

Cyclone Technical Reference Manual



ICE Parts & Service Department

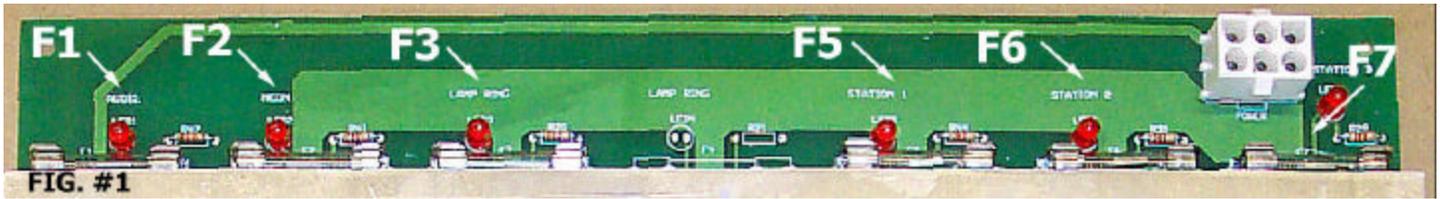
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CYCLONE TECH MANUAL

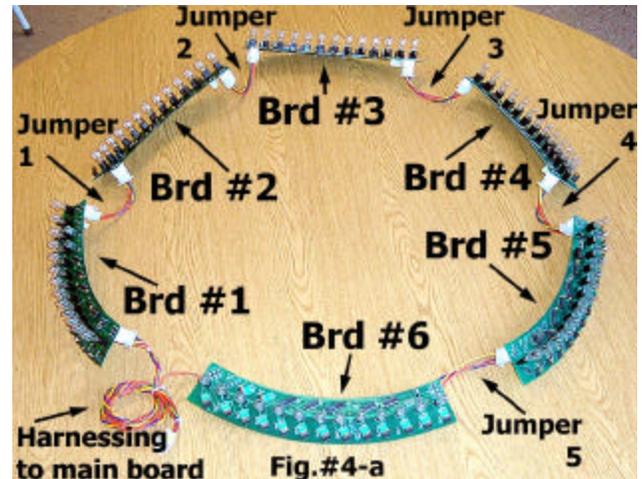
Fuse Ratings: **F1** – 3 amp, **F2** – 6 amp, **F3** – 10 amp, **F5** through **F7** – 3amp, **F8** – 10 amp, all fuses are slow blow (F8 not shown below in fig. #1).

