensionsGroup OBJECT-GROUP
38      OBJECTS { prtOutputDimUnit, prtOutputMaxDimFeedDir,
39                prtOutputMaxDimXFeedDir, prtOutputMinDimFeedDir,
40                prtOutputMinDimXFeedDir }
41      STATUS  current
42      DESCRIPTION
43          "The output dimensions group"
44      ::= { prtMIBGroups 8 }
45
46  prtOutputFeaturesGroup OBJECT-GROUP
47      OBJECTS { prtOutputStackingOrder,
48                prtOutputPageDeliveryOrientation, prtOutputBursting,
49                prtOutputDecollating, prtOutputPageCollated,
50                prtOutputOffsetStacking }
51      STATUS  current
52      DESCRIPTION
53          "The output features group."
54      ::= { prtMIBGroups 9 }
```

```
 1
 2  prtMarkerGroup OBJECT-GROUP
 3      OBJECTS { prtMarkerDefaultIndex, prtMarkerMarkTech,
 4                prtMarkerCounterUnit, prtMarkerLifeCount,
 5                prtMarkerPowerOnCount, prtMarkerProcessColorants,
 6                prtMarkerSpotColorants, prtMarkerAddressabilityUnit,
 7                prtMarkerAddressabilityFeedDir,
 8                prtMarkerAddressabilityXFeedDir, prtMarkerNorthMargin,
 9                prtMarkerSouthMargin, prtMarkerWestMargin,
10                prtMarkerEastMargin, prtMarkerStatus }
11      STATUS  current
12      DESCRIPTION
13          "The marker group."
14      ::= { prtMIBGroups 10 }
15
16  prtMarkerSuppliesGroup OBJECT-GROUP
17      OBJECTS { prtMarkerSuppliesMarkerIndex,
18                prtMarkerSuppliesColorantIndex, prtMarkerSuppliesClass,
19                prtMarkerSuppliesType, prtMarkerSuppliesDescription,
20                prtMarkerSuppliesSupplyUnit,
21                prtMarkerSuppliesMaxCapacity, prtMarkerSuppliesLevel }
22      STATUS  current
23      DESCRIPTION
24          "The marker supplies group."
25      ::= { prtMIBGroups 11 }
26
27  prtMarkerColorantGroup OBJECT-GROUP
28      OBJECTS { prtMarkerColorantMarkerIndex, prtMarkerColorantRole,
29                prtMarkerColorantValue, prtMarkerColorantTonality }
30      STATUS  current
31      DESCRIPTION
32          "The marker colorant group."
33      ::= { prtMIBGroups 12 }
34
35  prtMediaPathGroup OBJECT-GROUP
36      OBJECTS { prtMediaPathDefaultIndex,
37  prtMediaPathMaxSpeedPrintUnit,
38                prtMediaPathMediaSizeUnit, prtMediaPathMaxSpeed,
39                prtMediaPathMaxMediaFeedDir,
40                prtMediaPathMaxMediaXFeedDir,
41                prtMediaPathMinMediaFeedDir,
42                prtMediaPathMinMediaXFeedDir, prtMediaPathType,
43                prtMediaPathDescription, prtMediaPathStatus}
44      STATUS  current
45      DESCRIPTION
46          "The media path group."
47      ::= { prtMIBGroups 13 }
48
49  prtChannelGroup OBJECT-GROUP
50      OBJECTS { prtChannelType, prtChannelProtocolVersion,
51                prtChannelCurrentJobCntlLangIndex,
52                prtChannelDefaultPageDescLangIndex, prtChannelState,
53                prtChannelIfIndex, prtChannelStatus,
54  prtChannelInformation
```

```
                }
    STATUS  current
    DESCRIPTION
        "The channel group."
    ::= { prtMIBGroups 14 }

prtInterpreterGroup OBJECT-GROUP
    OBJECTS { prtInterpreterLangFamily, prtInterpreterLangLevel,
              prtInterpreterLangVersion, prtInterpreterDescription,
              prtInterpreterVersion,
prtInterpreterDefaultOrientation,
              prtInterpreterFeedAddressability,
              prtInterpreterXFeedAddressability,
              prtInterpreterDefaultCharSetIn,
              prtInterpreterDefaultCharSetOut, prtInterpreterTwoWay }
    STATUS  current
    DESCRIPTION
        "The interpreter group."
