

IMPULSE

MODEL 4010

NOTICE OF SOFTWARE ENHANCEMENT

TO OUR CUSTOMER

The following enhancement has been made to the software of your IMPULSE Model 4010:

- A SPEED CALIBRATE function has been added to the ADJUST DIGITAL SCREEN. The impeller that is shipped with your 4010 has a pulse rate of 19,000 pulses per statute mile (22,000 pulses per nautical mile). Factors such as impeller mounting, hull characteristics, and water flow can affect the accuracy of the speed reading. The SPEED CALIBRATE function will allow you to adjust the pulses per mile to obtain a correct speed reading.

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ADJUST DIGITAL SCREEN

There are four ADJUST DIGITAL functions:

- DIGITAL DEPTH TVG ADJUSTMENT
- MUSIC ALARM SELECTION
- COMPASS HEADING VS. TEMPERATURE
- SPEED CALIBRATE

DIGITAL DEPTH TVG (TIME VARIED GAIN)

The TVG adjustment is a sensitivity control for the Digital Depth in shallow water. The first ten feet of water contain numerous air bubbles caused by propeller action, etc. This "surface clutter" may cause a false shallow echo which may be interpreted by the Digital Depth as a bottom reading.

The TVG setting ranges from 1 to 7. The TVG circuitry attenuates (decreases) the received echo in shallow water. A TVG setting of 1 is minimum attenuation, while a TVG setting of 7 is maximum. To correctly adjust the TVG setting:

1. Take your boat to a shallow area of water. A depth measuring 4-6 feet is suggested.
2. Set the Fish Finder Range to 20 feet.
3. Using the **UP** arrow, set the TVG value to 7. Using the **DOWN** arrow, decrease the TVG setting one step at a time until you get a correct and consistent Digital Depth reading on the data line at the bottom of the LCD. Each time you change the TVG setting, wait approximately one minute before changing it again so that you will have adequate time to observe and evaluate the behavior of the digital depth.

Once you have completed the TVG adjustment, it should not be necessary to perform it again unless your boating location changes, or if your Permanent Memory is erased.

MUSIC ALARM SELECTION allows you to turn the music alarm on or off. If the music alarm is turned off, key presses will sound as monotone beeps.

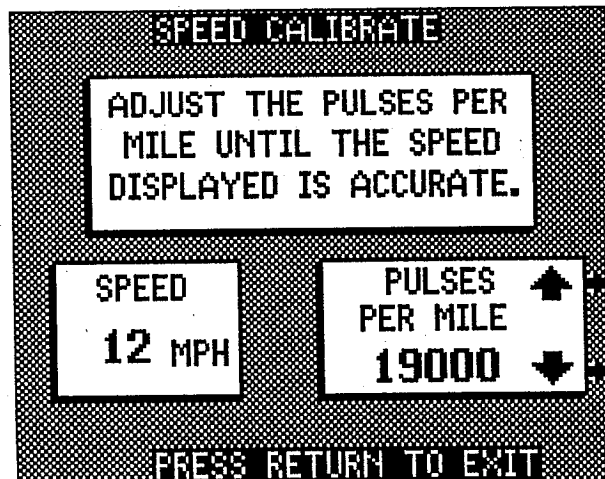
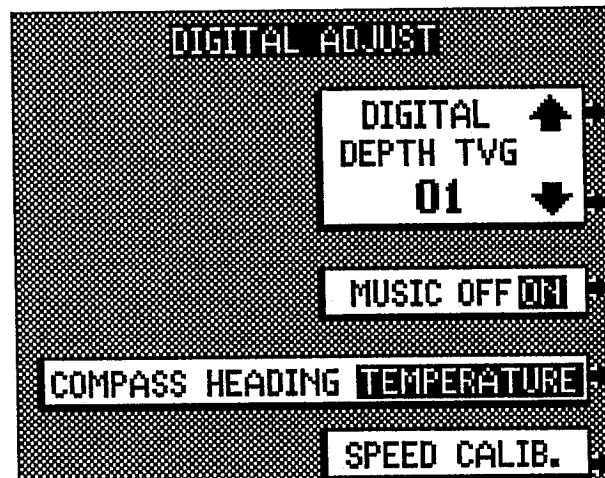
COMPASS HEADING VS. TEMPERATURE SELECTION allows you to select whether you would like to have the compass heading or the temperature displayed on the half screen DIGITAL screen.

