CHUCK A LUCK DARTS

Series Operator's Manual

Arachnid®

The Originator of Electronic Darts

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P/N 42383 Rev. F

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The most current version of this manual is always available on the Arachnid website at: http://www.arachnidinc.com

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Covered by one or more of the following U.S. and/or foreign patents.

140531, 5020806, 5197094, 5359510, 5401033, 5496039, 0477320, P69120886.7, 5114155, 5318319, D328726, 5355302, 5848398, 6397189, 6279912, D414521, D423597, D448809, D468368, 214662, 2815483, ZL01302307.1, 40103986.2, 151194, 6076021, 5743533, 5681044, 5482291, 4955967, 4881744, 6805354,

Warning: Keep Safety in mind, make sure all darts are thrown at the Chuck A Luck targets and not bystanders.

Suitable for indoor use only.

Introduction

This manual contains operation, parts lists and troubleshooting information for Arachnid's Chuck A Luck Darts carnival machine.

If you encounter a problem that is not covered in this manual, or if you have any questions, contact Arachnid at 1-800-435-8319 (815-654-0212) from 8 a.m. to 5 p.m. CST. You can also reach us at arachtech@bullshooter.com or visit our support site at **http://www.arachnidinc.com/support.php**

Section 1
General Description

Chuck A Luck Darts is a carnival game with four targets attached to metal arms. These arms are attached to a central axis that rotates counterclockwise.

Players try to win prizes by scoring points using only three darts. The total is displayed on a digital scoreboard. A high score wins a big prize!

1.1 Dimensions

Weight Boxed: 300 lbs

Weight Unboxed: 280 lbs

Boxed Dimensions: 70" x 35" x 68"

Game Height: 89.85"

Game Width: 69" X 41.5"

Section 2
Features of the Machine

This section lists the features available on the machine.

A. Rotating Heads

The Chuck A Luck has four target heads which are attached to four metal arms. These arms are connected to a central axis which is controlled by the operator. Each target has the numbers 1-20 displayed on a bright red background.

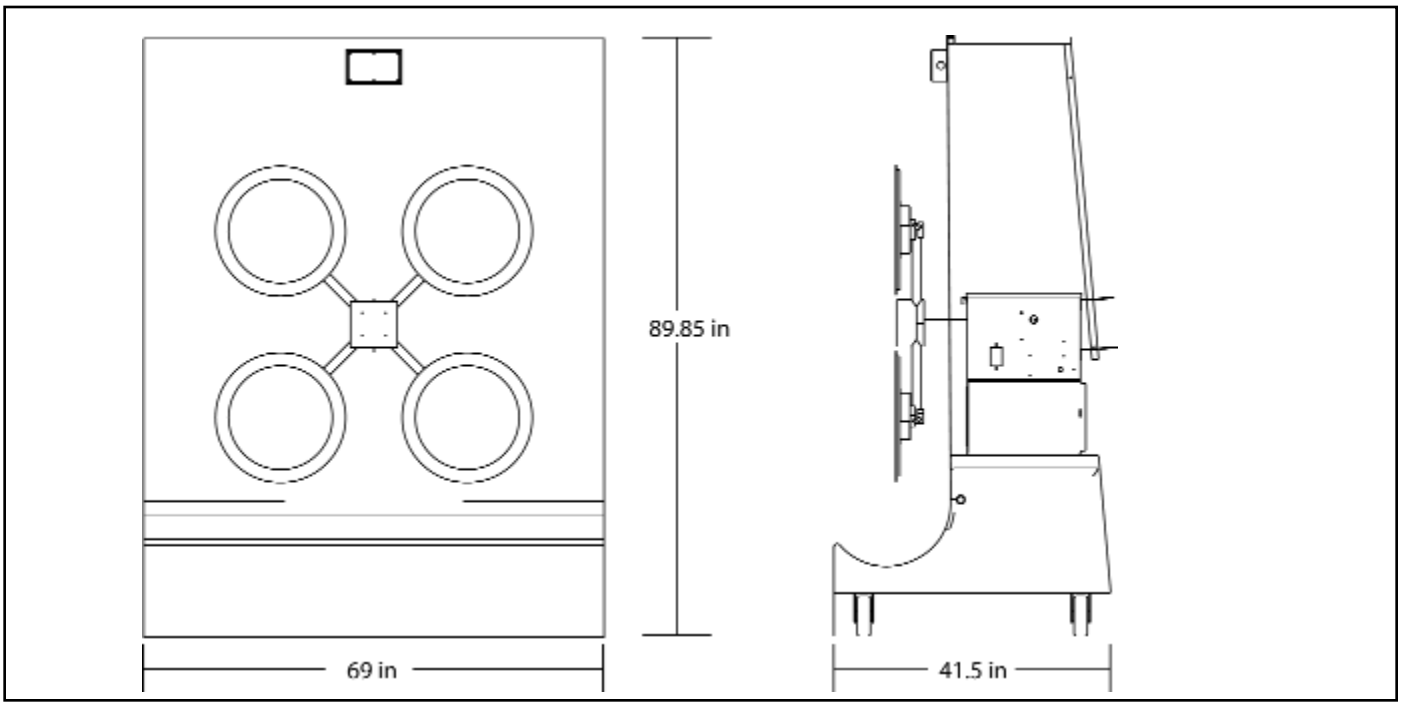
B. Scrolling Digital Scoreboard

The LED read out keeps track of every dart hit. It allows the accurate tracking of scores so the operator can spend more time with the customer. The display is reset each time the dartheads start their rotation or when the Remote Score Reset Button is pressed.

C. Remote Switch

This remote allows the operator to clear the score on the LED display without stopping the dartheads. This allows more customers to play without having to wait for the dartheads to reach maximum velocity.

Note: There is a five second delay after starting or stopping the motor with the reset switch.



Section 3
Chuck A Luck Basics

LED Score Board - Automatically keeps track of the customer's score on large (2.24") LED's.

Drape - Displays the Chuck A Luck graphic and catches missed darts. The darts slide down the drape and are deposited at the bottom for easy pick up.

Drape Support - Holds the drape, LED Scoreboard and Lights.

Dartheads - Customers throw the darts at these targets. Each one has its own matrix which senses dart hits.

Numbered Ring - Displays the darthead segment numbers so that players have an idea of the points they are aiming for.

Darthead Hub - Contains the Smart Target Interface Board that all the dartheads are connected.

Motor Case - Contains the motor that rotates the dartheads. It also contains the power supply that powers the lamps and scoreboard. The tethered Remote Score Reset Button comes out the back of the Motor Case.

Base - This plastic base supports the Chuck A Luck.

Casters - Allows for mobility so that the Chuck A Luck can be placed in any position. The front two casters lock so the Chuck A Luck will not roll once setup.

Section 4
Operation

4.1 Power Up

After the power cord is plugged into a power source, the Chuck A Luck will run through a segment test displaying 888 on the scoreboard. Once the segment test is finished, the Chuck A Luck will display it's current software version.

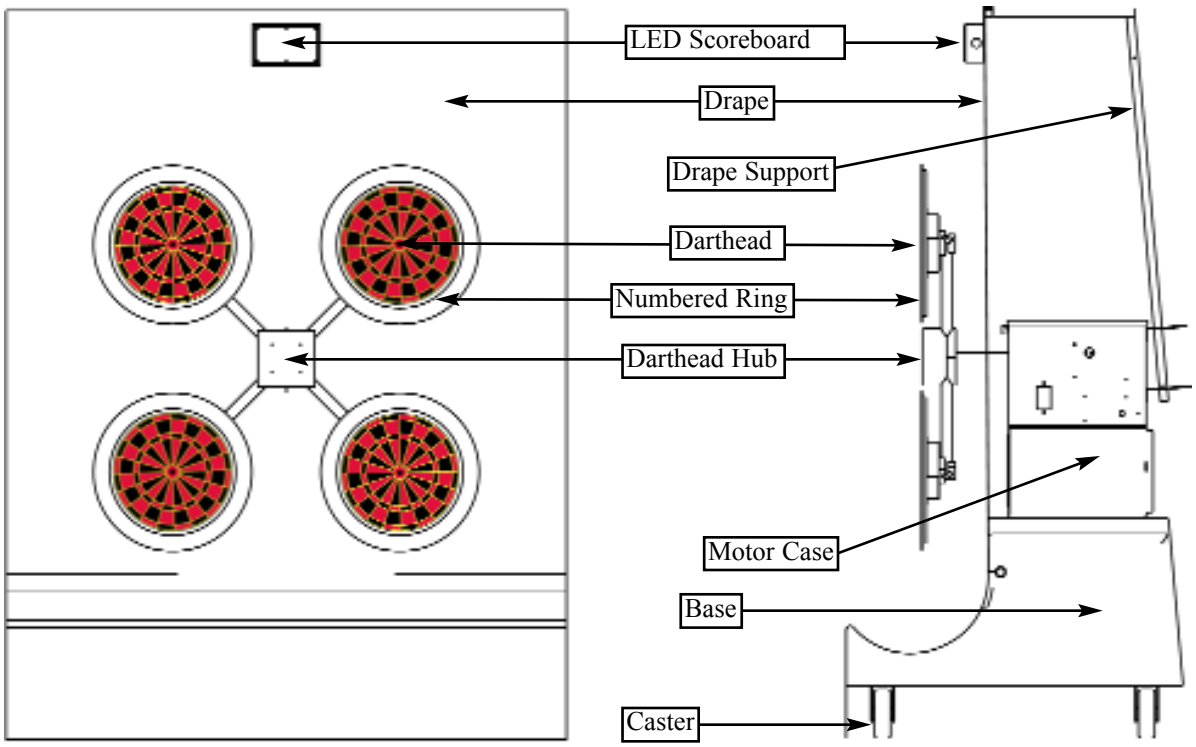
The scoreboard will then begin a countdown starting at 200. During this time, the capacitor is charging and a communications link with the computer boards is established. The Chuck A Luck is ready for play once the scoreboard shows 0.