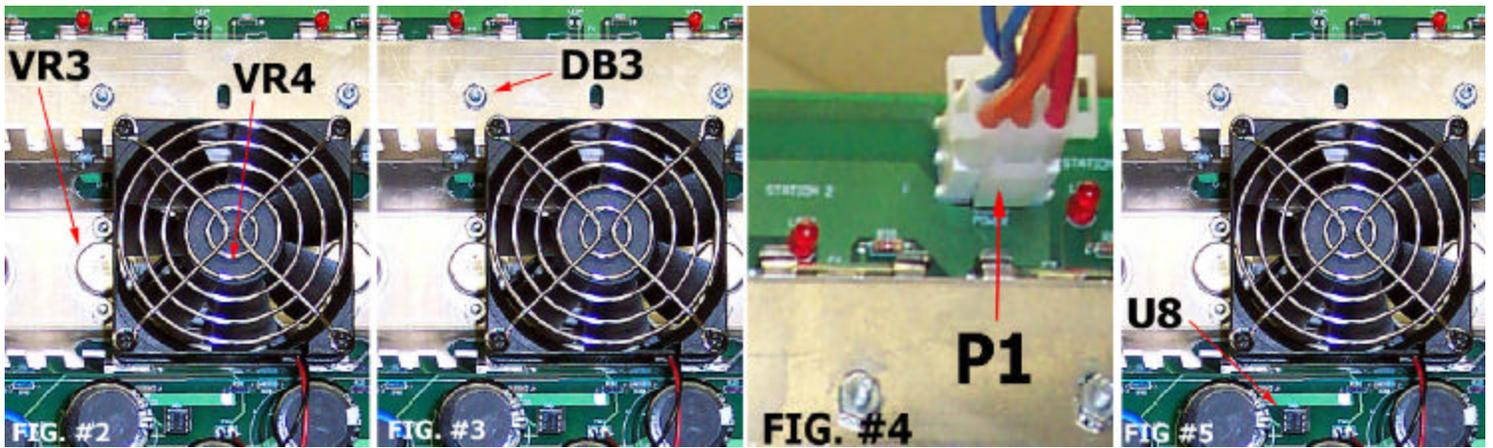


COMMON PROBLEMS

Light Ring is dim or not lighting:

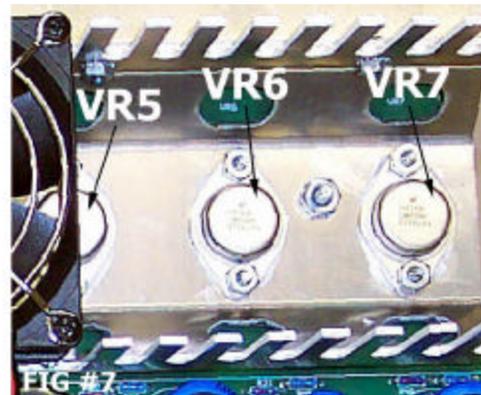
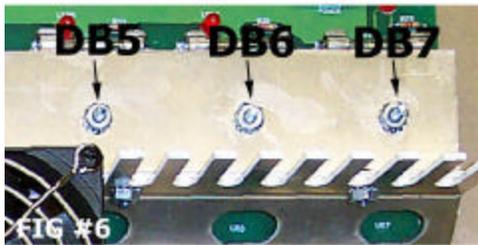
1. Check fuse **F3** (see above for rating), and make sure the fuse holder is in good condition.
2. Check voltage on **VR3** and **VR4** (**VR4** is located directly below the fan) for an output of **13vdc**. You can do this by placing your black lead of your voltmeter on the ground for the fan on the main board (black wire) and then touching the top of the voltage regulator with the red lead. If one or both of the regulators are below **11vdc** then **BOTH VR3 and VR4 will need to be replaced**. If the voltage is above **11vdc** then you may be able to get the voltage back up to **13vdc** by tightening the bolts holding the voltage regulator to the board and heat sink (see fig. #2).
3. Check the output of **DB3** (located below the heat sink) for approximately 15 volts of unregulated dc. You can do this by measuring the voltage on resistors **R49** and **R50**. These are located on either side of **DB3** (see fig.#3).
4. Check Connector **P1** for approximately **18vac** across a red and orange, and then the other red and orange, and the two blue wires (see fig. #4). Remember this is AC voltage and each set of wires is **18 vac**.
5. Check the light ring harnesses for damage if so replace.
6. To test the light ring pcb's you'll need to narrow down where a possible problem could be. First you need to identify what board is where. Open the blue coin door and look up at the bottom of the playfield. You'll see 6 light ring boards, with board number #1 to your left and #6 is to your right. The boards are in numeric order going counter-clockwise from this view. Now disconnect the wires between board #1 & #2 (only board #1 should light with the approximate time for the other 5 boards to light before board #1 lights again). If board #1 works then replace the jumper between boards #1 & #2 then remove jumper between boards #2 & #3. Boards #1 & #2 should light. Continue this process until you find the board that doesn't light. When this occurs either the suspect board is either the board previous to the one just connected (bad output) or the board itself has a bad input.
7. Try replacing **U8** on main board (this chip balances the regulators **VR3** and **VR4**) if this chip is bad it may have forced one of the regulators to be "overworked" and that regulator failed (see fig. #5). This would lead to replacing **VR3**, **VR4** and **U8**.





