Arachnid INC. ®

Information for the
3000 Series Dart Game

The following pages are being made available to those that need technical information on our older dart games. We realize that it is not in any way complete, and that some of the information is hand drawn, but we are furnishing what we have in case it will help someone. There are no parts available for these older games, nor is anyone at Arachnid familiar with them. We hope that what we can provide will be of some assistance.

ENGLISH MARK DARTS

3000 SERIES

Competition Brings Out The Best In People.

One To Four Players, Self-Scoring, Challenging Game of Skill.

Players May Select From 3 Different Games Of Darts.

Plastic Tipped Safety Darts.

Proven High Earning Power.

ENGLISH MARK DARTS

## The Electronic, Self-Scoring Dart Game The Whole World's Been Waiting For

Until now, no one thought it could be done. But we did it!. We improved on the age-old game of English Darts. We've created a space-age version that's unlike anything you've ever seen before. Take a look at these features and you'll see why.

- A challenging, automatically operated, 1 to 4-player game with its own built-in memory system.

- Microprocessor, controlled, fully integrated, electronically operated circuits for instant computerized scoring.

- Solid-state dart board, allowing maintenance-free operation.

- Offers a personal achievement factor not found in similar games.

- Scores are automatically tallied for each player or team.

- Bright, easy-to-read display panels.

- Poly-tipped darts . . . won't mar or damage game area.

- Occupies only 2½ sq. ft. of floor space . . . stands 6′ 5″ high.

- Complete, ready to plug in, with supply of extra darts and complete instructions on how to select and play the 3 different games of English Darts.
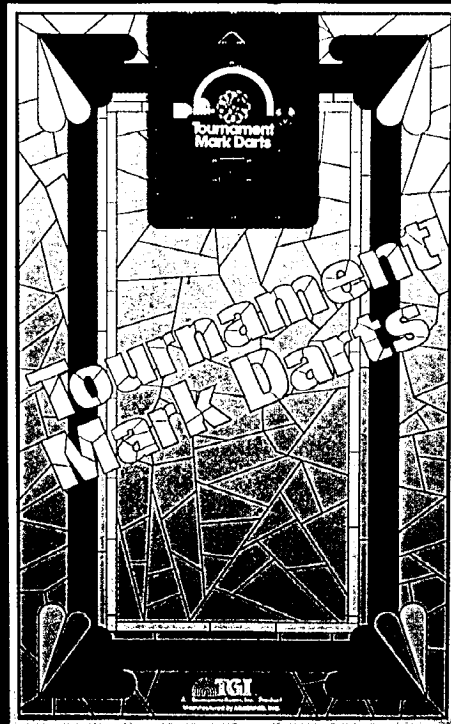
DISTRIBUTED BY:

4000
SERIES
TOURN. OR ENGLISH
DECALS
ON BOTTOM
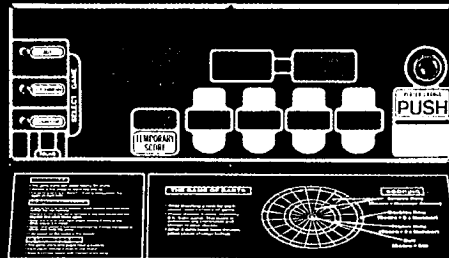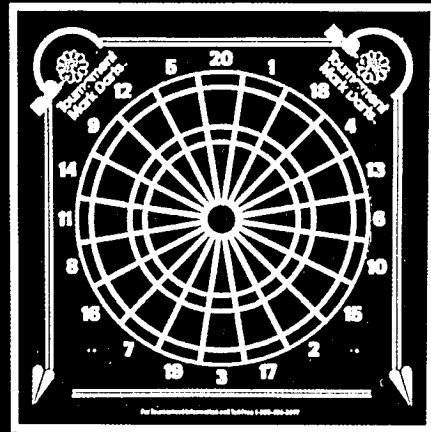
TOP OF
3000 WALL
MOUNT GAME
MAY LOOK LIKE
THIS

TGI ™
Tournament Games, Inc.

3000
HOME GAME
WALL MT.

<u>ENGLISH MARK DARTS</u> - <u>THEORY OF OPERATION</u>

by RICHARD D. CLARK

THE PURPOSE OF THIS BRIEF IS TO DO JUST THAT - PROVIDE A BRIEF

DESCRIPTION OF THE LOGIC USED IN ARACHNID'S DART GAME. IT IS

NOT INTENDED TO BE AN IN-DEPTH LOOK AT THE FUNCTIONS OF THE GAME.

IT COULD BE USED AS AN AID IN TROUBLE SHOOTING THE GAME, AND WE

HOPE WILL BE USEFULL TO YOU.

THE COIN ACCEPTOR CIRCUIT CONSISTS OF A 74121, (I.C. 5), WHOSE
OUTPUT PLUSE IS EXTENDED TIME WISE, BY VIRTUE OF AN EXTERNAL
R/C NETWORK, ITS OUTPUT, PIN 6, IS A POSITIVE GOING PLUSE TO
PIN 11 OF I.C. 4, A 7474.   ITS OUTPUT IS PIN 9 WHICH GOES TO
I.C. 25 PIN 13, A 74157 ITS OUTPUT GOES TO PIN 13 OF I.C. 2,
ALSO A 74157 IT OUTPUTS ON PIN 12 TO I.C.35, ANOTHER 74157
ON PIN 13 WHOSE OUTPUT, PIN 12 GOES DIRECTLY TO THE PROCESSOR.

PIN 6 OF I.C.5 ALSO TRIGGERS THE CIRCUITRY RESPONSIBLE FOR
AUTOMATICALLY SELECTING "301" ON COIN UP.

BY ROUTING I.C. 5's PIN 6 OUTPUT, WHICH IS A HIGH, THROUGH AN
INVERTER, WE HIT Q50, WHICH ALLOWS A HIGH THROUGH R129 TO GET
TO PIN 6 OF I.C. 1, A 74157.   IT OUTPUTS ON PIN 7, GOING TO PIN
5 OF I.C. 35 WHICH OUTPUTS TO THE PROCESSOR ON PIN 7.

I.C. 5's PIN 1 IS ANOTHER OUTPUT USED IN COIN UP.   IT OUTPUTS
A LOW TO I.C. 10 PIN 10.   I.C. 10 A 7474,BEING A FLIP-FLOP
CHANGES STATE ON PIN 9, SUPPLYING A HIGH TO PIN 5 OF I.C. 44,
WHICH IS A TWO INPUT NAND BUFFER.

THE OTHER INPUT OF THIS GATE, PIN 4, IS GIVEN A HIGH, LOW PULSE
STRING BY I.C. 8 PIN 3.   I.C. 8, A 555 TIMER, IS CONFIGURED AS AN
ASTBLE MULTIVIBRATER, SO IT WILL CONTINUOUSLY SUPPLY THE PULSE
STRING, AT A GIVEN RATE, TO I.C. 44, PIN 4.   WITH THE PULSE STRING
AND THE HIGH SUPPLIED BY I.C. 10, THE GATE OUTPUTS ON PIN 6 A LOW
GOING PULSE EVERY .387 SECONDS - THIS OUTPUT GOES TO PIN 9 OF
I.C. 21, A HEX INVERTER, WHICH OUTPUTS A HIGH GOING PULSE
ON PIN 8

(CON'?.)

TO THE BASE OF Q49 WHICH THEN SINKS CURRENT THRU THE SELECT GAME
LAMPS TO GROUND.   THE SELECT GAME LAMPS ARE THEN FLASHING ON AND
OFF ABOUT $2\frac{1}{2}$ TIMES A SECOND.

ON SELECTING A GAME, PIN 6 OF I.C.33 GOES LOW, AND SUPPLIES THAT
LOW TO PIN 9, WHICH AS WE MENTIONED EARLIER, GOES TO PIN 5, I.C.44.
THIS DISABLES THE GATE IN I.C.44 AND TURNS OFF THE GAME SELECT
LIGHTS.

