

# USER GUIDE AND SERVICE MANUAL

## ORBITER III

### OPERATION GUIDE

#### Manual Operation

- I. Press **POWER**
- II. Select workout time using **SPEED UP** or **SPEED DOWN** button. Default is 30 minutes. The time can be set from 5 to 90 minutes.
- III. Press **START**.
- IV. Select desired speed using **SPEED UP** or **SPEED DOWN** button.
- V. Begin exercising.
- VI. At any time during the workout the speed and incline of the treadmill may be adjusted.
- VII. Some windows share their display mode:
  - A. Time/Speed will scan every five seconds.
  - ∑ Distance/Calories will scan every five seconds.

#### Heart Rate Control Operation

- I. Press **POWER**.
- II. Select workout time using **SPEED UP** or **SPEED DOWN** button. Default is 30 minutes.
- III. Press **PRESET PROGRAM** button.
- IV. Select target heart rate by using **GRADE UP** or **GRADE DOWN** button.
- V. Press **START**.
- VI. Select desired speed using **SPEED UP** or **SPEED DOWN** button.
- VII. Begin exercising.
- VIII. At any time during the workout the speed of the treadmill may be adjusted.
- IX. The target heart rate may be adjusted at any time during the workout using the **GRADE UP** and **GRADE DOWN** buttons.
- X. During your exercise, you may switch to the Manual mode by pressing the **POWER** button.

#### Polar Chest Monitor

- I. Before placing the chest band around your chest, moisten both conductive electrode straps located on the inside of the transmitter.
- II. Place the chest band in the area directly beneath the breast area.

#### Heart Rate Control Program

- I. Target heart rate can be set from 70 to 200 beats per minute (bpm).
- II. Heart Rate LED's are programmed to light as follows:
  - ∑ Below target LED lights as actual heart rate is more than 2 bpm lower than target.
  - ∑ On target LED lights as actual heart rate is on or within 2 bpm of target.
  - ∑ Above target LED *flickers* as actual heart rate is more than 2 bpm above target.
3. The Heart Rate Control feature operates as follows:
  - ∑ If the actual heart rate is 25 bpm below the target, there is no adjustment to elevation. This allows for a proper warm-up period.
  - ∑ If the actual heart rate is from 11 to 24 bpm below target, elevation adjusts one higher grade for a period of 15 seconds.
  - ∑ If the actual heart rate is from 3 to 10 bpm below target, elevation adjusts one higher grade for a period of 30 seconds.
  - ∑ If the actual heart rate is 3 or more bpm above target, elevation adjusts one lower grade for a period of 15 seconds.

# ORBITER III CALIBRATION

## Set Speed

- I. Depress **Power**, **Speed Down** and **Program Interval** at the same time.
- II. Release **Speed Down** 1<sup>st</sup>, then release the other two buttons.
- III. Hit **Start**.
- IV. Hit **Power** to go to Max Speed.
- V. If Maximum Speed does not read 8.5 go to lower panel and adjust the max speed pot on the motor controller until it reaches 8.5.
- VI. Hit **Power** and it will run through the rest of the settings.

## Set Elevation

- I. Depress **Power**, **Speed** and **Program Interval** at the same time.
- II. Release **Speed Down** 1<sup>st</sup>, then release the other two buttons.
- III. Depress **Program Interval**, display will read **P1-D**. Machine will decline to a level position. Depress **Program Interval**, display will read **P1-U**. Machine will elevate while a pulse count is displayed in the speed window.
- IV. Depress **Program Interval** to end calibration mode. Machine will reset and return to level position.

## Heart Rate

- I. Depress **Power**, **Speed Down** and **Program Interval** at the same time.
- II. Depress **Custom Program**, Display should read **MS**.
- III. Depress **Program Interval** to go to **HC** in display window.  
Use **Speed Up** and **Speed Down** buttons to set at 1.
- IV. Hit **Program Interval** to complete

## **ORBITER III**

QQ2034 Software Programming Procedures

Version 1.8 Software FG0229

FG0229U1.W00

### **Procedure 1- Calibrating the Elevation Potentiometer**

This procedure allows the QQ2034 microprocessor to “learn” the voltage readings from the potentiometer for the fully up and fully down incline positions. By knowing the voltages at these end points, the percent grade of the treadmill can be linearly calculated at all positions.

