YModem Batch Analysis - Xiphod, Jan. 2026

The follow is an annotated log of a YModem Batch transfer between ZOC9 on Windows 11 and TELIX on an MS-DOS ‘486 based system.

The test files were used, all selected and queued to be sent from ZOC9 to TELIX at 9600 baud.

```
TEST0.DAT 0 byte
TEST1.DAT 33 bytes
TEST2.DAT 132 bytes (slightly above 128-byte block threshold)
TEST3.DAT 528 bytes (slightly beyond 512-byte threshold)
TEST4.DAT 2112 bytes (slightly beyond 2048-byte threshold)
TEST5.DAT 8448 bytes
```

BEGIN

```
All logged entries are in hex.  e.g.  #43 == 67 decimal == ASCII 'C'


RS-232 SERIAL PORT BYTE STREAM               DESCRIPTION / EXPLANATION
======================================================================================
<20260124151805.949 RX>
#43 --> 'C'                                  Attention to START/CONTINUE
                                             Optional, I typically see this as "CCC".
                                             It is sort of like +++, which switches a
                                             Hayes modem into command-mode.  This rapid
                                             "CCC" should get interpreted as switching
                                             over into "file transfer mode" (with YModem).
                                             The sender can open file-select dialog, or
                                             start to send a pre-selected set of files.

At this point, the receiver waits and monitors for a #01 or #02.
But should be prepared to receive an entire header packet of at least 128+3 bytes.

<20260124151809.340 TX>
#01#00#FF                                    Header block, #01 == 128 byte block
                                             NOTE: If the filename or its path are long
                                             (over 128 bytes), this could start with #02
                                             to indicate a 1024-byte block instead.
---START CRC CONTENT[
#54#45#53#54#30#2E#44#41#54#00               "TEST0.DAT" <NUL>
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00
#00#00#00#00#00#00]---END CRC CONTENT (128 bytes)
#00#47                                       (16-bit CRC)
<20260124151809.486 RX>
                                             Before responding, the receiver verifies that
                                             it can create the requested file.  This
                                             includes path and filename.  If file already
                                             exist, it might auto choose an alternate name,
                                             or ask to overwrite.  It could respond
                                             NAK or CAN (cancel), or ACK if all ok.
                                             The receiver does not yet know how many files,
                                             or what sizes.
#06#43                        <ACK> 'C' (agree with the CRC, continue)
<20260124151809.608 TX>
#04                                          <EOT> Nothing left for this stream, all bytes sent.
<20260124151809.616 RX>
#06#43                        <ACK> 'C' (acknowledge, continue for next file)
                                             Acknowledges that the file has been written
                                             (or for 0 bytes, maybe discarded).  Asks to
                                             continue for any subsequent files.

<20260124151810.970 TX>
#01#00#FF                                    Header block (#01 == 128 byte block)
---START CRC CONTENT[
#54#45#53#54#31#2E#44#41#54#00               "TEST1.DAT" <NUL>
#33#33#20                                    "33" <SPACE> (bytes)
#31#35#31#32#33#36#31#37#31#33#36#20         "15123617136" <SPACE> (time modified, in octal)
#30#20                                       "0" <SPACE> (mode)
#30#20                                       "0" <SPACE> (serial_number)
#35#20                                       "0" <SPACE> (other)
#31#31#32#35#33                              "11253"  (??? by ZOC)
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00   \
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00    \
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00     > pad fill the block
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00    /
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00   /
#00#00#00#00#00#00#00#00#00#00#00#01]---END CRC CONTENT (128 bytes)
                                             (#01 at end = number of 128-byte data blocks)
#2F#B0                                       (16-bit CRC, up to filename)
<20260124151811.114 RX>
#06#43                        <ACK> 'C' (agree with the CRC, continue)
<20260124151811.239 TX>
#01#01#FE                                    Data block (#01 == 128 byte block)
---START CRC CONTENT[
#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31   [16 bytes]
#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01   [16 bytes]
#19#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00   [1 byte, total of 33 expected]
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00   \
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00    \
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00     > pad fill the block
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00    /
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00   /
]---END CRC CONTENT (128 bytes)
#03#DC                                       (16-bit CRC)
<20260124151811.376 RX>
#06                           <ACK> (agree with the CRC, no retransmit - continue implied)
<20260124151811.376 TX>
#04                                          <EOT> Nothing left for this stream, all bytes sent.
<20260124151811.392 RX>
#06#43                        <ACK> 'C' (agree with the CRC, continue)



<20260124151812.944 TX>
#01#00#FF                                    Header block (#01 == 128 byte block)
```

```
---START CRC CONTENT[
#54#45#53#54#32#2E#44#41#54#00               "TEST2.DAT" <NUL>
#31#33#32#20                                 "132" <SPACE> (bytes)
#31#35#31#32#33#36#31#37#34#34#30#20         "15123617440" <SPACE> (time modified, in octal)
#30#20                                       "0" <SPACE> (mode)
#30#20                                       "0" <SPACE> (serial_number)
#34#20                                       "0" <SPACE> (other)
#31#31#32#32#30                              "1122" (??? by ZOC)
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00
#00#00#00#00#00#00#00#00#00#00#02]---END CRC CONTENT (128 bytes)
                                             (#02 at end = number of 128-byte data blocks)
#67#1D                                       (16-bit CRC)
<20260124151813.089 RX>
#06#43                        <ACK> 'C' (agree with the CRC, continue)
<20260124151813.212 TX>
#01#01#FE                                    Data block 1 (#01 == 128 byte block)
---START CRC CONTENT[
#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31 [16 bytes]
#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01 [16 bytes]
#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19 [16 bytes]
#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01 [16 bytes]
#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18 [16 bytes]
#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01 [16 bytes]
#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17 [16 bytes]
#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01 [16 bytes, 128 bytes so far for file]
]---END CRC CONTENT (128 bytes)
#07#C1                                       (16-bit CRC)
<20260124151813.356 RX>
#06                           <ACK> (agree with the CRC, no retransmit - continue implied)
<20260124151813.360 TX>
#01#02#FD                                    Data block 2 (#01 == 128 byte block)
---START CRC CONTENT[
#01#01#01#19#00#00#00#00#00#00#00#00#00#00#00#00 [4 bytes used, reached 132 byte total expected]
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00 \
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00  \
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00   \
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00    > pad fill the block
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00   /
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00  /
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00 /
]---END CRC CONTENT (128 bytes)