UPON COIN UP, '301' IS AUTOMATICALLY SELECTED, AND WILL PLAY OUT
EVEN THOUGH THE SELECT GAME LIGHTS ARE FLASHING.   WHEN PRESSING
THE '301' GAME SELECT BUTTON, THE ONLY THING IT DOES THEN IS
TURN OFF THE GAME SELECT LIGHTS.

SELECTING 'COUNT UP' OR 'CUT THROAT' HOWEVER; DOES A FEW OTHER
THINGS IN ADDITION TO TURNING OFF GAME SELECT LIGHTS.

PUSHING 'COUNT UP' PUTS A HIGH ON PIN 14 OF I.C.1 WHICH OUTPUTS
ON PIN 12 A HIGH GOING PULSE TO I.C. 35 PIN 14.   THIS OUTPUTS A
HIGH ON PIN 12 TO THE PROCESSOR.

PRESSING 'CUT THROAT' SELECT BUTTON PUTS A HIGH ON PIN 11 OF I.C.2
WHICH OUTPUTS ON PIN 9, GOES TO PIN 10 OF I.C.35 WHICH OUTPUTS
ON PIN 9 TO THE PROCESSOR.

REMOVE AND THROW TIMER.   I.C.6, A 555 TIMER, IS TRIGGERED ANYTIME
COINS ARE FED TO MACHINE OR ANY GAME IS SELECTED.   SEQUENCED
AS FOLLOWS:

I.C. 33 PIN 5 IS TIED TO DIODES D2 THROUGH D7 AND GETS A LOW
GOING PULSE EVERY TIME COINS ARE FED OR GAME SELECTED.   BEING
AN INVERTER, IT OUTPUTS A HIGH ON PIN 6 WHICH GOES TO THE 555
TIMER TRIGGER INPUT PIN 2, I.C.6 WILL TIME OUT IN ABOUT 5 SECONDS.
WHILE THE OUTPUT IS STILL HIGH, IT ENABLES TWO GATES WHICH ARE
PART OF A STRING OF GATES.   SINCE WE ARE CONCERNED RIGHT NOW WITH
THROW AND REMOVE LIGHTS, WE WILL EXAMINE THAT PART OF THIS STRING.

THE OUTPUT OF THE 555 TIMER IS HELD HIGH FOR A SPECIFIED AMOUNT
OF TIME FEEDING AN INVERTER, I.C.7, ON PIN 1.   ITS OUTPUT, PIN 2,
IS HELD LOW UNTIL THE TIMER TIMES OUT.   THE OUTPUT OF I.C.7
GOES TO f.C.50 PIN 10 AND I.C.11 PIN 10.   I.C.50 AND I.C.11 ARE
AND GATES, SO 2 LOWS IN GIVES A LOW OUT.   I.C.13 PIN 10 SUPPLIES
A LOW TO I.C.11 PIN 1.   THE OTHER INPUT TO THAT GATE COMES FROM
I.C.33 PIN 6.   THIS ENABLES THE GATE AND IT OUTPUTS A LOW TO PIN 9
OF I.C.50, THIS SIGNAL, ALONG WITH THE LOW FROM I.C.7 GIVES A
LOW OUT ON PIN 3 OF I.C.50 WHICH GOES TO I.C.9 PIN 1 AND PIN 4
OF I.C.11, PIN 5 OF WHICH SHOULD BE LOW BY VIRTUE OF THE LOW COMING
FROM INVERTER I.C.33.   THE LOW IS OUPUT ON PIN 6 OF I.C. 11 AND
GOES TO PIN 9 OF I.C.11, PIN 10, OF WHICH IS RECEIVING THE SUSTAINED
LOW FROM I.C.7.   PIN 8 OF I.C.11 THEN OUTPUTS A LOW TO PIN 5
OF I.C.50.   IT ALSO GOES TO PIN 4 OF I.C.12, PIN 5 BEING THE OTHER
INPUT OF THIS GATE IS GIVEN A LOW BY I.C.13, PIN 14 WHICH IS HELD
LOW ANYWAY.   THIS GATE OUTPUTS A HIGH ON PIN 6 WHICH GOES TO PIN 9

OF I.C.23 AND TURNS·OFF THE THROW DARTS LIGHT. IT ALSO GOES TO
PIN 9 OF I.C.12, THE OTHER INPUT BEING SUPPLIED ON PIN 10 BY PIN 6
OF I.C.10, GIVING A LOW OUT ON PIN 8. THIS SIGNAL GOES TO I.C.23
PIN 5 WHICH OUTPUTS A HIGH ON PIN 6 GOING TO THE BASE LEAD OF
Q36 BIASING IT ON AND TURNING ON 'REMOVE DARTS' LAMPS.

AFTER THE 555 TIMER, I.C.6, TIMES OUT, THE SYSTEM JUST DISCUSSED
RELAXES AND THE 'REMOVE DARTS' LAMP GOES OUT AND 'THROW DARTS'
LAMP COMES ON.

NOTE THAT WHILE TIMER I.C.6 IS ACTIVATED, I.C.11 PIN 8, OUTPUTING
A LOW, GOES TO I.C.50 PIN 5 WHOSE OTHER INPUT IS BEING HELD LOW
BY I.C.36. THIS OUTPUTS A LOW ON PIN 6 TO I.C.27 PIN 13 WHICH
ALONG WITH A LOW FROM I.C.39 PIN 16 PROVIDES A LOW OUTPUT ON
PIN 11 OF I.C.27 WHICH DISABLES THE SCORING CIRCUIT ENTIRELY BY
PLACING A LOW ON THE CLOCK INPUT PINS OF I.C.'S 4-16-17-18, AND
GAME WILL NOT SCORE WHEN 'REMOVE DARTS' LIGHT IS ON.

THE DART HEAD IS BUILT SO AS TO PROVIDE A BINARY CODE TO THE I.C.'S
18-17-16-4 WHICH ARE 7474 FLIP-FLOPS. SCORING A BULLSEYE WILL
APPLY A LOW TO I.C.18 PIN 4, I.C.17 PIN 10, I.C.16 PIN 4, AND I.C.16
PIN 10. EACH OF THE CORRESPONDING OUTPUTS OF THESE I.C.'S WILL
OUTPUT A HIGH. THESE OUTPUTS ARE FED INTO I.C.25, THEN TO I.C.2,
THEN TO I.C.35 AND THEN TO THE PROCESSOR.

IT CAN BE SEEN BY LOOKING AT THE SCHEMATIC THAT I.C.'S 41, 39,
24, 13, & 15 ALLOW COMMUNICATION FROM THE PROCESSOR TO US. THESE
I.C.'S ON COMMAND FROM THE PROCESSOR, TAKE CARE OF ALL VISUAL
INDICATIONS OF THE GAME'S PROGRESS, EXCEPT FOR THE SCORE DISPLAYS.

IT ALSO CAN BE SEEN THAT THE PROCESSOR RUNS THE SCORING DISPLAYS
THROUGH SEVERAL INVERTERS WHOSE OPERATION IS STRAIGHT FORWARD AND
NEEDS NO FURTHER DISCUSSION.

THE INITIALIZATION CIRCUIT FOR THE PROCESSOR IS MADE UP OF DIODE
D1 AND CAPACITOR C1 WHOSE JUNCTION POINT IS THE INPUT TO THE PRO-
CESSOR AT PIN 9, WHICH MUST BE HELD LOW OR THE PROCESSOR WILL
NOT OPERATE.

PINS 18 & 19 PROVIDE ACCESS TO THE INTERNAL CLOCK IN THE PROCESSOR.
WE ARE NO USING A 50PF. CAPACITOR AND A 22K RESISTER, INSTEAD OF
100PF AND 33K.

THESE COMPONENTS GIVE US A 417 K HZ. RATE WHICH STABILIZES THE
LED'S.

LIKE WE SAID, THIS ISN'T MEANT TO BE 100% DESCRIPTIVE, BUT WE HOPE
THERE IS ENOUGH DETAIL TO ALLOW USE AS AN AID IN TROUBLE SHOOTING,
AND SHOULD SERVE TO FAMILIARIZE YOU WITH THE BASIC OPERATION OF
THE GAME.

