

Comment #139 P163 L12

[MASTER COMMENT] Comments are for 15 User Defined bits in the preamble

ud_rxddata<14:0> user defined data field which consists of a 1 bit field ud_en which indicates if the user-defined data field is enabled for the current packet. This field is followed by a three bit sender_addr<2:0> field, then a 6 bit ud_data <5:0> field and finally by a 5 bit CRC-5 field.

Comment #141 SC 147.3.3.1 P163 L12

Add variable for `rx_ud_sup`

This variable indicates whether reception of user-defined data in the preamble is enabled. If set to ON, the PHY will look for `ud_en` bit in the user-defined data portion of the preamble of incoming packets. If this variable is set to OFF (default) or hard wired to off, the PHY will not look for `ud_en` bit in the user-defined data portion of the preamble of incoming packets.

#142 SC147.3.3.2 P158 L23

[UD] Add variable for ud_txdata

15 bits user-defined data to be sent over the packet preamble in the user-defined data field. This variable is set by MDIO or other equivalent functionality. If user-defined data is not supported or not enabled, the content of this variable is undefined.

[UD] add text for user-defined data in PCS Transmit Overview

If optional user-defined data channel is supported ($tx_ud_en = ON$), the 15 bit user defined data (ud_txdata) replaces part of the packet preamble starting at the 34th bit (included) from TX_EN asserted, overriding the TXD content as shown in figure 147-4. [see comment 140] The first bit of these positions is reserved to signal to the receiving PHY if the user-defined data field is active. If the user-defined data field is active, $tx_ud_en=ON$ and bit 0 is set to 1. The next three bits contain the $sender_addr<2:0>$. It is recommended in multidrop applications that the $sender_addr$ field be set to the 3 LSB of the node ID field. The next 6 positions contain user-defined data. The final 5 positions carry the 5-bit CRC.

The CRC-5 polynomial is x^5+x^3+x+1 . The CRC-5 shall produce the same result as the implementation shown in Figure 147-x. The 5 delay elements $S0, \dots, S4$, shall be initialized to zero.

Afterwards the 10 data bits are used to compute the CRC-5 with the switch connected (setting $CRCgen$). After all the 10 bits have been processed, the switch is disconnected (setting $CRCout$) and the 5 values stored in the delay elements are transmitted in the order illustrated, first $S4$, followed by $S3$, and so on, until the final value $S0$.

[ud] add figure for CRC-5 for user-defined data bits. Increment all subsequent figures in Clause 147

