

## About this Manual

The following conventions are used in this manual:

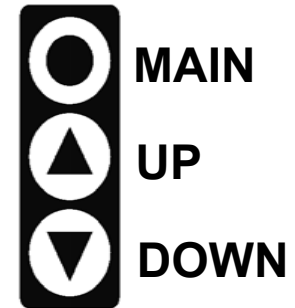
- Quoted capital letters relate to what you will see on the **WatchDog 2000** display. The actual display may use both capitals and lowercase letters. For example, "SEE SPDS" indicates the following will be shown on the **WatchDog 2000** display.



Some letters cannot be displayed in their true form. For instance, K's 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	<b>SPEED 30</b>	9:12:00
This is the AT mileage	4.30	<b>R TAR</b>	9:12:12
		.	
		.	
for a speed change or reset	14.40	<b>RESET TO</b>	9:39:20
	17.00	<b>R TR</b>	10:07:30
		.	
		.	
This is the TO mileage for a reset	96.20	<b>END</b>	13:40:00
		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 plates.
- Two #2025 coin batteries.
- Six bolts and four nuts.
- Thumb switch clamp.
- This manual.

Remove the two screws holding the backplate to the computer. Insert one battery into each battery holder with the “+” side up. Replace backplate with the recess in the backplate over the battery holders. Depending on the brand of batteries, **WatchDog** will run continuously for about two - three months, much longer if you turn it off in between races. Always replace the batteries in pairs. Do not use an old battery paired with a new one. Use only #2025 batteries (20 millimeter diameter by 2.5 millimeter thick). **WatchDog** retains all programmed information when the batteries are removed. You will not lose any data.

**Tip: After** replacing the backplate, smear a thin coat of RTV in the space around the backplate. Do not put RTV inside the backplate, you will never get it off again!

**Tip:** To remove the batteries, hold the computer with the batteries facing down and gently pull the battery retaining clip with your fingernail. The battery should fall right out. If it doesn't, turn the computer over and use a small screwdriver to push on the back of the battery while lifting the front of the battery over the lip of the battery holder. Be careful not to over extend the battery retaining clip.

### *WatchDog 2000*

The **WatchDog 2000** caters to the serious enduro rider, and to the enduro rider wanting to improve his or her ability to race competitively, accurately and with more finesse. The **WatchDog 2000** allows the rider to concentrate more on riding technique by alleviating the mental strain of keeping track of your minute, your speed, and programming.

The display during race-mode shows you only the critical information that you need to know to stay on time. Within your minute, DE's **MinuteMinder™** technology displays at once the distance to the next even minute (remaining distance you should cover each minute to stay on time), differential time and key time seconds. All the information you will need in a glance, to keep an edge on your competition is on your display! Outside of your minute, **MileMinder™** displays the mileage and time differential.

**WatchDog 2000** allows adjustments of all race variable while in race-mode, including mileage, your minute (for Brand-X), clock and tire size. In the event your sensor magnet gets sheared off, **WatchDog 2000** will calculate your “should-be” distance to keep you on time. In addition, a “Race Recovery” feature will enable **WatchDog 2000** to advance to any key time and mileage should you need to exit race-mode to adjust any programming (like speed changes or resets) during a race. Resets to zero allow programming for multiple loops.

The all-aluminum color-anodized **WatchDog 2000** off-road computer is designed for ease-of-use, during both programming and race-modes. The user does not need to have any technical experience to use or program the **WatchDog 2000**.

