

**IEEE 802.11**  
**Wireless Access Methods and Physical Layer Specifications**

**TITLE:** Proposed Text Change for MIB Variables  
Section 9 of Draft 1

**DATE:** July 10-13th, 1995

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**Introduction**

At the last joint PHY meeting a number of changes were made to the Managed Object list. The intent of these changes were to define a common list of MIB

parameters to be used by the MAC and LME when interfacing to the PHY and PHY LME. This contribution provides the updates for section 9 which are in concert with the efforts in the joint PHY.

## Physical Layer Management

This section covers ~~these~~ the attribute definitions and templates ~~aspects~~ of PHY layer management. ~~which are independent of the specific PHY type.~~ This includes both the PHY-dependent and the PHY-independent portions of the PHY-layer Management Information Base. PHY-specific MIB definitions are included within the subsequent PHY-specific layer descriptions. Not all attributes in the following section are supported by every PHY. Each PHY contains a Managed Object list which defines the PHY-specific values required for each PHY implementation.

### ~~PHY Independent~~ PHY Management Information Base

#### Phy Attributes

##### agPhyOperation\_grp

aCCA\_Rise\_Time,  
aCCA\_Fall\_Time,  
aPHY\_Type,  
aReg\_Domains\_Suprt,  
aCurrent\_Reg\_Domain,  
aSlot\_time,  
aCCA\_Asmnt\_Time,  
aRxTx\_Turnaround\_Time,  
aTxRx\_Turnaround\_Time,  
aRx\_Propagation\_Delay,  
aTx\_Propagation\_Delay,  
aPHY\_SAP\_Delay,  
aPLCP\_Time,  
aTx\_PLCP\_Delay,  
aRxTx\_Switch\_Time,  
aTxRamp\_On\_time,  
aTx\_RF\_Delay,  
aSIFS\_Time,  
aRx\_RF\_Delay,  
aRx\_PLCP\_Delay,  
aMAC\_Prc\_Delay,  
aTxRamp\_Off\_Time,  
aCCA\_Watchdog\_Timer\_Max,  
aCCA\_Watchdog\_Count\_Max,  
aCCA\_Watchdog\_Timer\_Min,  
aCCA\_Watchdog\_Count\_Min,  
aChannel\_Transit\_Delay,  
aChannel\_Transit\_Variance,  
aMPDU\_Maximum,  
aMPDU\_Minimum,  
aMPDU\_Current\_Maximum;

agPhyRate\_grp

aSuprt Data Rates,  
aMPDU Max Lngth 1M,  
aMPDU Max Lngth 2M,  
aSupported\_Tx\_Rates,  
aSupported\_Rx\_Rates,  
aBSS\_Basic\_Rate\_Set,  
aStation\_Basic\_Rate,  
aExtended\_Rate\_Set,  
aPLCP\_Rate,  
aPreferred\_Tx\_Rate,  
aPreferred\_Rx\_Rate;

agPhyAntenna\_grp

aSuprt Tx Antennas,  
aCurrent Tx Antenna,  
aSuprt Rx Antennas,  
aDiversity Suprt,  
aDiversity Slct Rx;

agPhyTxPwr\_grp

aNbr Suprtd Pwr Lvls,  
aTx Pwr Lvl1,  
aTx Pwr Lvl2,  
aTx Pwr Lvl3,  
aTx Pwr Lvl4,  
aTx Pwr Lvl5,  
aTx Pwr Lvl6,  
aTx Pwr Lvl7,  
aTx Pwr Lvl8,  
aCurrent Tx PwrLvl;

agPhyFHSS\_grp

aHop Time,  
aCurrent Channel Nbr,  
aMax Dwell Time,  
aCurrent Dwell Time,  
aCurrent Set,  
aCurrent Pattern,  
aCurrent Index;

agPhyStatus\_grp

aSynthesizer Locked; Not Grouped

## PHY Object Class

PHY MANAGED OBJECT CLASS

DERIVED FROM "ISO/IEC 10165-2":top;

CHARACTERIZED BY

pPHY\_base PACKAGE  
BEHAVIOR

bPHY\_base BEHAVIOR

DEFINED AS "The PHY object class provides the necessary support for the ~~timing~~ all the required PHY operational information, ~~and rate change information~~, which may vary from PHY to PHY and from STA to STA to be communicated to upper layers."

