Item	Category	Field_Name	Description	R/W	Step	Min	Max	Bits	Notes	CLT CNU	Status
2	**Preamble**		**Phy-Link preamble definitions**								h
3	**PHY Cmd**		**PHY-Link frame control and upper layer direct interface to PHY-Link**								h
3	PHY Cmd	Timestamp	PHY timestamp used to coordinate PHY layer functions. A 32 bit counter that rollsover on terminal count.	RW	1	0	4E+09	32	Implied in motion #11 Geneva(13) MULPI 3.1 Section 7.1.5. pg 206 (pdf) - 8 byte field, b3:0 - 204.8MHz *16, b4:8 - 204.8Mhz/20 (10.24MHz), b9:40 - 7 sec clocked at 10.24MHz, b41:63 - Epoc	B	i
3	PHY Cmd	PHY_Address	Which PHY is targeted This may or may not need to be an MDIO Register but will always be included in the PHY Link Frame	RO?	1	1	1024	10	MAC address - if we use MAC address on the PHY link we will need a table of ONU MAC addresses n x 48b long. Concept implied in Motion #11 Victoria (see boyd 3bn 02 0513 slide 8). Reviewed in PHY-Link call 6/5	B	R
3	PHY Cmd	ConfigID	need to discuss this - per CNU(?)	RO?	1	0	2	2	How do we want to set-up config ID bits? Should this be on a Per CNU basis? If so then the size of this register will determine a max number of CNUs		i
3	PHY Cmd	CNU_ID	Table of MAC addresses indexed by CNU_ID. How big does the table need to be?	RO?	1	0	2	48	How do we want to set-up CNU IDs? IF a table then the size of this table will determine a max number of CNUs.		i
~~3~~	~~PHY Cmd~~	~~Phy_Cmd_Opcode~~	~~Enumerated list of commands: NOP, Read, Write, Write/Read~~	~~RW~~	~~1~~	~~0~~	~~7~~	~~3~~	~~email thread PHY frame (in PHY-Link ad hoc folder). Implied in principle motion #11 Victoria (see boyd 3bn 02 0513 slide 8) Reviewed in PHY-Link call 6/5, some questions about need for this field, may need additional details on how upper layers talk to PHY-Link.~~	~~B~~	~~R~~
~~3~~	~~PHY Cmd~~	~~Register_Address~~	~~MDIO Address of targeted register~~	~~RW~~	~~1~~			~~16~~	~~email thread PHY frame (in PHY-Link ad hoc folder). Implied in principle motion #11 Victoria (see boyd 3bn 02 0513 slide 8) Reviewed in PHY-Link call 6/5, some questions about need for this field, may need additional details on how upper layers talk to PHY-Link.~~	~~B~~	~~R~~
3	PHY Cmd	PHY_Discovery_Start	Time of next open PHY Discovery window relative to PHY Timestamp. Setting this register to zero results in no open discovery windows.	RW	1	0	4E+09	32			i
3	PHY Cmd	PHY_Discovery_Duration	Duration of next open PHY Discovery window relative to the PHY Timstamp. Setting this register to zero results in no open discovery windows	RW	1	0	65535	16			i
3	PHY Cmd	PHY_Discovery_Period	Period (in PHY Clocks, Symbols PHY Frames ?) between PHY Discovery windows	RW					Allows upper layers to control the frequency of PHY_Discovery windows		i
4	**Global**										h
4	Global	Flag:_Transmit_enable	allow the device to activly transmit, default is disable. Allows PHY to respond to PHY Layer Discovery. Similar to bits defined in Table 45–11 but must default to disabled	RW	1	0	1	1	Could use Register 1.9.0 (Table 45–11) for this Global PMD Transmit disable except this bit is defined as default = enabled.	B	R

Item	Category	Field_Name	Description	R/W	Step	Min	Max	Bits	Notes	CLT CNU	Status
4	Global	Flag:_PHY_Layer_Registered	for a CNU PHY this PHY has been registered (i.e,, PHY layer Discover has been completed).	RO	1	0	1	1		B	R
4	Global	Flag:_TDD/FDD	Sets network Mode; TDD / !FDD	RW	1	0	1	1	Implied in motion #11 Geneva(13)	B	R
4	Global	Tx_Symbol_counter	Number of symbols transmitted, rolls over to zero at max count.	RO	1			16	basic PM	B	R
4	Global	Rx_Symbol_counter	Number of symbols received rolls over to zero at max count.	RO	1			16	basic PM	B	R
4	Global	FEC_Pointer	A pointer, in bits, to the first complete FEC codeword in the following PHY Link frame	RO	1	0	16383	14	Proposed during PHY-Link call 5/1 in EPOC-Downstream-Framing-v0.9.pdf, pointer concept implied in motion #11 Victoria. Reviewed in PHY-Link call 6/5, may not wish to include as to upper layers this will appear to be random.	B	R
