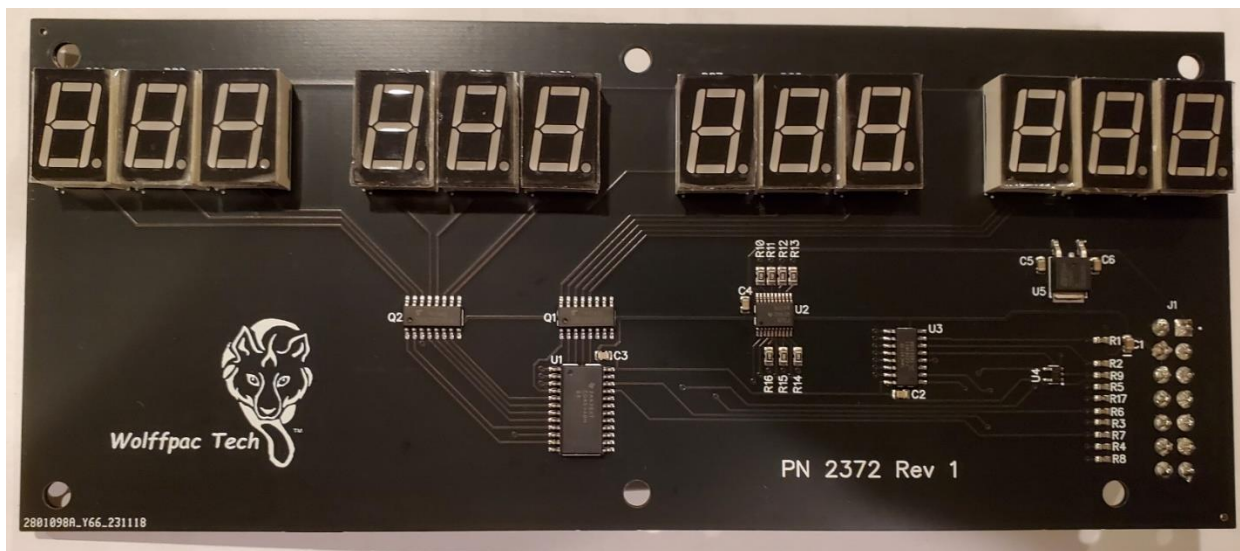# Wolffpac Technologies

Gottlieb™ Shaq Attaq Field Display Kit

Assembly Instructions

wolffpactech.com

When assembled, this display will replace the filed display used on Gottlieb™ Shaq Attaq and Hoops solid state pinball machines.

Gottlieb™ is a registered trademark of Gottlieb Development LLC.

Tools:

Soldering iron - A small to medium power soldering iron of 25-50 watts with a small tip, preferably temperature controlled, is recommended.

Alcohol –Isopropyl Alcohol, Denatured Alcohol or Flux Remover to be used for cleaning the board after assembly.

Solder - Use only solder designated for electronic component assembly. Either lead-based or lead-free flux-core solder are both acceptable.

→ **Use of solid core, acid core or plumbing solder is not acceptable and will void the warranty.** ←

All soldering should be done on the bottom (non-printed) side of the boards. This kit uses "old school" through-hole components requiring only basic soldering skills to assemble. However, if you have never soldered before or are unsure of your skill level, it is recommended that you first practice soldering on a scrap board before beginning to assemble this kit. There are many references on the internet which can help you learn how.
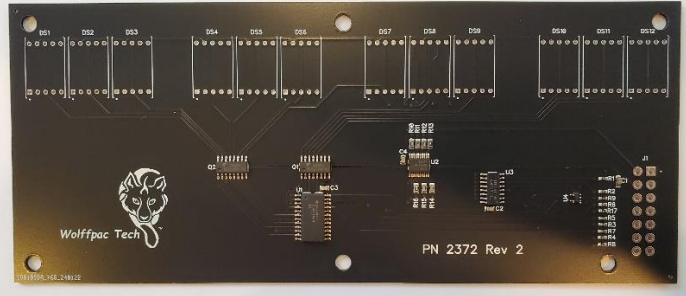

Caution - ⚠ Warning

Solder melts at around 400ºF to 600ºF (200ºC to 300ºC). Remember to use care when soldering as both the soldering iron and solder are <u>extremely</u> **hot and can produce serious burns. Make sure that you use an appropriate work surface since molten solder may drip and hot solder and components may damage or burn many materials.**

Eye protection is recommended as solder can splash and component leads may fly when cut.

We are not responsible for any damage or injury as a result of assembling this kit.