#46#9E                                       (16-bit CRC)
<20260124151813.496 RX>
#06                           <ACK> (agree with the CRC, no retransmit - continue implied)
<20260124151813.496 TX>
#04                                          <EOT> Nothing left for this stream, all bytes sent.
<20260124151813.514 RX>
#06#43                        <ACK> 'C' (agree with the CRC, continue)


<20260124151815.096 TX>
#01#00#FF                                    Header block (#01 == 128 byte block)
---START CRC CONTENT[
#54#45#53#54#33#2E#44#41#54#00               "TEST3.DAT" <NUL>
#35#32#38#20                                 "528" <SPACE> (bytes)
#31#35#31#32#33#36#31#37#35#32#32#20         "15123617522" <SPACE> (time modified, in octal)
#30#20                                       "0" <SPACE> (mode)
#30#20                                       "0" <SPACE> (serial_number)
#33#20                                       "3" <SPACE> (other)
#31#31#30#38#38                              "11088" (??? by ZOC)
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00  \
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00   \
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00    > pad fill the block
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00   /
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00  /
#00#00#00#00#00#00#00#00#00#00#00#00#05]---END CRC CONTENT (128 bytes)
                                             (#05 at end = number of 128-byte data blocks)
#D2#44                                       (16-bit CRC)
<20260124151815.241 RX>
#06#43                        <ACK> 'C' (agree with the CRC, continue)
<20260124151815.361 TX>
#01#01#FE                                    Data block 1 (#01 == 128 byte block)
---START CRC CONTENT[
#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31 [16 bytes]
#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01 [16 bytes]
#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19 [16 bytes]
#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01 [16 bytes]
#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18 [16 bytes]
#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01 [16 bytes]
#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17 [16 bytes]
#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01 [16 bytes, 128 bytes so far for file]
]---END CRC CONTENT (128 bytes)
#07#C1                                       (16-bit CRC)
<20260124151815.503 RX>
#06                           <ACK> (agree with the CRC, no retransmit - continue implied)
<20260124151815.503 TX>
#01#02#FD                                    Data block 2 (#01 == 128 byte block)
---START CRC CONTENT[
#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16 [16 bytes]
#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01 [16 bytes]
#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12 [16 bytes]
#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01 [16 bytes]
#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11 [16 bytes]
#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20 [16 bytes]
#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F [16 bytes]
#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30 [16 bytes, 256 bytes so far for file]
]---END CRC CONTENT (128 bytes)
#7D#0C                                       (16-bit CRC)
<20260124151815.652 RX>
#06                           <ACK> (agree with the CRC, no retransmit - continue implied)
<20260124151815.652 TX>
#01#03#FC                                    Data block 3 (#01 == 128 byte block)
---START CRC CONTENT[
#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E [16 bytes]
#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39 [16 bytes]
#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C [16 bytes]
#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38 [16 bytes]
#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B [16 bytes]
#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37 [16 bytes]
#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07 [16 bytes]
#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36 [16 bytes, 384 bytes so far for file]
]---END CRC CONTENT (128 bytes)
#33#77                                       (16-bit CRC)
<20260124151815.791 RX>
#06                           <ACK> (agree with the CRC, no retransmit - continue implied)
<20260124151815.791 TX>
#01#04#FB                                    Data block 4 (#01 == 128 byte block)
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```
---START CRC CONTENT[
#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05 [16 bytes]
#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35 [16 bytes]
#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04 [16 bytes]
#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34 [16 bytes]
#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02 [16 bytes]
#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33 [16 bytes]
#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01 [16 bytes]
#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32 [16 bytes, 512 bytes so far for file]
]---END CRC CONTENT (128 bytes)
#65#AE                                       (16-bit CRC)
<20260124151815.948 RX>
#06                           <ACK> (agree with the CRC, no retransmit - continue implied)
<20260124151815.948 TX>
#01#05#FA                                    Data block 5 (#01 == 128 byte block)
---START CRC CONTENT[
#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19 [16 bytes, 528 bytes of total file size reached]
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00 \
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00  \
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00   \
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00    > pad fill the block
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00   /
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00  /
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00 /
]---END CRC CONTENT (128 bytes)
#6C#D3                                       (16-bit CRC)
<20260124151816.091 RX>
#06                           <ACK> (agree with the CRC, no retransmit - continue implied)
<20260124151816.091 TX>
#04                                          <EOT> Nothing left for this stream, all bytes sent.
<20260124151816.091 RX>
#06#43                        <ACK> 'C' (agree with the CRC, continue)



<20260124151817.607 TX>
#01#00#FF                                    Header block (#01 == 128 byte block)
---START CRC CONTENT[
#54#45#53#54#34#2E#44#41#54#00               "TEST4.DAT" <NUL>
#32#31#31#32#20                              "2112" <SPACE> (bytes)
#31#35#31#32#33#36#31#37#35#37#34#20         "15123617574" <SPACE> (time modified, octal)
#30#20                                       "0" <SPACE> (mode)
#30#20                                       "0" <SPACE>(serial_number)
#32#20                                       "2" <SPACE> (other)
#31#30#35#36#30                              "1056" (??? by ZOC)
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00  \
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00   \
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00    > pad fill the block
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00   /
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00  /
#00#00#00#00#00#00#00#00#00#11                   /
]---END CRC CONTENT (128 bytes)
                                             (#11 at end = number of 128-byte data blocks)
#FC#43                                       (16-bit CRC)
<20260124151817.755 RX>
#06#43                        <ACK> 'C' (agree with the CRC, continue)
<20260124151818.405 TX>
#02#01#FE                                    Data block 1 (#02 == 1024 byte block)
---START CRC CONTENT[
#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01 [32 bytes]
#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01 [32 bytes]
#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01 [32 bytes]
```

```
#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01 [32 bytes]
#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01 [32 bytes]
#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01 [32 bytes]
#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20 [32 bytes]
#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30 [32 bytes]
#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39 [32 bytes]
