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Printer MIB

Status of this Memo

This document specifies an Internet standards track protocol for the Internet community, and requests discussion and suggestions for improvements. Please refer to the current edition of the "Internet Official Protocol Standards" (STD 1) for the standardization state and status of this protocol. Distribution of this memo is unlimited.

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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.

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: 7 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 critical alert is eliminated. "Out of paper", "toner empty" and "output bin full" are

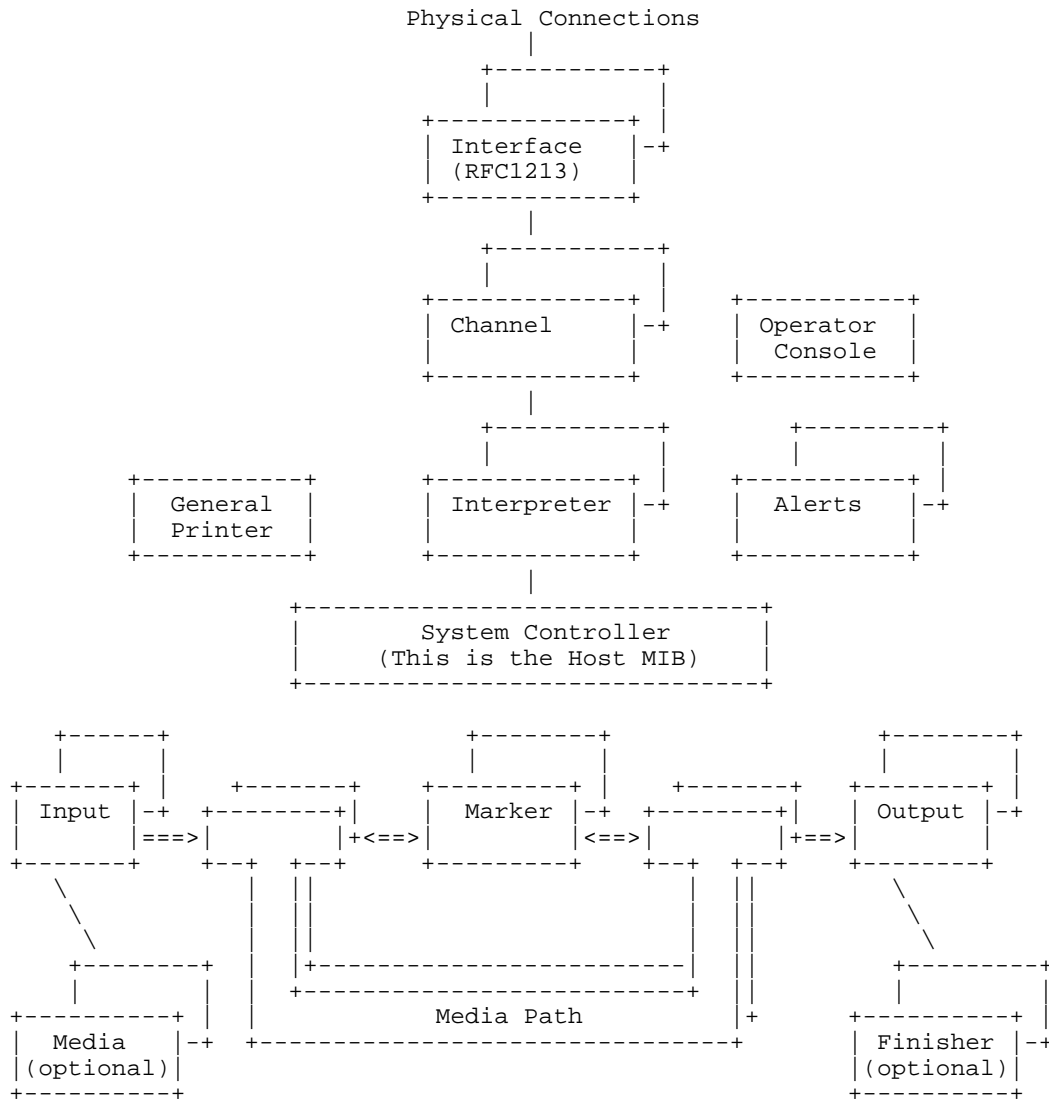
examples of critical alerts. Non-critical alerts are triggered by those events that enter a state in which printing is not stopped. Such a non-critical state may, at some future time, lead to a state in which printing may be stopped. Examples of this kind of non-critical alerts are "input media low", "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 printer can be thought of as a data base 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 data base 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 - 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 which 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 sub-unit is represented by the General Printer Group in the model. 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.

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.

Localization is only performed on those strings in the MIB that are explicitly marked as being localized. All other character strings are returned in ASCII.

The character set portion of the general printer sub-unit is responsible for identifying the possible character sets that are used by the interpreters, the operator console, and in network management requests for display objects. There may be one or more character sets per printer. The understood character sets are represented by the Character Set Table.

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. These are represented by the Input Group in the model. 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 a tray has an option for manually feeding paper as well as automatically feeding from the tray, then this is two input sub-units if these two sources can be (must be) separately selected and is one input sub-unit if putting a sheet in the manual feed slot overrides feeding from the contents of the tray; that is, 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 that media that is 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. These are represented by the Output Group in the model. 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 sub-units are represented by the Finisher Group in the model. Some examples of finishing processes are stapling, punching, binding, inserting, or folding. Finishing processes may have supplies associated~~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 exact interaction and sequencing between an output device and its associated finisher is not specified by the model. 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 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.

In this model the marker sub-unit is viewed as very generalized and encompasses all aspects of a marking process. For example, in a xero-graphic 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 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. These are represented by the Media Path Group in the model. 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, duplexing 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 are marked.

2.2.8. System Controller

The System Controller is the sub-unit upon which the software components of the Printer run. The System Controller is represented in the model by the Host MIB. 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). Some examples of

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—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~~ 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. Each channel is typically identified ~~typically identified~~

—by the electronic path and service protocol used to ~~deliver print~~ deliver print data to the printer. A channel sub-unit may be independently ~~enabled~~ enabled (allowing print data to flow) or disabled (stopping the flow of print data). It has a current 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 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, 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 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.

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. This console sub-unit is represented by the Console Group in the model. 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 "alert alert" 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, 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) there is the status of the printer as a whole reported in the Host MIB, (2) there is the status of various sub-units reported in the principle table of the Group that represents the sub-unit, and (3) there are alert codes 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 terminologies). A trained service person is typically necessary to make it available.

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—Busy / Temporarily Unavailable - The printer or sub-unit is operational but currently occupied with a request for activity. The sub-unit will become available without the need of human interaction.

Moving on-line or off-line - The printer is either off-line, in the process of moving off-line or in the process of moving back on-line; for example on high end printers reloading paper involves a transition to off-line to open the paper bin, it is then filled and, finally, there is a transition back to on-line as the paper bin is repositioned for printing.

Standby - The printer or sub-unit is unavailable for use because it is partially powered down and may need some period of time to become fully operational again. A unit in Standby state shall respond to network management requests.

Available - The printer is able to accept print jobs

Idle - The printer is not processing any print jobs

Active - The printer is working on one or more print jobs

Busy - The printer is "Active" and has also reached a resource threshold whereby it will not accept any new print jobs for a finite period of time. The expected next state transition from the "busy" state is to the "active" state, implying that resources are again available to accept new print jobs.

The Host MIB provides three status objects that can be used to describe the status of a printer: (1) hrDeviceStatus in the entry in the Host MIB 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 "interesting" states named above can be recognized by inspecting the values of the three printer-related objects in the Host MIB:

Printer Status	hrDeviceStatus	hrPrinterStatus	hrPrinterDetectedErrorState
Normal	running(2)	idle(3)	none set
Busy/ Temporarily Unavailable	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

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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 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.

Although the above mapping is workable, it would be improved with a few additions to `hrDeviceStatus` and `hrPrinterStatus` in the Host Resources MIB. In particular, it would be appropriate to add a "standby" enumeration to `hrDeviceStatus`. Similarly, it would be useful to add the following states to `hrPrinterStatus`: "offline" to indicate that reason for the printer being down (instead of having to use "other") which allows both "warning" and "offline" to indicate going offline and "down" and "offline" to indicate offline and "notApplicable" to cover cases, such as "standby", where the device state completely describes the state of the device.

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

2.2.13.2.1. Host MIB Printer Status

For completeness, the definitions of the Printer Status objects of the Host MIB 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(1), printing(2), or warmup(3) state, the corresponding hrDeviceStatus should be running(2) or warning(3). When in the unknown state, the corresponding hrDeviceStatus should be unknown(1)."

```
::= { hrPrinterEntry 1 }
```

```
hrPrinterDetectedErrorState OBJECT-TYPE
```

```
SYNTAX OCTET STRING
```

```
ACCESS read-only
```

```
STATUS mandatory
```

```
DESCRIPTION
```

"This object represents any error conditions detected by the printer. The error conditions are encoded as bits in an octet string, with the following definitions:

Condition	Bit #	hrDeviceStatus
-----------	-------	----------------

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

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:

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

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

Non-Critical

No Non-Critical Alerts	0
Non-Critical Alerts	8

Critical

No Critical Alerts	0
Critical Alerts	16

On-Line

Intended state is On-Line	0
Intended 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 unarysimple 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 is the event which 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. 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 unarysimple 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 simple 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 simple alerts that would overflow the storage ~~capacity~~^{capacity} of the table. When the table is full and a new alert needs to be added, an old alert needs to be deleted. The alert to be deleted should be chosen using the following rules:

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

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. Such gaps can be detected by the management application to indicate that the management application may want to re-acquire the Printer state and check for state changes it did not observe in the Alert Table.

2.2.13.5. Traversing Alert Table

2.3. Read-Write Objects

Some of the objects in the printer MIB report on the existence of or amount of a given resource used with the printer. Some examples of such resources are the size and number of sheets of paper in a paper tray or the existence of certain output options. On some printers there are sensors that allow these resources to be sensed. Other printers, however, lack sensors that can detect (all of) the properties of the resource. Because the printer needs to know of the existence or properties of these resources for the printer to function properly some other way of providing this information is needed. The chosen way to solve this problem is to allow a

—management application to write into objects which hold the descriptive or existence values for printers that cannot sense the values. Thus many of the objects in the MIB are given read-write access, but a printer implementation might only permit a management operation to change the value if the printer could not sense the value itself. Therefore, the ability to change the value of a read-write object may depend on the implementation of the agent. Note that even though some objects explicitly state the behaviour of conditional ability to change values, any read-write object may act that 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 "PostIt". 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.

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.

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 type 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 the Printer MIB specification (RFC for the Printer MIB). Additional enumerated values require a new RFC. 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. Additional enumerated values are registered after review by this working group. The initial versions of the MIB will contain the values registered so far. After the MIB is approved, additional values will be registered through IANA after approval by this working group. 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, additional values will be registered through IANA without approval by this working group. The current set of approved values should always 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. Objects from other MIB Specifications

This section lists the objects from other IETF MIB specifications

that are mandatory for conformance to this Printer MIB specification.

3.1. System Group objects

All objects in the system group of MIB-II (RFC 1213) must be implemented.

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3.2. System Controller

The System Controller is represented by the Storage and Device Groups of the Host Resources MIB (RFC 1514). These are the only groups that are required to be implemented. Other Groups (System, Running Software, Running Software Performance, and Installed Software) may be implemented at the discretion of the implementor.

3.3. Interface Group objects

All objects in the Interfaces Group of MIB-II (RFC 1213) shall be implemented.

Printer-MIB DEFINITIONS ::= BEGIN

IMPORTS

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

printmib MODULE-IDENTITY

LAST-UPDATED "9411250000Z"

ORGANIZATION "IETF Printer MIB Working Group"

CONTACT-INFO

" Steven Waldbusser

Postal: ~~International Network ServicesCarnegie Mellon University~~~~650 Castro Street Suite 260 4910 Forbes Ave~~~~Mountain View, CA 94041Pittsburgh, PA, 15213~~Tel: ~~415-2542-268-42516628~~~~Fax: 412-268-4987~~E-mail: ~~steve.waldbusser@ins.com~~edu"

DESCRIPTION

"The MIB module for management of printers."