## CHAPTER 3

# Installation

## Tools needed for Installation

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

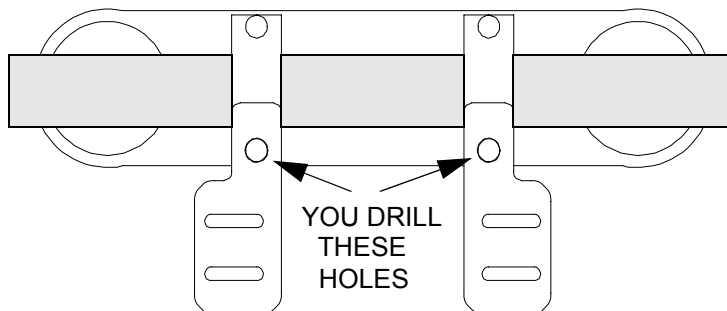
- Phillips screw driver.
- 9/64" hex key wrench
- 3/16" and 17/64" drill bit and 5/16 x 24 tap
- a drill bit, sized to clear your handle bar clamp bolts.

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 brackets



so 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 toward the rear. 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 necessary.

Locate the brackets by loosely assembling the **WatchDog 2000** to the brackets using the four Allen bolts and nuts provided. Position the **WatchDog 2000** where you want it. Adjust the brackets and mark the position of the holes in the bracket. 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.

## 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. This reduces the stress on the wire as the forks move. Connect the sensor to the computer. Take up the slack in the cable and secure it and the connector with ties to the handlebars or something else. When done, the connector should not move at all when forks are compressed.

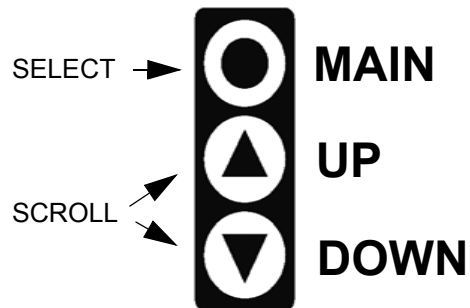
## CHAPTER 4

### 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™ chapter to program **WatchDog** for a race.

#### Thumb Switch Programming

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

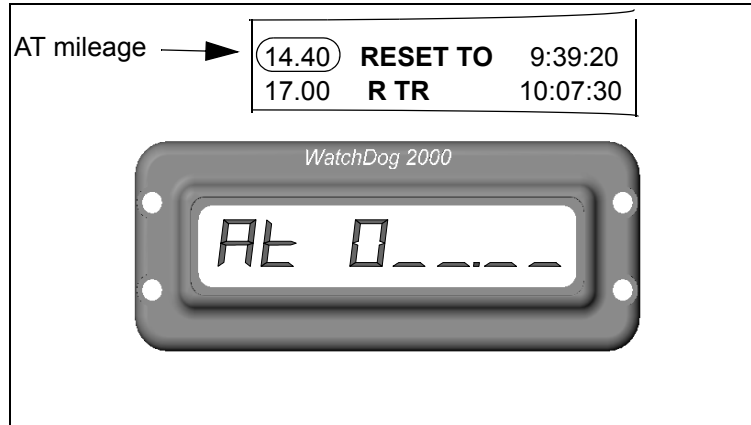
Use the **UP/DOWN** buttons to quickly scroll through the programming functions. These functions are:

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

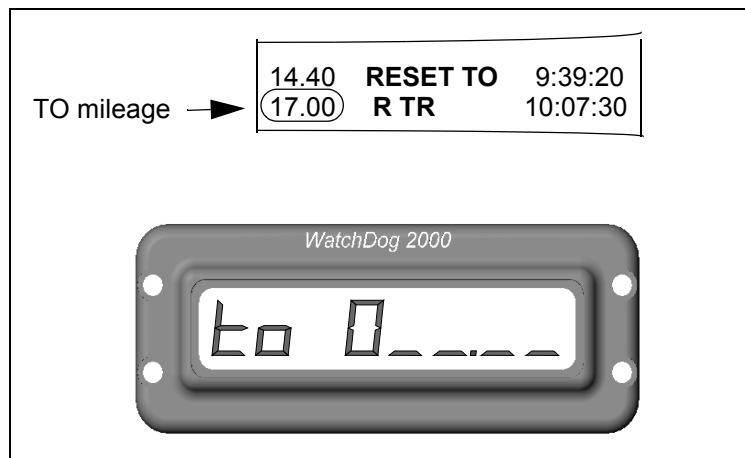
#### Program Mode Navigation

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 - XX" where XX 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 "TS 083.65"). If OK hit **DOWN** to advance to "MINUTE". To change tire size hit **MAIN**.
2. prompt is "TS 0 \_\_. \_\_", enter the five digits for tire size (circumference of tire in inches and hundredths of inches, 001.00 - 254.00), hitting **MAIN** after each. (See addendum on how to measure tire size.)