#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38 [32 bytes]
#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37 [32 bytes]
#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36 [32 bytes]
#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35 [32 bytes]
#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34 [32 bytes]
#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33 [32 bytes]
#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32 [32 bytes]
#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31 [32 bytes]
#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19 [32 bytes]
#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18 [32 bytes]
#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17 [32 bytes]
#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16 [32 bytes]
#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12 [32 bytes]
#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11 [32 bytes]
#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F [32 bytes]
#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E [32 bytes]
#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C [32 bytes]
#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B [32 bytes]
#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07 [32 bytes]
#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05 [32 bytes]
#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04 [32 bytes]
#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02 [32 bytes]
#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01 [32 bytes, 1024 bytes total]
]---END CRC CONTENT (1024 bytes)
#97#EC                                            (16-bit CRC)
<20260124151818.947 RX>
#06                           <ACK> (agree with the CRC, no retransmit - continue implied)
<20260124151819.495 TX>
#02#02#FD                                         Data block 2 (#02 == 1024 byte block)
---START CRC CONTENT[
#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19 [32 bytes]
#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01 [32 bytes]
#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01 [32 bytes]
#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01 [32 bytes]
#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01 [32 bytes]
#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01 [32 bytes]
#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01 [32 bytes]
#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20 [32 bytes]
#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30 [32 bytes]
#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39 [32 bytes]
#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38 [32 bytes]
#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37 [32 bytes]
#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36 [32 bytes]
#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35 [32 bytes]
#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34 [32 bytes]
#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33 [32 bytes]
#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32 [32 bytes]
#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31 [32 bytes]
#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19 [32 bytes]
#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18 [32 bytes]
#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17 [32 bytes]
#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16 [32 bytes]
#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12 [32 bytes]
#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11 [32 bytes]
#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F [32 bytes]
#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E [32 bytes]
#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C [32 bytes]
#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B [32 bytes]
#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07 [32 bytes]
#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05 [32 bytes]
#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04 [32 bytes]
#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02 [32 bytes, 2048 bytes total]
]---END CRC CONTENT (128 bytes)
#7E#90                                            (16-bit CRC)
<20260124151820.042 RX>
#06                           <ACK> (agree with the CRC, no retransmit - continue implied)
<20260124151820.044 TX>
#01#03#FC                                         Data block 3 (#01 == 128 byte block)
---START CRC CONTENT[
#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33 [16 bytes]
#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01 [16 bytes]
```

```
#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32 [16 bytes]
#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19 [16 bytes, 2112 bytes total file size]
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00 \
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00  \ pad fill the block
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00  /
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00 /
]---END CRC CONTENT (128 bytes)
#59#9A                                       (16-bit CRC)
<20260124151820.184 RX>
#06                           <ACK> (agree with the CRC, no retransmit - continue implied)
<20260124151820.184 TX>
#04                                          <EOT> Nothing left for this stream, all bytes sent.
<20260124151820.192 RX>
#06#43                        <ACK> 'C' (agree with the CRC, continue)



<20260124151821.789 TX>
#01#00#FF                                    (header block, #01 == 128 byte block)
---START CRC CONTENT[
#54#45#53#54#35#2E#44#41#54#00               "TEST5.DAT" <NUL>
#38#34#34#38#20                              "8448" <SPACE> (bytes)
#31#35#31#32#33#36#31#37#36#31#34#20         "15123617614” <SPACE> (time modified, in octal)
#30#20                                       "0" <SPACE> (mode)
#30#20                                       "0" <SPACE> (serial_number)
#31#20                                       "1" <SPACE> (other)
#38#34#34#38                                 "8448" (??? by ZOC)
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00  \
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00   \
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00    > pad fill the block
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00   /
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00  /
#00#00#00#00#00#00#00#00#00#00#42                /   (#42 = number of 128-byte blocks)
]---END CRC CONTENT (128 bytes)
#42#86                                       (16-bit CRC)
<20260124151821.936 RX>
#06#43                        <ACK> 'C' (agree with the CRC, continue)
<20260124151822.587 TX>
#02#01#FE                                    Data block 1 (#02 == 1024 byte block)
---START CRC CONTENT[
#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01
#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01
#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01
#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01
#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01
#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01
#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20
#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30
#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39
#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38
#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37
#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36
#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35
#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34
#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33
#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32
#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31
#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19
#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18
#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17
#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16
#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12
#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11
#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F
#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E
#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C
#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B
#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07
#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05
```

