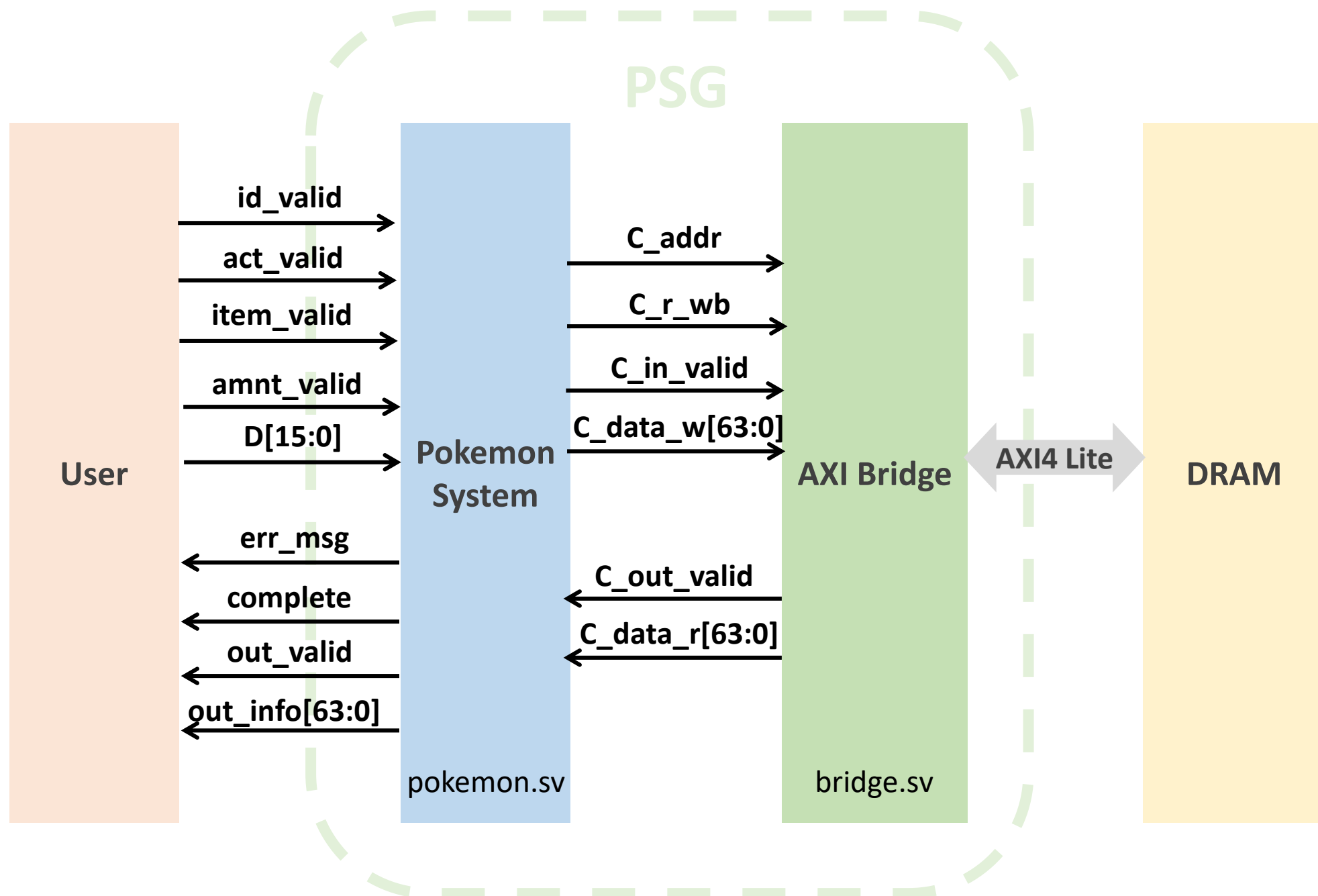
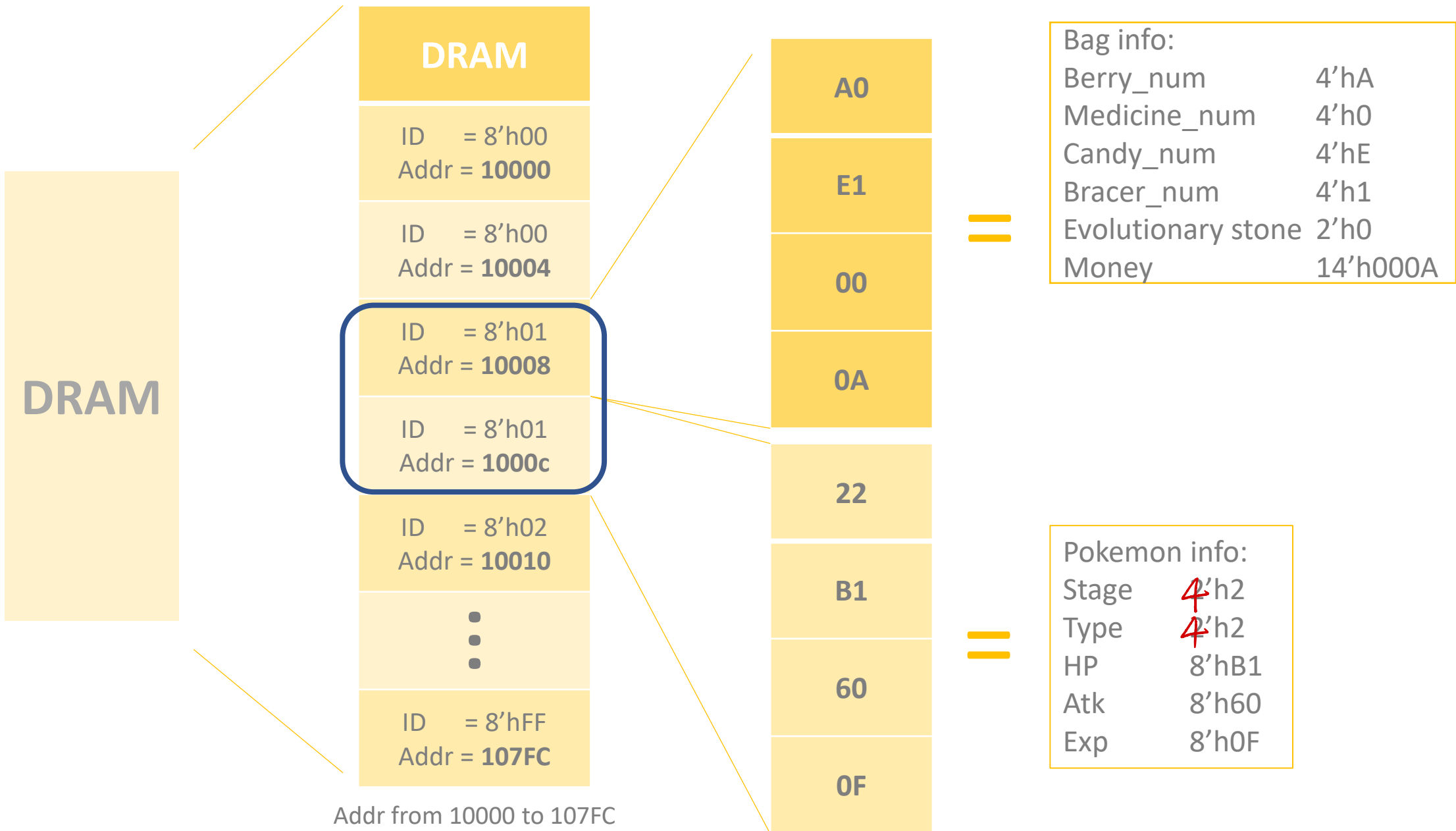