    ::= { prtMIBGroups 15 }

prtConsoleGroup OBJECT-GROUP
    OBJECTS { prtConsoleLocalization, prtConsoleNumberOfDisplayLines,
              prtConsoleNumberOfDisplayChars, prtConsoleDisable,
              prtConsoleDisplayBufferText, prtConsoleOnTime,
              prtConsoleOffTime, prtConsoleColor,
              prtConsoleDescription }
    STATUS  current
    DESCRIPTION
        "The console group."
    ::= { prtMIBGroups 16 }

prtAlertTableGroup OBJECT-GROUP
    OBJECTS { prtAlertIndex, prtAlertCriticalEvents,
prtAlertAllEvents,
              prtAlertSeverityLevel, prtAlertTrainingLevel,
              prtAlertGroup, prtAlertGroupIndex, prtAlertLocation,
              prtAlertCode, prtAlertDescription, prtAlertTime }
    STATUS  current
    DESCRIPTION
        "The alert table group."
    ::= { prtMIBGroups 17 }

--
-- prtAlertTimeGroup has been DEPRECATED (prtMIBGroups 18 )
--

prtAuxiliarySheetGroup OBJECT-GROUP
    OBJECTS { prtAuxiliarySheetStartupPage,
              prtAuxiliarySheetBannerPage }
    STATUS  current
    DESCRIPTION
        "The auxiliary sheet group."
    ::= { prtMIBGroups 19 }
```

```
prtInputSwitchingGroup OBJECT-GROUP
    OBJECTS { prtInputMediaLoadTimeout, prtInputNextIndex }
    STATUS  current
    DESCRIPTION
        "The input switching group."
    ::= { prtMIBGroups 20 }

END
```

6. IANA Considerations

See section 2.4.1, 'Registering Additional Enumerated Values'.

7. Internationalization Considerations

See section 2.2.1.1, 'International Considerations'.

8. Security Considerations

The Printer MIB specifies a database and not necessarily a protocol for accessing the database. With regards to the security of the information within the database, it is anticipated that the primary vehicle for accessing this data will be through the use of the Simple Network Protocol (SNMP). There are a number of management objects defined in this MIB that have a MAX-ACCESS clause of read-write. Such objects may be considered sensitive or vulnerable in some network environments. The support for SET operations in a non-secure environment without proper protection can have a negative effect on network operations.

SNMPv1 by itself is not a secure environment. Even if the network is secure (for example by using IPSec), there is no control as to who on the secure network is allowed to access and GET/SET (read/change) the objects in this MIB.

It is recommended that implementers consider the security features provided by the SNMPv3 framework. Specifically, the use of the User-based Security Model (RFC 2574 [25]) and the View-based Access Control Model (RFC 2575 [26]) is recommended.

It is then a customer/user responsibility to ensure that the SNMP entity giving access to an instance of this MIB, is properly configured to give access to the objects only to those principals (users) that have legitimate rights to indeed GET or SET them.

Where the operational capability of the printing device are especially vulnerable or difficult to administer, certain objects within this MIB have been tagged as READ-ONLY, preventing modification. Further, for all READ-WRITE objects within the MIB, the working group has included specific conformance guidelines stating that vendors are free to implement these objects as READ-ONLY. This conformance allowance should cover cases where specific vendor vulnerabilities may differ from product to product. (See conformance section with regards to MIN-ACCESS clauses).

9. Copyright Section

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Appendix A - Glossary of Terms

Addressability - On the marker, the number of distinct marking units (pels) per unit of addressability unit that can be set; for example, 300 dots per inch is expressed as 300 per 1000 Thousandths Of Inches and 4 dots per millimeter is 4 per 1000 Micrometers. Addressability is not resolution because marks that are one addressability position apart may not be independently resolvable by the eye due to factors such as gain in the area of marks so they overlap or nearly touch.