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#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04
#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02
#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01
]---END CRC CONTENT (1024 bytes)
#97#EC                                       (16-bit CRC)
<20260124151823.133 RX>
#06                           <ACK> (agree with the CRC, no retransmit - continue implied)
<20260124151823.673 TX>
#02#02#FD                                    Data block 2 (#02 == 1024 byte block)
---START CRC CONTENT[
#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19
#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01
#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01
#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01
#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01
#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01
#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01
#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20
#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30
#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39
#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38
#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37
#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36
#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35
#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34
#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33
#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32
#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31
#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19
#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18
#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17
#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16
#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12
#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11
#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F
#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E
#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C
#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B
#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07
#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05
#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04
#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02
]---END CRC CONTENT (1024 bytes)
#7E#90                                       (16-bit CRC)
<20260124151824.222 RX>
#06                           <ACK> (agree with the CRC, no retransmit - continue implied)
<20260124151824.760 TX>
#02#03#FC                                    Data block 3 (#02 == 1024 byte block)
---START CRC CONTENT[
#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01
#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19
#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01
#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01
#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01
#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01
#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01
#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01
#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20
#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30
#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39
#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38
#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37
#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36
#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35
#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34
#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33
#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32
#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31
#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19
#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18
#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17
#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16
#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12
#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11
#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F
#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E
#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C
```

