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Instruction Manual FOR FAN-TAS-TIC



Williams® ELECTRONICS, INC.
SUBSIDIARY OF THE SEEBURG CORPORATION

3401 N. California Ave.
Phone 267-2240

Chicago, Ill. 60618, U.S.A.
Cable Address: Wilcoin

"FAN-TAS-TIC"

4 PLAYER

ANY OF THE (3) EJECT POCKETS WILL RUN THE SPINNER UNIT.
CAPTIVE BALL (IN SPINNER UNIT) WILL THEN FALL INTO ONE OF
TWELVE HOLES TO SCORE THE FOLLOWING:

(1.) "STAR" SWITCH WILL SCORE 500 POINTS AND LITE UP ONE
STAR. LITING 3 STARS ALLOWS SAME PLAYER TO "SHOOT AGAIN".

(2.) "3,000" SWITCH SCORES 3,000 POINTS.

(3.) "OPENS GATE" SWITCH SCORES 500 POINTS AND OPENS
RIGHT BOTTOM GATE.

(4.) "ADVANCE BONUS TO TOP" SWITCH WILL STEP UP BONUS
UNIT TO TOP (10,000).

(5.) "LITES A & B LANES" SWITCH WILL LITE UP LEFT AND
RIGHT SIDE LANES TO SCORE 3,000 POINTS.

(6.) "BONUS" SWITCH SCORES THE LIT BONUS VALUE.

(7.) "DOUBLE BONUS" SWITCH SCORES TWICE THE LIT BONUS
VALUE.

(8.) "TRIPLE BONUS" SWITCH SCORES THREE TIMES THE LIT
BONUS VALUE.

LIT BONUS VALUE IS ADVANCED BY MAKING ROLLOVER BUTTONS OR TARGETS
MARKED "ADVANCE BONUS".

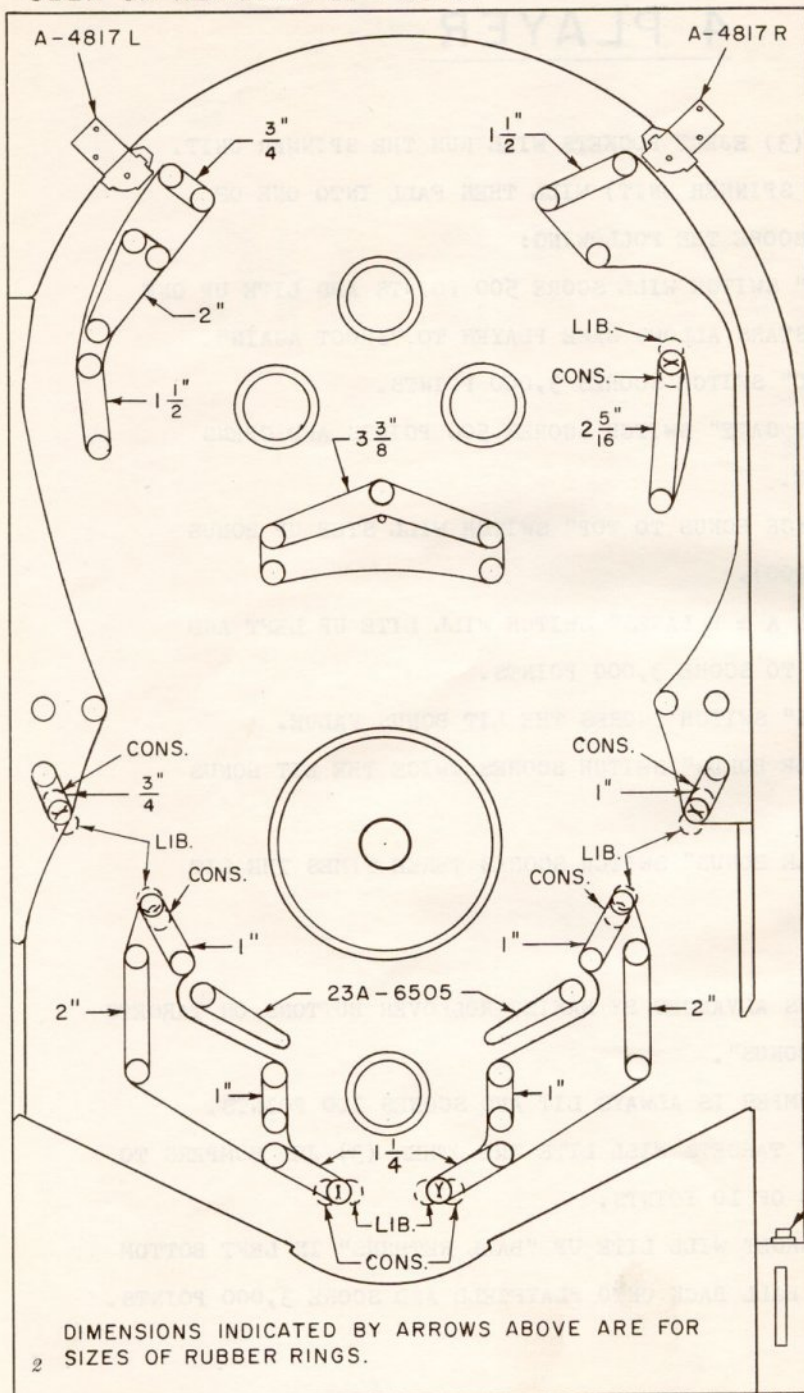
TOP CENTER JET BUMPER IS ALWAYS LIT AND SCORES 100 POINTS.

TOP LEFT OR RIGHT TARGETS WILL LITE THE OTHER (3) JET BUMPER TO
SCORE 100 INSTEAD OF 10 POINTS.

HITTING CENTER TARGET WILL LITE UP "BALL RETURNS" IN LEFT BOTTOM
OUTLANE, TO KICK BALL BACK ONTO PLAYFIELD AND SCORE 3,000 POINTS.

"FAN-TAS-TIC" — POST ADJUSTMENT SHEET

TO MAKE GAME MORE "CONSERVATIVE" OR "LIBERAL" — MOVE POST $\frac{3}{16}$ " AS SHOWN IN SKETCH BELOW. SPOTTING HOLES ARE PROVIDED AND CAN BE SEEN ON REMOVAL OF POSTS.



ABBREVIATIONS :

CONS. — CONSERVATIVE

LIB. — LIBERAL

RUBBER RING NUMBERS :

23A-6300	5/16" I. D.
23A-6301	3/4" I. D.
23A-6302	1" I. D.
23A-6303	1 1/4" I. D.
23A-6304	1 1/2" I. D.
23A-6305	2" I. D.
23A-6306	2 5/16" I. D.
23A-6308	3 3/8" I. D.

A-4817 L & R BALL GATE ASS

23A-6327 BALL SHOOTER
RUBBER TIP

I. GENERAL

NEVER EXPERIMENT with any of the mechanism. Locate any trouble with the aid of Wiring Diagrams or Operating & Servicing Information supplied with the machine, then check for proper adjustment of the units involved before making any changes. Improper adjustment or make-shift repair will only cause serious damage to other parts of the machine or repeated failure of the part.

NOTE: Always look for a possible loose wire, bad connection at a plug and socket, broken or unhooked springs on step-up units, relays, etc., before adjustments are made or wires reconnected.

