

# TuneMatic D.A.

## DUAL AUTOMATIC ANTENNA CONTROLLER OPERATING AND INSTRUCTION MANUAL

Rev: 072325 sw: 1.3x

### 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, uses 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.



**TuneMatic DA** is a self-contained, motorized antenna controller that stores and recalls frequency-based presets of two antennas, based on user input. Antenna position can be moved manually or automatically selected from rig frequency data, with extremely repeatable accuracy. Each antenna's position can be independently stored and tuned separately, with common storing and tuning features.

### INSTALLATION AND CONNECTIONS:

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

**Interface cable connection:** This molex-style 4 pin connector is **pre-wired to the applicable rig interface**, and supplies the rig keying signal, an amp relay contact closure (if used), and the 'wake-up' power signal from the rig.

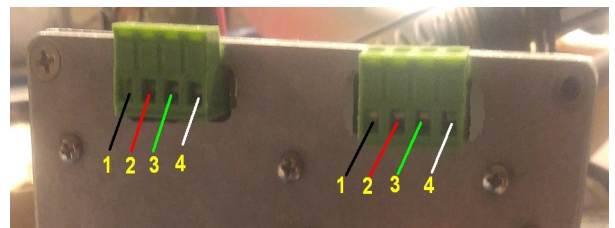
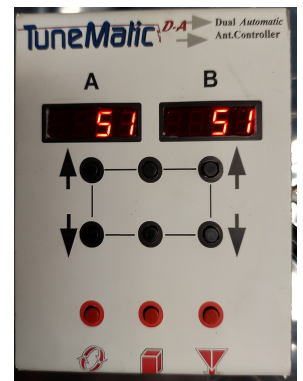
**RF coax sample (via supplied T-connection)** This UHF (PL-259) RF connector receives the RF frequency sample from the rig during storing and recall of memories. Connect this to the RF output jack of your transceiver.

**Motor control connector:** This removable screw-down 4 pin terminal block uses (as observed from rear, left to right) pins 1 & 2 as the motor leads, and pins 3 & 4 as the pulse sensor leads (no polarity). Observe the proper pin connections. If the antenna moves in the opposite direction, you can reverse the motor leads on the terminal block for the proper direction. UP direction should be set to move towards lower frequencies, as the antenna electrical wavelength increases (towards lower resonant frequencies) as the antenna moves up.

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

### **Amplifier relay key line( on external interface):**

This line is designed to connect to an SPDT relay (12V coil), for the purpose of opening the keyline to an external RF amplifier while the TuneMatic operates. The line is thermally current-limited, and would connect to one pin of the relay coil, and the other pin would connect to a 12v DC source. The NORMALLY CLOSED contacts of the relay would wire in SERIES with an external amplifier keyline between the rig and the amplifier. When **STORE** or **TUNE** function is initiated, The relay coil energizes opening the keyline. It is timed so that this amp keyline opens before



the TuneMatic initiates the PTT signal to the rig, and closes AFTER the PTT signal from the TuneMatic is removed. A separate document is available for the construction and wiring of this relay circuit.

### Rig Interface:

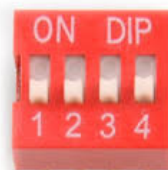
The rig interface is the communications between the the TuneMatic and your specific radio (*refer to the interface supplement) for wiring information and details*). The factory-supplied interface controls the keying and control for the specified radio, using a keyline and switched 12v. Each manufacturer is unique in the communications, and the interface allows TuneMatic to work universally with multiple rig makes and models. Some rigs do not contain a 'tune' feature (or the complication of communications is not compatible directly with the TuneMatic interface models), and those rigs will operate in AM mode (10-25w) when using tuning or storing functions of the TuneMatic. Any rig with switched 12v (low current) and a ground-enabled PTT keyline with operate with TuneMatic. Contact the factory if you have a rig that is not listed in the TuneMatic interface materials for instructions on how to connect to your specific rig. The TuneMatic PTT line is thermally limited to 0.5A.