4	Global	FEC_Enable	A bit mapped 8 bit register to enable individual FEC code rates. Setting a bit to a logical high enable the FEC code rate. Code rate (listed from bit 0 to 8) are; RA = 8/9, RB = 8/9, RC = 0.848, RD = 3/4, RE = 9/10, RF = 9/10, RG = 13/15, and RH = 3/4.	RW	1	0	255	8	Concept proposed/implied in motion #5 from Victoria (see prodan 3bn 0513.pdf slide 6). Reviewed in PHY-Link call 6/5.	B	R
4	Global	PHY_Config_ID	PHY Profile configuration in use, read only	RO	1	0	3	2	Discussed in PHY-Link ad hoc Straw Poll 10 & 11. In the CLT this may need to be a table with an entry for each CNU. Implied in Motion #11 Victoria (see boyd 3bn 02 slide 8). Reviewed in PHY-Link call 6/5.	B	R
4	Global	Target_RF_On_Time	The target time, in TQ, requested by the CLT in which the CNU is to turn on its RF Transmitter. This value must be greater than RF_On_Time_capability	RO	1	1	255	8	approved in Cl 102 baseline	B	i
4	Global	Target_RF_Off_Time	The target time, in TQ, requested by the CLT in which the CNU is to turn off its RF Transmitter. This value must be greater than RF_Off_Time_capability	RO	1	1	255	8	approved in Cl 102 baseline	B	i
4	Global	TDD_Guard_Time							This is a sum of one way(?) flight time (~2m/us), RF Switching time and possibly DAC, ADC times. Noted during TDD Cycle time discussion in Geneva13 meeting.	B	i
5	**DS OFDM Desc**		**This section includes parameters that are common to all DS OFDM Channels.**								h
5	DS OFDM De	DS_Number_of_OFDM_Channels	The number of OFDM Channels in use from 1 to tbd.	RW	1	1	tbd	tbd	Implied in motion #11 Geneva(13).	B	i
~~5~~	~~DS OFDM De~~	~~DS_OFDM_Duration~~	~~Enumerated list; 20 or 40 us.~~	~~RW~~	~~1~~	~~0~~	~~1~~	~~1~~	~~based on carrier spacing of 25/50 kHz or 25/50 us (Motion #10, Geneva12). Reviewed in RF Spectrum call 6/18.~~	~~B~~	~~R~~

Item	Category	Field_Name	Description	R/W	Step	Min	Max	Bits	Notes	CLT CNU	Status
5	DS OFDM De	DS_OFDM_FFT_Size	Determines the FFT size or subcarrier spacing. Enumerated list; 0=4k/50 kHz, 1=8k/25 kHz	RW	1	0	1	1	Aligned with Motion #14 Dallas (EPoC DS baseline starting point, laubach_3bn_04c_1113), & MULPI 3.1 (pg 162 Table 6-61). Alternative to 20/40 us. Discussed in PHY-Link call on 7/10. Implied in motion #11 Geneva(13).	B	i
5	DS OFDM De	DS_Cyclic_Prefix_le	Length of DS cyclic prefix for all channels. Enumerated list { 0 = .9375 us/192 samples , 1=1.25 us/256 samples, 2=2.5 us/512 samples, 3=3.75 us/768 samples, and 4=5 us/1024 samples}. Samples refer to OFDM clock (204.8 MHz).	RW	1	0	4	3	Aligned with Motion #14 Dallas (EPoC DS baseline starting point, laubach_3bn_04c_1113) & MULPI 3.1 (pg 162 Table 6-61). Aligned with and implied by Motion #26 Victoria (see pietsch 3bn 02 0313 slide 2). Changing CP is a system reregistration event. Reviewed in RF Spectrum call 6/18. Implied in motion #11 Geneva(13).	B	R
5	DS OFDM De	DS_Windowing	Enumerated list, 5 values of Tp for windowing calculation, Enumerated List { 0=0, 1=32, 2=64, 3=128, 4=192, 5=256}	RW	1	0	5	3	Aligned with Motion #14 Dallas (EPoC DS baseline starting point, laubach_3bn_04c_1113), & MULPI 3.1 (pg 162 Table 6-61). MULPI 3.1 has additional values of 160 & 224 and does not have 256 in text but only excludes 32 in table 6-61. Sizes adopted in Motion #9 Orlando. Register implied in motion #11 Geneva(13).	B	i
5	DS OFDM De	Time Interleaver	Number of Symbols used in the time interleaving function. The lsb is ignored if using an 8K FFT.	RW	1	1	32	5	Aligned with Motion #14 Dallas (EPoC DS baseline starting point, laubach_3bn_04c_1113) & MULPI 3.1 (pg 163 Table 6-61, ex MULPI use 0-32 & 0-16). Implied in motion #11 Geneva(13). Need description, size etc!	B	i