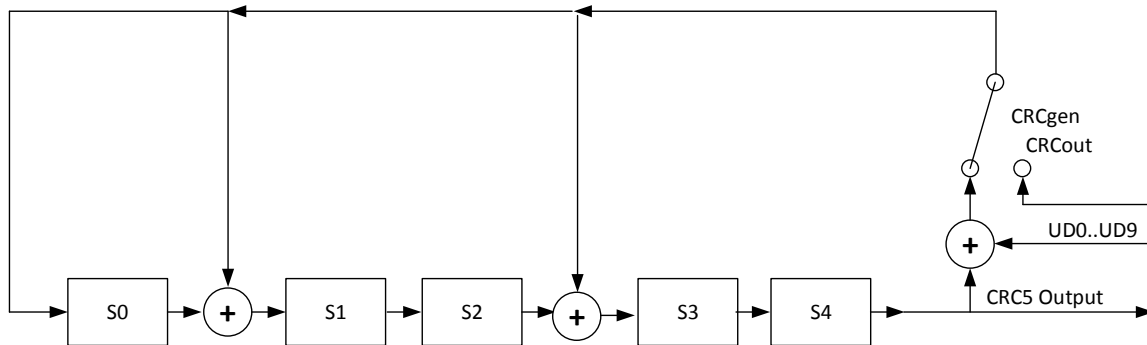


Figure 147-x CRC-5

#140 SC147.3.2.3 P160 L3

Replace figure 147-4 with figure below

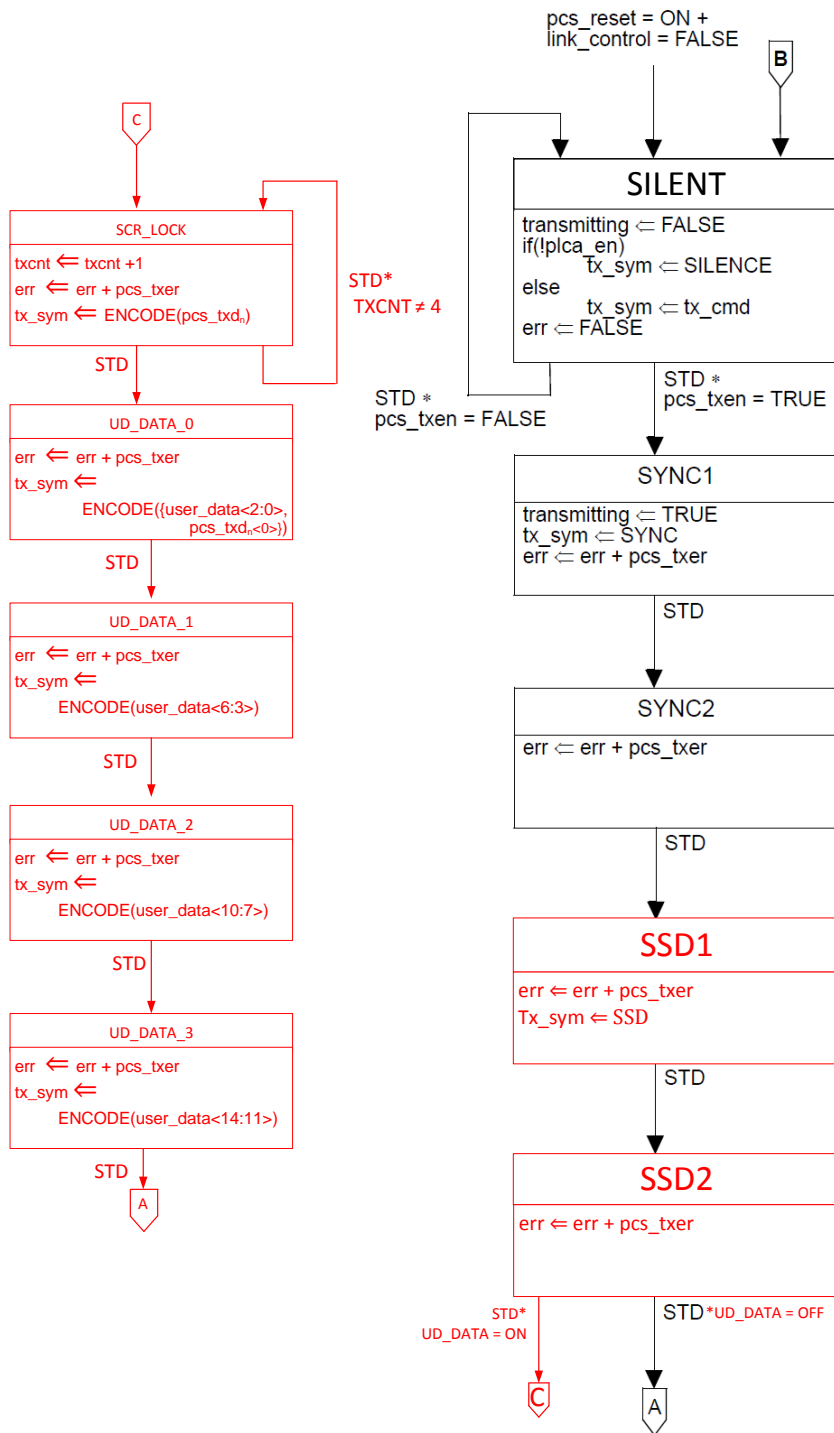


figure 147-4 revised