### 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).

### 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.**

## WatchDog 2000 QuickStart™

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

### 1. Power On Battery Check

Press and hold **MAIN** button until “ON” is displayed, release **MAIN**. A battery check will be performed and displayed (“BATT 98 “). The range is from 0 to 98. Change the batteries when the charge is around 50. 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. **Note, 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. For example, if the first loop is 40 miles long, enter a reset AT 40.00 TO 000.00. Once you enter a reset to zero the sorting feature is disabled and all subsequent resets (and speeds) are stored in the order they are entered. So, the first reset of the second loop is entered after the reset to zero. (ie AT 10.20 TO 10.50). A dash next to the function (“RESET -”) indicates sorting is disabled. After the resets are entered, enter all the speed changes in the order in which they appear. If there is a speed change at the start of the next loop (at mile 000.00), enter that speed change at the same mileage at which you entered the reset to zero (you can enter it at 000.00, but it looks more obvious when you view your speeds if its at the reset mileage). Clearing resets (CLR RSTS) will re-enable sorting. Once the resets, speed changes and layovers are programmed, they can be easily viewed and checked by selecting SEE RSTS and SEE SPDS. If you have entered a reset to zero (sorting is disabled), you can insert resets and speed changes by hitting the **UP** button while viewing the**

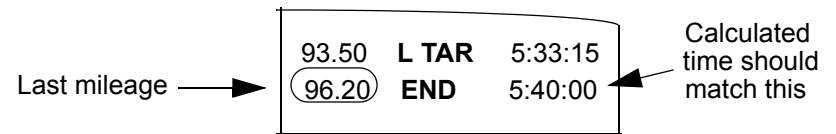
resets or speed changes. When you hit **UP**, “INSERT ?” is displayed. To insert a reset/speed change hit **MAIN**. Enter the reset/speed change as usual. When done, you will return and continue viewing from the one you just entered.

### 3. Entering 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. 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

### 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. 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. If you enter a keytime ahead of when you should leave (race start plus your minute) the computer will enter race mode and advance to that keytime.

### 1. Race Mode

When the countdown reaches zero.....twist that thang!!! Okay seriously, **WatchDog** enters race mode.

Within your minute, the following **MinuteMinder™** information is displayed:

- Number on far left => remaining distance to travel in the current minute to stay on time.
- Middle Number => Early/Late status in seconds.
- Number on far right => Keytime seconds.

When your early/late status is more than one minute, the following **MileMinder™** information is displayed:

- Number on left => Odometer in miles and hundredths.
- Number on right => Early/Late status in minutes and seconds.

### 2. Adjusting Mileage

To adjust your mileage, use the **UP/DOWN** buttons in the following manner depending on your early/late status.

While in **MinuteMinder™**, hit the **UP** button to temporarily display your mileage and differential time. After four seconds of no switch activity, the display will revert back to the **MinuteMinder™** (see above). If you need to adjust your mileage, use the **UP/DOWN** buttons before the four second delay expires.

While in **MinuteMinder™**, hit the **DOWN** button to display odometer and differential time without reverting back after the four second delay to **MinuteMinder™**. Use the **UP/DOWN** buttons to adjust mileage. Hit **MAIN** to revert back to **MinuteMinder™**.

### 3. Changing your Minute

If running Brand-X (NEI) rules and need to change your minute, from AUTO mode, hit **MAIN** once. Your minute will be displayed. Use the **UP/DOWN** buttons to adjust. The display will revert back to AUTO mode after four seconds of no switch activity. If you do not change your minute the display will revert to AUTO mode after 10 seconds.

