## *About this Manual*

The following conventions are used in this manual:

- Quoted capital letters indicate what you will see on the **WatchDog 2000** display.The actual display may use both capitals and lowercase letters. For example, "SEE SPDS" indicates the following will be shown on the **WatchDog 2000** display.



Some letters cannot be displayed in their true form. For instance, K's cannot be formed, so K's will look like capital H's. Therefore H's are always represented in lowercase on the display. Also, an "m" requires two digit fields to represent it in the display. For example, "KEYTIME" on the display looks like:



- The button functions: **UP**, **DOWN** and **MAIN** are always in bold type. These refer to the buttons on the thumb switch, as shown below.
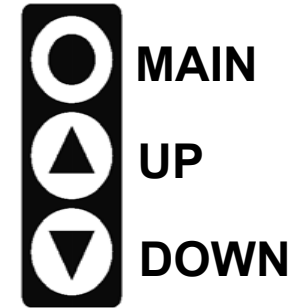


- For reference, typical route sheet entries are shown below:

This is the SPD
for a speed change

| | | |
|---|---|---|
| 4.20 | **SPEED 30** | 9:12:00 |
| 4.30 | **R TAR** | 9:12:12 |
| . | | |
| . | | |
| 14.40 | **RESET TO** | 9:39:20 |
| 17.00 | **R TR** | 10:07:30 |
| . | | |
| . | | |
| 96.20 | **END** | 13:40:00 |

This is the AT mileage

for a speed change or reset

This is the TO mileage for a reset

Last mileage    Keytime

*What's included with
WatchDog 2000?*

Your **WatchDog 2000** comes complete with everything you will need to start racing right away. Your kit should include the following items:

- **WatchDog 2000** with remote thumb switch.
- Sensor assembly.
- Nickel plated rare earth magnet.
- Two mounting brackets.
- Six bolts and four nuts.
- Thumb switch clamp.
- This manual.

Your **WatchDog** comes ready to use. The maintainance free, permanently sealed battery will provide more than 5000 hrs of on time. The auto-off feature will turn the computer off after 4 hrs of no switch activity and no sensor activity.

*Installation*

## Tools needed for Installation

Your **WatchDog 2000** is very easy to install. A typical installation will require:

- Phillips screw driver.
- 9/64" hex key wrench
- 3/16" and 17/64" drill bit and 5/16 x 24 tap
- a drill bit, sized to clear your handle bar clamp bolts.

Other tools may be needed depending on your specific installation.

## Mounting WatchDog 2000

**WatchDog 2000** comes with two brackets for mounting your computer to the handle bar clamps. The brackets can accommodate a wide range of center-to-center clamp distances.

With the tabs facing out the brackets accommodate clamps up to 4" apart. By flipping the bracket over so the tabs face inward, the center-to-center distance is increased to 5". The brackets are shipped w/o holes for the handlebar bolts. This way you can customize the bracketsso that **WatchDog 2000** clears other accessories, such as steering dampers. The brackets can be mounted on the front or back handlebar clamp bolts, facing forward or backwards. If you want **WatchDog 2000** to sit directly above the handlebar, mount the brackets to the front clamp bolts with the slots towards the rear.



YOU DRILL
THESE
HOLES
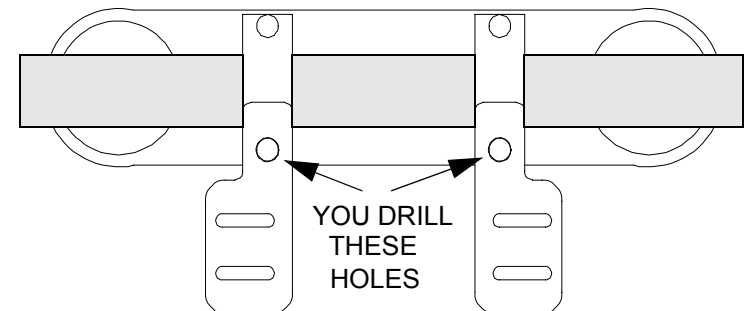
Use spacers between the bracket and clamp so that you have access to the bottom of the bracket for the nuts.  Always drill the hole in the bracket tab as near as possible to the computer.  Cut or grind off any unused portion of the bracket tab if neccessary.

Locate the brackets by loosely assembling the **WatchDog 2000** to the brackets using the four cap screws and nuts provided. Position the **WatchDog 2000** where you want it. Adjust the brackets and mark the position of the holes in the brackets. Drill the holes and mount the brackets to the handle bar clamps. You may have to use longer handlebar clamp bolts if you use spacers below the brackets. Tighten the **WatchDog 2000** to the brackets.Once the **WatchDog 2000** is mounted, run the switch wire along the handle bar and secure with zip ties. Mount the switch next to the left grip. Adjust the position of the switches so they are comfortable to access.  If necessary, move the kill switch so that the kill switch wire does not run near the thumbswitch or sensor wire.

