M-PA 101

Part #4: *Essential Items*

By Mark Cobbeldick, KB4CVN 2014-11-07

ESSENTIAL ITEMS FOR BUILDING/SERVICING A M-PA RADIO:

Now that you have made the decision to build an M-PA radio, there are a few items you will need to successfully complete the task. I will classify these into three different categories:

1. **HAND TOOLS**
2. **HARDWARE**
3. **SOFTWARE**

HAND TOOLS:

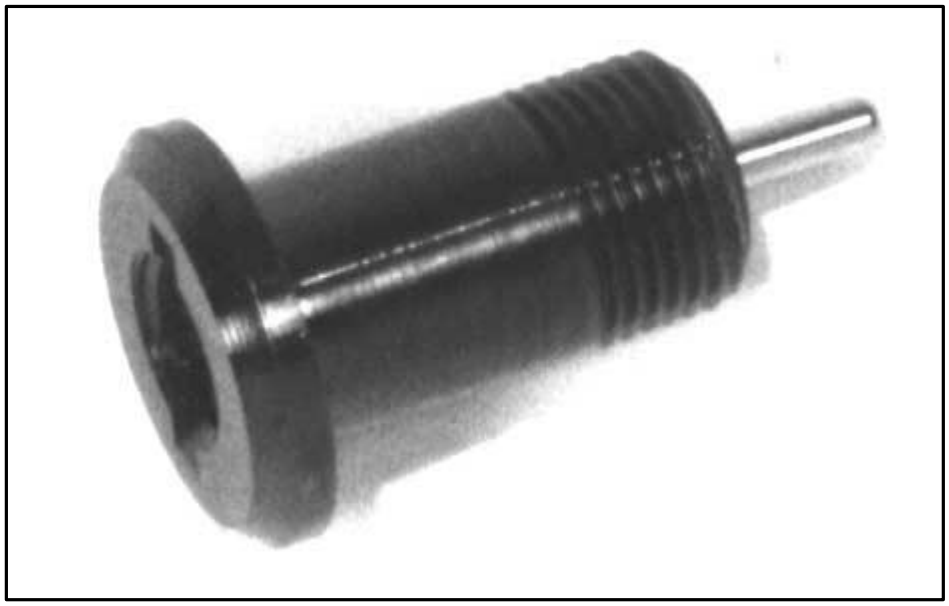
1. **T6 Torx driver** One of the great things about the M-PA family of radios is almost everything on the radio can be assembled and disassembled with a single tool: A **T6 Torx driver**.

   The rear cover is removed by loosening four captive screws in the cover. All internal boards and assemblies also use the same T6 Torx driver screws.

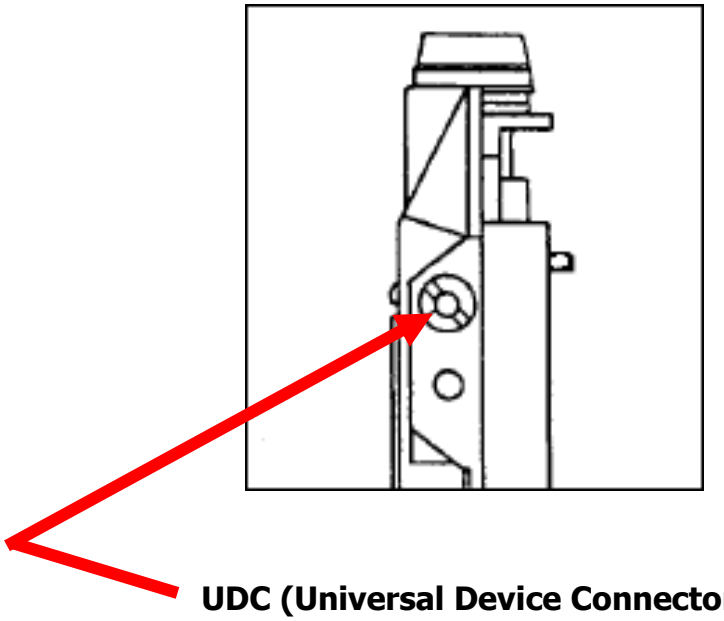
   However, I must mention that the original production run of M-PA radios used a **#0-Phillips Screws** in the rear cover. In all the years I have been involved with this product, I have only encountered one lone radio with the Phillips screws out of several hundred I have worked on or assembled. I doubt you will ever encounter one.