FEEL FREE TO CALL ANYTIME YOU HAVE A PROBLEM YOU WOULD LIKE HELP
WITH. L-815-962-3919 (ARACHNID, INC.).

ARACHNID, INC. Engineering Change No. 12-1-78

Auto 301, or elimination of "Around the Clock"

Purpose:

a) To simplify game selection sequence.
b) To prevent false service calls.
c) To eliminate "Around the Clock", a time consuming and difficult game to play.

Parts used: 2 x 1N4148, 1 x 10K ohm ¼ watt, 24" — 22 guage wire
              (Diodes)   (Resistor)

Procedure:

1) From backside of motherboard locate the 14 pin programming plug, wired to game selection switch.
2) Install 24" wire from pin number 2, second one down on left side, to the N.O. contact of the 301 switch, no connection.
3) Remove red wire tied to the contact arm of the 301 game select switch.
4) Connect "N" side of one diode to the red wire.
5) Connect "P" side of diode to the contact arm of the 301 game select switch.
6) Remove motherboard from game.
7) Locate I.C. #27 on top, component side of motherboard, immediately above the space between players 3 and 4's score LEDs.
8) Connect "P" side of diode to pin number 11, fourth pin down on right side.
9) Connect "N" side of diode to the solder connection that corresponds to pin number 12 of the game select programming plug as counte- on backside of motherboard. On the front side of motherboard this is the third solder connection down on left side of the game select programming plug.
10) Connect 10K ohm resistor to the solder connection that corresponds to pin number 7 of game selection programming plug. On front side of board this is the seventh solder connection down on right side of plug.
11) Connect other end of 10K ohm resistor to the "N" side of the diode you just installed.
12) Trim excess lead wire.
13) Install motherboard into cabinet and re-connect all connectors.
14) Power up game and check for proper operation.


                              Wayne Egner
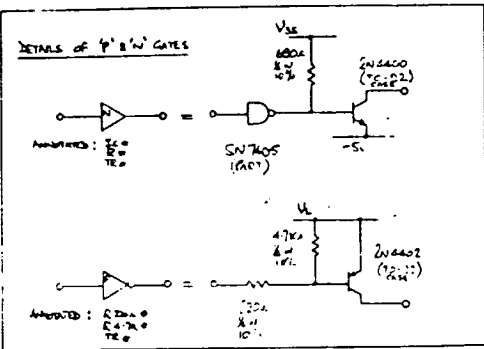
MODIFICATION OF 3000 POWER SUPPLY TO 4000

1. REMOVE BOLT AND NUT, UNSOLDER,, AND REMOVE VOLTAGE REGULATOR.

2. REMOVE TWO NUTS FROM STUD DIODES, THEN IJNSOLDEF? THE TWO WIRES
    FROM THE BOARD. REMOVE "HE DIODES FROM THE HEATSINK. LEAVE
    MICA WASHERS ON DIODES,

3. REMOVE THE HEATSINK.

    PARTS NEEDED TO CONVERT TO 4000 SERIES:

    1 - LM323K REGULATOR.
    1 - TO3 MI CA WASHER.
    1 - SPECIAL HEATSINK.
    1 - SOLDER LUG WITH 1 IN WIRE.
    1 - BOLT WITH INSULATION AND NUT.
    1 - BLACK INSULATING WASHER.
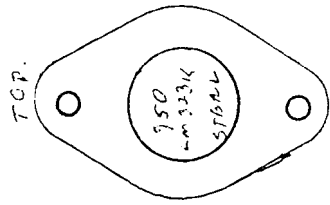
4. LINE UP THE HEATSINK WITH THE DIODES AND MARK "HE HOLES TO BE
    DRILLED IN THE BOARD. DRILL TWO HOLES WITH A 7/32 DRILL.

5. PUT THE HEATSINK BACK ON. MOUNT THE STUD DIODES THE SAME WAY
    AS THEY WERE.

6. PUT HEATSINK COMPOUND ON THE MICA WASHER. PUT THE MICA WASHER
    ON THE LM323K REGULATOR.

7. PUT SOLDER LUG ON BOLT THEN THROIJGH THE TOP (SEE DIAGRAM) HOLE
    ON THE REGULATOR. PUT INSULATION ON THE BOLT.

8. PUT ABOVE ASSEMBLY THPU THE HEATSINK AND BOARD. PLACE THE BLACK
    INSULATING WASHER ON THE END AND TIGHTEN DOWN THE NUT.
    RESOLDEP THE DIODES. SOLDER THE LEADS OU" OF THE LM323K TO THE LINES
    THAT THEY CAME THROUGH . SOLDER THE WIRE FROM THE SOLDER LUG
    TO GROUND.

9   USINGANOHMMETERCHECKTO MAKE SURE THAT NOTHING IS SHORTED TO
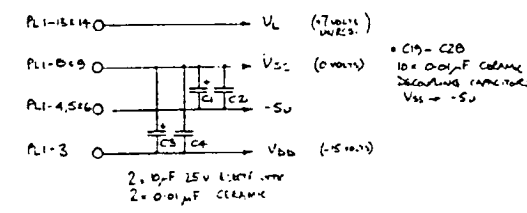   THE HEATSINK. IF "HEY ARE, START OVER AGAIN.

This is a hand-drawn electronic schematic diagram. It includes a "GAME SELECTION - IC15" link header table at the top, details of 'p' & 'n' gates, and various integrated circuits (IC4, IC5, IC6, IC11–IC28) with associated wiring, resistors, capacitors, and connector pin assignments.
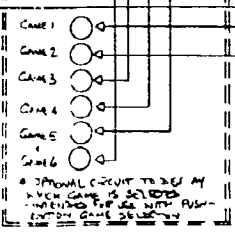
TEMPORARY SCORE

