# OWNERS AND SERVICE MANUAL WITH COMPLETE PARTS LISTINGS 



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U.S.A. and foreign patents pending.
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GAME SET UP
This game will be ready for operation after some minor adustments.

1. The on/off switch located on the top panel on the cabinet should be off. Toggle the switch to the off position.
2. Pull out the electrical cord from the game base and plug cord into a standard THREE (3) PRONG GROUNDED OUTLET. This model is designed to operate on A.C. voltage of 95-130 volts.

WARNING: A STANDARD THREE (3) PRONG GROUNDED OUTLET MUST BE USED.
FAILURE TO GROUND THE GAME WILL VOID YOUR WARRANTY AND COULD SERIOUSLY DAMAGE GAME ELECTRONICS AND MAY ALSO ADVERSELY AFFECT THE SAFETY OF YOUR GAME AND CAUSE INJURY TO YOURSELF AND OTHERS.

## OPERATOR ADJUSTABLE SETTINGS

These adjustable setting are located on the P.C. Boards inside the game, on the rear of the chassis.

## Main Logic Board

COST SWITCH:
$\begin{array}{crlll}\text { POSITION } & \# 1 & -- & 1 & \text { COIN } \\ & 2 & -- & 2 & \text { COINS } \\ & 3 & -- & 3 & \text { COINS } \\ & 4 & -- & 4 & \text { COINS }\end{array}$
TICKET SWITCH:

| POSITION \#1 | 1 ticket every round, starting at round 4 |
| :--- | :--- |
| POSITION \#2 | 1 ticket every other round, starting at round 4 |
| POSITION \#3 | Not used |
| POSITION \#4 | Not used |

VOLUME CONTROL: LOCATED ON THE LOWER LEFT HAND SIDE OF THE BOARD.

DISPLAY BOARD
TIME PER ROUND SWITCHES:

| 20 | SEC. PER ROUND | 1 OFF, 2 OFF |
| :--- | :--- | :--- | :--- |
| 25 | SEC. PER ROUND | 1 OFF, 2 ON |
| 30 | SEC. PER ROUND | 1 ON, 2 OFF |
| 35 | SEC. PER ROUND | 1 ON, 2 ON |

Any questions, call I.C.E. at 1-800-342-3433
In New York State call 1-716-693-9535

IMPORTANT: READ THROUGH ALL INSTRUCTIONS THOROUGHLY BEFORE PROCEEDING WITH SERVICE OR REPAIRS.

## MELTDOWN SERVICE PROCEDURES

NOTE: BEFORE PERFORMING ANY ROUTINE SERVICE, BE SURE TO THOROUGHLY INSPECT THE WAY THE GAME IS ASSEMBLED. THIS WILL ASSIST YOU IN PROPER REASSEMBLY AFTER SERVICE HAS BEEN PERFORMED.

OPENING THE GAME:
To open the game, turn the lock located behind the large tube at the top of the front display panel. The key for this lock is clipped inside the upper coin door. Turn the lock $1 / 4$ turn clockwise, then with one hand pull forward on the top of the large tube, while holding the main cabinet with the other hand.

As the chassis tips forward, you will notice a $U$ shaped support leg folded inside. Pull up, and swing this leg out until it stops by resting against the marquis. Slowly lower the chassis until the support leg rests on the floor.

NOTE: WE DO NOT RECOMMEND PLACING ANYTHING UNDER THE SUPPORT LEG, AS THE SUPPORT COULD BECOME UNSTABLE CAUSING DAMAGE TO THE UNIT.

When closing the game, swing up the support leg and slowly close the cabinet, making sure nothing hits on the cabinet edges. Secure the lock.

SERVICING DRIVE CABLES AND RADIATION SHIELD
NOTE: THE UPPER AND LOWER PULLEYS IN THE GAME ARE CALLED OUT BY THEIR LOCATION WHEN THE GAME IS IN OPERATING POSITION.