::= { mib-2 43 }

--

-- Textual conventions for this MIB module

--

--

-- Generic unspecific textual conventions

--

PrtMediaUnitTC ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"Units of measure for media dimensions."

-- This is a type 1 enumeration.

SYNTAX INTEGER {

tenThousandthsOfInches(3), -- .0001

micrometers(4)

}

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}

PrtCapacityUnitTC ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"Units of measure for media capacity."

-- This is a type 1 enumeration.

SYNTAX INTEGER {
tenThousandthsOfInches(3), -- .0001
micrometers(4),
sheets(8),
feet(16),
meters(17)
}

PrtSupplementaryPageContentTC ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"Supplementary pages are added by the printing system and are not part of the actual print job. Examples include error and banner pages. This textual convention is used to specify the information content of these pages."

SYNTAX INTEGER {
noPage(3), -- no page will be produced
concise(4), -- content of page is concise
verbose(5) -- content of page is verbose
}

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

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),
doorOpen(3),
doorClosed(4),
interlockOpen(5),
interlockClosed(6)
}

PrtSubUnitStatusTC ::= TEXTUAL-CONVENTION

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		
Intended state is On-Line	0	
Intended state is Off-Line	32	

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Transitioning

At intended state 0
 Transitioning to intended state 64

"

SYNTAX INTEGER (0..126)

PresentOnOff ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"Presence and configuration of a device or feature."

-- This is a type 1 enumeration.

SYNTAX INTEGER {
 other(1),
 on(3),
 off(4),
 notPresent(5)
 }

CodedCharSet ::= TEXTUAL-CONVENTION

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 space of the coded character set enumeration has been divide into three regions. The first region (3-999) consists of coded character sets that have been standardized by some standard setting organization. This region is intended for standards that do not have subset implementations. The second region (1000-1999) is for the Unicode and ISO/IEC 10646 coded character sets together with a specification of a (set of) sub-repertoires that may occur. The third region (>1999) is intended for vendor specific coded character sets.

NOTE: Unicode and ISO 10646 character coded data may be processed and stored in either Big Endian (most significant octet first) or Little Endian (least significant octet first) order. Intel x86, VAX, and Alpha/AXP architectures are examples of Little Endian processor architectures. Furthermore, in environments where either order may occur, so-called Unicode BYTE ORDER MARK (BOM) character (which is ISO 10646 ZERO WIDTH NO BREAK SPACE), coded as FEFF in two octets and 0000FEFF in four octets is used at the beginning of the data as a signature to indicate the order of the following data (See ISO 10646 Annex F). Thus either ordering and BOM may occur in print data streams sent to the interpreter. However, ISO 8824/8825 (ASN.1/BER) used by SNMP is quite clear that Big Endian order shall be used and

BOM shall NOT be used in transmission in the protocol. Transmitting Unicode in Big Endian order in SNMP should not prove to be a hardship for Little Endian machines, since SNMP ASN.1/BER requires integers to be transmitted in Big Endian order as well. So SNMP implementations on Little Endian machines are already reversing the order of integers to make them Big Endian for transmission via SNMP. Also Unicode characters are usually treated as two-octet integers, not short text strings, so that it will be straightforward for Little Endian machines to reverse the order of Unicode character octets as well before transmitting them and after receiving them via the SNMP protocol.

Where a given coded character set may be known by more than one name, the most commonly known name is used as the name of the enumeration and other names are shown in the comments. The comments also indicate where to find detailed information on the coded character set and briefly characterize its relationship to other similar coded character sets.

The current list of character sets and their enumerated values used to reference them is 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 available via anonymous ftp.

The ftp server is ftp.isi.edu.

The subdirectory is /in-notes/iana/assignments/.

The file name is character-sets.

To add a character set to the IANA Registry:

1. Format an entry like those in the current list, omitting the MIBenum value.
2. Send the entry with a request to add the entry to the character set list to iana@ISI.EDU.
3. The IANA will supply a unique MIBenum value and update the list."

-- This is a type 3 enumeration.

```
SYNTAX      INTEGER {
    other(1)          -- used if the designated coded
                      -- character set is not currently in
                      -- the enumeration
```

-- See IANA Registry for standard character sets in the
-- MIBenum range of 3-999.

-- See IANA Registry for Unicode and vendor-supplied
-- combinations of ISO collections and character sets based
-- on Unicode in the MIBenum range of 1000-1999.
-- See IANA Registry for vendor developed character sets
-- in the MIBenum range of 2000-xxxx.

```
--
-- General Group textual-conventions
--
```

```
PrtGeneralResetTC ::= TEXTUAL-CONVENTION
    STATUS      current
    DESCRIPTION
        "Values for reading and writing the prtGeneralReset object.
```

This value is a type 3 enumeration.

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 preferaby 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
    }
```

```
--
```

```
--
```

```
--
-- CodedCharSet ::= TEXTUAL-CONVENTION
--     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 space of the coded character set enumeration has been divide into three regions. The first region (3-999) consists of coded character sets that have been standardized by some standard setting organization. This region is intended for standards that do not have subset implementations. The second region (1000-1999) is for the Unicode and ISO/IEC 10646 coded character sets together with a specification of a (set of) sub-repertoires that may occur. The third region (>1999) is intended for vendor specific coded character sets.

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~~NOTE: Unicode and ISO 10646 character coded data may be processed and stored in either Big Endian (most significant octet first) or Little Endian (least significant octet first) order. Intel x86, VAX, and Alpha/AXP architectures are examples of Little Endian processor architectures. Furthermore, in environments where either order may occur, so-called Unicode BYTE ORDER MARK (BOM) character (which is ISO 10646 ZERO WIDTH NO BREAK SPACE), coded as FEFF in two octets and 0000FEFF in four octets is used at the beginning of the data as a signature to indicate the order of the following data (See ISO 10646 Annex F). Thus either ordering and BOM may occur in print data streams sent to the interpreter. However, ISO 8824/8825 (ASN.1/BER) used by SNMP is quite clear that Big Endian order shall be used and BOM shall NOT be used in transmission in the protocol. Transmitting Unicode in Big Endian order in SNMP should not prove to be a hardship for Little Endian machines, since SNMP ASN.1/BER requires integers to be transmitted in Big Endian order as well. So SNMP implementations on Little Endian machines are already reversing the order of integers to make them Big Endian for transmission via SNMP. Also Unicode characters are usually treated as two octet integers, not short text strings, so that it will be straightforward for Little Endian machines to reverse the order of Unicode character octets as well before transmitting them and after receiving them via the SNMP protocol.~~

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~~The file name is character-sets.~~

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- ~~2. Send the entry with a request to add the entry to the character set list to iana@ISI.EDU.~~
- ~~3. The IANA will supply a unique MIBenum value and update the list."~~

~~-- This is a type 3 enumeration.~~

~~SYNTAX INTEGER {~~
~~other(1) -- used if the designated coded~~
~~character set is not currently in~~
~~the enumeration~~

~~-- See IANA Registry for standard character sets in the~~
~~MIBenum range of 3-999.~~

~~-- See IANA Registry for Unicode and vendor-supplied~~
~~combinations of ISO collections and character sets based~~
~~on Unicode in the MIBenum range of 1000-1999.~~
~~-- See IANA Registry for vendor developed character sets~~
~~in the MIBenum range of 2000-xxxx.~~

~~}
 -- 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 determines whether control information and print data is allowed through this channel."

SYNTAX INTEGER {
 other(1),
 printDataAccepted(3),
 noDataAccepted(4)
 }

PrtChannelTypeTC ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"This enumeration indicates the type of channel that is receiving jobs.

This is a type 2 enum."

SYNTAX INTEGER {
 other(1),
 chSerialPort(3),
 chParallelPort(4),
 chIEEE1284Port(5),
 chSCSIPort(6),
 chAppleTalkPAP(7), -- AppleTalk Printer Access
 -- Protocol (PAP)
 chLPDServer(8), -- RFC 1179
 chNetwareRPrinter(9), -- Novell, Inc.etware
 chNetwarePServer(10), -- Novell, Inc.etware
 chPort9100(11), -- Bi-directional printing protocol

```

-- utilizing TCP port 9101 for
control
-- and TCP port 9100 for data.
chAppSocket(12), -- Adobe Systems, Inc. a bi-
directional, LPD-like
-- protocol using 9101 for
-- control and 9100 for data.
-- Adobe Systems, Inc.
chFTP(13), -- RFC xxxxFTP "PUT" to printer
chTFTP(14), -- RFC xxxx
chDLCLLCPort(15),
chIBM3270(16),
chIBM5250(17),
chFax(18),

chIEEE1394(19),
chTransport1(20), -- TCP port 35, see reserved
-- TCP port list in RFC 1700
-- or current "Assigned Numbers"
-- RFC. 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
chONCRemoteProcCall(23), -- Sun Microsystems, See also
-- RFC xxxx
chOLE(24), -- Microsoft, Inc.
chNamedPipe(25), -- Microsoft, Inc.
chPCPrint(26), -- Banyan
chServerMessageBlock(27),
-- File/Print sharing protocol used by
-- various network operating systems
-- from IBM 3Com, Microsoft and others
chPSM(28), -- Printing Systems Manager, IBM
chDLLAPI(29), -- Microsoft, Inc.
chVxDAPI(30), -- Microsoft, Inc.
chSystemObjectManager(31), -- IBM
chDECLAT(32), -- Digital Equipment Corp.
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.
ChBidirPortTCP(38), -- A bidirectional version of 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 Inside AppleTalk, second Edition, by

```

```

-- Sidhu, Andrews and Oppenheimer.
chPortSPX(41), -- Sequenced Packet Exchange (SPX) socket.
-- Novell, Inc. Similar to TCP, a
-- bi-directional data pipe using Novell
-- SPX as a transport.
chPortHTTP(42) -- Hypertext Transfer Protocol. See IETF
-- documents relating to HTTP 1.0/1.1
-- (RFCs XXXX,etc.)
}

}

-- Interpreter Group textual conventions

PrtInterpreterLangFamilyTC ::= TEXTUAL-CONVENTION
    STATUS      current
    DESCRIPTION
        "This enumeration indicates the type of interpreter that is
        receiving jobs.

        This value is a type 2 enumeration."
    SYNTAX      INTEGER {
        other(1),
        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 Language (tm)
        -- Postscript - a trademark of Adobe
        -- Systems Incorporated which may be
        -- registered in
        -- certain jurisdictions

        langPSPrinter(42), -- The PostScript Language used for
        -- control (with any PDLs)
        -- Adobe Systems Incorporated
        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.
        -- Pennant Systems, IBM
        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),
        langDDIF(11), -- Digital Document Interchange Format
        -- Digital Equipment Corp., Maynard MA
        langInterpress(12), -- Xerox Corp.
        langISO6429(13), -- ISO 6429. Control functions for Coded
        -- Character Sets (has ASCII control