PLAYER 1
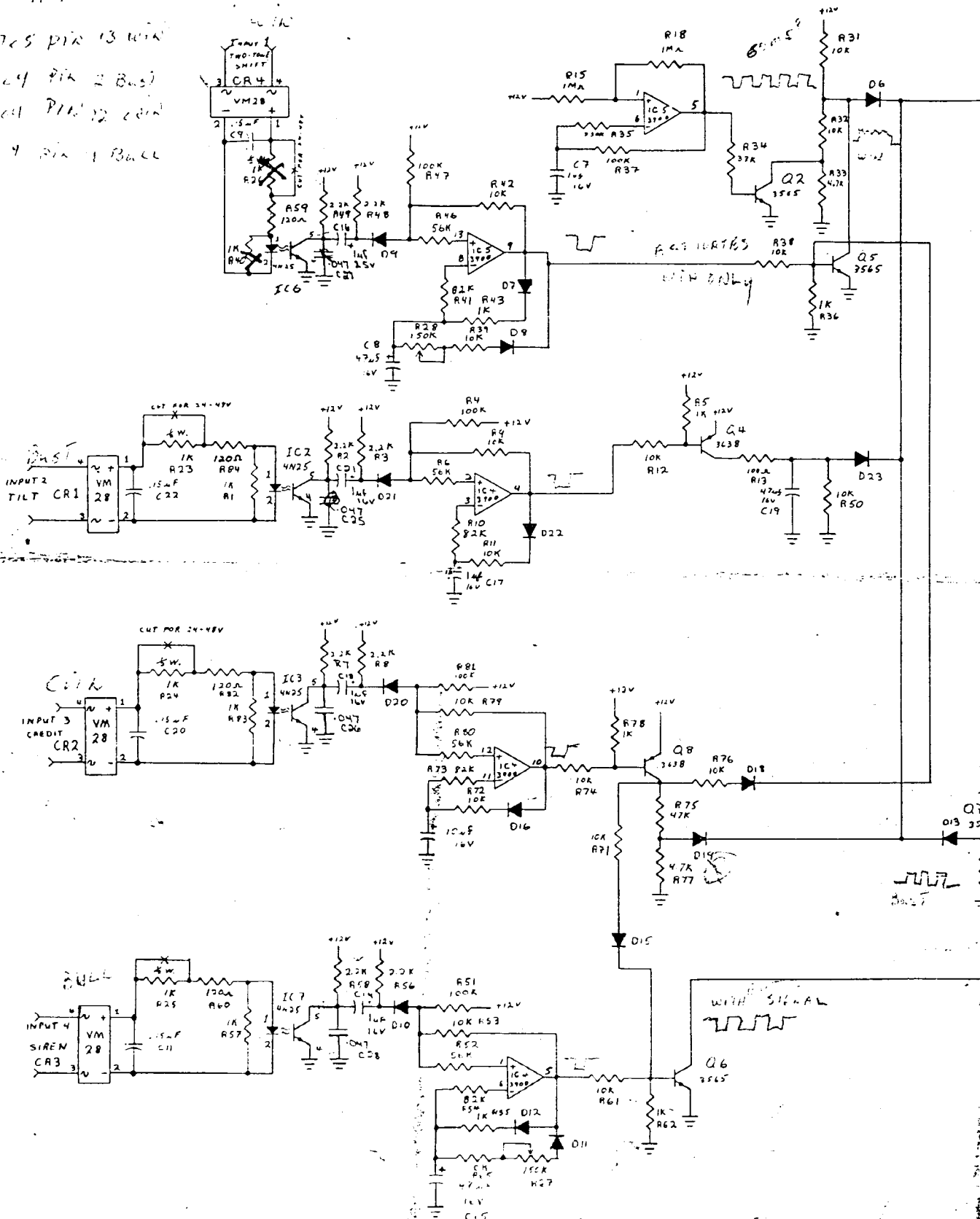
PLAYER 2

PLAYER 3

PLAYER 4
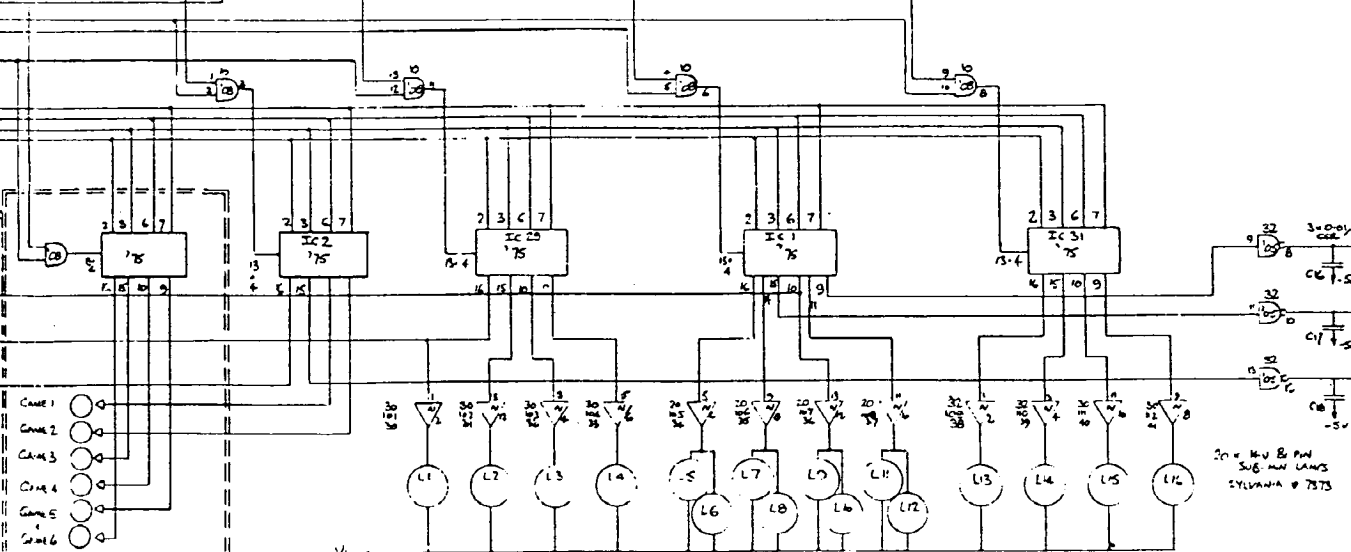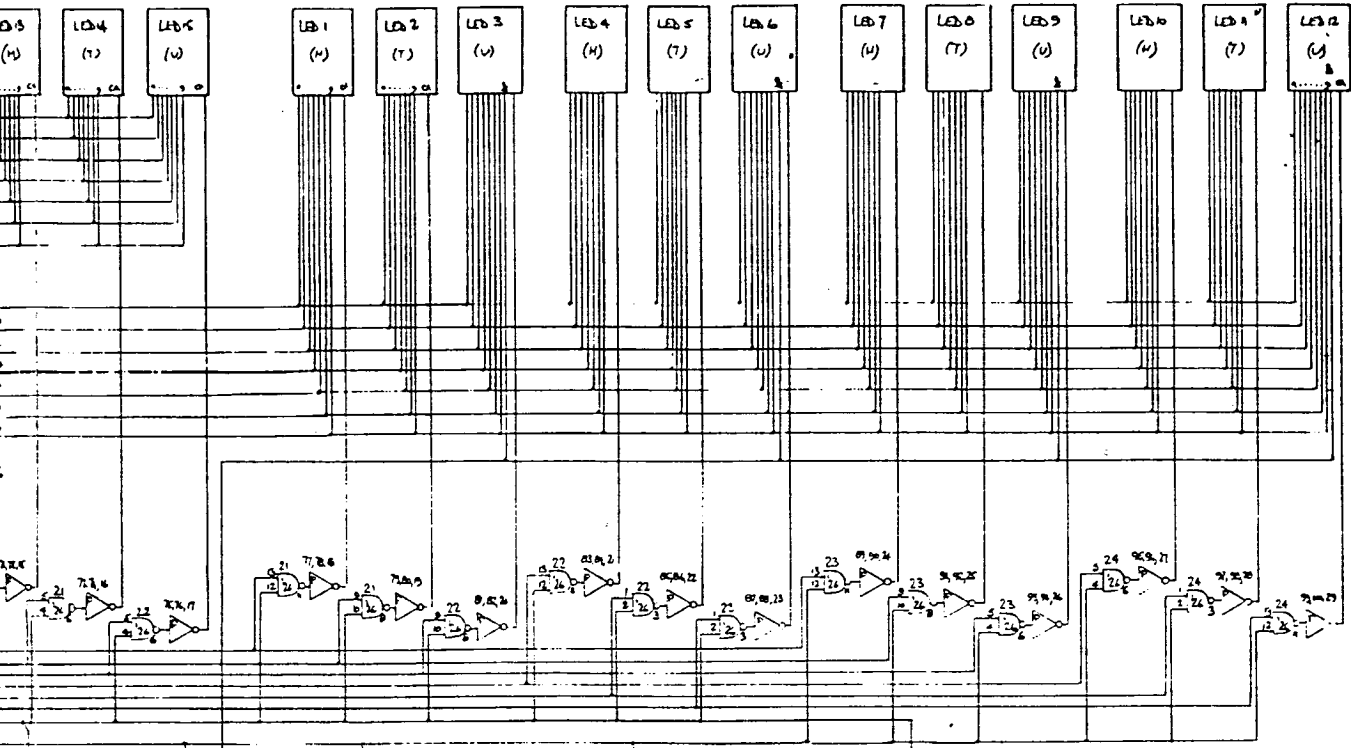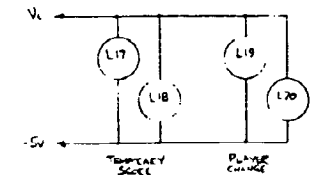
3000

REVISIONS

ARACHNID INC. 7500 N. MAIN ST ROCKFORD ILLINOIS 61101

CIRCUIT DIAGRAM - LOGIC CARD 3457 MAN-WR AB-1001-G4C

DRAWN SAD 7/2   ISSUE 1 Aug-3 1977   DRAWING No. 20 0130

SCOPE PROBE TO
ACTIVATES SCOPE.

