

## UTMC APPLICATION NOTE

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### BCRT/M RT-mode Transmission Error Message Recovery

The following paragraphs discuss re-synchronization of the RT after a message error occurs. Re-synchronization of the remote terminal is required when the bus controller observes a message error, and the remote terminal has invoked transmit message buffering (i.e., Control Word Index field not equal to zero). For this scenario, the remote terminal is instructed to transmit "N" data words. The remote terminal responds by transmitting a status word followed by "N" data words. The subaddress data pointer, message status pointer, and control word are updated after the last data word DMA is performed. Since the transaction results in a message error, the bus controller can attempt to re-try the same transmit command. However, the remote terminal descriptor was updated and no longer points to the data from the failed command. To re-transmit the failed data packet, set the remote terminal descriptor to transmit the failed message.

To re-synchronize the remote terminal, the host processor must modify, on command, the transmit subaddress descriptor. Utilize the Synchronize with Data mode code to

instruct the remote terminal host to begin modification of the transmit subaddress descriptor for re-try. The data word associated with the mode code designates which subaddress to modify along with the word count of the failed message. Use the failed word count to calculate the re-try data list pointer. As part of the descriptor re-synchronization, the message status list pointer is decremented by one to update the failed message status word. The host increments the Control Word Index field by one to maintain the proper buffered size.

To begin the re-synchronization process, the bus controller transmits a Synchronize with Data mode code. Upon reception of this command word the remote terminal generates an interrupt signaling, to the host, receipt of the re-synchronize command. The host reads the data word associated with the mode code and determines which subaddress descriptor to service. The host proceeds to reset the data list pointer, message status list pointer, and control word. Figure 1a and 1b shows a transmit message sequence and recovery after a message error.

MESS(0) = 100 (hex) ; message status list pointer initial condition  
 MESS(2) = 102 (hex) ; message status list pointer after two transmit commands  
 DATA(0) = 200 (hex) ; data list pointer initial condition  
 DATA(7) = 207 (hex) ; data list pointer after two transmit commands

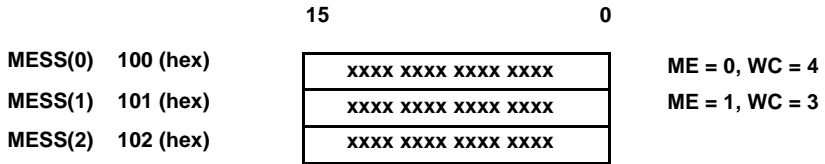


Figure 1a. Transmit Message Sequence

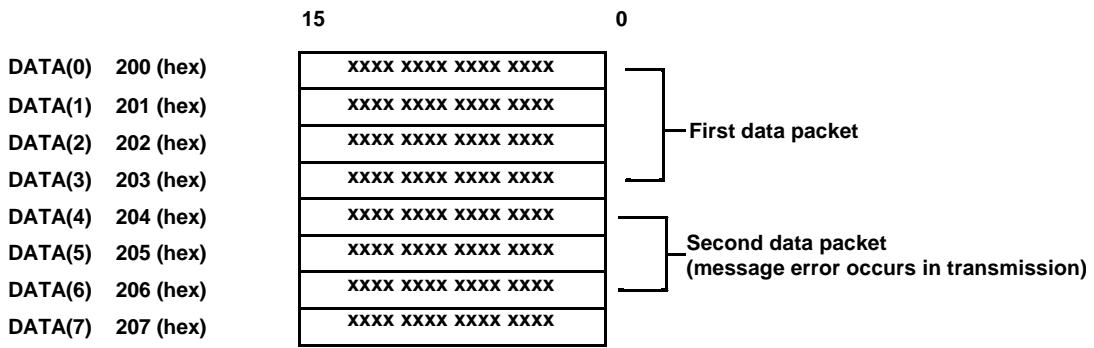


Figure 1b. Recovery Sequence

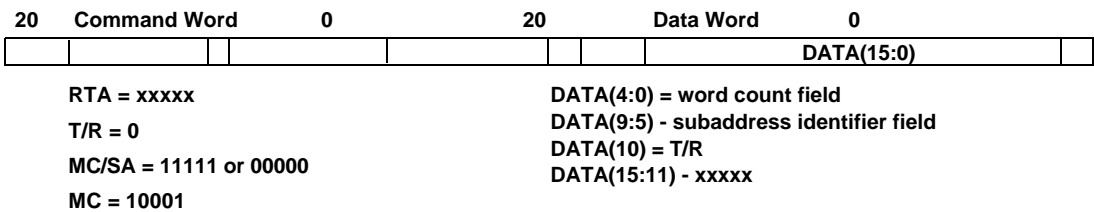


Figure 2. Synchronize with Data Example

To begin the re-synchronization process, the bus controller instructs the host to reset the data list pointer (DATA(n)), message status list pointer (MESS(n)), and control word. The host resets the data list pointer by subtracting the failed transmission word count from the present data list pointer value. Word count information along with a subaddress identifier is contained in the data word associated with the Synchronize with Data mode code. Organization of information contained in the data word is left up to the

system designer. The host completes the remote terminal reset by decrementing the message status list by one and incrementing the control word index field by one. For the above example the data list pointer is decremented to 204 (hex), message status list pointer to 101 (hex), and the Control Word Index is incremented by one.

Figure 2 is an example of information organized in the Synchronize with Data mode code data.