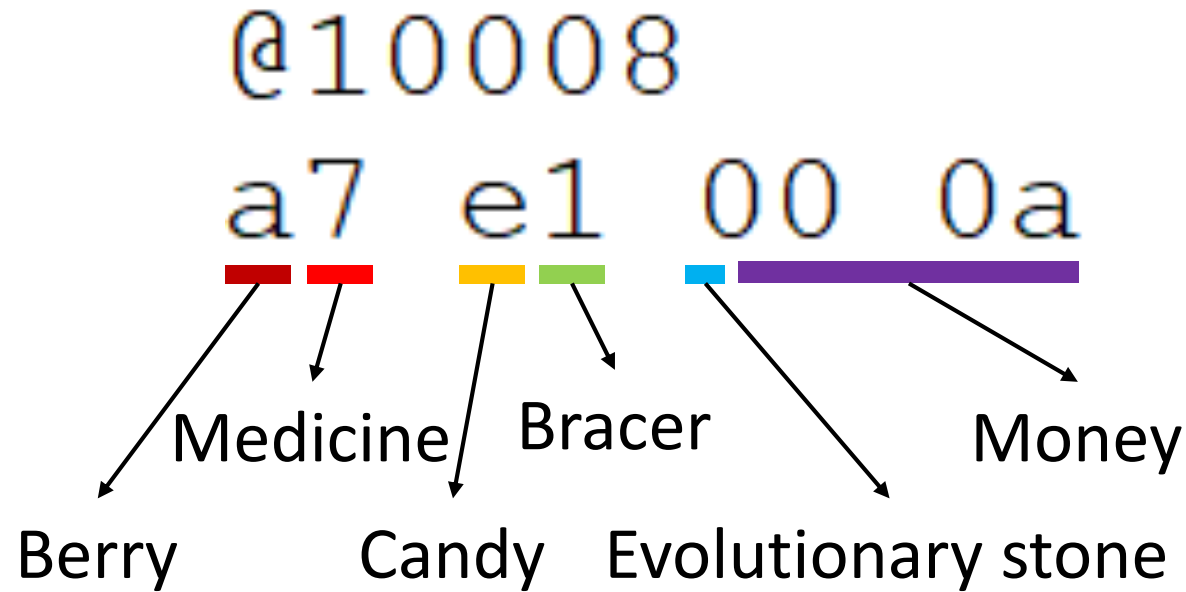
Lab08 Exercise note





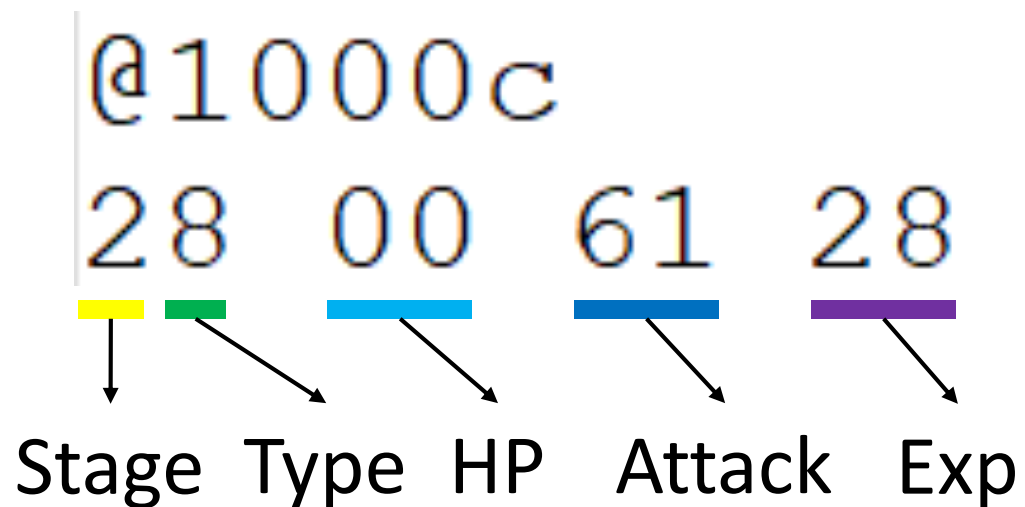
.dat file example

```
@10000
a0 e1 00 0a
@10004
22 b1 60 0f
@10008
a7 e1 00 0a
@1000c
28 00 61 28
@10010
83 e4 01 58
@10014
44 14 71 00
@10018
db 69 00 5e
@1001c
11 3a 3f 0d
@10020
```



Note: The data format in dram is different from the format of out_info. Make sure you have dealt with this difference.

$$atk = 3e = 62$$



$$hp = 70 = 124$$

$$192 - 62 = 62$$

DRAM note

- You may modify the following part in ../00_TESTBED/pseudo_DRAM.sv.

DRAM latency



```
parameter DRAM_R_latency = 1;  
parameter DRAM_W_latency = 1;  
parameter DRAM_B_latency = 1;
```

- If you want to initialize dram in pattern, you may use the following code.

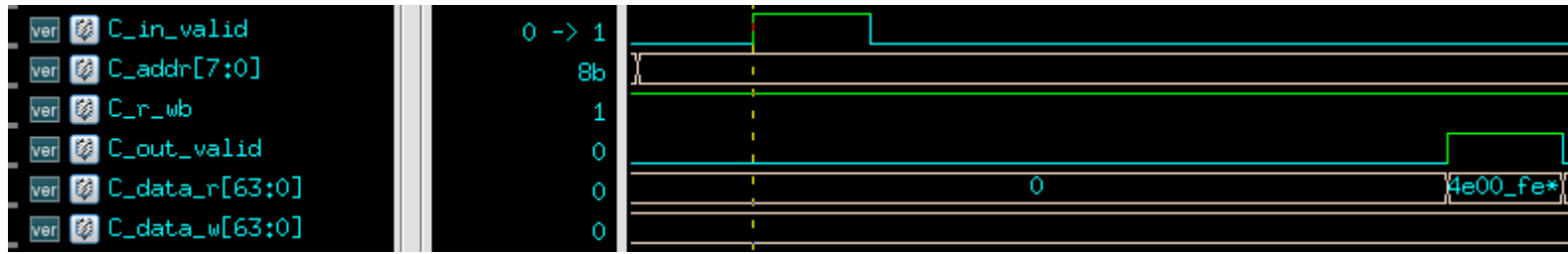
Declaration of
dram reg array



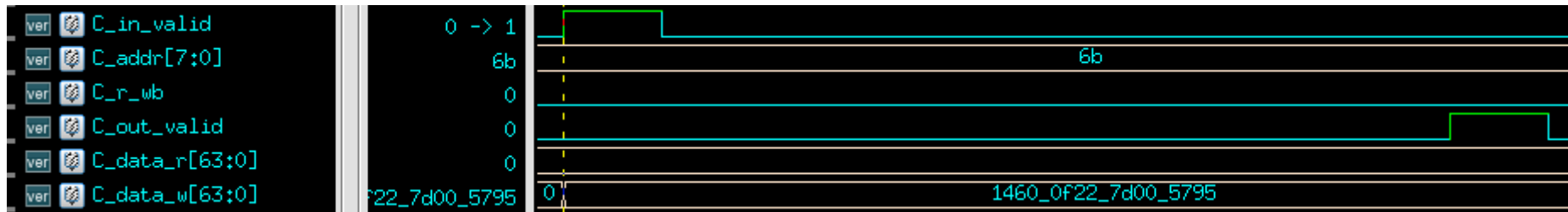
```
parameter DRAM_p_r = "../00_TESTBED/DRAM/dram.dat"  
  
logic [7:0] golden_DRAM[ ((65536+256*8)-1) : (65536+0)] ;  
  
initial $readmemh(DRAM_p_r, golden_DRAM);
```

Bridge

When C_in_valid is high, bridge will check C_r_wb

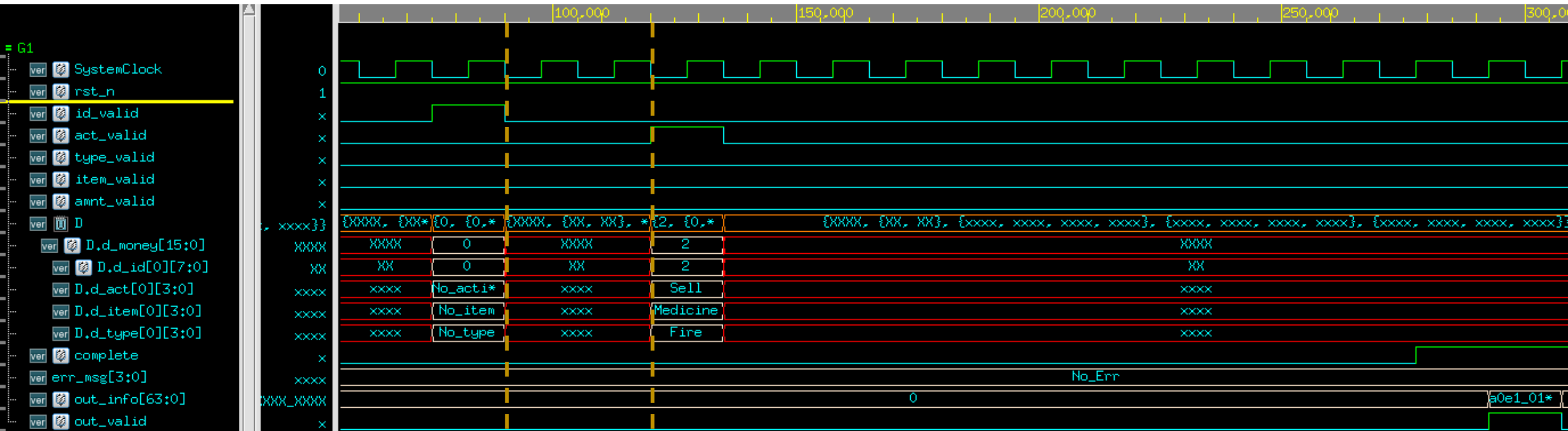


If C_r_wb is 1 (read), then it will base on C_addr to find the corresponding address in dram. When the data from dram is valid, it will pull high C_out_valid and return the value from dram.



If C_r_wb is 0 (write), then it will base on C_addr to find the corresponding address in dram. And then it will write C_data_w to that address. After writing, it will pull high C_out_valid to indicate that the write process is done.