```

```

-- characters, plus additional controls for
-- character imaging devices.)
-- ISO Standard, Geneva, Switzerland
langLineData(14), -- line-data: Lines of data as separate
-- ASCII or EBCDIC records and containing
-- no control functions (no CR, LF, HT, FF,
-- etc.). For use with traditional line
-- printers. May use CR and/or LF to
-- delimit lines, instead of records. See
-- ISO 10175 Document Printing Application
-- (DPA)
-- ISO standard, Geneva, Switzerland
langMODCA(15), -- Mixed Object Document Content
-- Architecture
-- Definitions that allow the composition,
-- interchange, and presentation of final
-- form documents as a collection of data
-- objects (text, image, graphics, bar
-- codes), resources (fonts, overlays) and
-- page, form and finishing instructions.
-- Pennant Systems, IBM
langREGIS(16), -- Remote Graphics Instruction Set,
-- Digital Equipment Corp., Maynard MA
langSCS(17), -- SNA Character String
-- Bi-directional print data stream for SNA
-- LU-1 mode of communications
-- IBM
langSPDL(18), -- ISO 10180 Standard Page Description
-- Language
-- ISO Standard
langTEK4014(19), -- Tektronix Corp.
langPDS(20),
langIGP(21), -- Printronix Corp.
langCodeV(22), -- Magnum Code-V, Image and printer control
-- language used to control impact/dot-
-- matrix printers.
-- QMS, Inc., Mobile AL
langDSCDSE(23), -- DSC-DSE: Data Stream Compatible and
-- Emulation Bi-directional print data
-- stream for non-SNA (DSC) and SNA LU-3
-- 3270 controller (DSE) communications
-- IBM
langWPS(24), -- Windows Printing System, Resource based
-- command/data stream used by Microsoft At
-- Work Peripherals.
-- 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)
-- ISO standard, Geneva, Switzerland
langNPAP(31), -- Network Printer Alliance Protocol (NPAP).
```

```

-- IEEE 1284.1This protocol has been
superseded
-- by the IEEE 1284.1 TIPSII standard.
-- (ref. LangTIPSII(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
-- line of systems. A binary language
-- providing representations for text,
-- simple graphics (rules, lines, conic
-- sections), 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. Technical reference
-- manual # TBD.
-- 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.
    langTIPSII(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 characters.
-- Technical reference manual:
-- "PRESCRIBE II Programming Manual"
langLinePrinter(51), -- A simple-text character stream which
-- supports the control codes LF, VT,
-- FF and CR 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.Tech Reference+
-- "IEEE Std. 1284.1".
}

```

```

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

```

PrtInputTypeTC ::= TEXTUAL-CONVENTION

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)
            }

```

PrtMarkerSuppliesSupplyUnitTC ::= TEXTUAL-CONVENTION

-- This value is a type 1 enumeration

STATUS current

DESCRIPTION

"Unit of this marker supply container/receptacle."

```

SYNTAX      INTEGER {
                tenThousandthsOfInches(3),  -- .0001
                micrometers(4),
                impressions(7),
                sheets(8),
                thousandthsOfOunces(12),
                hours(11),
                tenthsOfGrams(13),
                hundrethsOfFluidOunces(14),
                tenthsOfMilliliters(15),
                feet(16),
                meters(17)
            }

```

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)
}

--
-- Media Path Textual Conventions
--

PrtMediaPathMaxSpeedPrintUnitTC OBJECT-TYPE
-- This value is a type 1 enumeration
STATUS      current
DESCRIPTION
    "The unit of measure used in specifying the speed of all
    media paths in the printer."
SYNTAX      INTEGER {
    tenThousandthsOfInchesPerHour(3), -- .0001/hour
    micrometersPerHour(4),
    charactersPerHour(5),
    linesPerHour(6),
    impressionsPerHour(7),
    sheetsPerHour(8),
    dotRowPerHour(9),
    feetPerHour(16),
    metersPerHour(17)
}

PrtMediaPathTypeTC ::= TEXTUAL-CONVENTION
-- This value is a type 2 enumeration
STATUS      current
DESCRIPTION
    "The type of the media path for this media path."
SYNTAX      INTEGER {
    other(1),
    unknown(2),
    longEdgeBindingDuplex(3),
    shortEdgeBindingDuplex(4),
    simplex(5)
}

--
-- Interpreter Group Textual Conventions
--

PrtInterpreterDefaultOrientationTC ::= TEXTUAL-CONVENTION
-- This value is a type 1 enumeration
STATUS      current
DESCRIPTION
    "The current orientation default for this interpreter. This
    value may be overridden for a particular job (e.g., by a

```

command in the input data stream)."

```
SYNTAX      INTEGER {
    other(1),
    portrait(3),
    landscape(4)
}
```

PrtInterpreterTwoWayTC ::= TEXTUAL-CONVENTION

-- This is a type 1 enumeration

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)
}
```

--

--

-- 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 into the table. A warning is defined to be a non-critical alert. The value also indicates whether the event is a binary change event or a unary change event."

```
SYNTAX      INTEGER {
    other(1),
    criticalBinaryChangeEvent(3),
    warningUnaryChangeEvent(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 manufacture'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 printmib.

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)
    }

```

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 entry in the alert table for each event; either generic (preferred) or specific, not both.

Implementation of the unary change event
alertRemovalOfBinaryChangeEvent(1801) is optional. When implemented, this alert code shall indicate to network management stations that the trailing edge of a binary change event has occurred and the corresponding alert entry has been removed from the alert table. As with all events, the alertRemovalOfBinaryChangeEvent(1801) alert shall be placed at the end of the alert table. Such an alert table entry shall specify the following information:

prtAlertSeverityLevel	warningUnaryChangeEvent(4)
prtAlertTrainingLevel	noHumanInterventionRequired(7)
prtAlertGroup	alert(18)
prtAlertGroupIndex	the index of the row in the alert table of the binary change event that this event has removed.
prtAlertLocation	(-2)
prtAlertCode	alertRemovalOfBinaryChangeEvent(1801)
prtAlertDescription	<description or null string>
prtAlertTime	(Optional) the value of sysUpTime at the time of the removal of the binary change event from the alert table.

Optionally, the agent may generate a trap coincident with removing the binary change event and placing the unary change event

alertRemovalOfBinaryChangeEntry(1801) in the alert table.

For such a trap, the prtAlertIndex sent with the above trap parameters shall be the index of the alertRemovalOfBinaryChangeEvent row that was added to the prtAlertTable; not the index of the row that was removed from the prtAlertTable."

```
SYNTAX      INTEGER {
    other(1),          -- an event that is not represented by one of
                        -- the alert codes specified below.
    unknown(2),
        -- The following generic codes are common to multiple
        -- groups. The NMS may examine the prtAlertGroup
        -- object to determine what group to query for further
        -- information.
    coverOpened(3),
    coverClosed(4),
    interlockOpened(5),
    interlockClosed(6),
    configurationChanged(7),
    jammed(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),
        -- general Printer group
    doorOpened(501),
    doorClosed(502),
    poweredUp(503),
    poweredDown(504),
    printerNMSReset(505),  -- The printer has been reset by
                        -- some network management station
                        -- (NMS) writing into
                        -- 'prtGeneralReset'. The value
                        -- written shall be stored as the
                        -- value of the prtAlertLocation
                        -- object indicating the type of
                        -- reset: powerCycleReset(4),
                        -- resetToNVRAM(5),
                        -- resetToFactoryDefaults(6), etc.
    printerManualReset(506),
        -- The printer has been reset manually. The
        -- value of prtAlertLocation may be used to
        -- indicate the type of reset.
    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),
inputMediaSizeChanged(802),
inputMediaWeightChanged(803),
inputMediaTypeChanged(804),
inputMediaColorChanged(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),
markerTonerCartridgeEmpty(1115),
-- Media Path Device Group
mediaPathMediaTrayMissing(1301),
mediaPathMediaTrayAlmostFull(1302),
mediaPathMediaTrayFull(1303),
-- interpreter Group
interpreterMemoryIncreased(1501),
interpreterMemoryDecreased(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.
        interpreterContextSavingOn(1512),
        -- this value has been deprecated.
        interpreterContextSavingOff(1513),
        -- this value has been deprecated.
        --
        -- Alert Group
        --
        alertRemovalOfBinaryChangeEventEntry(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

```

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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 hostmib device table with a device type whose
type
        of is 'printer'"
    INDEX { hrDeviceIndex }
    ::= { prtGeneralTable 1 }
```

```
PrtGeneralEntry ::= SEQUENCE {
    -- Note that not all of the objects in this sequence are in the
    -- general printer group.
    prtGeneralConfigChanges      Counter32,
    prtGeneralCurrentLocalization Integer32,
    prtGeneralReset              PrtGeneralResetTCINTEGER,
    prtGeneralCurrentOperator    OCTET STRING,
    prtGeneralServicePerson      OCTET STRING,
    prtInputDefaultIndex         Integer32,
    prtOutputDefaultIndex        Integer32,
    prtMarkerDefaultIndex        Integer32,
    prtMediaPathDefaultIndex     Integer32,
    prtConsoleLocalization        Integer32,
    prtConsoleNumberOfDisplayLines Integer32,
    prtConsoleNumberOfDisplayChars Integer32,
    prtConsoleDisable            INTEGER,
    prtGeneralStartupPage        PresentOnOff,
    prtGeneralBannerPage        PresentOnOff
}
```

```
prtGeneralConfigChanges OBJECT-TYPE
    SYNTAX      Counter32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Counts configuration changes that change the capabilities of
        a printer, such as the addition/deletion of input/output bins,
        the addition/deletion of interpreters, or changes in media
        size. Such changes will often affect the capability of the
        printer to service certain types of print jobs.

        Management applications may cache infrequently changed
        configuration information about sub-units on the printer.
        This object should be incremented whenever the agent wishes
        such applications to invalidate that cache and re-download
```

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all of this configuration information, thereby ~~signalings~~signalling a change in the printer's configuration.

For example, if an input tray that contained paper of different dimensions was added, this counter would be incremented.

As an additional example, this counter would not be incremented when an input tray is removed or the level of an input device changes."

```
::= { prtGeneralEntry 1 }
```

prtGeneralCurrentLocalization OBJECT-TYPE

SYNTAX Integer32 (1..65535)

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The value of the prtLocalizationIndex corresponding to the current language, country, and character set to be used for localized string values that are identified as being dependent on the value of this object. Note that this object does not apply to localized strings in the prtConsole group or any object that is not identified as above."

```
::= { prtGeneralEntry 2 }
```

prtGeneralReset OBJECT-TYPE

-- This value is a type 3 enumeration

SYNTAX PrtGeneralResetTCINTEGER _____{

~~notResetting(3),~~

~~powerCycleReset(4),~~ Cold Start

~~resetToNVRAM(5),~~ Warm Start

~~resetToFactoryDefaults(6)~~ -- Reset contents of

~~NVRAM to factory defaults~~

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Setting this value to `powerCycleReset', `resetToNVRAM', or `resetToFactoryDefaults' will result in the resetting of the printer. When read, this object will always have the value `notResetting(3)', and a SET of the value `notResetting' shall 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 }
```

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```

-- 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 whose device type of is 'printer'."
    INDEX { hrDeviceIndex, prtCoverIndex }
    ::= { prtCoverTable 1 }

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

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

```

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```

STATUS      current
DESCRIPTION
    "The manufacturer provided cover sub-mechanism name in the
    localization specified by prtGeneralCurrentLocalization."
 ::= { prtCoverEntry 2 }

```

```

prtCoverStatus OBJECT-TYPE
    SYNTAX      PrtCoverStatusTC
prtCoverStatus OBJECT-TYPE
-- This value is a type 2 enumeration
SYNTAX      INTEGER {
    other(1),
    doorOpen(3),
    doorClosed(4),
    interlockOpen(5),
    interlockClosed(6)
}

```

```

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.

```

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Entries may exist in the table for each device
 index with a ~~whose~~~~whose's~~ device type of is 'printer'."