Alert - A reportable event for which there is an entry in the alert table.

Bin - An output sub-unit which may or may not be removable.

Binary Change Event - An event which comes in pairs; the leading edge event and the trailing edge event. The leading edge event enters a state from which there is only one exit. A binary change event may be critical or non-critical. See unary change event.

Bursting - The process by which continuous media is separated into individual sheets, typically by bursting along pre-formed perforations.

Channel - A term used to describe a single source of data which is presented to a printer. The model that we use in describing a printer allows for an arbitrary number of channels. Multiple channels can exist on the same physical port. This is commonly done over Ethernet ports where EtherTalk, TCP/IP, and SPX/IPX protocols can be supplying different data streams simultaneously to a single printer on the same physical port.

Collation - In multiple copy output, placing the pages from separate copies into separate ordered sets, ready for binding.

Control Language - A data syntax or language for controlling the printer through the print data channel.

Critical Alert - An alert triggered by an event which leads to a state in which printing is no longer possible; the printer is stopped.

Decollating - The process by which the individual parts within a multi-part form are separated and sorted into separate stacks for each part.

Description - Information about the configuration and capabilities of the printer and its various sub-units.

DPA - ISO 10175 Document Printing Application standard. A standard for a client server protocol for a print system, including (1) submitting print jobs to and (2) managing print jobs in a spooler.

Event - A state change in the printer.

Group - A collection of objects that represent a type of sub-unit of the printer.

Host Resources MIB - See RFC 2790 [28].

IANA - Internet Assigned Numbers Authority. See STD 2, RFC 1700 [15].

Idempotent - Idempotence is the property of an operation that results in the same state no matter how many times it is executed (at least once). This is a property that is shared by true databases in which operations on data items only change the state of the data item and do not have other side effects. Because the SNMP data model is that of operations on a database, SNMP MIB objects should be assumed to be idempotent. If a MIB object is defined in a non-idempotent way, the this data model can break in subtle ways when faced with packet loss, multiple managers, and other common conditions.

In order to fulfill the common need for actions to result from SNMP Set operations, SNMP MIB objects can be modeled such that the change in state from one state to another has the side effect of causing an action. It is important to note that with this model, an SNMP operation that sets a value equal to its current value will cause no action. This retains the idempotence of a single command, while allowing actions to be initiated by SNMP SET requests.

Input - A tray or bin from which instances of the media are obtained and fed into the Media Path.

Interpreter - The embodiment of an algorithm that processes a data stream consisting of a Page Description Language (PDL) and/or a Control Language.

Localization - The specification of human language, country, and character set needed to present information to people in their native languages.

Management Application (a.k.a. Manager) - A program which queries and controls one or more managed nodes.

Management Station - A physical computer on which one or more management applications can run.

Media Path - The mechanisms that transport instances of the media from an input, through the marker, possibly through media buffers and duplex pathways, out to the output with optional finishing applied. The inputs and outputs are not part of the Media Path.

Non-critical Alert - An alert triggered by a reportable event

which does not lead to a state in which printing is no longer possible; such an alert may lead to a state from which printing may no longer be possible in the future, such as the low toner state or the alert may be pure informational, such as a configuration change at the printer.

Output - A bin or stacker which accepts instances of media that have been processed by a printer.

Page Description Language (PDL) - A data syntax or language for the electronic representation of a document as a sequence of page images.

Printer - A physical device that takes media from an input source, produces marks on that media according to some page description or page control language and puts the result in some output destination, possibly with finishing applied.

Printing - The entire process of producing a printed document from generation of the file to be printed, choosing printing properties, selection of a printer, routing, queuing, resource management, scheduling, and finally printing including notifying the user.

Reportable event - An event that is deemed of interest to a management station watching the printer.

Status - Information regarding the current operating state of the printer and its various sub-units. This is an abstraction of the exact physical condition of the printer.

Sub-mechanism - A distinguishable part of a sub-unit.

Sub-unit - A part of the printer which may be a physical part, such as one of the input sources or a logical part such as an interpreter.