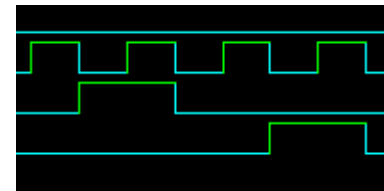
Start of the system



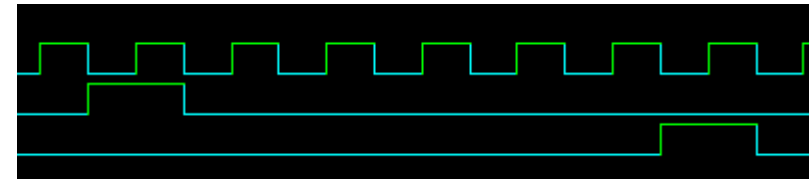
Delay not fixed

$1 \leq \text{Gap} \leq 5$
Order of input valid signal is fixed

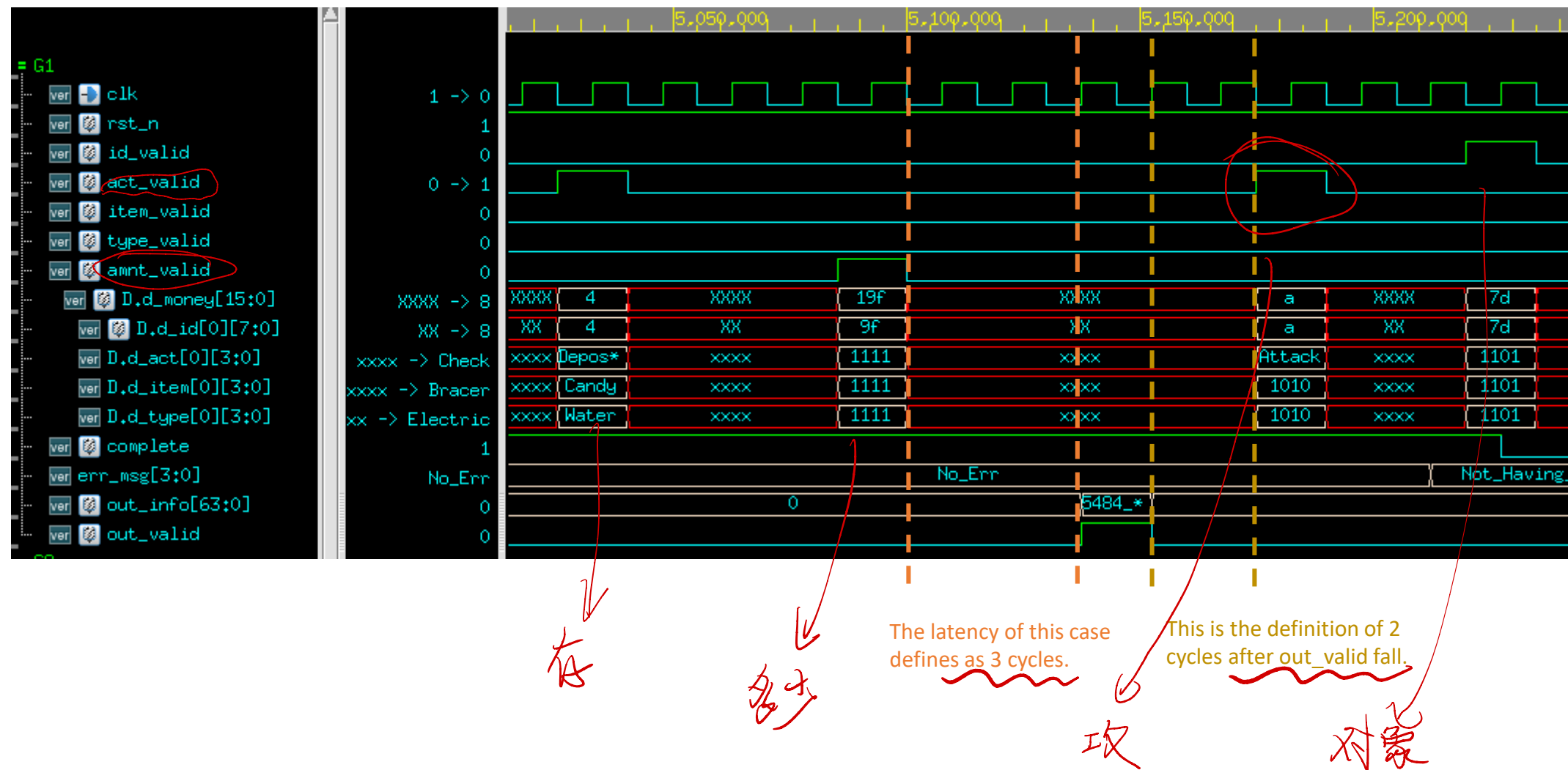
1 cycle



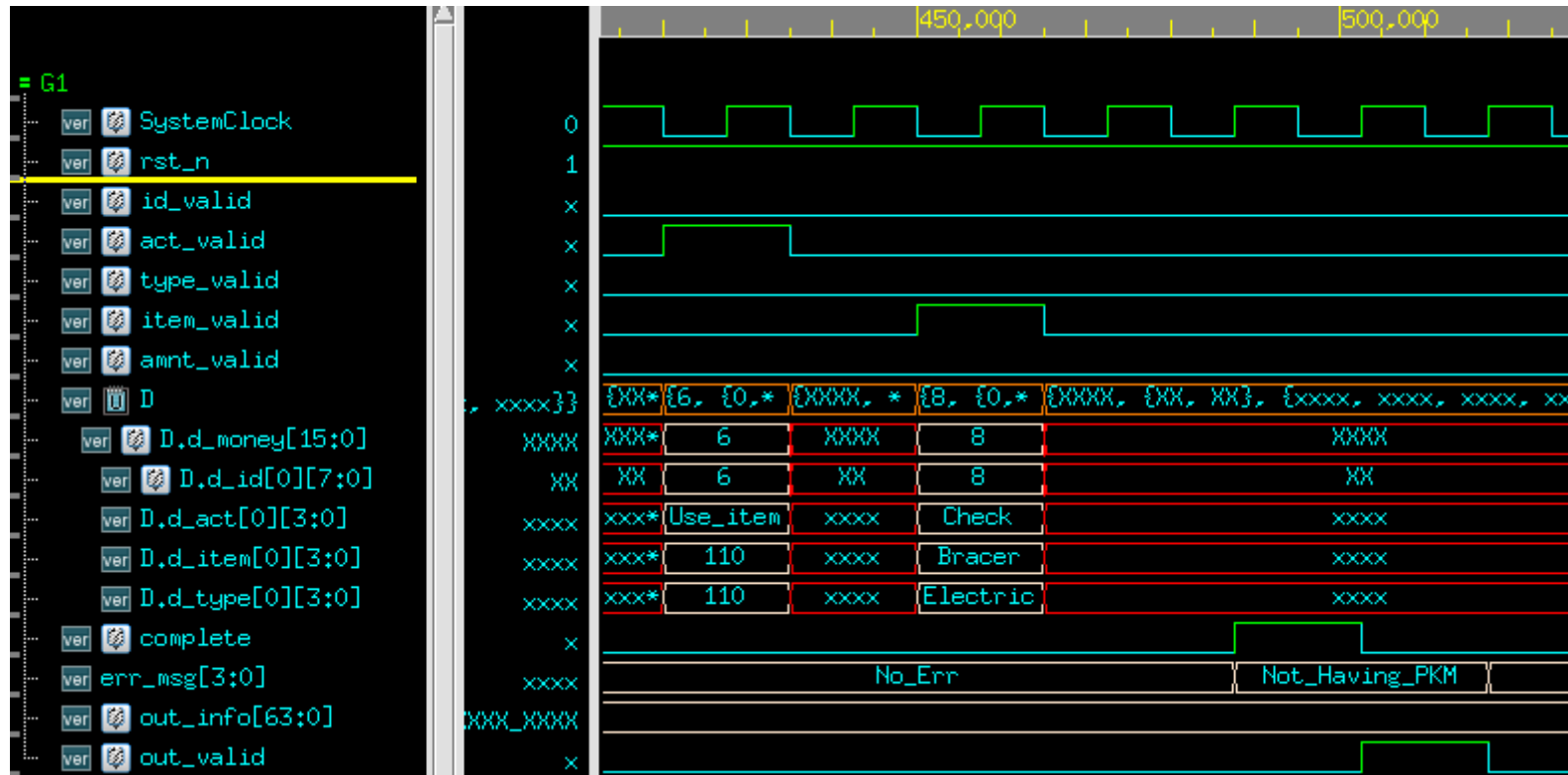
5 cycles



Next operation will be valid **2-10** cycles after out_valid fall.



Next action...

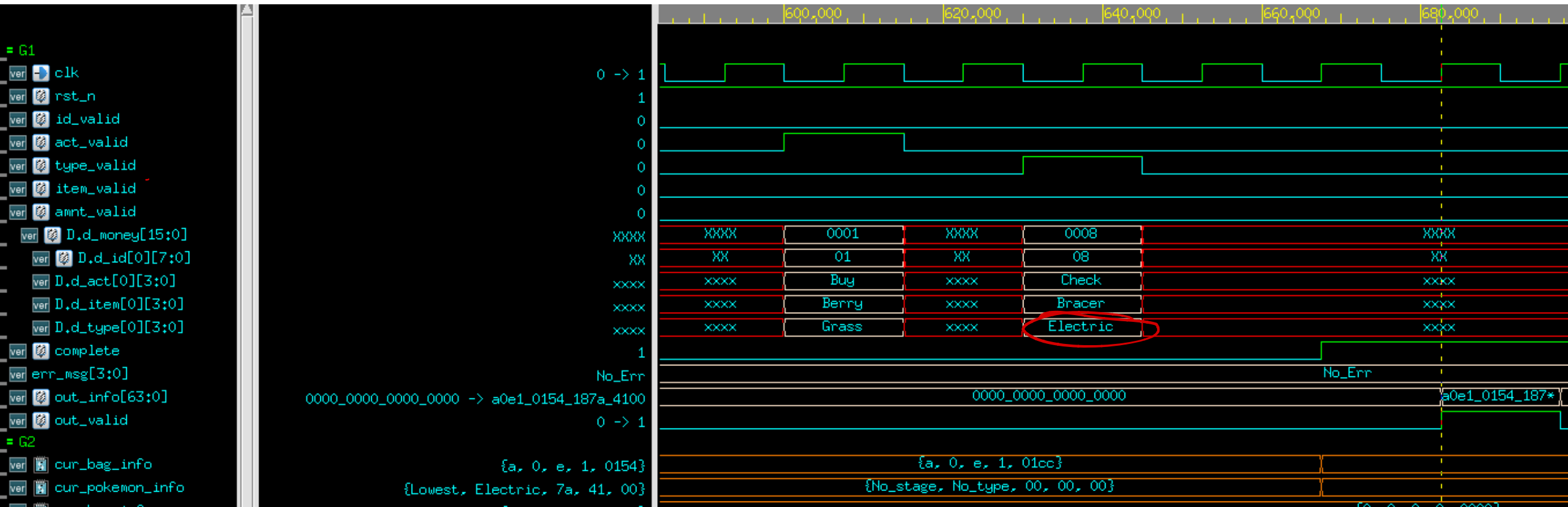


The operations will be performed on the same player until the id_valid be pulled high again. (Except when action is Attack. Please refer to the waveform of Attack)