IC5 PIN 13 WHT
IC4 PIN 2 BLU
IC1 PIN 12 GRN
IC4 PIN 1 BLK

INPUT 1
TWO-TONE
SHIFT
CR4
VM28

R18 1MA
R15 1MA
IC5 3900
R35
C7 1μ 16V
R37 100K
R34 37K
R47 100K

R31 10K
D6
R32 10K
Q2 3565
R33 4.7K
Q5 3565

ACTIVATES WITH DELAY

R38 10K
R36 1K

R59 120Ω
R49 2.2K
R48 2.2K
C14
D9
R46 56K
IC5 3900
R42 10K
R40 1K
IC6
4N25
R41 82K
R43 1K
D7
R28 150K
R39 10K
D8
C8 47μ 16V

INPUT 2
TILT CR1
VM28
R23 1K
C22 .15μF
R24 120Ω
R1 1K
IC2 4N25
R2 2.2K
R3 2.2K
C23
D21
.047 C25
R6 56K
IC4 3900
R4 100K
R9 10K
+12V
R12 10K
R5 1K
Q4 3638
R13 100Ω
C19 47μ 16V
D23
R50 10K
R10 82K
R11 10K
D22
C17 1μ 16V

CUT FOR 24-48V

INPUT 3
CREDIT CR2
VM28
R24 1K
C20 .15μF
R22 120Ω
R93 1K
IC3 4N25
R7 2.2K
R8 2.2K
C13
D20
.047 C26
R81 100K
R79 10K
R80 56K
IC4 3900
R73 82K
R72 10K
D16
R74 10K
R78 1K
Q8 3638
R76 10K
D18
R75 47K
R71 10K
D19
R77 4.7K
D15

INPUT 4
SIREN CR3
VM28
R25 1K
C11 .15μF
R60 120Ω
R57 1K
IC7 4N25
R58 2.2K
R56 2.2K
C14
D10
.047 C28
R51 100K
R53 10K
R52 56K
IC4 3900
R54 82K
R55 1K
D12
D11
R27 150K
C15 16V
R61 10K
Q6 3565
R62 1K

WITH SIGNAL

PIN 4

COIN

BULL PULSE

BUST

WIN

PIN 10
COIN
BULL
BUST

WIN

C24 .001

R19 330K

R21 680K

R44 2.2M

R14 33K

R20 180K

IC5 3M0

IC5 3M0

+12V R45 1M

Q3 3565

R30 33K

R29 10K

IC1 TBA 820/5

R16 2.2K

R17 100Ω

C3 330pF

C2 220uF

C23 .15uF

C4 22mF

C24 .15uF

8Ω

+12V

AC

AC

GND

1N4003

D3 D1

D4 D2

C6 3300uF 16V

Q1 EP3615

R22 560Ω

D5 1N4N3

C5 10uF 35V

C1 3300uF 16V

+12V

D17

R69 1M

R68 1M

R70 560K

IC4 900

R67 330K

R66 100K

R64 56K

D14

C10 .15uF

C12 1uF 16V

R63 100K

Q2 3565

PIN 1

ALL DIODES ARE 1N4148
UNLESS OTHERWISE NOTED

3000 ?

GAME SOUND CIRCUIT

SCALE: APPROVED BY: DRAWN BY: D G
DATE: 6-23-7   6-23-7

WICO CORPORATION

Form No. 28-0716   72-4471
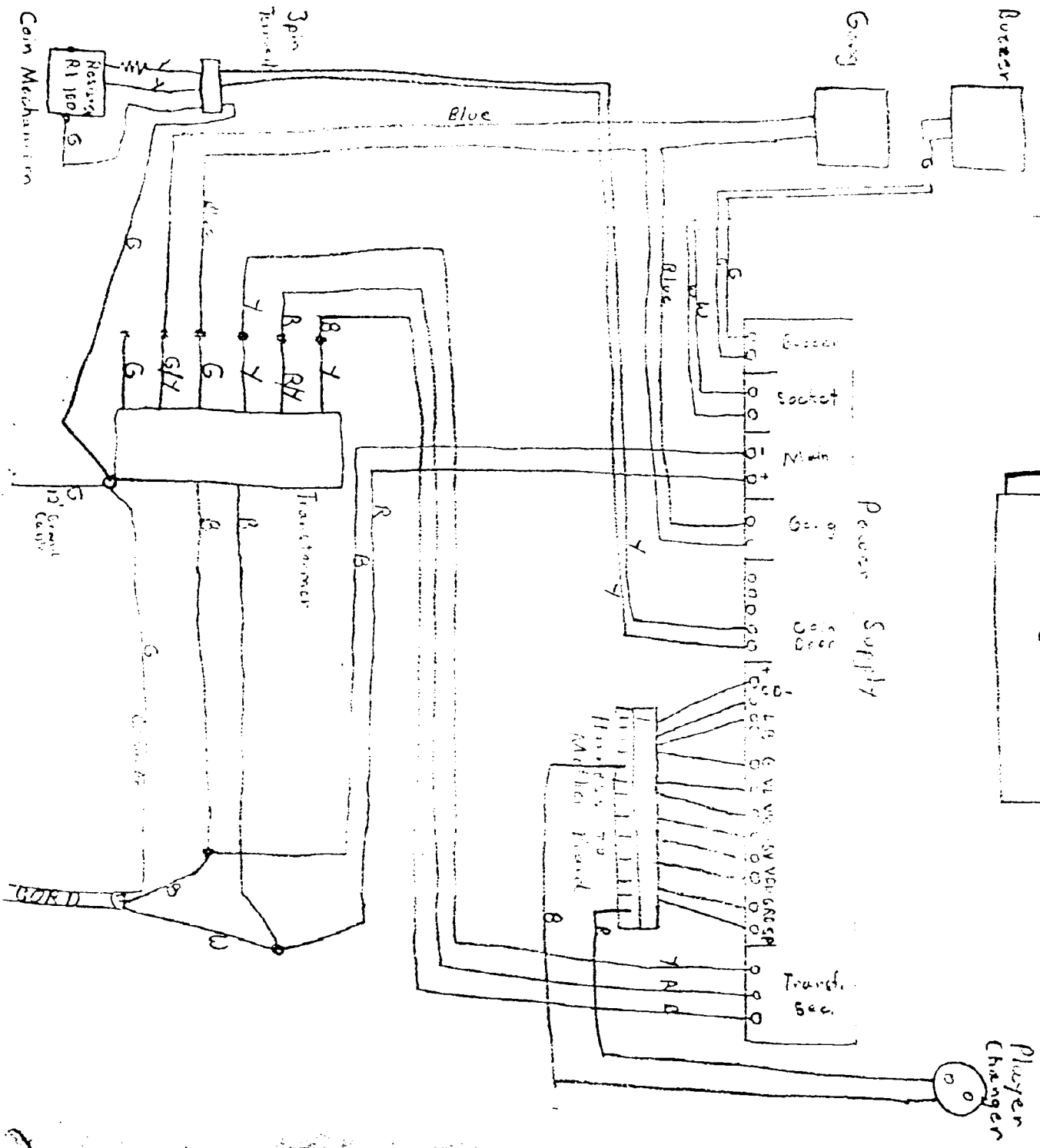
W - White
Y - Yellow
B - Black
R - Red
RY - Red/Yellow stripe
GY - Green/Yellow Stripe
G - Green