For access to the Radiation shield, or Drive cables:
-- Remove the flat drive cable from the upper pulley brackets. One of the brackets is hinged and retains the inner tube and orange ball, as well as having the bonus light and micro switch mounted to it. The upper cable holds this bracket in position, so be prepared for the tube and ball to come out when this bracket hinges back. Remove the ball and tube and place in a safe location.
-- Remove the round cable from the lower drive and idler pulleys. Please note before removal the way the cables are routed around the pulleys so they can later be reassembled the same way.
-- Unclip the modular phone plug on the display P.C. board. It looks just like the phone plugs found in residential homes. Push it through the hole in the cable containment channel (the white plastic extruded channel in the middle of this chassis).
-- Work the cables around the game until the radiation shield can be removed from the tube. It will come out by the upper hinged bracket.
-- Remove the cable connectors from the radiation shield. These are like common microphone connectors and are removed by unscrewing the knurled lock ring then pulling the connector straight out.
(THE CABLE ASSEMBLY CAN NOW BE REMOVED FROM THE GAME IF DESIRED)
-- If replacing the upper pulley cable (4 conductor flat cable) follow the following directions.

DO NOT CUT CABLE TIES TO SEPARATE ROUND URETHANE CABLE FROM THE FLAT 4 CONDUCTOR CABLE AT THIS TIME.

Lay out the original cable assembly and put the new 4 conductor flat cable next to the old one. Note the location of the round cable and cable ties connected to the flat cable. Cut the old cable ties, and install the new cable in the exact same position.

IT IS IMPORTANT TO RETAIN THE ORIGINAL OVERALL LENGTH TO MAINTAIN PROPER CABLE OPERATING TENSION.

Tighten the cable ties as tight as possible and snip off any excess tie, as on the original cable.
-- Reassemble the radiation shield into the game, by first feeding the cable down through the large tube.

NOTE: THE ROUND CABLE IS ATTACHED TO THE BOTTOM OF THE RADIATION SHIELD AND THE 4 CONDUCTOR FLAT CABLE IS ATTACHED TO THE TOP.
-- Plug the round cable into the botton of the radiation shield. (MAKE SURE THE SHIELD IS INSTALLED CORRECTLY). Guide the radiation shield just into the tracks in the large tube and reconnect the flat cable to the top of the shield.
-- Pull the cables around so the radiation shield is about half way into the large tube.
-- Install the round cable around the idler and drive pulleys.
-- Reinstall the inner tube and ball. While holding the tube, slide it in the large tube and engage the venturi. Put the ball in the tube. While holding the tube and ball in by hand, swing the upper hinged retainer bracket around and engage the inner tube. (DO NOT BEND THE MICRO SWITCH WIRE). While holding this bracket, grab the flat cable and pull it over the two upper pulleys. The retainer bracket is now secured in place.
-- Inspect to make sure cables are on all pulleys and not twisted. -- Feed the cable with the modular connectors through the hole in the cable containment channel and snap into the display P.C. board receptacle.
-- Start game and check for correct operation. If the radiation shield jumps or hangs up in the tracks, check to see that the cable is not twisted inside the cable containment channel. If it is, disconnect the modular connector, untwist it once or twice and reconnect it. This will make the wire bend differently in the containment channel.

## SERVICING THE JOYSTICK AND LINKAGE

-- Observe the way the linkages are positioned when the joystick has the venturi in the closed position. When replacing either the linkage or spring, be sure they do not bind on the aluminum bracket that the venturi is mounted on.
-- To remove the joystick from the game, remove all linkages, springs, and mounting screws. Then remove the cross link rod that has a nut on each end. It is necessary to remove this link as the joystick cannot be removed from the control panel, unless the joystick and handle are separated. You will see the nuts that hold this link on at the sides of the joystick body. Remove one of the nuts and slide the link out. Now pull the handle out of the joystick body. The joystick can now be removed from the game.

SERVICING THE NEON LIGHTING SYSTEM
The neon lighting system is composed of two straight neon tubes, interconnecting wire, a high voltage transformer, and all associated mounting hardware and brackets.

WARNING: THE NEON TRANSFORMER IN THIS GAME PRODUCES 2000 VOLTS OF ELECTRICITY, TURN OFF POWER AT THE ON/OFF SWITCH AS WELL AS THE INTERLOCK SAFETY SWITCH TO AVOID POTENTIAL INJURY.

When servicng the neon, make sure no bare wires are exposed as current can jump small distances through the air, when there is no insulation.

TO CHANGE NEON TUBES:
Turn off power. Cut the tie wraps that secure the insulating boots. Slide back the boots, and disconnect the Fast-on connectors by pulling on them.
BE CAREFUL OF THE GLASS TUBES AS THEY ARE FRAGILE AND IF BROKEN, COULD CAUSE SERIOUS INJURY.