## OPERATION AND SETTINGS

**Antenna Current DIP switches:** If you remove the rear cover plate, you will find two 4 position DIP switches, which set the antenna stall current for each antenna, 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	setting
Switch number		1 2 3 4
Lowest setting	200mA	0 0 0 -
<b>LittleTarheel/Pro</b>	<b>250 mA</b>	<b>1 0 0 - *FACTORY DEFAULT SETTING</b>
Hi-Q, Scorpion	300 mA	0 1 0 -
" "	500 mA	1 1 0 -
" "	700 mA	0 0 1 -
Tarheel Models 75 thru 400,	900 mA	1 0 1 -
Tarheel Models 1000 – 1200	1100mA	1 1 0 -
MAX setting	1300mA	1 1 1 -

note: These settings are *recommended only, and may need to be adjusted as necessary.*



**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 antenna stall current setting will flash on the LED display, before unit is ready to use. This indication will verify that the DIP switches are programmed to the users settings, and is displayed in millamperes (mA).

### Controls :


**Power on/off electronic pushbutton-** turns on and off the unit power.


**UP/DOWN direction buttons** - allows motor to be moved up or down.

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

**Up/Down/Common buttons** - These arrow buttons control the upward or downward movement of the antenna, and the center buttons will control both antennas simultaneously.

**INITIALIZATION**  This button starts (or re-starts) the antenna initialization step for both antennas.

**STORE**  This button is used to store a memory on both antennas, with the positions set by the user.

**TUNE**  This button is used to recall a stored memory on both antennas.

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

Static messages:

0-9 - numbers displayed for ant current or pulse count

flashing messages:

0-9 – numbers displayed during power up for antenna current in mA

FacT – factory reset complete – displayed upon completion of factory reset procedure.

PULS – Pulse error- This error indicates the antenna is not receiving pulses, (or only intermittent pulses) from the antenna sensor.

CLCL - current limit error- Displayed if the antenna has reached current limit. When this is displayed, power is removed from the antenna motor.

INSt - initialization started

FrE- - freq, read error – During storing or tuning operations, the frequency from the rig was not registered.

MEMO- - memory stored OK

ININ -initialized ok on power up

Not - not initialized on power up

SE-S - set to stored memory- This indicates the unit is set to a stored memory.

SE-C - set to close memory- This indicates the unit has moved the antenna as close as possible to a stored memory close to the transmit frequency. It does not indicate the antenna is properly tuned.

NONE – no memories stored- This will occur upon attempting to recall a memory when none have been stored.

PPPP – antenna parked

HHHH – high limit reached

LLLL – low limit reached

When power is first applied (or after factory reset), flashing numbers will appear on power-up. These numbers correspond to the antenna stall current, as set by internal DIP switches. Once flashing stops (3 times), unit will display 'Not' , indicating that the unit has not yet been initialized. Then display the pulse count “00”. Note that the default display is pulse count. Any time one of the red buttons is activated. the display changes to function mode.

**Initial antenna movement:** Press the up or down buttons to make sure antenna is traveling in the correct direction. After factory reset (or initial operation), the antenna will move in the corresponding direction at the fast rate. Verify that the display is counting properly during movement. **Make sure the antenna is moving in the correct direction.** If the antenna moves in the opposite direction, you can reverse the motor leads on the terminal block for the proper direction. UP direction represents longer length to the antenna, exposing more coil, and should be set to move towards lower frequencies, as the antenna electrical wavelength increases (towards lower resonant frequencies) as the antenna moves up.