4.2 Game Play

Start the dartheads rotating by gently spinning the darthead hub **counterclockwise**. The motor will start within a quarter of a turn.

Caution: Take care not to allow the rotating pieces to touch the drape. Static electricity can build up when this happens.

After starting the darthead rotation, allow 3 seconds for the dartheads to reach maximum speed. This allows the Chuck A Luck to finish its setup preparations and diagnostics.



Players throw darts at the rotating dartheads trying to score enough points to win a prize. The LED Scoreboard keeps track of the points. Typically the higher the points the better the prize. Below is a suggestion that has proved successful when the player is allowed three darts.

151 Points	Win a Huge Prize (TV Set, Giant Stuffed Animal, DVD Player)
101 Points	Win a Large Prize (Medium Stuffed Animal, Poster, CD)
71 Points	Win a Small Prize (Small Stuffed Animal, Plastic Ring, Fake Teeth)

Suggested Prizes

Stop the darthead rotation by holding the dartheads still for two seconds. Stopping and restarting the dartheads will clear the score from the scoreboard. The Remote Score Reset Button allows you to clear the score without stopping the dartheads.

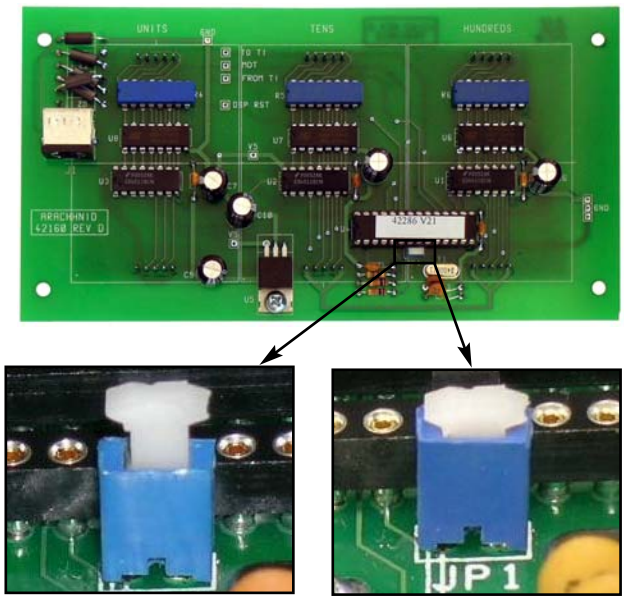
4.3 Removing the Darts

To remove the darts from the dartheads easily, grasp the dart shaft firmly and twist clockwise while pulling it toward you.

4.4 Disabling the Bullseye

By default the bullseye is on. The bullseye is the center two segments. When enabled it will score 50 points. To disable the bullseye, you will need to change a jumper setting in the scoreboard.

1. Open the back of the digital scoreboard.
2. Locate the jumper at JP1.
3. Pull the plunger up to enable the bullseye. Push the plunger down to disable the bullseye.

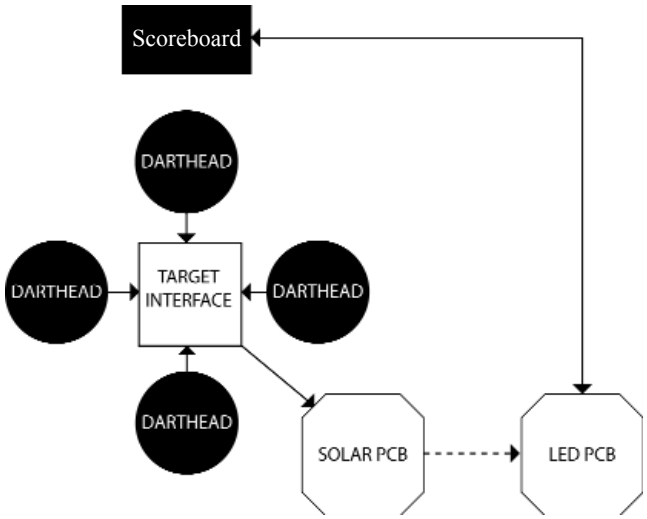


Bull Enabled **Bull Disabled**

4.5 How the Chuck A Luck Works

The following is a brief description on how the Chuck A Luck keeps score. These instructions, plus the flow chart below, should help you understand the process involved.

- When a dart strikes one of the dartheads, it triggers one of the sensors on the switch matrix.
- The switch matrix then sends a signal to the Smart Target Interface Board in the darthead hub.
- The Smart Target Interface Board sends a signal to the solar cell PCB in the motor enclosure.
- This board then sends an infrared signal to the LED board in the motor enclosure.
- The LED board sends the signal to the scoreboard which displays the points.
- The scoreboard sends a confirmation signal back to the LED board.



Section 5
Technical Description

Below are technical descriptions of the many parts within the Chuck A Luck.

5.1 Scrolling Digital Display Board

The digital display board converts input from the Smart Target Interface Board and displays it on three, seven segment LED displays. The display can count up to 99,999.

The digital display also receives input from the motor reset switch. This clears the score from the display.

5.2 Power Supply

The machine is equipped with a switching power supply. This supply has a universal 85 VAC to 264 VAC 50/60 HZ input. The inputs connect to J1 and the outputs are on J2.

J1
Pin 1 AC Line
Pin 2 AC Neutral

J2
Pin 1 +12 VDC
Pin 2 +5 VDC
Pin 3 Unused
Pin 4 Logic Ground
Pin 5 Logic Ground
Pin 6 -12 VDC-Not Used

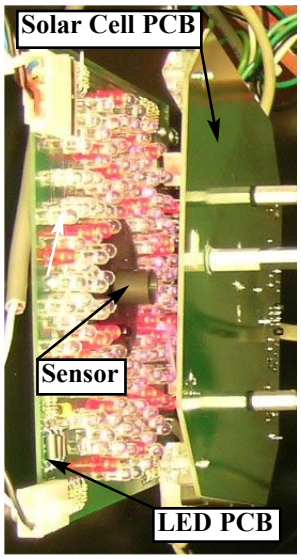
5.3 Rotation Motor

The Chuck A Luck uses a brushless AC shaded pole motor to control the darthead hub rotation. It is held securely in the motor enclosure by two brackets.

Warning: The fan needs to be on the motor if the Chuck A Luck is going to be used continuously.

5.4 Specialized Motor Controller

The Specialized Motor Controller, or "magic switch" operation, uses variations in infrared light to determine when to start or stop the motor. The optical sensor on the LED PCB senses the variations in infrared light as the Solar Cell PCB rotates. Once the microprocessor detects movement, it turns the motor on.



When you stop the darthead rotation for two seconds, the "magic switch" will detect that the darthead hub is not spinning and will shut the motor off.

Warning: Any movement between the sensors will cause the motor to start.

5.5 Solar Cell PCB

The Solar Cell PCB converts the infrared light from the LED PCB to power the Smart Target Interface Board and the Communications system.

The solar cells also reflect the infrared light back to the LED PCB as part of the "magic switch" operation.

5.6 LED PCB

The LED PCB performs many tasks for the Chuck A Luck. It provides the infrared light that the Solar Cell Board uses to power the Smart Target Interface Board and Communications. It contains the microprocessor that controls the "magic switch" operation as well as the score board reset switch.

5.7 Chuck A Luck Illumination

The Chuck A Luck is illuminated by two lamps containing 100 watt bulbs. These are mounted to the drape support via C clamps. The lamps have a flexible neck for ease of adjustment.