During this procedure, the voltage being read from the potentiometer is displayed on the speed display to aid in determining proper operation of the potentiometer and associated electronics. This voltage is monitored during the calibration process for possible bad spots on the grade potentiometer. If the voltage from the grade potentiometer varies by more than .1 volts from one sample to the next “PF” will be displayed on the grade display.

To initiate this procedure, depress and hold the POWER switch. With the POWER switch depressed, depress and hold the SPEED DOWN and PROG. INTERVAL switches (all three simultaneously), then release the SPEED DOWN switch. A high-pitched beep will be heard. Release all switches then depress the POWER switch. The unit will display “P1 D” on the time display. Depress the program interval button and the unit should move to the fully up position at this time. The potentiometer voltage should be observed for a proper value. When the unit is fully up, depress the PROGRAM INTERVAL switch to complete the procedure.

### **Procedure 2 - Speed Calibration**

This procedure allows the user to modify the unit’s minimum, maximum mid range speed software variables while the belt is moving and the actual belt speed is being observed.

To initiate this procedure, depress and hold the POWER switch. With the POWER switch depressed, depress and hold the SPEED DOWN and PROGRAM INTERVAL switches (all three simultaneously), then

release the SPEED DOWN switch. A high-pitched beep will be heard. Release all switches then depress the START switch. The belt will begin to move at the minimum speed (as determined by the present minimum speed variable) and the unit will display “Lo” on the distance display and the actual belt speed displayed on the speed display. The value of the minimum speed variable will be displayed on the time display. Utilize the SPEED UP and DOWN switches to modify this variable and observe the change in the minimum speed. When the proper value of this variable has been selected for the minimum speed, depress the POWER switch to proceed to setting the maximum speed variable.

The belt will ramp to the unit’s maximum speed (as determined by the present maximum speed variable) and the unit will display “HI” on the distance display. The actual belt speed will be displayed on the speed display. The value of the maximum speed variable will be displayed on the time display. Utilize SPEED UP and DOWN switches to modify this variable and observe the change in the maximum speed. When the desired maximum speed has been selected, depress the POWER switch to proceed to setting the mid range variable.

The belt will ramp to the unit’s mid range speed (as determined by the present mid range speed variable) and the unit will display “--” on the distance display. The actual belt speed will be displayed on the speed display. The target speed for this variable is displayed on the calorie display. The target speed is calculated by the unit as  $((\text{Maximum speed} - \text{Minimum speed})/2) + \text{Minimum speed}$ . The value of the mid range speed variable will be displayed on the time display. Utilize the SPEED UP and DOWN switches to modify this variable until the mid range speed equals the target. When the actual belt speed matches the mid-speed target, depress the POWER button.

The belt will then ramp to the units 25% speed range (as determined by the present 25% speed variable) and the unit will display “25” on the distance display. The actual belt speed will be displayed on the speed display. The target speed for this variable is displayed on the calorie display. The value of the 25% speed variable will be displayed on the time display. Utilize the SPEED UP and SPEED DOWN switches to modify this variable until the 25% speed equals the target, depress the power button.

The belt will ramp to the 75% speed range (as determined by the present 75% speed variable) and the unit will display “75” on the distance display. The actual belt speed will be displayed on the speed display. The target speed for this variable is displayed on the calorie display. The value of the 75% speed variable will be displayed on the time display. Utilize the speed up and speed down switches to modify this variable until the 75% speed equals the target.

Depress the POWER switch to store the value and complete the procedure. The maximum speed is stored by the unit and is used in all calculations to estimate desired speeds when speed changes occur in the operation of the unit.

### **Procedure 3 - System *Testing***

This procedure is provided to allow testing for proper operation of critical components in the control system. Steps are provided in the test sequence to test the console LED’s, switches, speed pick up input, motor controller outputs, incline control outputs, incline potentiometer input, pulse input, non volatile storage and watch dog timer operation.