5	DS OFDM De	DS_System_Frame_Length	Length of the OFDM frame (in Symbols) from 96 to 256	RW	1	96	256	8	For FDD may be fixed, in which case this is not needed	B	i
6	**US OFDM Desc**		**This section includes parameters that are common to all US OFDM Channels.**								h
6	US OFDM De	Number_of_US_OFDM_Channels	Assume up to 4 US RF Channels that can be bonded	RW	1	1	4	2	Ed - maybe in future, now one only.	T	i
~~6~~	~~US OFDM De~~	~~US_OFDM_Duration~~	~~Enumerated list; 20 or 40 us.~~	~~RW~~	~~1~~	~~0~~	~~1~~	~~1~~		~~B~~	~~R~~
6	US OFDM De	US_OFDM_FFT_Size	Determines the FFT size or subcarrier spacing. Enumerated list; {0=4k/50 kHz, 1=8k/25 kHz}.	RW	1	0	1	1	Alternative to 20/40 us. Discussed in PHY-Link call on 7/10. Implied in motion #11 Geneva(13).	B	i
6	US OFDM De	US_Cyclic_Prefix_le	Length of US cyclic prefix. Enumerated list {0= 0.9375 us/256 samples, 1= 1.25 us, 2= 1.5625 us, 3= 1.875 us, 4= 2.1875 us, 5= 2.5 us/512 samples, 6= 2.8125 us, 7= 3.125 us, 8= 3.75 us/768 samples, 9= 4.0625 us, 10= 4.375 us, 11= 4.6875 us, 12= 5 us/1024 samples, 13= 5.3125 us, 14= 5.625 us, and 15= 6.25 us}. Samples refer to OFDM clock (204.8 MHz).	RW	1	0	15	4	Aligned with and implied by Motion #26 Victoria (see pietsch 3bn 02 0313 slide 2). Changing CP is a system reregistration event. Reviewed in RF Spectrum call 6/18. Implied in motion #11 Geneva(13).	B	R

Item	Category	Field_Name	Description	R/W	Step	Min	Max	Bits	Notes	CLT CNU	Status
~~6~~	~~US OFDM De~~	~~US_Resource_Block_duration~~	~~The number of symbols in an US Resource Block from 1 to 17. When FFT size = 8k the maximum value is 17, when FFT size = 4k them maximum value is 9~~	~~RW~~	~~1~~	~~1~~	~~17~~				~~R~~
6	US OFDM De	US_Resource_Block_duration	The number of symbols in an US Resource Block from 1 to 17. When FFT size = 8k the maximum value is 17, when FFT size = 4k them maximum value is 9	RW	1	1	17	5	Implied in motion #24 Victoria (see pietsch 3bn 01 0513 slide 3, 4), needs additional details/refinment. Reviewed in RF Spectrum call 6/18. Implied in motion #11 Geneva(13).	B	R
~~6~~	~~US OFDM De~~	~~US_Resource_Block_Pilot_Spacing~~	~~The Pilot spacing in an US Resource Block from tbd to tbd~~	~~RW~~	~~tbd~~	~~tbd~~	~~tbd~~				~~R~~
6	US OFDM De	US_FrameLen	Number of Symbols in upstream OFDMA frame	RW	1	6	36	5	MULPI 3.1 pg 108	U	i
6	US OFDM De	US_Pilot_boost	Power boosting level for pilots in the US OFDM channel	RW	0.25	3	6	4	no decission on pilot power boosting yet	T	i
7	**PLC Desc**		**Parameters describing the PHY-Link**								h
7	PLC Desc	DS_PLC_Center_Frequency_#1	Location of the DS PHY-Link center frequency from lower edge of RF Channel. In MHz from 1 to 192 in steps of 1 Mhz.	RW	1	1	192	8	Discussed in PHY-Link ad hoc 3/27. Implied in Motion #13 Victoria (see boyd 3bn 02 0513 slide 3). Reviewed in PHY-Link call 6/5. Implied in motion #11 Geneva(13).	B	R
7	PLC Desc	DS_PLC_Start_#1	DS PHY-Link starting sub-carrier from 0 to 4095 in steps of 1 Sub-carriers or Sub-carrier pairs.	RW	1	0	4095	12	Alternative to center frequency - in early version but not in baseline starting motioned version. MULPI (pg 161 Table 6-35) Frequency: 4 bytes. The center frequency of the downstream channel (Hz). For an OFDM channel, this TLV is the center frequency of the lowest sub-carrier of the PLC. This TLV is intended only to assist CMs in speeding the acquisition of new channels prior to the completion of registration.	B	i
7	PLC Desc	DS_PLC_Cycle_Time_#1	The PHY Link cycle time, in symbols from tbd to tbd symbols.	RW	1	tbd	tbd	tbd	Discussed in PHY-Link ad hoc 3/27. Implied in Motion #13 Victoria (see boyd 3bn 02 0513 slide 6). Reviewed in PHY-Link call 6/5.	B	R
7	PLC Desc	DS_PLC_Internal_Guard_time_#1	Amount of guard time, in symbols, internal to the PHY-Link cycle.	RW	1	0	tbd	tbd	Discussed in PHY-Link ad hoc 3/27. Implied in Motion #13 Victoria (see boyd 3bn 02 0513 slide 5). Reviewed in PHY-Link call 6/5.	B	R