ATTRIBUTES

aCCA_Rise_Time	GET,
aCCA_Fall_Time	GET,
aPHY_Type	GET,
aReg_Domains_Suprt	GET,
aCurrent_Reg_Domain	GET-REPLACE,
aSlot_Time	GET,
aCCA_Asmnt_Time	GET,
aRxTx_Turnaround_Time	GET,
aTx_PLCP_Delay	GET,
aRxTx_Switch_Time	GET,
aTxRamp_On_Time	GET,
aTx_RF_Delay	GET,
aSIFS_Time	GET,
aRx_RF_Delay	GET,
aRx_PLCP_Delay	GET,
aMAC_Prc_Delay	GET,
aTxRamp_Off	GET,
aTxRx_Turnaround_Time	GET,
aRx_Propagation_Delay	GET,
aTx_Propagation_Delay	GET,
aPHY_SAP_Delay	GET,
aPLCP_Time	GET,
aCCA_Watchdog_Timer_Max	GET-REPLACE,
aCCA_Watchdog_Count_Max	GET-REPLACE,
aCCA_Watchdog_Timer_Min	GET,
aCCA_Watchdog_Count_Min	GET,
aChannel_Transit_Delay	GET,
aChannel_Transit_Variance	GET,
aMPDU_Maximum	GET,
aMPDU_Minimum	GET,
aMPDU_Current_Maximum	GET-REPLACE,
aSuprt_Data_Rates	GET,
aMPDU_Max_Lngth_1M	GET,
aMPDU_Max_Lngth_2M	GET,
aSupported_Rx_Rates	GET,
aSupported_Tx_Rates	GET,
aBSS_Basic_Rate_Set	GET,
aStation_Basic_Rate	GET-REPLACE,

<u>aExtended_Rate_Set</u>	GET,
<u>aPLCP_Rate</u>	GET,
<u>aPreferred_Tx_Rate</u>	GET-REPLACE,
<u>aPreferred_Rx_Rate</u>	GET-REPLACE,
<u>aSuprt_Tx_Antennas</u>	GET,
<u>aCurrent_Tx_Antenna</u>	GET-REPLACE,
<u>aSuprt_Rx_Antennas</u>	GET,
<u>aDiversity_Suprt</u>	GET,
<u>aDiversity_Slct_Rx</u>	GET-REPLACE,
<u>aNbr_Suprt_Pwr_Lvls</u>	GET,
<u>aTx_Pwr_Lvl_1</u>	GET,
<u>aTx_Pwr_Lvl_2</u>	GET,
<u>aTx_Pwr_Lvl_3</u>	GET,
<u>aTx_Pwr_Lvl_4</u>	GET,
<u>aTx_Pwr_Lvl_5</u>	GET,
<u>aTx_Pwr_Lvl_6</u>	GET,
<u>aTx_Pwr_Lvl_7</u>	GET,
<u>aTx_Pwr_Lvl_8</u>	GET,
<u>aCurrent_Tx_PwrLvl</u>	GET-REPLACE,
<u>aHop_Time</u>	GET,
<u>aCurrent_Channel_Nbr</u>	GET-REPLACE,
<u>aMax_Dwell_Time</u>	GET,
<u>aCurrent_Dwell_Time</u>	GET-REPLACE,
<u>aCurrent_Set</u>	GET-REPLACE,
<u>aCurrent_Pattern</u>	GET-REPLACE,
<u>aCurrent_Index</u>	GET-REPLACE,
<u>aSynthesizer_Locked</u>	GET;

## ATTRIBUTE GROUPS

agPhyOperation\_grp,  
agPhyRate\_grp,  
agPhyAntenna\_grp,  
agPhyTxPwr\_grp,  
agPhyFHSS\_grp,  
agPhyStatus\_grp;

## ACTIONS

acPHY\_init,  
acPHY\_reset;

## NOTIFICATIONS

REGISTERED AS { iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) };

## PHY Attribute Group Templates

agPhyOperation\_grp

PhyOperation\_grp ATTRIBUTE GROUP

## GROUP ELEMENTS

aCCA\_Rise\_Time,  
aCCA\_Fall\_Time,  
aPHY\_Type,  
aReg\_Domains\_Suprt,

aCurrent\_Reg\_Domain,  
aSlot\_time,  
aCCA\_Asmnt\_Time,  
aRxTx\_Turnaround\_Time,  
aTxRx\_Turnaround\_Time,  
aRx\_Propagation\_Delay,  
aTx\_Propagation\_Delay,  
aPHY\_SAP\_Delay,  
aPLCP\_Time,  
aTx\_PLCP\_Delay,  
aRxTx\_Switch\_Time,  
aTxRamp\_On\_time,  
aTx\_RF\_Delay,  
aSIFS\_Time,  
aRx\_RF\_Delay,  
aRx\_PLCP\_Delay,  
aMAC\_Prc\_Delay,  
aTxRamp\_Off\_Time,  
aCCA\_Watchdog\_Timer\_Max,  
aCCA\_Watchdog\_Count\_Max,  
aCCA\_Watchdog\_Timer\_Min,  
aCCA\_Watchdog\_Count\_Min,  
aChannel\_Transit\_Delay,  
aChannel\_Transit\_Variance,  
aMPDU\_Maximum,  
aMPDU\_Minimum,  
aMPDU\_Current\_Maximum;  
REGISTERED AS { iso(1) member-body(2) us(840) ieee802dot11(xxxx) phy(3) PhyOperation\_grp(0) };

agPhyRate\_grp

PhyRate\_grp ATTRIBUTE GROUP  
GROUP ELEMENTS

aSuprt\_Data\_Rates,  
aMPDU\_Max\_Lngth\_1M,  
aMPDU\_Max\_Lngth\_2M,  
aSupported\_Tx\_Rates,  
aSupported\_Rx\_Rates,  
aBSS\_Basic\_Rate\_Set,  
aStation\_Basic\_Rate,  
aExtended\_Rate\_Set,  
aPLCP\_Rate,  
aPreferred\_Tx\_Rate,  
aPreferred\_Rx\_Rate;  
REGISTERED AS { iso(1) member-body(2) us(840) ieee802dot11(xxxx) phy(3) PhyRate\_grp(1) };

agPhyAntenna\_grpPhyAntenna\_grp ATTRIBUTE GROUPGROUP ELEMENTS

aSuprt Tx Antennas,  
aCurrent Tx Antenna,  
aSuprt Rx Antennas,  
aDiversity Suprt,  
aDiversity Slct Rx;