5.8 Darthead Assembly

The darthead assembly consists of (from front to back): the spider and segments, a matrix cushion, and the switch matrix. This assembly is secured to the backboard by means of four shoulder bolts and lock nuts.

The 19 pin ribbon cable on the switch matrix is attached to the darthead wire harness. This harness then brings the signals to the Smart Target Interface Board in the darthead hub.

5.9 Smart Target Interface Board

Each switch matrix is connected to the Smart Target Interface Board via the darthead wire harness. This board collects the information sent by the dartheads and transfers it to the Solar Cell Board via a six pin flat cable.

5.10 Technical Information

Power Supply: 85 - 264 VAC, 1.32A Surge @ 264 VAC, 50/60 Hz

Light Bulbs: 240V, 100W
130V, 100W

Operation Conditions at 120VAC:

1.31A - W/O Lights and Motor
0.32A - Electronics Only
3.50A - Maximum, Lights, Motor, Electronics

Section 6
Maintenance

6.1 Cleaning the Dartheads

Clean dartheads are necessary for accurate scoring. For proper maintenance, the dartheads should be cleaned every 1000 hours of operation or anytime an error during scoring occurs.

1. Remove the plastic number ring.
2. Open the darthead hub.
3. Disconnect the darthead wire harness from the Smart Target Interface Board.

4. Loosen the socket head bolts on the darthead arm bracket.
5. Slide the darthead arm out of the hub.

6. Lay the assembly face down on a flat surface.
7. Unplug the switch matrix from the darthead wire harness.
8. Unscrew the lock nuts from the shoulder bolts on the mounting plate.

NOTE: It is recommended, at this point, that the switch matrix, matrix cushion, and spider be marked with a permanent marker before disassembly to make proper orientation during reassembly easier.

9. Lift off the the mounting plate.
10. Lift off the switch matrix.
11. Lift off the matrix cushion exposing the segments.

12. Check for dirt, broken tips, or other foreign matter between the spider, segments, matrix cushion, and switch matrix. Check and remove any broken tips inside the segments. Remove the segment back cover by gently prying it up. Empty the contents. Snap the cover back in place when finished.
13. Replace any worn or broken segments.
14. Check the matrix cushion for badly worn spots or holes. If none are found, place the cushion back on the spider using the alignment marks made earlier.
15. Clean the switch matrix. Place the matrix over the cushion. Use the alignment marks made earlier, to align the matrix with the cushion and spider.
16. Reattach the darthead assembly to the mounting plate. Make sure the darthead arm and the matrix ribbon are aligned.
17. Plug the ribbon cable back into the darthead wire harness. If the darthead was assembled properly, you should see silver leads surrounded by a green background on the matrix ribbon.
18. Slide the darthead arm back into the hub until it rests on the locator pin.
19. Tighten the socket head bolts on the darthead arm bracket.
20. Reconnect the darthead harness to the main PC board.

Caution: If you put the connectors in backwards, and push too hard, you may bend the pins on the Smart Target Interface Board.

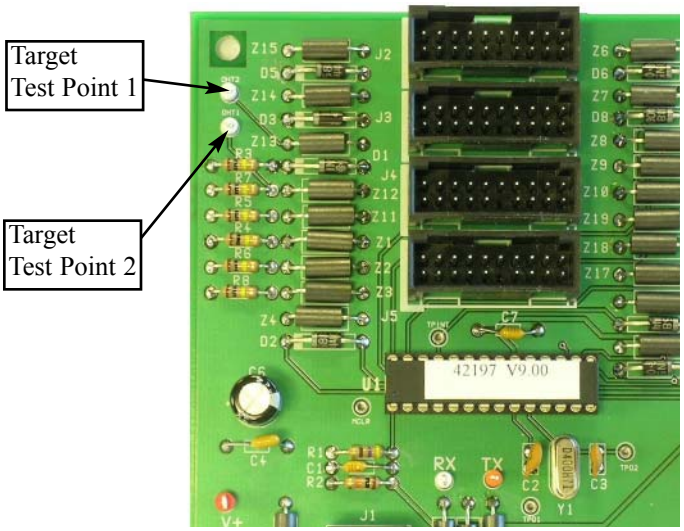
21. Reattach the plastic number ring. Make sure to align the number 3 so that it is over the darthead arm.
22. Repeat steps 1-21 for the other three dartheads.
23. Once finished, close the darthead hub.

6.2 Testing the Target Interface Board

Each switch matrix is connected to the Smart Target Interface Board via a darthead wire harness that runs the length of each darthead arm. This darthead wire harness plugs into the Smart Target Interface Board.

A. Using the Test Points

The Smart Target Interface Boards come equipped with test points on each side of the four connectors. When the Smart Target Interface Board is functioning properly, shorting these test points will score an inner 17. If it does not, the Smart Target Interface Board is malfunctioning.



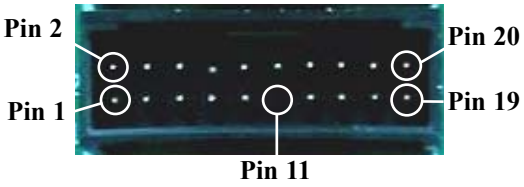
B. Testing the Pins

On occasion, it is necessary to know which pins on each of the four headers will give a particular score. This information is given in the table in the next column.

1. Plug in the Chuck A Luck.
2. Wait for the Chuck A Luck to finish establishing the communications (see section 4.1 Power Up).

Note: Do not spin the arms. This will cause this test to be invalid.

3. Open the darthead hub.
4. Unplug the darthead wire harness.
5. Using a jumper wire, touch and release any two pins. This simulates a dart hit. The score will display on the display board. Use the chart in the next column to determine if the correct pins caused the correct score.

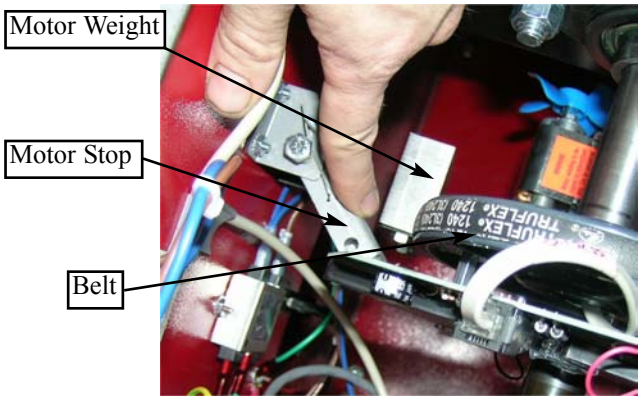


Pin #	14	13	12	10	9	8	7	6
1	D20	O20	T20	I20	D19	O19	T19	I19
2	D5	O5	T5	I5	D7	O7	T7	I7
3	D12	O12	T12	I12	D16	O16	T16	I16
4	D9	O9	T9	I9	D8	O8	T8	I8
5	D14	O14	T14	I14	D11	O11	T11	I11
15			OB	IB				
16	D1	O1	T1	I1	D17	O17	T17	I17
17	D18	O18	T18	I18	D2	O2	T2	I2
18	D4	O4	T4	I4	D15	O15	T15	I15
19	D13	O13	T13	I13	D3	O3	T3	I3
20	D6	O6	T6	I6	D10	O10	T10	I10

6.3 Replacing the Motor Belt

The motor belt rotates the dartheads. After 1000 hours of operation, its a good idea to check the condition of the motor belt. If the belt shows excessive wear and tear, use the instructions below to replace it.

1. Unplug the Chuck A Luck from the power source.
2. Open the top of the motor enclosure.
3. Swing motor stop out of the way.