7	PLC Desc	DS_PLC_Ending_Guard_time_#1	Amount of guard time, in symbols, at the end of of the PHY-Link cycle	RW	1	1	tbd	tbd	Discussed in PHY-Link ad hoc 3/27. Implied in Motion #13 Victoria (see boyd 3bn 02 0513 slide 5). Reviewed in PHY-Link call 6/5.	B	R

Item	Category	Field_Name	Description	R/W	Step	Min	Max	Bits	Notes	CLT CNU	Status
7	PLC Desc	DS_PLC_CRC_Errors_#1	Number of CRC Errors in the most recent period (tbd time). The 10P/2B TC CRC error register is a 16 bit counter that contains the number of TC frames received with the TC CRC error primitive asserted, defined in 61.2.3. These bits shall be reset to all zeros when the register is read by the management function or upon execution of the MMD reset. These bits shall be held at all ones in the case of overflow.	RW	1	0	tbd	tbd	Based on Motion #13 Victoria (see boyd 3bn 02 0513 slide 8) Reviewed in PHY-Link call 6/5, rationalize with previous CRC Error counter techniques (see example text).	B	R
~~7~~	~~PLC Desc~~	~~DS_PLC_FEC_Corrected_Errors_#1~~	~~Number of FEC Correctable Errors in the most recent period (tbd time). The 10P FEC correctable errors counter is a 16 bit counter that contains the number of FEC codewords that have been received and corrected. .. These bits shall be reset to all zeros upon execution of the MMD reset and upon being read.~~	~~RW~~	~~1~~	~~0~~	~~65535~~	~~16~~	~~Based on Motion #13 Victoria (see boyd 3bn 02 0513 slide 8) Reviewed in PHY-Link call 6/5, rationalize with previous CRC Error counter techniques (see example text).~~	~~B~~	~~R~~
~~7~~	~~PLC Desc~~	~~DS_PLC_FEC_Uncorrected_Errors_#1~~	~~Number of FEC uncorrectable Errors in the most recent period (tbd time) The 10P FEC uncorrectable errors counter is a 16 bit counter that contains the number of FEC codewords that have been received and are uncorrectable. .. These bits shall be reset to all zeros upon execution of the MMD reset and upon being read.~~	~~RW~~	~~1~~	~~0~~	~~65535~~	~~16~~	~~Based on Motion #13 Victoria (see boyd 3bn 02 0513 slide 8) Reviewed in PHY-Link call 6/5, rationalize with previous CRC Error counter techniques (see example text).~~	~~B~~	~~R~~
7	PLC Desc	DS_PLC_#2-N_Center_Frequency	as above for secondary PLC's	RW			10	80		B	i
7	PLC Desc	DS_PLC_Srch_Freq_Start	Frequency at which to start looking for the PLC Channel . From 1 to 5000 MHz in 1 MHz steps	RW	1	1	5000	13	Discussed in PHY-Link ad hoc 5/1 and presented in Victoria, Implied in Motion #13 Victoria (see boyd 3bn 02 0513 slide 3 & 4). Reviewed in PHY-Link call 6/5.	U	R
7	PLC Desc	DS_PLC_Srch_Freq_Step	Step frequency to use for PLC search. From 1 to 256 MHz in 1 MHz steps	RW	1	1	256	8	Discussed in PHY-Link ad hoc 5/1 and presented in Victoria, Implied in Motion #13 Victoria (see boyd 3bn 02 0513 slide 3 & 4). Reviewed in PHY-Link call 6/5.	U	R
7	PLC Desc	DS_PLC_Srch_Cnt	Number of grid steps in search range.	RW	1	1	5000	13	Discussed in PHY-Link ad hoc 5/1 and presented in Victoria, Implied in Motion #13 Victoria (see boyd 3bn 02 0513 slide 3 & 4). Reviewed in PHY-Link call 6/5.	U	R
7	PLC Desc	DS_PLC_Srch_Cntrl	Start and Stop a search.	RW	1	0	1	1	Discussed in PHY-Link ad hoc 5/1 and presented in Victoria, Implied in Motion #13 Victoria (see boyd 3bn 02 0513 slide 3 & 4). Reviewed in PHY-Link call 6/5.	U	R

Item	Category	Field_Name	Description	R/W	Step	Min	Max	Bits	Notes	CLT CNU	Status
7	PLC Desc	DS_PLC_Srch_Status	Indicates a completed search and successful or unsuccessful.	RO	1	0	3	2	Discussed in PHY-Link ad hoc 5/1 and presented in Victoria, Implied in Motion #13 Victoria (see boyd 3bn 02 0513 slide 3 & 4). Reviewed in PHY-Link call 6/5.	U	R
7	PLC Desc	US_PLC_Center_Frequency_#1	Location of the US PHY-Link center frequency.	RW	1	1	192	8	Discussed in PHY-Link ad hoc 3/27	B	R
