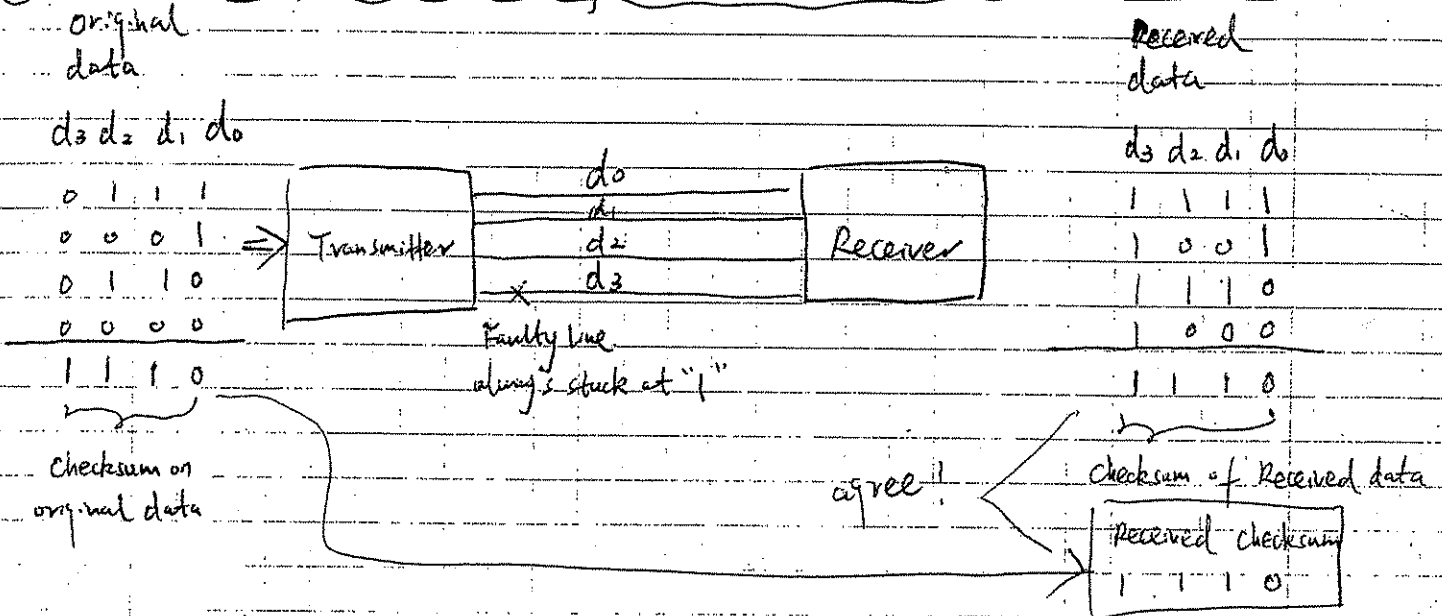


L#6

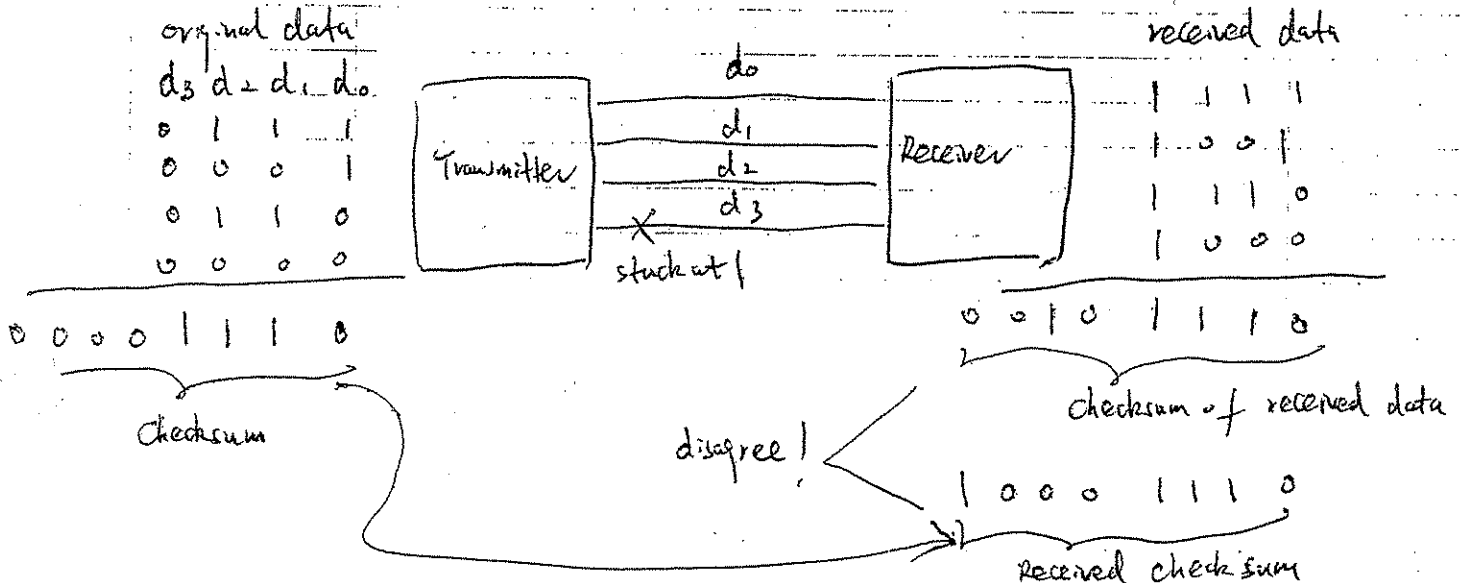
An example to show the primary difficulty of single-precision checksum (SPC)
 The use of SPC in the communication system:



The received check sum & the checksum of the received data are equal, no error is detected! But the received info is certainly not correct! Because the overflow (carry bit) is ignored!