SPEED CALIBRATE

The impeller shipped with your Model 4010 has a pulse rate of 19,000 pulses per statute mile (22000 pulses per nautical mile). Therefore, your Model 4010 is shipped from the factory with the Speed calibrated to 19,000 pulses per mile. However, factors such as impeller mounting, hull characteristics, and water flow can affect the accuracy of the speed reading. The SPEED CALIBRATE function will allow you to adjust the pulses per mile to obtain a correct speed reading. Note that this will calibrate your boat **SPEED IN THE WATER**, as opposed to your **SPEED OVER GROUND**.

To properly calibrate the Model 4010 Speed reading, do the following:

1. Use the **UP** and **DOWN** arrows to initially set the pulses per mile on the 4010 screen to 19000 PPM.
2. Run a known distance at a constant RPM, using a stopwatch to accurately time the run in seconds. Note the Speed as displayed on the SPEED CALIBRATE screen on the Model 4010. (Since the 4010 displays speed in MPH, measure the distance traveled in statute miles.)



3. Reverse your direction, and travel back to your starting point at the same RPM. Again, use a stopwatch to accurately time the run in seconds, and note the Speed as displayed on the SPEED CALIBRATE screen. (The Speed on the 4010 screen should be the same as the Speed displayed in Step 2 if running at the same RPM.)

4. Use the following formulas to determine the correct number of pulses per mile (PPM):

$$\text{STEP 2 SPEED} = \frac{(3600) \times (\text{DISTANCE FROM STEP 2})}{\text{TIME FROM STEP 2}}$$

$$\text{STEP 3 SPEED} = \frac{(3600) \times (\text{DISTANCE FROM STEP 3})}{\text{TIME FROM STEP 3}}$$

$$\text{AVERAGE SPEED} = \frac{(\text{STEP 2 SPEED}) + (\text{STEP 3 SPEED})}{2}$$

$$\text{CORRECT PPM} = (19000) \times \frac{(\text{SPEED DISPLAYED ON 4010})}{\text{AVERAGE SPEED FROM STEP 4}}$$

5. Use the **UP** and **DOWN** arrows to set the pulses per mile on the 4010 screen as close as possible to that calculated in Step 4.

EXAMPLE:

A boat running at a constant RPM, travels 1 statute mile upstream in 12 minutes (720 seconds). The reverse run takes 4 minutes (240 seconds). Due to impeller mounting and hull characteristics, the Model 4010 SPEED CALIBRATE screen displays an inaccurate speed of 12 MPH for both runs.

$\text{SPEED} = \frac{3600 \times \text{DISTANCE}}{\text{TIME}}$	<p>LAP 1</p> $\frac{3600 \times 1 \text{ MI}}{720 \text{ SEC}} = 5 \text{ MPH}$	<p>LAP 2</p> $\frac{3600 \times 1 \text{ MI}}{240 \text{ SEC}} = 15 \text{ MPH}$
$\text{AVERAGE SPEED} = \frac{\text{SPEED LAP 1} + \text{SPEED LAP 2}}{2} = \frac{5 + 15}{2} = 10 \text{ MPH}$		

$$\text{CORRECT PPM} = (19000) \times \frac{(12 \text{ MPH})}{(10 \text{ MPH})} = 22800 \text{ PPM}$$

To properly calibrate the Model 4010 Speed reading, adjust the Pulses per Mile on the 4010 screen as close as possible to 22800.