REGISTERED AS { iso(1) member-body(2) us(840) ieee802dot11(xxxx) phy(3) PhyAntenna\_grp(1) };

agPhyTxPwr\_grpPhyTxPwr\_grp ATTRIBUTE GROUPGROUP ELEMENTS

aNbr Suprtd Pwr Lvls,  
aTx Pwr Lvl1,  
aTx Pwr Lvl2,  
aTx Pwr Lvl3,  
aTx Pwr Lvl4,  
aTx Pwr Lvl5,  
aTx Pwr Lvl6,  
aTx Pwr Lvl7,  
aTx Pwr Lvl8,  
aCurrent Tx PwrLvl;

REGISTERED AS { iso(1) member-body(2) us(840) ieee802dot11(xxxx) phy(3) PhyTxPwr\_grp(1) };

agPhyFHSS\_grpPhyFHSS\_grp ATTRIBUTE GROUPGROUP ELEMENTS

aHop Time,  
aCurrent Channel Nbr,  
aMax Dwell Time,  
aCurrent Dwell Time,  
aCurrent Set,  
aCurrent Pattern,  
aCurrent Index;

REGISTERED AS { iso(1) member-body(2) us(840) ieee802dot11(xxxx) phy(3) PhyFHSS\_grp(1) };

agPhyStatus\_grpPhyStatus\_grp ATTRIBUTE GROUPGROUP ELEMENTS

aSynthesizer Locked;

REGISTERED AS { iso(1) member-body(2) us(840) ieee802dot11(xxxx) phy(3) PhyStatus\_grp(1) };



## PHY Attribute Templates

-aCCA\_Rise\_Time

CCA\_Rise\_Time ATTRIBUTE  
WITH APPROPRIATE SYNTAX

integer;

BEHAVIOR DEFINED AS

"Time (in hundreds of nanoseconds) from the disappearance of a transmission in the medium to the assertion of Clear Channel. The decay time of the CCA detector is included in this value.";

REGISTERED AS

{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) CCA\_Rise\_Time(11) };

-aCCA\_Fall\_Time

CCA\_Fall\_Time ATTRIBUTE  
WITH APPROPRIATE SYNTAX

integer;

BEHAVIOR DEFINED AS

"Time (in hundreds of nanoseconds) from the appearance of a transmission in the medium to the assertion of Busy Channel. The attack time of the CCA detector is included.";

REGISTERED AS

{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) CCA\_Fall\_Time(22) };

-aPHY\_Type

PHY\_Type ATTRIBUTE  
WITH APPROPRIATE SYNTAX

integer;

BEHAVIOR DEFINED AS

"This is a 8 bit integer value which identifies the PHY Type supported by the attached PLCP and PMD"

FHSS 2.4GHz = 01 , DSSS 2.4GHz = 02, IR Baseband = 03";

REGISTERED AS

{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) PHY\_Type(33) };

-aReg\_Domains\_Suprt

Reg\_Domains\_Suprt ATTRIBUTE  
WITH APPROPRIATE SYNTAX

Null Terminated list of byte integers;

BEHAVIOR DEFINED AS

"There are different operational requirements dependent on the regulatory domain. This attribute list describes the regulatory domains the PLCP and PMD support in this implementation. Each integer is an 8 bit value as defined below:

FCC = 10, DOC = 20, ETSI = 30, MKK = 40";

REGISTERED AS

{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Reg\_Domains\_Suprt(33) };

aCurrent\_Reg\_Domain

Current\_Reg\_Domain ATTRIBUTE  
WITH APPROPRIATE SYNTAX

integer;

BEHAVIOR DEFINED AS

"This octet defines the current regulatory domain this implementation of the PMD is supporting. This octet corresponds to one of the Reg\_Domains list in the Reg\_Domains\_Suprt attribute list";

REGISTERED AS

{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Current\_Reg\_Domain(33) };

aSlot\_Time

Slot\_Time ATTRIBUTE  
WITH APPROPRIATE SYNTAX

integer;

BEHAVIOR DEFINED AS

"The time in microseconds the MAC will use for defining the PIFS and DIFS periods. The Slot\_Time is defined as a function of the following the equation:  
CCA\_Asmnt\_Time + RxTx\_Turnaround\_Time + Air\_Propagation\_Time.  
Air\_Propagation\_Time is defined as 1 usec.";