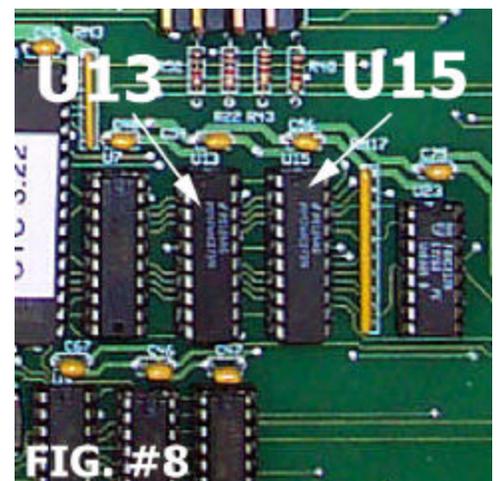
No Power To One Station:

1. Check fuses **F5** for the Blue Station, **F6** for the Pink Station, **F7** for the Green Station (see fig. #1).
2. Check diode bridges (**DB5** for blue station, **DB6** for the pink station, or **DB7** for the green station) for an output voltage of approximately **15vdc** (see fig. #6).
3. Check voltage regulators (**VR5** for blue, **VR6** for pink, or **VR7** for green) for a **12vdc** output (see fig. #7). Check station connectors and harnessing for damage (**P2** for blue, **P3** for pink, or **P4** for the green).
4. Make sure there is no damage to the wiring from the main PCB to inoperable station. On the station connector check to make sure there is **12vdc** across **pin 1** (+12vdc) and **pin 7** (gnd) (see fig. #8).
5. Try swapping a known working station connector with the one that is not to verify that the problem is a main PCB problem or a station problem.



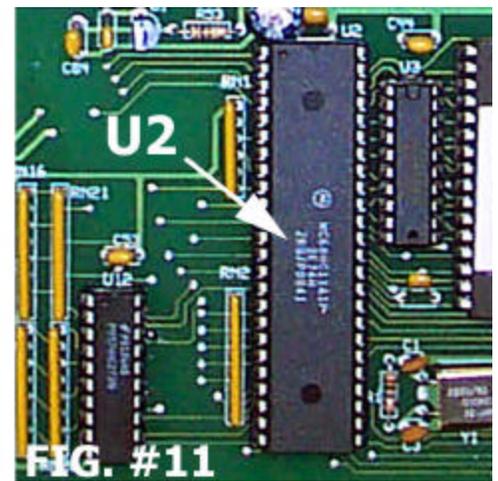
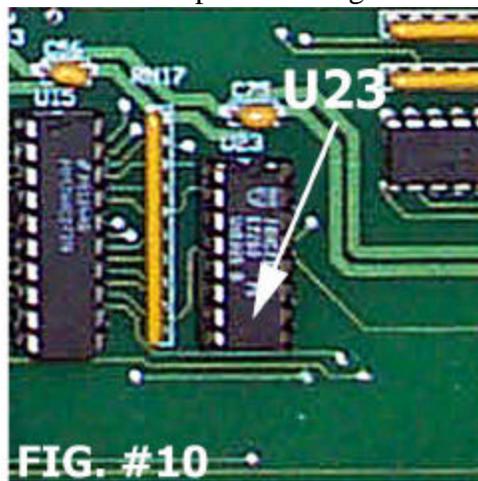
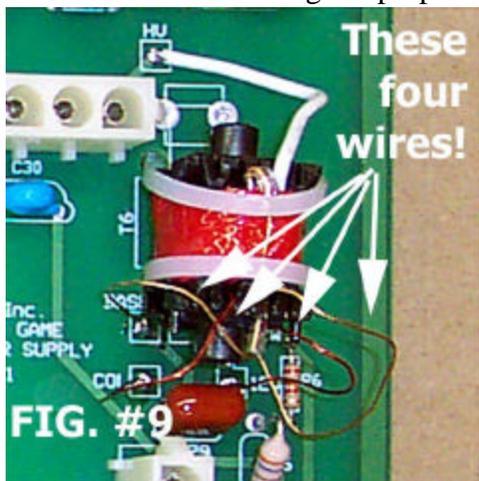
No Ticket Dispense:

1. Try swapping ticket mechs or ticket mech boards between stations to verify if it is a game problem or a ticket mech problem.
2. Check the station wiring between ticket dispenser and main PCB for damage and/or swap station connectors to see if problem follows switch.
3. Make sure the ticket mech is getting **12vdc** from the main PCB. See “No Power To One Station” above.
4. Swap chips **u13** and **u15** on main PCB (see fig. #9). These chips control ticket output, ticket counting (output to ticket counters), coin counting (output to coin counters), and flashing of the lights in the buttons after crediting up a station.