Example (Complete)

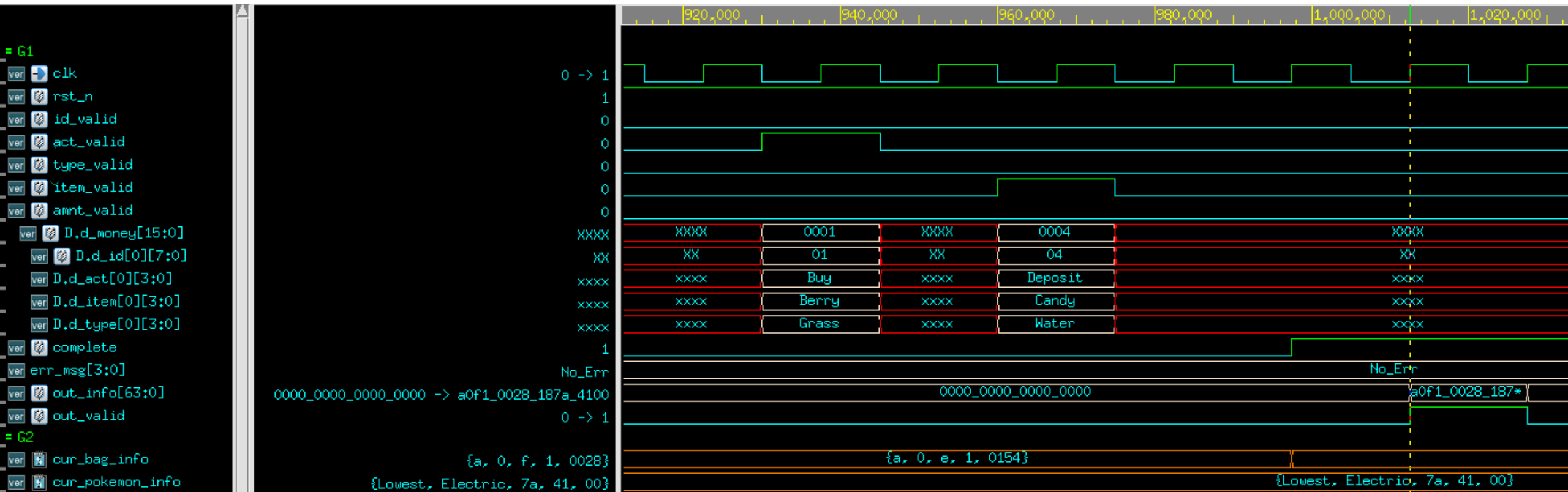
- Case 1 – Buy (pokemon)
- Case 2 – Buy (item)
- Case 3 – Sell (pokemon)
- Case 4 – Sell (item)
- Case 5 – Deposit
- Case 6 – Check
- Case 7 – Use_item
- Case 8 – Attack

Case 1 – Buy (pokemon)

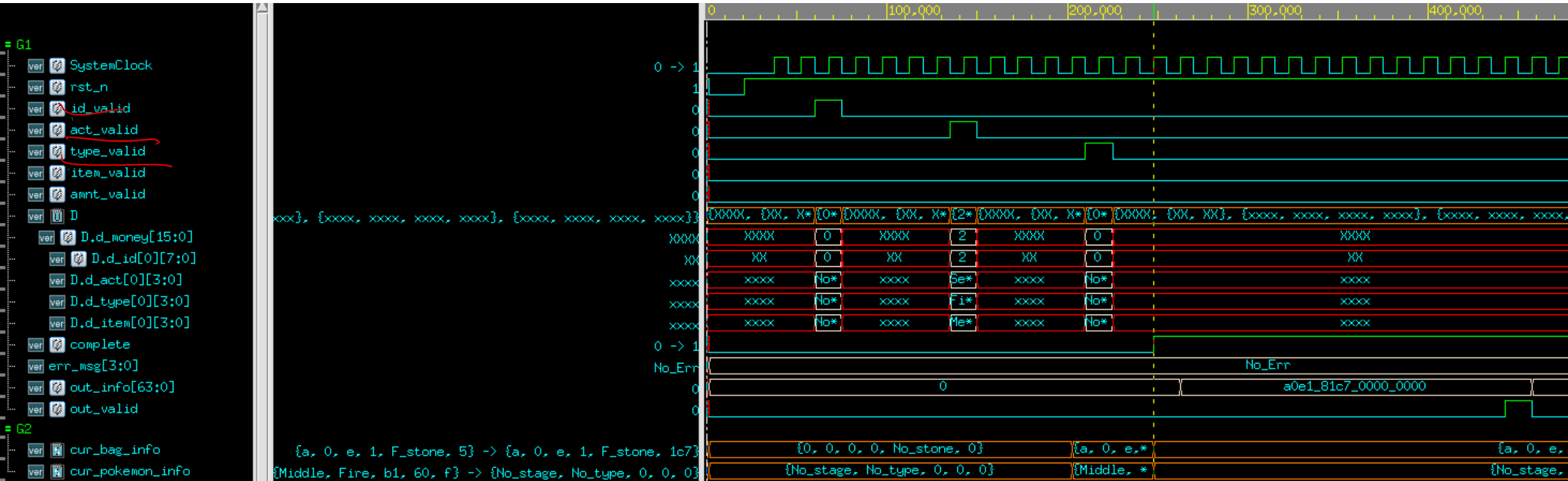


- cur_bag_info means current player's bag information
- cur_pokemon_info means current player's Pokemon information
- opp_bag_info means opponent's bag information
- opp_pokemon_info means opponent's Pokemon information

Case 2 – Buy (item)

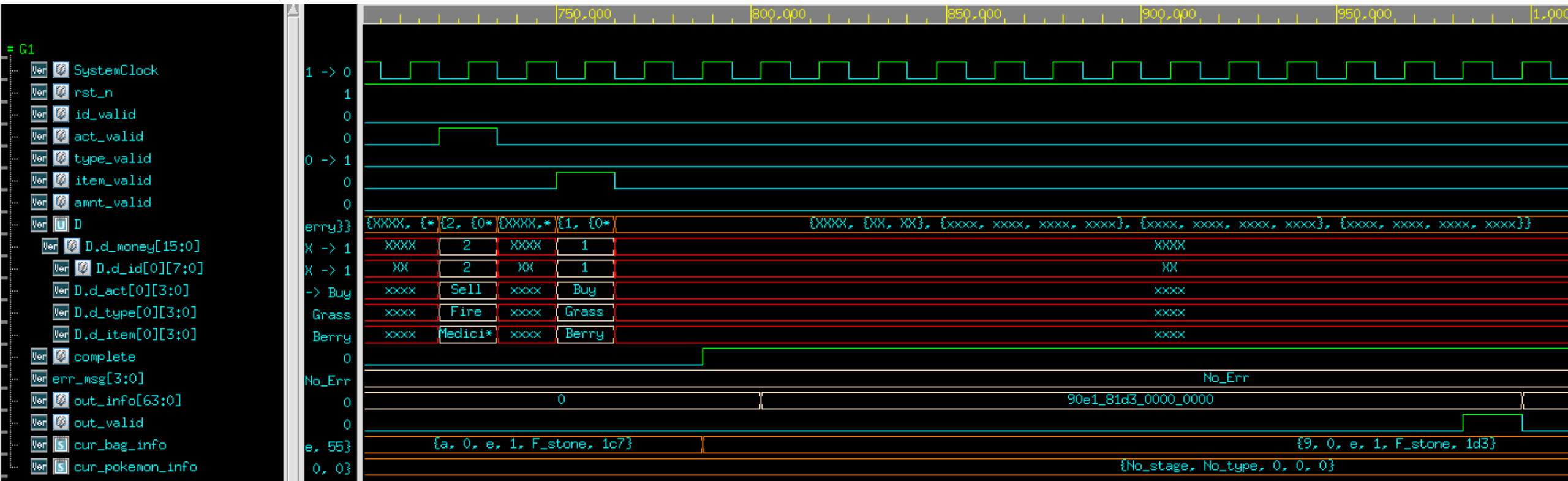


Case 3 – Sell (pokemon)

