

TuneMatic DUO

OPERATING AND INSTRUCTION MANUAL

Rev: 061522 sw: 1.7x

TuneMatic DUO is a self-contained, **dual-motorized** antenna controller that stores and recalls up to 99 presets, based on user input. Each antenna position can be moved manually or automatically from memory, with extremely repeatable accuracy,

Installation and connections:

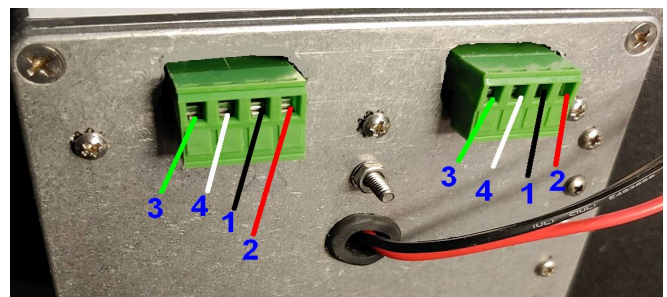
Mounting Screws: Located on the rear are two #6-32 threaded holes spaced 1.25" apart, for attachment of a rear bracket. **To avoid short-circuiting the PC board, DO NOT EXCEED ¼" SCREW LENGTH ON THE MOUNTING SCREWS!**

Red & Black fused power leads: Connect power leads to a 12v-15v DC power source with red as the positive connection, and black as the negative connection (**NEGATIVE GROUND SYSTEMS ONLY!**). The fuse is a 5x20mm GMA 3 or 3.15A standard fuse; **DO NOT EXCEED THIS RATING**, as it will void the warranty. Note that when the device is off, there is no current flow through the TuneMatic DUO, and can be wired to either a switched, or non-switched power source.

Ground terminal- This #6-32 screw allows device to be connected to your local station ground. This connection will help reduce surges from nearby lightning and EMP that may enter the motor control cables. There are internal MOV protection devices on the motor cables that route surge currents to the chassis, and connecting this ground is recommended.

Motor connectors (2): The wiring to the antenna motor cable connects to each 4-position block (as observed from rear counting from left to right) pins 3 & 4 ("M M" on label) for the motor leads, and pins 1 & 2 as the pulse sensor leads ("S S" on label) (no polarity). **Observe the proper pin connections.** If the antenna moves in the wrong direction, either reverse the motor leads on pins 3&4, or set the internal DIP switch to reverse the motor direction; see the next section for details on this feature.

DO NOT CONNECT ANY EXTERNAL DC TO THE MOTOR LEADS, AS THIS WILL DAMAGE THE TUNEMATIC AND VOID THE WARRANTY.



Color code for Tarheel antennas

Internal DIP switches: Behind the small rear cover, you will find two 4 position DIP switches (one for each antenna), which sets the antenna stall current, Note that **1=ON (UP)** and **0=OFF(DOWN)**, and direction of the motor. **Using ONLY DIP switches 1,2 & 3 for antenna current;** the settings are as follows:

Antenna	Current	1	2	3	4	notes
Lowest setting	200 mA	0	0	0		
LittleTarheel	250 mA	1	0	0		*FACTORY DEFAULT
Hi-Q, Scorpion, Diamond	300 mA	0	1	0		
" "	500 mA	1	1	0		
" "	700 mA	0	0	1		note: These settings are
Tarheel Models 75 thru 400	900 mA	1	0	1		<u>recommended only, and may need</u>
Tarheel Models 1000 – 1200	1100mA	1	1	0		<u>to be adjusted as necessary.</u>
MAX setting	1300mA	1	1	1		



NOTE: IT IS IMPORTANT TO SET THIS LIMIT PROPERLY, as damage can occur to the antenna motor if set too high, or will prematurely trip if setting is too low.

NOTE: Upon power up, the current setting will be flashed on the LED display, before unit is ready to use. This indication will verify that the DIP switches are properly set.

Any time the unit senses a current limit condition, it will display 'CLCL', and immediately stop the antenna. It also disables any other functions until power is cycled to the unit.



Motor reversal switch: DIP switch #4 will reverse the direction of the motor, so that when the up or down button is pressed, the antenna will always travel in the desired direction. The default setting is OFF, but if the motor is traveling backwards, set DIP switch #4 to the ON position. Note that changing the DIP switch will take effect AFTER the power is cycled. You also have the option of reversing the motor leads on the terminal block instead of using the DIP switch.