Scrambled Displays:

1. Swap display with known working display on another station. If problem follows the display board the display board is bad and needs to be replaced.
2. Try disconnecting the main to neon harness (connector **P7** on main pcb). If the game has any bad neon bulbs or harnessing to the neon bulbs, the neon circuits could transmit a high frequency “noise” which can interfere with the clock and data signals going to display boards. If you disconnect the harness for the neon at connector **P7** and the display or displays begin to operate properly you will need to check ALL harnessing for the neon bulbs. **MAKE SURE THERE ARE NO EXPOSED WIRES BETWEEN THE BULB AND THE NEON CONTROLLER PCB.** Also check and make sure that the four wires coming off each of the 12 neon ballasts on the neon controller pcb are not touching each other (this can cause “noise” in some cases) (see fig. #9).
3. Try replacing chip **U23** on main PCB (see fig. #10). This chip splits the clock pulse on the main PCB into 5 separate signals; one for each station (for the displays), the light ring, and the neon controller. If this chip is damaged it may cause more than just the displays to scramble.
4. Try replacing the microprocessor **U2** (see fig. #11). This chip is the brains of the game and it creates the clock plus and data information for the game. If this chip is malfunctioning it may not be creating the proper info and/or clock plus for the game.

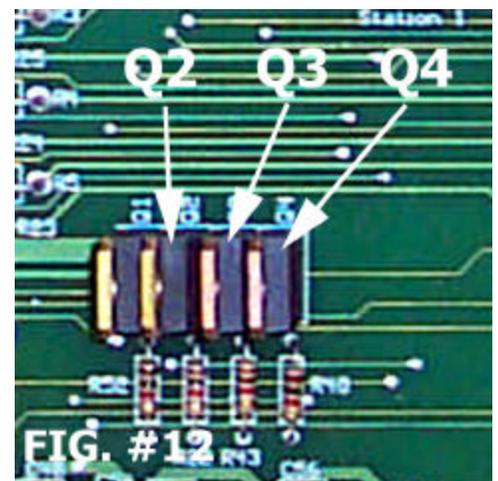


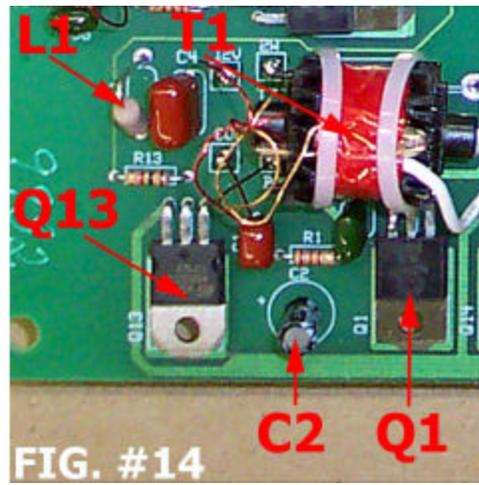
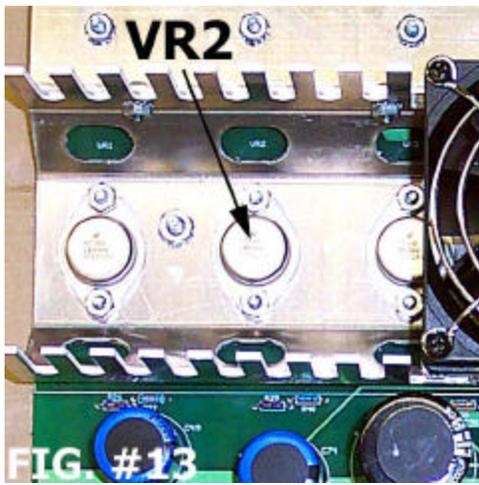
Light in Button On/ Off All The Time:

1. Check to make sure the bulb is good and that the harnessing / connectors are in good condition.
2. Check drive transistor on main PCB (**Q2** for blue, **Q3** for pink, **Q4** for green) (see fig. #12).