## Connecting the Sensor Wire

The sensor is threaded for a 5/16 x 24 thread. The best way to mount the sensor is to drill and tap a hole in the caliper carrier. If you use this method, locate a spot for the magnet first.  Find a location on the front disk that passes by the caliper carrier but does not interfere with the pads and mark it with tape or ink.  Locate a spot on the caliper carrier by which this mark will pass.  Drill a 3/16" hole thru the carrier and into the disk where you marked it (just spot drill the disk for now).  Rotate the disk and drill the hole about 1/64" deep in the disk and epoxy the magnet in the hole.  Drill out the hole in the carrier to 17/64ths and tap it with the 5/16 x 24 tap.  Remove one of the nuts from the sensor and gently thread the sensor into the caliper carrier until the sensor is about 3/16 of an inch from the magnet as it goes by. **DO NOT FORCE SENSOR.  IF TIGHT, RECUT THREADS AND USE OIL.**  Hand tighten the outside nut against the caliper. Run the sensor wire up along the brake line securing with ties or tape. Run the sensor cable all the way to the brake master cylinder.  **DO NOT** route the wire from the brake line directly across to the computer as this will quickly destroy the wires when the forks compress. By running the wire all the way to the master cyclinder there is no stress on the wire as the forks and brake line move.  Connect the sensor to the computer. Neatly bundle up the slack in the cable and secure it and the connector with ties to the handlebars. When done,  the connector should not move at all when forks are compressed.

## *WatchDog 2000  Programming Details*

This section describes and illustrates how to use the three buttons of the thumb switch to program your race data. Once you are comfortable with entering data and understand their functions, proceed to the QuickStart[TM] chapter to program **WatchDog** for a race.

## Programming Your WatchDog

In general, when using the thumb switch to program  **WatchDog 2000**, the **MAIN** button (top) is used to select functions or values while the **UP/ DOWN** buttons are used to scroll through the functions or values.
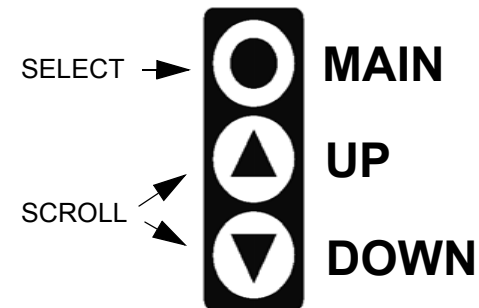
## Menu

Use the **UP/DOWN** buttons to quickly scroll through the programming functions. These functions are:

| Function | What you see in the Display | What it says |
|---|---|---|
| Enter a reset | rESEt | RESET |
| Enter a spd change | SPd Ch | SPD CH |
| See resets | SEE rStS | SEE RSTS |
| See speeds | SEE SPdS | SEE SPDS |
| Enter tiresize | tirESiZE | TIRESIZE |
| Enter minute | minutE | MINUTE |
| Enter race start time | Strt tm | STRT TM |
| See race information | rACEinFo | RACEINFO |
| Verify programming | vEriFYto | VERIFYTO |
| Enter keytime | HEYtimE | KEYTIME |
| Clear resets | CLr rStS | CLR RSTS |
| Clear speed changes | CLr SPdS | CLR SPDS |

The table above reflects the order in which you would typically enter data prior to a race. The **MAIN** button is used to select the function, the **UP** and **DOWN** buttons are used to scroll through values of that function. The same procedure is used to enter values for all the functions. For instance, to enter a reset, do the following:

Use the **UP/DOWN** buttons to scroll to "RESET". Select the reset function by hitting **MAIN**. The display will read "AT 0_ _. _ _", prompting you for the AT mileage of the reset. The zero indicates the current digit
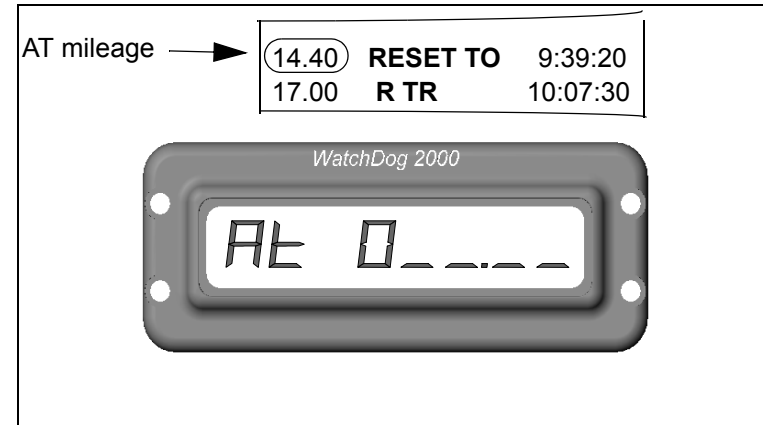