```
INDEX { hrDeviceIndex, prtLocalizationIndex }
 ::= { prtLocalizationTable 1 }
```

```
PrtLocalizationEntry ::= SEQUENCE {
    prtLocalizationIndex          Integer32,
    prtLocalizationLanguage       OCTET STRING,
    prtLocalizationCountry        OCTET STRING,
    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
        Cover sub-units to the printer), values are expected to remain
        stable across successive printer power cycles."
    ::= { prtLocalizationEntry 1 }
```

```
prtLocalizationLanguage OBJECT-TYPE
    SYNTAX      OCTET STRING (SIZE(0..2))
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "A two character language code from ISO 639. Examples EN, GB,
        CA, FR, DE."
    ::= { prtLocalizationEntry 2 }
```

```
prtLocalizationCountry OBJECT-TYPE
    SYNTAX      OCTET STRING (SIZE(0..2))
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "A two character country code from ISO 3166, a blank string
        (two space characters) shall indicate that the country is
        not defined. Examples: US, FR, DE, ..."
    ::= { prtLocalizationEntry 3 }
```

```
prtLocalizationCharacterSet OBJECT-TYPE
    SYNTAX      CodedCharSet
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
```

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-----"The coded character set used for this localization."
 ::= { prtLocalizationEntry 4 }

-- The System Resources Tables

-- The Printer MIB makes use of the Host MIB to
 -- define system resources by referencing the storage
 -- and device groups of the print group. In order to
 -- determine, amongst multiple printers serviced by
 -- one agent, which printer owns a particular
 -- resource, the prtStorageRef and prtDeviceRef tables
 -- associate particular storage and device entries to
 -- printers.

prtStorageRefTable OBJECT-TYPE

SYNTAX SEQUENCE OF PrtStorageRefEntry
 MAX-ACCESS not-accessible
 STATUS current
 DESCRIPTION
 ""
 ::= { prtGeneral 2 }

prtStorageRefEntry OBJECT-TYPE

SYNTAX PrtStorageRefEntry
 MAX-ACCESS not-accessible
 STATUS current
 DESCRIPTION
 "This table will have an entry for each entry in
 the host MIB storage table that represents storage associated
 with a printer managed by this agent."
 INDEX { hrStorageIndex, prtStorageRefSeqNumber }
 ::= { prtStorageRefTable 1 }

PrtStorageRefEntry ::= SEQUENCE {

prtStorageRefSeqNumber Integer32,
 prtStorageRefIndex Integer32

}

prtStorageRefSeqNumber OBJECT-TYPE

SYNTAX Integer32 (0..65535)
 MAX-ACCESS not-accessible
 STATUS current
 DESCRIPTION
 "This value will be unique amongst all entries with a common
 value of hrStorageIndex.

 This object allows a storage entry to point to the multiple
 printer devices with which it is associated."

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```

 ::= { prtStorageRefEntry 1 }

prtStorageRefIndex OBJECT-TYPE
    SYNTAX      Integer32 (0..65535)
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The value of the hrDeviceIndex of the printer device that this
        storageEntry is associated with."
    ::= { prtStorageRefEntry 2 }

prtDeviceRefTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF PrtDeviceRefEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        ""
    ::= { prtGeneral 3 }

prtDeviceRefEntry OBJECT-TYPE
    SYNTAX      PrtDeviceRefEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This table will have an entry for each entry in
        the host MIB device table that represents a device associated
        with a printer managed by this agent."
    INDEX      { hrDeviceIndex, prtDeviceRefSeqNumber }
    ::= { prtDeviceRefTable 1 }

PrtDeviceRefEntry ::= SEQUENCE {
    prtDeviceRefSeqNumber  Integer32,
    prtDeviceRefIndex      Integer32
}

prtDeviceRefSeqNumber OBJECT-TYPE
    SYNTAX      Integer32 (0..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

```

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SYNTAX Integer32 (0..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 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 current human operator 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 the network management station, the phone number, fax number or email address should be placed on a separate line starting with ASCII LF (hex 0C) and the ASCII text string (without the quotes): 'phone: ', 'fax: ', and 'email: ', respectively. Phone numbers may contain digits, whitespace and parentheses, which shall be ignored. Phone numbers may also include

⁺ ASCII comma characters(hex 2C) that are used to indicate a half-second pause during the dialing sequence.

NOTE: For interoperability purposes, it is advisable to use email addresses formatted according to RFC 822 requirements."⁺

```
::= { prtGeneralEntry 4 }
```

prtGeneralServicePerson OBJECT-TYPE

SYNTAX OCTET STRING (SIZE(0..127))

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The name of the last human 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 service person by the agent or a network management station, the phone number, fax number or email address should be placed on a separate line starting with ASCII LF (hex 0C) and the ASCII text string (without the quotes):

'phone: ', 'fax: ', and 'email: ', respectively. Phone numbers may contain digits, whitespace and parentheses, which shall be ignored.

Phone numbers can also include one or more ASCII comma characters (hex 2C) to indicate a half-second pause during the dialing sequence.

NOTE: For interoperability purposes, it is advisable to use email addresses formatted according to RFC 822 requirements."⁺

```
"
```

```
::= { prtGeneralEntry 5 }
```

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

```
prtGeneralStartupPage 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 16 }
```

```
prtGeneralBannerPage 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 17 }
```

```
-- 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 }
```

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prtInputDefaultIndex OBJECT-TYPE

SYNTAX Integer32~~22 (1..65535)~~

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The value of prtInputIndex corresponding to the default input sub-unit: that is, this object selects the default source of input media.

This value shall be 0 if there is no default input subunit specified for the printer as a whole. In this case, the actual default input subunit may be specified by means outside the scope of this MIB, such as by each interpreter in a printer with multiple interpreters."

..

::= { prtGeneralEntry 6 }

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 whose whose device type of is 'printer'."

INDEX { hrDeviceIndex, prtInputIndex }

::= { prtInputTable 1 }

PrtInputEntry ::= SEQUENCE {

prtInputIndex

Integer32,

prtInputType

PrtInputTypeTCINTEGER,

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,

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prtInputVersion	OCTET STRING,
prtInputSerialNumber	OCTET STRING,
prtInputDescription	OCTET STRING,
prtInputSecurity	PresentOnOff,
prtInputMediaWeight	Integer32,
prtInputMediaType	OCTET STRING,
prtInputMediaColor	OCTET STRING,
prtInputMediaFormParts	Integer32,
prtInputManualFeedTimeout	Integer32,
prtInputAutoSwitch	PresentOnOff,
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 new input sub-units to the printer), values are expected to remain stable across successive printer power cycles."~~

~~::= { prtInputEntry 1 }~~~~prtInputType OBJECT-TYPE~~~~SYNTAX PrtInputTypeTC~~~~This value is a type 2 enumeration~~~~SYNTAX INTEGER {~~~~other(1),~~~~unknown(2),~~~~sheetFeedAutoRemovableTray(3),~~~~sheetFeedAutoNonRemovableTray(4),~~~~sheetFeedManual(5),~~~~continuousRoll(6),~~~~continuousFanFold(7)~~~~}~~~~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~~

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——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 }

prtInputMediaDimFeedDirChosen OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The printer will act as if media of the chosen dimension (in the feed direction) is present in this input source. Note that this value will be used even if the input tray is empty."

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~~Feed dimension measurements~~
~~Feed dimension measurements~~ are taken parallel-relative to the feed direction
 direction associated with that sub-unit and are in input sub-unit dimensional units (~~MediaDimUnit~~). If the printer supports the declared dimension, the granted dimension is the same as the declared dimension. If not, the granted dimension is set to the closest dimension that the printer supports when the declared dimension is set. The value (-1) means other and specifically indicates that this sub-unit places no restriction on this parameter. The value (-2) indicates unknown."
 ::= { prtInputEntry 6 }

prtInputMediaDimXFeedDirChosen OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The printer will act as if media of the chosen dimension (in the cross feed direction) is present in this input source. Note that this value will be used even if the input tray is empty. 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 (~~MediaDimUnit~~). If the printer supports the declared dimension, the granted dimension is the same as the declared dimension. If not, the granted dimension is set to the closest dimension that the printer supports when the declared dimension is set. The value (-1) means other and specifically indicates that this sub-unit places no restriction on this parameter. The value (-2) indicates unknown."

::= { prtInputEntry 7 }

prtInputCapacityUnit 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 input sub-unit."

::= { prtInputEntry 8 }

prtInputMaxCapacity OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-write

STATUS current

DESCRIPTION

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"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

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```

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..32))
    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.

```

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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"

::= { 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

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this input sub-unit using standardized string values from ISO 10175 (DPA) and ISO 10180 (SPDL) which are:

other
unknown
white
pink
yellow
buff
goldenrod
blue
green
transparent

Implementors 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 manual
-- input subunit timeout 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.

prtInputManualFeedTimeout OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The duration (in seconds) after which the printer shall
either:

(a) switch to another input subunit, if the value of
prtInputNextIndex is non-zero and prtInputAutoSwitch
is on(3)

or

(b) abort any job waiting for manually fed input, if the
value of prtInputNextIndex is zero or
prtInputAutoSwitch is off(4) or notPresent(5).

The event which causes the printer to enter the waiting state
is product specific. A value of (-1) implies 'other' or
'infinite' which translates to 'this input subunit doesn't
support manual feed'. A value of (-2) implies 'unknown'."

::= { prtInputEntry 24 }

```

prtInputAutoSwitch OBJECT-TYPE
    SYNTAX      PresentOnOff
    MAX-ACCESS   read-write
    STATUS       current
    DESCRIPTION
        "Indicates the state of the auto input switching feature. The
        value notPresent(5) indicates the feature is not currently
        supported. Exact behavior of this feature is product specific."
    ::= { prtInputEntry 25 }

```

```

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. A value
        of zero(0) indicates that auto input switching will not occur
        when this input subunit is emptied."
    ::= { prtInputEntry 26 }

```

```

-- 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 }
```

```

prtOutputDefaultIndex OBJECT-TYPE
    SYNTAX      Integer32
    MAX-ACCESS   read-write

```

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STATUS current
DESCRIPTION

"The value of prtOutputIndex corresponding to the default output sub-unit; that is, this object selects the default output destination.

This value shall be 0 if there is no default output subunit specified for the printer as a whole. In this case, the actual default output subunit may be specified by means outside the scope of this MIB, such as by each interpreter in a printer with multiple interpreters."

..

::= { prtGeneralEntry 7 }

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 whose device type of is 'printer'."

INDEX { hrDeviceIndex, prtOutputIndex }

::= { prtOutputTable 1 }

PrtOutputEntry ::= SEQUENCE {

prtOutputIndex

Integer32,

prtOutputType

PrtOutputTypeTCINTEGER,

prtOutputCapacityUnit

PrtCapacityUnitTCCapacityUnit,

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,

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```

-----prOutputStackingOrder          PrtOutputStackingOrderTCINTEGER,
prOutputPageDeliveryOrientation
PrtOutputPageDeliveryOrientationTCINTEGER,
prOutputBursting                      PresentOnOff,
prOutputDecollating                   PresentOnOff,
prOutputPageCollated                  PresentOnOff,
prOutputOffsetStacking                PresentOnOff
}

```

prOutputIndex OBJECT-TYPE

SYNTAX Integer32

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."

::= { prOutputEntry 1 }

prOutputType OBJECT-TYPE

-- This value is a type 2 enumeration

SYNTAX PrtOutputTypeTCINTEGER {

other(1),

unknown(2),

removableBin(3),

unRemovableBin(4),

continuousRollDevice(5),

mailBox(6),

continuousFanFold(7)

}

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The type of technology supported by this output sub-unit."

::= { prOutputEntry 2 }

prOutputCapacityUnit 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."