Remove screws from the clamps that hold the neon in place. Remove the neon from the game. Remove and save the boots that protect the neon from the clamps.

Install the new tube(s) by reversing the disassembly procedure. Use caution when tightening the clamps that secure the neon in position. Make sure to secure the insulating boots with the tie wraps.

## QUICK REFERENCE REPAIR

| PROBLEM | CAUSE | REMEDY |
| :---: | :---: | :---: |
| NO POWER | 1. NOT PLUGGED IN. | 1. PLUG IN TO PROPER OUTLET. |
|  | 2. ON-OFF SWITCH OFF. | 2. TURN ON. |
|  | 3. INTERLOCK SWITCH OFF. | 3. CLOSE GAME OR PULL UP ON INTERLOCK SWITCH. |
|  | 4. BLOWN FUSE. | 4. REPLACE W/2 AMP SLO-BLO. |
|  | 5. LOOSE CONNECTORS | 5. CHECK FOR TIGHT CONNECTIONS. |
| INCORRECT | 1. FAULTY DISPLAYS | 1. REPLACE DEFECTIVE DISPlay. |
| POWER UP | 2. FAULTY 6502 | 2. REPLACE. |
| SEQUENCE | 3. FAULTY E PROM | 3. REPLACE |
|  | 4. LOOSE CONNECTORS | 4. CHECK FOR TIGHTNESS AND CONTINUITY. |
|  | 5. LIGHT DON'T LIGHT. | 5. CHECK FOR PROPER VOLTAGE. |
| RADIATION | 1. MOTOR BAD | 1. REPLACE. |
| SHIELD DOES | 2. TRANSMISSION BAD. | 2. REPLACE. |
| NOT MOVE | 3. CABLES OFF PULLEY | 3. REPLACE \& CHECK TENSION. |
|  | 4. CABLES STUCK | 4. CHECK FOR BINDING \& CORRECT. |
|  | 5. FAULTY WIRING. | 5. CHECK \& CORRECT AS |
| MOTOR RUNS BUT DOES NOT | 1. FAULTY REED SWITCHES | 1. CHECK \& REPLACE WHERE |
|  |  | NECESSARY. |
| STOP AT THE END OF ITS LIMIT | 2. FAULTY WIRING. | 2. CHECK \& CORRECT WHERE |
|  |  | NECESSARY. |
|  |  |  |
| GAME WILL NOT START | 1. NOT ENOUGH CREDITS | 1. CHECK COIN SWITCHES AND |
|  |  | INSERT COINS. |
|  | 2. RADIATION SHIELD | 2. FIND \& CORRECT DRIVE |
|  | DID NOT MOVE ON | SYSTEM FOR SHIELD. |
|  | POWER UP |  |
| FAN DOES NOTRUN | 1. FAULTY FAN. | 1. REPLACE. |
|  | 2. FAULTY RELAY. | 2. REPLACE. |
|  | 3. FAULTY WIRING. | 3. REPLACE. |
| BALL DOES NOT MOVE IN TUBE. | 1. NO FAN. | 1. LOCATE PROBLEM CORRECTLY. |
|  | 2. JOYSTICK LINKAGE BROKEN OR LOOSE. | 2. REPLACE OR TIGHTEN. |
|  | 3. VENTURI VALVE STUCK SHUT. | 3. LOOK FOR BINDING \& REPAIR. |