being edited. Use the **UP/DOWN** buttons to scroll through the numbers 0-9. Hit **MAIN** to select the currently displayed value for that digit field. The current digit will be accepted and the cursor will move to the next digit field. Continue entering the values for the remainder of the digit fields. When the last digit is entered, the display will change to "TO 0 _ _ · _ _", prompting you for the TO mileage of the reset.  Enter
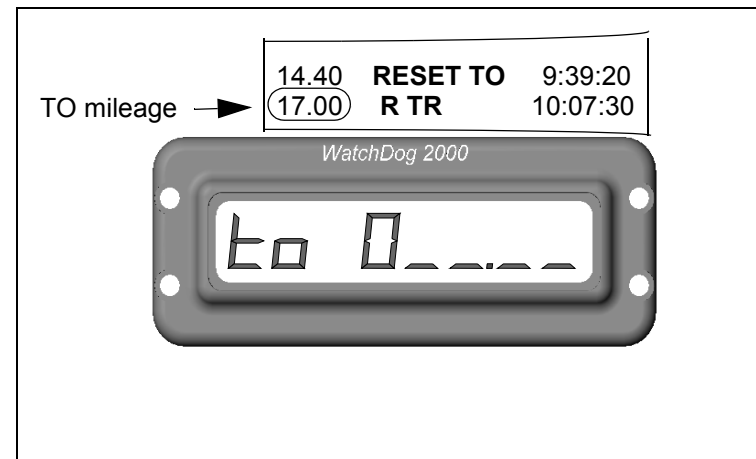
the TO mileage in the same manner. After entering the last digit for this, a confirmation prompt will be displayed, ("ENTER?"). To accept the entered reset values hit **MAIN**. This will store the values in memory. To cancel entry hit **DOWN**. The reset function will be displayed again. To continue entering resets hit **MAIN** and repeat.

At any point while entering the reset you can exit back to the start of the function by holding the **MAIN** button until "OFF" is displayed and then releasing. This will take you back to the beginning of the current function.

# Function Prompts

The following sections illustrate the prompts you will see for each function. Enter the values for each function as described in the previous section for entering resets. Parenthesis indicate valid value range.

## Speed Changes and Layovers (SPD CH)

1. hit **MAIN**
2. prompt is "AT 0 _ _._ _", enter the five digits indicating the AT mileage, (000.00 - 254.00) hitting **MAIN** after each.
3. prompt is "SPD 0_ _", enter the three digits for the speed (001 - 254), hitting **MAIN** after each.
4. prompt is "ENTER ?", hit **MAIN** to accept, **DOWN** to re-enter speed changes.

To enter a layover (aka WAITS and PAUSES) enter a speed of 000 when prompted for the speed in step 3 above. The following will be displayed "FOR 0_ _" prompting you for the duration in minutes. Enter the duration and hit **MAIN**.

**Note**: If a dash appears next to SPD CH or RESET (ie "RESET  -") this indicates that the resets contain a jump (reset to 000.00) and that the entries will not be sorted by mileage.
**Note**: Layovers are stored as speed changes, with the speed = 0 mph. They are sorted just as other speed changes are. When viewing speeds they appear as "SPD 0 - XXX" where XXX is the duration in minutes.

## See Resets (SEE RSTS)

1. hit **MAIN,** reset number (01, 02 etc) is briefly displayed, then
2. display will alternate between the AT and TO mileage for the first reset. Hit **MAIN** to display each of the remaining resets**.**

3. to delete the currently displayed reset, press **MAIN** until "OFF" is displayed. Release **MAIN** to delete the entry.
4. hit **DOWN** to exit

## See Speeds (SEE SPDS)

1. hit **MAIN**, speed number (01, 02, etc) is briefly displayed, then
2. display will alternate between the AT mileage ("AT 000.00") and the speed ("SPD  024") for the first speed or between the AT mileage and "SPD 0-XXX" for a layover, where 0 indicates 0 mph and XXX is the length of the layover in minutes. Hit **MAIN** to display each of the remaining speeds.
3. to delete the currently displayed speed, press **MAIN** until "OFF" is displayed. Release **MAIN** to delete the entry.
4. hit **DOWN** to exit

## Tire Size (TIRESIZE)

1. hit **MAIN**. Current tire size is displayed (ie "IN 083.65" or "CE 213.88"). If OK hit **DOWN** to advance to "MINUTE". To change tire size hit **MAIN**.
2. prompt is "IN 0 _ _._ _", enter the five digits for tire circumferance in either inches or centimeters, 001.00 - 254.00), hitting **MAIN** after each. (See Chapter 7 on how to measure tire size.) A value over 149.99 is assumed to be in centimeters.

## Minute (MINUTE)

1. hit **MAIN**, current rules and minute are displayed (ie "AMA  021"). If OK hit **DOWN** to advance to "STRT TM". To change hit **MAIN.**
2. prompt is "AMA      ", hit **MAIN** to select AMA rules, or
3. hit **UP/DOWN** to toggle rules to "NEI      ", hit **MAIN** to select NEI rules.
4. prompt is "AMA  0_ _" or "NEI  0_ _", enter the three digits for your minute, (001 - 254) hitting **MAIN** after each.

## Start Time (STRT TM)

1. hit **MAIN**. Current race start time is displayed (ie "ST  09:00"). If OK hit **DOWN** to advance to "RACEINFO" . To change, hit **MAIN.**
2. prompt is "ST  0_:_ _", enter the four digits for the race start time, (hour and minute  00:00 - 99:59) hitting **MAIN** after each.

## Race Info (RACEINFO)

1. hit **MAIN**, total ground miles from last race will be displayed (ie "TD 087.33"). Hit **MAIN**, highest speed from last race will be displayed (ie "HISP 067"). Hit **MAIN** to repeat or **DOWN** to exit and advance to "VERIFYTO".

## Verify To (VERIFYTO)

1. hit **MAIN**
2. prompt is "VE 0 _ _._ _", enter the five digits, hitting **MAIN** after each, for the mileage to which you want to verify the programming.
3. display is "HOLD ON", then display will return with calculated time for the selected mileage.
4. Hit **MAIN** to enter the next mileage and repeat step 3 for successive mileages, or hit **UP/DOWN** to advance to "KEYTIME".