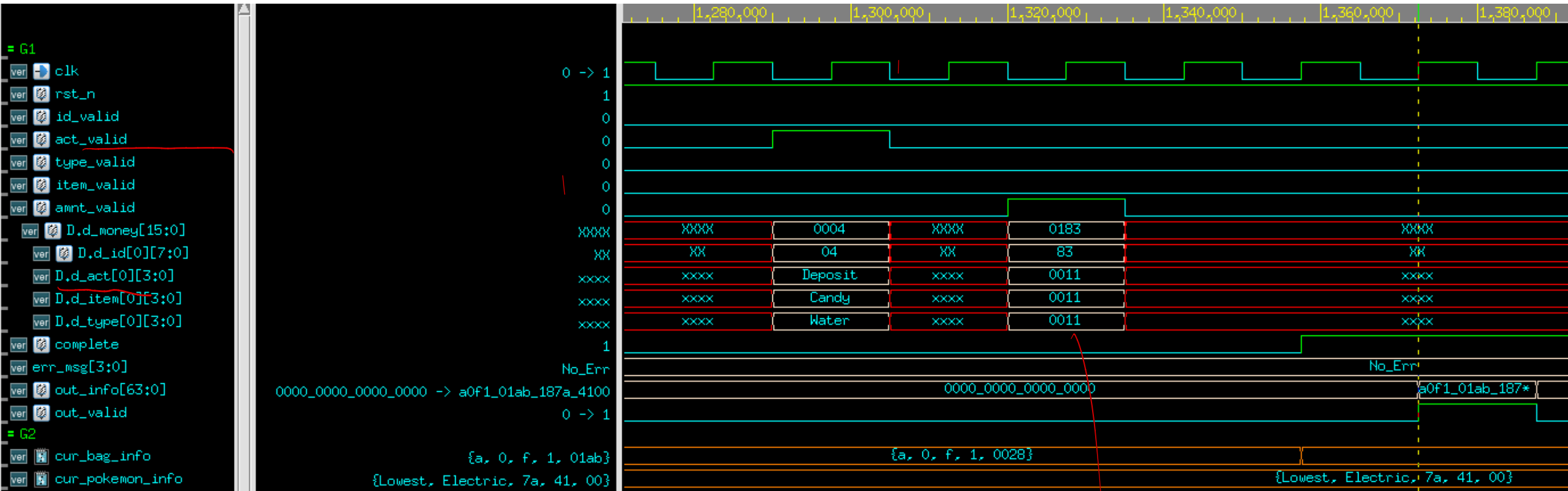


When sell pokemon, D should be 16'd0 when type_valid is high

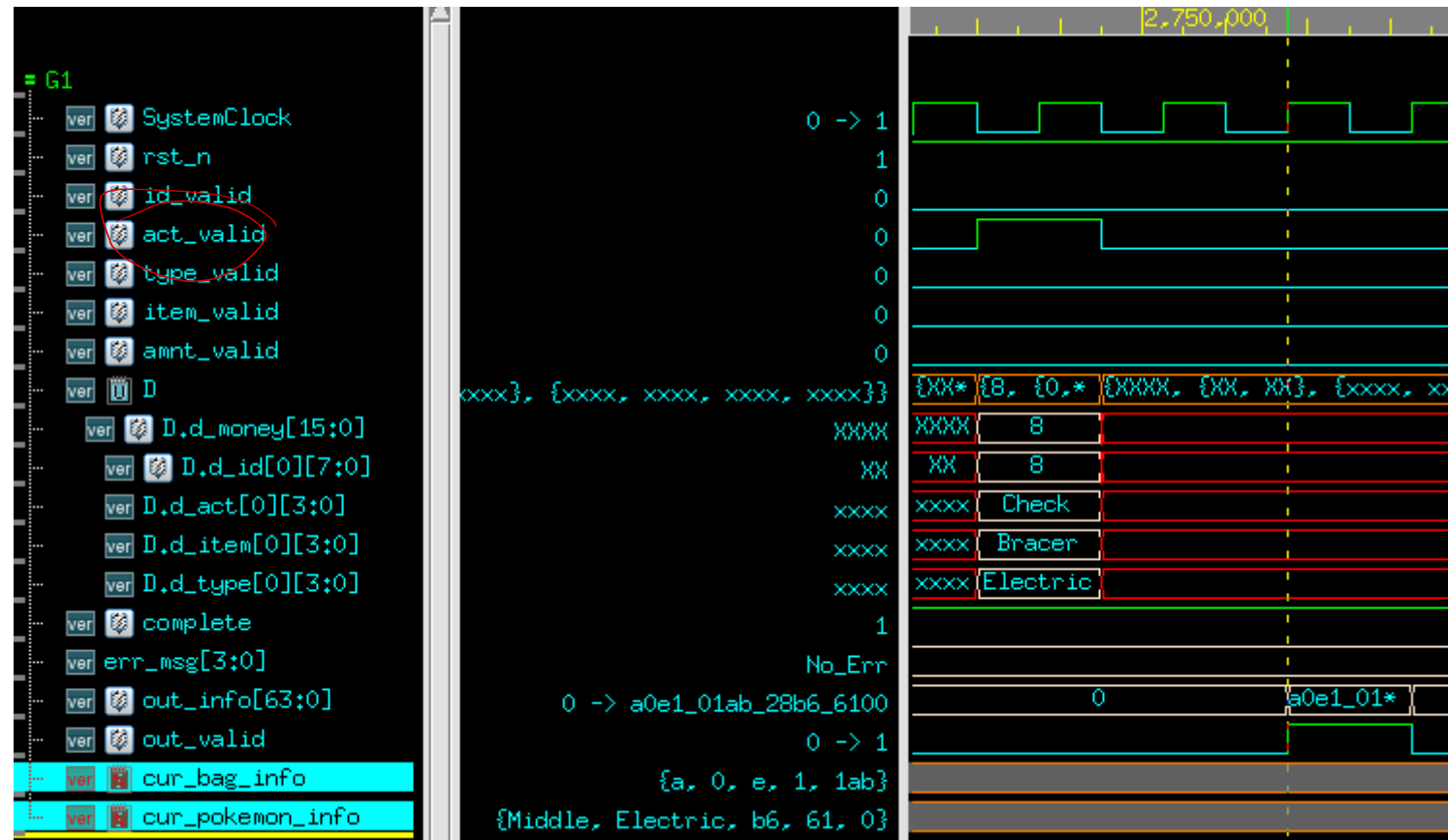
Case 4 – Sell (item)



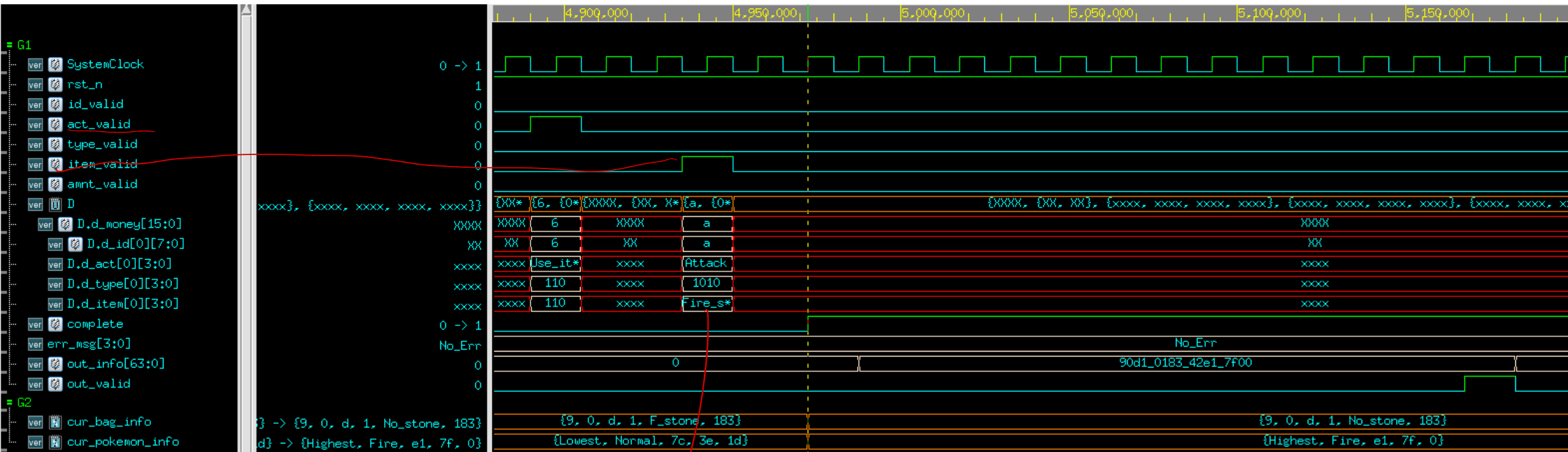
Case 5 – Deposit



Case 6 – Check

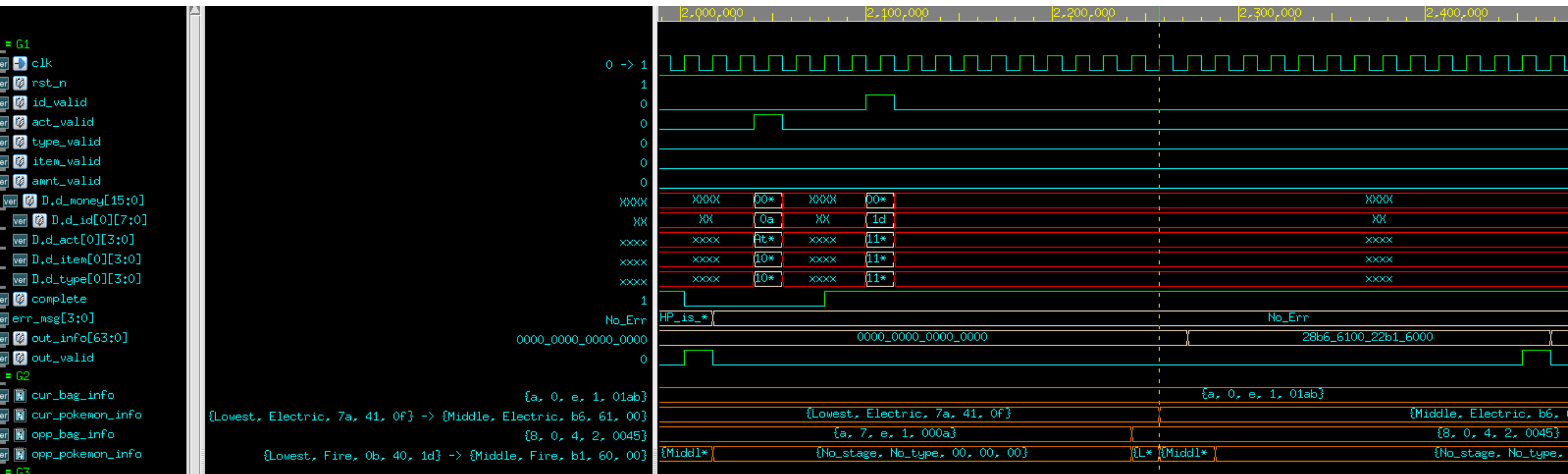


Case 7– Use_item



Fire stone.