::= { prOutputEntry 3 }

prOutputMaxCapacity OBJECT-TYPE

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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~~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~~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 }~~

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```

        "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.

prtOutputDimUnit OBJECT-TYPE
    SYNTAX      PrtMediaUnitTC
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The unit of measurement for use in calculating and relaying
          dimensional values for this output sub-unit."
 ::= { prtOutputEntry 14 }

prtOutputMaxDimFeedDir OBJECT-TYPE
    SYNTAX      Integer32
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION

```

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"The maximum dimensions supported by this output sub-unit for measurements taken parallel relative to the feed direction associated with that sub-unit in output sub-unit dimensional units (MediaDimUnit). 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 15 }

prtOutputMaxDimXFeedDir OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The maximum 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 (MediaDimUnit). 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 16 }

prtOutputMinDimFeedDir OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The minimum dimensions supported by this output sub-unit for measurements taken parallel 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 17 }

prtOutputMinDimXFeedDir OBJECT-TYPE

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."

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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 PrtOutputStackingOrderTCINTEGER {

unknown(2),

firstToLast(3),

lastToFirst(4)

};

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 PrtOutputPageDeliveryOrientationTCINTEGER {

faceUp(3),

faceDown(4)

};

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
faceU~~Face-Up~~ and faceD~~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)."

::= { prtOutputEntry 20 }

prtOutputBursting OBJECT-TYPE

SYNTAX PresentOnOff

MAX-ACCESS read-write

STATUS current

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DESCRIPTION

"This object indicates that the ~~outputting~~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 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."

::= { prtOutputEntry 23 }

prtOutputOffsetStacking OBJECT-TYPE

SYNTAX PresentOnOff

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"This object indicates that the output supports supports offset stacking, and if so, whether the feature is enabled."

::= { 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

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-- 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 }

prtMarkerDefaultIndex OBJECT-TYPE

SYNTAX Integer32 (1..65535)

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"The value of prtMarkerIndex --corresponding to the
 default marker_sub-unit; that is, this object selects the
 default marker."

::= { prtGeneralEntry 8 }

-- 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 whose whose device type of is `printer'."

INDEX { hrDeviceIndex, prtMarkerIndex }

::= { prtMarkerTable 1 }

PrtMarkerEntry ::= SEQUENCE {

prtMarkerIndex

Integer32,

prtMarkerMarkTech

PrtMarkerMarkTechTCINTEGER,

prtMarkerCounterUnit

PrtMarkerCounterUnitTCINTEGER,

prtMarkerLifeCount

Counter32,

prtMarkerPowerOnCount

Counter32,

prtMarkerProcessColorants

Integer32,

prtMarkerSpotColorants

Integer32,

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```

prtnMarkerAddressabilityUnit      INTEGER,
prtnMarkerAddressabilityFeedDir  Integer32,
prtnMarkerAddressabilityXFeedDir Integer32,
prtnMarkerNorthMargin            Integer32,
prtnMarkerSouthMargin            Integer32,
prtnMarkerWestMargin             Integer32,
prtnMarkerEastMargin             Integer32,
prtnMarkerStatus                 PrtnSubUnitStatusTC
}

```

```

prtnMarkerIndex OBJECT-TYPE
    SYNTAX      Integer32 (1..65535)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A unique value used by the printer to identify this marking
        SubUnitStatus. 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."
    ::= { prtnMarkerEntry 1 }

```

```

prtnMarkerMarkTech OBJECT-TYPE
    -- This value is a type 2 enumeration
    SYNTAX      PrtnMarkerMarkTechTCINTEGER-1{
        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),
    }

```

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```

_____ photographicImagesetter(23),
_____ photographicOther(24),
_____ ionDeposition(25),
_____ eBeam(26),
_____ typesetter(27)
_____ }
---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      PrtMarkerCounterUnitTCINTEGER {
_____      tenThousandthsOfInches(3), _____ .0001
_____      micrometers(4),
_____      characters(5),
_____      lines(6),
_____      impressions(7),
_____      sheets(8),
_____      dotRow(9),
_____      hours(11),
_____      feet(16),
_____      meters(17)
_____      }
---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

```

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```

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      INTEGER {
                    tenThousandthsOfInches(3), -- .0001
                    micrometers(4)
                }
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

```

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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~~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

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——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

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-----"Attributes of a marker supply.

Entries may exist in the table for each device
index with ~~whose~~ device type ~~of is~~ 'printer'."
INDEX { hrDeviceIndex, prtMarkerSuppliesIndex }
::= { prtMarkerSuppliesTable 1 }

```
PrtMarkerSuppliesEntry ::= SEQUENCE {
    prtMarkerSuppliesIndex      Integer32,
    prtMarkerSuppliesMarkerIndex Integer32,
    prtMarkerSuppliesColorantIndex Integer32,
    prtMarkerSuppliesClass      PrtMarkerSuppliesClassTCINTEGER,
    prtMarkerSuppliesType       PrtMarkerSuppliesTypeTCINTEGER,
    prtMarkerSuppliesDescription OCTET STRING,
    prtMarkerSuppliesSupplyUnit PrtMarkerSuppliesSupplyUnitTCINTEGER,
    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 printer 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
```

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corresponding to the colorant with which this marker supply sub-unit is associated. This value shall be 0 if there is no colorant table."

```
::= { prtMarkerSuppliesEntry 3 }
```

prtMarkerSuppliesClass OBJECT-TYPE

-- This value is a type 1 enumeration

```
SYNTAX      PrtMarkerSuppliesClassTCINTEGER {
    other(1),
    supplyThatIsConsumed(3),
    receptacleThatIsFilled(4)
}
```

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates whether this supply entity represents a supply container that is consumed or a receptacle that is filled."

```
::= { prtMarkerSuppliesEntry 4 }
```

prtMarkerSuppliesType OBJECT-TYPE

-- This value is a type 3 enumeration

```
SYNTAX      PrtMarkerSuppliesTypeTCINTEGER {
    other(1),
    unknown(2),
    toner(3),
    wasteToner(4),
    ink(5),
    inkCartridge(6),
    inkRibbon(7),
    wasteInk(8),
    ope(9),
    developer(10),
    fuserOil(11),
    solidWax(12),
    ribbonWax(13),
    wasteWax(14),
    fuser(15),
    coronaWire(16)
}
```

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

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"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      PrtMarkerSuppliesSupplyUnitTCINTEGER {
tenThousandsOfInches(3), .0001
micrometers(4),
impressions(7),
sheets(8),
thousandsOfOunces(12),
hours(11),
tenthsOfGrams(13),
hundredthsOfFluidOunces(14),
tenthsOfMilliliters(15),
feet(16),
meters(17)
}
```

~~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~~sensed~~ 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; the remaining space if this supply is a receptacle. If this supply container/receptacle can reliably sense this value, the value is reported~~sensed~~ 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

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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 ahosewho's device type ofis 'printer'."
```

```
INDEX { hrDeviceIndex, prtMarkerColorantIndex }
```

```
::= { prtMarkerColorantTable 1 }
```

```
PrtMarkerColorantEntry ::= SEQUENCE {
```

```
prtMarkerColorantIndex
```

```
Integer32,
```

```
prtMarkerColorantMarkerIndex
```

```
Integer32,
```

```
prtMarkerColorantRole
```

```
PrtMarkerColorantRoleTCINTEGER,
```

```
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
```

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~~reconfiguration of the device (e.g. the addition of new colorants to the printer).~~

~~, values are expected to remain~~

~~stable across successive printer power cycles."~~

~~::= { 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

~~INTEGER { Colorant Role~~

~~other(1),~~

~~process(3),~~

~~spot(4)~~

~~}~~

~~MAX-ACCESS read-only~~

STATUS current

DESCRIPTION

"The role played by this colorant."

::= { prtMarkerColorantEntry 3 }

prtMarkerColorantValue OBJECT-TYPE

SYNTAX OCTET STRING (SIZE(0..12763))

MAX-ACCESS read-only

STATUS current

DESCRIPTION

~~"The name of the color of this~~ The name of the color of this colorant using standardized string names from ISO 10175 (DPA) and ISO 10180 (SPDL) which are:

other

unknown

white

red

green

blue

cyan

magenta

yellow

black

Implementors may add additional string values. The naming conventions in ISO 9070 are recommended in order to avoid

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```

        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 }

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 }

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

```

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DESCRIPTION

"Entries may exist in the table for each device
index with whose device type of is 'printer'."

INDEX { hrDeviceIndex, prtMediaPathIndex }
 ::= { prtMediaPathTable 1 }

```
PrtMediaPathEntry ::= SEQUENCE {
    prtMediaPathIndex          Integer32,
    prtMediaPathMaxSpeedPrintUnit PrtMediaPathMaxSpeedPrintUnitTCINTEGER,
    prtMediaPathMediaSizeUnit   PrtMediaUnitTC,
    prtMediaPathMaxSpeed        Integer32,
    prtMediaPathMaxMediaFeedDir Integer32,
    prtMediaPathMaxMediaXFeedDir Integer32,
    prtMediaPathMinMediaFeedDir Integer32,
    prtMediaPathMinMediaXFeedDir Integer32,
    prtMediaPathType            PrtMediaPathTypeTCINTEGER,
    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

```
SYNTAX INTEGER {
    tenThousandthsOfInchesPerHour(3), --- .0001/hour
    micrometersPerHour(4),
    charactersPerHour(5),
    linesPerHour(6),
    impressionsPerHour(7),
    sheetsPerHour(8),
    dotRowPerHour(9),
    feetPerHour(16),
    metersPerHour(17)
}
-- MAX-ACCESS read-only
```

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```

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',
        value 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

```

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~~RFC 1759~~~~Printer MIB~~~~March 1995~~~~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~~~~INTEGER {~~~~other(1),~~~~unknown(2),~~~~longEdgeBindingDuplex(3),~~~~shortEdgeBindingDuplex(4),~~~~simplex(5)~~~~}~~~~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."~~~~Smith, Wright, Hastings, Zilles & Gyllenskog~~~~[Page 67]~~

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```

--- ::= { 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,
-- printer and not what is currently being performed by the printer.

```

```

-- Basically, the print job delivery channel abstraction describes is intended
to cover
-- the final processing step all the aspects of getting the print data to an
-- interpreter. This might include transporting the data
-- from one place to another, it might include some level of (invisible)
-- decompression, or it might include decoding of print stream data. or
packetizing to
-- provide multiple information sources over a single
-- physical interface and it might include filtering
-- characters that were destined for another kind of
-- channel. All of these aspects are hidden in the channel
-- abstraction.
-- (Note some Page Description Languages have
-- compression built into them so "invisible" compression
-- refers to compression done by the transport medium and
-- removed before the data is presented to the interpreter.)

```

```

-- 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 itself over a network connection (interface); or
-- it could be a disk drive into which a floppy disks with
-- the print data is inserted. Each print job delivery channel is typically
-- identified by the electronic path and/or service protocol
-- used to deliver print data to a print data interpreter. the printer.

```

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 Local-, Ether- or
	TokenTalk
LPD Server channel	typically TCP/IP based, port 515

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```

-- Novell Remote Printer          typically SPX/IPX based channel
-- Novell Print Server            typically SPX/IPX based channel
-- port 9100 channel              HP and friends
-- Adobe AppSocket(9101) channel  a bi-directional extension of LPD
--
-- 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
-- thru the channel.
--
-- The print job delivery channel sub-units are represented by the Channel
-- Print Job Delivery Channel Group in the Model.  It has a current
-- print job control language, Control Language which can be used to specify
which
-- 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
-- ManagementMangement Applications).  There is also a default
-- interpreter that is to be used if an interpreter is not
-- explicitly specified using the Control Language. Channel
-- sub-units are based on an underlying interface.
--
-- The print job delivery channel table and its underlying structure
--
-- 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
-- thru the channel.
-- It is necessary to provide control of
-- the (perhaps complex) process by which print data arrives
-- at an interpreter.  Control of a print job delivery channel is largely
limited to enabling
-- or disabling the entire whole-channel itself.  It is likely, however,
-- 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.
--
-- Some examples of the kind of control are where
-- compression or encoding is used; and whether the data is
-- filtered to remove file storage anomalies such as those
-- created by using MS-DOS/PC-DOS LPT1:.
```

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```
-- 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 ahosewhose device type ofis 'printer'."
    INDEX { hrDeviceIndex, prtChannelIndex }
    ::= { prtChannelTable 1 }
```

```
PrtChannelEntry ::= SEQUENCE {
    prtChannelIndex      Integer32,
    prtChannelType       PrtChannelTypeINTEGER,
    prtChannelProtocolVersion OCTET STRING,
    prtChannelCurrentJobCntlLangIndex Integer32,
    prtChannelDefaultPageDescLangIndex Integer32,
    prtChannelState      INTEGER,
    prtChannelIfIndex     Integer32,
    prtChannelStatus      PrtSubUnitStatusTC
}
```

```
prtChannelIndex OBJECT-TYPE
    SYNTAX      Integer32
    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."
```