**Note**:When multiple loops are programmed, you must verify to the end of each loop in order. For example, if there are resets to zero at 45.00 and then 35.00 miles, first verify to 45.00 miles. Then hit **MAIN** again to enter and verify to 35.00 miles.
This incremental verification can be used with all programs (to help find programming errors, for example).
To abort a verify calculation hit **MAIN** while "HOLD ON" is displayed.

## Keytime (KEYTIME)

1. hit **MAIN**
2. prompt is "KT0_:_ _:_ _ ", enter the six digits, hitting **MAIN** after each of the digits, for the advanced posted keytime. Wait on hitting **MAIN** for the last digit until the posted keytime equals the entered keytime. Running keytime is displayed.
3. Hit **DOWN** to display countdown to race time.

## Clear Resets (CLR RSTS)

1. hit **MAIN**, a confirmation prompt is displayed "CLR RS ?"
2. to clear resets hit **MAIN**, or hit **UP/DOWN** to escape. Display is "HOLD ON", while reset memory is being cleared, then display will return with "CLR SPDS". The reset and speed change sorting feature will be enabled. "

## Clear Speeds (CLR SPDS)

1. hit **MAIN**, a confirmation prompt is displayed "CLR SP ?"
2. to clear speeds hit **MAIN**, or hit **UP/DOWN** to escape. Display is "HOLD ON", while speed memory is being cleared, then display will return with "RESET". This also clears all layovers. **Default speed at 000.00 miles will be 24mph**.

## Programming for Multiple Loop Races

For multiple loop races where the mileage is reset to zero at the start of each loop you must enter the resets and speeds in the order in which they occur. Always do the resets before the speeds and enter a reset to zero at the end mileage of each loop. Once you enter a reset to zero the sorting feature is disabled and all subsequent resets (and speeds) are stored in the order in which they are entered. If you did the speeds first they would be sorted by mileage. A dash next to the function ("RESET -") indicates sorting is disabled. For example, if the first loop is 40 miles long, enter a reset AT 40.00 TO 000.00. Then, a reset in the second loop is entered after the reset to zero:

> AT 034.00  TO 034.50
> AT 040.00  TO 000.00  (end of first loop/start of next loop)
> AT 010.20  TO 012.00

After the resets are entered, enter all the speed changes in the order in which they occur. If there is a speed change at the start of the next loop (at mile 000.00), you can enter that speed change at the same mileage at which you entered the reset to zero or you can enter it at 000.00. (where it occurs looks more obvious as you view your speeds if its at the reset mileage). For example you can enter it as follows:

> AT  000.00  SPD 024     (start of first loop)
> AT  024.00  SPD 036
> AT  040.00  SPD 018     (end of first loop)
> AT  018.00  SPD 024

or

> AT  000.00  SPD 024     (start of first loop)
> AT  024.00  SPD 036
> AT  000.00  SPD 018     (start of second loop)
> AT  018.00  SPD 024

You can have multiple speed changes at the same mileage. For example, if there was also a layover at 040.00, you could enter it at 000.00 or at 040.00 and you could enter it before or after the speed change if the speed change is at the same mileage. Or you could put the speed change at 040.00 and the layover at 000.00.....etc.

Once the resets, speed changes and layovers are programmed, they can be easily viewed, checked and edited by selecting SEE RSTS and SEE SPDS.

**Note:** If the first speed of the first loop is not 24mph (default speed after clearing speed changes) you will have to delete this speed change manually before (or after) programming your speeds.

# Editing Race Data

## Data Entry Errors

If you make a mistake while entering resets, speed changes, tiresize, keytime, verify mileage, start time, or your minute, simply press and hold the **MAIN** button until "OFF " is displayed then release **MAIN**. This will bring you back to the start of the current function. No data will be saved.

## Adding Resets and Speed Changes

For single loop races (no resets to zero) you can add resets and speed changes to your program by simply using the RESET and SPD CH functions. The reset and speed changes are sorted by mileage and can be entered in any order.

If there is a reset to zero in your program you can insert resets and speed changes using the SEE RSTS and SEE SPDS functions. To insert a reset, select the SEE RSTS function and hit **MAIN** until you see the reset before which you want to insert a new reset. Hit the **UP** button and "INSERT ?" will be displayed. Hit **MAIN** to insert a reset and then enter the reset as usual. Hit **UP** or **DOWN** to cancel. Follow the same procedure using SEE SPDS to insert a speed change.

## Deleting Resets and Speed Changes

You can delete speed changes and resets using the SEE SPDS and SEE RSTS functions. Select the desired function and use **MAIN** to view the entry you want to delete. While you are viewing it press and hold **MAIN** until "OFF" is displayed, then release **MAIN**. "DELETED" will be displayed briefly and then the next entry will be displayed as usual.

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CHAPTER 4

# *WatchDog 2000 QuickStart^{TM}*

**WatchDog 2000** was designed to simplify timekeeping before and during a race. To start a new race with **WatchDog 2000**, use the following QuickStart^{TM} procedure.

1.  **Power On Battery Check**
    Press and hold **MAIN** button until "ON" is displayed, release **MAIN**. A battery check will be perfomed and displayed ("BATT  99 "). The range is from 0 to 99. Change the batteries when the charge is around 25. To exit the battery check press any button. "RESET" will be displayed.