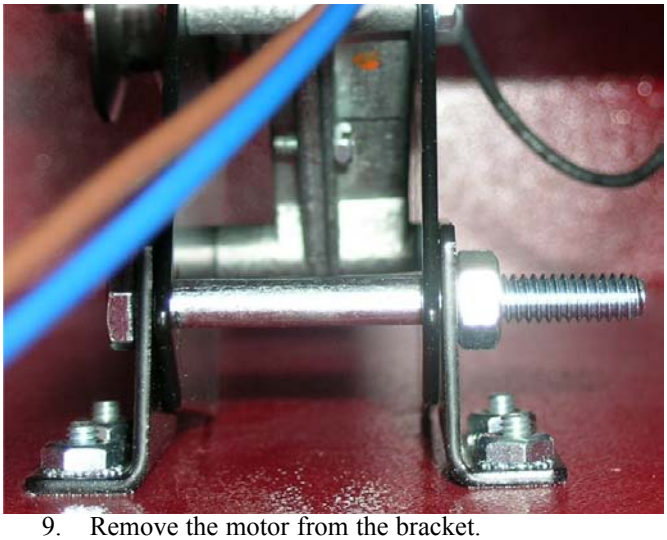


4. Lift and hold motor.
5. Remove belt from the motor.
6. Gently lower motor.
7. Replace old belt with a new one.

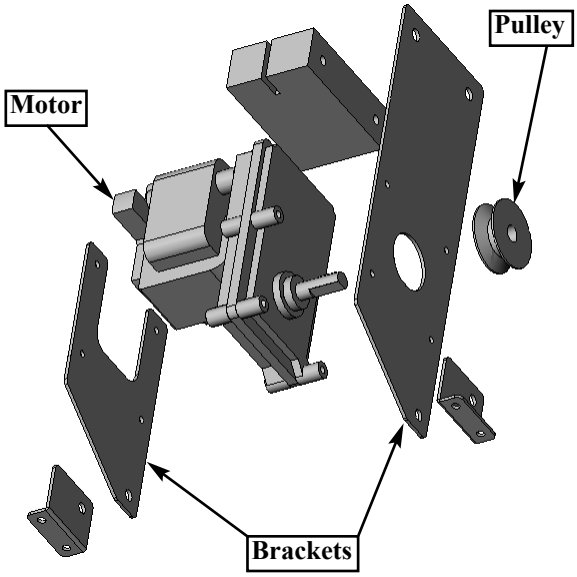
6.4 Replacing the Motor

Follow the instructions below to remove and replace the rotation motor if needed.

1. Unplug the Chuck A Luck from the power source.
2. Open the top to the motor enclosure.
3. Unplug the wiring harness from the motor.
4. Swing motor stop out of the way (see image above).
5. Lift and hold motor.
6. Remove belt from the motor.
7. Gently lower motor.
8. Unscrew the 1/4” bolt from the motor bracket.



9. Remove the motor from the bracket.
10. Place the motor on a work bench.
11. Remove the pulley using a 1/8” allen wrench.

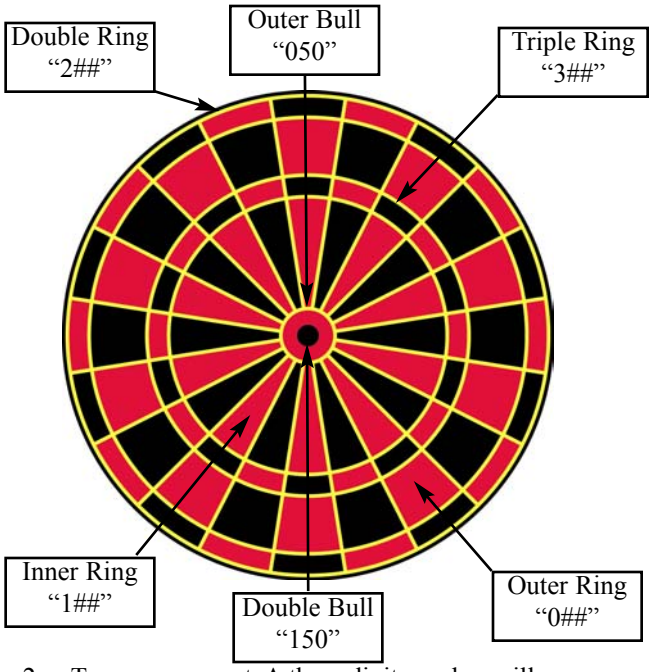


12. Gently, remove the fan. There are no screws or bolts, the fan just slides off.
13. Remove the retaining brackets using a small straight screwdriver and a 5/16” wrench.
14. Reassemble using the new motor.

6.5 Segment Test

If you notice that the Chuck A Luck does not score or scores improperly, you will want to perform a segment test to determine which segment has the issue. In order to perform a segment test, the dartheads must not be rotating.

1. On one darthead, tap the bullseye 6 times. If done correctly, the display will flash **000**.



2. Tap any segment. A three digit number will appear on the display. The first number tells you which ring the segment is in. The second set of numbers tells you which pie the segment is in. Example: If **120** appears on the display, it means that the inner 20 was hit. If **315** appears on the display, it means that the triple 15 was hit.
3. Once done with the segment test, spin the dartheads to exit out of test mode.

6.6 Viewing the Reset Counter

The Reset Counter allows you to view how many times the score has been reset. Once the counter reaches 99,999, it resets to 0.

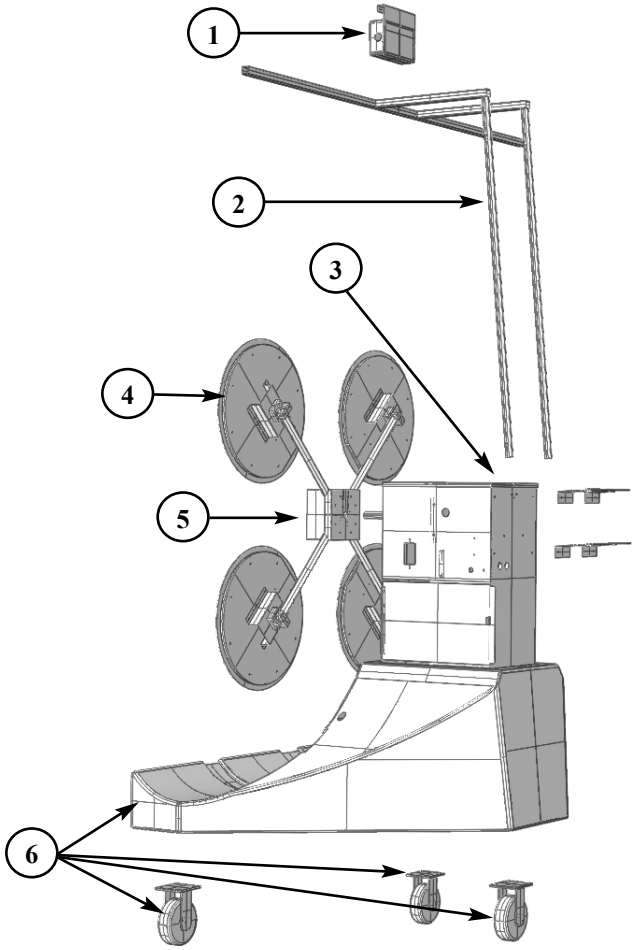
The dartheads need to be stopped before you can view the Reset Counter. On one darthead, tap the Outer 20 three times.

Section 7
Parts Listing

The numbers listed are Arachnid part numbers. Please use the Arachnid numbers when placing an order. Some descriptions are followed by a number in parentheses. This number is the quantity used in that assembly.

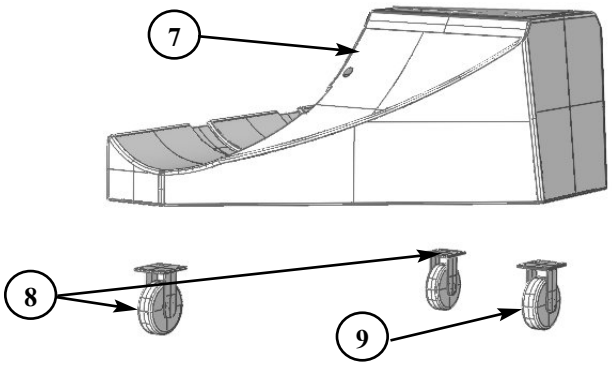
7.1 Chuck A Luck Darts - 42201

Part#	Ref#	Description
42355	1	Scoreboard Assembly
42212	2	Drape Support Assembly
42356	3	Motor Enclosure Assembly
42293	3	Storage Bin
42357	4	Target Arm Assembly
42354	5	Darthead Hub
42353	6	Base Assembly



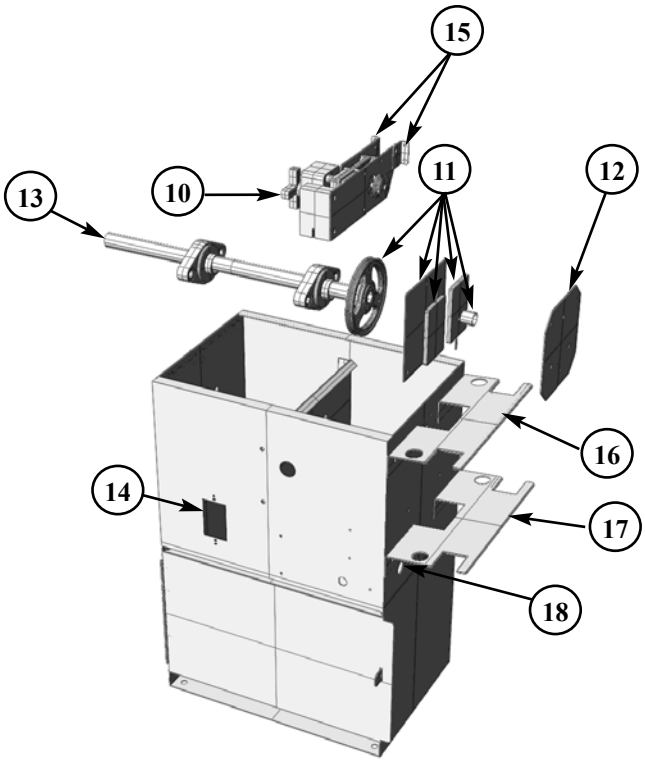
7.2 Base Assembly - 42353

Part#	Ref#	Description
42202	7	Base
42289	8	Caster With Brake
42204	9	Caster Without Brake