Neon (or Neons) Are Out:

1. Check fuse **F2** on main PCB (see fig. #1).
2. Check voltage on **VR2**, you'll be looking for **12vdc** (see fig. #13).
3. Check the harness/connector between the neon PCB and the main PCB for exposed or broken wires.
4. Try swapping with a known working neon to see if neon is bad or output for that section is dead.
5. Replace neon transformer, 2 transistors, capacitor, and inductor (see fig. #14 NOTE the parts shown in fig #14 are for ONE NEON BULB ONLY, each neon has a set of what is displayed in fig 14).



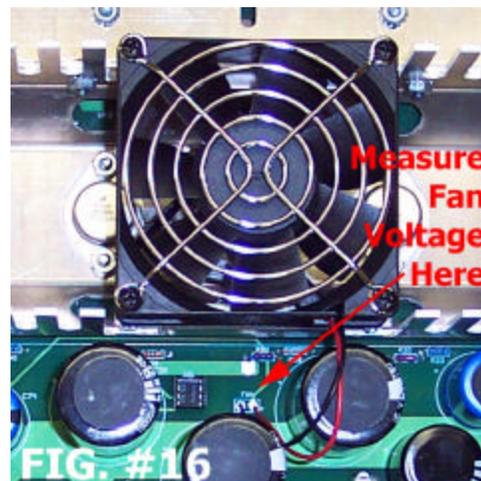
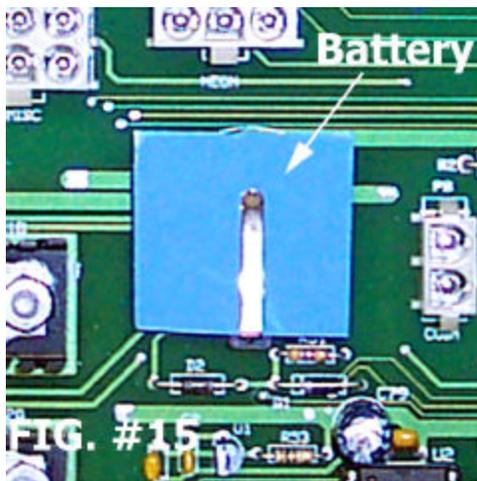


Game Not Saving Programming Options:

1. Check battery voltage on main PCB (approximately 3.2vdc) (see fig. #15 – NOTE the picture shows the battery with a piece of paper between it and the clip, this is to ensure customers don't receive main pcb's with dead batteries, check to make sure it is removed). Make sure the game is off when measuring this voltage. Also if you measure the battery right after the game is shut off it, may give you the correct voltage but it still doesn't save the program options overnight. This is because the main PCB charges the battery and the reason for failure may be because the battery cannot hold a charge for more than a few hours.
2. Replace U2 (see fig. #11).

Fan On Main PCB Dead:

1. Check voltage of fan on main PCB. This is the same voltage that the neon controller PCB uses (see fig.#13). This can be done by measuring the wires going to the fan (see fig. #16).
2. Replace fan, NOTE if this fan fails and game continues to be run, severe damage of the main pcb can result. As temperatures of the voltage regulators gets higher and higher, components will begin to breakdown and possibly shorting regulators (VR1-7), diode bridge rectifiers (DB1-7) and/or any other components that heat up.