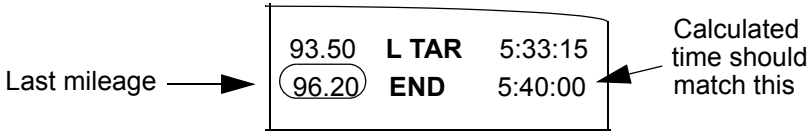2.  **Program Resets and Speed Changes**
    Clear old resets and speed changes by scrolling down to the CLR RST/CLR SPDS functions. Hit **MAIN** at each function to clear the resets and speed changes. Enter all the resets, speed changes, layovers, and jumps as outlined on your route sheet. **If the first speed is not 24mph you must enter a new speed for 000.00 miles**. Speed changes and resets can be entered in any order. **WatchDog 2000** will sort them by mileage. Error checking disallows certain invalid entries. For instance, you can't enter a reset from 11.50 miles to 10.50 miles.

3.  **Enter Tiresize, Minute and Race Start time**
    Use the TIRESIZE, MINUTE, and STRT TM functions to enter your tire size, your start minute, and the race start time (i.e., 9:00).

4.  **Verify Programming**
    Scroll down, using the **DOWN** button to "VERIFYTO" and enter the last mileage indicated on your route sheet. See page 16. Hit the **MAIN** button. "HOLD ON" will appear on your display. When done (usually about 1sec/3miles) **WatchDog 2000** will display the calculated time for the entered mileage. It should match your route sheet. If not, make sure the speed changes match the route sheet. For multiple loops you must verify to the end of each loop in order. For example, if you have a reset to zero at 45.00 miles, first verify to 45.00. Then hit **MAIN** and enter the mileage at the end of the next loop, etc. This routine does not check the resets so you need to make sure they are correct as you view them. To abort a verify calculation hit MAIN while "HOLD ON" is displayed.

| | | |
|---|---|---|
| 93.50 | **L TAR** | 5:33:15 |
| 96.20 | **END** | 5:40:00 |

Last mileage → (96.20 circled)

Calculated time should match this

**5. Enter Keytime**

Once all the data has been entered correctly, scroll down to "KEYTIME", hit **MAIN**. Enter a time 10 or 15 seconds ahead of the posted keytime (this provides sufficient time to synchronize **WatchDog** with keytime). When the posted keytime reaches the entered value hit the **MAIN** button. After you press **MAIN** the display will continue to show the running keytime and **WatchDog 2000** will begin the countdown to your race time. Press the **DOWN** button to view the countdown time. You can scroll through the menu as usual after entering keytime. Anytime you go back and change your minute or start time, the countdown stops until a new keytime is entered. Also, once keytime is entered, the CLR RSTS, CLR SPDS, and VERIFY TO functions are disabled and are not displayed. These functions can be re-enabled by resetting your minute, start time, or by turning off the computer and then turning it on again. **Remember**: Always enter the posted keytime directly. **WatchDog** will adjust for your minute and the race start time when displaying the countdown.
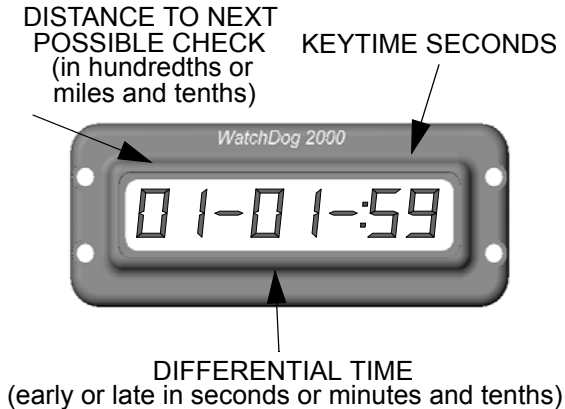
# *Race Mode*

There are two main displays when you are racing. AUTO mode automatically selects what is displayed depending on your early/late status. WatchDog's **MinuteMinder™** is displayed if you are less than ten minutes early or less than one minute late. When you are more than one minute late WatchDog's **MileMinder™** is displayed. While racing, you can also adjust your mileage, your minute, keytime, and tiresize. You can also use Interactive Calculated Distance (ICD) mode.

## MinuteMinder™

The **MinuteMinder™** displays three fields of information. The two left digit fields indicate the countdown distance to the next possible checkpoint. If the distance is less than one mile it is displayed in hundredths, ie "**88** -45- :23", indicating 0.88 miles or 88 hundredths. If the distance is more than one mile it is displayed as miles and tenths of miles, ie. "**1.3** -44- :52", indicating 1.3+ miles. The initial countdown value is dependant on the currently programmed speed average, for example, at 24mph it will count down from 40 to 00, then start at 40 again; at 18mph it will count from 30, etc. Use this information wisely to get a early jump into sections. As long as the count is high you can ride hot into the section. As the countdown gets close to zero, be careful. If the count will reach zero around the next blind corner don't be early!!! If you are early, wait until the differential time is close to 00, then proceed carefully. Don't burn a check!!

DISTANCE TO NEXT POSSIBLE CHECK (in hundredths or miles and tenths)    KEYTIME SECONDS

WatchDog 2000

01-01-:59

DIFFERENTIAL TIME (early or late in seconds or minutes and tenths)

If the count is low but you can see ahead enough, it is safe to keep going until the count down approaches zero again (don't forget to adjust your mileage at the markers).