| PROBLEM | CAUSE | REMEDY |
| :---: | :---: | :---: |
| RADIATION | 1. FAULTY WIRING. | 1. CHECK \& REPAIR. |
| SHIELD DOES | 2. BAD SENSORS. | 2. REPLACE UNIT. |
| NOT SENSE | 3. FAULTY 4 CONDUCTOR | 3. CHECK FOR CONTINUITY |
| BALL OR LIGHT | FLAT CABLE. | \& REPLACE IF NECESSARY. |
| RED L.E.D.'S | 4. LOOSE SENSOR COVER. | 4. REPLACE COVER. |
| GAME SCORES | 1. LOOSE SENSOR COVER. | 1. REPLACE COVER. |
| WHEN BALL IS | 2. FAULTY WIRING. | 2. CHECK \& CORRECT AS |
| NOT IN |  | NECESSARY. |
| RADIATION | 3. FAULTY SENSORS. | 3. REPLACE UNIT. |
| SHIELD | 4. FAULTY 4 CONDUCTOR FLAT CABLE. | 4. CHECK CONTINUITY \& REPLACE IF NECESSARY |
| NO SOUND | 1. FAULTY SPEAKER. | 1. RERLACE |
|  | 2. FAULTY WIRING. | 2. REPLACE . |
|  | 3. VOLUME TURNED DOWN | 3. TURN VOLUME UP |
|  | 4. FAULTY SOUND CHIP. | 4. REPLACE . |
| NO BONUSES | 1. BAD MAIN BOARD. | 1. REPLACE. |
|  | 2. SWITCH SHORTED OUT. | 2. REPLACE . |
|  | 3. SWITCH TRIGGER WIRE | 3. REBEND WIRE |
|  | BENT, KEEPING SWITCH CLOSED. |  |
| BONUSES NOT | 1. FAULTY SWITCH. | 1. REPLACE . |
| COUNTED | 2. FAULTY WIRING | 2. REPLACE. |
|  | 3. INCORRECTLY BENT | 3. REBEND |
|  | WIRE TRIGGER |  |

GAME INITIALIZING

The game must complete the following power reset and initializing before game play can begin:

1. Power is appplied via the ON/OFF swtich located on top of the game as well as the interlock switch located on the inside of the game.
2. When the power is turned on, the neon and marquee will light and remain lit until the power is turned off. The power reset and lamp test is a self test sequence that occurs each time the power is turned on. this will last approximately 20 seconds. During this time the following will occur:
a. The displays will illuminate 8 's on all characters.
b. The fan will turn on.
c. All lights in the temperature guage will illuminate.
d. The lights in the radiation shield will illuminate.
3. After the power up reset the radiation shield will travel to its lower most limit and then to its upper most limit. Finally coming to rest in the center area.

The game is now initialized and play can begin.

1. When the proper amount of coins are placed in the coin acceptor (amount depending on the switch position of the coin switch located on the MAIN P.C. assembly; see operator adjustable settings) the proper amount of credits will be indicated on the display panel. There will be a sharp electronic sound emitted from the speaker signaling the acceptance of the credits.
2. The game will begin when either one player or two player buttons are depressed. A sharp electronic sound will signal the beginning of the game.
3. The radiation shield will travel to the lowest position awaiting the ball activation.
4. As the game begins the radiation shield will be raised to approximately the middle of the game allowing the player to maneuver the ball to the center of the shield where so long as this position is maintained points will be added to the players score. The red L.E.D.'s lit to indicate the ball is in scoring position. As the rounds progress, the shield will be moved more often, and at a faster rate.
5. The sound will start at a low tone raising higher and higher as time counts the end of the round.
6. The length of each round is either $20,25,30$ or 35 seconds depending on the switch position located on the display P.C. assembly. (See operator adjustable settings).
7. The player must achieve a minimum score in order to continue to the next round. If this score is not achieved, the temperature guage will raise until MELTDOWN occurs and the game will end.
8. 100 bonus points will be offered randomly though the game. The bonus is signaled by a distinct electronic sound and the lighting of the red bonus light. The player must pull the joystick all the way back propelling the ball up to the bonus switch at the top of the tube. If successful a sharp electronic tone will be emitted and 100 points added to the player score. As the rounds progress, the time allowed for the bonus will shorten, increasing the difficulty.

The display conveys 6 different types of information; they are:

1. PLAYER ONE SCORE
a. The actual score of player one 4 characters.
2. PLAYER TWO SCORE
a. Same as player one accept for player two.
3. SCORE TO NEXT ROUND
a. Minimum score to be made to continue to next round the score area:

| Round 1 | 100 | points | Round 5 | 1900 | points | Round 9 | 5300 | points |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Round | 2 | 400 | points | Round | 6 | 2600 | points | Round 10 | 6400 |
| Roints |  |  |  |  |  |  |  |  |  |
| Round | 3 | 800 | points | Round | 7 | 3400 | points | Round 11 | 7600 |
| Round | 4 | 1300 | points | Round 8 | 4300 | points | Round 128900 | points |  | ETC., ETC.