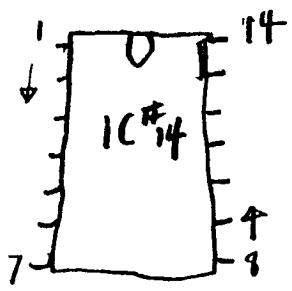Lamp Socket

Mother Board

Dart Board
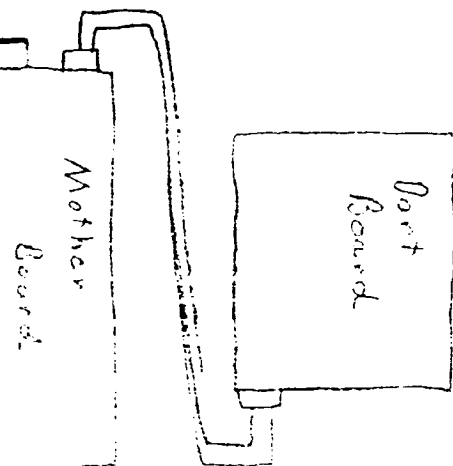
TESTER, 3000 & 4000

Arachnid

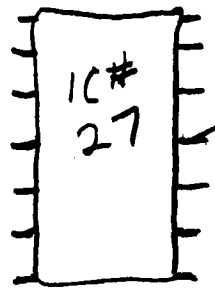6421 Material Avenue • Rockford, Illinois 61132

DWG NO	38-9035		

CHANGE	DATE	ECN	DRAWN BY	DATE	CHECKED BY	DATE
REVISION			MATERIAL			SCALE

Add this diode, 1N4148, and 10K Ω resistor for Auto 301

3000 SERIES
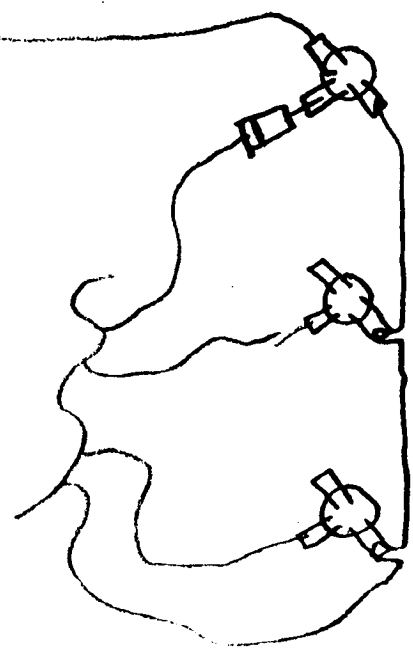WALLMOUNT
HOMEGAME

IC#14

Component Side of mother board

IC#27

IC#28
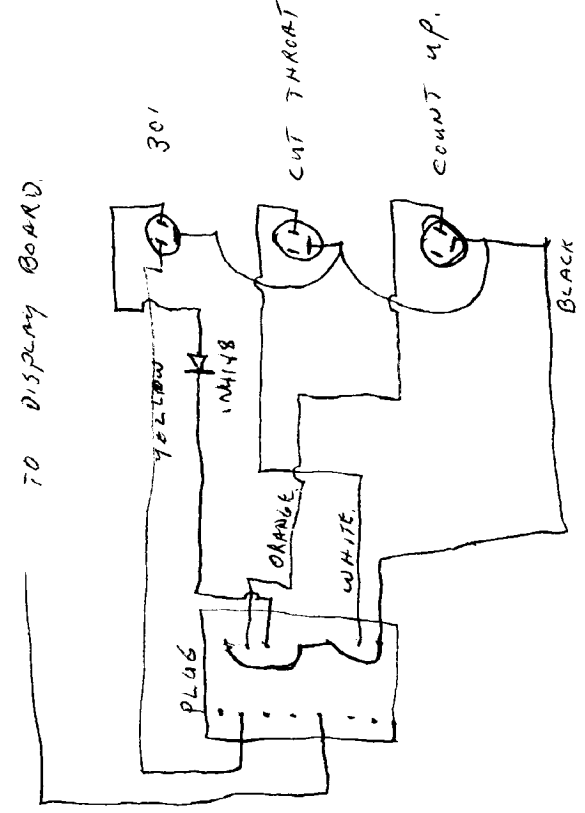
Res
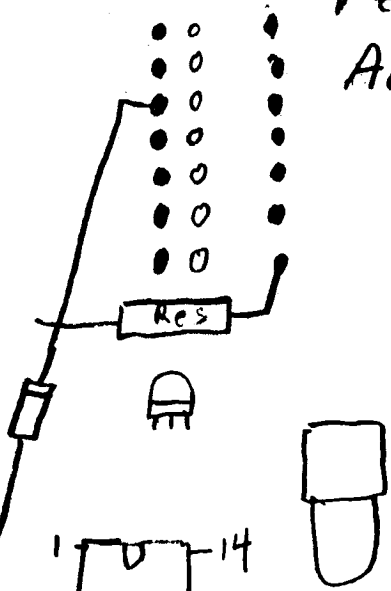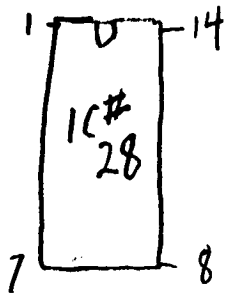
Add this wire and diode, 1N4148

for Auto 301

301

C.T.