Tray - An input sub-unit which is typically removable.

Unary Change Event - An event that indicates a change of state of the printer, but to a state which is (often) just as valid as the state that was left, and from which no return is necessary. See binary change event.

Visible state - The portion of the state of the printer that can be examined by a management application.

Warning - A non-critical alert. See non-critical alert.

Appendix B - Media Size Names from ISO/IEC 10175 Document Printing Architecture

For the convenience of management application developers, this appendix lists the standardized media size names from ISO/IEC 10175 Document Printing Application (DPA), [7]. Management applications that present a dialogue for choosing or displaying media size are encouraged to present relevant names from this list to avoid requiring the user to remember the physical dimensions used to describe the size of the media. A printer implementing the Printer MIB has no knowledge of these names, however; all media sizes in the MIB are given in terms of media dimensions as the values of prtMediaDimFeedDir and prtInputChosenMediaDimXFeedDir.

String name	Description
other	
unknown	
na-letter or letter	North American letter size: 8.5 by 11 inches
na-legal or legal	North American legal size: 8.5 by 14 inches
na-10x13-envelope	North American 10x13 envelope size: 10 by 13 inches
na-9x12-envelope	North American 9x12 envelope size: 9 by 12 inches
na-number-10-envelope	North American number 10 business envelope size: 4.125 by 9.5 inches
na-7x9-envelope	North American 7x9 size: 7 by 9 inches
na-9x11-envelope	North American 9x11 size: 9 by 11 inches
na-10x14-envelope	North American 10x14 envelope size: 10 by 14 inches
na-number-9-envelope	North American number 9 business envelope size: 3.875 by 8.875 inches
na-6x9-envelope	North American 6x9 envelope size: 6 by 9 inches
na-10x15-envelope	North American 10x15 envelope size: 10 by 15 inches
a	engineering A size 8.5 inches by 11 inches
b	engineering B size 11 inches by 17 inches
c	engineering C size 17 inches by 22 inches
d	engineering D size 22 inches by 34 inches
e	engineering E size 34 inches by 44 inches
iso-a0	ISO A0 size: 841 mm by 1189 mm
iso-a1	ISO A1 size: 594 mm by 841 mm
iso-a2	ISO A2 size: 420 mm by 594 mm
iso-a3	ISO A3 size: 297 mm by 420 mm
iso-a4	ISO A4 size: 210 mm by 297 mm
iso-a5	ISO A5 size: 148 mm by 210 mm
iso-a6	ISO A6 size: 105 mm by 148 mm
iso-a7	ISO A7 size: 74 mm by 105 mm

1	iso-a8	ISO A8	size: 52 mm by 74 mm
2	iso-a9	ISO A9	size: 37 mm by 52 mm
3	iso-a10	ISO A10	size: 26 mm by 37 mm
4	iso-b0	ISO B0	size: 1000 mm by 1414 mm
5	iso-b1	ISO B1	size: 707 mm by 1000 mm
6	iso-b2	ISO B2	size: 500 mm by 707 mm
7	iso-b3	ISO B3	size: 353 mm by 500 mm
8	iso-b4	ISO B4	size: 250 mm by 353 mm
9	iso-b5	ISO B5	size: 176 mm by 250 mm
10	iso-b6	ISO B6	size: 125 mm by 176 mm
11	iso-b7	ISO B7	size: 88 mm by 125 mm
12	iso-b8	ISO B8	size: 62 mm by 88 mm
13	iso-b9	ISO B9	size: 44 mm by 62 mm
14	iso-b10	ISO B10	size: 31 mm by 44 mm
15	iso-c0	ISO C0	size: 917 mm by 1297 mm
16	iso-c1	ISO C1	size: 648 mm by 917 mm
17	iso-c2	ISO C2	size: 458 mm by 648 mm
18	iso-c3	ISO C3	size: 324 mm by 458 mm
19	iso-c4	ISO C4	size: 229 mm by 324 mm
20	iso-c5	ISO C5	size: 162 mm by 229 mm
21	iso-c6	ISO C6	size: 114 mm by 162 mm
22	iso-c7	ISO C7	size: 81 mm by 114 mm
23	iso-c8	ISO C8	size: 57 mm by 81 mm
24	iso-designated	ISO Designated Long	
25			size: 110 mm by 220 mm
26	jis-b0	JIS B0	size 1030 mm by 1456 mm
27	jis-b1	JIS B1	size 728 mm by 1030 mm
28	jis-b2	JIS B2	size 515 mm by 728 mm
29	jis-b3	JIS B3	size 364 mm by 515 mm
30	jis-b4	JIS B4	size 257 mm by 364 mm
31	jis-b5	JIS B5	size 182 mm by 257 mm
32	jis-b6	JIS B6	size 128 mm by 182 mm
33	jis-b7	JIS B7	size 91 mm by 128 mm
34	jis-b8	JIS B8	size 64 mm by 91 mm
35	jis-b9	JIS B9	size 45 mm by 64 mm
36	jis-b10	JIS B10	size 32 mm by 45 mm
37			

Appendix C - Media Names