REGISTERED AS

{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Slot\_Time(33) };

aCCA\_Asmnt\_Time

CCA\_Asmnt\_Time ATTRIBUTE  
WITH APPROPRIATE SYNTAX

integer;

BEHAVIOR DEFINED AS

"The minimum time in microseconds the CCA mechanism has available to assess the media within every slot to determine whether the media is clear or busy";

REGISTERED AS

{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) CCA\_Asmnt\_Time(33) };

aRxTx\_Turnaround\_Time

RxTx\_Turnaround\_Time ATTRIBUTE  
WITH APPROPRIATE SYNTAX

integer;

BEHAVIOR DEFINED AS

"Minimum required time (in hundreds of nanoseconds) between the PHY\_DATA.indicate(END\_OF\_ACTIVITY) and the earliest possible transmission of a new packet. This does not include any recovery time required by the receiver. The maximum time in microseconds the PHY requires to change from receive to transmitting the start of the first symbol out on the air. The following equation is used to derive the RxTx\_Turnaround\_Time:  
aTx\_PLCP\_Delay + aRxTx\_Switch\_Time + aTxRamp\_On\_Time + aTx\_RF\_Delay.";

## REGISTERED AS

{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7)  
RxTx\_Turnaround\_Time(44) };

-aTxRx\_Turnaround\_TimeTxRx\_Turnaround\_Time ATTRIBUTE

## WITH APPROPRIATE SYNTAX

integer;

## BEHAVIOR DEFINED AS

"Minimum required time (in hundreds of nanoseconds) between the transmission of the last symbol of an outgoing frame and the recovery of the receiver to within 3 dB of its nominal gain and noise performance parameters.";

## REGISTERED AS

{ iso(1) member body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7)  
TxRx\_Turnaround\_Time(44) };

-aRx\_Propagation\_DelayRx\_Propagation\_Delay ATTRIBUTE

## WITH APPROPRIATE SYNTAX

integer;

## BEHAVIOR DEFINED AS

"The electronic delay time (in hundreds of nanoseconds) in the receiver from the reception of a signal at the antenna to a PHY\_DATA.indicate. Includes the conversion of eight bits from a serial stream to an octet. Startup delays introduced by the PLCP header are not included in this value."

## REGISTERED AS

{ iso(1) member body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7)  
Rx\_Propagation\_Delay(55) };

-aTx\_Propagation\_DelayTx\_Propagation\_Delay ATTRIBUTE

## WITH APPROPRIATE SYNTAX

integer;

## BEHAVIOR DEFINED AS

"The electronic delay time (in hundreds of nanoseconds) in the transmitter from the reception of a PHY\_DATA.indicate to the generation of a signal at the antenna. Startup delays introduced by the PLCP header are not included in this value."

## REGISTERED AS

{ iso(1) member body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7)  
Tx\_Propagation\_Delay(66) };

-aPHY\_SAP\_Delay

PHY\_SAP\_Delay ATTRIBUTE  
WITH APPROPRIATE SYNTAX

integer;

BEHAVIOR DEFINED AS

"The delay introduced (in hundreds of nanoseconds) from PHY\_DATA.request(class DATA) to PHY\_DATA.indicate(class DATA) in a peer PHY. This includes propagation delays, channel delays, and parallel-serial-parallel conversion of information."

REGISTERED AS

{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) PHY\_SAP\_Delay(77) };

-aPLCP\_Time

PLCP\_Time ATTRIBUTE  
WITH APPROPRIATE SYNTAX

set of integer;

BEHAVIOR DEFINED AS

"The set of times required (in hundreds of nanoseconds) by the PHY to construct and transmit the PLCP header and the PLCP corresponding to each aPLCP\_Rate. Does not include aTx\_Propagation\_Delay. The receive time is assumed to be identical to or less than the transmit time."

REGISTERED AS

{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) PLCP\_Time(88) };

-aTx\_PLCP\_Delay

Tx\_PLCP\_Delay ATTRIBUTE  
WITH APPROPRIATE SYNTAX

integer;

BEHAVIOR DEFINED AS

"The nominal time in microseconds the PLCP uses to deliver a symbol from the MAC interface to the transmit data path of the PMD";

REGISTERED AS

{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Tx\_PLCP\_Delay(88) };

-aRxTx\_Switch\_Time

RxTx\_Switch\_Time ATTRIBUTE  
WITH APPROPRIATE SYNTAX

integer;

BEHAVIOR DEFINED AS

"The nominal time in microseconds the PMD takes to switch from Receive to Transmit";

REGISTERED AS

{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) RxTx\_Switch\_Time(88) };

aTxRamp\_On\_Time

TxRamp\_On\_Time ATTRIBUTE  
WITH APPROPRIATE SYNTAX

integer;  
 BEHAVIOR DEFINED AS

"The maximum time in microseconds the PMD takes to turn the Transmitter on";

REGISTERED AS

{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) TxRamp\_On\_Time(88) };

aTx\_RF\_Delay

Tx\_RF\_Delay WITH APPROPRIATE SYNTAX

integer;  
 BEHAVIOR DEFINED AS

"The nominal time in nanoseconds the PMD uses to transfer a symbol through the Transmit path of the PMD";

