

Main memory

RAM is 1D: address and value

addr	Value
0	0
1	1
2	55
3	200
4	250
5	0
6	10
7	255
8	10
9	250
10	1
11	10
12	255
13	10
14	250
15	0
16	10
17	255
18	10
19	250
20	1
21	10
22	255
23	10
24	250

Sum of 250 = 25000

$$i = r \times \text{row_cols} + c$$

$$r = i / \text{cols}, c = i \% \text{cols}$$

↓

row, col

For P60, must fit 3 arrays for P60

0	1	55	200	250
1	10	255	10	250
2	1	250	0	10
3	10	255	10	250
4	1	250	0	10
5	10	255	10	250
6	1	250	0	10
7	10	255	10	250
8	1	250	0	10
9	10	255	10	250
10	1	250	0	10
11	10	255	10	250
12	1	250	0	10
13	10	255	10	250
14	1	250	0	10
15	10	255	10	250
16	1	250	0	10
17	10	255	10	250
18	1	250	0	10
19	10	255	10	250
20	1	250	0	10
21	10	255	10	250
22	1	250	0	10
23	10	255	10	250
24	1	250	0	10
25	10	255	10	250
26	1	250	0	10
27	10	255	10	250
28	1	250	0	10
29	10	255	10	250
30	1	250	0	10
31	10	255	10	250
32	1	250	0	10
33	10	255	10	250
34	1	250	0	10
35	10	255	10	250
36	1	250	0	10
37	10	255	10	250
38	1	250	0	10
39	10	255	10	250
40	1	250	0	10
41	10	255	10	250
42	1	250	0	10
43	10	255	10	250
44	1	250	0	10
45	10	255	10	250
46	1	250	0	10
47	10	255	10	250
48	1	250	0	10
49	10	255	10	250
50	1	250	0	10
51	10	255	10	250
52	1	250	0	10
53	10	255	10	250
54	1	250	0	10
55	10	255	10	250
56	1	250	0	10
57	10	255	10	250
58	1	250	0	10
59	10	255	10	250
60	1	250	0	10
61	10	255	10	250
62	1	250	0	10
63	10	255	10	250
64	1	250	0	10
65	10	255	10	250
66	1	250	0	10
67	10	255	10	250
68	1	250	0	10
69	10	255	10	250
70	1	250	0	10
71	10	255	10	250
72	1	250	0	10
73	10	255	10	250
74	1	250	0	10
75	10	255	10	250
76	1	250	0	10
77	10	255	10	250
78	1	250	0	10
79	10	255	10	250
80	1	250	0	10
81	10	255	10	250
82	1	250	0	10
83	10	255	10	250
84	1	250	0	10
85	10	255	10	250
86	1	250	0	10
87	10	255	10	250
88	1	250	0	10
89	10	255	10	250
90	1	250	0	10
91	10	255	10	250
92	1	250	0	10
93	10	255	10	250
94	1	250	0	10
95	10	255	10	250
96	1	250	0	10
97	10	255	10	250
98	1	250	0	10
99	10	255	10	250
100	1	250	0	10
101	10	255	10	250
102	1	250	0	10
103	10	255	10	250
104	1	250	0	10
105	10	255	10	250
106	1	250	0	10
107	10	255	10	250
108	1	250	0	10
109	10	255	10	250
110	1	250	0	10
111	10	255	10	250
112	1	250	0	10
113	10	255	10	250
114	1	250	0	10
115	10	255	10	250
116	1	250	0	10
117	10	255	10	250
118	1	250	0	10
119	10	255	10	250
120	1	250	0	10
121	10	255	10	250
122	1	250	0	10
123	10	255	10	250
124	1	250	0	10
125	10	255	10	250
126	1	250	0	10
127	10	255	10	250
128	1	250	0	10
129	10	255	10	250
130	1	250	0	10
131	10	255	10	250
132	1	250	0	10
133	10	255	10	250
134	1	250	0	10
135	10	255	10	250
136	1	250	0	10
137	10	255	10	250
138	1	250	0	10
139	10	255	10	250
140	1	250	0	10
141	10	255	10	250
142	1	250	0	10
143	10	255	10	250
144	1	250	0	10
145	10	255	10	250
146	1	250	0	10
147	10	255	10	250
148	1	250	0	10
149	10	255	10	250
150	1	250	0	10
151	10	255	10	250
152	1	250	0	10
153	10	255	10	250
154	1	250	0	10
155	10	255	10	250
156	1	250	0	10
157	10	255	10	250
158	1	250	0	10
159	10	255	10	250
160	1	250	0	10
161	10	255	10	250
162	1	250	0	10
163	10	255	10	250
164	1	250	0	10
165	10	255	10	250
166	1	250	0	10
167	10	255	10	250
168	1	250	0	10
169	10	255	10	250
170	1	250	0	10
171	10	255	10	250
172	1	250	0	10
173	10	255	10	250
174	1	250	0	10
175	10	255	10	250
176	1	250	0	10
177	10	255	10	250
178	1	250	0	10
179	10	255	10	250
180	1	250	0	10
181	10	255	10	250
182	1	250	0	10
183	10	255	10	250
184	1	250	0	10
185	10	255	10	250
186	1	250	0	10
187	10	255	10	250
188	1	250	0	10
189	10	255	10	250
190	1	250	0	10
191	10	255	10	250
192	1	250	0	10
193	10	255	10	250
194	1	250	0	10
195	10	255	10	250
196	1	250	0	10
197	10	255	10	250
198	1	250	0	10
199	10	255	10	250
200	1	250	0	10
201	10	255	10	250
202	1	250	0	10
203	10	255	10	250
204	1	250	0	10
205	10	255	10	250
206	1	250	0	10
207	10	255	10	250
208	1	250	0	10
209	10	255	10	250
210	1	250	0	10
211	10	255	10	250
212	1	250	0	10
213	10	255	10	250
214	1	250	0	10
215	10	255	10	250
216	1	250	0	10
217	10	255	10	250
218	1	250	0	10
219	10	255	10	250
220	1	250	0	10
221	10	255	10	250
222	1	250	0	10
223	10	255	10	250
224	1	250	0	10
225	10	255	10	250
226	1	250	0	10
227	10	255	10	250
228	1	250	0	10
229	10	255	10	250
230	1	250	0	10
231	10	255	10	250
232	1	250	0	10
233	10	255	10	250
234	1	250	0	10
235	10	255	10	250
236	1	250	0	10
237	10	255	10	250
238	1	250	0	10
239	10	255	10	250
240	1	250	0	10
241	10	255	10	250
242	1	250	0	10
243	10	255	10	250
244	1	250	0	10
245	10	255	10	250
246	1	250	0	10
247	10	255	10	250
248	1	250	0	10
249	10	255	10	250
250	1	250	0	10
251	10	255	10	250
252	1	250	0	10
253	10	255	10	250
254	1	250	0	10
255	10	255	10	250

