

## Procedure 5.5 - Troubleshooting Hand Held Heart Rate

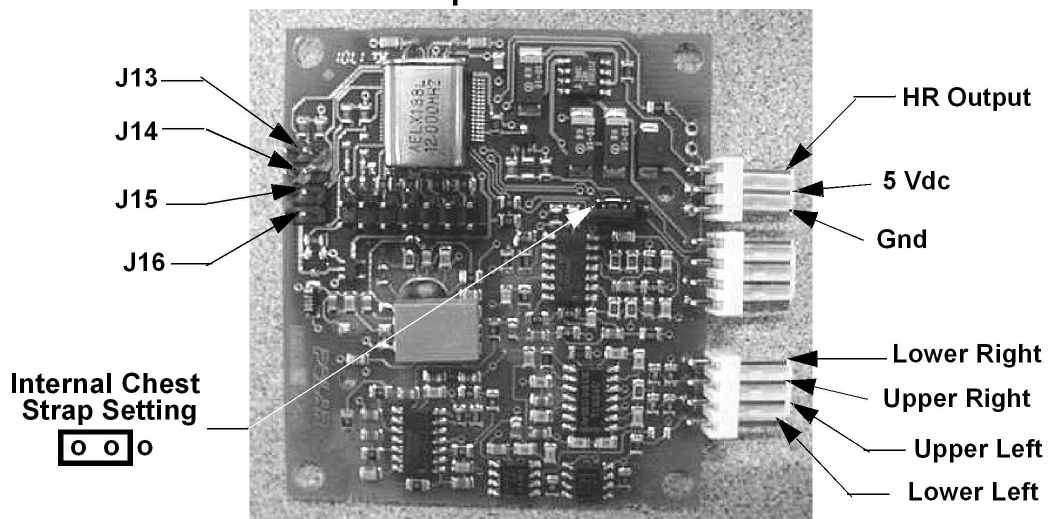
### Circuit Description

The hand held heart rate system is actually a dual system, that is, it can accept a heart rate signal from either the hand held heart rate contacts on the unit's handlebar or from a Polar heart rate chest strap transmitter. Refer to Diagram 5.3 and verify that no jumpers are equipped on J13, J14, J15 or J16. Also, verify that there is a jumper equipped on the internal chest strap setting. The internal chest strap setting is the two left hand pins on the three pin connector as shown below in Diagram 5.3. These settings allow the heart rate system to operate on the internal chest strap receiver with the chest strap heart rate priority. That is, if both a chest strap and hand heart rate signal is being received, the system will accept the chest strap signal and ignore the hand held signal. If a chest strap signal is not being received, the system will accept the hand held signal.

### Note:

There are four typical failure modes for the hand held/chest strap heart rate system. They are: 1 - hand held is normal - no chest strap reading; 2 - no hand held reading - chest strap normal; 3 - no hand held or chest strap reading; 4 - constant or intermittent readings when neither hand held or chest strap are in use.

**Diagram 5.3 - Hand held/chest strap heart rate PCA**



### Normal hand held reading - No chest strap reading

1. Set the on/off switch in the  $\text{ion}$  position and access the diagnostic program (Procedure 2.1 or 2.2). Advance to the heart rate display portion of the diagnostic program. Verify that a chest strap signal is not being accepted with either a Polar heart rate test transmitter or a known good chest strap transmitter. If this reading is good, skip to step 3.
2. Using a Polar heart rate test receiver, verify the operation of the chest strap transmitter furnished with the unit. If the Polar heart rate test receiver does not receive a signal, replace the chest strap transmitter.

3. Set the on/off switch in the **off** position and remove the display housing.
4. Verify the internal chest strap setting is set as shown in Diagram 5.3. Verify that a ferrite bead is installed on the heart rate PCA to upper PCA cable.
5. If the above procedures did not correct the problem, replace the heart rate PCA.