**Memory operation:** Before the [TuneMatic](#) can store memories, the antenna first be initialized

***NOTE: IF YOU SKIP THE INITIALIZATION STEP, YOU WILL BE UNABLE TO MANUALLY OR AUTOMATICALLY STORE ANY MEMORIES, OR USE ANY OF THE TUNE FEATURES OF TuneMatic!***

To initialize the antenna to the TuneMatic:

- 1) Make sure you have properly installed and tested wiring of TuneMatic as indicated in the INSTALLATION step above.
- 2) Apply power to TuneMatic. Allow unit to complete the displayed message, and display the pulse count
- 3) Press (INIT) button once. TuneMatic will display 'INSt' , indicating unit will start the initialization process.
- 4) Antenna will move all the way to the top (highest/longest) position of travel until it reaches the upper motor current limit position. The displays will show increased counting as the antenna moves upward.
- 5) Once current limit is reached at the top, antenna will stop moving, and the TuneMatic will begin moving downward, and the display will begin counting down.
- 6) Antenna will move all the way to the bottom (lowest/shortest) position of travel until it reaches the lower motor current limit position.
- 7) Once current limit is reached, antenna will stop moving, and the TuneMatic will spell alternate between PPPP and LLLL , indicating Initialization is complete and then display the soft limit of count '03', indicating that the antenna is at the lowest operating limit, and initialization is completed.

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**If you force an antenna stall, disconnect antenna motor cables, or turn off power while in the Initialization process, the TuneMatic will stop the initialization. If the entire initialization process does not successfully complete, then the initialization process must be restarted.**

Once initialization is complete, TuneMatic will:

- 1) Allow you to manually move the antenna up/down **in two speeds**. When corresponding UP/DN button is pressed and held, antenna will move slowly, **and if the button is held down more than four seconds, it will move rapidly**. This will allow you to make small adjustments during fine tuning of the antenna. Each time up/down is released, it resets the speed to slow, which allows you to 'bump' the motor in either direction, allowing an exact tune.
- 2) Sets the 'soft' limits, so that movement of the antenna will not reach the motor current limit points. When either upper or lower limit is reached, TuneMatic will display 'HHHH' (higher limit), or 'LLLL' (lower limit), and stop further movement, preventing the antenna from traveling beyond these soft limits.
- 3) 'Park' antenna- explained in lower section on how to park.
- 4) Manually store frequency presets.
- 5) Automatically operate the TuneMatic.
- 6) Re-Initialize TuneMatic if necessary. *NOTE: RE-initializing antenna will not disturb memory settings.*
- 7) Sense lack of pulses within several seconds after start of any motor movement, If the missing pulse detector trips, it will stop the motor, and display 'PULS'. It will automatically de-initialize the TuneMatic (without losing memories), and require you to re-initialize.

**IF MOTOR DOES NOT MOVE DURING INITIALIZATION, AND YOU RECEIVE A PULSE ERROR (PE) MESSAGE, CHECK THE WIRING BETWEEN TuneMatic AND ANTENNA. YOU CAN ALSO PERFORM THE SENSOR CONTINUITY TEST, AS DETAILED IN SECTION D.**

## **TESTING ANTENNA OPERATIONAL LIMITS:**

You may manually tune the antenna, by using an external VSWR meter, or radio-provided internal VSWR meter. This will give you a good indication as to the operational frequency range of the antenna, and will help you determine the expected performance of the system. The make and model of the antenna, and its physical properties, balun matching, and overall installation will determine the usable operational range of the TuneMatic. It is advisable to check the limits of the antenna system, so that you will know what to expect during operation.

Using the external VSWR meter, use *low levels* of RF power (10 watts in AM mode) so that you do not cause interference on the air, or damage to radio and antenna. While adjusting the UP/DN buttons, check the parameters of the system, by alternately moving the antenna, and spot-checking the VSWR, by keying the rig. Start at the highest band, and work down to the lowest. This check will assure you that the system will tune properly, and to what frequency range it will perform over.