The two center digits indicate your early/late status. Use this as the main indicator of how you are doing. Always use this in conjunction with the keytime seconds (right most field) when approaching checkpoints. If you are late the minus "-" sign appears around the differential time (DT) If you are early the DT flashes.   If you are less than a minute early or late the DT is displayed as second, ie "23  -45-  :21", indicating 45 second late.  If you are more than a minute early the DT is displayed as minutes and tenths of seconds, ie "12  **1:2**  :44", indicating one minute and twenty something seconds early.

The right most digits display the keytime seconds. This is used as a final check before entering checkpoints. A diff time equal to 00 should not be used alone as an indicator of when to enter a check, since this is dependent on the accuracy of your odometer. Always use the keytime seconds as the last indicator of when to enter the checkpoint. Enter as the seconds roll over to zero, or at 30 seconds for an emergency check.

# MileMinder<sup>TM</sup>

When you are more than ten minutes early or more than one minute late the **MileMinder<sup>TM</sup>** displays two fields of information.The left field displays your mileage in miles and hundreths of a mile. The right field displays your DT in minutes and seconds. Go faster if you are late. Go slower if you are early!

ODOMETER
(in miles and hundredths)



DIFFERENTIAL TIME
(in minutes and seconds)
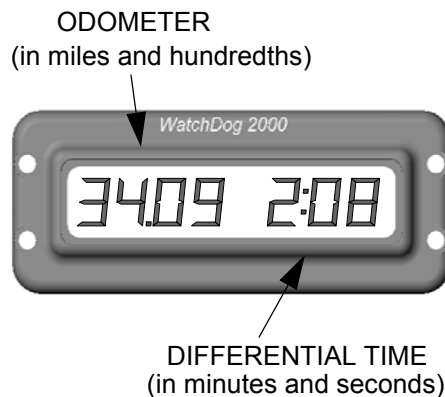
# Other Race Mode Displays

The following sections describes other race mode displays and how to adjust race variables.

## Adjusting Mileage

In **MinuteMinder<sup>TM</sup>** there are two ways to view and/or adjust your mileage. To view or adjust the mileage hit either the **UP** or **DOWN** button. The display switches to **MileMinder<sup>TM</sup>**. Then use the **UP/DOWN** buttons to adjust your mileage.

If you initially hit the **UP** button to enter **MileMinder<sup>TM</sup>** , the display will return to  **MinuteMinder<sup>TM</sup>**  after 4 seconds of no button activity.  If you initially hit the **DOWN** button the display will remain in **MileMinder<sup>TM</sup>** until you hit the **MAIN** button.

When you hit the **UP** or **DOWN** button the displayed mileage stops incrementing except for when you adjust it.  If you are still moving, the mileage is accumulated in the background.  A few seconds after you are done adjusting your mileage the accumulated mileage is added to the displayed mileage.  This allows you to adjust your mileage to match a trail marker even though you are still moving forward.  Just make sure that you begin adjusting your mileage when you are next to the trail marker.

**Tip:** Use the **UP** button to quickly view your mileage and adjust if necessary. Use the **DOWN** button on road sections or fast sections when you stay within your minute and want a constant display of your mileage.

**Tip:** The longer you hold the **UP/DOWN** button the faster the mileage will scroll.

## Marking a Check and Changing your Minute (Brand-X)

In AMA rules you can mark a check by pressing the **MAIN** button once from AUTO mode.  If your odo is within 0.09 miles of the correct checkpoint mileage when you press **MAIN** the display will show "CHEC  023"  (the 023 is your minute and is not adjustable). If you leave the display here for ten seconds several things will happen.  First, your odometer will be synchronized to the correct mileage for the checkpoint. For example, if the check point mileage is 24.40 and your odo is between 24.35 and 24.45 your odo will jump to 24.40.  Then, the next possible countdown will be set to 3.00 miles. If your odo is not within 0.09 miles of the actual mileage  "CHEC 023" will not be displayed when you hit the **MAIN** button.  Instead, the odometer will be displayed. You must first adjust your mileage then mark the check.  After ten

seconds on "CHEC 023" the display will return to AUTO mode.  If you change the display (by pressing  **MAIN**) before the ten seconds is up the check will not be marked and your mileage will not be changed. There is no need to wait for any of this to happen.  Simply, press the **MAIN** button once (make sure "CHEC 023" is displayed) and take off. The mileage will be accumulated in the background.

In Brand-X you can enter this mode at any time so that you can change your minute.  As in AMA rules, press **MAIN** once from AUTO and the display will show "CHEC 023" .  You can change your minute by using the **UP/DOWN** buttons.  If you are within 0.05 miles of a check the odo will sync to the checkpoint mileage.  However,  the countdown will not be set to 3.00 miles.   Again, there is no need to wait, simply adjust you minute and take off.  The display will return to AUTO after a few seconds.

## View Odometer and Speedometer

You can view your odometer and speedometer by pressing **MAIN** once in AMA or twice in Brand-X.  The speed is a 3 second running average.