REGISTERED AS

{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Tx\_RF\_Delay(88) };

aSIFS\_Time

SIFS\_Time ATTRIBUTE  
WITH APPROPRIATE SYNTAX

integer;  
 BEHAVIOR DEFINED AS

"The time in microseconds the MAC and PHY will require to receive the last symbol of a frame at the air interface, process the frame and response with the first symbol on the air interface of the earliest possible response. The following equation is used to determine the SIFS\_Time: aRx\_RF\_Delay + aRx\_PLCP\_Delay + aMAC\_Prc\_Delay + aRxTx\_Turnaround\_Time";

REGISTERED AS

{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) SIFS\_Time(88) };

aRx\_RF\_Delay

Rx\_RF\_Delay ATTRIBUTE  
WITH APPROPRIATE SYNTAX

integer;  
 BEHAVIOR DEFINED AS

"The nominal time in nanoseconds the PMD uses to deliver a symbol from the antenna to the PLCP.";

REGISTERED AS

{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Rx\_RF\_Delay(88) };

aRx\_PLCP\_Delay

Rx\_PLCP\_Delay ATTRIBUTE  
WITH APPROPRIATE SYNTAX

integer;

BEHAVIOR DEFINED AS

"The nominal time in nanoseconds the PLCP uses to deliver a bit from the PMD receive path to the MAC";

REGISTERED AS

{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Rx\_PLCP\_Delay(88) };

aMAC\_Prc\_Time

MAC\_Prc\_Delay ATTRIBUTE  
WITH APPROPRIATE SYNTAX

integer;

BEHAVIOR DEFINED AS

"The nominal time in microseconds the MAC uses to process a frame and prepare a response to the frame";

REGISTERED AS

{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) MAC\_Prc\_Delay(88) };

aTxRamp\_Off\_Time

TxRamp\_Off\_Time ATTRIBUTE  
WITH APPROPRIATE SYNTAX

integer;

BEHAVIOR DEFINED AS

"The time in nanoseconds the PMD takes to turn the Transmit PA off";

REGISTERED AS

{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) TxRamp\_Off\_Time(88) };

aCCA\_Watchdog\_Timer\_Max

CCA\_Watchdog\_Timer\_Max ATTRIBUTE  
WITH APPROPRIATE SYNTAX

integer;

BEHAVIOR DEFINED AS

"The time (in hundreds of nanoseconds) at which the watchdog timer in the PMD CCA mechanism generates an alarm. The product of aCCA\_Watchdog\_Timer\_Max and the aCCA\_Watchdog\_Count\_Max must be set to match the length of the maximum length undecoded packet that is to be allowed time to operate.<sup>1</sup>"

REGISTERED AS

{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7)  
 CCA\_Watchdog\_Timer\_Max(99) };

<sup>1</sup> A default product of 22 msec allows time for 802.11 type maximal length packets.

aCCA\_Watchdog\_Count\_Max

CCA\_Watchdog\_Count\_Max ATTRIBUTE  
WITH APPROPRIATE SYNTAX

integer;

BEHAVIOR DEFINED AS

"The count of alarms which the watchdog counter in the PMD CCA is permitted to generate before an undecoded energy detection in the medium is ignored."

REGISTERED AS

{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7)  
CCA\_Watchdog\_Count\_Max(1010) };

aCCA\_Watchdog\_Timer\_Min

CCA\_Watchdog\_Timer\_Min ATTRIBUTE  
WITH APPROPRIATE SYNTAX

integer;

BEHAVIOR DEFINED AS

"The minimum time (in hundreds of nanoseconds) to which the aCCA\_Watchdog\_Timer\_Max may be set."

REGISTERED AS

{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7)  
CCA\_Watchdog\_Timer\_Min(1111) };

aCCA\_Watchdog\_Count\_Min

CCA\_Watchdog\_Count\_Min ATTRIBUTE  
WITH APPROPRIATE SYNTAX

integer;

BEHAVIOR DEFINED AS

"The minimum time (in hundreds of nanoseconds) to which the aCCA\_Watchdog\_Count\_Max may be set."

REGISTERED AS

{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7)  
CCA\_Watchdog\_Count\_Min(1212) };

~~aChannel\_Transit\_Delay~~

~~Channel\_Transit\_Delay ATTRIBUTE  
WITH APPROPRIATE SYNTAX~~

~~integer;~~

~~BEHAVIOR DEFINED AS~~

~~"Antenna to antenna signal transit time measured in hundreds of nanoseconds."~~

~~REGISTERED AS~~

~~{ iso(1) member body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Channel\_Transit\_Delay  
(1313) };~~

-aChannel\_Transit\_Variance

Channel\_Transit\_Variance ATTRIBUTE  
WITH APPROPRIATE SYNTAX

integer;

BEHAVIOR DEFINED AS

"Expected variance in the channel transit time, measured in hundreds of nanoseconds."