[UD] Replace Figure 147-8 with figure below

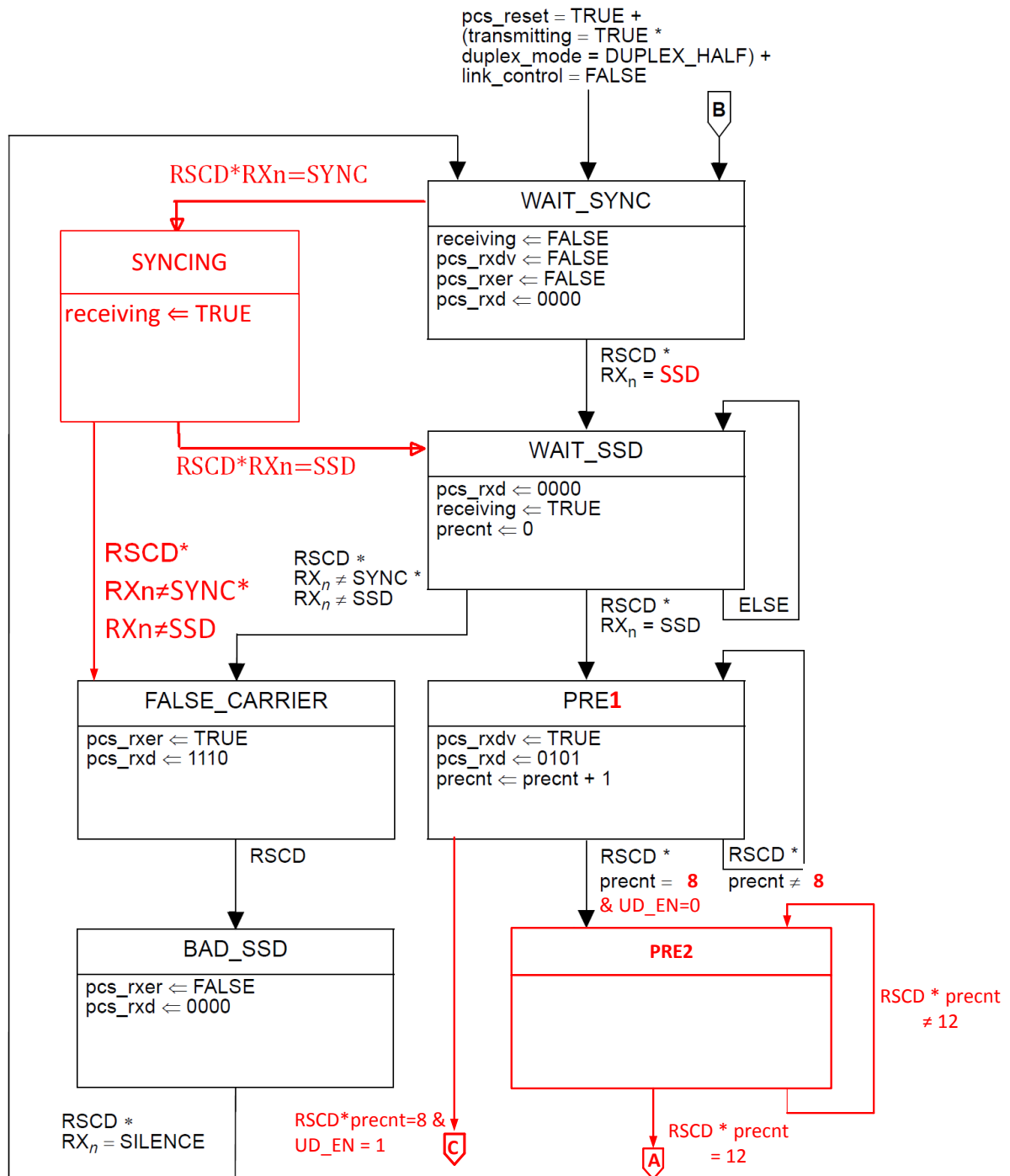


Figure 147-8

Comment #145 P165 L2

Comment Type TR

Suggested remedy:

Redraw Figure 147-9 with the following picture:

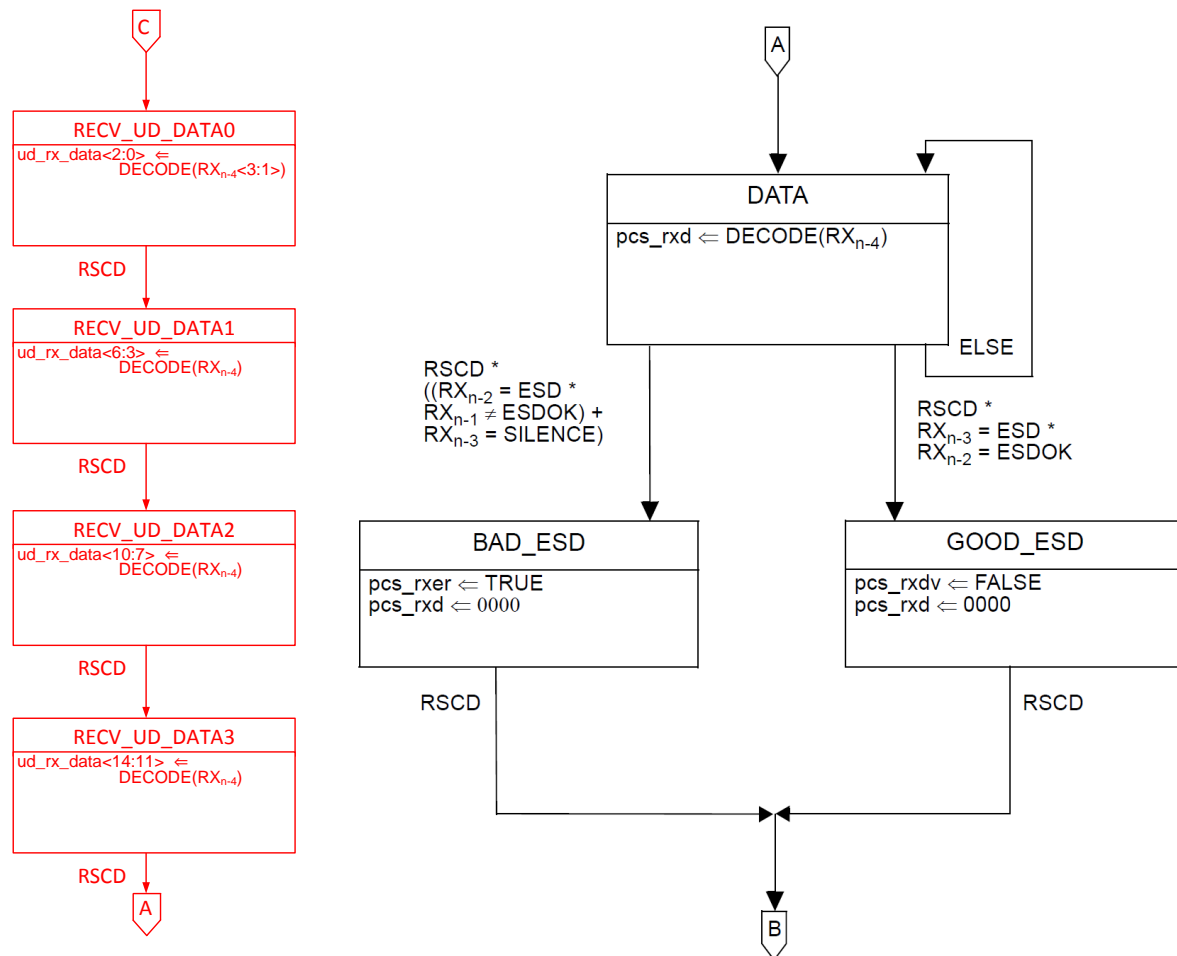


Figure 147-9

#146 SC 147.3.3 P162 L27

[ud] delete sentence and add 3 paragraphs which explain user-defined data in receive

delete sentence starting "Following the SSD marker there are four states before the DATA state to accomplish this task"

add

After the last SSD is received, the PCS Receive function discards the next eight symbols which shall instead be used to achieve lock of the self-synchronizing scrambler. Afterwards, the PCS Receive function decodes one more symbol containing the last bit needed for scrambler locking and the first three least significant bits of the optional user-defined field. If user-defined data is supported, the least significant user-defined bit `ud_en` will be 1. The remaining bits of the optional user-defined fields are then decoded from the next three 5B symbols. If user-defined data is not supported or the lsb of the incoming user-defined data portion of the preamble `ud_en=0`, the PCS receive function ignores the user-defined data bits. **After the first 10 bits of the user-defined data field are received, the CRC-5 is calculated in the same manner as described in 147.3.2.1 and compared with the last 5 bits received bits of the user-defined field. If the CRC-5 matches, `ud_data<5:0>` and `sender_addr<2:0>` are written in the appropriate register fields between 3.2300..3.3203 depending on the sender address field. The CRC Error bit for the appropriate sender address field is set to zero to indicate the message was received correctly, and the new message received from sender address bit is set to one. If there was an unread message in the user-defined register field, the `ud_data<5:0>` for `sender_addr<2:0>` will be overwritten. If the calculated CRC-5 does not match, the `ud_data<5:0>` for `sender_addr<2:0>` is not overwritten, and the CRC Error bit for the appropriate sender address is set to one and New Message Received from Sender Address is set to zero.**

