
Motorola DynaTAC 8000 -X -S -L -M

Autor:

Data de publicació: 20-10-2017

"The further backward you look," said Winston Churchill, "the further forward you can see." In that spirit, we've cracked open one of the original Motorola Analogmobile Phone System (AMPS) "brick phones" to do a retro teardown.

It seems appropriate to pay tribute to the earlier days of mobile-phone development and—with a little extrapolation—use our findings as a benchmark for what the future may hold.

The late-1980s design—also dubbed DynaTAC—from the cellular leader of the day is certainly not small. Measuring 8.3-by-4.5-by-19.5cm (even absent the 14cm-long whip antenna) and weighing in at 670g, the handheld sold in earliest form for nearly \$4,000 in mid-'80s money. Adjust for inflation, and those wanting to go mobile were staring at a price tag in excess of \$7,000.

From a functional standpoint, the brick did pretty much one thing—make a call. While the design could store and recall selected phone numbers, there were no cameras, color screens, MP3 players or high-speed data capabilities to be found. Ironically, of course, voice remains the killer app for mobiles. Particularly for emerging markets, the voice-only handset remains the target device.

So what's going on inside this old-school hardware? As an analog phone, the architecture is quite a bit different from today's digital terminals. AMPS is based on frequency-division multiple access, which splits transmit-and-receive signals into different portions of the cellular band. Outbound signals are FM versions of the spoken voice upconverted to the 824- to 850MHz portion of the RF spectrum, where they are amplified and transmitted. Conversely, received FM signals are downconverted and demodulated from spectrum in the 869- to 894MHz region.

Motorola DynaTAC 'brick' phone (Click image to view teardown diagram)

Within each of these transmit/receive bands, the cellular network assigns a narrow, 30kHz-wide channel for each caller, implemented in concert with the mobile device's tuner and the means by which multiple channels (callers) share a cell. Because the AMPS system uses purely analog modulation and transmission schemes, security in conversation is nonexistent. As with much of today's public-safety radio network, a readily available scanner allows call eavesdropping.

Digging deeper into the specific design—a DynaTAC whose exact model number wasn't clear—we find three primary PCBs. Function is partitioned onto a "human interface board" (supporting keyboard, display and audio I/O), a "baseband board" for nonradio electronics and the "RF board" containing all the air interface circuitry. A stout plastic two-piece enclosure with plated internal walls for shielding and a slide-on 245g NiCd battery, which runs the length of the handset, surround the three-board stack.

The human interface board implements a membrane keypad whose underlying technology is still employed in handsets today. Three small IC devices serve the needs of speaker interface, keypad control and display drive. The display itself is based on a seven-character, seven-segment LED module with integrated indicators for In Use, Roam and No Service (some things never change).

Baseband functions are contained on the second board, whose primary devices are Motorola (now Freescale) chips. As with most devices in the phone, parts are of a custom nature. That, combined with the age of the components, made research on IC function next to impossible; so the designation of microprocessor and audio processors is speculative, but consistent with expected architecture. A dedicated analog chip was used for battery interface and system power regulation.

Definitive component ID on the radio board was challenging for the same reasons, but inspection and trace-out suggest a single-chip transmit path and an intermediate-frequency (IF) demodulator. The MC145158 PLL frequency synthesizer used as the reference oscillator for mixing was one of the few parts still available as old stock through hobbyist and commercial hoards.

Front-end receiver amplification and RF-to-IF downconversion appear to be implemented in discrete components. Of particular note on the RF board are the RF power amplifier and duplex filter, the latter responsible for splitting transmit-and-receive sub-bands. Size and weight of both have dropped dramatically with the passage of time, with the duplex filter used here coming in at more than 100 times the weight and volume of modern equivalents.

Other noteworthy benchmarks include the use of socketed E2PROM from National Semiconductor, a company that left the often-brutal world of memory devices almost a decade ago. At 64KBytes, system code and user storage is a tiny fraction of that found in even the most basic of modern handsets.