```
#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B
#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07
#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05
#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04
]---END CRC CONTENT (1024 bytes)
#CC#C5                                      (16-bit CRC)
<20260124151825.299 RX>
#06                           <ACK> (agree with the CRC, no retransmit - continue implied)
<20260124151825.839 TX>
#02#04#FB                                   Data block 4 (#02 == 1024 byte block)
---START CRC CONTENT[
#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02
#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01
#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19
#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01
#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01
#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01
#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01
#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01
#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01
#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20
#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30
#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39
#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38
#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37
#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36
#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35
#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34
#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33
#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32
#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31
#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19
#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18
#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17
#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16
#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12
#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11
#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F
#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E
#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C
#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B
#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07
#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05
]---END CRC CONTENT (1024 bytes)
#9B#74                                      (16-bit CRC)
<20260124151826.383 RX>
#06                           <ACK> (agree with the CRC, no retransmit - continue implied)
<20260124151827.146 TX>
#02#05#FA                                   Data block 5 (#02 == 1024 byte block)
---START CRC CONTENT[
#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04
#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02
#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01
#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19
#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01
#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01
#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01
#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01
#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01
#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01
#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20
#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30
#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39
#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38
#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37
#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36
#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35
#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34
#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33
#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32
#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31
#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19
#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18
#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17
#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16
#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12
#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11
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#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F
#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E
#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C
#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B
#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07
]---END CRC CONTENT (1024 bytes)
#61#A8                                       (16-bit CRC)
<20260124151827.691 RX>
#06                            <ACK> (agree with the CRC, no retransmit - continue implied)
<20260124151828.226 TX>
#02#06#F9                                    Data block 6 (#02 == 1024 byte block)
---START CRC CONTENT[
#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05
#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04
#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02
#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01
#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19
#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01
#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01
#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01
#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01
#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01
#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01
#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20
#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30
#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39
#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38
#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37
#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36
#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35
#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34
#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33
#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32
#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31
#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19
#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18
#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17
#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16
#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12
#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11
#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F
#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E
#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C
#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B
]---END CRC CONTENT (1024 bytes)
#B1#69                                       (16-bit CRC)
<20260124151828.776 RX>
#06                            <ACK> (agree with the CRC, no retransmit - continue implied)
<20260124151829.309 TX>
#02#07#F8                                    Data block 7 (#02 == 1024 byte block)
---START CRC CONTENT[
#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07
#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05
#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04
#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02
#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01
#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19
#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01
#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01
#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01
#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01
#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01
#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01
#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20
#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30
#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39
#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38
#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37
#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36
#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35
#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34
#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33
#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32
#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31
#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19
#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18
#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17
```