## View/Adjust Keytime

From AUTO mode, you can view  the current  keytime  by pushing **MAIN** twice, three times if running Brand-X rules. You cannot change the keytime from this display .  If you  need  to change keytime,  press and  hold  the **MAIN**  button until   "CLOCK"   appears  on the display. Release the button. A "C" will be displayed on the left indicating keytime can be adjusted. Adjust the keytime in increments of minutes using the **UP/DOWN** buttons. The seconds are reset to zero each time you change the minute. Hit the **MAIN** button to return to AUTO mode.

When you adjust your keytime in this mode you need to enter the elapsed keytime since leaving the gate.  If your backup watch displays elapsed time then you can use this time directly.  If it shows the actual posted keytime you must subtract your minute before using it.
For AMA events, simply enter the time directly from your backup watch. When running Brand-X, first set your minute to your original minute, then adjust the clock to match your backup watch.  After adjusting the clock set your minute to your current minute.
Whichever rule you are running, adjust the clock so that the full minutes match the backup watch.  For example, if the backup shows 1:23:35, set the computer clock to 1:23:00.  When the backup seconds turn to 00, increment the clock minute. Make sure they match then hit **MAIN** to return to race the displays.  Adjust your minute if necessary.
Note: In Brand-X the keytime you see once back in race mode is adjusted for your current minute.  You can compare this directly to your route sheet.

## Adjusting Tire Size

At any time, to adjust your tire size, hold down the **MAIN** button until "TIRESIZE" is displayed. Release the button. Now use the **UP/DOWN** buttons to adjust your tire size in increments of 0.01 inches. Hit the **MAIN** button to return to  AUTO mode.

**Tip:** If your mileage is off by one one-hundredth (1/100) of a mile over the course of a mile, adjust your tire size by about 0.80 inch.

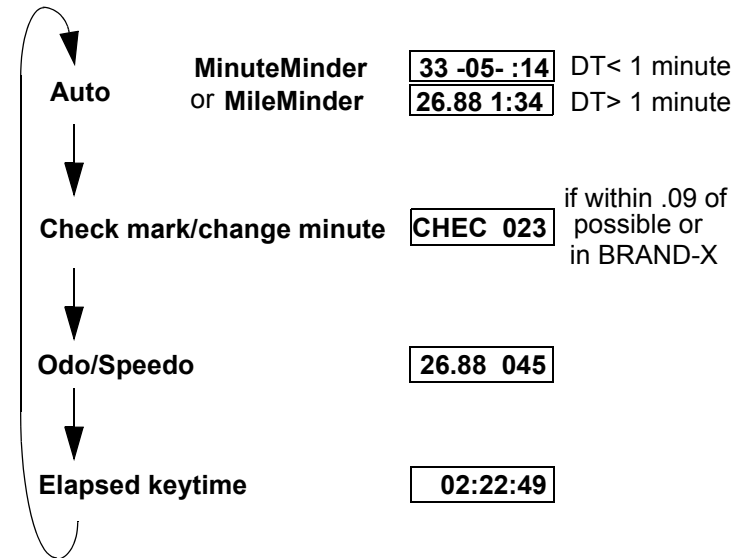## Interactive Calculated Distance Mode  (ICD)

In the event your magnet gets sheared off (or anytime), you can still use **WatchDog 2000** to display your differential time and calculated mileage. To enter ICD mode, press and hold **MAIN** button until " ICD ON  " is displayed. Calculated distance will be displayed on the left, and differential minutes and seconds will be displayed on the right. You will immediately see the mileage change until the diff time is zero.  The diff time will remain 0:00 until you adjust the mileage.  When you adjust the mileage at a trail marker, the diff time will reflect your early or late status.  If you are late, after a short delay the displayed mileage will return to the calculated mileage for the current keytime, and the diff time will return to 0:00.  If you are early, the displayed mileage will remain as is until the diff time reaches 0:00.  At which time the calculated distance will begin to increment again and the diff time will remain at 0:00. Since the mileage is automatically incremented in this mode, you should not have to adjust the mileage too much at the trail markers. With a quick mileage adjustment you can determine your diff time and either take off again or wait.
Another use for ICD is during a gas stop or layover when you want to monitor your remaining time but dont want the mileage to increment (while driving around the pits for example).  When you get to the gas stop, enter ICD and set the odo to the desired mileage.  For example, set it to the mileage at the start of the next section (ie. known control mileage).  Then as you ride around you will not affect the remaining duration of the gas stop.  **Caution!!  Don't forget to get out of ICD when you get to the known control!**  To exit ICD hold **MAIN** until "ICD OFF" is displayed, then release.
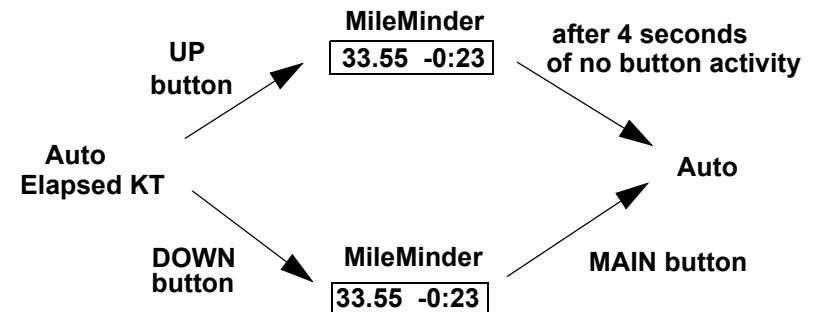
## Race Recovery