To play the design forward, consider the impact of 15 years in phone design and evolution. Comparing a 2006 entry-level voice cellular terminal to the DynaTAC, we have one-tenth the weight and volume, five to 10 times the talk time and one-tenth the cost, all in an everyday phone. Continuing at this rate, the next 15 years will give us sugar-cube-size cellular communications with gigabytes of storage, weeks or months of practical use-time per charge and a cost of under \$5. Of course, human interface limitations and some physics could get in the way of such a feat, but it's an interesting point to ponder.

While not too hip anymore, the brick launched an industry still growing by leaps and bounds today, with targets set for bringing on board "the next billion users." Interestingly, though, not everyone rejects the DynaTAC's somewhat gargantuan simplicity even now. Enterprising shops in Asia and elsewhere are actually hacking modern phone guts into the cases of their oversize forbears to make the MP3-playing, picture-taking, color-screen aspects of today's handsets available in brick form.

So, feel free to slip on your Ray-Bans, put on some Eurythmics and make that call in retro style. Just don't forget the significant and serious accomplishments of the cellular pioneers; we're standing today on the shoulders of some pretty impressive technology history.

El telèfon mòbil Dynatac 8000X va ser desenvolupat l'any 1983 per Motorola, sent el primer telèfon mòbil del món i va ser posat a la venda el 13 de març del mateix any. Pesava 800 grams i mesurava 33 per 4,5 per 8,9 centímetres. A la data de sortida al mercat del producte, costava 3.995 dòlars nord-americans i la seva bateria tenia únicament la autonomia d'una hora en conversa. Un any més tard (1984) 300.000 usuaris havien comprat el terminal. Aquest primer pas de la revolució mòbil venir de la mà de Rudy Krolopp.

La Sèrie DynaTAC va ser succeïda per la Sèrie MicroTAC el 1989, i aquesta al seu torn per la Sèrie StarTAC. "TAC" era una d'abreviatura de Total Àrea Coverage en els tres sèries.

Martin Cooper utilitzant un Motorola DynaTAC.

- 1 Historia
- 2 Descripció de
- 3 Referències
- 4 Enllaços externs

Història

Mentre Motorola estava desenvolupant el seu propi telèfon mòbil, durant 1968-1983, Bell Labs va treballar en el sistema anomenat AMPS, mentre que altres van dissenyar telèfons mòbils per a aquest i altres sistemes cel·lulars. Martin Cooper, ex gerent general de la divisió de sistemes de Motorola, va dirigir un equip que va produir el DynaTAC 8000X, el primer telèfon mòbil disponible comercialment prou petit com per portar fàcilment, i va realitzar la primera trucada telefònica des d'allà. Dr. Martin Cooper va ser la primera persona a fer una trucada telefònica cel·lular analògica en un prototip en 1973.

Martin Cooper és considerat un desenvolupador clau del telèfon mòbil. Va ser el primer telèfon portàtil veritable. Abans existien telèfons que es consideraven "telèfons per a automòbils", però eren massa grans com per transportar-los.

El Motorola DynaTAC 8000X era molt gran en comparació amb els telèfons actuals. Aquest primer telèfon mòbil va ser molt car quan es va llançar en els EE. UU. En 1984. El preu minorista de DynaTAC, \$ 3,995 (al voltant de \$ 9600 en dòlars de 2016 [3]), va assegurar que no es convertiria en un element del mercat de masses; El 1998, quan Mitchell es va retirar, els telèfons mòbils i els serveis associats representaven dos terços dels ingressos de Motorola per valor de \$ 30 mil milions. [10]

El 13 d'octubre de 1983, David D Meilahn va col·locar la primera trucada sense fil comercial en un DynaTAC des de la seva Mercedes 380SL 1983 fins Bob Barnett, expresident de Ameritech Mobile Communications, qui després va fer una trucada a un DynaTAC des d'un Chrysler convertible al nèt de Alexander Graham Bell, que va estar a Alemanya per a l'esdeveniment. L'anomenada, realitzada en Soldier Field a Chicago, és considerada per molts com un important punt d'inflexió en les comunicacions. Més tard, Richard H. Frenkiel, cap de desenvolupament de sistemes de Bell Laboratories, va dir sobre el DynaTAC: "Va ser un triomf real, un gran avanç" [11].