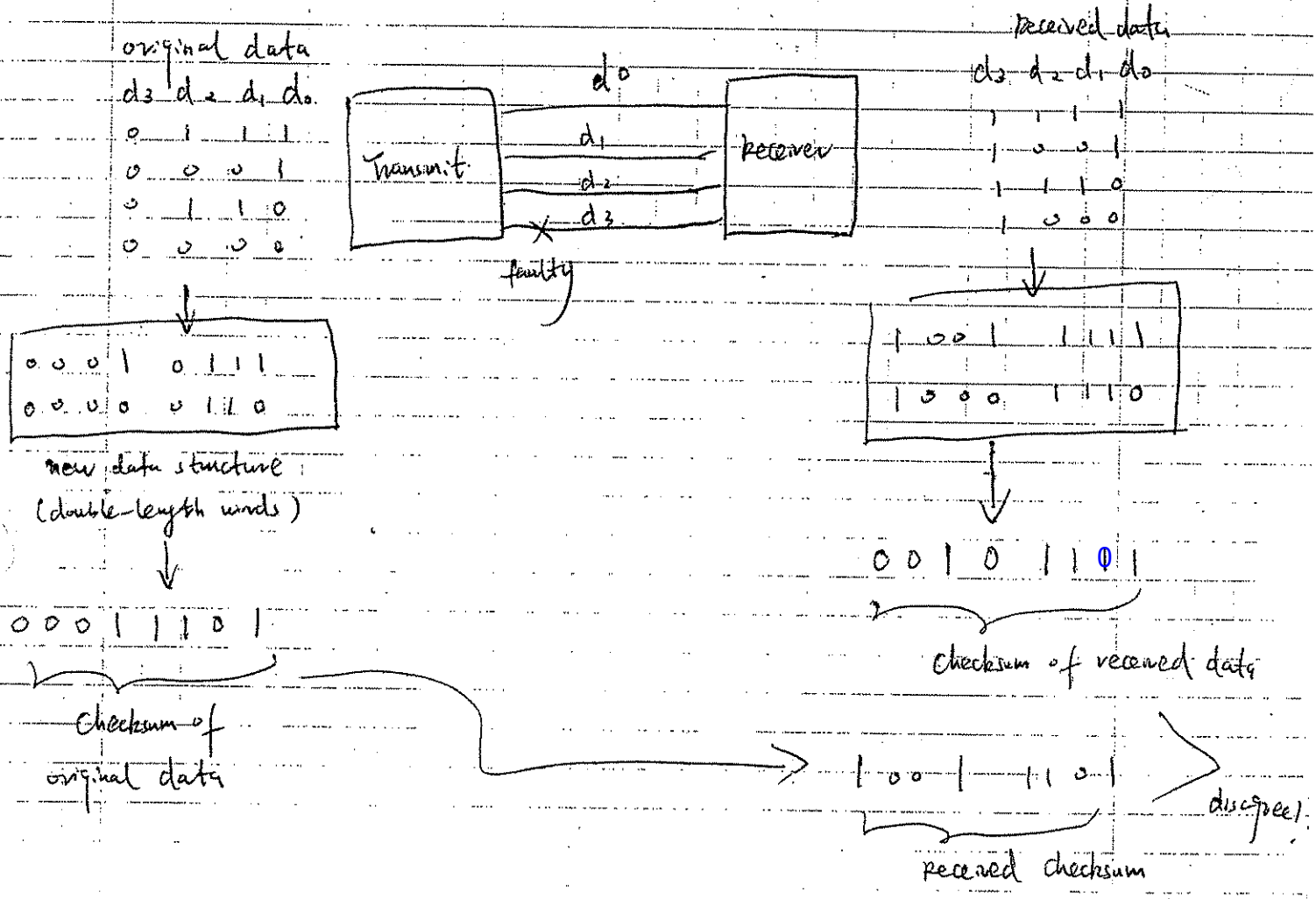
2. double-precision checksum:

Consider the sample example as above, only now the checksum generated in the transmission point is 8 bit and sent as two 4-bit quantities. At the receiving point, each word has its msb stuck at logic 1. Also, the checksum has the msb of each of its 4-bit halves stuck at 1. Now the regenerated checksum is 0010 1110 which disagrees with the received checksum 1000 1110, thus the error is detected!



2. Honeywell checksum

At the transmitting point, the new data structure is formed and the checksum is computed. If line d_3 is faulty, the regenerated checksum at the receiving point will differ from the checksum that is transmitted, thus the error is detected!

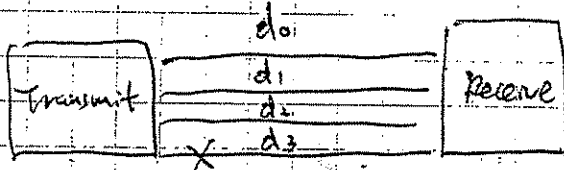


4. Residue checksum

original Data

$d_3 \ d_2 \ d_1 \ d_0$

0 1 1 1
 0 0 0 1
 0 1 1 0
 0 0 0 0



Received Data

$D_3 \ d_2 \ d_1 \ d_0$

1 1 1 1
 1 0 0 1
 1 1 1 0
 1 0 0 0

1 1 1 0

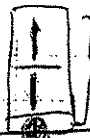
checksum
of the original
data

disagree

checksum of received data

1 1 1 0

received checksum



3 carries generated during end-around carry addition