7	PLC Desc	US_PLC_Start_#1	US PHY-Link starting sub-carrier from 0 to 4095 in steps of 1 Sub-carriers.	RW	1	0	4095	12	Alternative to center frequency	B	i
7	PLC Desc	US_PLC_Cycle_time	Number of Symbols? Fixed/Configurable? Fixed in Std?	RW	1	tbd	tbd	tbd	Discussed in PHY-Link ad hoc 3/27 This may be same as DS Frame length	B	R
8	**DS CH Desc**		**OFDM Parameters uniquely describing a single DS OFDM Channel on a multi OFDM Channel system**						functionally equivilent to OCD of MULPI?		h
8	DS CH Desc	DS_Center_Freq_Ch1	96 to 4904 MHz in 1 MHz steps. This eqates to channel bounds of 0 to 5000 Mhz. Permissable lower bound TDB.	RW	1	96	4904	13	1 MHz steps & upper bound of 5G agreed in Motion #17 Orlando. Reviewed in RF Spectrum call 6/18, some discussion on precise description (i.e., center frequency of what). Implied in motion #11 Geneva(13).	B	R
8	DS CH Desc	DS_Center_Freq_SC0_Ch1	This is a 32-bit number that specifies the center frequency in Hz of the subcarrier 0 of the OFDM transmission. Note that since subcarrier 0 is always excluded, it will actually be below the allowed downstream spectrum band. This is the frequency of subcarrier X(0) in the definition of the DFT . Range of 0 to 4294967295 MHz in 1 Hz steps. This eqates to channel bounds of -96 to 4294967391 khz. Permissable lower bound TDB.	RW	1	0	4E+09	32	MULPI 3.1 uses this definition for F0 (4 bytes in 1 Hz steps from 0 to 2^32-1 to specify SC0 F0 (pg 163 Table 6-61)).	B	i
8	DS CH Desc	Time Interleaver	Number of Symbols used in the time interleaving function. The lsb is ignored if using an 8K FFT.	RW	1	1	32	5	Is this part of the Channel or Profile?	B	i
8	~~DS CH Desc~~	~~DS_Lower_Exclusion_Band_Ch1~~	~~Lower Exclusion band upper limit expressed as the distance in Sub-Carriers from lower limit of the RF Channel; 20 (1 MHz) to 4095 in integer number of sub-carriers. If set to 0 then Lower Exclusion band is disabled.~~	~~RW~~	~~1~~	~~0~~	~~4095~~	~~12~~	~~Should this cover full 4k/8k range?~~	~~B~~	~~R~~
8	~~DS CH Desc~~	~~DS_Upper_Exclusion_Band_Ch1~~	~~Upper Exclusion band upper limit expressed as the distance, in Sub-Carriers, from upper limit of the RF Channel; 20 (1 MHz) to 4095 in integer number of sub-carriers. If set to 0 then Upper Exclusion band is disabled.~~	~~RW~~	~~1~~	~~0~~	~~4095~~	~~12~~	~~Should this cover full 4k/8k range?~~	~~B~~	~~R~~
8	~~DS CH Desc~~	~~DS_Internal_Exclusion_band_1_Start_Ch1~~	~~Internal Exclusion band lower limit, in sub-carriers; 0 to 8191 sub-carriers in steps of 1.~~	~~RW~~	~~1~~	~~0~~	~~8191~~	~~13~~	~~Aligned with and Implied by motion #15, 17, 19, & 20 Victoria. Still need to determine minimum step size. Reviewed in RF Spectrum call 6/18, note there would be some number of these fields, one for each internal exclusion band.~~	~~B~~	~~R~~

Item	Category	Field_Name	Description	R/W	Step	Min	Max	Bits	Notes	CLT CNU	Status
8	DS CH Desc	DS_Internal_Exclusion_band_1_Width_Ch1	Internal Exclusion band width, expressed in sub-carriers, from tbd (1 MHz) to tbd in steps of 1 sub-carriers. A value of 0 disables the exclusion band.	RW	1	tbd	tbd	tbd	Need to agree on max width	B	R
10	**US CH Desc**		**OFDM Parameters uniquely describing a single DS OFDM Channel on a multi OFDM Channel system**							B	h
10	US CH Desc	US_Center_Freq_Ch1	101 to 109 MHz in 1 MHz steps. This equates to channel bounds of 5 to 205 Mhz	RW	1	101	109	4	Implied in motion #11 Geneva(13).	B	R
10	US CH Desc	US_Lower_Exclusion_Band_Ch1	Lower Exclusion band upper limit expressed as the distance in Sub-Carriers from lower limit of the RF Channel; 20 (1 MHz) to 4095 in integer number of sub-carriers. If set to 0 then Lower Exclusion band is disabled.	RW	1	0	4095	12		B	R
10	US CH Desc	US_Upper_Exclusion_Band_Ch1	Upper Exclusion band upper limit expressed as the distance, in Sub-Carriers, from upper limit of the RF Channel; 20 (1 MHz) to 4095 in integer number of sub-carriers. If set to 0 then Upper Exclusion band is disabled.	RW	1	0	4095	12		B	R