   When purchasing a T6 Torx Driver, strongly suggest purchasing at least two (2). Murphy's Law will dictate that one driver will fall on the floor and roll under something unmovable at the exact moment you are assembling a radio. My favorite is the Sears Craftsman brand. About $4.00 each.

2. A common **1/4 inch flat blade screwdriver** will come in handy for removing the Antenna Insert (PN# 19B801618P1) on the top of the radio, and the UDC (Universal Device Connector) antenna port on the side of the radio. The Antenna Insert has a 7mm thread which is common to most all GE portable radios, but there is also a flat-slot cut into the jack for installation/removal. There is a special BIT available to fit a drive handle. There is also a special BIT available for the UDC's antenna jack. If you can find these special BITS, great. But you can get by without them.



Antenna Insert (PN# 19B801618P1) on top of radio.



UDC (Universal Device Connector)
antenna port on side of radio.

3. **<u>30 Watt Soldering Iron and Solder</u>** will be required if you are repair a 'punched-out' keypad flex assembly. The other thing a soldering iron will come in handy for is to bypass the *CRYPTOGRAPHIC KEYDUMP TAMPER SWITCH* found on the "Ø81" Control Logic Board. This was a requirement for DES Encrypted radios sold to the US Federal Government under the old FS-1027 standard's Physical Security requirement, and can be annoying as hell for our purposes. A solder blob is used to bypass this switch. (More on this topic in a later installment.)

4. **<u>Anti-Static pad or workstation</u>** will help in protecting the radio assemblies from stray static damage. Anyone who has worked with static sensitive electronics or Personal Computers will understand this. As an alternate, a simple board (or workbench) covered with aluminum foil sheets that have been grounded will serve the same purpose. A simple piece of copper wire attached to your wrist and connected to the aluminum foil sheets will serve [as a wrist strap] to drain any static charges in your body, and equalize with the radio being serviced on the bench. *(Don't get all worried about this. It is easier than it sounds!)*

HARDWARE:

1. You will need a **Personal Computer or laptop**. If it has a RS-232 Serial Port, all the better. If not, you will require a USB-to-Serial Adapter. All programming, firmware upgrade or changing, and radio maintenance adjustments are done via software.
2. A **USB-to-Serial Adapter**. I like ***SeaLevel*** brand products, and recommend their **SeaLink 2105R adapter**. (http://www.sealevel.com/store/serial/asynchronous-serial/usb/2105r-usb-to-1-port-rs-232-db9-serial-interface-adapter.html) Never had one fail. And it has TX and RX data LEDs on it to indicate that the device is communicating with the radio.
3. A **RS-232 cable** to connect radio programming interface box to the computer's Serial Port or a USB adapter.
4. A **TQ-3370 Programming Interface Box**, or equivalent. This is the interface between the radio and the computer. A photo of this box is shown below. The 110 Volt power supply cube is <u>not required</u> for the M-PA series radio.

TQ-3370 PC Programming Adapter Kit
(complete with accessories and power supply)

