

Cardputer Mic

APIs and example programs related to the Cardputer Mic, applicable to Cardputer and Cardputer-Adv.

| Example Program

| Compilation Requirements

- M5Stack board manager version $\geq 3.2.2$
- Board option = M5Cardputer
- M5Cardputer library version $\geq 1.1.0$
- M5Unified library version $\geq 0.2.8$
- M5GFX library version $\geq 0.2.10$

```
1  #include <M5Cardputer.h>
2
3  static constexpr const size_t record_number = 256;
4  static constexpr const size_t record_length = 240;
5  static constexpr const size_t record_size = record_number * record_length;
6  static constexpr const size_t record_samplerate = 17000;
7  static int16_t prev_y[record_length];
8  static int16_t prev_h[record_length];
9  static size_t rec_record_idx = 2;
10 static size_t draw_record_idx = 0;
11 static int16_t *rec_data;
12
13 void setup(void) {
14     auto cfg = M5.config();
15     M5Cardputer.begin(cfg);
16
17     M5Cardputer.Display.startWrite();
18     M5Cardputer.Display.setRotation(1);
19     M5Cardputer.Display.setTextDatum(top_center);
20     M5Cardputer.Display.setTextColor(WHITE);
21     M5Cardputer.Display.setFont(&font::FreeSansBoldOblique12pt7b);
22
23     rec_data = (typeof(rec_data))heap_caps_malloc(record_size * sizeof(int16_t), MALLOC_CAP_8BIT);
24     memset(rec_data, 0, record_size * sizeof(int16_t));
25     M5Cardputer.Speaker.setVolume(255);
26
27     // Turn off the speaker, because the microphone and speaker cannot be used at the same time.
28     M5Cardputer.Speaker.end();
29     M5Cardputer.Mic.begin();
30     M5Cardputer.Display.fillCircle(70, 15, 8, RED);
31     M5Cardputer.Display.drawString("REC", 120, 3);
32 }
33
34 void loop(void) {
35     M5Cardputer.update();
36
37     if (M5Cardputer.Mic.isEnabled()) {
38         static constexpr int shift = 6;
39         auto data = &rec_data[rec_record_idx * record_length];
40         if (M5Cardputer.Mic.record(data, record_length, record_samplerate)) {
41             data = &rec_data[draw_record_idx * record_length];
42
43             int32_t w = M5Cardputer.Display.width();
44             if (w > record_length - 1) {
45                 w = record_length - 1;
46             }
47             for (int32_t x = 0; x < w; ++x) {
48                 M5Cardputer.Display.writeFastVLine(x, prev_y[x], prev_h[x], TFT_BLACK);
49                 int32_t y1 = (data[x] >> shift);
50                 int32_t y2 = (data[x + 1] >> shift);
```

```

51     if (y1 > y2) {
52         int32_t tmp = y1;
53         y1 = y2;
54         y2 = tmp;
55     }
56     int32_t y = ((M5Cardputer.Display.height()) >> 1) + y1;
57     int32_t h = ((M5Cardputer.Display.height()) >> 1) + y2 + 1 - y;
58     prev_y[x] = y;
59     prev_h[x] = h;