Descripció

La sèrie DynaTAC 8, Classic, Classic II, Ultra Classic i Ultra Classic II tenia una pantalla que feia servir LEDs vermells; la sèrie DynaTAC International, LEDs verds, i la DynaTAC 6000XL feia servir una pantalla fluorescent de buit. Aquestes pantalles estaven severament limitades en la informació que podien mostrar. La bateria permetia una trucada de fins a 60 minuts, després de la qual cosa era necessari carregar el telèfon en 10 hores en un carregador lent o en una hora en un carregador ràpid, que era un accessori separat. el 6000XL, encara conservava el nom de DynaTAC, no tenia cap relació amb la sèrie DynaTAC 8000, ja que era un telèfon transportable destinat a ser instal·lat en un vehicle.

A més del típic teclat numèric (keypad) telefònic, tenia nou tecles especials, situades sota d'aquest:

- Rcl (Recall).
- Clr (Clear).
- Snd (Send).
- Sto (Store).
- FCN (Function).
- End (End).

PWR (Power).
Lock (lock).
Vol (Volume).

Models
America series (analògic)

DynaTAC 8000X

DynaTAC 8000L

DynaTAC 8000S

DynaTAC 8000M

DynaTAC 8500x
DynaTAC 8900x (1989)

International 3200/3300

Ultra Classic/II

International series (GSM)

International 3200/3300

Referències

«Motorola DynaTAC: el primer telèfon mòbil va arribar al mercat fa 30 anys» . Consultat el 14 de març de al 2014.

Enllaços externs

Imatge del Motorola DynaTAC 8000X

MOTOROLA 8000 1981 PROTOTYPE

MOTOROLA DYNATAC 8000X

The age of the cellular phone truly began with the Motorola DynaTAC 8000X cellular phone, the world's first commercial cell phone. This Motorola cell phone is a major piece of history and demonstrates how far this type of technology has come since it was first created. In 1983, the one hour of talk time available on the Motorola DynaTAC 8000X cellular phone was a significant milestone, especially when measured alongside the eight hours of standby time and LED display featured on this phone. This particular Motorola cell phone features a white color scheme, which is the same color scheme seen in many historical photos and films from that era. This cellular phone is the 8000X model, which featured a smaller LED display than the later 8000M and 8500X models, which had a larger display..

MOTOROLA DYNATAC 8000S Mark II

The year was 1987. Wall Street starring Michael Douglas was one of the blockbuster movies that became a cult movie partly because of the memorable quotes. For me, one of the more distinct scenes was Gecko talking on his then, very cool Motorola brick phone. He was “the man” with the cool gadget that would change business, if not communications.

Fast forward 23 years later, Wall Street: Money Never Sleeps is being released later this year and I hope to be one of the first to see it on opening night. A chance to attend a sneak preview would even be better. So what's different? There's a Facebook fan page and a twitter account: @officialwallst to help advertise. I'm sure as it gets closer, there will be other things to help promote the anticipated movie release.

MOTOROLA DYNATAC 8000M 1990's

MOTOROLA DYNATAC 8000 Cellular ONE 1992

Motorola Vintage Thick Brick Cell Mobile Phone F09NFD8404AG ABZ89FT5723

This Motorola Cell Phone is the thick regular full size brick phone 1980's ERA. This Rare Brick Phone is going to be worth a FORTUNE in the coming years! This is a beige phone. includes the 12 car adapter there is a few stickers and the antenna is missing and it has tiny etchings on top as shown

MOTOROLA DYNATAC 8000 Cellular ONE 1992

Manel's

Motorola ultra classic brick phone in excellent condition. There is no charger included, I have not been able to test the phone. It's condition is near mint and comes with a carrying pouch with hand strap, perfect for toting your phone between important business meetings.

MOTOROLA DYNATAC International 3200 GSM