**NOTE: You can conduct these tests when TuneMatic is either initialized or not initialized. Remember: you cannot use any of the automatic tuning or storing features until the antenna has first been initialized.**

## **RE-INITIALIZATION:**

The TuneMatic depends on precise feedback information from the antenna. If the pulse counting sequence is interrupted for any reason the TuneMatic may need to be re-initialized. As the antenna is used and antenna characteristics may change or other physical changes occur, it may cause errors. This condition will necessitate a re-initialization. If it becomes necessary to re-initialize the unit, stored memories will be retained unless a full factory reset is performed.

TuneMatic also reverts back to an un-initialized state during some failure conditions, such as:

- Missed pulses during antenna movement after initialization- This can happen if the connection between the antenna pulse switch (internal to the antenna) either fails, or the wiring becomes disconnected.
- Motor fails during antenna movement, or antenna current DIP switches are set incorrectly
- Antenna current limit is reached (when NOT in park mode)- This can happen if there is a catastrophic failure in the TuneMatic software, major pulse count error, or other software failure.
- Power to TuneMatic is interrupted during antenna movement – If the TuneMatic power is disconnected while the antenna is moving, it will cause the pulse count to lose track of where it was last. TuneMatic detects this loss of power, and automatically puts TuneMatic into the uninitialized state. This process assures you that the antenna pulse count integrity is maintained through all operations.

***You will know the initialized state of TuneMatic upon power up. If you don't see the 'ININ' message on power up after the current setting message, TuneMatic is NOT initialized*** (it will display the 'Not' message instead).

It would also be necessary to re-initialize if you disassemble the antenna for servicing. ***'De-initialization' only occurs after antenna has been initialized the first time, and any occurrence of antenna/pulse error.***

To perform re-initialization if already initialized:

1) Make sure TuneMatic is powered up, and the motor is not in motion, or in tune or store mode, and wait for start-up messages.

2) Press and hold (INIT) button for at least 3 seconds; TuneMatic will repeat the initialization process. Once you hear the Morse message; you can then release the INIT button.

To park the antenna, make sure the LED displays as shown, then depress UP and DOWN at the same time. The antenna will then move to the lowest position, stop, then the display will alternately flash 'PPPP' and 'LLLL', indicating the antenna has been parked and is at the lower limit. It will then indicate a count of '03', which is the lower soft limit,

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. You can move either or both antennas to obtain the best match. Once the optimum match is obtained, press the STORE button. This action will key the rig, measure the transmit frequency, and store the pulse count of each antenna in independent memories for each antenna, and MEMO message will flash on each display. 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.

## **ANTENNA TUNING AND MEMORY STORAGE:**

Once you know the operational frequency limits, you can manually store frequencies. It is recommended that you store ***at least one*** frequency in each band that the system (antenna and radio) is capable of covering. Make sure radio is turned on and operational. You will be manually keying radio at a low power level at various frequencies for this step. When using legacy radios, be sure radio is in AM or CW mode, set between 10-20 watts output. TuneMatic will send a message if it is unable to read the transmit frequency from the rig. *Note that the following steps only work AFTER the antenna has been initialized.*

- 1) Start at the highest band of operation (lowest/shortest antenna position).
- 2) Manually move antenna UP while testing VSWR of desired frequency until VSWR is minimized.
- 3) Press (STORE) button. Radio will automatically key for one second, and measure the frequency.
- 4) If power is too low or non-existent, TuneMatic will display 'FrE-'. The power range is 5-35 watts. If you get this error, readjust power to within the specified parameters. If you are using a legacy radio, make sure radio is in CW or AM mode, and power is set within 10-20w. *Radios connected to the factory interface will automatically set the power level for tuning.* **NOTE: EXCESS POWER MAY CAUSE FREQUENCY READ ERRORS.**
- 5) If you are attempting to operate the radio outside the frequency limitations of the TuneMatic (between 1 and 60 MHz), it will display "FrE-", indicating the radio is out of the operational frequency range. This error message will also spell out if it is unable to read frequency due to low/no power.
- 6) If memory is successful, TuneMatic will display 'MEMO', indicating successful store of the desired frequency to memory.