Controls :

RED Power on/off button- turns unit on and off.

UP/DOWN direction buttons (arrows) - allows each antenna to be moved up or down individually.

Center common UP/DOWN direction – allows simultaneous movement of both antennas, either up or down.

Memory selector knob – selects, stores, and tunes memories.

Cal button (recessed) – used to synchronize memories (if needed).

LED display: 4 digit red LED display indicates pulse count or memory of each antenna as well as other status messages, detailed below:

Flashing numbers on power-up – displays antenna stall current as set by internal DIP switches.

Pulse count- displays pulse count, increases as antenna changes in height.

Memory display- Displays “M” and memory number, selected by rotary encoder knob.

Flashing “PPPP”- indicates antenna has just been parked.

Flashing “NONE”- indicates the recalled memory selected is empty.

Flashing “FACT” – indicates unit has been factory reset

Failsafe messages:

Flashing “CLCL”- indicates antenna has reached current limit.

Flashing “PULS” – indicates no pulses detected during antenna movement.

When power is first applied, flashing numbers corresponding to the antenna stall current (as set by internal DIP switches) will appear. Once flashing stops (3 times), unit will display the pulse count “00” (it may first display the memory indicated by an “M” on the left most digit, then switch back to pulse count). Note that the default display is pulse count. Any time the memory select knob is turned in either direction or depressed, the display changes to memory mode. Once you stop rotating the memory select knob, the LED display will return to the pulse count indication, after a 4 second timeout. This time period allows you sufficient time to remain in the memory select mode.

Manual operation: Press the up and down buttons to make sure the antennas are traveling in the correct direction. When first pressing either button, the antenna will move in the corresponding direction at a slow rate. If you continue to hold the button down, after 4 seconds, the speed of the motor will move at a fast rate. The dual-speed function allows you to fine-tune the antenna for the best possible match. When moving the antenna, the display will count up when the UP button is pressed, and down if the DN button is pressed. If the antenna moves backwards, either reverse the motor leads, or set DIP switch #4 in the opposite direction, as instructed in the *dip switch setting* section. The unit will count up to 1998 pulses.

Note that you can move each antenna independently, or using the center common buttons, move both antennas simultaneously.

Memory operation: Before the **TuneMatic DUO** can store memories, and fresh from factory, **both antennas first must be ‘parked’ at the lowest position, otherwise the antennas will never be properly calibrated, and memory selection will not be available.** When unit is first turned on, or set to factory default, all memories are cleared.

Upon factory setting or factory reset, if you rotate the memory selector, the LED will display ONLY this: →



You will not be able to select any memories until the unit is parked first!

To park the antennas, make sure the LED displays as shown, then depress the memory selector. The antenna will move to the lowest position, stop, then the display will flash ‘PPPP’, indicating the antenna has been parked. **From this point forward, you will be able to access and store memories.** If the antenna bottoms out, and displays PULS after several seconds, the current limit setting is too high, and needs to be reduced accordingly.

To store a memory. Move antenna to desired frequency of operation until the best match is obtained. To store into a memory, rotate the memory selector knob to the desired memory (1-99), then press and **hold** the memory selector knob (approx. 1 sec.) until MEMO flashes on both displays. This indicates the unit has stored the pulse count into memory. You can store and/or overwrite any memory position an unlimited number of times. Note that both antennas will be stored

simultaneously when storing and recalling memories, however you can store different positions for each antenna into each memory.

To recall a memory, rotate the memory selector knob to the desired memory, and press (*but do NOT hold*) the memory selector knob. Antennas will move to the stored pulse count, then stop when the pulse count is reached. You will see the display begin to count once the memory has been selected. If you select a blank memory, the display will flash 'NONE'.

To display current memory position when not in memory mode: press & release the memory selector knob, and the current memory will be displayed. This will also place you directly into the memory mode.

Memory 'P' is the "park" position, and can be accessed as needed. Parking the antenna also automatically recalibrates the pulse count. Parking the antenna sets it to the lowest position, and resets the pulse count to 0.

Emergency stop: If antenna is moving in memory mode, and you want it to immediately stop, press up and down together. This will immediately stop the antenna movement. This will work with either or both antennas simultaneously.