10	US CH Desc	US_Internal_Exclusion_band_1_Start_Ch1	Internal Exclusion band lower limit, in sub-carriers; 0 to 8191 sub-carriers in steps of 1.	RW	1	0	8191	13		B	R
10	US CH Desc	US_Internal_Exclusion_band_1_Width_Ch1	Internal Exclusion band width, expressed in sub-carriers, from 20 (1 MHz) to tbd in steps of 1 sub-carriers. A value of 0 disables the exclusion band.	RW	1	20	tbd	tbd		B	R
10	US CH Desc	US_Internal_Exclusion_band_1_Start_Ch1	as per US_Internal_Exclusion_band_1_Start_Ch1 above for bands 2-5	RW	1		5	65		B	R
10	US CH Desc	US_Internal_Exclusion_band_1_Width_Ch1	as per US_Internal_Exclusion_band_1_Width_Ch1 above for bands 2-5	RW	1		5	60		B	R
10	US CH Desc	US_Resource_Block_spectrum	An enumerated list defining the number of sub-carriers in an US Resource Block. {0 = 1 SC, 1 = 2 SC, 2 = 4 SC, and 3 = 8 SC}	RW	1	0	3	2	Implied in motion #24 Victoria (see pietsch 3bn 01 0513 slide 3, 4), needs additional details/refinment. Reviewed in RF Spectrum call 6/18. Implied in motion #11 Geneva(13).	B	R
10	US CH Desc	US_Resource_Block_Pilot_Spacing	The Pilot spacing in an US Resource Block from tbd to tbd	RW	tbd	tbd	tbd	tbd	Implied in motion #24 Victoria (see pietsch 3bn 01 0513 slide 3, 4), needs additional details/refinment. Reviewed in RF Spectrum call 6/18.	B	R
11	**DS Profile Desc**		**Parameters needed to describe the DS profile**						Functionally equivilent to DPD of MULPI?	B	h

Item	Category	Field_Name	Description	R/W	Step	Min	Max	Bits	Notes	CLT CNU	Status
11	DS Profile D	DS ModType	Modulation to be used for a Subcarrier or Subcarrier pair. Enumerated list; 0=Null, 1=BPSK, 2=QPSK, 3=16-QAM, 4=64-QAM, 5=128-QAM, 6=256-QAM, 7=512-QAM, 8=1024-QAM, 9=2048-QAM, 10=4096-QAM, 11=8192-QAM, 12=16384-QAM, all other values reserved and interperated as 0 on receive)	RW	1	0	9	4	Aligned with Motion #14 Dallas (EPoC DS baseline starting point, laubach_3bn_04c_1113 pg 10 Section 1.2.4.5). MULPI uses something different (see pg 163 Table 6-61, pg 165 Table 6-62, & pg 166 Table 6-63). Propose one 4 bit value per Subcarrier (for 4k FFT, 1 for 2 for 8k FFT). Nulled subcarriers are not modulated, either because they are nulled SC or they are part of an Exclusion Band) Could we use 0xEh (15) to designated contineous pilots? Could we use 0xFh (14) to designate PHY-Link carriers?	B	i
11	DS Profile D	DS ModMap	Table of modulation type for each Subcarrier (4k FFT) or subcarrier pair (8k FFT).	RW	1	0	9	16380	Total of 16,384 bits or 1024 MDIO Registers. The lowest order nibble (bits 0-3 of base register) represents Modulation type for Subcarrier 0, the highest order nibble (bits 13-16 of register base + 1024) represents the modulation type for Subcarrier 4095.	B	i
12	**US Profile Desc**		**Parameters needed to describe a unique US profile**							B	h
12	US Profile D	MMP 1 Marker_Type	Marker Type, ternary or binary, used by the CNU to delineate this profile; enumerated list	RW	1	0	1	1	Used to indicate the burst marker type, ternary (0) or binary(1).	B	i
12	US Profile D	MMP 1 Marker_Length	Marker Length used by the CNU to delineate this profile.	RW	1	1	64	6	Used to indicate the burst marker length	B	i
12	US Profile D	Profile1: US_ModType	Modulation to be used for a Subcarrier or Subcarrier pair, Enumerated list; 0=Null, 1=BPSK, 2=QPSK, 3=16-QAM, 4=64-QAM, 5=256-QAM, 6=1024-QAM, 7=4096-QAM, 8=8192-QAM, 9=16384-QAM, all other values reserved and interperated as 0 on receive.	RW	1	0	9	4	see Motion #14 Dallas (EPoC DS baseline starting point, laubach_3bn_04c_1113 pg 11 Section 1.2.4.5) and MULPI 3.1 (additional values for 8-QAM, 32-QAM, 128-QAM, 512-QAM & 2048-QAM, does not include 8/16k-QAM) Propose one 4 bit value per Subcarrier (for 4l FFT, 1 for 2 for 8k FFT). Nulled subcarriers are not modulated, either because they are nulled SC or they are part of an Exclusion Band) Can we use 0xFh for US PHY-Link carriers?	B	i