2. FUSES

IMPORTANT: Never replace fuses with any rating other than specified on the fuse block; this block is located adjacent to the transformer.

3. LUBRICATION

Over-lubrication causes far more trouble in coin operated equipment than under-lubrication. Practically all cases of poor contact on switches and wiper discs are due to oil or grease, or oil vapor, which forms a film or residue on the contacts and will not allow current to pass through. Excess lubricant may also seep into clutches causing them to slip.

IMPORTANT: NEVER USE VASELINE FOR LUBRICATION OF ANY PART OF THE MACHINE. Vaseline is not a true lubricant. It leaves a dirty and gummy residue and it becomes very thick when cold. A special Coin Machine Lubricant is supplied with each machine.

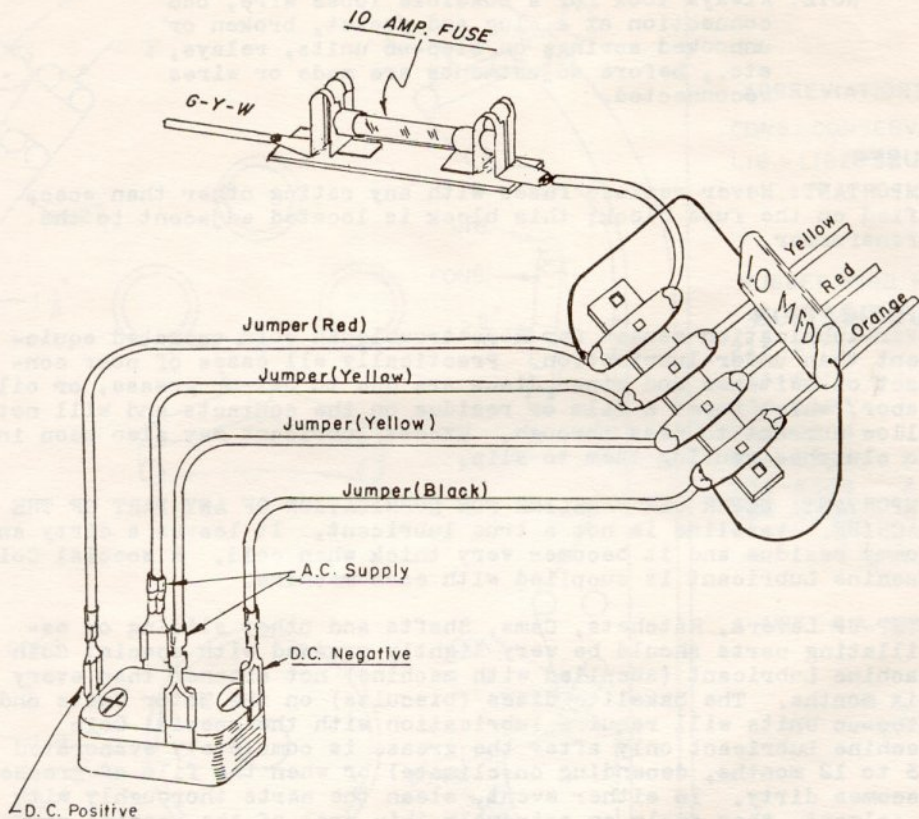
STEP-UP Levers, Ratchets, Cams, Shafts and other sliding or oscillating parts should be very lightly greased with special Coin Machine Lubricant (supplied with machine) not oftener than every six months. The bakelite discs (biscuits) on the Motor Units and Step-up Units will require lubrication with the special Coin Machine Lubricant only after the grease is completely evaporated (3 to 12 months, depending on climate) or when the film of grease becomes dirty. In either event, clean the parts thoroughly with a solvent, then apply an extremely thin coat of the special grease.

Solenoid Plungers should not have a lubricant of any kind. Should there be a sluggish tendency or if plungers are sticking, the parts should be cleaned with a solvent and flaked graphite applied on reassembly.

SWITCH ADJUSTMENT

BEFORE ADJUSTING SWITCHES, MAKE CERTAIN THE SCREWS HOLDING THE SWITCH STACKS ARE DOWN TIGHTLY. BAKELITE SPACERS IN THE SWITCH STACKS, DUE TO EXCESSIVE MOISTURE, HAVE OCCASIONALLY SHRUNK BY DRYING OUT, CAUSING POOR ADJUSTMENT.

SILICON BRIDGE RECTIFIER



THE FUNCTION OF THE RECTIFIER AND CAPACITOR IS TO CONVERT THE ALTERNATING CURRENT (A.C.) TO DIRECT CURRENT (D.C.), SUPPLYING D.C. TO THE BUMPERS, KICKERS ETC.

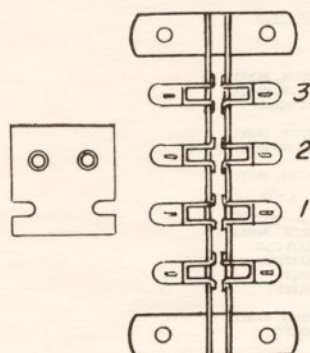
THE BRIDGE RECTIFIER SHOULD PRACTICALLY NEVER NEED REPLACING, AS IT IS RATED WELL OVER THE VOLTAGE AND CURRENT REQUIREMENTS OF THE COMPONENTS IT SUPPLIES.

IF, HOWEVER, THE 15 AMP 24 VOLT FUSE ON THE MECHANISM PANEL OPENS, IT COULD BE DUE TO A FAULTY RECTIFIER. DISCONNECT THE A.C. INPUT TO RECTIFIER, REPLACE FUSE, AND RECHECK.

IF THE 10 AMP FUSE LOCATED NEXT TO THE RECTIFIER OPENS, CHECK ALL D.C. COMPONENTS I.E. BUMPERS, KICKERS ETC. FOR SHORTS.

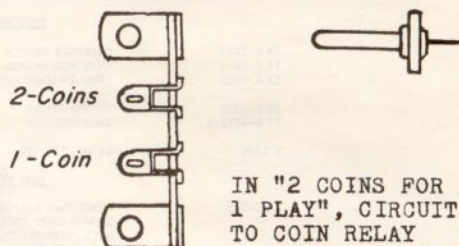
ADJUSTMENTS ON MECHANISM PANEL

10¢ Adjustment



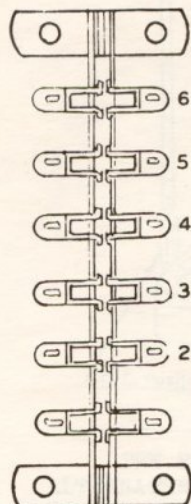
PROVIDES
1, 2 OR
3 PLAYS
FOR ONE
COIN.

5¢ Adjustment



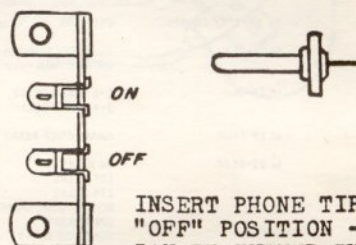
IN "2 COINS FOR
1 PLAY", CIRCUIT
TO COIN RELAY
PASSES THRU SW.
ON ALTERNATOR
UNIT.

25¢ Adjustment



PROVIDES 2, 3, 4, 5
OR 6 PLAYS FOR 25¢.