60     M5Cardputer.Display.writeFastVLine(x, prev_y[x], prev_h[x], WHITE);
61 }
62
63 M5Cardputer.Display.display();
64 M5Cardputer.Display.fillCircle(70, 15, 8, RED);
65 M5Cardputer.Display.drawString("REC", 120, 3);
66 if (++draw_record_idx >= record_number) {
67     draw_record_idx = 0;
68 }
69 if (++rec_record_idx >= record_number) {
70     rec_record_idx = 0;
71 }
72 }
73 }
74
75 if (M5Cardputer.BtnA.wasHold()) {
76     auto cfg = M5Cardputer.Mic.config();
77     cfg.noise_filter_level = (cfg.noise_filter_level + 8) & 255;
78     M5Cardputer.Mic.config(cfg);
79     M5Cardputer.Display.clear();
80     M5Cardputer.Display.fillCircle(70, 15, 8, GREEN);
81     M5Cardputer.Display.drawString("NF:" + String(cfg.noise_filter_level), 120, 3);
82
83 } else if (M5Cardputer.BtnA.wasClicked()) {
84     if (M5Cardputer.Speaker.isEnabled()) {
85         M5Cardputer.Display.clear();
86         while (M5Cardputer.Mic.isRecording()) {
87             delay(1);
88         }
89         // Turn off the microphone, because the microphone and speaker cannot be used at the same time
90         M5Cardputer.Mic.end();
91         M5Cardputer.Speaker.begin();
92
93         M5Cardputer.Display.fillTriangle(70 - 8, 15 - 8, 70 - 8, 15 + 8, 70 + 8, 15, 0x1c9f);
94         M5Cardputer.Display.drawString("PLAY", 120, 3);
95         int start_pos = rec_record_idx * record_length;
96         if (start_pos < record_size) {
97             M5Cardputer.Speaker.playRaw(&rec_data[start_pos], record_size - start_pos, record_samplerate);
98         }
99         if (start_pos > 0) {
100             M5Cardputer.Speaker.playRaw(rec_data, start_pos, record_samplerate, false, 1, 0);
101         }
102         do {
103             delay(1);

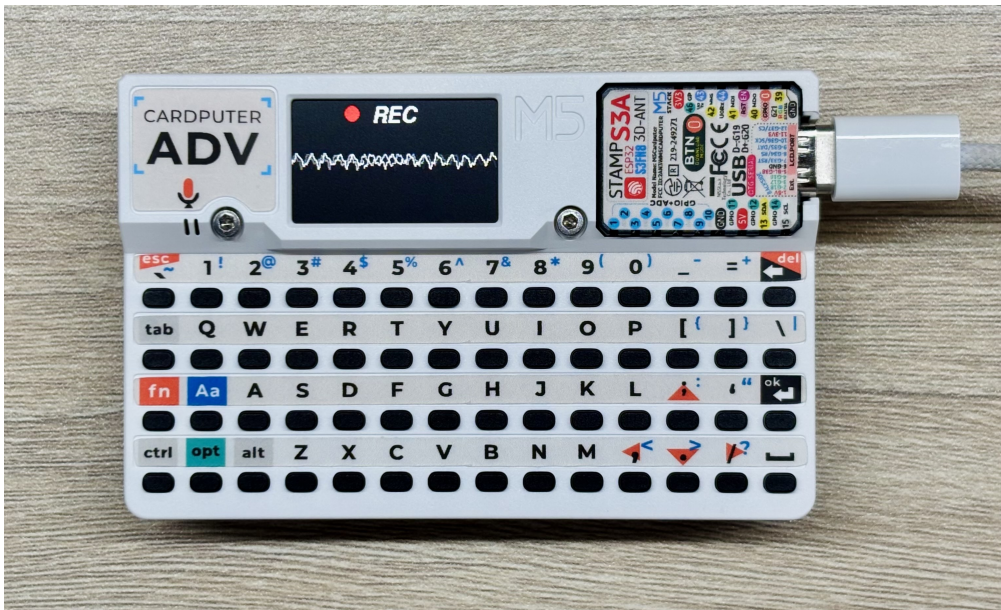
```

```

104     M5Cardputer.update();
105 } while (M5Cardputer.Speaker.isPlaying());
106
107 // Turn off the speaker, because the microphone and speaker cannot be used at the same time.
108 M5Cardputer.Speaker.end();
109 M5Cardputer.Mic.begin();
110
111 M5Cardputer.Display.clear();
112 M5Cardputer.Display.fillCircle(70, 15, 8, RED);
113 M5Cardputer.Display.drawString("REC", 120, 3);
114 }
115 }
116 }

```

This program displays the waveform of the sound collected by the microphone on the device screen, and buffers the recording of the last few seconds. By pressing the G0 button (BtnA) on the top side, the device will replay the most recent few seconds of recording (the playback volume will be lower than the actual volume).



API

The **M5Cardputer** library is built on top of the **M5Unified** library. The microphone driver uses the **Mic_Class** from the **M5Unified** library. For more detailed APIs, please refer to the following documentation:

- [M5Unified - Mic Class](#)