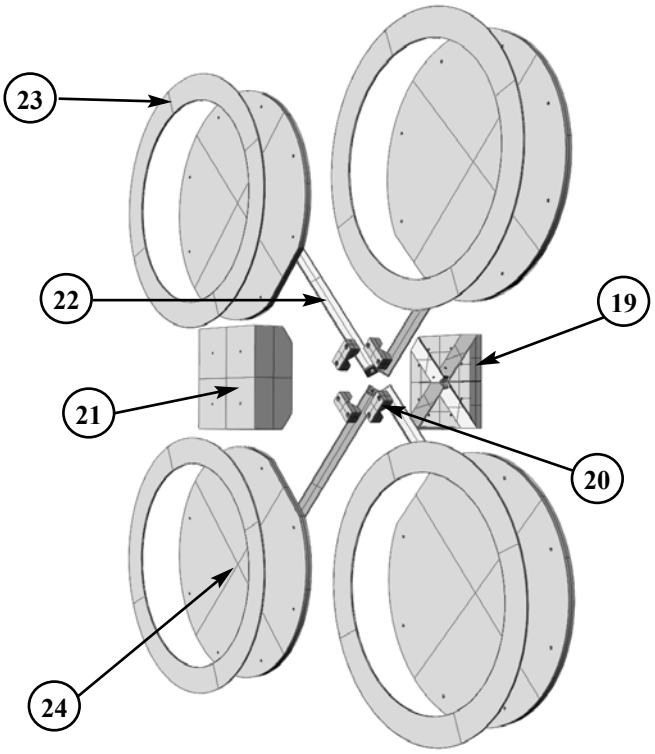
7.3 Motor Enclosure Assembly - 42356

Part#	Ref#	Description
42378	10	Motor Assembly
42359	11	Pulley Board Assembly
42266	11	Motor Belt
42170	12	LED PCB
42205	13	Drive Shaft
39267		Power Supply
42187		DC Power Harness
42339		Main AC Harness
42264		Fuse Holder
42282	14	Weatherproof Outlet
42292	14	Weatherproof Outlet Cover
42233	15	Right Motor Pivot Bracket
42234	15	Left Motor Pivot Bracket
42379	15	Motor Lock, Pivot Bracket
42380	15	Motor Lock, Channel Bracket
42369	16	Top Drape Support Bracket
42370	17	Bottom Drape Support Bracket
42371	18	Strain Relief
42372	18	Strain Relief Nut
42394	18	Cable Reset Assembly



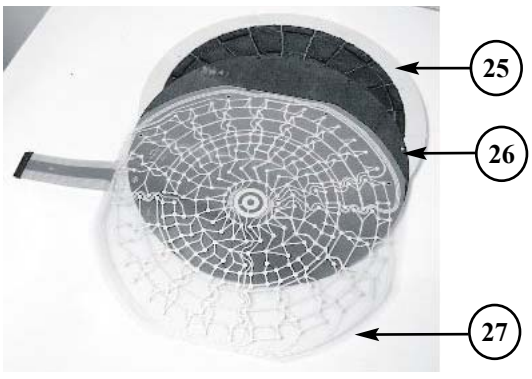
7.4 Darthead Hub Assembly - 42354

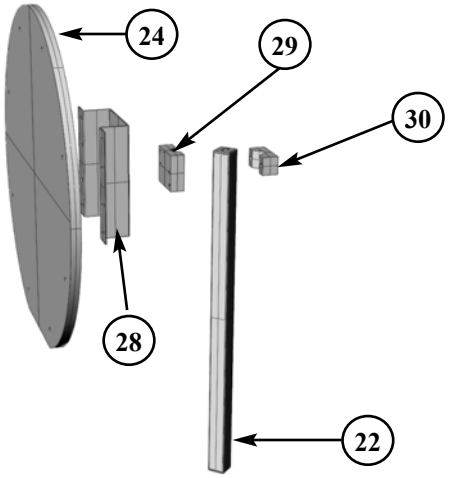
Part#	Ref#	Description
42164		Smart Target Interface Board
42235	19	Solid Coupling Plate
42236	20	Target Arm Clamp
42246	21	Darthead Hub Cover



7.5 Target Arm Assembly - 42357

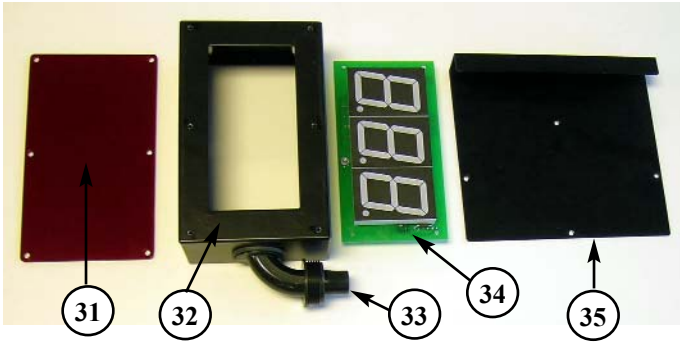
Part#	Ref#	Description
42358	22	Target Arm Harness Assembly
42243	22	Target Arm
42245	22	Target Arm Cap (2)
42185	22	Matrix Extension Cable
42250	22	Darthead Boot Connector
42239	23	Number Ring
42395	24	1/4” Target Back
37376	25	Target Assembly, Spider, Segments, Double Bull
28258	26	Rubber Matrix Damper
12575	27	Switch Matrix
42241	28	Target Mount Bracket
42242	29	Target “V” Block
42236	30	Target Arm Clamp





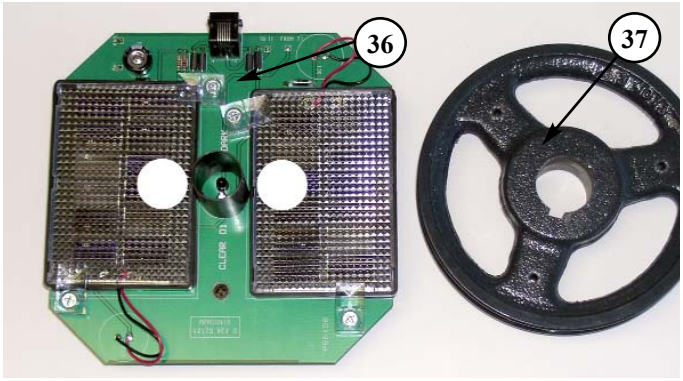
7.6 LED Scoreboard Assembly - 42355

Part#	Ref#	Description
42249	31	Display Lens
42295	32	Display Enclosure
42262	33	Elbow Fitting
42160	34	Scoreboard Display PCB
42294	35	Display Bracket
42267		Black Flex Conduit Tubing
42186		Display Cable



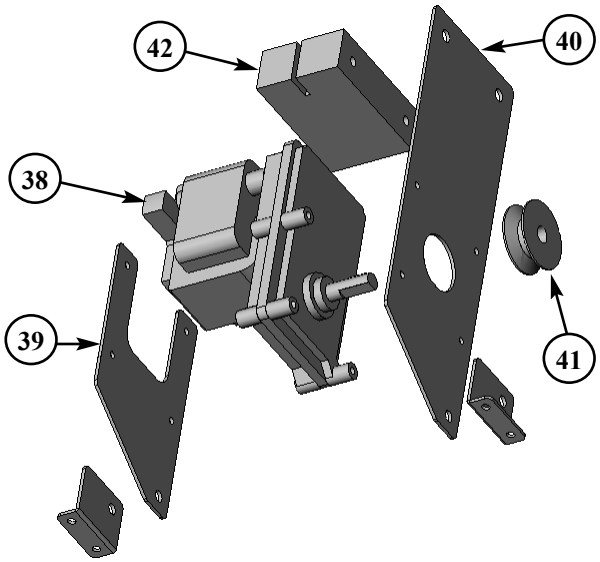
7.7 Pulley Board Assembly - 42359

Part#	Ref#	Description
42173	36	Solar Cell PCB
42207	37	Drilled Pulley, OK50x1
42274		O-ring Seal, 1/8 ID x 1/16