Motor Service Jack



INSERT PHONE TIP IN
"OFF" POSITION - CAMS
CAN BE TURNED BY HAND
TO CHECK ADJUSTMENT OF
SWITCHES.

SUGGESTED SCORE CARD

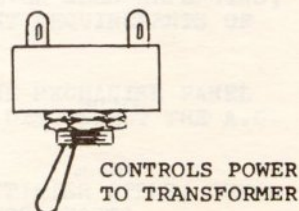
REPLAY

5 BALL-----387-1

3 BALL-----387-2

MASTER ON-OFF SW.

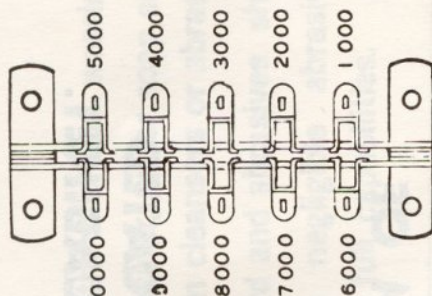
(Located under front of
Cabinet)



CONTROLS POWER
TO TRANSFORMER

ADJUSTMENTS IN BACKBOX

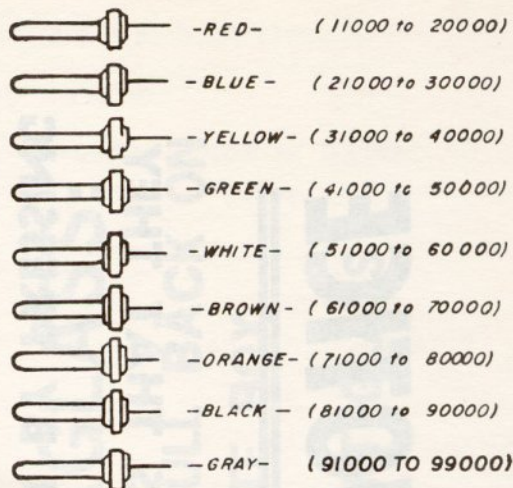
Hi-Score Adjustment



Insert plugs into 10 Point Female at desired positions.

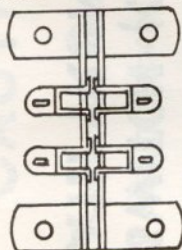
Examples:

Yellow wire into 3000 position scores at 33000.
Yellow wire into 0000 position scores at 40000.



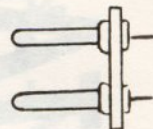
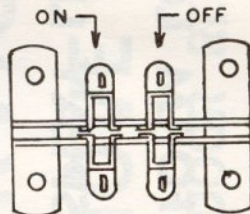
No. of Balls Adjustment

3 BALL ——— 5 BALL



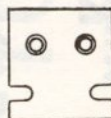
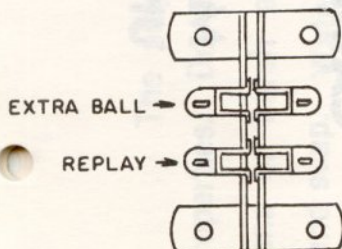
THIS JACK CHANGES 3 BALL TO 5 BALL PLAY OR VICE VERSA.

NUMBER MATCH ADJUSTMENT



In 'ON' position, a number match lite will appear when game is over. To award replays, when number is matched, Extra Ball Adjustment Jack must be in 'Replay' position. In 'Off' position, Number Match is inoperative.

Extra Ball Jack Adj.



IN REPLAY POSITION... HI-SCORES AND NUMBER MATCH AWARD REPLAYS.

IN EXTRA BALL POSITION... HI-SCORE AWARDS AN EXTRA BALL AND NUMBER MATCH SHOULD BE IN "OFF" POSITION.

IMPORTANT NOTICE

**KINDLY INFORM LOCATIONS THAT THEY
CAN TURN DISPLAY LIGHTS ON BY PRESSING
LEFT FLIPPER BUTTON. MACHINE CAN STILL
BE SHUT OFF BY TAPPING BOTTOM OF
CABINET.**

**MASTER SWITCH (ON-OFF) IS LOCATED
UNDERNEATH FRONT PART OF CABINET.**

CAUTION!

The playboard on this machine has an improved finish with excellent wearing properties. Do not under any circumstances clean the board with water, water soap solutions or harsh abrasives. Avoid such things as steel wool, kitchen cleansers or abrasive hand soap. Water will weaken the adhering of the paint to the board and abrasives shorten the board life by many thousand plays. A wax base cleaner with negligible abrasive qualities used lightly, but frequently, will extend the board life to its full capabilities.

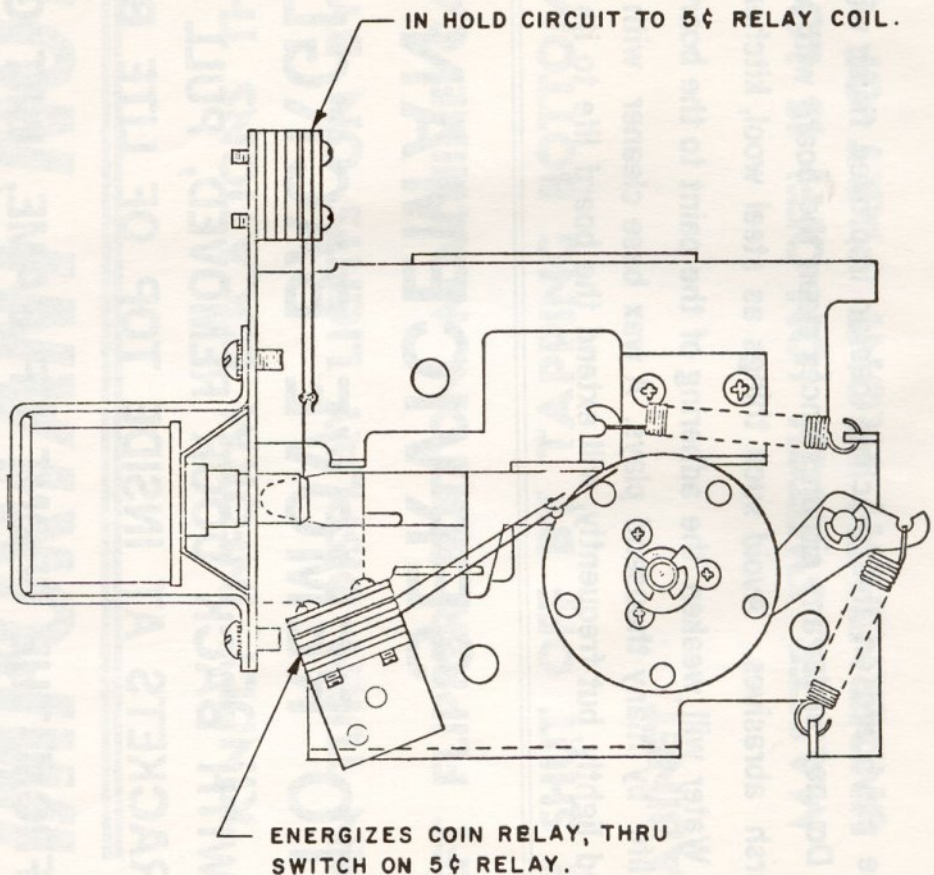
SERVICEMAN TO REMOVE BACKGLASS:

- **WITH BACK DOOR REMOVED, PULL BACK ON BRACKETS AT INSIDE TOP OF LITE BOX.**
- **FROM THE FRONT OF GAME, LIFT GLASS UP AND OUT.**

ALTERNATOR UNIT

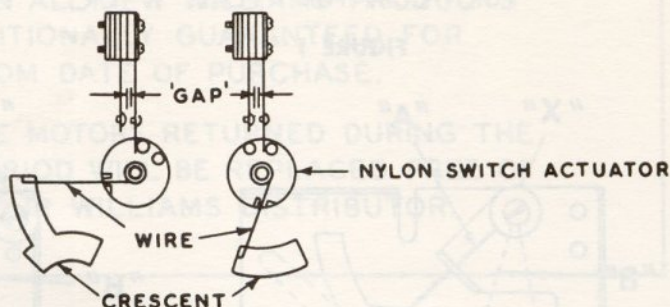
LOCATED ON MECHANISM PANEL.

USED IN CONJUNCTION WITH 5¢ RELAY FOR "2 COINS-1 PLAY" FEATURE.



INSTRUCTIONS FOR COIN TRIP SWITCH ADJUSTMENT

WIRE SHOULD BE IN CONTACT WITH END OF CRESCENT OPENING WHEN BLADE ADJUSTMENT IS MADE.



Long blade should be in contact with nylon switch actuator and have a maximum overtravel of $1/32$.

or

Using a gram gauge, tension of long blade should not exceed 10 grams.

SWITCH ADJUSTMENT

1. For small coins, such as dimes, adjust short blade so that the 'gap' between the silver contacts is .045 to .055.
2. For larger & heavier coins the 'gap' should be .045 to .060.
3. Do not adjust 'gap' closer than .040.

POWER TRANSFORMER:

LOCATED ON MECHANISM PANEL. IT IS EQUIPPED WITH A SECONDARY TAP. IF YOUR GAME IS ON LOCATION WITH EXTREMELY LOW LINE VOLTAGE, REMOVE LEAD FROM LUG MARKED 24 VOLTS AND SOLDER TO ALTERNATE LUG MARKED "HIGH". THIS WILL BOOST SECONDARY VOLTAGE APPROXIMATELY 2-3 VOLTS.

LEG LEVELERS:

ARE PROVIDED FOR TWO PURPOSES - 1ST TO LEVEL GAME ON LOCATION, 2ND TO INCREASE PITCH FOR GAME PERCENTAGING. IF IT IS DESIRED TO SPEED UP PLAY AND DECREASE SCORES, RAISE REAR LEG LEVELERS TO INCREASE PITCH.

INSTRUCTIONS FOR ALTERING COIN CHUTES EQUIPPED WITH A FLIP-OVER DEVICE.

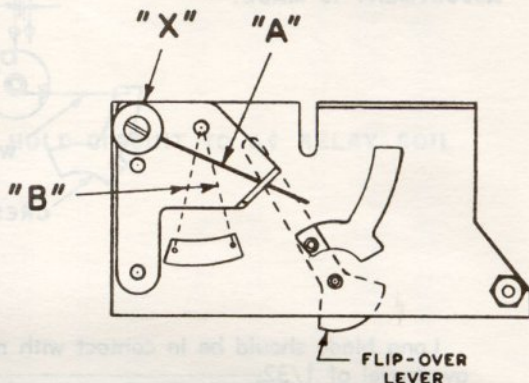
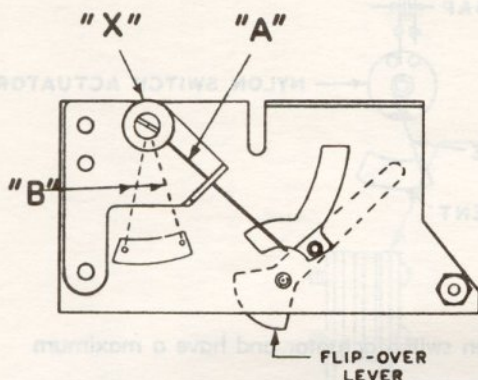
FOR 1 COIN - FOR 1 PLAY

OR

2 COINS - FOR 1 PLAY

FIGURE 1

FIGURE 2



1 COIN - FOR 1 PLAY (FIGURE 1):

Wire form "A" should be in position as shown in Figure 1. Flip-over lever should rebound from wire form "A" and return to position shown in Figure 1 everytime a coin is inserted. All coins pass over the coin trip switch wire "B".

2 COINS - FOR 1 PLAY (FIGURE 2):

Wire form "A" should be in position as shown in Figure 2 (see note). Flip-over lever should alternate from side to side. 1st coin should go to cash box without actuating coin trip switch wire "B", 2nd coin should pass the coin trip switch wire "B" and returns flip-over to position as shown in Figure 2.

NOTE:

To change from 1 coin play to 2 coin play or vice versa - loosen screw "X" and move screw, bushing & wire form "A" to position as required - shown in Figure 1 position as required - shown in Figure 1 or Figure 2.

When using 1 coin for 1 play, wire form "A" should not under any circumstances be allowed to enter the "Banana" slot and cause binding of flip-over lever.

WARRANTY

THE MOTORS IN ALL NEW WILLIAMS PRODUCTS ARE UN-CONDITIONALLY GUARANTEED FOR 6 MONTHS FROM DATE OF PURCHASE.

ANY DEFECTIVE MOTORS RETURNED DURING THE WARRANTY PERIOD WILL BE REPLACED FREE OF CHARGE BY YOUR WILLIAMS DISTRIBUTOR.

IMPORTANT NOTICE

WHEN ORDERING PARTS ALWAYS SPECIFY NAME OF UNIT, GAME AND SERIAL NUMBER, IN ADDITION TO A CLEAR DESCRIPTION OF THE PART AND PART NUMBER IF POSSIBLE.

UNIT PARTS LIST

UNIT NAME	CONTACT DISC	WIPER ASSEMBLY	RATCHET GEAR ASSEMBLY	MOTORS
REPLAY	-----	-----	A-6400	
BALL COUNT	C-6414	B-7456-6	A-6402-5	
NO. MATCH	C-6414	B-7456-2	A-6401	
PLAYER	C-6417	C-6521	A-6405-3	
COIN	C-6414	B-7456-9	A-6402-3	14A-7805 (60 CYCLE)
BONUS	C-6417	B-7456-21	A-6402-10	SCORE MOTOR
10 POINT	B-7253	A-6294	3C-7272	14A-7806 (50 CYCLE)
100 POINT	-----	-----	3C-7272	SCORE MOTOR
1000 POINT	B-7253	A-6294	3C-7272	
10000 POINT	B-7253	A-6294	3C-7272	
ALTERNATOR	-----	-----	3C-7272	

BALL COUNT UNIT DISC

THIS UNIT RESETS AT THE START OF A NEW GAME, (DURING RESET CYCLE). IT ADVANCES ONE STEP EACH TIME THE LAST PLAYER COMPLETES HIS TURN.

View looking at WIPER FINGER side
with WIPER in ZERO position.