For the convenience of management application developers, this appendix lists the standardized media names from ISO/IEC 10175 Document Printing Application (DPA), [7]. Management applications that present a dialogue for choosing media may wish to use these names as an alternative to separately specifying, size, color, and/or type. Using standard media names will mean that a single management application dealing with printers from different vendors and under different system mangers will tend to use the same names for the same media. If selection of media by name is used, the attributes (size, type or color) implied by the name must be explicitly mapped to the appropriate object (prtInputDeclared-MediaDimFeedDir, prtInputDeclaredMediaDimXFeedDir, prtInputMediaType and prtInputMediaColor) in the MIB. The object prtInputMediaName is intended for display to an operator and is purely descriptive. The value in prtInputMediaName is not interpreted by the printer so using a standard name for this value will not change any of the other media attributes nor will it cause an alert if the media in the input sub-unit does not match the name.

Simple Name	Descriptor Text
other	
unknown	
iso-a4-white	Specifies the ISO A4 white medium with size: 210 mm by 297 mm as defined in ISO 216
iso-a4-coloured	Specifies the ISO A4 colored medium with size: 210 mm by 297 mm as defined in ISO 216
iso-a4-transparent	Specifies the ISO A4 transparent medium with size: 210 mm by 297 mm as defined in ISO 216
iso-a3-white	Specifies the ISO A3 white medium with size: 297 mm by 420 mm as defined in ISO 216
iso-a3-coloured	Specifies the ISO A3 colored medium with size: 297 mm by 420 mm as defined in ISO 216
iso-a5-white	Specifies the ISO A5 white medium with size: 148 mm by 210 mm as defined in ISO 216
iso-a5-coloured	Specifies the ISO A5 colored medium with size: 148 mm by 210 mm as defined in ISO 216
iso-b4-white	Specifies the ISO B4 white medium with size: 250 mm by 353 mm as defined in ISO 216
iso-b4-coloured	Specifies the ISO B4 colored medium with size: 250 mm by 353 mm as defined in ISO 216
iso-b5-white	Specifies the ISO B5 white medium with size: 176 mm by 250 mm as defined in ISO 216
iso-b5-coloured	Specifies the ISO B5 colored medium with size: 176 mm by 250 mm as defined in ISO 216
jis-b4-white	Specifies the JIS B4 white medium with size: 257 mm by 364 mm as defined in JIS P0138
jis-b4-coloured	Specifies the JIS B4 colored medium with size: 257 mm by 364 mm as defined in JIS P0138

jis-b5-white Specifies the JIS B5 white medium with size: 182 mm by 257 mm as defined in JIS P0138

jis-b5-coloured Specifies the JIS B5 colored medium with size: 182 mm by 257 mm as defined in JIS P0138

The following standard values are defined for North American media:

na-letter-white Specifies the North American letter white medium with size: 8.5 inches by 11 inches

na-letter-coloured Specifies the North American letter colored medium with size: 8.5 inches by 11 inches

na-letter-transparent Specifies the North American letter transparent medium with size: 8.5 inches by 11 inches

na-legal-white Specifies the North American legal white medium with size: 8.5 inches by 14 inches

na-legal-coloured Specifies the North American legal colored medium with size: 8.5 inches by 14 inches

The following standard values are defined for envelopes:

iso-b5-envelope Specifies the ISO B5 envelope medium with size: 176 mm by 250 mm as defined in ISO 216 and ISO 269

iso-b4-envelope Specifies the ISO B4 envelope medium with size: 250 mm by 353 mm as defined in ISO 216

iso-c4-envelope Specifies the ISO C4 envelope medium with size: 229 mm by 324 mm as defined in ISO 216 and ISO 269

iso-c5-envelope Specifies the ISO C5 envelope medium with size: 162 mm by 229 mm as defined in ISO 269

iso-designated-long-envelope Specifies the ISO Designated Long envelope medium with size: 110 mm by 220 mm as defined in ISO 269

na-10x13-envelope Specifies the North American 10x13 envelope medium with size: 10 inches by 13 inches