C.U.
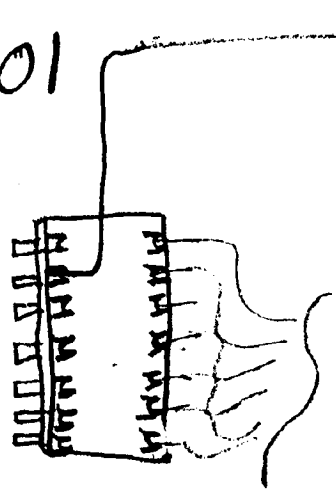
IC#15
Programing Plug

Game Select Switches

Home Game
Game Select
Harness

Round the Clock
301
301 Start and End X2
Cut Throat
301 End X2
Count Up

ORANGE

DISPLAY BOARD

YELLOW
RED
BLUE
WHITE
GREEN
BLACK

VENDING GAME 3000 SERIES
GAME SELECT HARNESS

TO DISPLAY BOARD

301
CUT THROAT
COUNT UP.

YELLOW
1N4148
ORANGE
WHITE
BLACK

PLUG
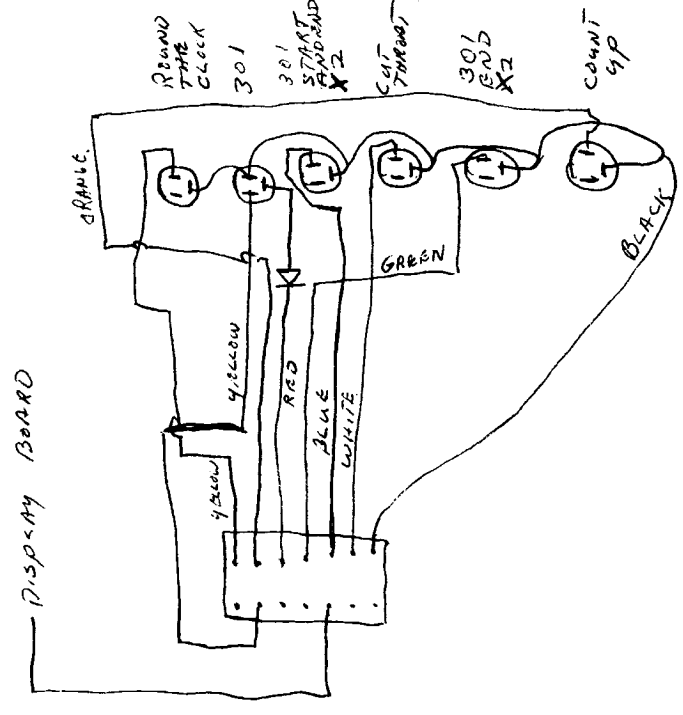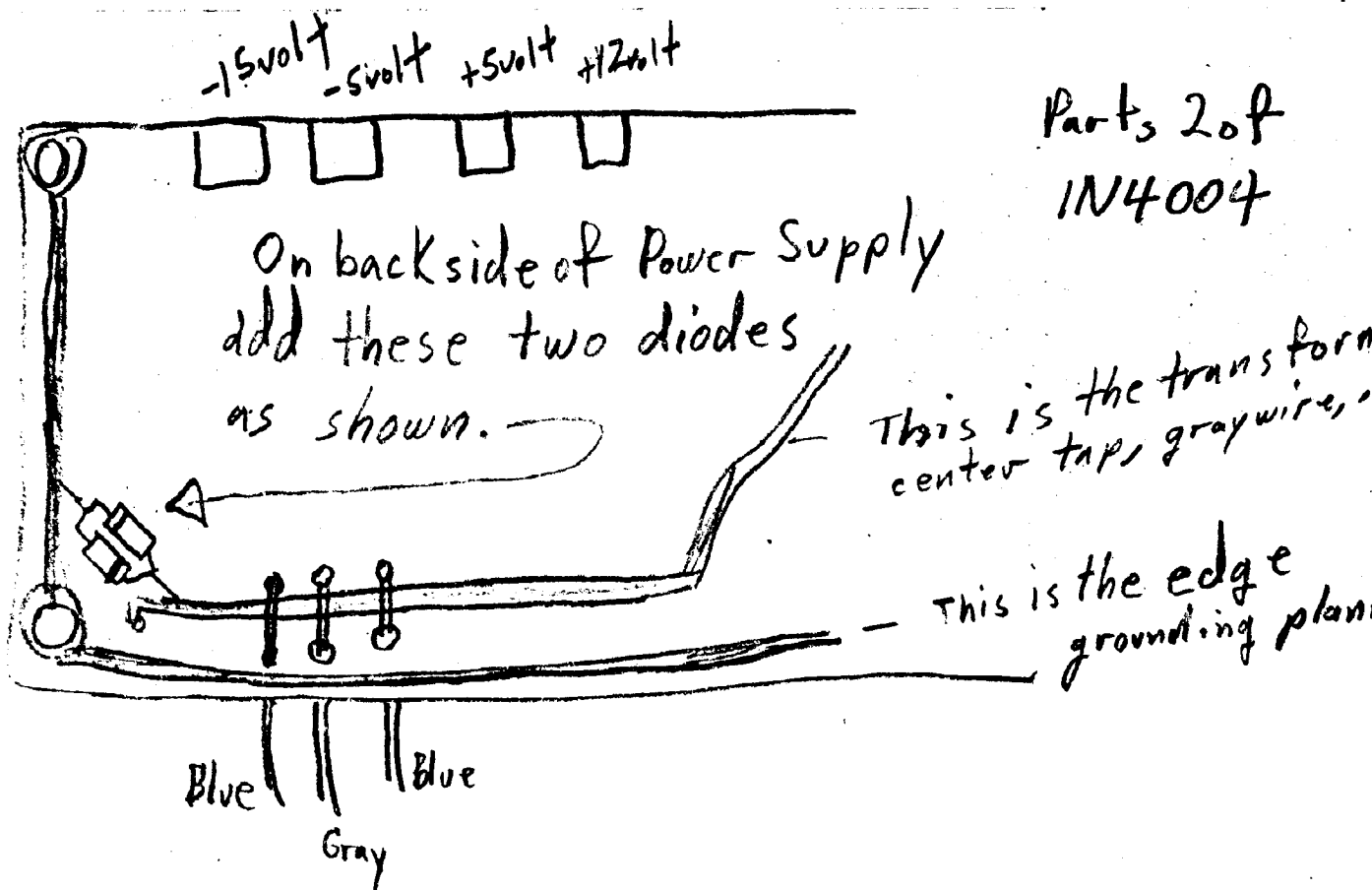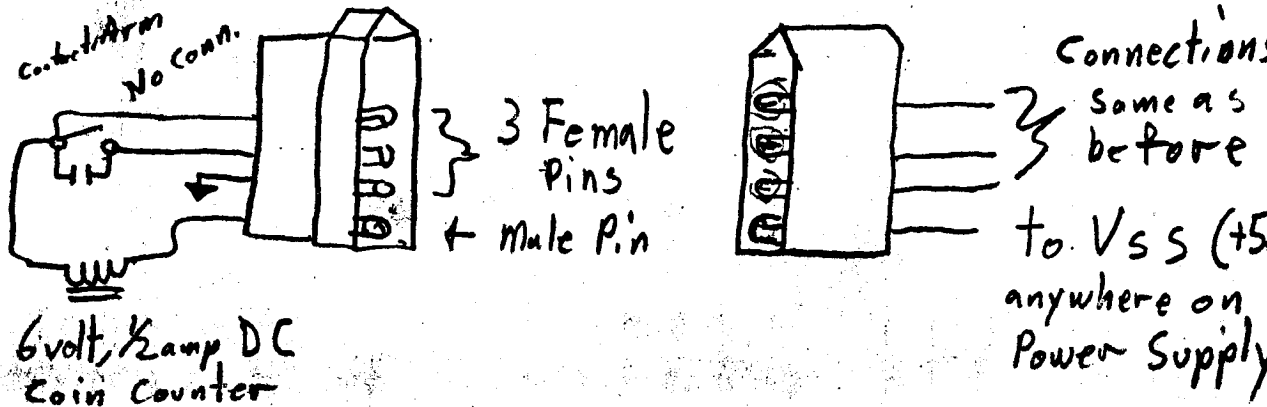
Tie a grounding wire from the player change push button ring to the transformer mounting / binding post where the other grounding wires come together.
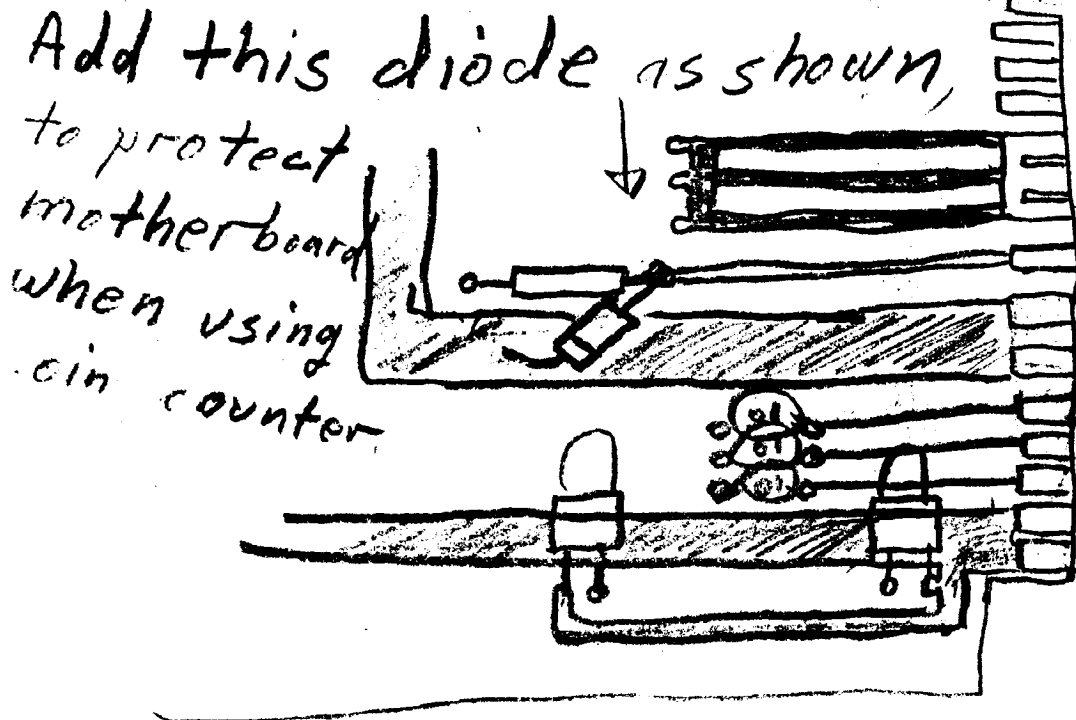
-15volt -5volt +5volt +12volt

Parts 2 of
IN4004

On back side of Power Supply
add these two diodes
as shown.

This is the transform
center taps, gray wire,

This is the edge
grounding plan

Blue Blue

Gray

All current games have a
coin counter option, there fore 3000
a fourth wire on the coin door.

COIN
COUNTER

co..bel Arm   No Conn.