In the unlikely event that the computer unexpectedly resets, (EMI noise etc) **WatchDog** will either recover automatically or prompt you to enter the keytime ("KEYTIME"). If the computer determines that no information has been corrupted it will recover automatically.  During this time the computer will display  "HOLD ON"   while it returns to the current mileage and keytime in the race.  If your **WatchDog** has determined that data has been corrupted it will prompt you to enter the current keytime. Using your back-up watch (which you should always have), enter the current  un-adjusted keytime (the posted keytime).  You will then be prompted for an AT mileage ("AT 0 _ _._ _").  Enter the mileage to which you want to advance.  To enter a mileage past a reset to zero, you must enter the total accumulative mileage to that point.  For example, if the reset to zero is at 30.00 miles and you want to advance to mile 10.00 of the 2nd loop, enter 40.00 miles at the prompt.  If you make a mistake entering either value, hold **MAIN** until "OFF" is displayed.  You will be prompted for the keytime again.   **WatchDog** will enter race mode and advance to the entered keytime and mileage.  Once back in race mode, adjust your minute if necessary.  While recovering, "HOLD ON" is displayed, during  which you DO NOT need to wait....GO!!

This feature can be used at any time to enter or re-enter race mode. Anytime you enter a post race-start keytime (race start time plus your minute) you will always be prompted for a mileage.  For example,  if you are in a race and realize that you programmed something wrong, simply turn the computer off, fix the program, then use race recovery to re-enter the race.  To do this, scroll down to "KEYTIME" and enter the current unadjusted keytime.  At the "AT 0_ _._ _" prompt enter the current mileage.  The computer will advance to that point in the race.

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**Race mode displays using MAIN button to select**

| | | | |
|---|---|---|---|
| **Auto** | **MinuteMinder** | 33 -05- :14 | DT< 1 minute |
| | or **MileMinder** | 26.88 1:34 | DT> 1 minute |
| **Check mark/change minute** | | CHEC  023 | if within .09 of possible or in BRAND-X |
| **Odo/Speedo** | | 26.88  045 | |
| **Elapsed keytime** | | 02:22:49 | |

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**Race mode displays using UP/DOWN button to select**

**Auto Elapsed KT**

**UP button** → **MileMinder** 33.55  -0:23 → **after 4 seconds of no button activity** → **Auto**

**DOWN button** → **MileMinder** 33.55  -0:23 → **MAIN button** → **Auto**

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**Race mode displays holding MAIN button
(release MAIN when desired function is displayed)**

Hold for 2 seconds    "TIRESIZE"    to change tire size

Hold for 3 seconds    " CLOCK "    to adjust elapsed time

Hold for 4 seconds     "  ICD  "    to enter ICD mode

## *Tiresize Measurement*

### Measuring Tire Circumference

In order for the computer to accurately track your mileage you must enter the circumference of the front tire. The computer then knows how far you travel each time the tire rotates. The accuracy of your odometer depends on the accuracy of this measurement. The caveat to this is that you will probably need to adjust it again once on the trail to match the odometer of whoever laid out the course.

There are several ways to measure this. The most accurate is to put some paint on one of the center knobbies of the front tire and move the bike through two tire rotations. Measure the distance between the first and third knobby print and divide this distance by two. This is the value you enter using the TIRESIZE function.

You can also mark the tire with a piece of tape. Rotate the tire so the tape is at dead bottom. Mark the ground then move the bike through two rotation and mark the ground again. Make the measurement as described above.

### Miles and MPH Display

If you want the computer to display distances in miles and speed in miles per hour, measure and enter the tire size in inches and hundredths of inches. Any value less than 150 is assumed to be in inches. When you view your tiresize you will see "**IN** 084.88" indicating the size is in inches.

### Kilometers and Km/h Display

If you want to display distances in kilometers and speed in kilometers per hour, measure and enter your tiresize in centimeters. When you enter a value over 149.99 for tiresize, the computer assumes that the value is in centimeters. When you view your tiresize you will see "**CE** 214.43" indicating the size is in centimeters.

## *Other WatchDog 2000 Features*

### Sensor Check Mode

You can check to see if the sensor is working by entering a tiresize of zero (000.00). This will not be stored in memory. The display will show you the software revision level on the left and a hit count on the right, ie "91  000". As you rotate your tire, the count will increment every time the magnet goes by the sensor. If the count does not increment, check both the sensor wiring and the distance between the sensor and the magnet. The magnet should be about 1/8" from the sensor as it passes by. You can check intermitent problems by holding the magnet on the sensor and wiggling the wires at the connectors.

### Instant Race Mode

For recreational or practice riding  (or panic race starts) you can instantly enter Race Mode by entering a keytime of zero (00:00:00). All the functions of Race Mode are enabled.

**Tip:** Use Instant Race Mode if you just need to use the odometer or speedometer. Also use Instant Race Mode for practicing by programming a speed average (using speed change function) and using the differential time to maintain that pace. This is good practice for using **WatchDog 2000** and for improving racing skills.

### Software Reset

In the event that you find a way to "hang" the software, there is an escape sequence built in to **WatchDog 2000**. If your computer does not seem to be responding to switch input, wait about one minute then press the **MAIN** button for a few seconds. The software will reset itself and return to the battery check. No programming information will be lost.

Need help?  Comments?  Please, don't hesitate to call or email us.

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