

Chapter 7

Navigating with Infrared Headlights

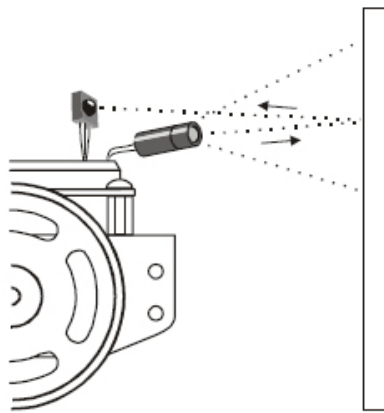


Figure 7-1
Object Detection
with IR Headlights

Getting started:

- 1. Remove Whiskers and associated parts**
- 2. Install "Reset signal" (See page 107-109)**
- 3. Assemble Infrared Headlights**

Important: Before you start look at the back side of the LED shield assembly. There is a - sign near one of the holes. Be sure the short lead (cathode) of the LED comes through the hole which is near the - sign.

Now go to the textbook, read pages 235,236 and complete activity 1.

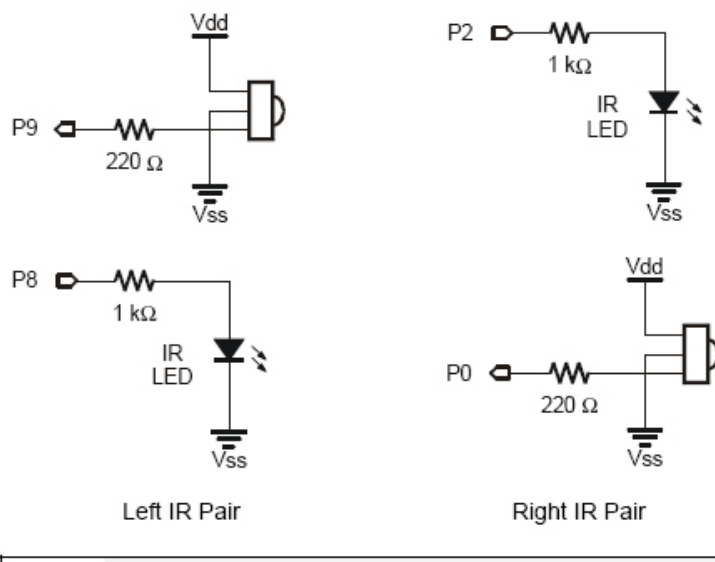


Figure 7-4
Left and Right IR Pairs

Check out detecting different distances:

- **different resistor in the LED circuit
(Larger R = smaller distance) p.248**
- **FREQOUT different frequencies for
different distances. Ch8.**

Student Suggestion:

(Ignore this unless you have extra time)

Third Headlight and sensor in the center.

Start thinking about how to implement this:

- How will I test for reflection?**
- What should I do if there is one?**

Navigation with LED Headlights and 'Eyes'

- 1. If you haven't done so already, do Chapter 7 activity #3 (Pages 247-249). If necessary, get some higher value resistors. Make a chart of which resistor detects at which distance.**
- 2. Also do Chapter 8 Activity # 1 using different frequencies to detect at different distances. Make a chart of which distance is detected by which frequency.**
- 3. Ignore Chapter 7 activity #6. We will not do drop-off detection.**

4. Program your BoeBot to detect and navigate around obstacles using the two headlights/detectors.

(5. Only if you have extra time) Add a front-facing LED and detector in the center of the front of your BoeBot. Then Plan a program which uses all three headlight/detector pairs to detect obstacles.)

The next performance test will be to navigate a course having several obstacles and to reach the end without touching any of them. Touching an obstacle will result in a time penalty.

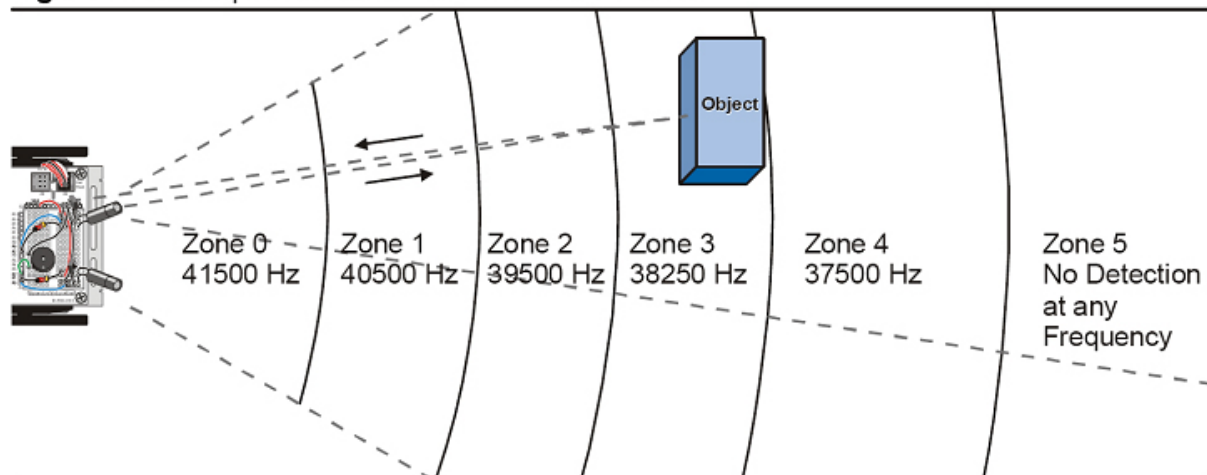
Chapter 7 Activities

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241 – 242	Your Turn
242 – 243	Rebuilding the LED Indicator Lights
243 – 245	Example Program: TestIrPairsAndIndicators.bs2
246	Example Program: IrInterferenceSniffer.bs2
247 – 248	Series resistance and LED Brightness Example Program – P1LedHigh.bs2 Your Turn – Testing LED Brightness
248 – 249	Series Resistance and IR Detection Range Your Turn – Testing IR LED Range
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252 – 253	Example Program: FastIrRoaming.bs2
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258 – 259	Example Program: AvoidTableEdge.bs2
261	Your Turn

Chapter 8

Robot Control With Distance Detection

Figure 8-2: Frequencies and Zones for the Boe-Bot



<u>Page</u>	<u>Section in Robotics with the Boe-Bot</u>
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274 – 275	Testing the Right IR LED/Detector Pair
275 – 276	Example Program – DisplayBothDistances.bs2
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290 – 293	Example Program: StripeFollowingBoeBot.bs2