na-9x12-envelope Specifies the North American 9x12 envelope medium with size: 9 inches by 12 inches

na-number-10-envelope Specifies the North American number 10 business envelope medium with size: 4.125 inches by 9.5 inches

na-7x9-envelope Specifies the North American 7x9 inch envelope

na-9x11-envelope Specifies the North American 9x11 inch envelope

na-10x14-envelope Specifies the North American 10x14 inch envelope

na-number-9-envelope
Specifies the North American number 9 business envelope 3.875 by 8.875 inches

na-6x9-envelope Specifies the North American 6x9 inch envelope

na-10x15-envelope Specifies the North American 10x15 inch envelope

The following standard values are defined for the less commonly used media (white-only):

iso-a0-white Specifies the ISO A0 white medium with size: 841 mm by 1189 mm as defined in ISO 216

iso-a1-white Specifies the ISO A1 white medium with size: 594 mm by 841 mm as defined in ISO 216

iso-a2-white Specifies the ISO A2 white medium with size: 420 mm by 594 mm as defined in ISO 216

iso-a6-white Specifies the ISO A6 white medium with size: 105 mm by 148 mm as defined in ISO 216

iso-a7-white Specifies the ISO A7 white medium with size: 74 mm by 105 mm as defined in ISO 216

iso-a8-white Specifies the ISO A8 white medium with size: 52 mm by 74 mm as defined in ISO 216

iso-a9-white Specifies the ISO A9 white medium with size: 39 mm by 52 mm as defined in ISO 216

iso-a10-white Specifies the ISO A10 white medium with size: 26 mm by 37 mm as defined in ISO 216

iso-b0-white Specifies the ISO B0 white medium with size: 1000 mm by 1414 mm as defined in ISO 216

iso-b1-white Specifies the ISO B1 white medium with size: 707 mm by 1000 mm as defined in ISO 216

iso-b2-white Specifies the ISO B2 white medium with size: 500 mm by 707 mm as defined in ISO 216

iso-b3-white Specifies the ISO B3 white medium with size: 353 mm by 500 mm as defined in ISO 216

iso-b6-white Specifies the ISO B6 white medium with size: 125 mm by 176 mm i as defined in ISO 216

iso-b7-white Specifies the ISO B7 white medium
with size: 88 mm by 125 mm
as defined in ISO 216
iso-b8-white Specifies the ISO B8 white medium
with size: 62 mm by 88 mm
as defined in ISO 216
iso-b9-white Specifies the ISO B9 white medium
with size: 44 mm by 62 mm
as defined in ISO 216
iso-b10-white Specifies the ISO B10 white medium
with size: 31 mm by 44 mm
as defined in ISO 216
jis-b0-white Specifies the JIS B0 white medium with size:
1030 mm by 1456 mm
jis-b1-white Specifies the JIS B1 white medium with size:
728 mm by 1030 mm
jis-b2-white Specifies the JIS B2 white medium with size:
515 mm by 728 mm
jis-b3-white Specifies the JIS B3 white medium with size:
364 mm by 515 mm
jis-b6-white Specifies the JIS B6 white medium with size:
257 mm by 364 mm
jis-b7-white Specifies the JIS B7 white medium with size:
182 mm by 257 mm
jis-b8-white Specifies the JIS B8 white medium with size:
128 mm by 182 mm
jis-b9-white Specifies the JIS B9 white medium with size:
91 mm by 128 mm
jis-b10-white Specifies the JIS B10 white medium with size:
64 mm by 91 mm

The following standard values are defined for engineering media:

a Specifies the engineering A size medium with size: 8.5 inches by 11 inches

b Specifies the engineering B size medium with size: 11 inches by 17 inches

c Specifies the engineering C size medium with size: 17 inches by 22 inches

d Specifies the engineering D size medium with size: 22 inches by 34 inches

e Specifies the engineering E size medium with size: 34 inches by 44 inches

Appendix D - Roles of Users

Background

The need for "Role Models" stemmed in large part from the need to understand the importance of any given proposed object for the MIB. Many times the real world need for a proposed object would be debated within the group; the debate would typically result in the need to describe the potential usage of the object in terms of a "live" person performing some type of printing-related task.