Case 8 – Attack



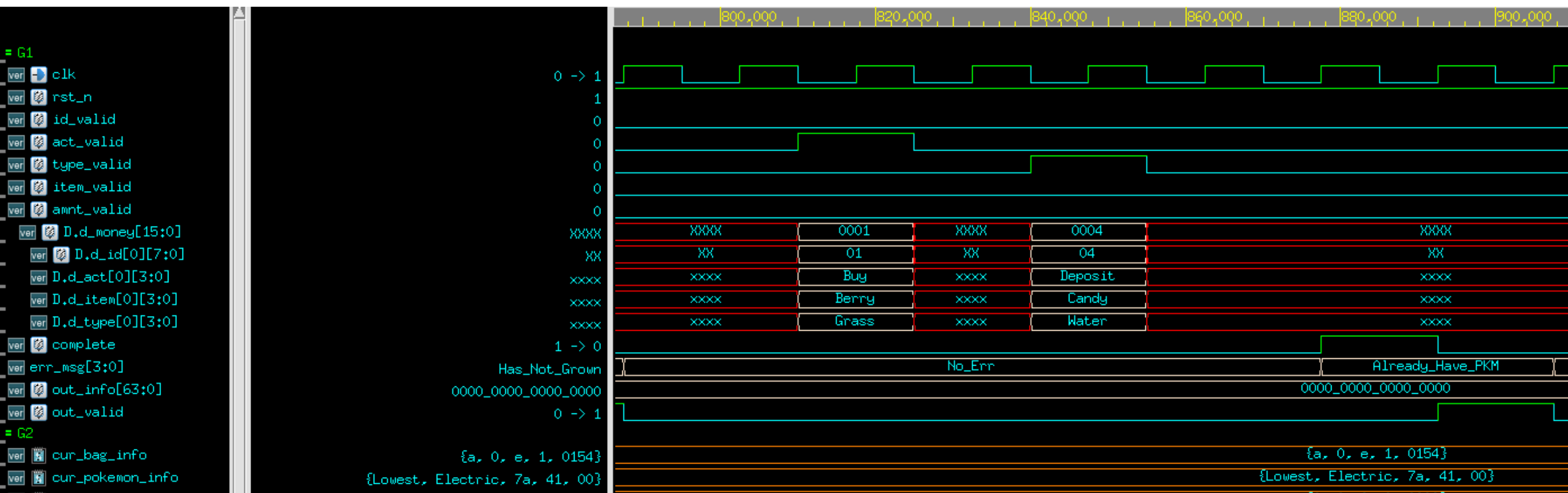
Notice that the out information should be the **Final status (Consider the effect of bracer or evolution)**
This example shows a special situation when 2 pokemons evolve at the same time.

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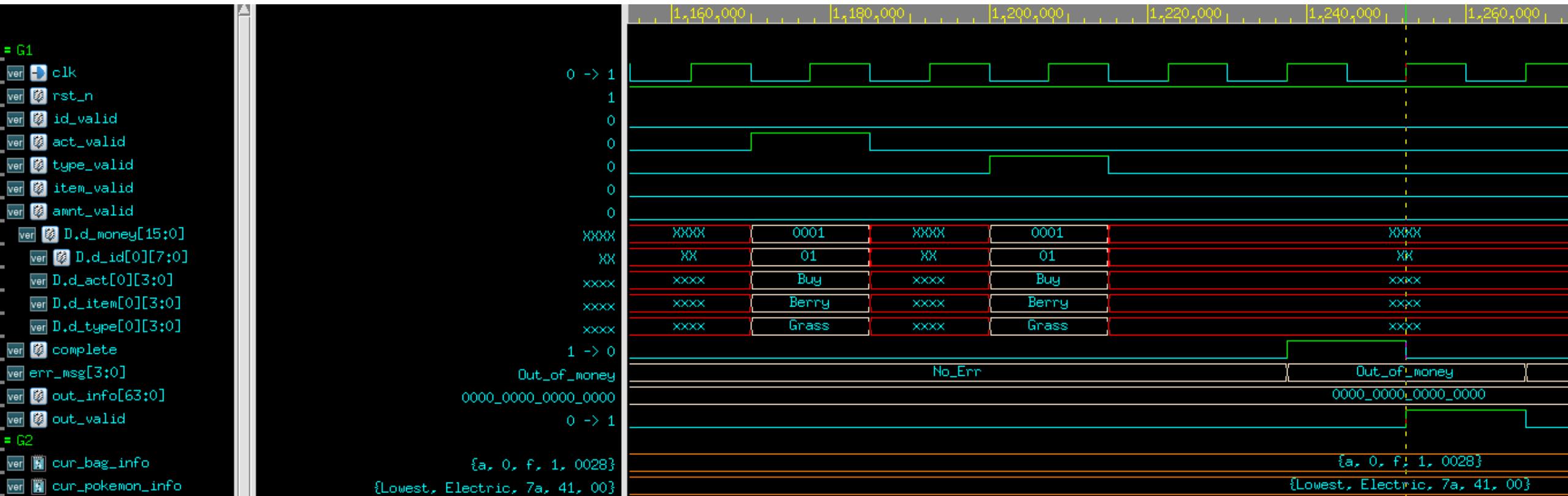
Example (Error)

- Case 9 – Buy (pokemon), but already have a Pokemon
- Case 10 – Buy (pokemon), but out of money
- Case 11 – Buy (item), but out of money
- Case 12 – Buy (item), but bag is full
- Case 13 – Sell (pokemon), but do not have a Pokemon
- Case 14 – Sell (pokemon), but Pokemon is in the lowest stage
- Case 15 – Sell (item), but do not have that item
- Case 16 – Use_item, but do not have a Pokemon
- Case 17 – Use_item, but do not have that item
- Case 18 – Attack, but do not have a Pokemon
- Case 19 – Attack, but HP is zero

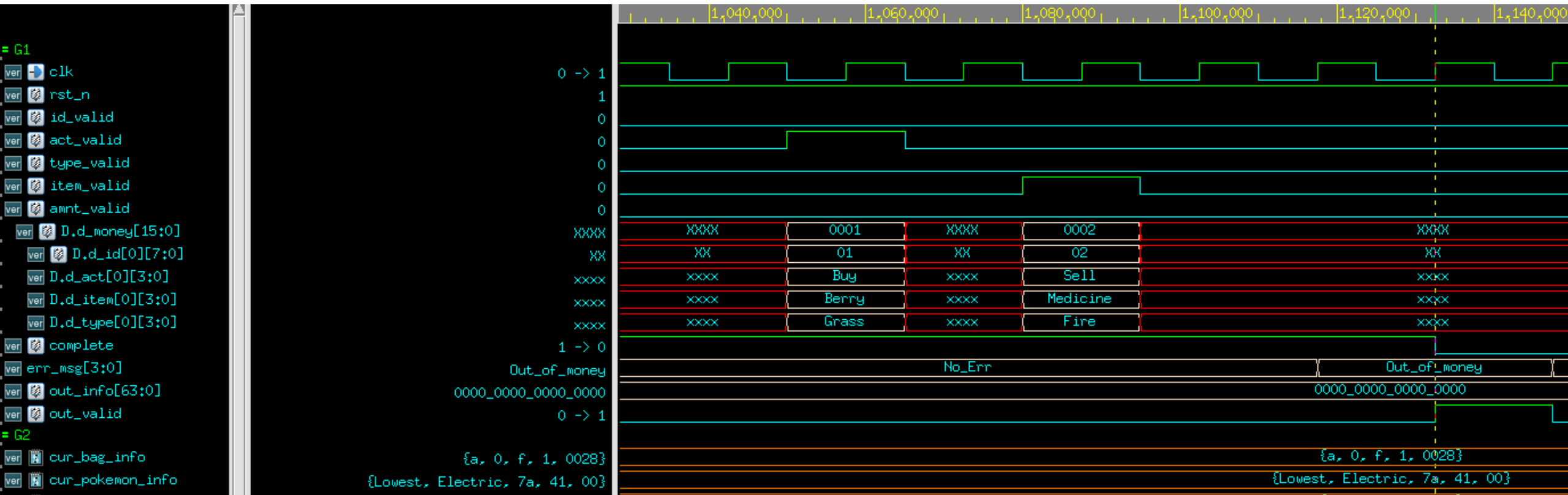
Case 9 – Buy (pokemon), but already have a Pokemon