DIAGRAM
LOCATION

TRIPS GAME OVER RELAY
IN 5 BALL GAME.

C-17 BLU-R

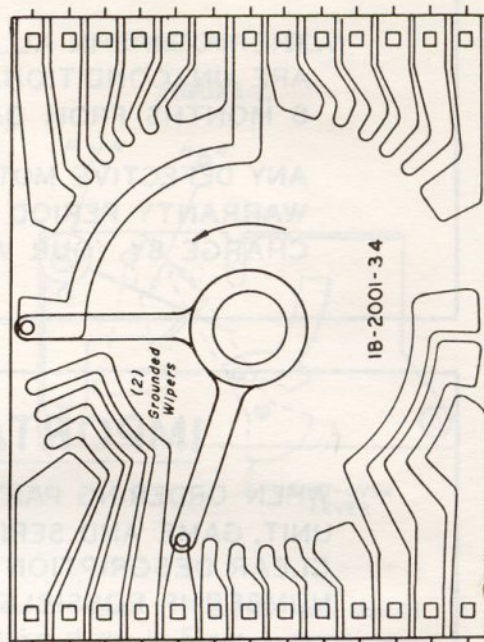
TRIPS GAME OVER RELAY
IN 3 BALL GAME.

C-17 BLU-BR

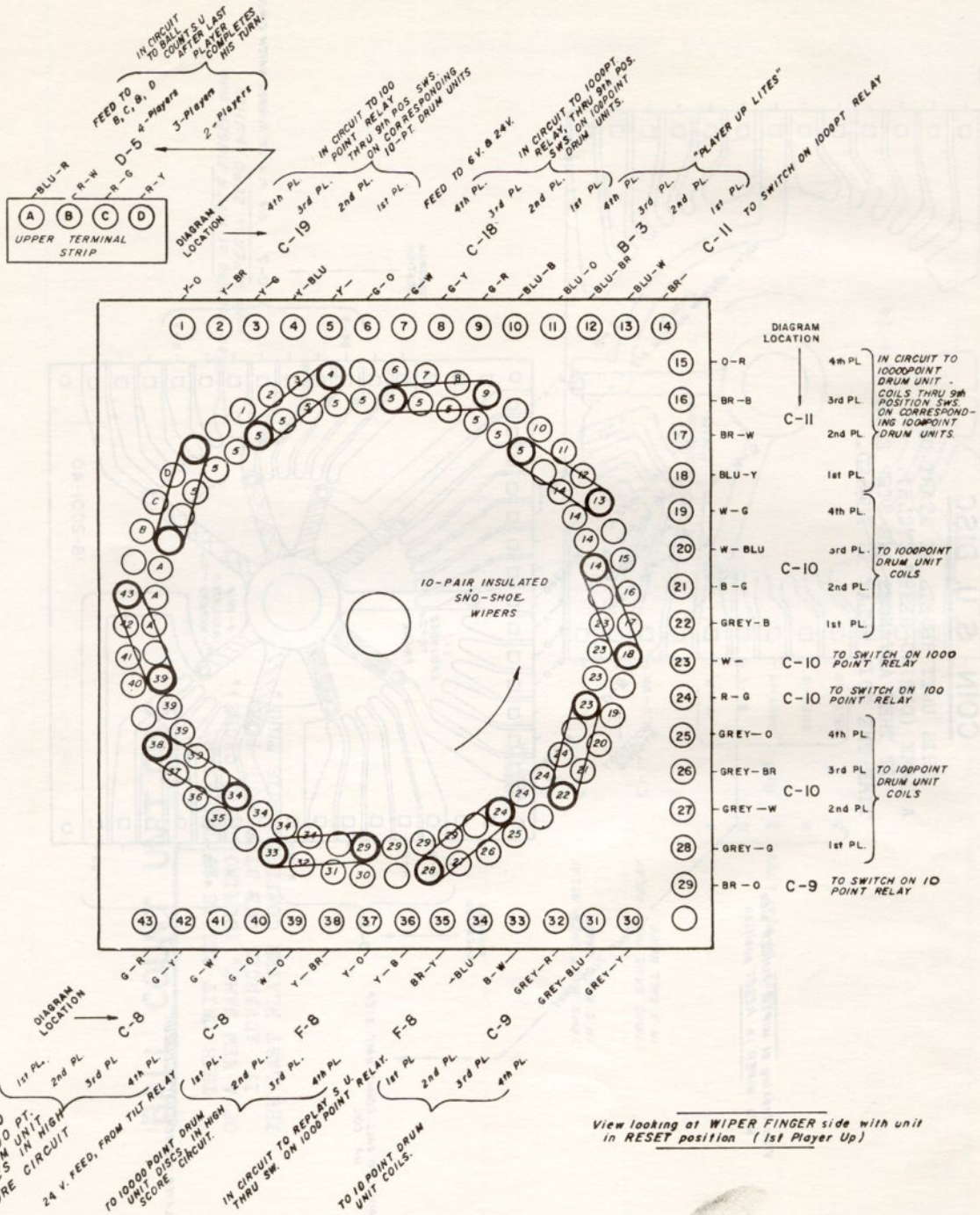
1 2 3 4 5
BALL IN PLAY LITES

B-3

W-B
B-Y
GREY-Y
GREY-G
GREY-BR

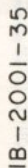


PLAYER UNIT DISC



THIS UNIT ADVANCES ONE STEP EACH TIME THE TEN POINT RELAY IS PULSED.

IN NO. MATCH CIRCUIT.
THESE WIRES COME FROM
10 PT. D.U. DISC.



BONUS UNIT

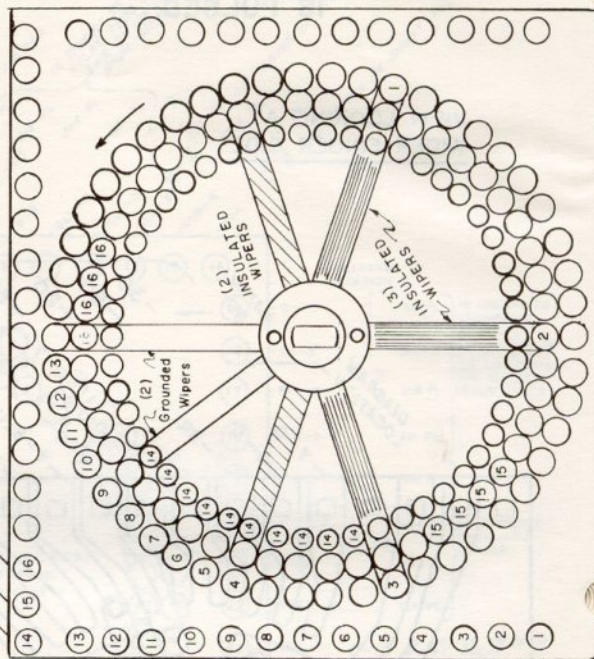
THE STEP-UP COIL IS ENERGIZED BY "ADVANCE RELAY" OR "BONUS ADVANCE RELAY". IT ALSO ADVANCES ONE STEP AT ZERO POSITION. IT RESETS ONE STEP AT A TIME, THRU BONUS RELAY, DOUBLE BONUS RE., OR TRIPLE BONUS RELAY. IT RESETS COMPLETELY WHEN OUTHOLE RELAY PULLS IN.

