As the wearable electronics market evolves and matures, different smartwatch vendors (and different products within each vendor's line) are taking different paths to differentiation and (hopeful) success. Most devices are all-LCD or -OLED across the entirety of the watch face. LG's new Watch W7 takes the "unique" (and largely so-far panned, although as I write this I haven't yet seen any hands-on reviews) approach of placing mechanical watch hands in front of the full-face digital display. Then there's Martian's G1 and successor products, which devote only a portion of the face to a mini-OLED display for text-only notifications. They also offer Amazon Alexa, "OK Google," and Apple Siri voice interface options via an integrated microphone and speaker along with a Bluetooth tether to a companion smartphone, a capability which was the primary motivation for this teardown.

Martian may not be a familiar name to you; it wasn't to me until I saw its watches show up on closeout site Meh several times. Once the price dropped to $29 (plus $5 for shipping) I could no longer resist my curiosity and entered my credit card. Like Pebble, Martian started out as a Kickstarter-funded project back in 2012; the initial G1 family was succeeded by the mVoice (showcased here) and simpler mVip product lines. Martian returned to Kickstarter for the G2 family in late 2017, but the company's reportedly now down for the count; its website is still up and running, but everything's listed as being "out of stock," and retailers like Amazon and Meh seem to just be working through remaining warehouse inventory.

Enough of the background, on to the teardown. I'll start out with a few obligatory unboxing shots:
The **mVoice product line** was a fairly diverse combination of various colors and styles of faces, hands, and bands (which I suspect may have been part of the company’s challenge ... too much proliferation can lead to line item management nightmares versus being willing to "not optimally serve everyone" in exchange for a more focused product portfolio ... not to mention the [lukewarm-a-best reviews](#):
I think mine was pretty nice looking; it was a bit difficult to begin to dissect as a result, knowing I’d likely never get it back together again intact and fully functional:

Slipped behind the watch were two scant pieces of documentation:

And tucked into the watch band was a micro-USB-to-USB cable (employed by the mVoice for charging purposes), which I’ll be able to use in the future:
The left side of the watch encompasses the charging port (above) and speaker (below):

while on the right are three control buttons and (below them) the microphone:
Now for the back panel:

The *other* thing I’ll potentially be able to use in the future is the (nice, IMHO) leather band; it’s 22mm in width, easily removed and replaced, and uses an industry-standard clasp:
After removing four screws, thanks to my iFixit 64-bit driver kit, it’s time to dive inside:
The item glued to the back panel and cable-connected to the PCB is, perhaps obviously, a lithium polymer battery. But what’s that within the circular cutout in the PCB ... is that another coin battery cell (stay tuned)? The other obvious item discernible in this overview shot (aside from multiple ribbon cables and multi-wire harnesses) is the speaker in the lower right corner of the PCB.

Here are closeups of both the lithium polymer battery and its connector at the PCB:
Not desirous of an explosion I didn't try to peel the battery away from the panel ;-) 

Looking closely at the PCB, two screws were in obvious view, which I removed:
Peeling off the polka-dot stickers on the PCB revealed three more screw heads underneath:
In doing so, I realized that the "ring" around the watch frame was made of soft rubberized material (likely intended as an environmental seal), no hard plastic, and was easily removable:

I was able to get two of the three off, but the head on the third one stripped (and the rubber hand trick didn't help). It ended up only being used to attach one of the side-button "spring" contacts to the PCB so its removal was unnecessary for overall disassembly:
Disconnecting the ribbon cable between the main PCB and the micro-USB module, enabled removal off the latter:

Here are some micro-USB module closeups:
After removal of the rubber gasket, I started carefully wrestling the PCB assembly out of the watch frame, assisted by a flat head screwdriver-as-lever and beginning with the lower edge. Here's what the end of the speaker module looks like:

And the microphone has now popped into view, too:
With the PCB assembly free of its confines, here's what its backside looks like:

![PCB Backside](image)

Here's a closeup of the now-visible OLED module:

![OLED Closeup](image)
And here's what's left inside the watch; that IS a coin cell!