Determining the value of a proposed object through identification of the associated human users was found to be so common that a more formalized model was required for consistent analysis. The model describing categories of human-oriented tasks is called "Role Models" in this document.

In developing the Role Models it was necessary to identify the common, primary tasks that humans typically face when interacting with a printer and its related printing system(s). It was expected that certain kinds of tasks would serve to identify the various Role Models.

In presenting the set of Role Models, the set of "Common Print System Tasks" are first presented, followed by the set of Role Model definitions. Finally, a simple matrix is presented in which Role Models and Tasks are cross-compared.

Common Print System Tasks

Upon researching the many tasks encountered by humans in dealing with printers and printing systems, the following were found to be pervasive within any operating environment:

Printer job state - Determine the status of a job without a printer.

Printer capabilities - Determine the current capabilities of a printer, for example, the available media sizes, two-sided printing, a particular type of interpreter, etc.

Printer job submission - Submit a print job to a printer.

Printer job removal - Remove a job from a printer.

Notification of events - Receive notification of the existence of a defined printer event. An event can be of many types, including warnings, errors, job stage completion (e.g., "job done"), etc.

Printer configuration - Query the current configuration of a printer.

Printer consumables - Determine the current state of any and all consumables within a printer.

Print job identification - Determine the identification of a job within a printer.

Internal printer status - Determine the current status of the printer.

Printer identification - Determine the identity of a printer.
Printer location - Determine the physical location of a printer.

Local system configuration - Determine various aspects of the current configuration of the local system involved with the operation of a printer.

These "tasks" cover a large spectrum of requirements surrounding the operation of a printer in a network environment. This list serves as the basis for defining the various Role Models described below.

Proposed Role Models

Following is the list of "Role Models" used to evaluate the requirements for any given Printer MIB object. Note that the keyword enclosed in parentheses represents an abbreviation for the particular Role Model in the matrix described later in this document.

User (USER) - A person or application that submits print jobs to the printer; typically viewed as the "end user" within the overall printing environment.

Operator (OP) - A person responsible for maintaining a printer on a day-to-day basis, including such tasks as filling empty media trays, emptying full output trays, replacing toner cartridges, clearing simple paper jams, etc.

Technician (TECH) - A person responsible for repairing a malfunctioning printer, performing routine preventive maintenance, and other tasks that typically require advanced training on the printer internals. An example of a "technician" would be a manufacturer's Field Service representative, or other person formally trained by the manufacturer or similar representative.

System Manager (MGR) - A person responsible for configuration and troubleshooting of components involved in the overall printing environment, including printers, print queues and network connectivity issues. This person is typically responsible for ensuring the overall operational integrity of the print system components, and is typically viewed as the central point of coordination among all other Role Models.

Help Desk (HELP) - A person responsible for supporting Users in their printing needs, including training Users and troubleshooting Users' printing problems.