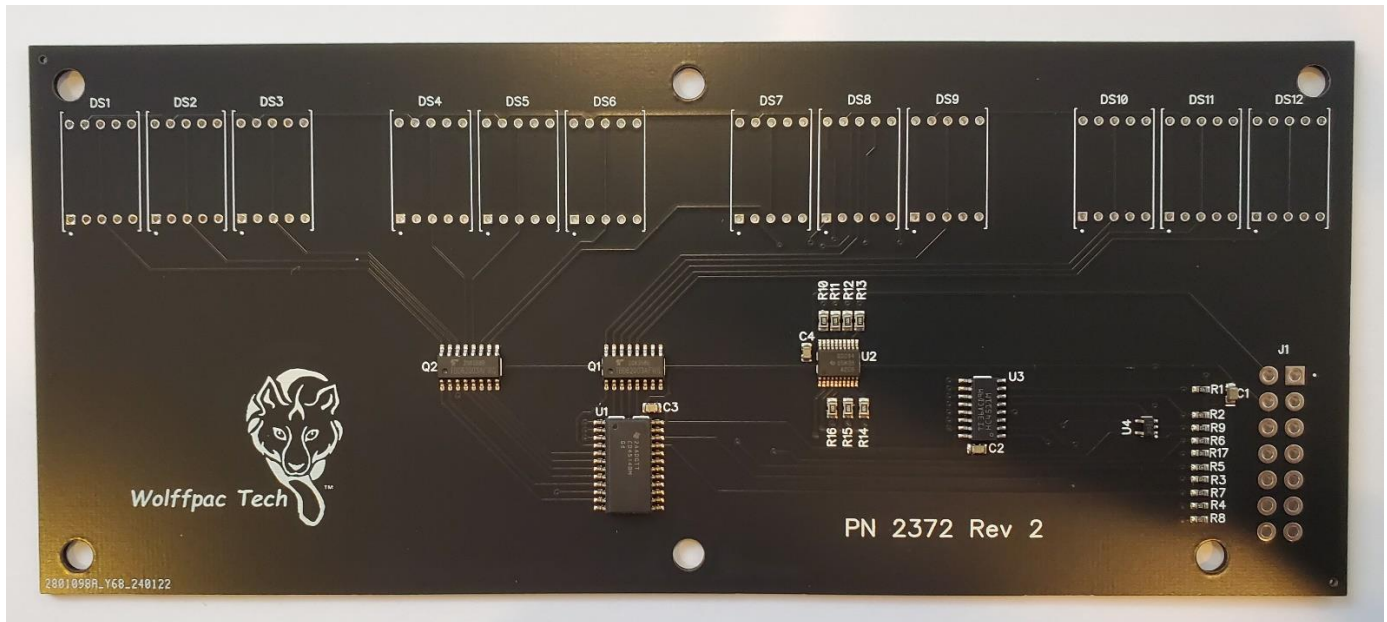**<u>Remember: Solder and components will remain very hot for several minutes after soldering.</u>**

Parts List:

Part Description	Ref	Qty	
Printed Circuit Board Marked: P/N 2372		1	
2x7 Connector	J1	1	
7-segment LED	DS1- DS12	12	

Start Here:

Before starting, check the components received against the parts list on page two. (We do occasionally make mistakes!) If any components are missing, or you have any questions regarding these assembly instructions please contact Wolffpac Tech at 'wolffpactech@gmail.com'.

If you have any problems with the display after assembly, you may contact Wolffpac Tech at 'wolffpactech@gmail.com'. If you need to return the display for repair, we will provide a pre-paid return label. Any problem found to be due to defective components will be repaired free of charge within 1 year of purchase. Any problem found to be due to assembly error or damage will be charged for postage and the cost of any components which need to be replaced.

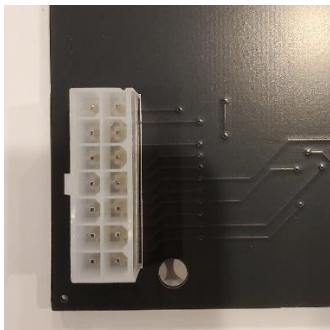Step 1: Start with the PC Board (marked P/N 2372):

Most of the components are already assembled to the board.

Step 2: 7-segment LED's. The LED's are installed in positions DS1-DS12.

Important: Install the LEDs from the front of the circuit board so that the side with the decimal point ('.') is facing towards the bottom of the display. Lay the board face down and solder one pin in each row of the LED. Inspect to ensure that the LED is seated flush with the PC board. If not, reheat the pin while pressing on the display from the front of the board. Once the LED is correctly seated, solder the remaining pins. Repeat for the remaining LED display.