DIAGRAM LOCATION

B-Y
R-B
E-15
C-13

IN HOLD CIRCUIT TO BONUS ADVANCE RELAY.
IN CIRCUIT TO EJECT COILS.

View looking at WIPER FINGER side with WIPER in ZERO position.



1000	BLU-B	13
2000	BLU-BR	12
3000	BLU-Y	11
4000	BLU-R	10
5000	R-B	9
6000	B-G	8
7000	BR-B	7
8000	R-W	6
9000	O-W	5
10,000	O-B	4
	R-Y	3
	R-BLU	2
	R-BR	1

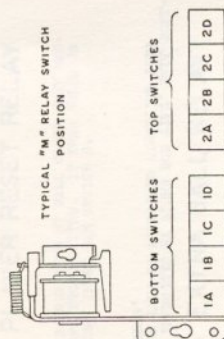
FEED FROM CAM SW. 6A.

TO BONUS UNIT S.U. COIL.

TO EJECT COILS.

RELAYS & SWITCHES

LOCATED ON MECHANISM PANEL



SWITCH TYPE

DIAGRAM LOCATION

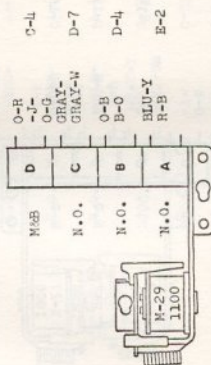
10¢ RELAY

OPENS IN CIRCUIT TO KNOCKER COIL AND CLOSSES TO RUN SCORE MOTOR.

PULSES REPLAY UNIT S.U. COIL, THRU IMPULSE CAM SWITCH B.

ENERGIZES LOCK RELAY.

IN HOLD CIRCUIT TO THIS RELAY.



25¢ RELAY

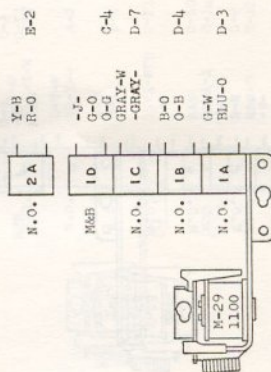
IN HOLD CIRCUIT TO THIS RELAY.

OPENS IN CIRCUIT TO KNOCKER COIL AND CLOSSES TO RUN SCORE MOTOR.

PULSES REPLAY UNIT S.U. COIL, THRU IMPULSE CAM SWITCH B.

ENERGIZES LOCK RELAY.

ENERGIZES COIN RELAY IN "6 PLAYS FOR 25¢".



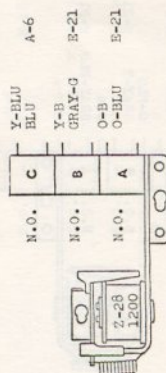
No. 2 STAR RELAY

No. 2 STAR RELAY

TO NUMBER 2 STAR LITE.

IN CIRCUIT TO EXTRA BALL RELAY.

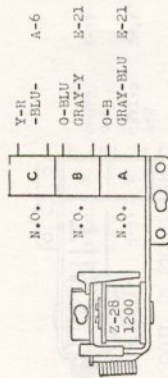
IN HOLD CIRCUIT TO THIS RELAY.



IS ENERGIZED BY "STAR SET-UP" RELAY, THRU SWITCH ON NO. 1 STAR RELAY.

No. 1 STAR RELAY

IS ENERGIZED BY "STAR SET-UP" RELAY, AT SCORE MOTOR CAM SWITCH 4C.



No. 1 STAR RELAY

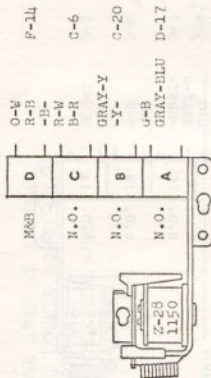
TO NUMBER 1 STAR LITE.

IN CIRCUIT TO NO. 2 STAR RELAY.

IN HOLD CIRCUIT TO THIS RELAY.

BALL INDEX RELAY

IS ENERGIZED BY 10 POINT, 100 POINT OR 1,000 POINT RELAY, THRU SWITCH ON EXTRA BALL RELAY.
ALSO BY TILT RELAY.



BALL INDEX RELAY

IN CIRCUIT TO EJECT COILS.

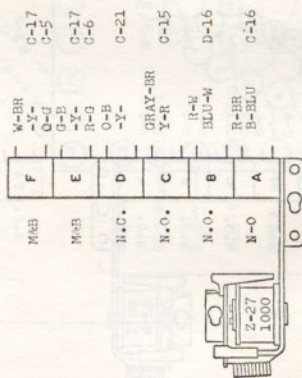
IN CIRCUIT TO BALL COUNT S.U. COIL---ALSO IN SERIES WITH SWITCH C ON PLAYER RESET RELAY.

IN SERIES WITH SWITCH A ON EXTRA BALL RELAY.

IN HOLD CIRCUIT TO THIS RELAY.

OUTHOLE RELAY

IS ENERGIZED BY OUTHOLE SWITCH, THRU INDEX CAM SWITCH D.



OUTHOLE RELAY

OPENS IN HOLD CIRCUIT TO TILT RELAY AND CLOSSES TO HUB SCORE MOTOR.

OPENS IN HOLD CIRCUIT TO BALL INDEX RELAY AND CLOSSES IN SERIES WITH SWITCH E ON EXTRA BALL RELAY.

IN HOLD CIRCUIT TO NO. 1 & NO. 2 STAR RELAYS, BALL RETURN RE., A & B ROLLOVER RE. AND ON BUMPER RE.

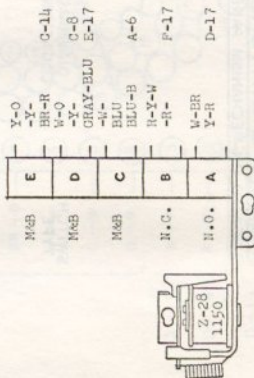
IN CIRCUIT TO BONUS UNIT RESET COIL.

ENERGIZES BALL RELEASE COIL, THRU SCORE MOTOR CAM SWITCH 4A.

IN HOLD CIRCUIT TO THIS RELAY.

TILT RELAY

IS ENERGIZED BY PLUMB BOB TILT, BALL ROLL-DOWN TILT OR FAIRFIELD VIBRATION TILT SWITCH.



TILT RELAY

OPENS CIRCUIT TO EJECT RELAY AND CLOSSES TO EJECT COILS.

OPENS SCORING CIRCUITS TO SCORE DRUMS AND CLOSSES TO BALL INDEX RELAY.

OPENS IN CIRCUIT TO PLAYFIELD LITES AND CLOSSES TO TILT LITE.

OPENS ALL SCORING CIRCUITS.

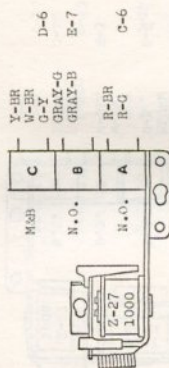
HOLD CIRCUIT TO THIS RELAY, THRU SWITCH ON OUTHOLE RELAY.

PLAYER RESET RELAY

OPENS IN CIRCUIT TO PLAYER UNIT S.U. COIL AND CLOSSES TO PLAYER UNIT RESET COIL.