Note: If you are running AMA rules, this will not be displayed.

### 4. Viewing Odometer and Speedometer

From AUTO mode, hit **MAIN** twice in Brand-X or once in AMA.

### 5. Viewing Keytime

To view keytime, from AUTO mode, hit **MAIN** three times in Brand-X, or twice in AMA.

In Brand-X the keytime is adjusted for your current minute for direct comparison to the route sheet.

### 6. Adjusting Tiresize

To adjust the tiresize, press and hold **MAIN** button until "TIRESIZE" appears in the display. Release the **MAIN** button. Your tiresize is displayed and can be adjusted using the **UP/DOWN** buttons. Hit **MAIN** to revert back to race display.

### 7. Adjusting Elapsed Keytime

To adjust the elapsed keytime clock, press and hold the **MAIN** button until "CLOCK" is displayed. Release the **MAIN** button. Keytime is displayed and can be adjusted in increments of minutes using the **UP/DOWN** buttons. Remember, this is the elapsed time since you left the gate and is the time you see on your route sheet. The method for setting this clock depends on the rules you are racing. For all events you should set your backup watch to display the elapsed time during the race. That is, set your backup watch to the posted keytime minus your minute during pre-race, or start your stopwatch when you leave.



## CHAPTER 6

### Race Mode

For AMA events, if you ever need to change the clock, you simply take the time directly from your backup watch.

When running Brand-X, if you need to change the clock, you 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 to one minute less than the backup watch. When the backup seconds turn to :00, increment the clock minute. Make sure they match then hit **MAIN** to return to race 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.

#### 8. Calculated Mileage Mode

To enter calculated mileage mode, press and hold **MAIN** button until "CALCDIST" is displayed. Calculated distance will be displayed on the left, and keytime minutes and seconds will be displayed on the right. You can change which field of information is displayed in it's entirety by hitting either the **UP** or **DOWN** button. Notice that either the least significant mileage digit or the most significant time digit is blanked. This is to visually separate them.

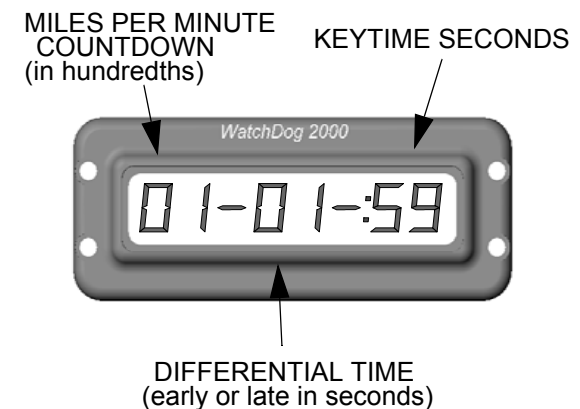
#### 9. Power Off

After winning the race...turn off **Watchdog** by pressing and holding **MAIN** until "OFF" is displayed and then the screen blanks.

There are two main displays when you are racing. AUTO mode automatically selects what is displayed depending on your early/late status. When you are within your minute (differential time less than one minute), the **MinuteMinder™** is displayed. When the differential time is greater than one minute the **MileMinder™** is displayed. While racing, you can adjust your mileage, your minute, keytime, and tiresize. You can also view calculated mileage.

### MinuteMinder™

The **MinuteMinder™** displays three fields of information. The two left digit fields indicate the distance to where the next whole minute should be in hundredths of a mile. For example, at 24mph this will countdown 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 keep going. As the countdown gets close to zero, make sure you are on time. If the count will reach zero around the next blind corner....watch out, don't be early!!! If 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).