Step 3: Locate connector J1. Note that the connector is inserted into the PC board from the back side and soldered on the front side.
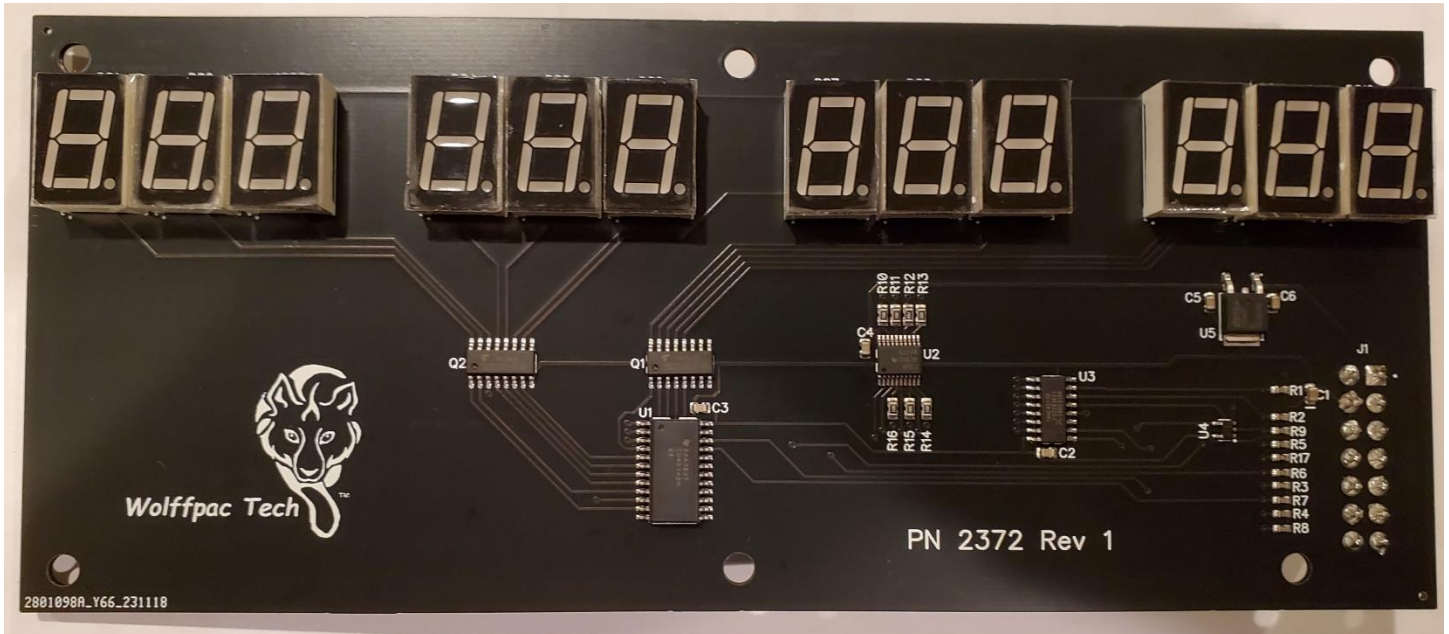
Align the connector with printed outline so the retaining tab is towards the edge of the circuit board and solder from the front side.

Final Assembly

Step 1. If desired or your solder requires it, wipe or rinse the boards with Isopropyl Alcohol, Denatured Alcohol, Flux Remover or water depending on the type of solder used in order to remove the solder flux residue.

Step 2. When the board is completely dry, peel the clear plastic protective film from the front surface of each LED display.

Step 4. install the display in your pinball machine with the power off and attach the original cable. Apply power and enjoy!

Note: These displays can safely be used with the existing displays in your machine.

This is believed to be an accurate list of machines with displays compatible with this replacement. Since we are unable to test this board in every configuration, we take no responsibility for any errors. However, we do welcome feedback as to any errors that are found so that we can update this list.

System 3

Shaq Attaq
Hoops

+5V

C1
10 uF
C2
100nF
C3
100nF

+12V
L78M05ABDT
VCC
IN   OUT
GND
U5
C6
470nF
C5
100nF
C4
100nF
U2
VCC
GND
SN74ACT244PWLE

GND_DIGITAL

+5V
U3
A
B
C
D
VDD
a
b
c
d
e
f
g
LE
BI
LT
GND
MC14511BD

U2.1
OE
A1
A2
A3
A4
Y1
Y2
Y3
Y4
SN74ACT244PWLE

U2.2
OE
A1
A2
A3
A4
Y1
Y2
Y3
Y4
SN74ACT244PWLE

R10 150
R11 150
R12 150
R13 150
R14 150
R15 150
R16 150

DS1   DS4   DS7   DS10
A A_1
B A_2
C
D
E
F
G DP
SA56-11EWA

DS2   DS5   DS8   DS11
A A_1
B A_2
C
D
E
F
G DP
SA56-11EWA

DS3   DS6   DS9   DS12
A A_1
B A_2
C
D
E
F
G DP
SA56-11EWA

+12V +5V +5V
R1 R2 R3 R4 R5 R6 R7 R8 R9 R17
4.7k ... 100k

U4
A   Vcc
NC
GND   Y
74AHCT1G04GV,125

+5V

J1
1
2
3
4
5
6
7
8
9
10
11
12
13
14
PPTC072LFBN-RC

GND_DIGITAL

+5V
U1
VDD
STB
A
B
C
D
INH
GND
Y0
Y1
Y2
Y3
Y4
Y5
Y6
Y7
Y8
Y9
Y10
Y11
Y12
Y13
Y14
Y15
CD4514BCWM

Q2
IN1 OUT1
IN2 OUT2
IN3 OUT3
IN4 OUT4
IN5 OUT5
IN6 OUT6
IN7 OUT7
GND COM
TBD62003

Q1
IN1 OUT1
IN2 OUT2
IN3 OUT3
IN4 OUT4
IN5 OUT5
IN6 OUT6
IN7 OUT7
GND COM
TBD62003