Item	Category	Field_Name	Description	R/W	Step	Min	Max	Bits	Notes	CLT CNU	Status
12	US Profile D	Profile1: US_ModMap	Table of ModTypee for each Subcarrier (4k FFT) or subcarrier pair (8k FFT)	RW	1	0	9	16380	Total of 16,384 bits or 1024 MDIO Registers per Profile (4 profiles possible, only one profile in CNU). The lowest order nibble (bits 0-3 of base register) represents Modulation type for Subcarrier 0, the highest order nibble (bits 13-16 of register base + 1024) represents the modulation type for Subcarrier 4095.	B	i
13	**CLT Capability**		**Registers describing the CLT capabilities to the System**							T	h
13	CLT Capabili	Number of DS OFDM Channels Supported	Indicates the number of downstream OFDM channels supported by the CLT from 1 to tbd	RO	1	1	tbd	tbd	Need to agree on max channel number capability (allowing room for growth beyoun EPoC R1)	T	R
13	CLT Capabili	Number of US OFDM Channels supported	Indicates the number of upstream OFDM channels supported by the CLT from 1 to 4	RO	1	1	4	2	Need to agree on max channel number capability (allowing room for growth beyoun EPoC R1)	T	R
13	CLT Capabili	CLT_FEC_Capability	A bit mapped 8 bit register to indicate if the CLT PHY supports the individual FEC code rates. A bit set to a logical high indicaste support for a specific FEC code rate. Code rate (listed from bit 0 to 7) are; RA = 8/9, RB = 8/9, RC = 0.848, RD = 3/4, RE = 9/10, RF = 9/10, RG = 13/15, and RH = 3/4.	RW	1	0	255	8	FEC concept proposed/implied in motion #5 from Victoria (see prodan 3bn 01 0513.pdf slide 6). Capability register suggesed on PHY-Link ad hoc call on5 Jun 13	B	R
14	**CNU Capability**		**Registers describing the CNU capabilities to the System**							U	h
14	CNU Capabil	Number of DS OFDM Channels Supported	Indicates the number of downstream OFDM channels supported by the CNU from 1 to tbd	RO	1	1	tbd	tbd	Need to agree on max channel number capability (allowing room for growth beyoun EPoC R1)	U	R
14	CNU Capabil	Number of US OFDM Channels supported	Indicates the number of upstream OFDM channels supported by the CNU from 1 to 4	RO	1	1	4	2	Need to agree on max channel number capability (allowing room for growth beyoun EPoC R1)	U	R
14	CNU Capabil	CNU_FEC_Capability	A bit mapped 8 bit register to indicate if the CNU PHY supports the individual FEC code rates. A bit set to a logical high indicaste support for a specific FEC code rate. Code rate (listed from bit 0 to 7) are; RA = 8/9, RB = 8/9, RC = 0.848, RD = 3/4, RE = 9/10, RF = 9/10, RG = 13/15, and RH = 3/4.	RW	1	0	255	8	FEC concept proposed/implied in motion #5 from Victoria (see prodan 3bn 01 0513.pdf slide 6). Capability register suggesed on PHY-Link ad hoc call on5 Jun 13	B	R
4	Global	RF_On_Time_capability	The minimum time, in TQ, needed by the CNU to turn on its RF Transmitter.	RO	1	1	255	8	approved in Cl 102 baseline	B	M
4	Global	RF_Off_Time_capability	The minimum time, in TQ, needed by the CNU to turn off its RF Transmitter.	RO	1	1	255	8	approved in Cl 102 baseline	B	M
15	**CLT Reporting**		**Status Reporting registers for the CLT**							T	h
16	**CNU Reporting**		**Status Reporting registers for the CNU**							U	h
16	CNU Reporti	SNR by Sub-carrier	SNR of subcarrier, one entry in a table of 4k (8k?) such entries	RO	0.5	0	-50	7	view of the DS Channel by CNU MULPI pg 173 Table 6-66	U	?
16	CNU Reporti	Received Power by Sub-carrier	SNR of subcarrier within this group	RO	1			0	view of the DS Channel by CNU for discussion	U	?

Item	Category	Field_Name	Description	R/W	Step	Min	Max	Bits	Notes	CLT CNU	Status
16	CNU Reporti	Echo coeficients by Sub-carrier	SNR of subcarrier within this group	RO	1			0	view of the DS Channel by CNU for discussion	U	?