During the time the PCS Receive function is decoding data for the scrambler locking and whether or not user-defined data field is supported, the special value 5 is conveyed to the MII via the `pcs_rxd` variable, thus rebuilding the original preamble transmitted by the MAC. Eventually the PCS Receive function switches to the DATA state where 5B symbols are being decoded and conveyed to the MAC via MII interface as appropriate.

Comment#ud_new_1 **sc45.2.1.147.e** & **Table 45-142e** 10BASE-T1S PMA status register bit definitions

page **42** lines 11, 14, 36 and 41 **TR**

Delete 45.2.1.174e.1 10BASE-T1S OAM ability (1.2300.13) on line 36.

When read as a one, this bit indicates that the 10BASE-T1S PHY supports 10BASE-T1S user-defined data (see 147.3.2.1 and 147.3.3). When read as a zero, this bit indicates that the 10BASE-T1S PHY does not support 10BASE-T1S user-defined data.

Replace 45.2.1.174f with the following table and text

Table 45-142f- 10BASE-T1S User-Defined Data Transmit Register

Bits	Name	Description	R/W ^a
1.2301.15:14	Reserved	Value Always 0	RO
1.2301.13:11	User-Defined Data Sender Address	3-bit Sender Address field to send to link partner.	R/W
1.2301.10:5	User-Defined Data Field	6-bit user-defined data field to sent to the link partner	R/W
1.2301.4:2	Reserved	Value Always 0	RO
1.2301.1	10BASE-T1S User-Defined Data Transmit Enable	1 = Transmit 10BASE-T1S user-defined data in 1.2301.13:5 to link partner. 0= Do not transmit 10BASE-T1S user-defined data to link partner.	R/W
1.2301.0	Reserved	Value Always 0	RO

45.2.1.174f.1 User Defined Sender address (1.2301.13:11) Bits 1.2301.13:11 are a user defined 3-bit field which is transmitted in the user defined data portion of the preamble. For 10BASE-T1S PHYs, which support user-defined data, there are eight sets of user-defined registers at the receiver. This field is intended to indicate to the link partner PHY the sender of the user-defined data so the user defined data may be placed in the appropriate register at the receiver. In a 10BASE-T1S PHY which supports Clause 148, the 3 lsb of the node ID field from 45.2.3.58c.2 may be set in the User Defined Sender address bits. These bits may be used for other purposes which are outside the scope of this standard.

45.2.1.174f.2 User Defined Data field (1.2301.10:5) Bits 1.2301.10:5 are a user defined 6-bit field that is transmitted to the link partner if user-defined data is supported and enabled. The message data is user defined and its definition is outside the scope of this standard.

45.2.1.174f.3 10BASE-T1S User-Defined Transmit Enable (1.2301.1)

When set as a one, this bit sets the Transmit PCS variable tx_ud_en to ON. This bit is transmitted as the lsb of the user-defined data field and user-defined data sender address in 1.2301.13:11 and user-defined data in 1.2301.10:5 are transmitted in the preamble in the user-defined data field. This bit shall be set to zero if the 10BASE-T1S PHY does not support 10BASE-T1S user-defined data, and the user-defined data field will not overwrite the preamble.

Comment#ud_new_3 45.2.3.58i Link partner 10BASE-T1S OAM message register (Registers 3.2300 to 3.2303) &
Table 45–220h—Link partner 10BASE-T1S OAM message register bit definitions

page 55 Line 2 and line 44

Replace Table 45-220h with the following:

Bits	Name	Description	R/W ^a
3.2300. 15	CRC Error from User-Defined Sender Address 0	1= CRC Error received from user-defined data sender_addr 0 since last read 0= No CRC error received from user-defined data sender_addr 0 since last read	RO
3.2300. 14	New Message Received from Sender Address 0	1= New message received from this sender since last read 0= No new message received from this sender since last read	RO
3.2300. 13:8	Link Partner Address 0 User-Defined Data Message	6-bit User defined message where link partner set sender_addr<2:0> field to 0.	RO
3.2300. 7	CRC Error from User-Defined Sender Address 1	1= CRC Error received from user-defined data sender_addr 1 since last read 0= No CRC error received from user-defined data sender_addr 1 since last read	RO
3.2300. 6	New Message Received from Sender Address 1	1= New message received from this sender since last read 0= No new message received from this sender since last read	RO
3.2300. 5:0	Link Partner Address 1 User-Defined Data Message	6-bit User defined message where link partner set sender_addr<2:0> field to 1.	RO
3.2301. 15	CRC Error from User-Defined Sender Address 2	1= CRC Error received from user-defined data sender_addr 2 since last read 0= No CRC error received from user-defined data sender_addr 2 since last read	RO
3.2301. 14	New Message Received from Sender Address 2	1= New message received from this sender since last read 0= No new message received from this sender since last read	RO
3.2301. 13:8	Link Partner Address 2 User-Defined Data Message	6-bit User defined message where link partner set sender_addr<2:0> field to 2.	RO
3.2301. 7	CRC Error from User-Defined Sender Address 3	1= CRC Error received from user-defined data sender_addr 3 since last read 0= No CRC error received from user-defined data sender_addr 3 since last read	RO
3.2301. 6	New Message Received from Sender Address 3	1= New message received from this sender since last read 0= No new message received from this sender since last read	RO
3.2301.	Link Partner Address 3 User-	6-bit User defined message where link partner	RO

5:0	Defined Data Message	set sender_addr<2:0> field to 3.	
3.2302.15	CRC Error from User-Defined Sender Address 4	1= CRC Error received from user-defined data sender_addr 4 since last read 0= No CRC error received from user-defined data sender_addr 4 since last read	RO
3.2302.14	New Message Received from Sender Address 4	1= New message received from this sender since last read 0= No new message received from this sender since last read	RO
3.2302.13:8	Link Partner Address 4 User-Defined Data Message	6-bit User defined message where link partner set sender_addr<2:0> field to 4.	RO
3.2302.7	CRC Error from User-Defined Sender Address 5	1= CRC Error received from user-defined data sender_addr 5 since last read 0= No CRC error received from user-defined data sender_addr 5 since last read	RO
3.2302.6	New Message Received from Sender Address 5	1= New message received from this sender since last read 0= No new message received from this sender since last read	RO
3.2302.5:0	Link Partner Address 5 User-Defined Data Message	6-bit User defined message where link partner set sender_addr<2:0> field to 5.	RO
3.2303.15	CRC Error from User-Defined Sender Address 6	1= CRC Error received from user-defined data sender_addr 6 since last read 0= No CRC error received from user-defined data sender_addr 6 since last read	RO
3.2303.14	New Message Received from Sender Address 6	1= New message received from this sender since last read 0= No new message received from this sender since last read	RO
3.2303.13:8	Link Partner Address 6 User-Defined Data Message	6-bit User defined message where link partner set sender_addr<2:0> field to 6.	RO
3.2303.7	CRC Error from User-Defined Sender Address 7	1= CRC Error received from user-defined data sender_addr 7 since last read 0= No CRC error received from user-defined data sender_addr 7 since last read	RO
3.2303.6	New Message Received from Sender Address 7	1= New message received from this sender since last read 0= No new message received from this sender since last read	RO
3.2303.5:0	Link Partner Address 7 User-Defined Data Message	6-bit User defined message where link partner set sender_addr<2:0> field to 7.	RO
Registers 3200..3203			

Replace text starting on line 44 with the following:

45.2.3.58i Link partner 10BASE-T1S user-defined data message registers (Registers 3.2300 to 3.2303)

The link partners 10BASE-T1S user-defined message registers contain the 6 bit user-defined messages from the sender address 0 to 7. When register 3.3200 is read, bits 3.3200.15:14 and 7:6 shall be cleared. When register 3.3201 is read, bits 3.3201.15:14 and 7:6 shall be cleared. When register 3.3202 is read, bits 3.3202.15:14 and 7:6 shall be cleared. When register 3.3203 is read, bits 3.3203.15:14 and 7:6 shall be cleared.

The assignment of the bits in the Link partner 10BASE-T1S user-defined message register is shown in Table 45-220h.