I. Common Parts

Main PCB Components

<u>Components</u>	<u>Board Position</u>	<u>Part Number</u>	<u>ICE's Part Number</u>
Voltage Regulator	VR1 – VR7	LM338k	208009
Voltage Regulator	VR8	LM340at-5	2362
IC Chip	U13, U15	74hc273	2305
IC Chip	U23	74hc237	2266
Diode Bridge Rectifier	DB1 – DB3, DB5 – DB7	mb354w	2444
IC Chip	U24	u1n2003	208004
Transistor	Q1 – Q4	tip122	2110
Microprocessor	U2	68hc11a1p	2368
IC Chip	U9	74hc00	2297
IC Chip	U11, U14	74hc165	2301
Fan	Fan	kde1212pt	2364
Audio Amp	U17 – U22	tda2003	2254
Op Amp	U8	ca3193e	2523

Neon Controller PCB Components

<u>Components</u>	<u>Board Position</u>	<u>Part Number</u>	<u>ICE's Part Number</u>
Voltage Regulator	VR1	LM340t-5	pc20435
IC Chip	U1, U2	74hc165	2301
IC Chip	U3, U4	74hc174	2262
IC Chip	U5	74hc14	2117
* Transistor	Q13 – Q24	tip122	2110
* Transistor	Q1 – Q12	mje3055npn	2532
* Neon Transformer	T1 – T12	transformer	cc2001
* Inductor	L1 – L12	3.6uH 1.5amp	cc2007
* Capacitor	c2, c7, c12, c17, c22, c27, c32, c37, c42, c47, c52, c57	10uf 50V electrolytic	2325

*All of these parts are available in a repair kit (cc2020rx), one kit will repair one neon driver circuit (i.e. In fig. #14 you would need to replace L1, T1, Q1, Q13, and C2 to fix neon from connector P1)

General Game Parts

<u>Part Description</u>	<u>ICE's Part Number</u>
Blue Top Panel Overlay (specify left or right)	cc1011
Pink Top Panel Overlay (specify left or right)	cc1014
Green Top Panel Overlay (specify left or right)	cc1017
Blue Cabinet Door Frame	cc1022
Pink Cabinet Door Frame	cc1023
Green Cabinet Door Frame	cc1024
Blue Cash Door Frame	cc1025
Pink Cash Door Frame	cc1026
Green Cash Door Frame	cc1027
Blue Cabinet Coin Door	cc1028
Pink Cabinet Coin Door	cc1029
Green Cabinet Coin Door	cc1030
Blue Cash Box Door	cc1032
Pink Cash Box Door	cc1033
Green Cash Box Door	cc1034
Blue Jackpot Display Housing	cc1035
Pink Jackpot Display Housing	cc1036
Green Jackpot Display Housing	cc1037
Dome Assembly	cc3001x
Control Panel Assembly	cc3002x
Cash Box	cc3012
Coin Funnel	cc3013
Game Transformer	cc2002x
Storm Stopper Button Assembly	cc7005x
Jackpot Beacon Light	cc2006
Neon Arch Socket Nut	cc2016
Neon Arch Socket	cc2017
Pink Neon Arch	cc2018a
Green Neon Arch	cc2019a

Blue Neon Arch	cc2020a
Pink Neon Triangle	cc2021a
Green Neon Triangle	cc2022a
Blue Neon Triangle	cc2023a
Light Ring Bulb	2005
Jackpot Light Bulb	2061
Counter	pc20224
Jackpot Light PCB	cc2005x
Neon Controller PCB	cc2020x
Tickets Owed Display PCB	cc2032x
Jackpot Display PCB	cc2033x
Main Controller PCB	cc2034x
Coin Door Lock	5014
Speaker	fp2007
Dome Bolt	pc60622
Control Panel Nut	6040
Control Panel Carriage Bolt	6045
Pem Stud (for clear cover on control panel)	656
Pem Stud Nut	6145
Power Module (5 amp.)	hh2050ax
Cyclone Side Cabinet Decal	cc7001
By ICE Decal	cc7002
Control Panel Decal	cc7004
Storm Stopper Button Decal	cc7005
Scoreboard Overlay	cc7006
Winner Everytime Decal	cc7008
Light Ring Zone Decal (right)	cc7011
Light Ring Zone Decal (left)	cc7012
Bonus Decal	cc7013
Alternate Zone Number Decal Sheet	cc7014