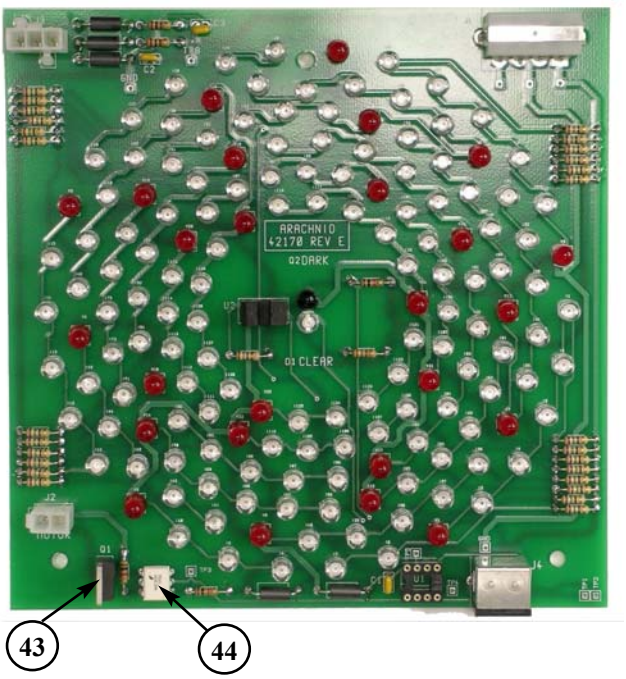
7.8 Motor Assembly - 42378

Part#	Ref#	Description
42189	38	Shaded Pole Motor, 115V@60HZ
42400	38	Shaded Pole Motor, 240V@50HZ
42231	39	Shaft Side Bracket
42232	40	Motor Bracket
42265	41	Pulley, 1 1/2 Pitch X 3/8 Bore
42314	42	Motor Weight



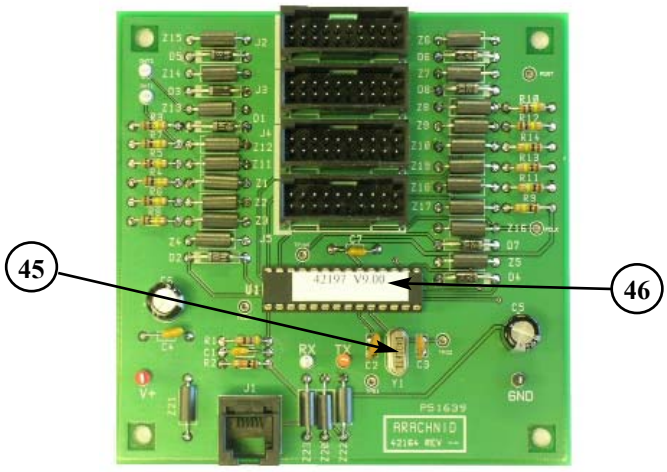
7.9 LED PCB - 42170

Part#	Ref#	Loc	Description
42082	43	Q1	Triac, 12A
12527	44	QD1	IC, Optoisolator



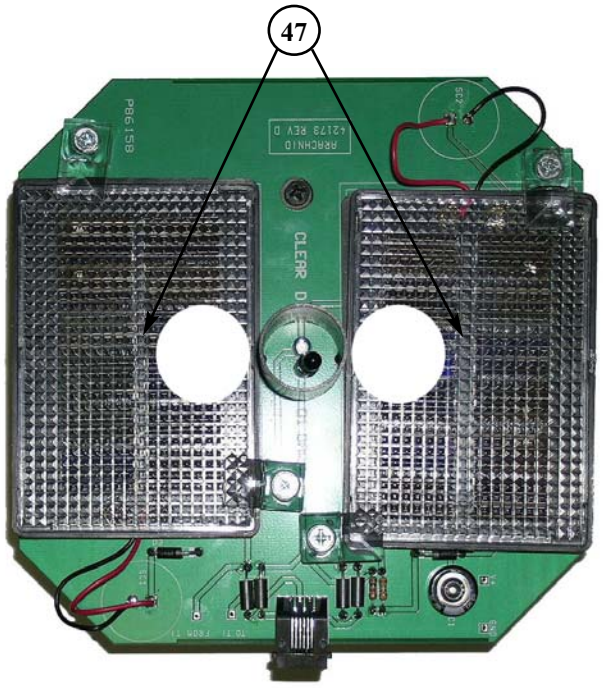
7.10 Smart Target Interface Board - 42164

Part#	Ref#	Loc	Description
42193	45	Y1	XTAL,4MHZ, HC49/S
42197	46	U1	Programmed IC



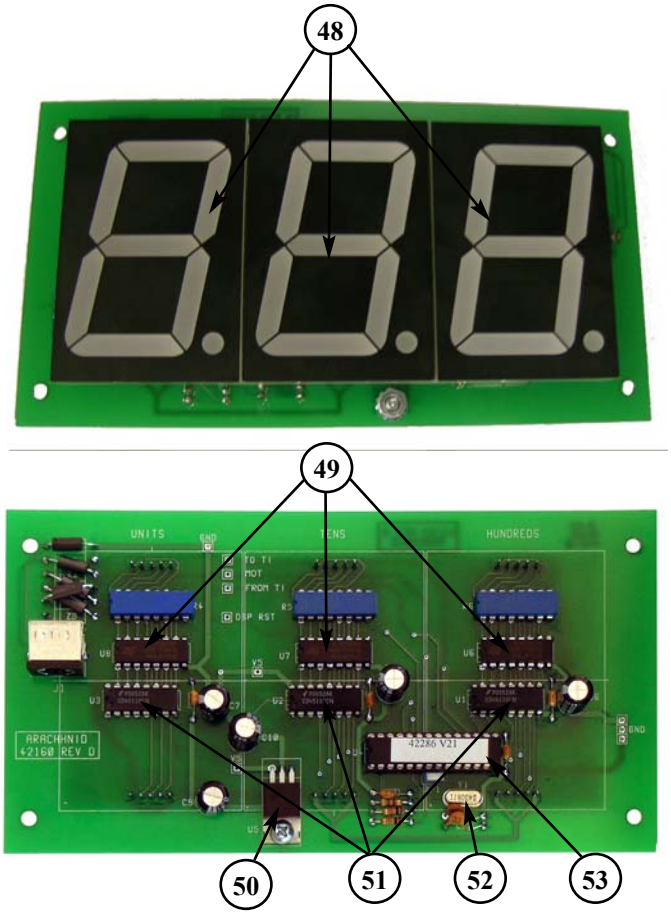
7.11 Solar Cell PCB - 42173

Part#	Ref#	Loc	Description
42184	47	B1, B2	Solar Cell Panel



7.12 LED Scoreboard PCB - 42160

Part#	Ref#	Loc	Description
42190	48	DSP1-DSP3	2.24” 7 Segment LED
30513	49	U6, U7, U8	XTOR, ULN2003A
21416	50	U5	IC, 5V Reg, MC7805
42288	51	U1, U2, U3	Logic IC
42193	52	Y1	XTAL,4MHZ, HC49/S
42286	53	U4	Programmed IC