addr	Val
0	0
1	10
2	200
3	9
4	10
5	200
6	95
7	9
8	200
9	9

For all bits, 1st 2 bits indicate how bits are stored (format)

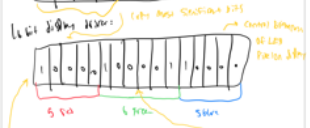
$$P_5 = \text{cols} - \text{rows} - 255$$
 (Note: 255 is the value, 255 is the constant)

16-bit (8-bit) → 16-bit (8-bit) → 16-bit (8-bit)
 (16-bit (8-bit) → 16-bit (8-bit))

Version 1 of file format, 2nd part

8-bit to 16-bit conversion

File format = 135; (Note: 135 is the value, 135 is the constant)



Human eyes are sensitive

image color to all colors in 16-bit grey

16-bit (8-bit) = 132; (Note: 132 is the value, 132 is the constant)

task: 16-bit in 8-bit grayscale and convert to 16-bit RGB

bits are 8-bit with

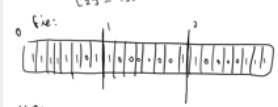
Windows 16-bit



Windows 16-bit register 6 bits to 16-bit

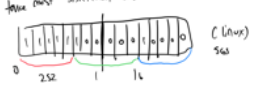
24-bit 16-bit RGB

File format = 132; (Note: 132 is the value, 132 is the constant)
 132 = 128 (Note: 128 is the value, 128 is the constant)
 132 = 132 (Note: 132 is the value, 132 is the constant)

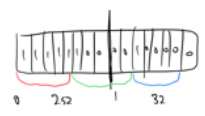


16-bit (8-bit) 16-bit (8-bit)

16-bit (8-bit) 16-bit (8-bit)



Windows: 555x



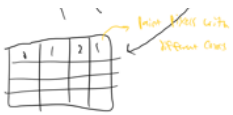
Color map

Format:

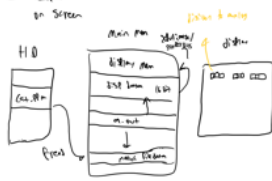
16	16	16	16
0	0	0	0
0	0	0	0
0	0	0	0

Map:

index	16	16	16
0	16	0	0
1	16	0	0
2	16	0	0
3	16	0	0



- Call 1 spans in table and written to buffer
- Read/write: when line on host call field or buffer on screen



- OS reserves latest part of mem for buffer or disk
- mem/heap is continuous X put int
- X put int is stream function