IN NUMBER MATCH CIRCUIT TO REPLAY UNIT S.U. COIL.

HOLD CIRCUIT TO THIS RELAY, THRU INDEX CAM SWITCH B.



PLAYER RESET RELAY

IS ENERGIZED BY BALL COUNT UNIT END-OF-STROKE SWITCH. IT THEN HOLDS IN THRU INDEX CAM SWITCH B.

EXTRA BALL RELAY

IN CIRCUIT TO BALL INDEX RELAY.

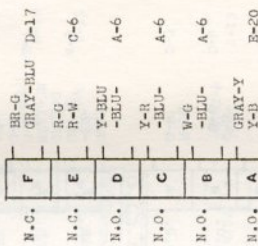
IN SERIES WITH SWITCH C ON BALL INDEX RELAY.

TO "NO. 2 STAR" LITE.

TO "NO. 1 STAR" LITE.

TO "SHOOT AGAIN" AND "NO. 3 STAR" LITES.

IN HOLD CIRCUIT TO THIS RELAY.



EXTRA BALL RELAY

IS ENERGIZED BY "STAR SET-UP" RELAY, THRU SWITCH ON "NO. 2 STAR" RELAY. ALSO BY HI-SCORE CIRCUIT THRU "REPLAY-EXTRA BALL" ADJUSTMENT JACK.

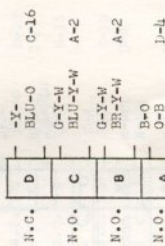
LOCK RELAY

ENERGIZES GAME-OVER RELAY (TRIP COIL).

6 VOLTS FROM TRANSFORMER TO LITES.

6 VOLTS FROM TRANSFORMER TO LITES.

IN HOLD CIRCUIT TO THIS RELAY.



LOCK RELAY

IS ENERGIZED BY LEFT FLIPPER BUTTON OR 5¢, 10¢, 25¢ OR COIN RELAYS.

EJECT RELAY

OPENS IN CIRCUIT TO BONUS UNIT S.U. AND CLOSSES IN CIRCUIT TO EJECT COILS.

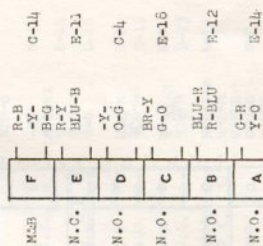
IN CIRCUIT TO SPIN RELAY, THRU (2) EJECT POCKET SWITCHES.

RUNS SCORE MOTOR.

PULSES 1,000 POINT RELAY, THRU BONUS, DOUBLE BONUS OR TRIPLE BONUS RELAYS.

IN CIRCUIT TO ALL RELAYS WHICH ARE PULLED IN BY SPINNER UNIT SWITCHES.

IN HOLD CIRCUIT TO THIS RELAY.

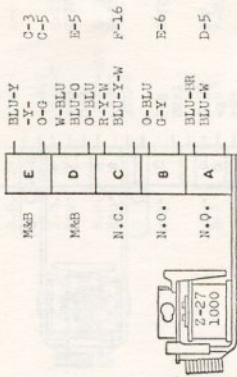


EJECT RELAY

IS ENERGIZED BY SPIN RELAY, THRU SCORE MOTOR CAM SWITCH 1E.

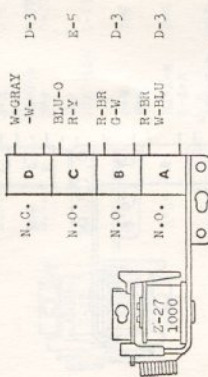
RESET RELAY

IS ENERGIZED BY COIN RELAY, THRU SWITCH ON GAME-OVER RELAY.



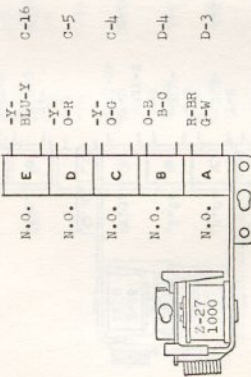
REPLAY RELAY

IS ENERGIZED BY REPLAY BUTTON, THRU ZERO SWITCH ON REPLAY UNIT.



COIN RELAY

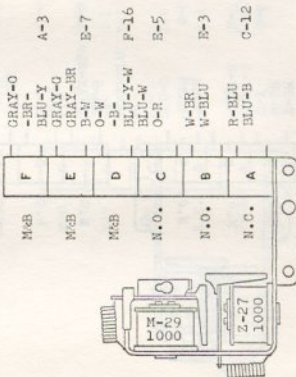
IS ENERGIZED BY REPLAY RELAY OR COIN SWITCH.



GAME OVER RELAY

INTERLOCK

LATCH COIL IS PULSED BY SCORE MOTOR CAM SWITCH 1A, THRU SWITCHES ON COIN RELAY. TRIP COIL IS ENERGIZED BY COIN RELAY, LOCK RELAY OR WIPER ON BALL COUNT UNIT.



RESET RELAY

OPENS IN CIRCUIT TO REPLAY RELAY AND CLOSSES TO RUN SCORE MOTOR.

OPENS IN CIRCUIT TO COIN UNIT S.U. AND CLOSSES TO RESET COILS ON COIN, BALL COUNT & GAME OVER.

OPENS ALL SCORING CIRCUITS ON PLAYFIELD.

IN CIRCUIT TO PLAYER UNIT RESET COIL.

IN HOLD CIRCUIT TO THIS RELAY, THRU (16) DRUM UNIT ZERO SWITCHES.

REPLAY RELAY

OPENS CIRCUIT TO COIN LOCKOUT COIL.

IN CIRCUIT TO REPLAY UNIT RESET COIL.

ENERGIZES COIN RELAY.

IN HOLD CIRCUIT TO THIS RELAY.

COIN RELAY

TRIPS GAME-OVER RELAY, THRU BALL COUNT OR PLAYER UNIT ZERO SWITCH.

ENERGIZES RESET RELAY, THRU SWITCH C ON GAME-OVER RELAY.

RUNS SCORE MOTOR.

ENERGIZES LOCK RELAY.

IN HOLD CIRCUIT TO THIS RELAY.

GAME OVER RELAY

OPENS TO PLAYER UP LITES AND CLOSSES TO NUMBER MATCH AND GAME-OVER LITES.

OPENS IN HI-SCORE CIRCUIT AND CLOSSES IN NUMBER MATCH CIRCUIT.

OPENS CIRCUITS TO PLAYFIELD SWITCHES AND CLOSSES IN CIRCUIT TO RESET COILS.

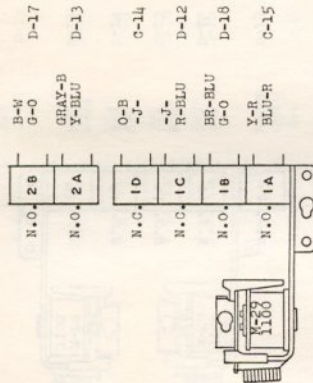
IN SERIES WITH SWITCH D ON COIN RELAY.

IN CIRCUIT TO REPLAY RELAY.

IN DELAY CIRCUIT TO SPIN RELAY. (IN SERIES WITH SWITCH 1C ON TRIPLE BONUS RELAY).