NOTE: WITH VALUES OVER 10,000 THE LEADING ONE WILL NOT BE DISPLAYED.
4. TIME REMAINING
a. The time left in a particular "round". You must reach your "score to next round" before time runs out.
5. CREDITS
a. Purpose is to count credits or games available to the player.
6. ROUND
a. Indicated present round of play.

TICKET DISPENSER
(Optional)
With the ticket switch (located on the main P.C. assembly) in position one, one ticket will be dispensed at the completion of every round after round three (3). With the switch in any other position (2-4) one ticket will be dispensed at the completion of every other round after round three.

## TICKET DISPENSER MODEL DL-1275 <br> PATENT NO. 4272001

## 1. MECHANICAL DESCRIPTION OF OPERATION

The tickets are moved through the ticket shute by means of a power driven roller which is spring loaded against an idler roller. The power driven roller is mounted on the output shaft of the motor gear train assembly. The motor assembly is mounted to the pivot bracket assembly in two oilite bearings. The motor assembly has a limited free swing, limited by the brake sprag. The brake sprag engages the power roller as an anti-theft device. With the free swing of the motor assembly, the direction of torque, when electric power is applied, is in a direction to release the brake sprag. When an attempt is made to pull tickets from the machine when power is off, the torque is reversed and the brake sprag is engaged. The pulling of tickets also will cause the pivot bracket assembly to apply a pressure to the power driven roller against the ticket and idler roller greater than the pre-set spring load.

## 2. LOADING OF TICKETS

Tickets are entered into the rear of ticket shute and pushed forward. The power driven roller will be spring loaded against the idler roller and tickets will not pass until rollers are clear of each other. This is accomplished by use of thumb and index finger, one placed on the block to which spring is attached, the other on the pivot bracket assembly, then squeeze. Push tickets through until you see edge of ticket. Machine is now ready to operate.

## 3. ELECTRONIC SYSTEM

Attached to the ticket machine is a transistor motor controller, which provides dynamic braking to ensure accurate and repeatable ticket stopping after issuing any number of tickets. Included as part of the controller is ticket sensing by means of an opto-electronic beam breaker sensor, which senses the notch between tickets. The output of the ticket sensing circuitry is an open collector transistor.

## 4. ROLLER TENSION SPRING

The roller tension spring keeps constant tension on tickets, which insures proper delivery and prevents tickets from being pulled through when the dispenser is idle. To increase tension, loosen screw and move spring forward. Tension is adjusted correctly when tickets cannot be pulled from dispenser.
5. TICKET GUIDE SPRING

The ticket guide spring insures that the notches in the tickets pass through the opto-beam breaker sensor. To increase tension, loosen screw and move outer spring up. This changes the tension on the inner spring. Tickets should be snug between spring and side plate but not deformed by excess tension. The spring is adjusted at the factory for $1-3 / 16^{\prime \prime}$ wide tickets.

## 6. TICKET STOP ADJUSTMENT

The ticket stop adjustment allows positioning of tickets while the machine is off. The ticket should protrude through the slot approximately $1 / 16^{\prime \prime}$. The ticket dispenser P.C. board is mounted with 2 screws in 2 slotted holes. Loosening the screws and moving the board forward, will allow the tickets to stop farther out beyond the edge of the slot.




```
M101
M102
M103
M104
M105
M106
M107
M108
M109
M110
M111
200 - 100
200 - 200
200 - 300
200 - 4.00
200 - 500
200 - 600
200 - 700
200 - 800
200 - 900
200 - 1000 DISPLAY TO RADIATION SHIELD
200 - 1100
200 - }120
M201
M2O2
M205
M206
M207
M208
M209
M210
M211
M212
M213
M217
M218
M219
M220
M221
M223
M225
M227
M234
M236
M237
M238
M239
M240
M300
    MOTOR MOUNTING BRACKET
    LOWER PULLEY BRACKET
    UPPER PULLEY BRACKET
    LARGE TUBE SUPPORT BRACKET
    VENTURI SUPPORT BRACKET
    NEON CLAMP BRACKET
    INTERLOCK SWITCH BRACKET
    ON/OFF SWITCH MOUNTING PLATE
    BONUS LIGHT BRACKET
    MICRO SWITCH BRACKET
    MARQUIS BRACKET
    TRANSFORMER TO MAIN AND LIGHTS
    MAIN TO DISPLAY
    MAIN TO DISPLAY
    MAIN TO DISPLAY UPPER & LOWER SWITCHES
    MAIN TO COUNTER & COIN DOOR
    MAIN TO BONUS LIGHT
    MAIN TO SPEAKER
    MAIN TO MOTOR & FAN
    RADIATION SHIELD INTERNAL
    TRANSFORMER TO MAIN
    A.C. FROM BLOCK TO FAN AND NEON
    MAIN PC BOARD (SEE SEPARATE PARTS LISTING)
    DISPLAY PC BOARD (SEE SEPARATE PARTS LISTING)
    INFRA-RED EMITTER
    INFRA-RED RECEIVER
    TARGET CABLE
    GAME COUNTER
    BONUS LIGHT
    MARQUIS LIGHT
    MARQUIS LIGHT SOCKET
    NEON LIGHT
    RADIATION SHIELD LED
    PLAY BUTTON
    POWER SUPPLY TRANSFORMER
    NEON LIGHT
    MICRO SWITCH
    EXTERIOR ON/OFF SWITCH
    SAFETY INTERLOCK SWITCH
    BLOWER FAN
    DRIVE MOTOR
    RADIATION SHIELD CABLE CONNECTOR
    REED SWITCH ASSEMBLY
    NEON CABLE
    NEON BOOTS
    MODULAR PHONE CONNECTOR
    FAN RELAY
    MARQUIS
```