To initiate this procedure, insert the safety pull pin, and depress and hold the POWER switch. With the POWER switch depressed, depress and hold the SPEED DOWN and PROGRAM INTERVAL switches (all three simultaneously), then release the SPEED UP switch. A high-pitched beep will be heard. Release all switches then depress the SPEED UP switch. A low pitched beep will be heard followed by a high pitched beep to indicate that step 1 of the test procedure is underway.

#### **Test Procedure Step 1 - *LED Test***

This step in the test sequence verifies the operation of the console LED’s. The sequence begins by turning rows of the matrix display one at a time from top to bottom. The user should observe this display to determine if all rows illuminate and that only one row is on at a time. When the bottom row is turned off, the unit will begin turning on the columns of the matrix display one at a time from right to left. The user should observe this display to determine if all columns illuminate and that only one column is on at a time. When the left most column is turned off, the unit will begin the row display again. While the matrix display is being

tested, no seven segment LED's that illuminate out of sequence or seven segment/discrete LED's that illuminate during this portion of the test indicates the console is defective and should be replaced.

By depressing any switch, the unit will proceed to test the seven segment displays and the discrete displays underneath the time display. The test begins with each discrete LED being turned on one at a time, followed by each element in the rightmost seven-segment display being turned on one at a time. The user should observe this display to determine if each LED illuminates in the proper sequence. Failure of any LED or seven segment to illuminate or illuminates out of sequence or matrix LED's that illuminate during this portion of the test indicates that the console is defective and should be replaced. The unit will then turn on all segments of each seven-segment display one at a time from right to left. Seven-segment display "U7" in the time display will blink twice. This is to remind the tester that this display should be inserted "upside down" with respect to the other displays. The user should determine that all segments of each display illuminate in the proper sequence or matrix LED's that illuminate during this portion of the test indicate console failure.

By depressing any switch, all LED's will be turned on to allow the user to double check that all LED's will illuminate. Depressing any switch will cause the controller to begin Step 2 of the test procedure

### **Test Procedure Step 2 - Switch Test**

This step in the test procedure is provided to verify that all console switches are functional. "S-1" will be displayed on the matrix display to indicate that the switch test is underway. To pass this portion of the test, the switches should be depressed on at a time in the proper sequence. If the microprocessor correctly reads the expected switch input, a high-pitched beep will be given and the user should move to the next switch. The proper switch sequence is given below:

POWER  
START  
SPEED UP  
SPEED DOWN  
GRADE UP  
GRADE DOWN  
PRESENT PROGRAM  
CUSTOM PROGRAM  
PROGRAM INTERVAL

A low pitch beep will be given if an improper switch input is encountered. The user should retry the switch test if a low pitch beep is heard by restarting with the power switch. Three failures of this test indicates that the console is defective and should be replaced. Since the noise in the area of the assembly line prevents personnel operating the unit from hearing the annunciator, the switch number (1-9) that should be depressed next is displayed on the time display. If the unit passes this test, it will proceed to Step 3.

### **Test Procedure Step 3 - Motor Controller Output / Speed Input Test**

This test procedure step verifies that the control system can output signals to the motor controller and read inputs from the speed pick up. "dC" will be displayed on the time display to indicate that step 3 of the test routine is underway. Signals will be sent to the motor controller to move the belt at minimum speed and the console will beep when the speed pick up encounters the pulley magnet. The measured speed of the belt will be displayed on the speed display. If the belt does not move, or no beep is heard, or the displayed speed is erratic, trouble shooting of the system will be necessary to determine the source of the problem. Depressing any switch will proceed to step 4.

### **Test Procedure Step 4 - Incline Test**

This procedure determines if the unit can output the necessary signals to move the treadmill incline up or down, and read the voltage from the incline potentiometer. "grd" will be displayed on the time display and the potentiometer voltage on the speed display.

The user should utilize the GRADE UP & DOWN switches to determine if the treadmill moves in the selected incline direction. The potentiometer voltage should be observed to change in an orderly manner with the treadmill incline movement. Erratic voltage readings or failure of the treadmill to move up or down will require trouble shooting of the system to determine failure. Depress the POWER switch to proceed to procedure 5.