16	CNU Reporti	Burst Noise in CH 1	Number and duration of events in last time period	RO	1			0	view of the DS Channel by CNU for discussion	U	?
16	CNU Reporti	Transmit Power Level	Current Transmitter power level setting, in steps of 1/4 dB	RW	0.25			2	view of the DS Channel by CNU for discussion	U	?
16	CNU Reporti	MER by Sub-carrier	Integer modulation error ratio measurements in 0.25dB steps (0xFF is 63.75dB). One entry in a table of 4k (8k?) such entries	RW	0.25	0	63	8	view of the DS Channel by CNU MULPI pg 173 Table 6-66 RxMER per Subcarrier for Candidate NCP Profile	U	?
17	**CNU Tuning**		**Register which allow the PHY to tune the CNU to the US OFDM Channel**								h
17	CNU Tuning	Timing Offset, Integer Part	TX timing offset adjustment. Signed 32-bit, units of 1/204.8 MHz.	RO	1	###	2E+09	32	MULPI 3.1 pg 110 table 6-31		i
17	CNU Tuning	Timing Offset, Fractional Part	TX timing fine offset adjustment. 8-bit unsigned value specifying the fine timing adjustment in units of 1/(256*204.8 MHz).	RO	1	-127	127	8	MULPI 3.1 pg 110 table 6-31		i
17	CNU Tuning	Power Offset	TX Power offset adjustment (signed 8-bit, 1/4-dB units).	RO	0.25	-31	31	8	MULPI 3.1 pg 110 table 6-31		i
17	CNU Tuning	Frequency Offset	TX frequency offset adjustment (signed 16-bit, Hz units).	RO	1	###	32767	16	MULPI 3.1 pg 110 table 6-31		i
17	CNU Tuning	CH1: Commanded Power	Transmit Power Level for each of the channels in the CM's Transmit Channel Set, expressed in units of quarter dBmV.	RW	0.25	0	8192	16	MULPI 3.1 pg 114 table 6-33		i
17	CNU Tuning	US_Sub-Carrier_PreEqualization	Pre-equalization in dB from tbd to tbd from nomiinal in tbd dB steps	RO	tbd	tbd	tbd	tbd	See Motion # 27 Victoria. Pre-equalization agreed but no details provided. Reviewed in RF Spectrum call 6/18. May be pwr only or a complex number (pwr/phase, 24b for each [I,j] pair value). Additional details needed. In Geneva13 (Avi presentaiton on PLC content) it was suggested +-8 to 16 would be sufficient.	U	R
17	CNU Tuning	Probing start subcarrier	First used subcarrier in the next probing symbol to be used by the CNU	RW	1	0	7	3	Indicates the first used subcarrier in the next probing symbol to be used by the CNU		i
17	CNU Tuning	Probing subcarrier skipping	Subcarrier skipping pattern to be used by the CNU in the next probing symbol	RW	1	0	7	3	Indicates the number of subcarriers that the CNU should skip between used subcarriers in the next probing frame. When staggering is enabled also indicates the number of OFDM symbols in the staggering pattern is "Probing subcarrier skipping" + 1.		i
17	CNU Tuning	Probing staggering	Subcarrier staggering to be used by the CNU in the next probing symbol	RW	1	0	1	1	Indicates the CNU should stagger subcarriers in the next probing frame		i
19	**TDD Control**		**Registers unique to TDD**								h
20	**Pwr Mngmt**		**This section includes parameters that control power management.**								h
90	**CL45 Extensions**										h

Item	Category	Field_Name	Description	R/W	Step	Min	Max	Bits	Notes	CLT CNU	Status

Color_Key	Assumed Values (changes below reflected in tabel above)	
Proposed/new	PHY Address Space (bits)	48
Presented	DS PHY-Link Preamble Length	256
Agreed_Motion	US PHY-Link Preamble Length	tbd
Calculated_(locked	Number of DS RF Channels	tbd
Assumed_Value_(lock	Minimum US Center Frequency	101
	Maximum US Center Frequency	109
	Number of US RF Channels	4
	Number of Internal Exclusion Bands	6
	Sub-Carrier Group Size	8
	Number of Sub-Carrier Groups	###
	Symbol Size (us)	25
	Number of DS MMPs	4
	Number of US MMPs	4
	Number of supported CNUs	128
	Number of DS PHY-Link channels	10
	Number of US PHY-Link channels	4
	PHY Frame Period (sec)	0
	PHY-Init_Update_Rate	1
	204.8 MHz clock period	4.9

Status	
to be reviewed	i
Reviewed	R
Straw Polled	S
Motioned	M

Motioned Values	
DS RF Channel Spectrum (MHz)	192
Minimum DS Center Frequency	96
Maximum DS Center Frequency	4904
US RF Channel Spectrum (MHz)	192
FFT Size	8192
Number of Sub-Carriers	7680
Sub-Carriers Spacing (kHz)	50
Sub-Carriers Spacing (kHz)	25