#### **No hand held reading - Normal chest strap reading**

6. Set the on/off switch in the **on** position and access the diagnostic program (Procedure 2.1 or 2.2). Advance to the heart rate display portion of the diagnostic program. Verify that a hand held signal is not being accepted by firmly grasping both the right and left hand held contacts on the handlebars. Cover as much of the contact surface area with your hands as possible (without moving your hands), you should receive a heart rate reading within ten seconds.
7. If a hand held signal is not being accepted, set the on/off switch in the off position.
8. Temporarily, install a spare jumper on J14 of the heart rate PCA (hand held priority). Set the on/off switch in the **on** position and repeat the procedure in step 6.
9. If the hand held signal is now being accepted, something in the near vicinity is radiating RF (radio frequency) energy that is being received by the chest strap portion of the heart rate PCA. Disabling the chest strap signal proves that it is radiated energy that is causing the problem.
10. If a hand held signal still not being accepted, skip to step 13.
11. The source of the radiated energy must be determined and relocated so that it no longer affects the heart rate PCA. Televisions, cell phones, Cardio-theatre receivers, etc. are possible sources of radiated energy.
12. Set the on/off switch in the **off** position, and remove the temporary jumper from J14 of the heart rate PCA. Re-locate all potential sources of radiation. Set the on/off switch in the **on** position and repeat the procedure in step 6.
13. Set the on/off switch in the **on** position and access the diagnostic program (Procedure 2.1 or 2.2). Advance to the heart rate display portion of the diagnostic program. Verify that a hand held signal is not being accepted by firmly grasping both the right and left hand held contacts with the opposite hands, right hand on the left handlebar contacts and left hand on the right handlebar contacts. Cover as much of the contact surface area with your hands as possible, you should receive a heart rate reading within ten seconds. If a hand held signal is still not being accepted, skip to step 15.

14. If a hand held signal was accepted in step 13, the hand held contact wiring is reversed. The end of the wire harness that connects to the hand held contacts in the handlebar is segregated into two groups. One group has blue shrink wrap around it and the other group has black shrink wrap around it. The blue group must go to the right hand contacts and the black group must go to the left hand contacts. In both groups the black wire must go to the lower contact and the red wire must go to the upper contact. If necessary, rewire the hand held contacts as described above and test as described in step 6.
15. Set the on/off switch in the off position. Refer to Diagram 5.3 for the following measurements. With an ohmmeter measure between the lower right contact pin on the J1 connector and the lower right hand held heart rate contact on the handlebar. The reading should be 1 W or less. Measure between the upper right contact pin on the J1 connector and the upper right hand held heart rate contact on the handlebar. The reading should be 1 W or less. Measure between the upper left contact pin on the J1 connector and the upper left hand held heart rate contact on the handlebar. The reading should be 1 W or less. Measure between the lower left contact pin on the J1 connector and the lower left hand held heart rate contact on the handlebar. The reading should be 1 W or less. If any of the above readings are greater than 1 W, replace the heart rate PCA to handlebar wire harness.

#### **No hand held reading - No chest strap reading**

16. Set the on/off switch in the on position and access the diagnostic program (Procedure 2.1 or 2.2). Advance to the heart rate display portion of the diagnostic program. Verify that neither a chest strap signal or a hand held signal is being accepted with either a heart rate test transmitter or a chest strap transmitter.
17. Check the plug/connector connections on both the heart rate PCA (J4), and upper PCA (J1).
18. If neither a chest strap signal or a hand held signal is being accepted, measure between the ground and 5 Vdc pins on J4 for 5 Vdc. If 5 Vdc is present, replace the heart rate PCA.
19. If 5 Vdc is not present, remove the connector from J4 of the heart rate PCA. Measure between the ground and 5 Vdc pins of the connector (just removed from the heart rate PCA) for 5 Vdc. If 5 Vdc is present, replace the heart rate PCA. If the 5 Vdc is not present, measure between the corresponding pins of J1 on the upper PCA (red and black wires). If 5 Vdc is not present replace the upper PCA. If 5 Vdc is present, replace the upper PCA to heart rate PCA cable.

#### **Constant or intermittent readings when neither the hand held or chest strap is in use**

20. Verify that a ferrite core is clamped around the heart rate PCA to upper PCA cable.
21. Constant or intermittent heart rate readings when neither heart rate system is in use is caused by something in the near vicinity radiating RF energy that is being received by the chest strap portion of the heart rate PCA.
22. Temporarily, install a spare jumper on J14 of the heart rate PCA (hand held priority). Set the on/off switch in the on position and repeat the procedure in step 6.

23. If the hand held signal is now being accepted, something in the near vicinity is radiating RF energy that is being received by the chest strap portion of the heart rate PCA. Disabling the chest strap signal proves that it is radiated energy that is causing the problem.
24. The source of the radiated energy must be determined and relocated so that it no longer affects the heart rate PCA. Televisions, cell phones, Cardio-theatre receivers, etc. are possible sources of radiated energy.
25. Set the on/off switch in the off position, and remove the spare jumper from J14 of the heart rate PCA. Re-locate all potential sources of radiation. Set the on/off switch in the on position and repeat the procedure in step 6.