REGISTERED AS

{ iso(1) member body(2) us(840) ieee802dot11(XXXX) PHY(3) attribute(7)  
Channel\_Transit\_Variance(1414) };

-aSupported\_Rx\_Rates

Supported\_Rx\_Rates ATTRIBUTE  
WITH APPROPRIATE SYNTAX

set of integer;

BEHAVIOR DEFINED AS

"This attribute shall be a set of all the reception rates supported by the PHY. The values of the numbers for the reception rates are defined by each PHY."

REGISTERED AS

{ iso(1) member body(2) us(840) ieee802dot11(XXXX) PHY(3) attribute(7) Supported\_Rx\_Rates  
(1515) };

-aSupported\_Tx\_Rates

Supported\_Tx\_Rates ATTRIBUTE  
WITH APPROPRIATE SYNTAX

set of integer;

BEHAVIOR DEFINED AS

"This attribute shall be a set of all the transmission rates supported by the PHY. The values of the numbers for the reception rates are defined by each PHY."

REGISTERED AS

{ iso(1) member body(2) us(840) ieee802dot11(XXXX) PHY(3) attribute(7) Supported\_Tx\_Rates  
(1616) };

-aBSS\_Basic\_Rate\_Set

BSS\_Basic\_Rate\_Set ATTRIBUTE  
WITH APPROPRIATE SYNTAX

set of integer;

BEHAVIOR DEFINED AS

"This attribute shall be a set of all the reception rates that must be supported by all PHY in the BSS of which the STA is a member. The values of the numbers for the reception rates are defined by each PHY."

REGISTERED AS

{ iso(1) member body(2) us(840) ieee802dot11(XXXX) PHY(3) attribute(7) BSS\_Basic\_Rate\_Set  
(1717) };



-aStation\_Basic\_Rate

Station\_Basic\_Rate ATTRIBUTE  
WITH APPROPRIATE SYNTAX

integer;

BEHAVIOR DEFINED AS

"This attribute shall be the transmission rate, preferred by the PHY in this STA. This rate must be a member of aBSS\_Basic\_Rate\_Set. The values of the numbers for the reception rates are defined by each PHY."

REGISTERED AS

{ iso(1) member body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Station\_Basic\_Rate (1818) };

-aExtended\_Rate\_Set

Extended\_Rate\_Set ATTRIBUTE  
WITH APPROPRIATE SYNTAX

set of integer;

BEHAVIOR DEFINED AS

"This attribute shall be a set of all the reception rates supported by the PHY, which rates are not also a member of the aBSS\_Basic\_Rate\_Set."

REGISTERED AS

{ iso(1) member body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Extended\_Rate\_Set (1919) };

-aPLCP\_Rate

PLCP\_Rate ATTRIBUTE  
WITH APPROPRIATE SYNTAX

set of integer;

BEHAVIOR DEFINED AS

"This attribute shall be the set of rates at which the PHY in this STA will always transmit the PLCP header. These values must be members of the aBSS\_Basic\_Rate\_Set. The values of the numbers for the rates are defined by each PHY."

REGISTERED AS

{ iso(1) member body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) PLCP\_Rate (2020) };

-aPreferred\_Tx\_Rate

Preferred\_Tx\_Rate ATTRIBUTE  
WITH APPROPRIATE SYNTAX

integer;

BEHAVIOR DEFINED AS

"This attribute shall be the distinguished rate at which the PHY in this STA would prefer to transmit in the data phase. This value is not constrained to be a member of the aBSS\_Basic\_Rate\_Set. The values of the numbers for the reception rates are defined by each PHY."

REGISTERED AS

{ iso(1) member body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Preferred\_Tx\_Rate (2121) };

-aPreferred\_Rx\_Rate

Preferred\_Rx\_Rate ATTRIBUTE  
WITH APPROPRIATE SYNTAX

integer;

BEHAVIOR DEFINED AS

"This attribute shall be the distinguished rate at which the PHY in this STA would prefer to receive in the data phase. This value is not constrained to be a member of the aBSS\_Basic\_Rate\_Set. The values of the numbers for the reception rates are defined by each PHY."

REGISTERED AS

```
{ iso(1) member body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Preferred_Rx_Rate (2222)
};
```

-aMPDU\_Maximum

MPDU\_Maximum ATTRIBUTE  
WITH APPROPRIATE SYNTAX

integer;

BEHAVIOR DEFINED AS

"This attribute shall be the maximum MPDU, in octets, that the PHY shall ever be capable of accepting. This maximum MPDU is distinguished from the maximum size which is currently acceptable to the PHY."

REGISTERED AS

```
{ iso(1) member body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) MPDU_Maximum (2323)
};
```

-aMPDU\_Minimum

MPDU\_Minimum ATTRIBUTE  
WITH APPROPRIATE SYNTAX

integer;

BEHAVIOR DEFINED AS

"This attribute shall be the Minimum MPDU, in octets, that the PHY shall ever be capable of accepting."