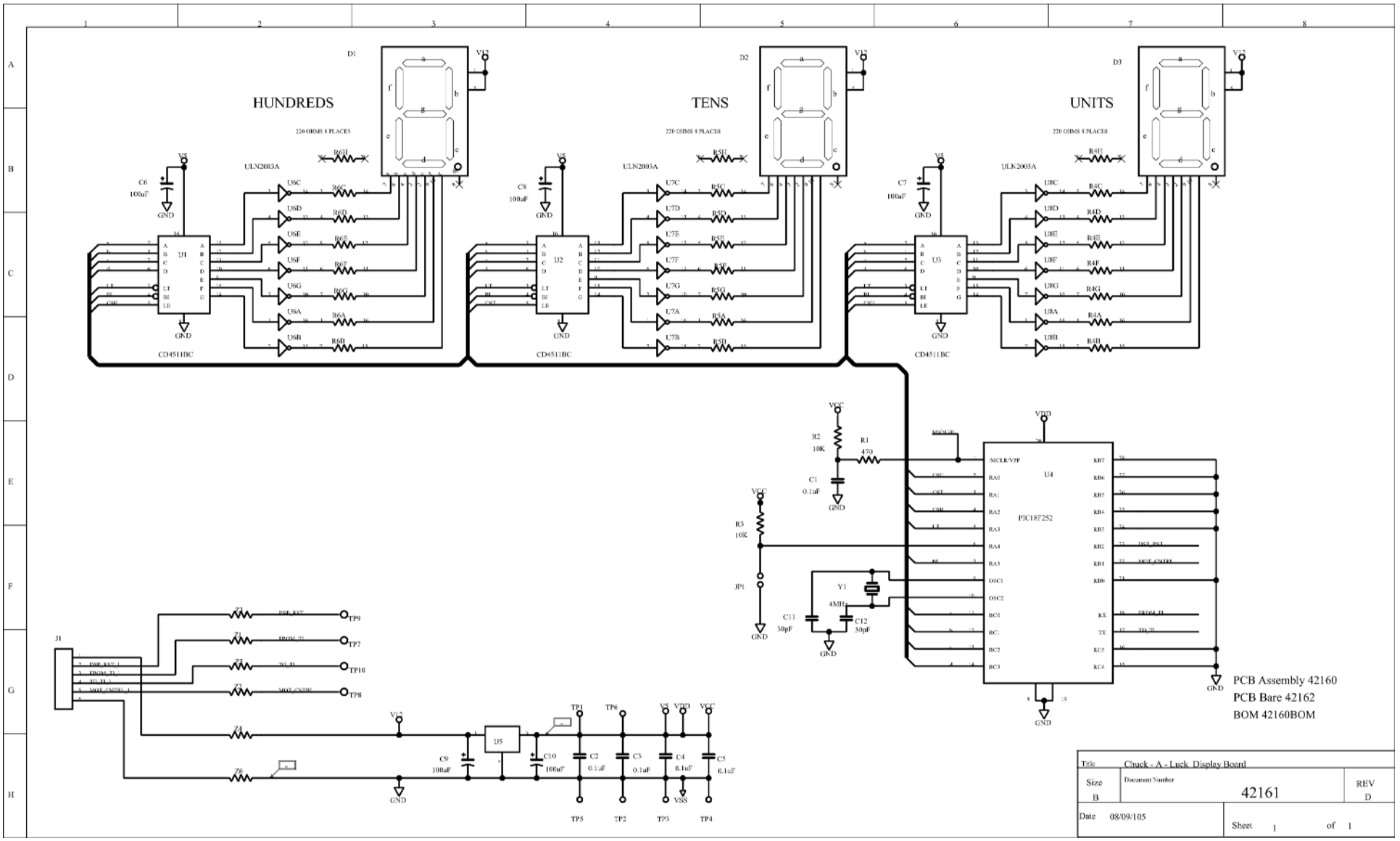
Section 8
Troubleshooting

Warning: Unplug power to the Chuck A Luck before performing any repairs.

Problem	Probable Cause	Procedure
A red LED on the LED PCB is out.	a. One or more infrared LEDs in the series is out.	a. Replace the LEDs in that series.
Darthead Hub not spinning.	a. Motor belt slipped off the pulley.	a. Make sure belt is on pulley and not damaged in any way. If severely worn, replace the belt.
	b. Motor is not functioning.	b. See next section.
	c. There is an obstruction between the sensors.	c. Remove the obstruction.
Motor not functioning	a. The game is not plugged in.	a. Make sure the Chuck A Luck is plugged into a power source.
	b. The fuse on the side of the Chuck A Luck may have been blown.	b. Replace the 4A Fuse.
	c. Loose connections at the power supply and motor.	c. Tighten any loose crimps.
The LED PCB is not lighting up.	a. No power getting to the LED PCB.	a. Check to make sure the wire harness is correctly connected to the LED PCB. If it is, check for loose connections in the wire harness.
The LED Display is not functioning.	a. The cable connecting the display board to the LED board is disconnected.	a. Check the cable at the Display board and at the LED board.

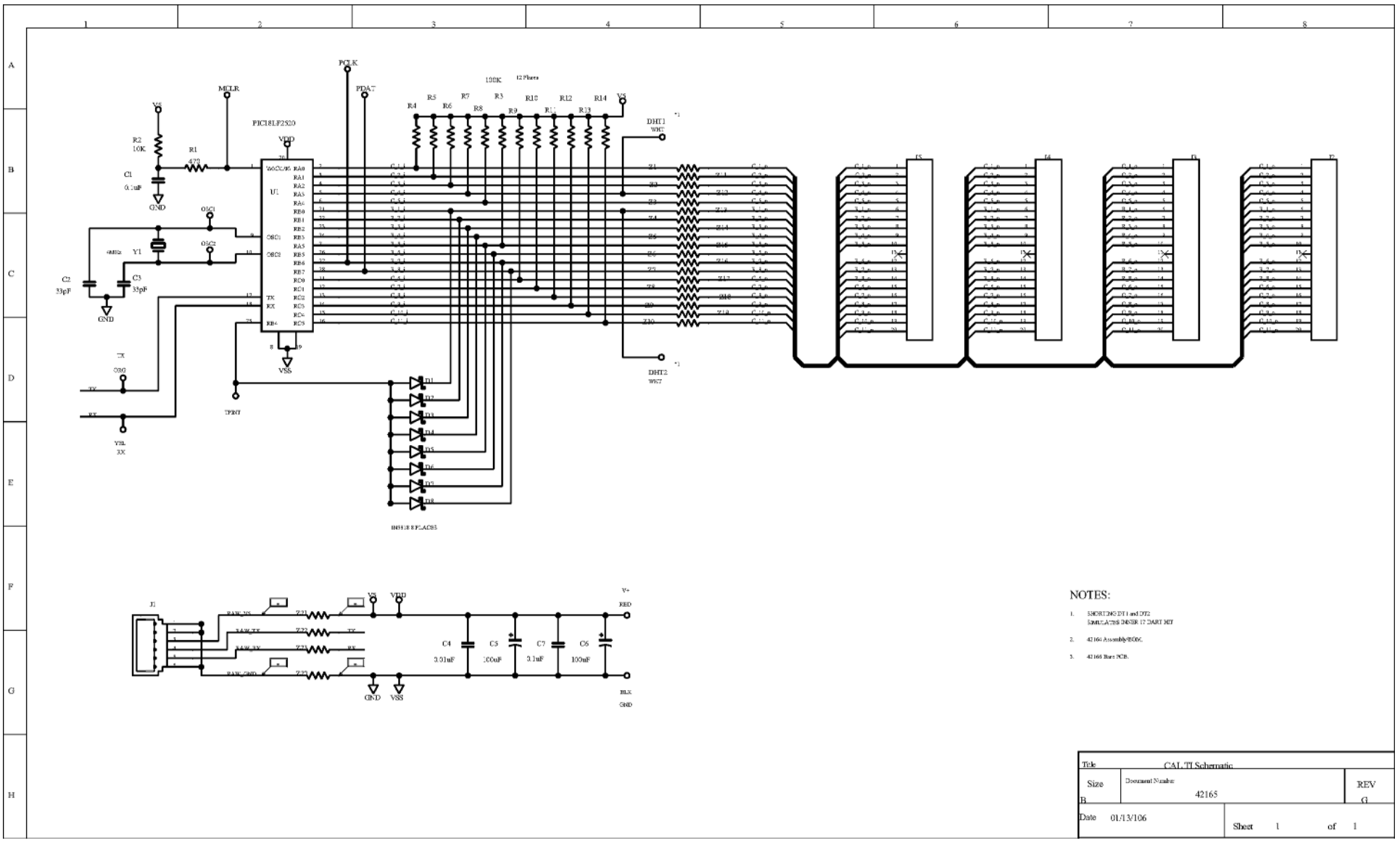
Error Codes

Code	Description	Occurrence	Possible Solution
900	Comlink Not Established	This error code may appear at the end of the startup sequence. (See section 4.1 on page 2.)	Check to see if there is an obstruction between the LED PCB and the Solar Cell PCB. If there is remove it and restart the Chuck A Luck. If this is the case, try replacing one of the PCB's.
910	Multiple Stuck Segments	This error code will appear during game play.	Check the dartheads for broken tips. It may be necessary to clean the darthead (section 6.1) or test the Smart Target Interface Board (section 6.4).
0##	Stuck Outer Single Segment	This error code will appear during game play. The number of the segment will follow the "0" (i.e., 050=Outer Bull, 020=Outer 20).	Check the dartheads for broken tips. It may be necessary to clean the darthead (section 6.1) or test the target interface board (section 6.4).
1##	Stuck Inner Single Segment	This error code will appear during game play. The number of the segment will follow the "1" (i.e., 150=Inner Bull, 120=Inner 20).	Check the dartheads for broken tips. It may be necessary to clean the darthead (section 6.1) or test the target interface board (section 6.4).
2##	Stuck Double Segment	This error code will appear during game play. The number of the segment will follow the "2" (i.e., 220=Double 20, 211=Double 11).	Check the dartheads for broken tips. It may be necessary to clean the darthead (section 6.1) or test the target interface board (section 6.4).
3##	Stuck Triple Segment	This error code will appear during game play. The number of the segment will follow the "3" (i.e., 320=Triple 20, 311=Triple 11).	Check the dartheads for broken tips. It may be necessary to clean the darthead (section 6.1) or test the target interface board (section 6.4).