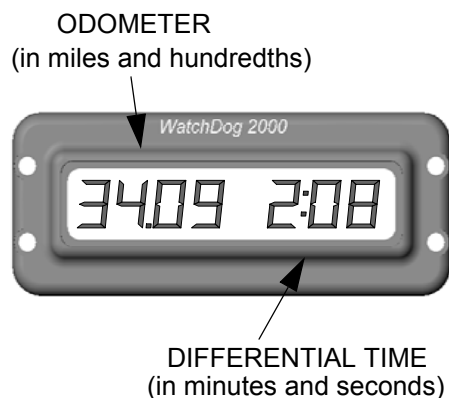


The two center digits indicate your early/late status. Use this as the main indicator of how you are doing. Always use this in conjunction with the keytime seconds (right most field) when approaching checkpoints. If you are late the minus “-” sign appears around the differential time (DT) If you are early the DT flashes.

The right most digits display the keytime seconds. This is used as a final check before entering checkpoints. The DT 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™

When your differential time is greater than one minute the **MileMinder™** displays two fields of information. The left field displays your mileage in miles and hundredths 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!



## Other Race Mode Displays

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

### Adjusting Mileage

In **MinuteMinder™** there are two ways to view and/or adjust your mileage. To view or adjust the mileage hit either the **UP** or **DOWN** button. Display switches to **MileMinder™**. Use the **UP/DOWN** buttons to adjust your mileage.

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

**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.

### Changing your Minute (Brand-X)

To change your minute in Brand-X racing, hit the **MAIN** button once from AUTO mode. Your minute is displayed. Use the **UP/DOWN** buttons to adjust. The display will return to the AUTO mode display after 4 seconds of no button activity, or after 10 seconds if you did not adjust your minute.

**Note:** In AMA rules, your minute will not be displayed. Hitting the **MAIN** button will display odometer and speedometer.

**Tip:** The display will automatically return to AUTO mode so don't worry about the display, adjust your minute and take off!!

### 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.

## 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.

## Calculated mileage mode

In the event your magnet gets sheared off (or anytime), you can use **WatchDog 2000** to display the calculated mileage for comparison to the trail mileage markers. To enter this mode, hold the **MAIN** button until “CALCDIST” (calculated distance) is displayed. Release the button. the display will show the calculated mileage on the left and the keytime on the right. You can change which field of information is displayed in its entirety by hitting either the **UP** or **DOWN** button. Notice that either the least significant mileage digit or the most significant time bit is blanked. This is just to visually separate them.

## Race Recovery

In the unlikely event the batteries lose contact (big wipeout, high speed tree contact, scuba diving, ....etc), **WatchDog** will recover and prompt you to enter the keytime (“KEYTIME”). Using your back-up watch (which you should always have), enter the current un-adjusted 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!!

**Note:** This feature can be used at any time to enter race mode. If you enter a post race-start keytime (keytime plus minute) you will always be prompted for a mileage.

## CHAPTER 7

### *Other WatchDog 2000 Features*

**WatchDog 2000** offers additional useful features. These are:

- Sensor Check Mode
- Instant Race Mode
- Race Information
- Software Reset

## 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. As you rotate your tire, the display will alternate between all ones (11111111) when the magnet passes the sensor, and all zeros (00000000) when the sensor is off. If ones (11111111) are not displayed as magnet goes by the sensor, check both the sensor wiring and the distance between the sensor and the magnet. The magnet should be less than a quarter inch (1/4”) from the sensor as it passes by.

## Instant Race Mode

For recreational or practice riding 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.

## Race Information

While racing, **WatchDog** will keep track of and store the total ground miles and the top speed attained. To view these stats scroll down to “RACEINFO” while in programming mode. Hit **MAIN** to display the total ground miles. Hit **MAIN** again to see highest speed.

## 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.

Note: The verify and race recovery routines may take a while to complete (more than the one minute timeout), depending on the mileage and the number of speed changes and resets programmed in. Therefore, it is possible to accidentally reset the software during these routines if you hold down the **MAIN** button. If you inadvertently reset the software during race recovery it will prompt you for the keytime again.

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

### **DUGAS ENGINEERING**

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## Addendum

### How to determine tire size

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

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 (in inches and hundredths of an inch) 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.

### Race mode displays (using MAIN button to select)