Calibrate function – This button is used in the event the two antennas do not track the memories. To re-synchronize, rotate the memory knob until you have a designated memory on the left display. Then with a toothpick or small screwdriver, depress and hold the calibrate button. This will freeze the left memory. Rotate the memory knob until the right memory matches the left "frozen memory", then release the synchronize button. The memories will now track together.

Fail-safe conditions: The unit will revert to a fail-safe condition if any of the following occurs:

- 1) pulses are not detected for a length of time during antenna movement (after displaying by the PULS message),
- 2) antenna current limit occurs (requires power cycle to recover),
- 3) power is removed during antenna movement.
- 4) Current limit prematurely reached.
- 5) Current set too high and antenna reaches bottom limit during parking (safety feature which keeps motor from becoming damaged).

Any of these conditions can cause the pulse count to become un-calibrated. As a fail-safe, unit will disable the storing or recalling of memories until it is parked. Once it is parked, all memories will be restored. See the *Display messages* section for an explanation of the fail-safe messages.

NOTE: If your antenna pulse sensor fails, you will still be able to manually move the antenna, but the unit will still show the error and stop the motor. You can continue to move the antenna manually after the message stops.

Factory reset: To clear all memories, and set unit back to factory default, with power OFF, press and hold memory selector knob and UP button at the same time. While holding, turn on power, wait one second, then release the memory selector and UP buttons. After approximately 5 seconds, display will flash "FACT", indicating unit has been set back to factory default settings. Performing factory reset requires user to go through the PARK routine to store memories.

Troubleshooting:

Symptom	Resolution
No power	check power source, connections, and fuse
No antenna movement	check motor connections
Current limits when antenna moves	check DIP switch settings and wiring for shorts
Antenna runs backwards	reverse motor leads or set of DIP switch #4 inside unit
PULs message when parking	DIP switches set too high for antenna
PULs message when moving	no pulses detected, check pulse sensor and wiring

ONE-YEAR LIMITED WARRANTY ON PARTS AND LABOR-

*Covers Product purchased as new only. JT COMMUNICATIONS LLC provides a warranty to the original purchaser of new Products against defects in materials and workmanship for a period of **One (1) year** of normal consumer (non-commercial) usage. This warranty is not transferrable. If a Product covered by this warranty is determined to be defective within the warranty period, JT COMMUNICATIONS LLC will, unless otherwise required by applicable law, either repair or exchange the Product at its sole option and discretion.*

To obtain warranty service, contact JT COMMUNICATIONS LLC Technical Support via email: TechSupport@jtcomms.com or or via phone at 352-236-0744 from 8:00AM to 6:00PM Monday through Friday (holidays excluded), Eastern Time. PRE-AUTHORIZATION

MUST BE OBTAINED BEFORE SENDING PRODUCT TO A JT COMMUNICATIONS LLC SERVICE CENTER. Proof of purchase in the form of a purchase receipt or copy thereof is required to show that a Product is within the warranty period.

Exchange: Should JT COMMUNICATIONS LLC elect to exchange a Product due to a covered defect during the warranty period, the replacement unit may at JT COMMUNICATIONS LLC's Sole option and discretion, be new or one which has been recertified, reconditioned, refurbished or otherwise remanufactured from new or used parts and is functionally equivalent to the original Product.

Repair: Parts and Labor There will be no charge for parts or labor to repair a Product for a covered defect during the warranty period. Replacement parts may, at JT COMMUNICATIONS LLC's sole option and discretion, be new, used, reconditioned, refurbished or otherwise remanufactured or recertified as functionally equivalent replacement parts.

Remaining Warranty: Repaired or exchanged units are warranted for the remaining portion of the Product's original warranty or for ninety (90) days from warranty service or exchange, whichever is longer. Any upgrade to the original Product will be covered only for the duration of the original warranty period.

Returning a Product for Warranty Service: After obtaining pre-authorization from JT COMMUNICATIONS LLC Technical Support (see above), defective Products within the warranty period must be sent to a JT COMMUNICATIONS LLC service center to obtain warranty service. JT COMMUNICATIONS LLC is not responsible for transportation costs to the service center, but JT COMMUNICATIONS LLC will cover return shipping to the customer. Products returned to JT COMMUNICATIONS LLC's service centers must be shipped in either the original carton box and shipping material or packaging that provides an equal degree of protection. JT COMMUNICATIONS LLC Technical Support will provide instructions for packing and shipping the covered Product to the JT COMMUNICATIONS LLC service center.