```
#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16
#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12
#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11
#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F
#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E
#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C
]---END CRC CONTENT (128 bytes)
#F1#C0                                        (16-bit CRC)
<20260124151829.856 RX>
#06                           <ACK> (agree with the CRC, no retransmit - continue implied)
<20260124151830.393 TX>
#02#08#F7                                     Data block 8 (#02 == 1024 byte block)
---START CRC CONTENT[
#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B
#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07
#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05
#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04
#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02
#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01
#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19
#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01
#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01
#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01
#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01
#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01
#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01
#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20
#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30
#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39
#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38
#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37
#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36
#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35
#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34
#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33
#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32
#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31
#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19
#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18
#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16#17
#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12#16
#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11#12
#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F#11
#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E#0F
#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C#0E
]---END CRC CONTENT (1024 bytes)
#E4#C3                                        (16-bit CRC)
<20260124151830.939 RX>
#06                           <ACK> (agree with the CRC, no retransmit - continue implied)
<20260124151830.943 TX>
#01#09#F6                                     Data block 9 (#01 == 128 byte block)
---START CRC CONTENT[
#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38#39
#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B#0C
#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37#38
#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07#0B
#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36#37
#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05#07
#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35#36
#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04#05
]---END CRC CONTENT (128 bytes)
#E3#9F                                        (16-bit CRC)
<20260124151831.239 RX>
#06                           <ACK> (agree with the CRC, no retransmit - continue implied)
<20260124151831.239 TX>
#01#0A#F5                                     Data block 10 (#01 == 128 byte block)
---START CRC CONTENT[
#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34#35
#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02#04
#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33#34
#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01#02
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#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32#33
#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19#01
#02#04#05#07#0B#0C#0E#0F#11#12#16#17#18#19#31#32
#33#34#35#36#37#38#39#30#20#01#01#01#01#01#01#19
]---END CRC CONTENT (128 bytes)
#80#D7                                       (16-bit CRC)
<20260124151831.387 RX>
#06                           <ACK> (agree with the CRC, no retransmit - continue implied)
<20260124151831.387 TX>
#04                                          <EOT> Nothing left for this stream, all bytes sent.
<20260124151831.403 RX>
#06#43                        <ACK> 'C' (agree with the CRC, continue)
<20260124151832.931 TX>
#01#00#FF                                    Header block (#01 == 128 byte block)
---START CRC CONTENT[
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00
#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00#00
]---END CRC CONTENT (128 bytes)
#00#00                                       (a way to say "no more data or files")
<20260124151833.070 RX>
#06#06 --> <ACK> <ACK>                       (the transfer session is concluded)
```

NOTES

For the header blocks, the number-of-blocks at the end is optional (likely just a debug-aid used by ZOC). Note that it assumes the use of 128-byte blocks. This impacts the computed CRC – a valid client/receiver would match the same CRC computation, but would otherwise ignore this piece of data.

ZOC automatically switch to 128-byte blocks when the bytes remaining goes below a certain threshold (about 512-bytes). This is prudent, especially at low baud rates, so that the last block doesn’t have to be a full 1KB length.

Header blocks can switch to 1024-byte block if the filename is long (or contains a long path). It remains ambiguous on what constraints the path has – relative, absolute, and direction of slashes.

The “`(??? by ZOC)`“ parts of the Block Header also seem optional.

If the filesize is large (255 blocks * 1024 bytes, so over 256KB), my understanding is the block increment counter rolls over from FF back to 01 (to avoid being confused with the 00 header block). Like the 3rd byte rolls from 00 to FE. [this is not yet confirmed]

Sample C Implementation for 16-bit CRC