M301
M302
M303
M30 4
M305
M306
M307
M309
M310
M311
M313
M317
M323
M323A
M323B
M323C
M325
M327
M50 4
M505
M506
M512
M513
M515
HARDWARE:
M601
M602
M603
M60 4
M605
M606
M607
M608

FACE PANEL
SMALL TUBE
LARGE TUBE
BUTTERFLY VALVE
VENTURI BODY
JOYSTICK
BLACK ROUND URETHANE CABLE
PING PONG BALL
RADIATION SHIELD ASSEMBLY
TARGET TRACKS
SMALL TUBE RETAINER RING
FAN/TUBE ASSEMBLY
3/4" PULLEY
1" PULLEY FLAT
1" PULLEY ROUND
$13 / 4 "$ PULLEY
CABLE CONTAINMENT CHANNEL
BONUS LIGHT TUBE
JOYSTICK LINKAGE
VENTURI SHAFT
VENTURI LINKAGE
SUPPORT LEG
VENTURI COLLARS
NEON CLAMP

SHOULDER BOLT
\#10-24 NYLOOK NUT
LINKAGE BUSHING
NEON CLAMPS
NEON BOOTS
MALE . 250 FAST-ON
FEMALE . 250 FAST-ON
FEMALE . 187 FAST-ON

| Item | Quantity | Reference | Part |
| :---: | :---: | :---: | :---: |
| 1 | 16 | R1, R2, R3, R4, R5, R9, R12 R13,R18,R30,R34,R35,R36, R135,R136,R137 | 1K |
| 2 | 1 | U1 | 74LS365 |
| 3 | 2 | R6,R132 | 150 |
| 4 | 1 | D1 | 1N5908 |
| 5 | 1 | U4 | 6502 |
| 6 | 1 | U5 | 74 LSOO |
| 7 | 1 | U6 | 2532 |
| 8 | 1 | U7 | 6810 |
| 9 | 1 | U8 | 6522 |
| 10 | 1 | U9 | AY-3-8912 |
| 11 | 2 | U10, U11 | $74 \mathrm{LS138}$ |
| 12 | 3 | U12, U13, U14 | 7417 |
| 13 | 2 | U17, U3 | 74LS74 |
| 14 | 8 | $\begin{aligned} & \text { Q9,Q1,Q2,Q8,Q10,Q11,Q } \\ & \text { Q13 } \end{aligned}$ | TIP110 |
| 15 | 10 | $\begin{aligned} & \text { R59,R60,R61,R62,R63,R } \\ & \text { R65,R66,R67,R69 } \end{aligned}$ | 1. 2 K |
| 16 | 2 | U15, U16 | 74LS164 |
| 17 | 5 | Q14, Q5, Q15, Q16, Q18 | TIS92 |
| 18 | 1 | U2 | 74LS04 |
| 19 | 5 | D3,D2,D4, D5, D6 | 1N4004 |
| 20 | 1 | U19 | LM358N |
| 21 | 5 | R14,R15,R23,R25,R40 | 100K |
| 22 | 2 | C16, C17 | . 47 POLY |
| 23 | 4 | R16,R24,R28,R32 | 470 K |
| 24 | 3 | R17,R39,R48 | 22K |
| 25 | 2 | C2, C21 | . 01 |