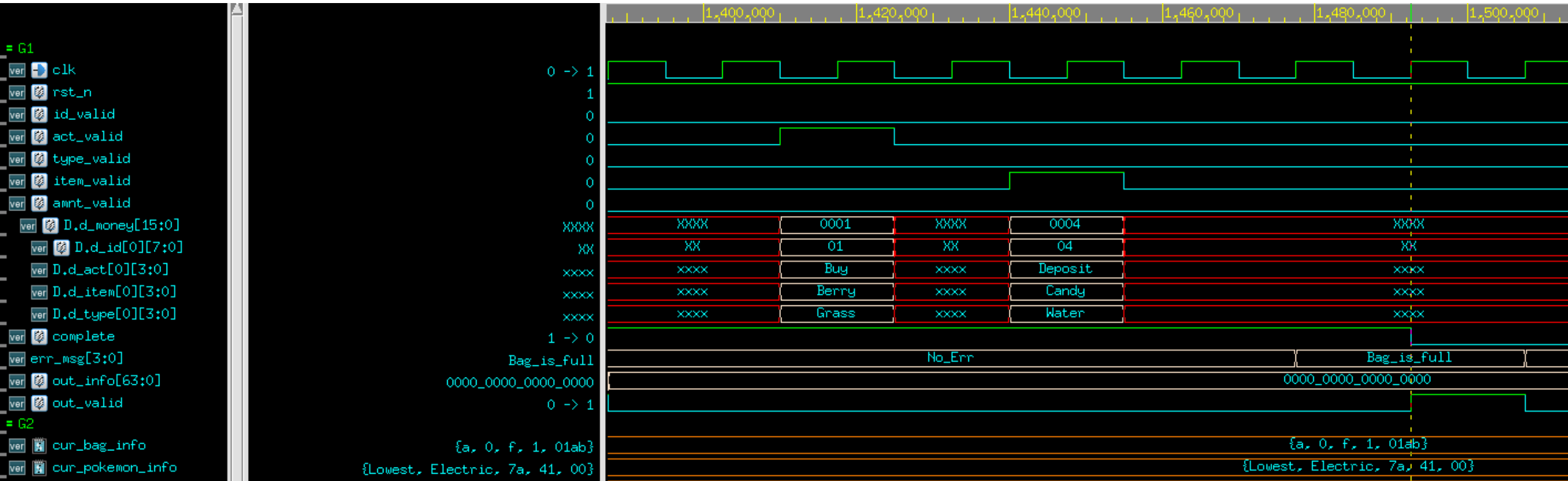
Case 10 – Buy (pokemon), but out of money



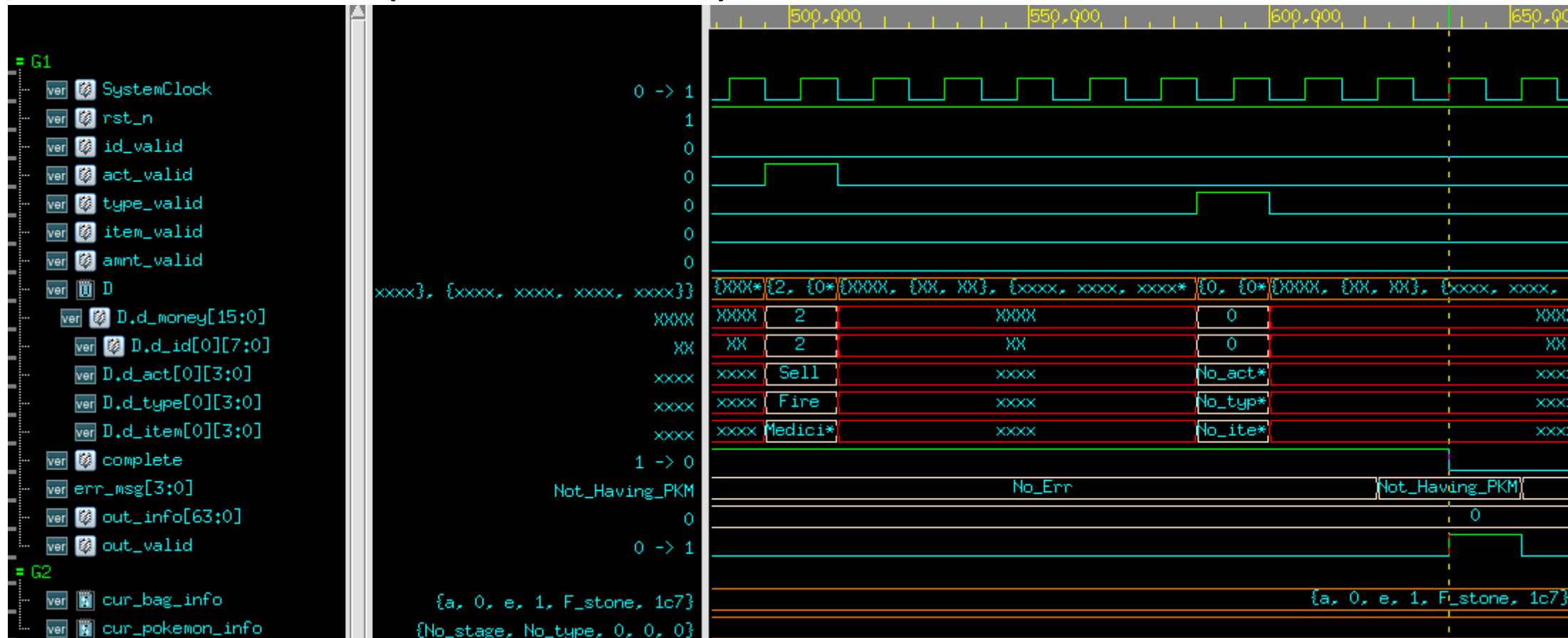
Case 11 – Buy (item), but out of money



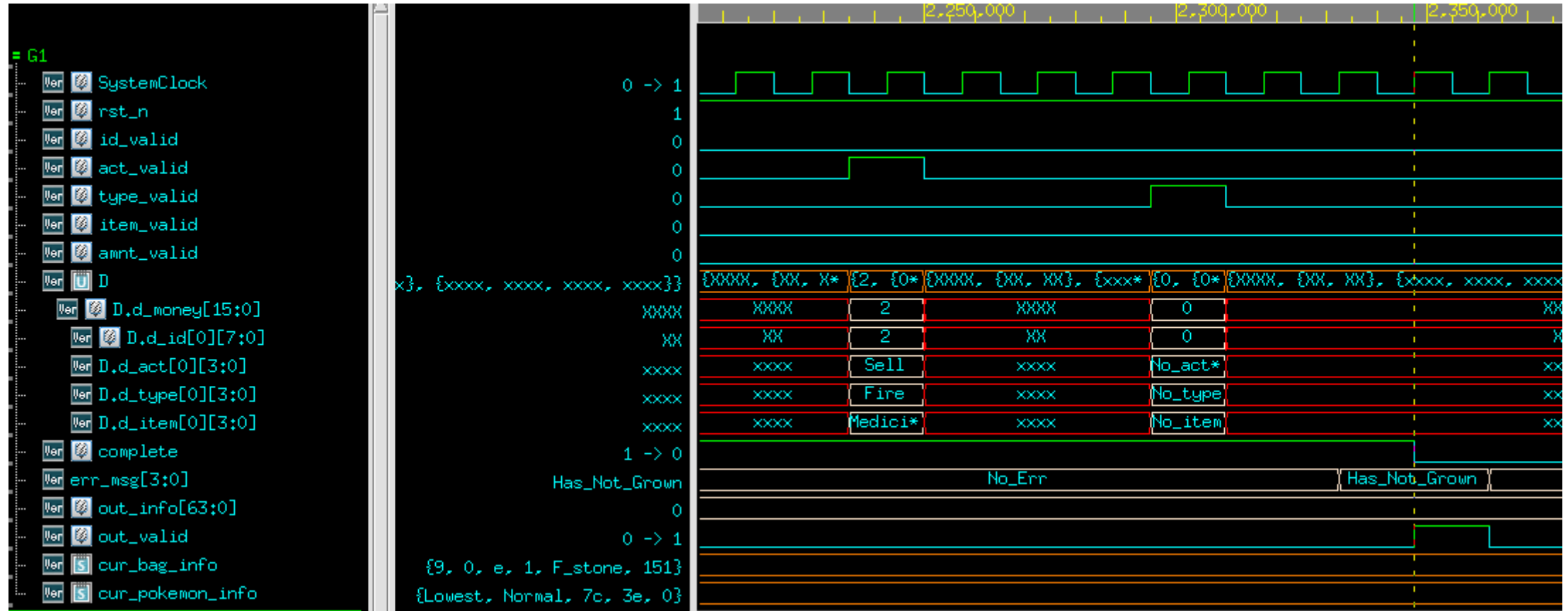
Case 12 – Buy (item), but bag is full



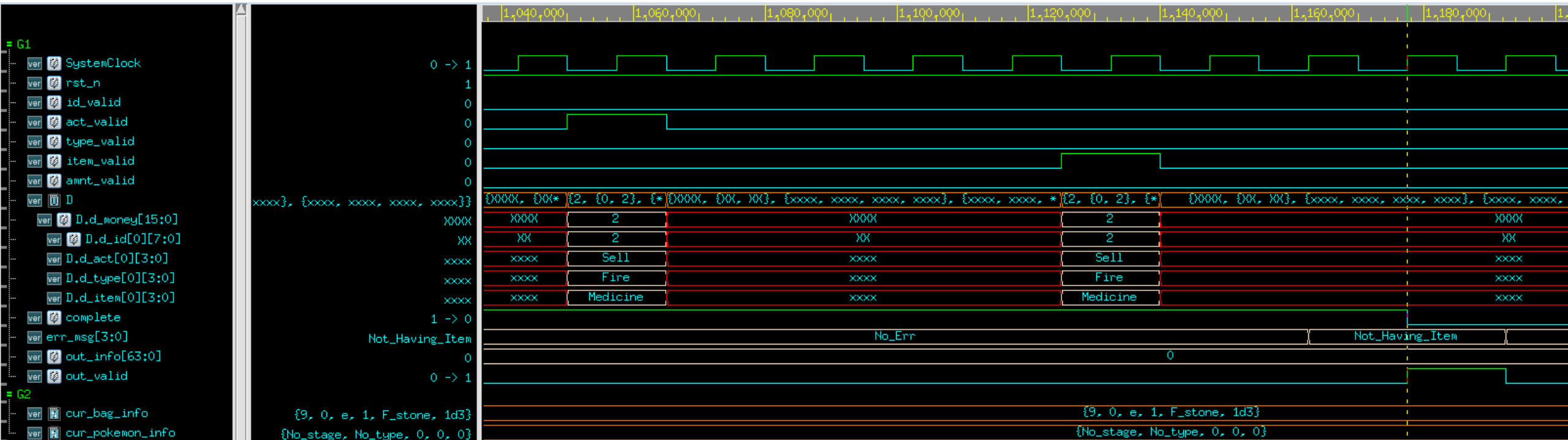
Case 13 – Sell (Pokemon), but do not have a Pokemon



