Motorola MTR2000

Station Index Page
Maintained by Robert Meister WA1MIK

The MTR2000 has been replaced by the MTR3000. You can purchase (for a lot of money) a conversion kit to upgrade your MTR2000 station to an MTR3000 station. The kit has a new exciter, receiver, and control module, as well as a new front cover. This index page has some MTR3000 information as well.

The Product Planning guides as well as some sales literature may show two model numbers for the same station, with no explanation of what the differences are. For example, a VHF station has model numbers T5544 and T5766. These stations are identical; one number is used when the station is ordered through a dealer, while the other number is used when the station is ordered directly from Motorola inside sales. Thanks to Eric, now we all know.

The CW ID on the MTR2000 is a "polite" ID. It will be transmitted when the station is otherwise idle and without PL/DPL, which is standard for Motorola equipment. If the station is keyed up during the CW ID, it will stop transmitting the CW ID and try to do it all over again when the station goes idle. It could go on like this forever and may never ID. The only parameter you can change in RSS is the CW ID interval; any other parameters (such as tone frequency and speed) aren't presented in RSS.

Articles and Other Information:

- Some notes on the MTR2000   by Eric Lemmon WB6FLY
  Read this article before buying either a new or a second-hand MTR2000. It contains some excellent information including an important caution to anyone contemplating buying an MTR2000.

- When interfacing an MTR2000 station to **ANY** external repeater, D-STAR, DMR, or DVM controller, make sure you've set the station configuration (Repeater/Base) to **BASE** so the station looks like a fully independent receiver and transmitter. This removes the internal repeater controller from the

audio and PTT paths.

- 🔴 If your station has a Wireline board, make sure you set it to **4-wire** even if you aren't using it. If set to "2-wire", the receiver audio will be muted when the transmitter is active, because the 2-wire configuration only lets one audio signal pass at a time. This is crucial when the station is configured as a "BASE" and an external repeater controller is being used.

- 🔴 If you're interfacing an MTR2000 station using the MRTI connector, make sure you've set the External PTT Mapping on the Channel Information / PTT screen to "Microphone". When the MRTI PTT input is grounded, MRTI TX Audio replaces the front panel microphone audio as the input to the exciter.

- 🔵 Interfacing the MTR2000 to an external controller (Arcom RC210)   by the Reno Ham Radio Club W7RHC.

- 🔵 A better way to interface the MTR2000 to an external controller   by by Matthew Littleton KN4SWB.
  Not thrilled with the other interfacing methods, Matt figured out a way that lets the MTR2000 handle PL/DPL while the external controller does everything else. While he had an Arcom RC210, this method can be used with most common repeater controllers.

- 🔵 Interfacing the MTR2000 to an external controller (CAT250)   originally written by Robert Shepard in 2004, who later asked that it be removed. It was recovered, modified, and resubmitted by Robert Meister WA1MIK.

- 🔵 Interfacing the MTR2000 to an external controller (CAT200B)   by Robert W. Meister WA1MIK
  Yet another way of interfacing an external controller to these stations. This one uses the MRTI connector to get around the PL/DPL problems that seem to arise with the other methods.

- 🔵 External Controller Interfacing Summary   by Robert W. Meister WA1MIK
  A summary of the connection points and available signals to interface any external repeater controller. The information was extracted from other articles here and info found on the web.

- 🔵 Making a MaxTrac and MTR2000 Dual-Purpose Programming Cable   by Robert W. Meister WA1MIK
  Why spend $25 or more for a gutless programming cable? Modify an existing cable to do double duty.

- 🔵 A Photo Tour of a 100w UHF MTR2000 Repeater   by Robert W. Meister WA1MIK
  I came across one that was being thrown in the dumpster and it was filthy and full of rodent and bird droppings, fur, feathers, and nesting material. I washed everything and took some photos of the innards. The power supply is shot. The station works fine with an external 28V supply.

- 🔵 The MTR2000's Modular Connectors   by Robert W. Meister WA1MIK
  Pictures and pin descriptions of the modular jacks behind the front cover.

- 🔵 The MTR2000's Backplane Connectors   by Robert W. Meister WA1MIK
  Pictures and pin descriptions of the connectors on the rear of the station.

- 🔵 Making the MTR2000 Operate in the 900 MHz Amateur Band   by Robert W. Meister WA1MIK
  A few easy hex-edits extend the TX range from 935-941 MHz to 925-941 MHz.

