Change to the Very Distant Host Specification

Attached is a new version of figure F-4 for BBN Report 1822,
Specification for the Interconnection of a Host and an IMP. Also
attached is replacement text for the paragraph beginning at the
bottom of page F-7 and continuing through page F-8.

Please put this RFC with your copy of 1822 pending update of 1822.

DCW/ph

```
                 SPECIAL PACKET BIT ___
                                      |
                                      |
        ___HELLO/I-HEARD-YOU BIT      |      ___  UNUSED __
       |                              |     |             |
       |                              |     |             |
       V                              V     V             V
     _____
    |   |   |   |   |   |   |   |   |   |///////|   |   |///|   |
    |   |   |   |   |   |   |   |   |   |///////|   |   |///|   |
    |___|___|___|___|___|___|___|___|___|///|///|___|___|///|___|
      ^   ^     PACKET WORD COUNT    ^             ^   ^         ^
      |   |       ( 6 BITS )         |             |   |         |
      |   |                          |             |   |    CHANNEL
      |   |                          |             |   |    NUMBER
      |   |                          |             |   |
      |   PACKET                 HOST/IMP BIT      |   CHANNEL ZERO
      |   ODD/EVEN BIT                             |   ACKNOWLEDGE BIT
      |                                            |
    LAST PACKET BIT                          CHANNEL ONE
                                             ACKNOWLEDGEMENT BIT
```
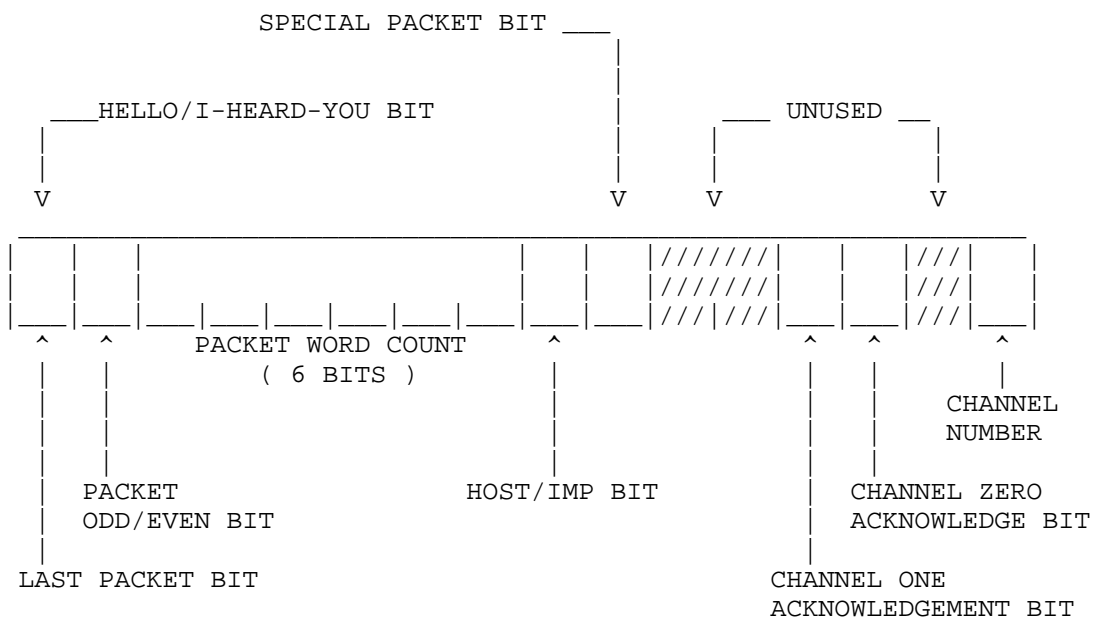
            FIG. F-4   CONTROL WORD FORMAT

The following algorithm is used to decide whether the circuit between
an IMP and a very distant Host is dead or alive. We first define
what we call a special packet -- this is (logically) a one word
packet consisting of only the control word and having the SPECIAL
PACKET bit set to one. All packets which are not special packets
(i.e., which are regular data packets or null packets) have the
SPECIAL PACKET bit set to zero. In a special packet, none of the
control word fields or bits have their usual meanings; consequently,
a special packet cannot be used to acknowledge data packets or send
data. In a special packet, only one bit other than the SPECIAL
PACKET bit has any meaning, the HELLO/I-HEARD-YOU bit.

Every r seconds both IMP and Host (independently) send a HELLO
packet, a special packet with the HELLO/I-HEARD-YOU bit set to zero.
When either IMP or Hosts receives a HELLO packet, it must promptly
(with highest priority) send the other an I-HEARD-YOU packet, a
special packet with the HELLO/I-HEAR-YOU bit set to one. In other
words, the I-HEARD-YOU packet is an acknowledgement of the periodic
HELLO packet, and a I-HEARD-YOU packet must only be sent as
acknowledgement for a HELLO packet. If either IMP or Host sends more
than t HELLO packets without receiving an I-HEARD-YOU packet in
acknowledgement, the IMP or Host declares the line dead. Once either
IMP or Host declares the line dead, it must send or accept no packets
(either special or regular) for 2*t*r* seconds to allow the other
party also to declare the line dead. After waiting 2*t*r* seconds,
an attempt is made to bring the line alive. This is done by sending
HELLO packets (but no regular packets) every r seconds while noting
received I-HEARD-YOU packets until k HELLO packets in a row are
acknowledged with I-HEARD-YOU packets. While doing this, received
HELLO packets must be acknowledged with I-HEARD-YOU packets. Once
acknowledgement for k HELLO packets have been received in a row
(i.e., one acknowledgement every r seconds for k intervals[1]), the
line is declared alive, and regular packets again may be sent,
received, and acknowledged along with the periodic (every r seconds)
HELLO packets. If a regular data packet is received while a party is
trying to bring the line up (due perhaps to slight timing differences
between the parties at the ends of the line), the data packet must
not be acknowledged.

The odd/even bits, the used/unused bits, and the channel filling and
emptying sequences must be initialized at start up[2] and
reinitialized every time the line is declared dead. If either the
IMP or Host decides the line is dead, the same action is taken as the
IMP or Host normally takes when the other's ready line is down. The
line being up causes the same action as is normally taken when the
ready line is up. The value of r is currently 1.25 seconds, the
value of t is currently 4, and the value of k is currently also 4.

It is likely that the values of r, t, and k will be adjusted in the
future; very distant Host programmers are advised to make it easy to
change these parameters.

Endnotes

[1] In particular, the IMP implementation requires the receipt of an
acknowledgement within r seconds of the transmission of a HELLO
packet in order to consider that the HELLO packet was successfully
acknowledged.

[2] At start-up, the line must be assumed to be dead and the
procedure of waiting 2*t*r* seconds before sending HELLO packets,
etc. must be used to bring the line alive initially.

        [This RFC was put into machine readable form for entry]
         [into the online RFC archives by Jeff McClellan 1/98]