Here's a closeup:
What Martian seemingly did here, which was surprising at first but seems quite clever in retrospect, was to leverage a mainstream, mature, cost-effective mechanical clock module (including its own battery) for the clock hands, relying on the lithium polymer battery to power the remainder of the watch. Coin cell replacement could occur fairly easily via the cutout in the PCB, once the back panel was removed. **PCB components**

Speaking of removal, by the way, post-disassembly I realized that removal of the aforementioned screws wasn't necessary to lift the PCB assembly out of the watch frame. Speaking of which, I still wasn't able to separate the PCB from the plastic frame to which it was normally connected, a function that screw removal *should* have allowed. Looking under the ribbon cable that previously tethered the PCB to the micro-USB module, I found one more screw hiding there:
With that final stealth screw out of the way, and the ribbon cable between the PCB and OLED module also disconnected, liftoff was finally achieved:

Looking first at the now-exposed backside of the plastic assembly, the haptic vibration motor disc is now discernable. Here's a closeup:
Now for the "business" side of the PCB:
The dominant IC in the landscape is [Qualcomm's CSR8670 Bluetooth Audio SoC](https://www.qualcomm.com/), used to send microphone-sourced audio to a wirelessly connected smartphone or tablet, speaker-intended audio from the tethered mobile electronics device back to the smartwatch, and general control and management commands between the two. The square region to its left, I'm guessing, where the PCB-embedded Bluetooth antenna resides:

And here are some closeups of other areas of this side of the PCB:
The bulk of the other side of the PCB contains connectors:

The manufacturer and model of the IC that's seemingly responsible for the microphone and speaker is indeterminate, but I'm guessing its functions include an ADC (for the mic) and a DAC plus class D amplifier (for the speaker):
And here's a zoom-in on the dominant IC on this side of the PCB, a Macronix MX25L25635E 256 Mbit serial interface NOR flash memory:
Truth be told, in summary, this is a fairly nondescript (albeit compact) hardware design. And, to quote Shakespeare, "aye, there's the rub." The "magic" happens in the associated Android and iOS apps which, assuming industry reports are correct and the company (like a parrot) is now bereft of life, are no longer being maintained. At least (versus Pebble, for example) there's seemingly no associated server dependence that will hasten the watch's functional terminus. Nevertheless, ongoing Android and iOS operating system evolution will inevitably sooner-or-later result in application (therefore watch) demise, unless the code is open-sourced (and, even then, with a future dependent on uncertain-at-best developer attention). Which is why Meh wisely included the following offer in their last few sales attempts:

Some of you – the button-down squares among you, who value predictability above all else, and who never understood the appeal of the television game show “Press Your Luck” – are gonna worry that when a smartwatch maker goes under, their smartwatches might soon stop working.

First, let’s just say that even if all the “smart” stuff shuts down, you’ll still have a pretty OK watch.

Second, we don’t have any reason to expect that will happen. But who knows? Maybe a server bill goes unpaid somewhere in the next couple months, and your Martian watch can’t do its notifications thing anymore. Systems are complex. Life’s unpredictable. Excrement transpires. So we’ve cooked up a nutty warranty scheme to help assuage your worries.

In addition to a standard four-month Mediocre warranty on regular hardware-type issues, we’re offering four months of coverage, starting today, against sunsetting of the “smart” functions on these watches.

If, within a month from today, your Martian watch software fails, unsupported by its no-longe-existent manufacturer, we’ll give you four $10 coupon codes for use at Meh (or other Mediocre stores).
If it happens in the second month, we’ll send you three such codes.

If it happens in the third month, we’ll send you two.

Fourth month, one.

Also, we’re offering this same smart-functions coverage to anyone else who bought a Martian watch from us earlier in 2018. Effective automatically. (But you will have to email us to ask for your coupon codes if it happens.)

Hopefully this makes you feel better about gambling on – again – a pretty nice watch even without “smart” functions. And we think we’ve priced these in a way that makes them worth the risk.

In our opinion, the attitude to take here is one of COME ON, BIG MONEY, NO WHAMMIES.

Clever writers, those Meh folks! Thoughts, readers? As always, I welcome your feedback in the comments.

— Brian Dipert is Editor-in-Chief of the Embedded Vision Alliance, and a Senior Analyst at BDTI and Editor-in-Chief of InsideDSP, the company's online newsletter.

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