- 🔵 Making the 403-435 MHz MTR2000 Operate up to 440 MHz   by Robert W. Meister WA1MIK
  A few easy hex-edits extend the TX and RX range from 403-435 MHz to 403-440 MHz.

- 🔵 Making the 100w VHF 150-174 MHz MTR2000 Station Work in the 132-154 MHz Amateur Range   A cooperative effort by
  Robin Feil W7MSE, Scott Lichtsinn KBØNLY, and Robert W. Meister WA1MIK

Modify the PA to enable the station to work below 150 MHz.

- If you have a 40w VHF station and need more power, you can use it to feed an external power amplifier, such as from an MSF5000 or one made by Mirage, Henry, or TPL. The MTR2000's output power can be turned down to 1-5 watts to drive an MSF5000 PA or 1-30 watts to drive something else. Remember there will be no SWR protection on the external PA and you may need an external circulator or filter to keep spurious signal levels low, especially at busy sites.

- A List of Module Numbers in the MTR2000   by Eric Lemmon WB6FLY
  In some cases the only way to determine what you have is to inventory the Field Replaceable Units (FRUs). This list was compiled from the MTR manual and RSS.

- Programming the transmitter idle frequency on the MTR   by Eric Lemmon WB6FLY
  What to do when exciter/transmitter local oscillator leakage is a problem (this is mandatory if you are running an MTR on a simplex channel, and nice when on a repeat channel and you are local to the site).

- Setting up the MTR2000 for Battery Backup   by Eric Lemmon WB6FLY
  Especially when you are on a budget...

- ICS Controls makes a nifty adapter board that plugs into the 96-pin System Connector on the back of the MTR2000. It provides a DB-9 interface connector for the ICS Linker II repeater controller. This can probably be used with any other repeater controller. You probably can add additional signals to the DB-9 too. Click here to go to their Accessories page, then scroll down.

- Another alternative to the Argus battery charger is the Samlex SEC2450BRM power supply. It contains five redundant 10 amp switching power supplies, way more power than any 100 watt MTR2000 could ever require. The manual indicates there were 30 and 40 amp units as well that had three and four modules respectively. This unit charges the batteries and runs the entire station on DC instead of AC. Going with this solution means you can no longer have two power settings (one for AC operation, one for battery operation).