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```

--- ::= { prtChannelEntry 1 }

```

```

prtChannelType OBJECT-TYPE

```

```

--- This value is a type 2 enumeration

```

```

--- SYNTAX      PrtChannelType INTEGER {
---              other(1),
---              chSerialPort(3),
---              chParallelPort(4),
---              chIEEE1284Port(5),
---              chSCSIPort(6),
---              chAppleTalkPAP(7), --- AppleTalk Printer Achess Protocol
---              chLPDServer(8),
---              chNetwareRPrinter(9), --- Netware
---              chNetwarePServer(10), --- Netware
---              chPort9100(11),
---              chAppSocket(12), --- a bi-directional, LPD-like
---                                --- protocol using 9101 for
---                                --- control and 9100 for data.
---                                --- Adobe Systems, Inc.
---              chFTP(13), --- FTP "PUT" to printer
---              chTFTP(14),
---              chDLCLLCPort(15),
---              chIBM3270(16),
---              chIBM5250(17),
---              chFax(18),
---              chIEEE1394(19),
---              chTransport1(20), --- port 35
---              chCPAP(21), --- port 170
---              chDCERemoteProcCall(22), --- OSF
---              chONCRemoteProcCall(23), --- Sun Microsystems
---              chOLE(24), --- Microsoft
---              chNamedPipe(25),
---              chPCPrint(26), --- Banyan
---              chServerMessageBlock(27),
---              --- File/Print sharing protocol used by
---              --- various network operating systems
---              --- from IBM 3Com, Microsoft and others
---              chDPMF(28), --- Distributed Print Mgt. Framework, IBM
---              chDLLAPI(29), --- Microsoft
---              chVxDAPI(30), --- Microsoft
---              chSystemObjectManager(31), --- IBM
---              chDECLAT(32), --- Digital Equipment Corp.
---              chNPAP(33)
---          }

```

```

MAX-ACCESS read-only

```

```

STATUS current

```

```

DESCRIPTION

```

```

    "The type of this print data channel. This

```

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```

        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. PDL,
        PostScript, NPAP). Must be 1 or greater."
 ::= { 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., PDL, PostScript Language,
        auto-sense). Must be 1 or greater."
 ::= { prtChannelEntry 5 }

prtChannelState OBJECT-TYPE
    -- This value is a type 1 enumeration
    SYNTAX      PrtChannelStateTCINTEGER {
        other(1),
        printDataAccepted(3),
        noDataAccepted(4)
    }

```

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```

}
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-2/RFC 1213) 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 }

```

```

prtChannelStatus OBJECT-TYPE
    SYNTAX PrtSubUnitStatusTC
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The current status of the channel."
    ::= { prtChannelEntry 8 }

```

```

-- 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
--

```

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-- 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 ahosewho's device type of is 'printer'."

INDEX { hrDeviceIndex, prtInterpreterIndex }

::= { prtInterpreterTable 1 }

PrtInterpreterEntry ::= SEQUENCE {

prtInterpreterIndex

Integer32,

prtInterpreterLangFamily

PrtInterpreterLangFamilyTCINTEGER,

prtInterpreterLangLevel

OCTET STRING,

prtInterpreterLangVersion

OCTET STRING,

prtInterpreterDescription

OCTET STRING,

prtInterpreterVersion

OCTET STRING,

prtInterpreterDefaultOrientation

INTEGER,

prtInterpreterFeedAddressability

Integer32,

prtInterpreterXFeedAddressability

Integer32,

prtInterpreterDefaultCharSetIn

CodedCharSet,

prtInterpreterDefaultCharSetOut

CodedCharSet,

prtInterpreterTwoWay

INTEGER

}

prtInterpreterIndex OBJECT-TYPE

SYNTAX Integer32

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

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cycles."

```
::= { prtInterpreterEntry 1 }
```

prtInterpreterLangFamily OBJECT-TYPE

-- This value is a type 2 enumeration

```
SYNTAX      PrtInterpreterLangFamilyTCINTEGER {
    other(1),
    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 Language (tm)
                        -- Postscript -- a trademark of Adobe
                        -- Systems Incorporated which may be
                        -- registered in certain jurisdictions
    langPSPrinter(42),   -- The PostScript Language used for
                        -- control (with any PDLs)
                        -- Adobe Systems Incorporated
    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.
                        -- Pennant Systems, IBM
    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),
    langEpson(10),
    langDDIF(11),        -- Digital Document Interchange Format
                        -- Digital Equipment Corp., Maynard MA
    langInterpress(12),
    langISO6429(13),     -- ISO 6429. Control functions for Coded
                        -- Character Sets (has ASCII control
```

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```

----- characters, plus additional controls for
----- character imaging devices.)
----- ISO Standard, Geneva, Switzerland
langLineData(14), --- line data: Lines of data as separate
----- ASCII or EBCDIC records and containing
----- no control functions (no CR, LF, HT, FF,
----- etc.). For use with traditional line
----- printers. May use CR and/or LF to
----- delimit lines, instead of records. See
----- ISO 10175 Document Printing Application
----- (DPA)
----- ISO standard, Geneva, Switzerland
langMODCA(15), --- Mixed Object Document Content Architecture
----- Definitions that allow the composition,
----- interchange, and presentation of final
----- form documents as a collection of data
----- objects (text, image, graphics, bar
----- codes), resources (fonts, overlays) and
----- page, form and finishing instructions.
----- Pennant Systems, IBM
langREGIS(16), --- Remote Graphics Instruction Set,
----- Digital Equipment Corp., Maynard MA
langSCS(17), --- SNA Character String
----- Bi-directional print data stream for SNA
----- LU 1 mode of communications
----- IBM
langSPDL(18), --- ISO 10180 Standard Page Description
----- Language
----- ISO Standard
langTEK4014(19),
langPDS(20),
langIGP(21),
langCodeV(22), --- Magnum Code V, Image and printer control
----- language used to control impact/dot-
----- matrix printers.
----- QMS, Inc., Mobile AL
langDSCDSE(23), --- DSC-DSE: Data Stream Compatible and
----- Emulation Bi-directional print data
----- stream for non-SNA (DSC) and SNA LU-3
----- 3270 controller (DSE) communications
----- IBM
langWPS(24), --- Windows Printing System, Resource based
----- command/data stream used by Microsoft At
----- Work Peripherals.
----- Developed by the Microsoft Corporation.
langLN03(25), --- Early DEC PPL3, Digital Equipment Corp.
langCCITT(26),
langQUIC(27), --- QUIC (Quality Information Code), Page

```

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```

----- 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)
----- ISO standard, Geneva, Switzerland
langNPAP(31), ----- Network Printer Alliance Protocol
----- IEEE 1284.1
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
----- line of systems. A binary language
----- providing representations for text,
----- simple graphics (rules, lines, conic
----- sections), 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

```

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```

----- 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
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
}

```

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. This type 2 list of enumerations requires review before additional entries are made."

::= { 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 }

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~~RFC 1759~~~~Printer MIB~~~~March 1995~~~~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 }~~~~prtInterpreterVersion OBJECT-TYPE~~~~SYNTAX OCTET STRING (SIZE(0..31))~~~~MAX-ACCESS read-only~~~~STATUS current~~~~DESCRIPTION~~~~"The date code, version number, or other product specific information tied to this interpreter. This value is associated with the interpreter, rather than with the version of the language which is being interpreted or emulated."~~~~::= { prtInterpreterEntry 6 }~~~~prtInterpreterDefaultOrientation OBJECT-TYPE~~~~-- This value is a type 1 enumeration~~~~SYNTAX PrtInterpreterDefaultOrientationTCINTEGER {~~~~other(1),~~~~portrait(3),~~~~landscape(4)~~~~};~~~~MAX-ACCESS read-write~~~~STATUS current~~~~DESCRIPTION~~~~"The current orientation default for this interpreter. This value may be overridden for a particular job (e.g., by a command in the input data stream)."~~~~::= { prtInterpreterEntry 7 }~~~~prtInterpreterFeedAddressability OBJECT-TYPE~~~~SYNTAX Integer32~~~~MAX-ACCESS read-only~~~~STATUS current~~~~DESCRIPTION~~~~"The maximum interpreter addressability in the feed direction in 10000 prtMarkerAddressabilityUnit-s (see prtMarkerAddressabilityFeedDir) for this interpreter. The value (-1) means other and specifically indicates that the sub-unit places no restrictions on this parameter."~~~~Smith, Wright, Hastings, Zilles & Gyllenskog~~~~[Page 79]~~

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—— ::= { prtInterpreterEntry 8 }

prtInterpreterXFeedAddressability OBJECT-TYPE

SYNTAX Integer32

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The maximum interpreter addressability in the cross feed direction in 10000 prtMarkerAddressabilityUnit-s (see prtMarkerAddressabilityXFeedDir) for this interpreter. The value (-1) means other and specifically indicates that the sub-unit places no restrictions on this parameter."

::= { prtInterpreterEntry 9 }

prtInterpreterDefaultCharSetIn OBJECT-TYPE

SYNTAX CodedCharSet

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."

~~"The default coded character set for input octets encountered outside a context in which the Page Description Language established the interpretation of the octets.~~

~~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."

~~"The default character set for data coming from this interpreter through the printer's output channel.~~

~~This value shall be (2) if there is no default."~~

—— ::= { prtInterpreterEntry 11 }

prtInterpreterTwoWay OBJECT-TYPE

-- This value is a type 1 enumeration

SYNTAX PrtInterpreterTwoWayTCINTEGER {

~~yes(3),~~

~~no(4)~~

}

MAX-ACCESS read-only

STATUS current

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~~RFC 1759~~~~Printer MIB~~~~March 1995~~~~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.~~~~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~~~~Smith, Wright, Hastings, Zilles & Gyllenskog~~~~[Page 81]~~

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```

SYNTAX      INTEGER {
                operatorConsoleEnabled enabled(3),
                operatorConsoleDisabled disabled(4)
            }
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
    "If the object prtConsoleDisable has value
    "operatorConsoleDisabled" then input is not accepted from the
    operator console. If the object prtConsoleDisable has the value
    "operatorConsoleEnabled" then input is accepted from the
    operator console.
    This object enables or disables manual input from the
    operators console.
    ::= { prtGeneralEntry 13 }

-- The Display Buffer Table

prtConsoleDisplayBuffer OBJECT IDENTIFIER ::= { printmib 16 }

prtConsoleDisplayBufferTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF PrtConsoleDisplayBufferEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        ""
    ::= { prtConsoleDisplayBuffer 5 }

prtConsoleDisplayBufferEntry OBJECT-TYPE
    SYNTAX      PrtConsoleDisplayBufferEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "This table contains one entry for each physical line on
        the display. Lines cannot be added or deleted.

        Entries may exist in the table for each device
        index with whose whose device type of is `printer'."
    INDEX { hrDeviceIndex, prtConsoleDisplayBufferIndex }
    ::= { prtConsoleDisplayBufferTable 1 }

PrtConsoleDisplayBufferEntry ::= SEQUENCE {
    prtConsoleDisplayBufferIndex      Integer32,
    prtConsoleDisplayBufferText       OCTET STRING
}

prtConsoleDisplayBufferIndex OBJECT-TYPE
    SYNTAX      Integer32 (1..65535)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A unique value for each console line in the printer. The
        value is used to identify this console line. Although

```

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_____ these values may change due to a major reconfiguration of the device (e.g. the addition of new console lines to the printer), values are expected to remain stable across successive printer power cycles."

```
::= { prtConsoleDisplayBufferEntry 1 }
```

```
prtConsoleDisplayBufferText OBJECT-TYPE
```

```
SYNTAX      OCTET STRING (SIZE(0..255))
```

```
MAX-ACCESS read-write
```

```
STATUS      current
```

```
DESCRIPTION
```

"The content of a line in the logical display buffer of the operator's console of the printer. When a write operation occurs, normally a critical message, to one of the LineText strings, the agent should make that line displayable if a physical display is present. Writing a zero length string clears the line. It is an implementation-specific matter as to whether the agent allows a line to be overwritten before it has been cleared. Printer generated strings shall be in the localization specified by prtConsoleLocalization. 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 ~~whose~~ device type of ~~is~~ 'printer'."