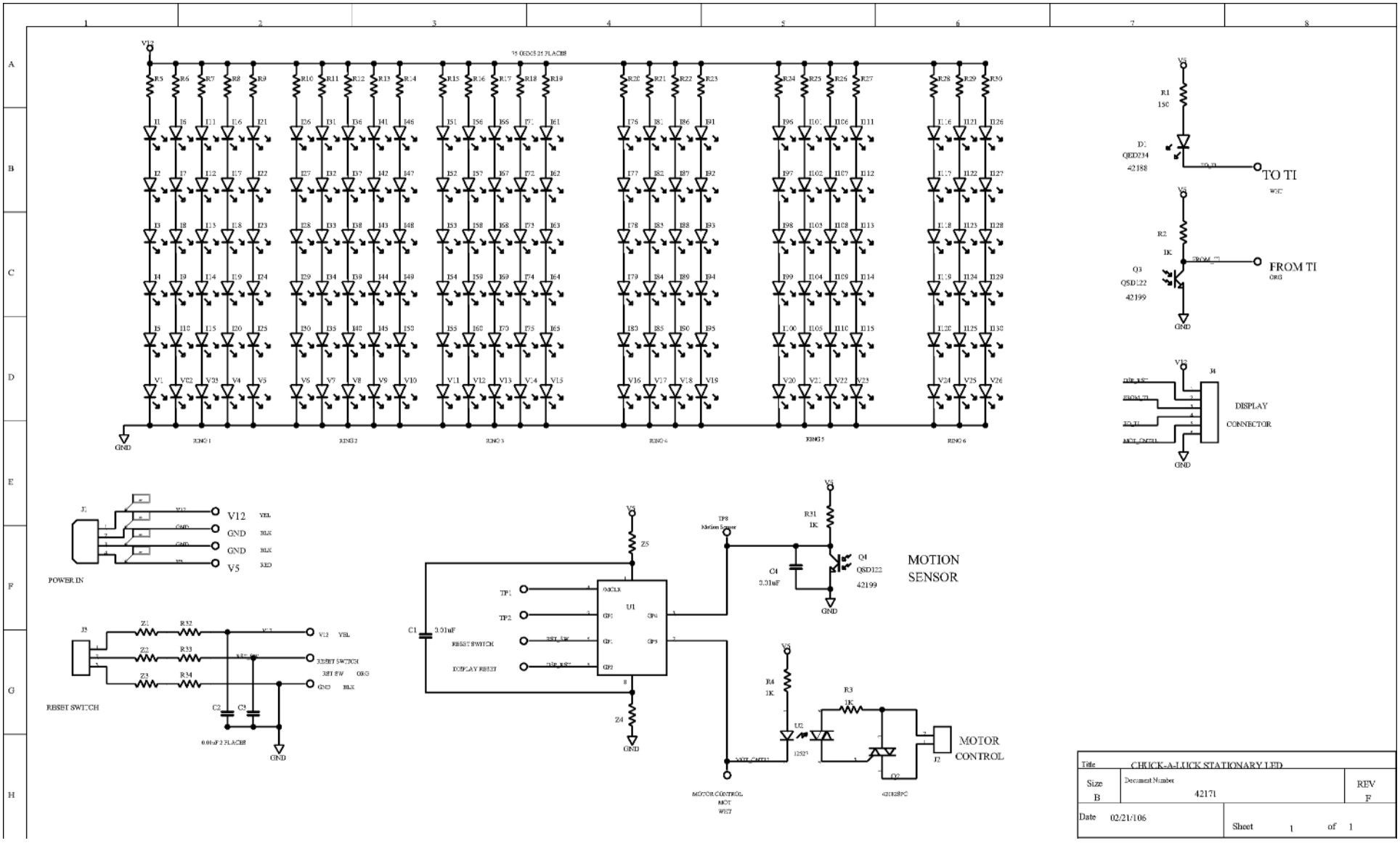
Chuck A Luck Darts Display Board

Full Sized Versions Can Be found on http://www.arachnidinc.com/support/chuckaluckdarts/



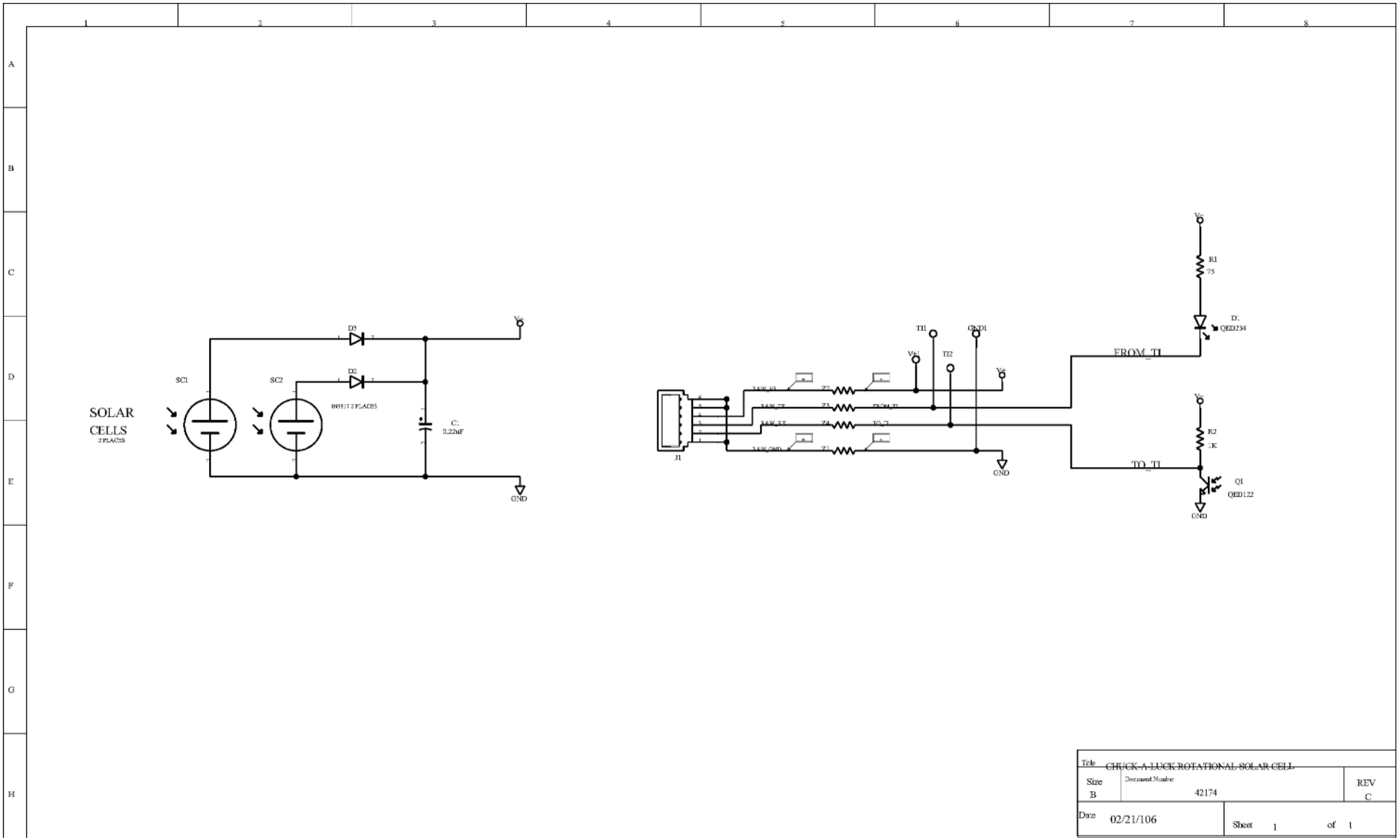
Chuck A Luck Darts Target Interface Board

Full Sized Versions Can Be found on http://www.arachnidinc.com/support/chuckaluckdarts/



Chuck A Luck Darts LED Board

Full Sized Versions Can Be found on http://www.arachnidinc.com/support/chuckaluckdarts/



Chuck A Luck Darts Solar Cell Board

Full Sized Versions Can Be found on http://www.arachnidinc.com/support/chuckaluckdarts/