- The DC power cable that comes with a DC-only MTR2000 station is Motorola part number 3082009X02, which comes with the station or can be purchased as a service part for about $40. It is 10 feet long, with #8 AWG stranded wires, one black and one red, both terminated in 75 amp Anderson Power Poles. The same cable fits the backup DC connector on the back of an AC-powered MTR2000, but the receptacle is normally covered with a piece of sheet metal. The 75A PowerPole connectors are red and black, stacked vertically, with black on top and the other wire ends are stripped. There is a 30 ampere cartridge fuse in the red wire, one foot from the stripped end. If you want battery backup on your MTR2000 that has the built-in AC supply you can clone or buy the 3082009X02 cable and use the above circuit developed by Eric Lemmon.
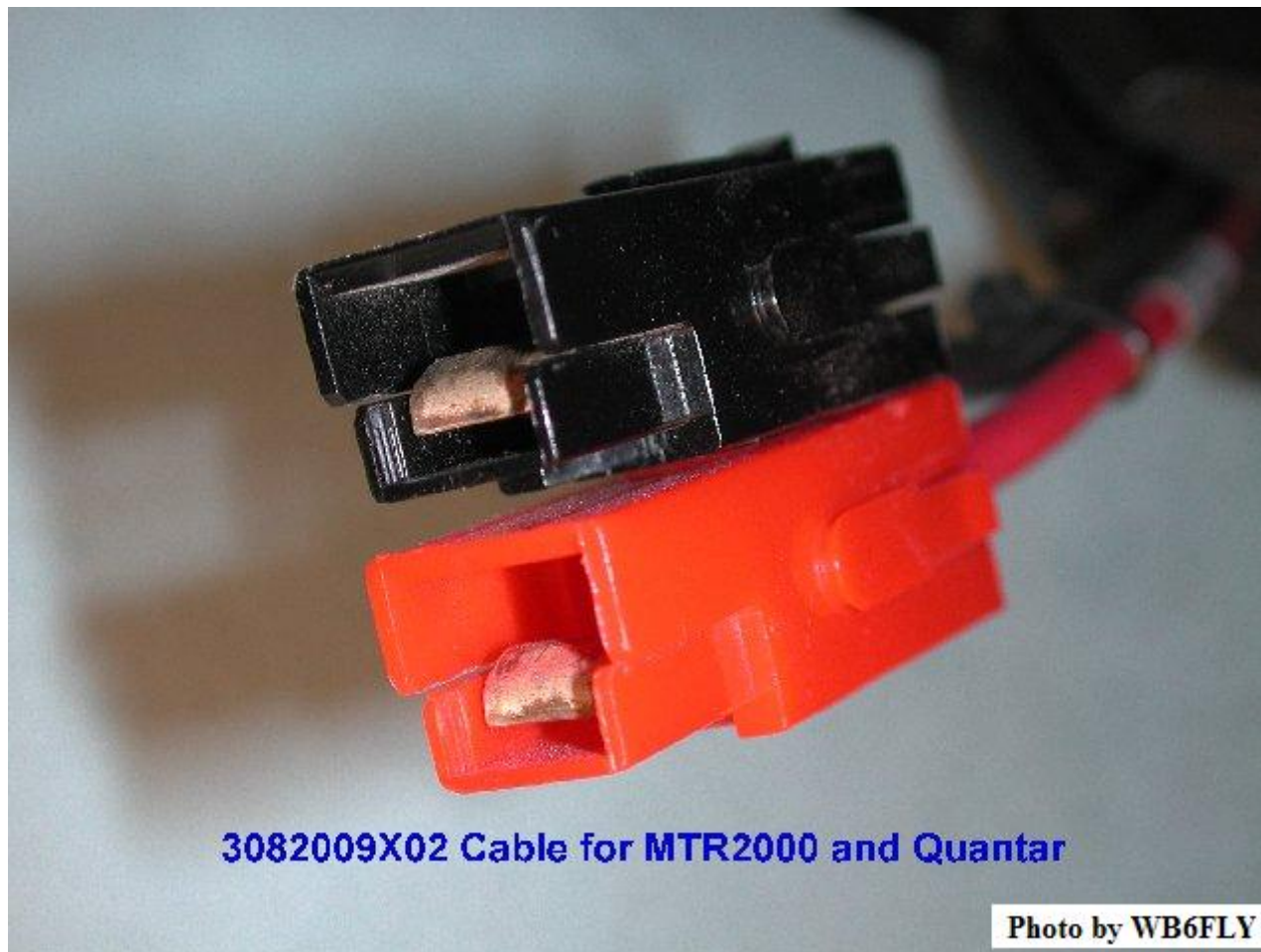
The above photo shows how you need to configure the 75 amp PowerPole connectors on the #8 DC cable so it will mate with the MTR2000 or the Quantar system DC connector.

From an email to repeater-builder:

The MTR is a very nice unit, and the internal controller will do 80%-90% of what most any amateur system needs to do. The unit has a connector on the back that is designed for Motorola's Mobile Radio Telephone Interconnect (MRTI) unit and all the interfacing can be done through that. One quirk: the microprocessor in the station will not pass its own power-on-self-test with the transmitter PL encoder inhibit line (pin 24 of the the 25 pin MRTI connector) grounded (i.e. active). So if your needs include switching the internal PL encoder on and off (it's a handy thing to have through a controller output to use for level setting), when you configure your repeater controller you set up a timer to make sure that this line is not asserted until after the self-test is finished. The simplest way is to use a timer in the start-up macro to inhibit all repeater operation for the number of seconds that the self test takes, plus one or two extra. This quirk also applies to the other logic input signals on the MRTI connector, such as PTT and Monitor.

Manuals, Data Sheets, and Other Documentation:

- [The original MTR2000 VHF and UHF catalog sheet](#)   This is a PDF of the original glossy catalog sheet. 73kB PDF file.

- [The original MTR2000 800 and 900 catalog sheet](#)   This is a PDF of the original glossy catalog sheet. 148kB PDF file.

- [An MTR2000 Product Planner and Ordering Guide](#)   This document describes the various options available when a station was to be ordered brand new. Lots of useful details here. 300kB PDF file.

- [The MTR2000 Installation and Operation Manual](#)   Just what it says. 2.4MB PDF file.

- [An MTR3000 Product Planner and Ordering Guide](#)   Even though this is for the newer MTR3000 station, there's still a lot of useful stuff that applies to the MTR2000 here, since you could upgrade your MTR2000 to an MTR3000. 1.9MB PDF file.

- [The original MTR3000 Specification / Sales sheet](#)   208kB PDF file.

- [A comparison of the major differences between the MTR2000 and the MTR3000](#)   185kB PDF file.