```
INDEX { hrDeviceIndex, prtConsoleLightIndex }
```

```
::= { prtConsoleLightTable 1 }
```

```
PrtConsoleLightEntry ::= SEQUENCE {
```

```
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```

```
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```

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```

prtnotConsoleLightIndex      Integer32,
prtnotConsoleOnTime          Integer32,
prtnotConsoleOffTime         Integer32,
prtnotConsoleColor           INTEGER,
prtnotConsoleDescription     OCTET STRING
}

```

prtnotConsoleLightIndex OBJECT-TYPE

```

SYNTAX      Integer32 (0..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 expected to remain stable across successive printer power cycles."

```
 ::= { prtnotConsoleLightEntry 1 }
```

prtnotConsoleOnTime OBJECT-TYPE

```

SYNTAX      Integer32
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION

```

"This object, in conjunction with prtnotConsoleOffTime, defines the current status of the light. If both prtnotConsoleOnTime and prtnotConsoleOffTime are non-zero, the lamp is blinking and the values presented define the on time and off time, respectively, in milliseconds. If prtnotConsoleOnTime is zero and prtnotConsoleOffTime is non-zero, the lamp is off. If prtnotConsoleOffTime is zero and prtnotConsoleOnTime is non-zero, the lamp is on. If both values are zero the status of the lamp is undefined."

"The on time in milliseconds of blinking of this light; 0 indicates off always. If both prtnotConsoleOnTime and prtnotConsoleOffTime are 0, then the light is always off."

```
 ::= { prtnotConsoleLightEntry 2 }
```

prtnotConsoleOffTime OBJECT-TYPE

```

SYNTAX      Integer32
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION

```

"This object, in conjunction with prtnotConsoleOnTime, defines the current status of the light. If both prtnotConsoleOnTime and prtnotConsoleOffTime are non-zero, the lamp is blinking and the values presented define the on time and off time, respectively, in milliseconds. If prtnotConsoleOnTime is zero and prtnotConsoleOffTime is non-zero, the lamp is off. If prtnotConsoleOffTime is zero and prtnotConsoleOnTime is non-zero, the lamp is on. If both values are zero the status of the lamp is undefined."

prtnotConsoleOffTime DESCRIPTION

"The off time in milliseconds of blinking of this light; 0 indicates on always. If both prtnotConsoleOnTime and prtnotConsoleOffTime are 0, then the light is always off."

```
 ::= { prtnotConsoleLightEntry 3 }
```

```
prtConsoleColor OBJECT-TYPE
    -- This value is a type 2 enumeration
    SYNTAX      PrtConsoleColorTCINTEGER {
        d                other(1),
        unknown(2),
        white(3),
        red(4),
```

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```

_____green(5),
_____blue(6),
_____cyan(7),
_____magenta(8),
_____yellow(9)
_____}
---MAX-ACCESS read-only
  STATUS      current
  DESCRIPTION
    "The color of this light."
    ::= { prtConsoleLightEntry 4 }

```

```

prtConsoleDescription OBJECT-TYPE
  SYNTAX      OCTET STRING (SIZE(0..255))
  MAX-ACCESS  read-only
  STATUS      current
  DESCRIPTION
    "The vendor description or label of this light in the
    localization specified by prtConsoleLocalization."
    ::= { prtConsoleLightEntry 5 }

```

```

-- The Alerts Group
--
-- The prtAlertTable lists all the critical and non-critical alerts
-- currently active in the printer.  A critical alert is one that stops
-- the printer from printing immediately and 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.
--
-- 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 }

```

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```

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

PrtAlertEntry ::= SEQUENCE {
    prtAlertIndex          Integer32,
    prtAlertSeverityLevel  INTEGER,
    prtAlertTrainingLevel  INTEGER,
    prtAlertGroup          INTEGER,
    prtAlertGroupIndex     Integer32,
    prtAlertLocation       Integer32,
    prtAlertCode           INTEGER,
    prtAlertDescription    OCTET STRING,
    prtAlertTime           TimeTicks -- NOTE - prtAlertTime is
                                -- in the optional Alert Time Group
}

prtAlertIndex OBJECT-TYPE
    SYNTAX      Integer32
    MAX-ACCESS  not-accessible
    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

```

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_____ 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 PrtSeverityLevelTC INTEGER {

other(1),

critical(3),

warning(4)

_____ }

_____ 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 INTEGER {

other(1),

unknown(2),

untrained(3),

trained(4),

fieldService(5),

management(6),

noInterventionRequired(7)

_____ }

_____ MAX-ACCESS read-only

STATUS current

DESCRIPTION

"See textual convention PrtAlertTrainingLevelTC"

```
 ::= { prtAlertEntry 3 }
```

~~The level of training required to handle this alert. 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~~

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```

_____ and its sub-units. An example of a technical
_____ person would be a manufacture'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."
_____ ::= { prtAlertEntry 3 }

```

prtAlertGroup OBJECT-TYPE

-- This value is a type 1 enumeration

SYNTAX PrtAlertGroupTC 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)
_____ }

```

-- 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

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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 PrtAlertCodeTCINTEGER {

other(1),

unknown(2),

~~codes common to serveral groups~~

coverOpen(3),

coverClosed(4),

interlockOpen(5),

interlockClosed(6),

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```

configurationChange(7),
jam(8),
-- general Printer group
doorOpen(501),
doorClosed(502),
powerUp(503),
powerDown(504),
-- Input Group
inputMediaTrayMissing(801),
inputMediaSizeChanged(802),
inputMediaWeightChanged(803),
inputMediaTypeChanged(804),
inputMediaColorChanged(805),
inputMediaFormPartsChange(806),
inputMediaSupplyLow(807),
inputMediaSupplyEmpty(808),
-- Output Group
outputMediaTrayMissing(901),
outputMediaTrayAlmostFull(902),
outputMediaTrayFull(903),
-- Marker group
markerFuserUnderTemperature(1001),
markerFuserOverTemperature(1002),
-- 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),
-- Media Path Device Group
mediaPathMediaTrayMissing(1301),
mediaPathMediaTrayAlmostFull(1302),
mediaPathMediaTrayFull(1303),
-- interpreter Group
interpreterMemoryIncrease(1501),
interpreterMemoryDecrease(1502),
interpreterCartridgeAdded(1503),
interpreterCartridgeDeleted(1504),
interpreterResourceAdded(1505),

```

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```

_____ interpreterResourceDeleted(1506),
_____ interpreterResourceUnavailable(1507)
_____ }
_____ MAX-ACCESS read-only
_____ STATUS current
_____ DESCRIPTION
_____ "See associated textual convention PrtAlertCodeTC"
_____ "The code that describes the type of alert for this entry in
_____ the table. There are different codes for each
_____ sub-unit type: for example, Media Supply Low and Media
_____ Supply Empty are Alert codes for the Input sub-unit."
_____ ::= { 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 ask 'other' or 'unknown'. The printer is required
        to return a description string but the string may be a null
        string."
    ::= { prtAlertEntry 8 }

printerV1Alert OBJECT-IDENTITY
    STATUS current
    DESCRIPTION
        "The value of the enterprise-specific oid in an SNMPv1 trap sent
        signalling 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:
--

```

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```

-- 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

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

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 }

-- 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

```

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"It is conformant to implement just these two states in this object. Any additional states are optional."

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."

-- the prtResponsiblePartyGroup, prtExtendedInputGroup,
-- prtInputMediaGroup, prtExtendedOutputGroup,
-- prtOutputDimensionsGroup, prtOutputFeaturesGroup,
-- prtMarkerSuppliesGroup, prtMarkerColorantGroup,
-- and the prtAlertTimeGroup, prtAuxiliarySheetGroup, and the
-- prtInputSwitchingGroup are completely optional.
~~completely optional.~~
 ::= { prtMIBConformance 1 }

prtMIBGroups OBJECT IDENTIFIER ::= { prtMIBConformance 2 }

prtGeneralGroup OBJECT-GROUP
OBJECTS { prtGeneralConfigChanges, prtGeneralCurrentLocalization,
prtGeneralReset, prtCoverDescription, prtCoverStatus,
prtLocalizationLanguage, prtLocalizationCountry,
prtLocalizationCharacterSet, prtStorageRefIndex,
prtDeviceRefIndex }
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,

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~~prtInputStatus, prtInputMediaName }~~

```

STATUS current
DESCRIPTION
    "The input group."
::= { prtMIBGroups 3 }

```

```

prtExtendedInputGroup OBJECT-GROUP

```

```

    OBJECTS { prtInputName, prtInputVendorName, prtInputModel,
               prtInputVersion, prtInputSerialNumber,
               prtInputDescription, prtInputSecurity }
    STATUS current
    DESCRIPTION
        "The extended input group."
    ::= { prtMIBGroups 4 }

```

```

prtInputMediaGroup OBJECT-GROUP

```

```

    OBJECTS { prtInputMediaWeight, prtInputMediaType,
               prtInputMediaColor, prtInputMediaFormParts }
    STATUS current
    DESCRIPTION
        "The input media group."
    ::= { prtMIBGroups 5 }

```

```

prtOutputGroup OBJECT-GROUP

```

```

    OBJECTS { prtOutputDefaultIndex, prtOutputType,
               prtOutputCapacityUnit, prtOutputMaxCapacity,
               prtOutputRemainingCapacity, prtOutputStatus }
    STATUS current
    DESCRIPTION
        "The output group."
    ::= { prtMIBGroups 6 }

```

```

prtExtendedOutputGroup OBJECT-GROUP

```

```

    OBJECTS { prtOutputName, prtOutputVendorName, prtOutputModel,
               prtOutputVersion, prtOutputSerialNumber,
               prtOutputDescription, prtOutputSecurity }
    STATUS current
    DESCRIPTION
        "The extended output group."
    ::= { prtMIBGroups 7 }

```

```

prtOutputDimensionsGroup OBJECT-GROUP

```

```

    OBJECTS { prtOutputDimUnit, prtOutputMaxDimFeedDir,
               prtOutputMaxDimXFeedDir, prtOutputMinDimFeedDir,
               prtOutputMinDimXFeedDir }
    STATUS current
    DESCRIPTION
        "The output dimensions group"

```

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prtOutputPageDeliveryOrientation, prtOutputBursting,
prtOutputDecollating, prtOutputPageCollated,
prtOutputOffsetStacking }~~~~STATUS current~~~~DESCRIPTION~~~~"The output features group."~~~~::= { prtMIBGroups 9 }~~~~prtMarkerGroup OBJECT-GROUP~~~~OBJECTS { prtMarkerDefaultIndex, prtMarkerMarkTech,
prtMarkerCounterUnit, prtMarkerLifeCount,
prtMarkerPowerOnCount, prtMarkerProcessColorants,
prtMarkerSpotColorants, prtMarkerAddressabilityUnit,
prtMarkerAddressabilityFeedDir,
prtMarkerAddressabilityXFeedDir, prtMarkerNorthMargin,
prtMarkerSouthMargin, prtMarkerWestMargin,
prtMarkerEastMargin, prtMarkerStatus }~~~~STATUS current~~~~DESCRIPTION~~~~"The marker group."~~~~::= { prtMIBGroups 10 }~~~~prtMarkerSuppliesGroup OBJECT-GROUP~~~~OBJECTS { prtMarkerSuppliesMarkerIndex,
prtMarkerSuppliesColorantIndex, prtMarkerSuppliesClass,
prtMarkerSuppliesType, prtMarkerSuppliesDescription,
prtMarkerSuppliesSupplyUnit,
prtMarkerSuppliesMaxCapacity, prtMarkerSuppliesLevel }~~~~STATUS current~~~~DESCRIPTION~~~~"The marker supplies group."~~~~::= { prtMIBGroups 11 }~~~~prtMarkerColorantGroup OBJECT-GROUP~~~~OBJECTS { prtMarkerColorantMarkerIndex, prtMarkerColorantRole,
prtMarkerColorantValue, prtMarkerColorantTonality }~~~~STATUS current~~~~DESCRIPTION~~~~"The marker colorant group."~~~~::= { prtMIBGroups 12 }~~~~prtMediaPathGroup OBJECT-GROUP~~~~OBJECTS { prtMediaPathDefaultIndex, prtMediaPathMaxSpeedPrintUnit,
prtMediaPathMediaSizeUnit, prtMediaPathMaxSpeed,~~~~Smith, Wright, Hastings, Zilles & Gyllenskog~~~~[Page 95]~~