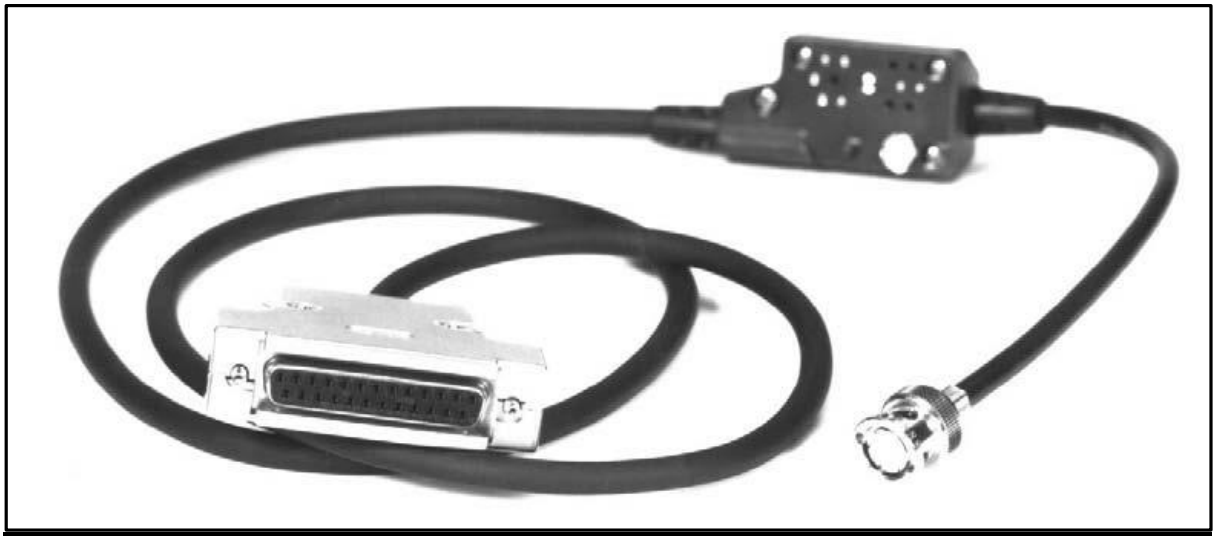
EQUIVALENT BOXES are available from several sources. Harris Corporation, who is the current owner of the old GE radio operations in Lynchburg, Virginia has priced a new TQ-3370 kit at the ridiculous price of $1,500.00 each. Their final production run was for a total of 500 boxes. Therefore a surplus box or alternative is your best bet.

Also, the original **TQ-3310 programming box** is available surplus on the internet and at Hamfests. However, **the TQ-3310 WILL NOT FLASH UPGRADE AN M-PA PORTABLE RADIO**. When this older TQ-3310 box was released, the concept of flash upgradable BIOS in a radio did not exist. The later TQ-3370 added this feature.

Price Industries manufactured an aftermarket TQ-3370. I have one, and it works great.

RFGuys.com is new selling an aftermarket TQ-3370 which plugs directly into a USB port (eliminating the need for a USB-to-Serial adapter). See: http://www.rfguys.com/product/brand-new-tq3370-tq3310-interface-replacement-for-ge-ericsson-macom-radio-programming-rpm-programmer

5. A **TQ-3311 Programming Cable**.



TQ3311 (PN# 19A705477) **PC Programming Cable**

There are two different versions of the M-PA programming cable. The original cable for the M-PD series radio (PN# 19A705477**P1**) also supported the M-PA radio, but did not support Flash upgrading. When that technology was developed, a second cable (PN# 19A705477**P2**) was released that did support Flash upgrading of a radio. The only difference between the two cables is position of one wire. [In the P1 cables, the GREEN wire is on Pin-10 of the DB-25 connector. In the FLASH capable P2 cables, this GREEN wire is moved to Pin-5 of the DB-25 connector.]

This change is documented in a Technical Service Memo (TSM) which will be available for download from the Sparks31 website.

EQUIVALENT CABLES are available from several sources.

RFGuys.com also sells an M-PA radio cable. See: http://www.rfguys.com/product/ge-mpa-mpd-mtl-p400-vhf-uhf-programming-cable

Note:

I have no personal experience with any **RFGuys.com** products, and therefore cannot offer any endorsement as to their quality, good or bad.

SOFTWARE:

All of the software for these radios is DOS based. Older computers with Win-2000 and earlier will handle these DOS applications without issue. Newer computers with Win-7 or later might need to be configured to run in a Win-95 Compatible Mode.

M-PA (TQ4339) is the Conventional version programming software.

EDACS-1 is the Trunked version programming software, and is required for 900 MHz amateur radio operation. It is also used if your are programming an 800 MHz radio for monitoring an EDACS system.