- [VHF duplexer options](#)   1MB PDF file.
  One of the options from Motorola for the VHF MTR2000 is an in-cabinet duplexer. See the table below for the option number to order when ordering a duplexer with Quantar or MTR2000 stations. The unit that Motorola supplies is a relabeled Celwave model PD5042-1. The performance of this six-cavity pass-notch duplexer can be better than 100 dB isolation between transmitter and receiver.

Range (MHz)	Part Number	Option Number
132-146	0185417U01	X182AA
144-160	0185417U02	X182AB
158-174	0185417U03	X182AJ

  More details on this duplexer can be found [here](#) and [here](#).

- [UHF duplexer options](#)   1MB PDF file.
  One of the options from Motorola for the UHF MTR2000 is an in-cabinet duplexer. See the table below for the option number to order when ordering a duplexer with Quantar or MTR2000 stations. The unit that Motorola supplies is a relabeled Celwave model PD526-4-2. The performance of this six-cavity pass-notch duplexer is better than 100 dB isolation between transmitter and receiver.

Range (MHz)	Part Number	Option Number
403-435	0185417U04	X182AC
435-470	0185417U05	X182AD
470-490	0185417U06	X182AE

490-520	0185417U07	X182AF

- [Motorola Field Service Bulletin FSB10174](#)   donated by by Eric Lemmon WB6FLY. 100kB PDF file.
  Issue 1: MTR2000 station locks up in transmit with no PL.
  Issue 2: MTR2000 station does not transmit an analog audio on wireline line 2.
  Motorola has identified a firmware issue in all versions prior to and including version R03.04.002 and has a warranty fix. The PDF file linked above includes a software order form.

- [The Argus Switched Mode Charger](#)   donated by Eric Lemmon WB6FLY. 1.43MB PDF file.
  This is the Model L1883 Battery Reverting Charger, model "010-519-20" or "010-523-20", made by Argus Technologies in Britsh Columbia, Canada for the MTR2000 station. It is a much more complicated device than its catalog description implies, perhaps justifying its significant cost ($1451 new, dealer cost is $1222 in 2004). As noted in the manual, it must be used with an MTR2000 that includes a power supply, since its purpose is to provide only a charging and equalizing function for the backup batteries, along with various alarm and monitoring capabilities. The L1883 model is intended for the 30 and 40 watt MTR2000 stations that operate on 14 volts; the 75 and 100 watt stations must use the L1884 28 volt version.

  Note that to use the Argus with the MTR2000 it must be connected with the following items:

  1. CDN6226A Charger Load Cable. This is intended to connect the output terminals of an Argus Battery Backup/Charger Unit to the MTR2000. This is about 10 feet of #8 red and black stranded wires and is not fused. It has the 75 ampere PowerPole connectors on one end (the DC power connector for the MTR2000 is arranged one over the other, with black on top) and the other end has ring lug terminals for the 1/4" studs on the back of the Argus. The price was $40 to $45 in 2005.
  2. CDN6227 Charger Battery Cable. Goes from the Argus to the local battery.
  3. TDN9879 Battery Temperature Sensor.

- [Argus 14 Volt, 20 Amp battery charger](#)   For 40 watt stations. This came directly from Argus. 750kB PDF file.

- [Argus 28 Volt, 10 Amp battery charger](#)   For 100 watt stations. This came directly from Argus. 750kB PDF file.

- [Motorola HSN1000A Amplified Speaker Instruction Manual](#)   Scanned by Eric Lemmon WB6FLY. 410kB PDF file.
  The HSN1000B speaker is essentially identical, however it uses surface-mount components.

- [Motorola HSN1000A Amplified Speaker Instruction Manual](#)   Scanned by Robert Meister WA1MIK. 2.9MB PDF file.
  Same as above, only done with photographic quality and is therefore much larger.

- [Motorola HSN1006A Amplified Speaker Instruction Manual](#)   Scanned by Eric Lemmon WB6FLY. 280kB PDF file.
  The HSN1006A replaced the HSN1000A/B speakers.

- [Motorola 0185180U01 Speaker Adapter Cable Diagram](#)   Drawn by Eric Lemmon WB6FLY. 66kB PDF file.
  This connects the HSN1000/HSN1006 speakers to the MTR2000/MTR3000 stations.

- [Motorola GMN6147B Service Microphone Instructions](#)   Scanned by Eric Lemmon WB6FLY. 110kB PDF file.
  The three-buttons on the side of the microphone are used to do things like open the squelch and adjust the speaker volume on the MTR2000/MTR3000

stations.

This page was last modified on 17-Feb-2019