| Item | Quantity | Reference | Part |
| :---: | :---: | :---: | :---: |
| 26 | 2 | C3, C4 | 20pf |
| 27 | 2 | R8, R7 | 470 |
| 28 | 1 | X1 | 4 MHZ |
| 29 | 1 | U41 | LM7 8L05 |
| 30 | 21 | ```C59,C1,C5,C6,C9,C10,C C12,C13,C14,C15,C18,C22, C37,C38,C42,C43,C45,C53, C55,C57``` | . 1 |
| 31 | 4 | C62, C36, C39, C56 | 100/25 |
| 32 | 4 | C54, C23, C25, C41 | 10/16 |
| 33 | 1 | U42 | LM7805 |
| 34 | 1 | R131 | 47 |
| 35 | 2 | D7: D8 | MR752 |
| 36 | 1 | C58 | 15000/16 |
| 37 | 2 | R130,R31 | 220K |
| 38 | 1 | R27 | 4.7K |
| 39 | 3 | R29,R37,R41 | 100 |
| 40 | 1 | R26 | 1 MEG |
| 41 | 2 | C20, C24 | . 1 POLY |
| 42 | 1 | C7 | 10/16 NP |
| 43 | 4 | C8, C28, C29, c30 | $1 / 50$ |
| 44 | 6 | R10,R38,R42,R43,R44,R | 10K |
| 45 | 1 | R11 | 270 |
| 46 | 1 | U22 | LM3080 |
| 47 | 2 | Q6, Q7 | TIS93 |
| 48 | 1 | R47 | 6.2 K |
| 49 | 1 | R46 | 3.9 K |
| 50 | 2 | R33,R57 | 10K VAR |


| Item | Quantity | Reference | Part |
| :---: | :---: | :---: | :---: |
| 51 | 1 | C27 | 47/35 |
| 52 | 1 | C26 | . 001 |
| 53 | 1 | R49 | 2.2K |
| 54 | 1 | C 31 | . 033 POLY |
| 55 | 4 | c $32, \mathrm{c} 33, \mathrm{c} 35, \mathrm{c} 40$ | . 22 POLY |
| 56 | 1 | R 50 | 50K VAR |
| 57 | 1 | C61 | 220pf |
| 58 | 2 | U23, U24 | TDA2002 |
| 59 | 3 | R51,R53,R54 | 220 |
| 60 | 2 | R52,R55 | 4.7 |
| 61 | 3 | R134,R58,R133 | 2.2 |
| 62 | 1 | SP1 | SPEAKER 8 OHM |
| 63 | 1 | R56 | 47 K |
| 64 | 1 | U18 | MM5837 |
| 65 | 1 | C60 | 10/25 |

## MELTDOWN DISPLAY BOARD PARTS LIST

| Item | Quantity | Reference | Part |
| :---: | :---: | :---: | :---: |
| 1 | 1 | M1 | FAN MOTOR |
| 2 | 5 | Q1,Q2,Q3,Q12,Q15 | 2N3906 |
| 3 | 1 | R16 | 75/1/2 WATT |
| 4 | 1 | K1 | 12V SPST RELAY |
| 5 | 1 | M2 | TARGET MOTOR |
| 6 | 1 | U5 | 74LS14 |
| 7 | 21 | R5,RN1,R2,RN2,RN3,R4 RN5,RN6,RN7,RN8,RN9,RN10, RN11, RN12, RN14, RN16, RN17, RN18, RN19, RN20 | 220 |
| 8 | 3 | R6, R1, R3 | 330 |
| 9 | 10 | $\begin{aligned} & \text { U14, U3, U4, U10, U11, U1 } \\ & \text { U19, U25, U33, U34 } \end{aligned}$ | 74LS164 |
| 10 | 2 | U17, U22 | 74LS75 |
| 11 | 3 | U35, U27, U41 | 7406 |
| 12 | 20 | $\begin{aligned} & R 7, R 12, R 13, R 14, R 15, R \\ & R 20, R 21, R 22, R 28, R 34, R 36, \\ & R 37, R 38, R 41, R 45, R 47, R 50, \\ & R 52, R 53 \end{aligned}$ | 1 K |
| 13 | 9 | $\begin{aligned} & \text { R11,R9,R10,R23,R26,R } \\ & \text { R39,R42,R51 } \end{aligned}$ | 10K |
| 14 | 2 | Q4.28 | TIP32A |
| 15 | 6 | Q6,25,27,29,210,211 | TIP110 |
| 16 | 5 | D4,D3,D5,D6, D7 | 1N4004 |
| 17 | 1 | U38 | 7437 |
| 18 | 1 | C34 | . 068 |
| 19 | 4 | R48,R24,R28,R46 | 100K |
| 20 | 1 | R49 | 51K |