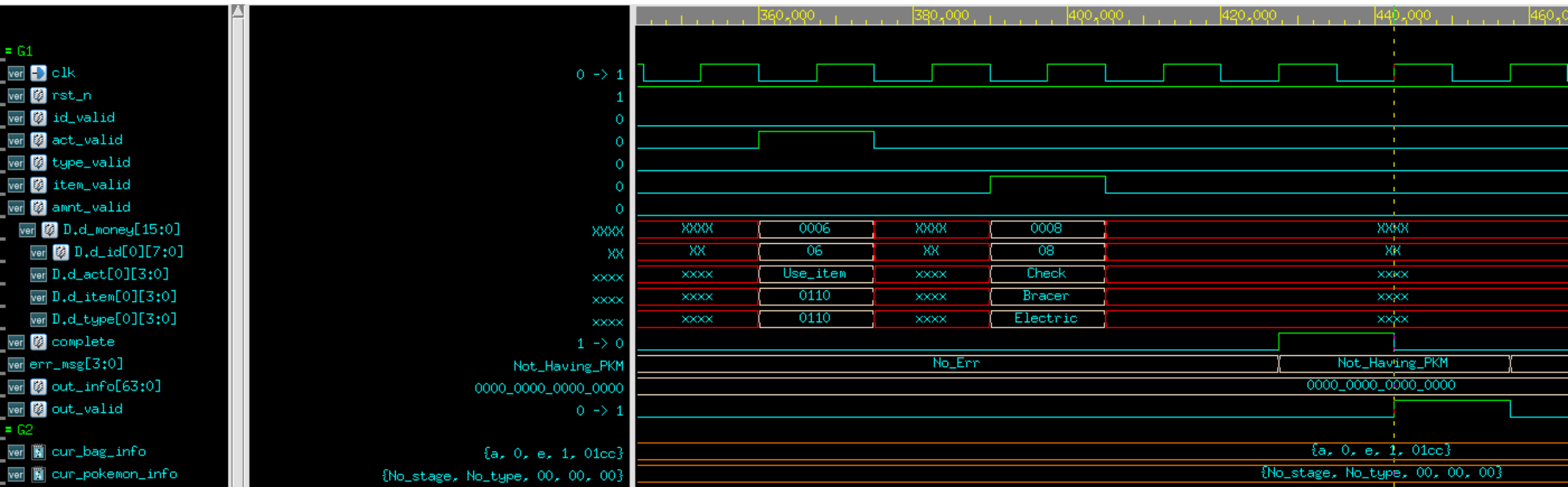
Case 14 – Sell (pokemon), but Pokemon is in the lowest stage



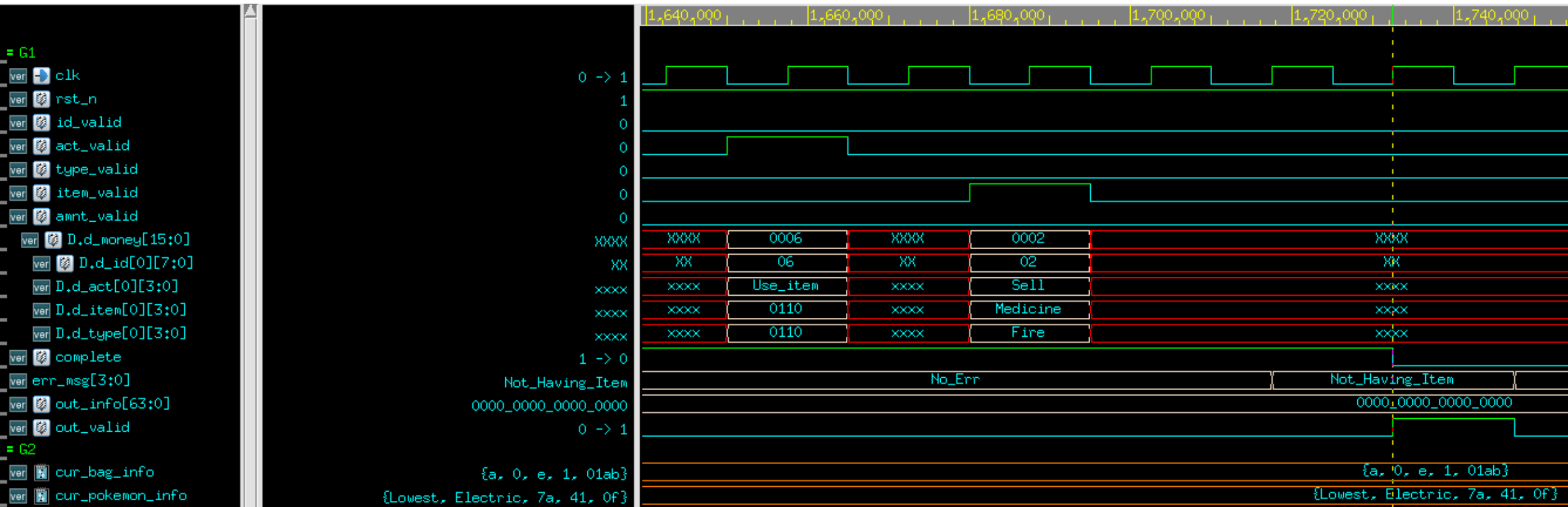
Case 15 – Sell (item), but do not have that item



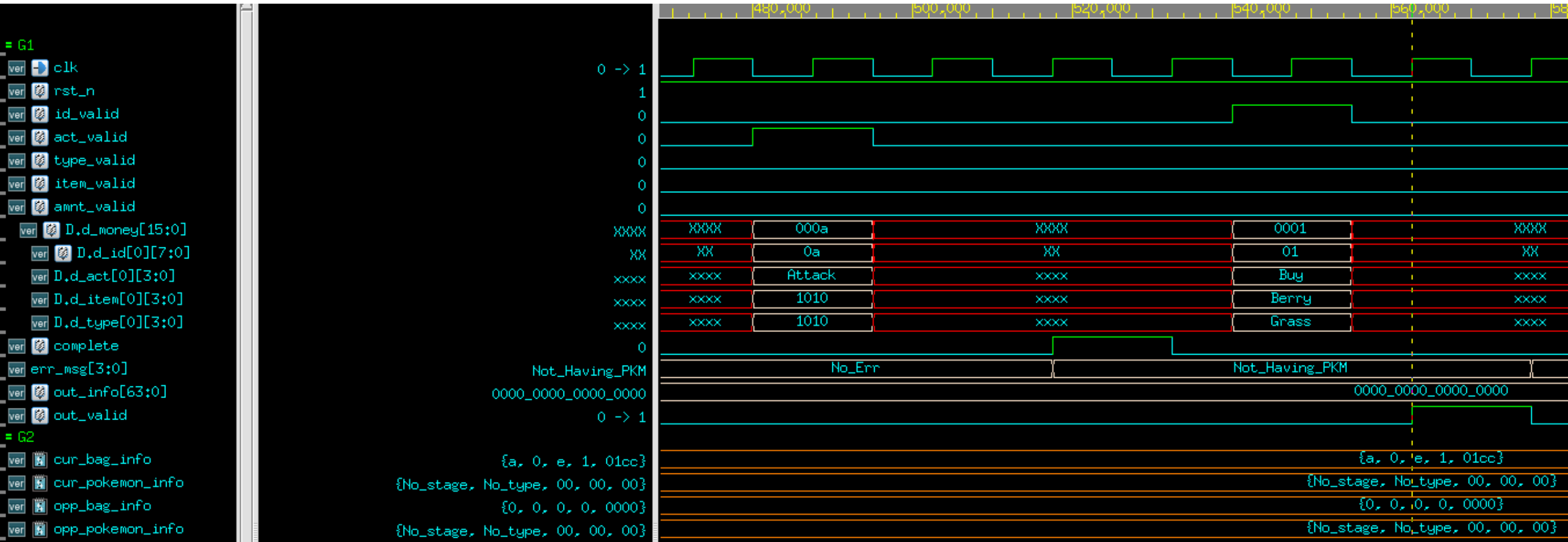
Case 16 – Use_item, but do not have a Pokemon



Case 17 – Use_item, but do not have that item



Case 18 – Attack, but do not have Pokemon



Case 19 – Attack, but HP is zero