Asset Manager (AM) - A person responsible for managing an organization's printing system assets (primarily printers). Such a person needs to be able to identify and track the location of printing assets on an ongoing basis.

Capacity Planner (CP) - A person responsible for tracking the usage of printing resources on an ongoing basis for the purpose of planning printer acquisitions and/or placement of printers based on usage trends.

Installer (INST) - A person or application responsible for installing or configuring printing system components on a local system.

Accountant (ACCT) - A person responsible for tracking the usage of printing resources on an ongoing basis for the purpose of charging Users for resources used.

Matrix of Common Print System Tasks and Role Models

To better understand the relationship between the set of defined "Common Print System Tasks" and the various "Role Models," the following matrix is provided.

It is important to recognize that many of the tasks will appear to be applicable to many of the Role Models. However, when considering the actual context of a task, it is very important to realize that often the actual context of a task is such that the Role Model can change.

For example, it is obvious that a "System Manager" must be able to submit print jobs to a printer; however, when submitting a print job, a person identified as a "System Manager" is actually operating in the context of a "User" in this case; hence, the requirement to submit a print job is not listed as a requirement for a System Manager.

Conversely, while a "User" must be able to remove a job previously submitted to a printer, an "Operator" is often expected to be able to remove any print job from any printer; hence, print job removal is a (subtly different) requirement for both the "User" and "Operator" Role Models.

Role Models

Requirement Area	USER	OP	TECH	MGR	HELP	AM	CP	INST	ACCT
Print job status	xx	xx	xx	xx	xx				
Printer capabilities	xx			xx	xx				
Print job submission	xx								
Print job removal	xx	xx							
Notification of events		xx	xx						
Printer configuration				xx				xx	
Printer consumables		xx					xx	xx	
Print job identification		xx		xx	xx		xx		xx
Internal printer status		xx	xx	xx					
Printer identification		xx	xx	xx	xx	xx	xx	xx	
Printer location							xx		
Local system configuration				xx				xx	

Appendix E - Overall Printer Status Table

The Status Table establishes a convention for the top 25 printer errors. The table defines a suggested relationship between various printer states and the variables Printer hrDeviceStatus, hrPrinterStatus, hrPrinterDetectedErrorState, prtAlertGroup, prtAlertCode and various sub-unit status variables (prtInputStatus, prtOutputStatus, prtMarkerStatus, prtMediaPathStatus and prtChannelStatus). This table is the recommended implementation of these variables. It is provided to guide implementors of this MIB and users of the MIB by providing a sample set of states and the variable values that are expected to be produced as result of that state. This information supplements that provided in Section 2.2.13.2 "Overall Printer Status". This is not an exhaustive list rather it is a guideline.

The definition of PrtSubUnitStatusTC specifies that SubUnitStatus is an integer that is the sum of 5 distinct values/states: Availability, Critical, Non-Critical, On-line and Transitioning. Thus when a non-critical alert or alerts are present the values for Availability, On-Line and Transitioning will be summed with the Non-Critical Alerts (8) value.

The table was generated in landscape format and is located at ftp://ftp.pwg.org/pub/pwg/pmp/contributions/Top25Errors.pdf.

Appendix F – Participants

The following people attended at least one meeting of the Printer Working Group; many attended most meetings.

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Jay Cummings - Novell
Andy Davidson - Tektronix
Lee Farrell - Canon
Joel Gyllenskog - Microworks
Tom Hastings - Xerox
Scott Isaacson - Novell
Binnur Al-Kazily - Hewlett-Packard
Rick Landau - Digital Equipment Corporation
David Kellerman - Northlake Software
Harry Lewis - IBM
Pete Loya - Hewlett-Packard
Jay Martin – Underscore, Inc.
Bob Pentecost - Hewlett-Packard
Dave Roach - Unisys
Stuart Rowley - Kyocera
Bob Setterbo - Adobe
Ron Smith - Texas Instruments
Mike Timperman - Lexmark
Randy Turner - 2Wire, Inc.
Bill Wagner - NETsilicon, Inc.
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