### **Test Procedure Step 5 - *Non-Volatile Memory Test***

Programmable operating parameters utilized by the control system are stored in electrically erasable programmable read only memory (EEPROM). This allows the control system to retain this information when power is removed from the unit. In this test, the microprocessor writes out a bit pattern to the EEPROM then reads it back and compares the read pattern to the written pattern. If the two match, the unit will display “EE PASS” on the distance and time display. If a mismatch occurs, “EE FAIL” will display and the console should be rejected.

Depress any switch to proceed to procedure 6.

### **Test Procedure 6 - *Watch Dog Timer Test***

This portion of the test procedure tests the watch dog timer circuit. The unit will continuously beep and will not reset the watch dog timer. If the circuit works properly, the unit will reset and resume normal operation. If the circuit does not work, the unit will issue a lower pitched beep to indicate that a failure has occurred and the console should be rejected.

### **Procedure 4- *Resetting All Programmable Variable to Default Values***

This procedure is provided for the user to reset all programmable values to the default values. (Minimum speed variable-16, Maximum Speed variable 164, Mid range speed variable 79, Maximum speed 10.0 MPH, minimum speed .5 MPH, British units (miles & MPH), Maximum Grade - 20, 2.175 roller diameter, Heart rate to 0. To initiate this procedure, insert the safety pull pin, and depress and hold the POWER switch. With the POWER switch depressed, depress and hold the SPEED DOWN and PROGRAM INTERVAL switches (all three simultaneously), then release the DOWN switch. A high-pitched beep will be heard. Release all switches then depress the SPEED DOWN switch. A “beep” will be heard for approximately 1 second. The unit will then reset. Since this procedure also erases the grade calibration values, the unit will immediately perform Procedure 1. (Note: The treadmill operation hours maintained by the unit are not affected by this procedure.)

### **Procedure 5 - *Viewing/Setting Misc. Variables***

This procedure allows the user to view and modify several variables associated with the units operation. To initiate this procedure, depress and hold the POWER switch. With the POWER switch depressed, depress and hold the SPEED DOWN and PROG. INTERVAL switches (all three simultaneously), then release the SPEED DOWN switch. A high-pitched beep will be heard. Release all switches then depress the CUSTOM PROGRAM switch.

“Ms” will be displayed on the dot matrix display to indicate that the maximum displayed speed of the treadmill can be modified. The maximum speed will be displayed on the speed display. Use the speed up/down switches to modify this value if necessary then depress the PROGRAM INTERVAL switch. “Mg” will be displayed to indicate that the maximum displayed grade of the treadmill at the upper limit switch. Use the SPEED UP/ SPEED DOWN switches to modify this value if desired then depress the PROGRAM INTERVAL switch.

“St” will be displayed to indicate that the speed display operation can be selected. If “1” is displayed on the time display, the unit will display the set point speed during operation. If “0” is displayed, the unit will display actual speed during normal operation and will only display the set point speed when it is being modified or during interval changes. Use the SPEED UP/DOWN switches to select the method of operation then depress the PROGRAM INTERVAL switch. “R1” will be displayed to indicate that the roller diameter can be modified. The roller diameter will be displayed on the calorie display. Use the SPEED UP/DOWN switches to modify this value if desired then depress the PROGRAM INTERVAL switch to store this value and return to normal operation.

### **Procedure 6 - *Viewing the Treadmill Operation Hours***

This procedure allows the user to view the total hours of operation of the treadmill. To initiate this procedure, depress and hold the POWER switch. With the POWER switch depressed, depress and hold the SPEED DOWN and PROGRAM INTERVAL switches (all three simultaneously), then release the DOWN switch. A high-pitched beep will be heard. Release all switches then depress the PROG. INTERVAL switch. The hours of treadmill operation will then be displayed on the time display. The hours of operation can have a value from 0 to 9999. Normal operation can be resumed by depressing the POWER switch.

The hours of operation can be zeroed by depressing and holding the PROGRAM INTERVAL switch (while the hours of operation are displayed) then depressing the POWER switch. Normal operation will be resumed when all switches are released.

#### **ORBITER MAINTENANCE SCHEDULE**

- ∑ Periodic cleaning and inspection will extend the life of your treadmill and keep it looking good. Periodic inspections assist in finding problems before they arise.
- ∑ Below are guidelines on cleaning and maintenance intervals. Cleaning and inspecting intervals should be more frequent if the treadmill is in a dirty environment or is in use more than “normal” operations.
- ∑ Abrasive brushes and cleaners can scratch the paint and plastic on your Orbiter and should not be used. Do not soak any surface, as you may harm the sensitive electronics.