REGISTERED AS

```
{ iso(1) member body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) MPDU_Minimum (2424)
};
```

-aMPDU\_Current\_Maximum

MPDU\_Current\_Maximum ATTRIBUTE  
WITH APPROPRIATE SYNTAX

integer;

BEHAVIOR DEFINED AS

"This attribute shall be the current maximum MPDU, in octets, that the PHY is capable of accepting at the time the object is inspected. The value shall always be greater than or equal to aMPDU\_Minimum, and less than or equal to aMPDU\_Maximum. The PHY shall replace this value at it's discretion as the maximum deliverable MPDU changes."

REGISTERED AS

```
{ iso(1) member body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7)
MPDU_Current_Maximum(2525) };
```

aSuprt\_Data\_Rates

Suprt\_Data\_Rates ATTRIBUTE  
WITH APPROPRIATE SYNTAX

Null Terminated list of byte integers;

BEHAVIOR DEFINED AS

"The bit rates supported by the PLCP and PMD. The following list defines the supported data rates:

1M bps = 01, 2M bps = 02";

REGISTERED AS

{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Suprt\_Data\_Rates (2424) };

aMPDU\_Max\_Lngth\_2M

MPDU\_Max\_Lngth\_2M ATTRIBUTE  
WITH APPROPRIATE SYNTAX

integer;

BEHAVIOR DEFINED AS

"The maximum number of octets in a MPDU that can be load into the PLCP\_PDU when transmitting at 2M bit per second";

REGISTERED AS

{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) MPDU\_Max\_Lngth\_2M (2424) };

aSuprt\_Tx\_Antennas

Suprt\_Tx\_Antennas ATTRIBUTE  
WITH APPROPRIATE SYNTAX

Null terminated list of integers;

BEHAVIOR DEFINED AS

"This attribute represent a list of one or more antennas which can be used as the transmit antenna.

Each antenna is define as an integer starting with antenna 1 to antenna N where N is < or = 255";

REGISTERED AS

{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Suprt\_Tx\_Antennas (2424) };

aCurrent\_Tx\_Antenna

Current\_Tx\_Antenna ATTRIBUTE  
WITH APPROPRIATE SYNTAX

integer;

BEHAVIOR DEFINED AS

"The current antenna being used to transmit. This value is one of the attributes appearing in the list defined as the Suprt\_Tx\_Antennas.";

REGISTERED AS

{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) MPDU\_Max\_Lngth\_1M (2424) };

aSuprt Rx Antennas

Suprt Rx Antennas ATTRIBUTE  
WITH APPROPRIATE SYNTAX

Null terminated list of integers;

BEHAVIOR DEFINED AS

"This attribute represent a list of one or more antennas which can be used as the tranmit antenna.

Each antenna is define as an integer starting with antenna 1 to antenna N where N is < or = 255.";

REGISTERED AS

{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Suprt Rx Antennas (2424) };

aDiversity Suprt

Diversity Suprt ATTRIBUTE  
WITH APPROPRIATE SYNTAX

integer;

BEHAVIOR DEFINED AS

"This attribute defines this implementation's support for diversity. This attribute can have one of three values. 01h indicates that diversity is available and performed over a fixed list of antennas define in attribute Diversity Slct Rx. 02h indicates that diversity is not supportted. 03h indicates that diversity is supportted and that control of diversity is also available. Diversity control indicates that the Diversity Slct Rx can be dynamically modified by the LME.";

REGISTERED AS

{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) MPDU Max Lngth 1M (2424) };

aDiversity Slct Rx

Diversity Slct Rx ATTRIBUTE  
WITH APPROPRIATE SYNTAX

Null terminated list of integers;

BEHAVIOR DEFINED AS

"This attribute represent a list of one or more antennas which can be used as receive antennas. Each antenna is define as an integer starting with antenna 1 to antenna N where N is < or = 255.";

REGISTERED AS

{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Diversity Slct Rx (2424) };

aNbr Suprt Pwr Lvl

Nbr Suprt Pwr Lvl ATTRIBUTE  
WITH APPROPRIATE SYNTAX

integer;

BEHAVIOR DEFINED AS

"This defines the number of power levels supported by the PMD. This attribute can have a value of 1 to 8.";

REGISTERED AS

{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Nbr Suprt Pwr Lvl (2424) };

aTx\_Pwr\_Lvl\_1

Tx\_Pwr\_Lvl\_1 ATTRIBUTE  
WITH APPROPRIATE SYNTAX

integer;

BEHAVIOR DEFINED AS

"This defines the transmit output power for LEVEL1 in mWatts. This is also the default power level.";

REGISTERED AS

{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Tx\_Pwr\_Lvl\_1 (2424) };

aTx\_Pwr\_Lvl\_2

Tx\_Pwr\_Lvl\_2 ATTRIBUTE  
WITH APPROPRIATE SYNTAX

integer;

BEHAVIOR DEFINED AS

"This defines the transmit output power for LEVEL2 in mWatts.";

REGISTERED AS

{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Tx\_Pwr\_Lvl\_2 (2424) };

aTx\_Pwr\_Lvl\_3

Tx\_Pwr\_Lvl\_3 ATTRIBUTE  
WITH APPROPRIATE SYNTAX

integer;

BEHAVIOR DEFINED AS

"This defines the transmit output power for LEVEL3 in mWatts.";