3 Female
Pins
+ male Pin

Connections
same as
before

to Vss (+5
anywhere on
Power Supply

6 volt, ½ amp DC
Coin Counter

Component Side of Mother- Board
Parts used 1 of IN4004

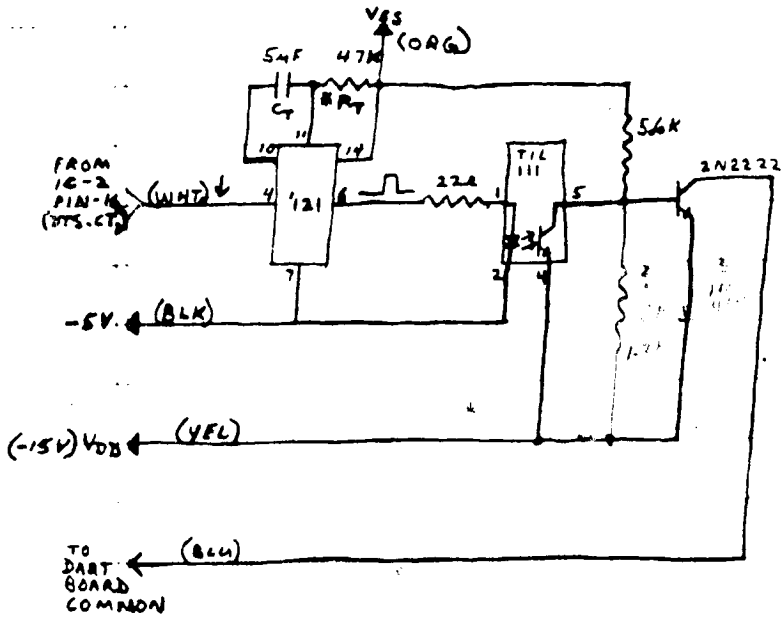Add this diode as shown,
to protect
motherboard
when using
coin counter

To Power
Supply

for 3000 S..

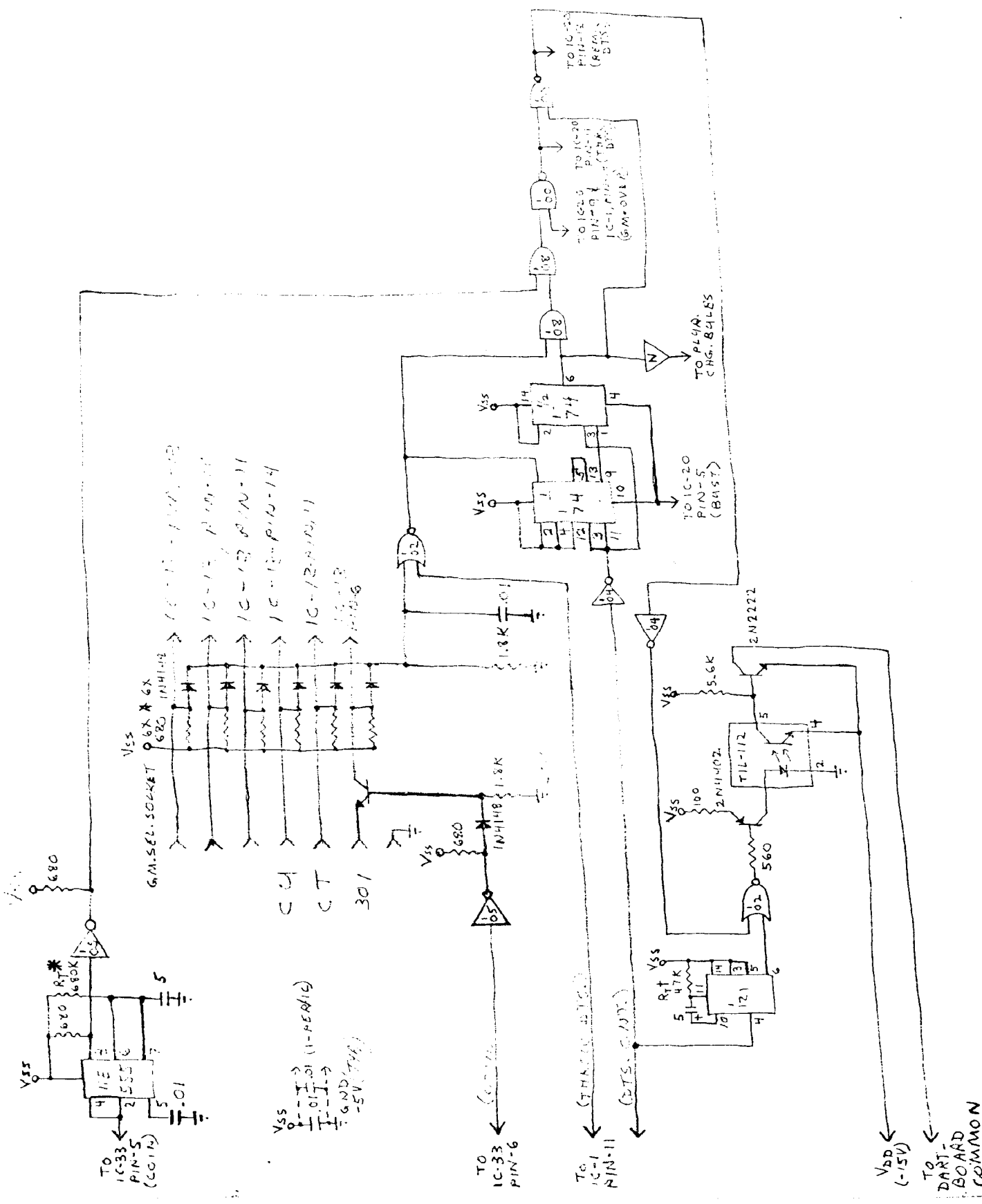## KIT#: DB-3 (REPLACES: DB-1 & DB-2)

PARTS

1 - SN74121

1 - TIL111 (or TIL-112) (opto coupler)

(C_T) 1 - 5μF - 6V CAP.

* (R_T) 1 - 47K - RES. - 1/4 W - 10%

1 - 22Ω - "   "   "

1 - 5.6K - "   "   "

1 - 2N2222 - (NPN) TRANSISTOR

1 - 14-PIN-IC-SOCKET

1 - 8-PIN- "   "

1 - PERF BOARD

* WITH C_T VALUE OF 5μF
AT 6V, THE FOLLOWING T
MAY BE USED TO DETERMINE

* R_T-VALUE	APPROX. TIME DE
100K	1 SEC.
82K	.82 "
68K	.68 "
56K	.56 "
50K	.5 "
47K	.47 "
33K	.33 "

KEY:

⏚ GROUND (-5V SUPPLY / TRANSFORMER CENTER TAP

⏛ EARTH GROUND

▽ SEE DETAILS OF 'N' GATES

✳ 680Ω RESISTORS & IN4148 DIODES ONLY
NECESSARY IF GAME IS ON CAPTION PLATE
(E.G. BOY, COW, THREAT, & COUNT-UN EACH NEED
680 & IN4148)

+ ✳ REDUCE STARTS DELAY AFTER COIN
1M = 8-SECONDS
680K = 5   "   (EQUAL TO MASTER CAPTIONS DELAY)

R_T + DARTBOARD DELAY—(W/ GOLE INHIBIT) = (.01 SEC. PER K)
100 K = 1.0 SECOND
82 K = .82   "
68 K = .68   "
56 K = .56   "
47 K = .47   "
33 K = .33   "

3K   to change to any other
game remove were from
14 pin header and put onto
~~then~~ other pin on header
and ground out the pin
which you removed wire from.

no light Pin 1 - round the clock

Pin 2 - count up.

Pin 3 - ~~~~ 301

no light Pin 4 - 301- End X2

no light Pin 5 - 301 slant & End X 2

Pin 6 - cut throat

Pin 7 - grd.

Pin - 10 dec. driver - R.B.

Pin - 13 wire to 301 part of
        auto 301 circuit