**CAUTION: Turn off treadmill and disconnect the power cord before cleaning.**

#### **WEEKLY:**

1. Clean handrails, front display panel, cosmetic covers.
2. Inspect power cord.
3. Check overall condition of treadmill.

#### **MONTHLY:**

1. Lubricate transporters (gym, rehab. center and hospital use).

#### **BI-MONTHLY:**

1. Lubricate transporters (home use).

#### **ONE TO TWO (1-2) MONTHS AFTER PURCHASE:**

1. Tighten transporters.

#### **EVERY FOUR TO FIVE (4-5) MONTHS**

1. Check transporters for tightness and adjust accordingly.
2. Grease elevation screw.
3. Grease front legs.

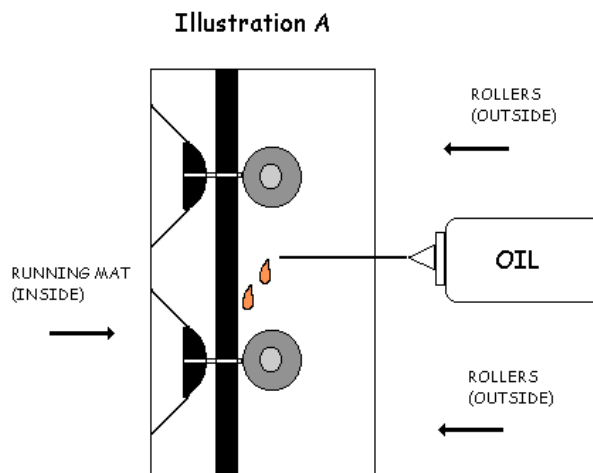
#### **EVERY SIX (6) MONTHS**

1. Vacuum inside Orbiter (unplug the machine and slide cones that are at the base of the handrails above the bend in the handrails).
2. Clean running surface with 409 or Fantastic type cleaner.  
**\* If these procedures are not followed accordingly, the machine could experience the loss of transporters and a difference in calibration. Please follow directions accordingly. If these problems occur warranty may not apply.**

## MAINTENANCE INSTRUCTIONS

### Lubricating Transporters

- Turn ORBITER on and run at slowest speed.
- A. Lift cone (located at base of handrails) attached with Velcro. Under the cone will be the transporter opening for maintenance.
  - B. Turn cone to the side so that it stays clear of the transporter opening.
  - C. Place two to three drops of oil on the outside of the steel rail (over which the middle of the roller passes.) (See Illustration A). A transporter roller will pass this oiled section and spread the oil over the entire rail.
    1. You should be putting the oil on the side of the metal rail that is on the side opposite the running mat, NOT the side that is closest to the running mat.
  - D. Repeat this procedure between each transporter, counting until all 20 transporters have been oiled.
  - E. Replace cone over opening and secure Velcro.
  - F. Repeat this procedure on the opposite side of the machine.



### ***I. Tightening Transporters***

- A. Elevate machine to 5-7%
- B. Unplug machine.
- C. Lift cone at base of handrails and gently slide the cone above the bend of the handrail
- D. Remove fender screws located at the top of fender toward running surface
- E. Unplug 3 connectors at bottom left hand side of handrail. Remove the four 9/16" nuts and bolts, holding handrail secure.
- F. Remove handrail.
- G. Lift inside top lip of fender onto footplate. Pull out on bottom of fender. Then lift upward to remove.
- H. Transporters are now exposed and accessible toward the front of machine.
  - I. Locate transporter adjustment nut (at the end of transporter bolt toward running mat).
  - J. Turn transporter adjustment nut clockwise to tighten transporters. (Turn counter clockwise should you ever need to loosen the nut.)
- K. Check and adjust all 20 transporters to ensure snug adjustment.

- L. Replace fender and tighten screws.
- M. Replace handrail and plug in connectors.
- N. Replace cone over opening.
- O. Repeat procedure on opposite side.

(If you have any questions regarding this process, please call us at 800 949-2052)