REGISTERED AS

{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Tx\_Pwr\_Lvl\_3 (2424) };

aTx\_Pwr\_Lvl\_4

Tx\_Pwr\_Lvl\_4 ATTRIBUTE  
WITH APPROPRIATE SYNTAX

integer;

BEHAVIOR DEFINED AS

"This defines the transmit output power for LEVEL4 in mWatts.";

REGISTERED AS

{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Tx\_Pwr\_Lvl\_4 (2424) };

aTx\_Pwr\_Lvl\_5

Tx\_Pwr\_Lvl\_5 ATTRIBUTE  
WITH APPROPRIATE SYNTAX

integer;

BEHAVIOR DEFINED AS

"This defines the transmit output power for LEVEL5 in mWatts.";

REGISTERED AS

{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Tx\_Pwr\_Lvl\_5 (2424) };

aTx Pwr Lvl 6

Tx Pwr Lvl 6 ATTRIBUTE  
WITH APPROPRIATE SYNTAX

integer;

BEHAVIOR DEFINED AS

"This defines the transmit output power for LEVEL6 in mWatts.";

REGISTERED AS

{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Tx\_Pwr\_Lvl\_6 (2424) };

aTx Pwr Lvl 7

Tx Pwr Lvl 7 ATTRIBUTE  
WITH APPROPRIATE SYNTAX

integer;

BEHAVIOR DEFINED AS

"This defines the transmit output power for LEVEL7 in mWatts.";

REGISTERED AS

{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Tx\_Pwr\_Lvl\_7 (2424) };

aTx Pwr Lvl 8

Tx Pwr Lvl 8 ATTRIBUTE  
WITH APPROPRIATE SYNTAX

integer;

BEHAVIOR DEFINED AS

"This defines the transmit output power for LEVEL8 in mWatts.";

REGISTERED AS

{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Tx\_Pwr\_Lvl\_8 (2424) };

aCurrent Tx PwrLvl

Current Tx PwrLvl ATTRIBUTE  
WITH APPROPRIATE SYNTAX

integer;

BEHAVIOR DEFINED AS

"The Tx\_Pwr\_Lvl\_N currently being used to transmit data. Some PHYs also use this value to determine the receiver sensitivity requirements for CCA.";

REGISTERED AS

{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Current\_Tx\_PwrLvl (2424) };

aHop Time

Hop Time ATTRIBUTE  
WITH APPROPRIATE SYNTAX

integer;

BEHAVIOR DEFINED AS

"The time in nanoseconds for the PMD to change from channel 2 to 80";

REGISTERED AS

{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Hop\_Time (2424) };

aCurrent\_Channel\_Nbr

Current\_Channel\_Nbr ATTRIBUTE  
WITH APPROPRIATE SYNTAX

integer;

BEHAVIOR DEFINED AS

"This defines the current channel number of the frequency loaded in the RF synthesizer";

REGISTERED AS

{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Current\_Channel\_Nbr (2424) };

aMax\_Dwell\_Time

Max\_Dwell\_Time ATTRIBUTE  
WITH APPROPRIATE SYNTAX

integer;

BEHAVIOR DEFINED AS

"The maximum time in nanoseconds that the radio can operate on a single channel";

REGISTERED AS

{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Max\_Dwell\_Time (2424) };

aCurrent\_Dwell\_Time

Current\_Dwell\_Time ATTRIBUTE  
WITH APPROPRIATE SYNTAX

integer;

BEHAVIOR DEFINED AS

"The current time in nanoseconds that the radio shall operate on a single channel set by the MAC";

REGISTERED AS

{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Current\_Dwell\_Time (2424) };

aCurrent\_Set

Current\_Set ATTRIBUTE  
WITH APPROPRIATE SYNTAX

integer;

BEHAVIOR DEFINED AS

"This attribute represents the current set of patterns the PHY LME is using to determine the hop sequence.";

REGISTERED AS

{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Current\_Set (2424) };

aCurrent\_Pattern

Current\_Pattern ATTRIBUTE  
WITH APPROPRIATE SYNTAX

integer;

BEHAVIOR DEFINED AS

"This attribute represents the current pattern the PHY LME is using to determine the hop sequence.";

REGISTERED AS

{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Current\_Pattern (2424) };

aCurrent\_Index

Current\_Index ATTRIBUTE  
WITH APPROPRIATE SYNTAX

integer;

BEHAVIOR DEFINED AS

"This attribute represents the current index value the PHY LME is using to determine the  
Current\_Channel\_Nbr.":

REGISTERED AS

{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Current\_Index (2424) };

aSynthesizer\_Locked

Synthesizer\_Locked ATTRIBUTE  
WITH APPROPRIATE SYNTAX

integer;

BEHAVIOR DEFINED AS

"This is an indication that the PMD's synthesizer is locked to the current channel speciifed in the  
Current\_Channel\_Nbr. 00h represents unocked while FFh represents locked. ";

REGISTERED AS

{ iso(1) member-body(2) us(840) ieee802dot11(xxxx) PHY(3) attribute(7) Synthesizer\_Locked  
(2424) };