```c
#include <stdio.h>
#include <stdint.h>
#include <stddef.h>

uint16_t calculate_xmodem_crc(const unsigned char* data, size_t len)
{
    uint16_t crc = 0x0000; // Initial value (other CRC might start with 0xFFFF)
    int16_t signed_ref;
    uint8_t i;

    while (len--) {
        // XOR with the current byte shifted into the high byte
        printf("%c(%d) %X ", *data, *data, crc);
        printf(" ^ (%X)", (uint16_t)(*data) << 8);
        crc ^= (uint16_t)(*data++) << 8;
        signed_ref = crc;
        printf("= %X(%d)\n", crc, signed_ref);
        for (i = 0; i < 8; ++i) {
            printf("  %d %X  --> ", i, crc);
            if (crc & 0x8000) {
                // If the most significant bit is set, shift left
                // and XOR with the polynomial
                crc = (crc << 1) ^ 0x1021;  // The XMODEM polynomial
            } else {
                // Otherwise, just shift left
                crc <<= 1;
            }
            signed_ref = crc;
            printf("%X(%d)\n", crc, signed_ref);
        }
    }

    return crc;  // The result is used directly without final XOR
}

int main()
{
    uint16_t crc_result;
    int16_t unsigned_ref;
    char test_str[128] = {
            0x01, 0x02, 0x04, 0x05, 0x07, 0x0B, 0x0C, 0x0E, 0x0F, 0x11, 0x12, 0x16, 0x17, 0x18, 0x19, 0x31,
            0x32, 0x33, 0x34, 0x35, 0x36, 0x37, 0x38, 0x39, 0x30, 0x20, 0x01, 0x01, 0x01, 0x01, 0x01, 0x01,
            0x19, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00,
            0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00,
            0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00,
            0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00,
            0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00,
            0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00, 0x00
          };

    crc_result = calculate_xmodem_crc(test_str, 128);
    unsigned_ref = crc_result;
    printf("%X(%d)", crc_result, unsigned_ref);

    return 0;
}
```

Sample BASIC Implementation for 16-bit CRC

Style is X16 BASLOAD, but dialect is very similar to CBM BASIC V2 (just add line numbers).

```
REM XIPHOD - DEC 2025

MAGIC.VALUE% = $1021
REM THESE ONLY WORK WHEN X <= 32767 AND X >= -32768 (SPECIFICALLY THE "OR" AND "AND" KEYWORDS)
REM X XOR Y = (X OR Y) AND NOT (X AND Y)
REM ALTERNATIVE:  (X+Y) - 2*(X AND Y)
DEF FN XM(X) = (X + XV) - 2*(X AND XV)

DIM CRC.DATA%(1024) : REM CRC.DATA%(0) CONTAINS LENGTH

GOSUB INIT.CRC.DATA

GOSUB CALC.CRC

GOSUB PRINT.CRC.AS.HEX

END

REM INTERNAL EXAMPLE OF RECEIVING SOME DATA THAT WE WANT TO
REM THEN MAINTAIN A CRC OF.  THIS "SIMULATES" A FILE LOAD OR
REM SERIAL DATA RECEIVE.
INIT.CRC.DATA:
  I% = 0
INIT.CRC.NEXT:
  READ A% : REM SIGNED 16-BIT
  IF A% < 0 THEN CRC.DATA%(0) = I% : RETURN
  I% = I% + 1 : CRC.DATA%(I%) = A%
  GOTO INIT.CRC.NEXT

CALC.CRC:
  CRC.RESULT = $0 : REM INITIAL VALUE  (XMODEM INIT 0, FOR IBM 3740 - START WITH $FFFF)
  DATA.IDX% = 1 : REM DATA STARTS AT INDEX 1

NEXT.BYTE:
  IF DATA.IDX% > CRC.DATA%(0) THEN RETURN : REM CRC.RESULT COMPUTED

  REM CHR$ $80 ENABLES A "DON'T INTERPRET" SIGNAL, SO PETSCII SYMBOL
  REM OF SUBSEQUENT OUTPUT IS SHOWN INSTEAD OF CRT-EFFECT APPLIED.
  PRINT CHR$($80);CHR$(CRC.DATA%(DATA.IDX%));"(";CRC.DATA%(DATA.IDX%);") ";CRC.RESULT;" ";