| Item | Quantity | Reference | Part |
| :---: | :---: | :---: | :---: |
| 21 | 1 | R32 | 100 |
| 22 | 1 | C32 | 10 |
| 23 | 3 | R31, R30,R43 | 10k |
| 24 | 1 | R29 | 300 k |
| 25 | 1 | C28 | . 022 |
| 26 | 1 | R40 | 510 K |
| 27 | 1 | C29 | 220 pf |
| 28 | 1 | R44 | 3.9K |
| 29 | 1 | D2 | 1N34 |
| 30 | 1 | C27 | $1.0 / 50$ |
| 31 | 1 | R27 | 620 |
| 32 | 1 | D1 | 1N4148 |
| 33 | 2 | R17,R18 | 5.6/5W |
| 34 | 26 | $\begin{aligned} & \mathrm{C} 23, \mathrm{C} 1, \mathrm{C} 2, \mathrm{C} 3, \mathrm{C} 4, \mathrm{C} 5, \mathrm{C} \\ & \mathrm{C} 8, \mathrm{C} 9, \mathrm{C} 10, \mathrm{C} 11, \mathrm{C} 12, \mathrm{C} 13, \\ & \mathrm{C} 14, \mathrm{C} 15, \mathrm{C} 16, \mathrm{C} 17, \mathrm{C} 18, \mathrm{c} 19, \\ & \mathrm{C} 20, \mathrm{C} 21, \mathrm{c} 22, \mathrm{C} 24, \mathrm{C} 30, \mathrm{c} 31 \end{aligned}$ | . 1 |
| 35 | 1 | U32 | 4017 |
| 36 | 1 | R8 | 10K |
| 37 | 1 | R35 | 39 |
| 38 | 2 | U40, U39 | LM358 |
| 39 | 1 | R25 | 13K |
| 40 | 3 | LED1, LED2, LED3 | LED |
| 41 | 2 | C25, C26 | 100uf |
| 42 | 1 | Q13 | 2N3904 |
| 43 | 1 | Q14 | PHOTO NPN |


| Item | Quantity | Reference | Part |
| :--- | :---: | :--- | :--- |
| 44 | 2 | VR1,VR2 | 7805 |
| 45 | 1 | R54 | SELECT |
| 46 | 1 | C33 | $1.0 / 50 \mathrm{~V}$ |
| 47 | 18 | U2,U1,U6,U7,U8,U9,U1 <br> U13,U15,U16,U20,U21,U23, <br> U28,U30,U31,U36,U37 | 74 LS 47 |
| 48 | 9 | DIS2,DIS1,DIS3,DIS4, <br> DIS6,DIS7,DIS9,DIS10 | MAN6610 |

MELTDOWN TEMPERATURE GUAGE BOARD

| ITEM | QUANTITY | REFERENCE | PART |
| :---: | :---: | :---: | :---: |
| 1 | 10 | BULB | GTE 74 |
| 2 | 10 | SOCKET GTE 4130 |  |

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Seller ,warrants that its printed circuit boards and parts thereon are free from defects in material and workmanship under normal use and service for a period of thirty (30) days from date of purchase of end user.

If the products described in this manual fail to conform to this warranty. Sellers' sole liability shall be, at its option, to repair, replace, or credit Buyer's account for such products which are returned to Seller during said warranty period, provided:
a. Seller is promptly notified in writing upon discovery by Buyer that said products are defective;
b. Such products are returned prepaid to Sellers' plant; and
c. Sellers examination of said products discloses to Seller's satifaction that such alleged defectsexisted and were not caused by accident, misuse, neglect, alteration, improper repair, installation or improper testing.

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