

# MEMORANDUM

BARKER

To: IMP Guys  
From: John McQuillan  
Subject: New Diagnostic Messages

Date: March 15, 1973 IG# 18

The IMPs are now sending a message to the TTY on the Tinker IMP whenever they detect a software checksum error or other discrepancy. The format of the message is: (all numbers are octal)

<u>0503XX</u>	XX is IMP number
<u>000000</u>	link word
<u>TRAP PC</u>	Three numbers reported as a trap to NCC. PC indicates the kind of trap.
<u>TRAP AC</u>	X is the interface number, counting from 0.
<u>TRAP X</u>	
<u>BUFFER LOC=L</u>	Memory location of buffer in error
<u>CONTENTS OF L</u>	
<u>CONTENTS OF L+1</u>	
<u>. . .</u>	Contents of buffer.
<u>CONTENTS OF L+107</u>	
<u>CONTENTS OF L+110</u>	
<u>LOC OF LAST DATA WORD</u>	Memory location of last word in buffer.

Some things to know about the format of the buffer:

1. The IMP does a DMC input into locations L+4 to L+110. That is, the first word of a packet goes into L+4, and the last word of a maximum length packet goes into L+110.
2. The last word of a packet is software checksum received by the IMP. It equals the twos complement of [the sum of the data words - the number of data words] where the checksum is not included as a data word.

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3. The minimum length packet is five words, that is from L+4 to L+10 (octal).

4. If the low-order bit of L+5 is on, the packet is a routing message. The left 8 bits of L+5 is then the IMP number of the source of the routing message. If the two bit is on (the next-to-low-order bit) in L+5, the routing message is a null and should have 5 words, ending at L+10. If not, it is a routing update message and the last word (the checksum) should be at L+107. Also, the data of an update message should fall into specific forms, and an IMP programmer can probably recognize this data.

5. If the low-order bit of L+5 is off, the packet is a part of a message. The source IMP is given by the last two octal digits in L+7, and the destination IMP by the last two octal digits in L+6. Again, an IMP or TIP programmer may be able to recognize whether the packet format is correct.

Some information about the trap data:

1. If traps happen at the same IMP in rapid succession within a few seconds of each other, some NCC messages may be lost. Probably the last trap will be reported. Diagnostic messages will not, in general, be lost but they may come in out of order in this brief period.

2. The current NCC traps causing diagnostic messages are:

PC = 7514 or 7552 Spurious Acknowledge  
AC for the first gives bad ack bits  
AC for the second gives bad packet pointer

PC = 7741 Software Checksum Error  
AC = Error in checksum  
(gives the bit pattern picked if positive,  
or dropped if negative)

PC - 7743 Unchecksummed Packet  
AC = Always zero