  XV = CRC.DATA%(DATA.IDX%) * 256 : REM (CRC.DATA AT CURRENT INDEX) << 8
  REM THE FOLLOWING IS NECESSARY SO WE CAN USE "XV" LATER IN THE DO.XOR SUBROUTINE
  IF XV > 32767 THEN XV = XV - 65536
  IF XV < -32768 THEN XV = XV + 65536

  CRC.TEMP = CRC.RESULT
  CRC.TEMP = FN XM(CRC.TEMP) : REM XOR'D WITH XV
  CRC.RESULT = CRC.TEMP
  GOSUB PRINT.CRC.AS.HEX : PRINT : REM PRINT HEX$(CRC.RESULT)

  XV = MAGIC.VALUE% : REM PREPARE THAT WE WILL XOR BY THE XMODEM POLYNOMIAL
  FOR I = 0 TO 7

    REM CAN'T USE "AND" RELIABLY ON SIGNED 16-BIT, BUT WE JUST NEED
    REM TO CHECK IF THE HIGH BIT (MSB) IS SET.  SO JUST LOOK AT THE HIGH-BYTE
    REM BY DIVIDING THE VALUE BY 256 (SAME AS SHR >> 8).
    CRC.LOW% = CRC.RESULT / 256
    IF CRC.LOW% AND $80 THEN GOTO HANDLE.HIGH.BIT.CASE

    REM ELSE...
    CRC.RESULT = CRC.RESULT * 2 : REM (CRC << 1)
HIGH.BIT.WAS.SET:
    IF CRC.RESULT > 32767 THEN CRC.RESULT = CRC.RESULT - 65536
    IF CRC.RESULT < -32768 THEN CRC.RESULT = CRC.RESULT + 65536
    PRINT "  ";I;" ";:GOSUB PRINT.CRC.AS.HEX : PRINT : REM PRINT HEX$(CRC.RESULT)
  NEXT

  DATA.IDX% = DATA.IDX% + 1
  GOTO NEXT.BYTE

HANDLE.HIGH.BIT.CASE:
  CRC.TEMP = CRC.RESULT * 2 : REM (CRC << 1)
  IF CRC.TEMP > 32767 THEN CRC.TEMP = CRC.TEMP - 65536
  IF CRC.TEMP < -32768 THEN CRC.TEMP = CRC.TEMP + 65536
  CRC.TEMP = FN XM(CRC.TEMP) : REM XOR'D WITH XV
  CRC.RESULT = CRC.TEMP
  GOTO HIGH.BIT.WAS.SET : REM RESUME PAST THE IF-ELSE THAT WE CAME FROM

REM PRINT HEX$(CRC.RESULT)
PRINT.CRC.AS.HEX:
  TEMP = CRC.RESULT : IF TEMP < 0 THEN TEMP = TEMP + 65536
  PRINT HEX$(TEMP);"(";CRC.RESULT;")";
  RETURN

REM EXAMPLE DATA TO CRC, DECIMAL ASCII VALUES (A=65, ETC.)
DATA $01, $02, $04, $05, $07, $0B, $0C, $0E, $0F, $11, $12, $16, $17, $18, $19, $31
DATA $32, $33, $34, $35, $36, $37, $38, $39, $30, $20, $01, $01, $01, $01, $01, $01
DATA $19, $00, $00, $00, $00, $00, $00, $00, $00, $00, $00, $00, $00, $00, $00, $00
DATA $00, $00, $00, $00, $00, $00, $00, $00, $00, $00, $00, $00, $00, $00, $00, $00
DATA $00, $00, $00, $00, $00, $00, $00, $00, $00, $00, $00, $00, $00, $00, $00, $00
DATA $00, $00, $00, $00, $00, $00, $00, $00, $00, $00, $00, $00, $00, $00, $00, $00
DATA $00, $00, $00, $00, $00, $00, $00, $00, $00, $00, $00, $00, $00, $00, $00, $00
DATA $00, $00, $00, $00, $00, $00, $00, $00, $00, $00, $00, $00, $00, $00, $00, $00
DATA -1
```

End.