- 7) Repeat steps 1-7 for each band, one at a time. On 40M and below, store top, middle and bottom of band.
- 8) If STORE is pressed additional times without changing frequency, TuneMatic will simply re-write the memory that corresponds to the transmit frequency.
- 9) The more frequencies stored at this point, the quicker the Tune feature will work, and the faster the antenna tuning will become.

#### **To recall a memory.**

Set the rig to the desired frequency, and press the TUNE button. The radio will key for a moment, measure frequency parameters, and search the memories for the desired or closest frequency. TuneMatic will move the antenna to move *as close as possible* to the desired frequency (based on the stored memory, or the corresponding memory to any previously stored frequency), then stop at the stored position when the pulse count of each antenna is reached. You will see the display then flash SE-S, indicating that the TuneMatic has moved the antenna to the stored frequency.

If you decide to transmit on a frequency that you have not yet tuned, and press the TUNE button, TuneMatic will attempt to move the antenna *as close as possible to what has already been stored* (if not inside the memory window), and display ' SE-C ', indicating that TuneMatic is set to a close memory (which is dependent upon how close the memory is to the transmit frequency).

You can manually move the antenna to whatever position you desire and store the position. ***This does not guarantee that the stored memory antenna position has the best match. TuneMatic relies on the users tuning settings, and stores the positions based on the transmit frequency. It does not tune for best SWR match.***

**NOTE: You should wait for both antennas to complete their movements before attempting other operations, so that the antennas do not operate in an unusual manner.** As some antenna installations may have different movements and positions, the left antenna does not communicate with the right antenna with regard to completion of operation. ***It is up to the user to allow this process to complete when using automatic operations.***

**Emergency stop:** If antenna is moving in automatic mode, and you want it to immediately stop, press the INIT button. This will immediately stop the antenna movement, and cancel the auto-tuning process.

**Parking antenna:** Once initialized, you can 'park' the antenna, by **pressing both UP and DOWN arrow buttons at same time**. This will lower the antennas to their minimum position. ***Parking the antenna also re-calibrates the pulsecount to the initialized settings.*** The antenna **must be STOPPED** to park it. The park position is at the lower soft limit point, which assures bottom of travel, and proper re-set of pulsecount calibration.

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

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

Any of the above 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 re-parked. Once it is re-parked, all memories will be restored. See the *Display messages* section for an explanation of the fail-safe messages.

**NOTE: If your antenna loses the ability to sense pulses, you will still be able to manually move the antenna, but the unit will only operate at one speed, and you will not know the physical position of the antenna.** You will still have the current limit safety feature, which stops the motor if current limit is reached. This mode is known as the 'fail-safe' mode.

**Factory reset:** To clear all memories, and set unit back to factory default, with power OFF, press and hold STORE and INIT buttons at the same time. While holding, turn on power, wait one second, then release the buttons. The display will show a single dot during the factory reset process. After approximately 25 seconds, display will flash "FACT", indicating unit has been set back to factory default settings.

## Troubleshooting:

<u>Symptom</u>	<u>Resolution</u>
No power	check power source, connections, and fuse
No antenna movement	check motor connections
Current limit (CLCL) when antenna moves	check DIP switch settings and wiring for shorts
Antenna movement backwards	incorrect setting of DIP switch #4 inside unit
PULs message a few seconds after parking	DIP switches set too high for antenna
PULs message when moving and unit stops	NO pulses detected, perform pulse test.
Antenna not returning to exact memory position	Possible pulse sensor issue.

### **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 transferable. 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.*

#### How to Obtain Warranty Service

To obtain warranty service, contact JT COMMUNICATIONS LLC Technical Support via email: [TuneMatic\\_support@jtcomms.com](mailto:TuneMatic_support@jtcomms.com) 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 re manufactured 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 re manufactured 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, and 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

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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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