Exclusions- This warranty does not cover, for example: abuse, accident, acts of God, protective coatings, cosmetic damage (e.g. scratches, dents, cracks), odor, damage caused by misuse with other products (e.g. accessories, housing, parts or software), damages from shipping, improper installation or operation, failure to follow installation/operation instructions, improper voltage supply or power surges, operating with higher than rated fuse, lack of reasonable use, misuse, modifications or alterations, normal wear and tear or aging, as well as installation and set-up issues or any tampering. Product repairs attempted by anyone other than by a JT COMMUNICATIONS LLC authorized service center. Products with unreadable or removed serial numbers or requiring routine maintenance are not covered. This one year limited warranty does not cover Products sold "AS IS", "FACTORY RE-CERTIFIED", or by a non-authorized reseller.

Limitations- THERE ARE NO EXPRESS WARRANTIES OTHER THAN THOSE LISTED OR DESCRIBED ABOVE. ANY IMPLIED WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, SHALL BE LIMITED IN DURATION TO THE PERIOD OF TIME SET FORTH ABOVE. JT COMMUNICATIONS LLC'S TOTAL LIABILITY FOR ANY AND ALL LOSSES AND DAMAGES RESULTING FROM ANY CAUSE WHATSOEVER INCLUDING JT COMMUNICATIONS LLC'S NEGLIGENCE, ALLEGED DAMAGE, OR DEFECTIVE GOODS, WHETHER SUCH DEFECTS ARE DISCOVERABLE OR LATENT, SHALL IN NO EVENT EXCEED THE PURCHASE PRICE OF THE PRODUCT. JT COMMUNICATIONS LLC SHALL NOT BE RESPONSIBLE FOR LOSS OF USE, INFORMATION OR DATA INCLUDING THAT CONTAINED IN OR STORED ON ANY DEVICE RETURNED TO JT COMMUNICATIONS LLC, WORK STOPPAGE, SYSTEM FAILURE OR MALFUNCTION, FAILURE OF OTHER EQUIPMENT OR PRODUCTS TO WHICH THE PRODUCT IS CONNECTED, COMMERCIAL LOSS, LOST REVENUE OR LOST PROFITS, LOSS OF GOODWILL, LOSS OF REPUTATION, OR ANY OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES.

NO ORAL OR WRITTEN REPRESENTATIONS MADE BY JT COMMUNICATIONS LLC OR ANY SELLER, RESELLER OR DISTRIBUTOR OF THE PRODUCT, INCLUDING EMPLOYEES AND AGENTS THEREOF, SHALL CREATE ANY ADDITIONAL WARRANTY OBLIGATIONS, INCREASE THE SCOPE, OR OTHERWISE MODIFY IN ANY MANNER THE TERMS OF THIS LIMITED WARRANTY. TO THE EXTENT PERMITTED BY APPLICABLE LAW, JT COMMUNICATIONS LLC DOES NOT WARRANT THAT THE OPERATION OF ANY PRODUCTS OR SOFTWARE COVERED UNDER THIS LIMITED WARRANTY WILL MEET THE REQUIREMENTS, WORK IN COMBINATION WITH ANY HARDWARE OR SOFTWARE APPLICATIONS OR THIRD PARTY SERVICES, BE UNINTERRUPTED, ERROR FREE, OR WITHOUT RISK TO, OR LOSS OF, ANY INFORMATION, DATA, SOFTWARE OR APPLICATIONS CONTAINED THEREIN, OR THAT DEFECTS IN THE PRODUCTS OR SOFTWARE WILL BE CORRECTED.

SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS OR THE EXCLUSION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATIONS OR EXCLUSIONS MAY NOT APPLY TO YOU. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS, WHICH VARY FROM STATE TO STATE. THIS LIMITED WARRANTY IS SUBJECT TO CHANGE WITHOUT NOTICE.

In the event that any term or provision contained in this limited warranty is found to be invalid, illegal or unenforceable by a court of competent jurisdiction, then such provision shall be deemed modified to the extent necessary to make such provision enforceable by such court, taking into account the intent of the parties. The invalidity in whole or in part of any portion of this limited warranty shall not impair or affect the validity or enforceability of the remaining provisions of this limited warranty.

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NOTICE TO CONSUMER:

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, and can radiate radiofrequency energy and, if not installed and used in accordance with the instructions, may cause interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, you are encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio electronics technician for help.