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```


prMediaPathMaxMediaFeedDir,
prMediaPathMaxMediaXFeedDir,
prMediaPathMinMediaFeedDir,
prMediaPathMinMediaXFeedDir, prMediaPathType,
prMediaPathDescription, prMediaPathStatus}

STATUS current
DESCRIPTION
    "The media path group."
 ::= { prtMIBGroups 13 }

prtChannelGroup OBJECT-GROUP
    OBJECTS { prtChannelType, prtChannelProtocolVersion,
               prtChannelCurrentJobCntlLangIndex,
               prtChannelDefaultPageDescLangIndex, prtChannelState,
               prtChannelIfIndex, prtChannelStatus }
    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 { prtAlertSeverityLevel, prtAlertTrainingLevel,
               prtAlertGroup, prtAlertGroupIndex, prtAlertLocation,
               prtAlertCode, prtAlertDescription }


```

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~~STATUS current~~
~~DESCRIPTION~~
~~"The alert table group."~~
~~::= { prtMIBGroups 17 }~~

~~prtAlertTimeGroup OBJECT-GROUP~~
~~OBJECTS { prtAlertTime }~~
~~STATUS current~~
~~DESCRIPTION~~
~~"The alert time group."~~
~~::= { prtMIBGroups 18 }~~

~~prtAuxiliarySheetGroup OBJECT-GROUP~~
~~OBJECTS { prtGeneralStartupPage, prtGeneralBannerPage }~~
~~STATUS current~~
~~DESCRIPTION~~
~~"The auxiliary sheet group."~~
~~::= { prtMIBGroups 19 }~~

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

END

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Appendix A - Glossary of Terms

Addressability -- on the marker, the number of distinctly setable marking units (pels) per unit of addressability unit; 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 separate output bins.

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

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

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

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.

For example, a switch like the foot switch that changes from high beams to low beams is not idempotent. If the command is received multiple times the result may be different than if the command was received a single time. In the SNMP world preferred commands would be "set lights to high beam" and "set lights to low beam". These commands yield predictable results when executed perhaps multiple times. A command like "press foot toggle switch", is not idempotent because when executed an unknown number of times, it yields an indeterminate result.

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

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—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 duplexing pathways, out to the output with optional finishing applied. The inputs and outputs are not part of the Media Path.

MIB - Management Information Base - the specification for a set of management objects to be managed using SNMP or other management protocol; also an instance of the data for such a set

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.

Object - a data item that has a name, a syntax, and a value. usage).

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.

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—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 -- that 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). 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 prtInputChosenMediaDimFeedDir 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
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

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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
iso-a8	ISO A8	size:	52 mm	by	74 mm
iso-a9	ISO A9	size:	37 mm	by	52 mm
iso-a10	ISO A10	size:	26 mm	by	37 mm
iso-b0	ISO B0	size:	1000 mm	by	1414 mm
iso-b1	ISO B1	size:	707 mm	by	1000 mm
iso-b2	ISO B2	size:	500 mm	by	707 mm
iso-b3	ISO B3	size:	353 mm	by	500 mm
iso-b4	ISO B4	size:	250 mm	by	353 mm
iso-b5	ISO B5	size:	176 mm	by	250 mm
iso-b6	ISO B6	size:	125 mm	by	176 mm
iso-b7	ISO B7	size:	88 mm	by	125 mm
iso-b8	ISO B8	size:	62 mm	by	88 mm
iso-b9	ISO B9	size:	44 mm	by	62 mm
iso-b10	ISO B10	size:	31 mm	by	44 mm
iso-c0	ISO C0	size:	917 mm	by	1297 mm
iso-c1	ISO C1	size:	648 mm	by	917 mm
iso-c2	ISO C2	size:	458 mm	by	648 mm
iso-c3	ISO C3	size:	324 mm	by	458 mm
iso-c4	ISO C4	size:	229 mm	by	324 mm
iso-c5	ISO C5	size:	162 mm	by	229 mm
iso-c6	ISO C6	size:	114 mm	by	162 mm
iso-c7	ISO C7	size:	81 mm	by	114 mm
iso-c8	ISO C8	size:	57 mm	by	81 mm
iso-designated	ISO Designated Long	size:	110 mm	by	220 mm
jis-b0	JIS B0	size	1030 mm	by	1456 mm
jis-b1	JIS B1	size	728 mm	by	1030 mm
jis-b2	JIS B2	size	515 mm	by	728 mm
jis-b3	JIS B3	size	364 mm	by	515 mm
jis-b4	JIS B4	size	257 mm	by	364 mm
jis-b5	JIS B5	size	182 mm	by	257 mm
jis-b6	JIS B6	size	128 mm	by	182 mm
jis-b7	JIS B7	size	91 mm	by	128 mm
jis-b8	JIS B8	size	64 mm	by	91 mm
jis-b9	JIS B9	size	45 mm	by	64 mm
jis-b10	JIS B10	size	32 mm	by	45 mm

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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). 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 managers 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 (prtInputDeclaredMediaDimFeedDir, 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 coloured 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 coloured 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 coloured 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 coloured 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 coloured medium with size: 176 mm by 250 mm as defined in ISO 216
jis-b4-white	Specifies the JIS B4 white medium with

jis-b4-coloured size: 257 mm by 364 mm as defined in JIS P0138
 Specifies the JIS B4 coloured 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 coloured 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 coloured
 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 coloured
 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

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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

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-10-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

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~~—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

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_____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 D -- Roles of Users

Background

The need for Role Models stemmed in large part from the need to understand the importance any given managed object under consideration for inclusion in the specification. Many times the presence or nature of a particular proposed object would be debated within the group; the debate would typically end when one or more persons would describe the potential usage for the object, usually in terms of a "live" person operating in some target environment.

Steve Zilles (Adobe) first mentioned that he had considered this general problem and had come up with a short list of categories by which the group can evaluate the relative utility of a proposed object. The list Steve described was:

— User

— Trained Operator

— Service

Upon further examination of the overall problem I found it useful to expand the list of categories, as well as attempt to define a basic set of "requirements areas" that can help define the basic nature of each category.

Every concept needs a name, and this concept is no different. For lack of better alternatives, I refer to these categories as "Role

~~Models" in this document. This name was chosen in light of the fact that many times we try to find a "person" (or similar entity) for which the use of a proposed object is targeted. (I resisted the temptation to use the term "Usage Models," as I felt the term was too generic in nature.)~~

~~In presenting the initial list of Role Models, the initial set of "requirements areas" are presented, followed by the set of Role Model definitions. Finally, a simple matrix is presented in which Role Models and requirements areas are cross-compared.~~

~~It should be emphasized at this point that all of this is proposed as initial information for further discussion. No doubt major changes~~

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~~will be proposed by members of the group as time goes on.~~

~~Proposed Print System Requirements Areas~~

~~Surrounding printers and printing systems, the following list of "requirement areas" is proposed as a "check list" of needs for the various Role Models:~~

- ~~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 identify 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 "requirements" cover a large spectrum of requirements surrounding the operation of a printer in a network environment. This list is by no means complete, but serves as a starting point for assessing major requirements of the various Role Models described below.~~

~~Proposed Role Models~~

- ~~Following is a proposed list of "Role Models" to be used in evaluating the requirements for any given object defined within the Printer MIB. 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.~~

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~~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, 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 organizations 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. An optional related activity might be to acquire printing resource utilization information for the purposes of charging Users for resources used.~~

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

~~The purpose of these Role Models is to evaluate the relative merit of any given managed object. Whenever a managed object is proposed for inclusion into the specification, discussion on its expected value should be geared around which Role Models benefit from its presence and operation.~~

~~Matrix of Requirement Areas and Role Models~~

~~To better understand the relationship between the set of defined "Requirements Areas" and the various "Role Models," the following matrix is offered.~~

~~It is important to recognize that many of the requirements areas will appear to be applicable to many of the Role Models. However, when considering the actual context of a requirement area, it is very important to realize that often the actual context of a requirement~~

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— is such 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 "User" and an "Operator" Role Models.

— That being said, I'm sure you'll find some inconsistencies in the following matrix, depending on your particular interpretations of the various requirements areas.

Role Models								
Requirement Area	USER	OP	TECH	MGR	HELP	AM	CP	INST
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	
Print job identification		xx		xx	xx		xx	
Internal printer status		xx	xx	xx				
Printer identification		xx		xx	xx	xx	xx	xx
Printer location							xx	
Local system configuration				xx				xx

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Appendix E - Participants

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

Azmy Abouased - Compaq
 Avi Basu - HP
 Kerry Bott - Intel
 Michael Bringmann - QMS
 Ted Brunner - Tektronix
 Jeff Case - SNMP Research Inc.
 Rong Chang - IBM
 Jay Cummings - Novell
 Andy Davidson - Tektronix
 Jack Demcak - Jadtech
 Andria Demetroulakos - Digital Products
 Mike Evans - ESI
 Richard Everman - uci.edu
 Lee Farrel
 Neal Fischer - Fujitsu
 Joseph Flick - HP
 Rod Gerhart - Ricoh
 Christine Gressley - University of Illinois
 Joel Gyllenskog - HP
 Tom Hastings - Xerox Corporation
 Tim Hathaway - Pacific Data
 Mark Held - CMU
 Bob Herriot - SUN
 Jeff Johnson - Cisco
 Jeff Johnson - Microsoft
 Binnur Al-Kazily - HP
 Theodore Kearley - QMS
 Barry Kelman - Microsoft
 Charles Kimber - Dataproducts
 Andrew Knutsen - SCO
 Peter Leunig - Leunig GmbH
 Harry Lewis - IBM Pennant Systems
 Bill Lott - QMS
 Mike MacKay - Xerox
 Jay Martin - Underscore
 Mike Mayes - Brother
 Kevin McBride - Underscore
 Stan McConnell - XEROX
 Gaylord Miyata - Underscore
 Michael Moore - Ricoh
 Rudy Nedved - CMU Computer Science Dept.
 Pete Neergaard - CMU
 Bill Norton - merit.edu
 Ron Norton - Printronix
 Roman Orzol - Okidata
 Bob Pentecost - HP
 Alan Perelman - Emulex

~~RFC 1759~~~~Printer MIB~~~~March 1995~~~~Noga Prat - Intel~~~~Dave Roach - Unisys~~~~Marshall Rose - Dover Beach Consulting~~~~John Saperia - BGS Systems Inc.~~~~Mike Scanlon - FTP Software~~~~Avi Schlank - Canon~~~~Bob Setterbo - Adobe~~~~Ron Smith - TI~~~~Larry Stein - Farpoint~~~~Koji Tashiro - NEC Technologies~~~~Jody Terrill - Extended Systems~~~~Chris Thomas - Intel Products~~~~Mike Timperman - Lexmark~~~~Randy Turner - Sharp LaboratoriesQMS~~~~Bill Wagner - Digital Products~~~~Steve Waldbusser - CMU~~~~Tim Wells - Microsoft~~~~Craig Whittle - Compaq~~~~Don Wright - Lexmark~~~~Lloyd Young - Lexmark-International Inc.~~~~Steve Zilles - Adobe~~~~Jim Zuber - Genoa~~~~Smith, Wright, Hastings, Zilles & Gyllenskog~~~~[Page 112]~~

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Security Considerations

Security issues are not discussed in this memo.

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