TRIPLE BONUS RELAY

IS ENERGIZED BY TRIPLE BONUS SWITCH ON SPINNER UNIT, THRU SWITCH B ON EJECT RELAY.



D-17 IN CIRCUIT TO 1,000 POINT RELAY, THRU SWITCH C ON EJECT RELAY.

D-13 HOLD CIRCUIT TO THIS RELAY, THRU BONUS UNIT ZERO SWITCH.

O-14 IN SERIES WITH SWITCH 1D ON DOUBLE BONUS RELAY. (ORIGINATES AT CAM SWITCH 4D).

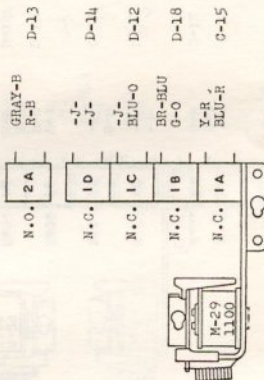
D-12 IN SERIES WITH SWITCH 1C ON DOUBLE BONUS RELAY.

D-18 PULSE 1,000 POINT RELAY, THRU SWITCH ON EJECT RELAY.

C-15 IN CIRCUIT TO BONUS UNIT RESET COIL.

DOUBLE BONUS RELAY

IS ENERGIZED BY DOUBLE BONUS SWITCH ON SPINNER UNIT, THRU SWITCH B ON EJECT RELAY.



D-13 HOLD CIRCUIT TO THIS RELAY, THRU BONUS UNIT ZERO SWITCH.

D-14 IN SERIES WITH SWITCH D ON BONUS RELAY.

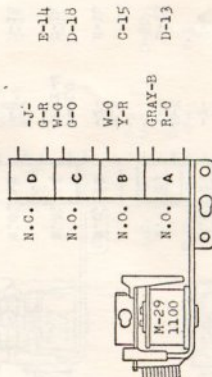
D-12 IN SERIES WITH SWITCH A ON DELAY RELAY.

D-18 PULSES 1,000 POINT RELAY, THRU SWITCH ON EJECT RELAY.

C-15 IN CIRCUIT TO BONUS UNIT RESET COIL.

BONUS RELAY

IS ENERGIZED BY BONUS SWITCHES ON SPINNER UNIT, THRU SWITCH B ON EJECT RELAY.



E-14 IN HOLD CIRCUIT TO EJECT RELAY.

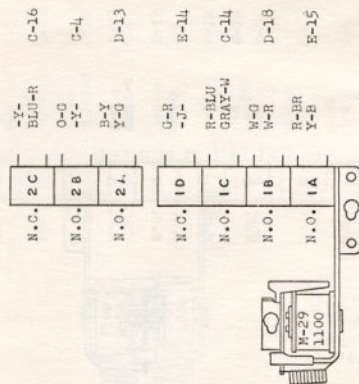
D-13 PULSES 1,000 POINT RELAY, THRU IMPULSE CAM SWITCH D AND SWITCH ON EJECT RELAY.

C-15 PULSES BONUS UNIT RESET COIL, THRU IMPULSE CAM SWITCH C.

D-13 HOLD CIRCUIT TO THIS RELAY, THRU ZERO SWITCH ON BONUS UNIT.

BONUS ADVANCE RELAY

IS ENERGIZED BY BONUS ADVANCE SWITCH ON
SPINNER UNIT, THRU SWITCH B ON EJECT RELAY.



IN SERIES WITH SWITCH 1B ON SPIN RELAY.

RUNS SCORE MOTOR.

IN HOLD CIRCUIT TO THIS RELAY.

IN HOLD CIRCUIT TO EJECT RELAY. (SEE SWITCH 1D ON 3,000
RELAY).

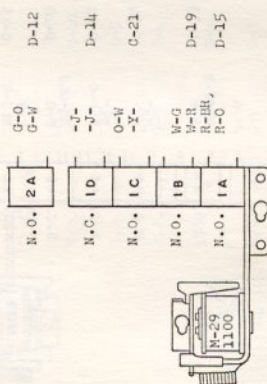
PULSES BONUS UNIT S.U., THRU IMPULSE CAM SWITCH B.

PULSES 100 POINT RELAY, THRU IMPULSE CAM SWITCH D.

IN CIRCUIT TO EJECT COILS, THRU 10TH POSITION ON BONUS
UNIT DISC.

A & B SET-UP RELAY

IS ENERGIZED BY A & B SET-UP SWITCH ON
SPINNER UNIT, THRU SWITCH B ON EJECT RELAY.



HOLD CIRCUIT TO THIS RELAY, THRU SCORE MOTOR CAM SWITCH 5B.

IN SERIES WITH SWITCH 1D ON BONUS ADVANCE RELAY.

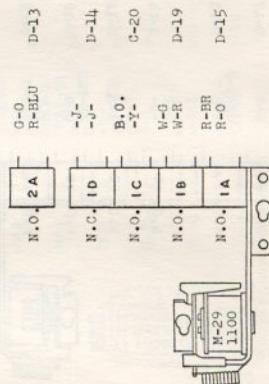
ENERGIZES A & B ROLLOVER RELAY.

PULSES 100 POINT RELAY, THRU IMPULSE CAM SWITCH D.

IN CIRCUIT TO EJECT COILS.

GATE SET-UP RELAY

IS ENERGIZED BY GATE SET-UP SWITCH ON
SPINNER UNIT, THRU SWITCH B ON EJECT RELAY.



HOLD CIRCUIT TO THIS RELAY, THRU SCORE MOTOR CAM SWITCH 5B.

IN SERIES WITH SWITCH 1D ON "A & B SET-UP" RELAY.

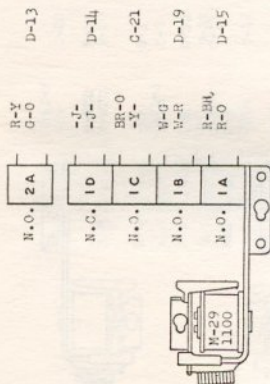
ENERGIZES GATE RELAY.

PULSES 100 POINT RELAY, THRU IMPULSE CAM SWITCH D.

IN CIRCUIT TO EJECT COILS.

STAR SET-UP RELAY

IS ENERGIZED BY STAR SET-UP SWITCHES ON SPINNER UNIT, THRU SWITCH B ON EJECT RELAY. IT THEN HOLDS IN UNTIL SCORE MOTOR CAM SWITCH 5B OPENS.



HOLD CIRCUIT TO THIS RELAY, THRU SCORE MOTOR CAM SWITCH 5B.

IN SERIES WITH SWITCH 1D ON GATE SET-UP RELAY.

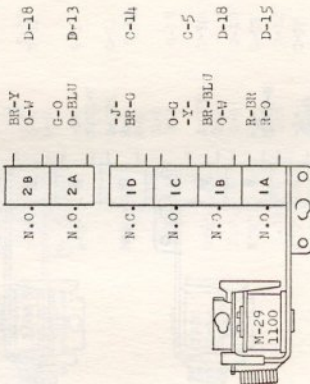
IN CIRCUITS TO EXTRA BALL, NO. 1 AND NO. 2 STAR RELAYS.

PULSES 100 POINT RELAY, THRU IMPULSE CAM SWITCH D.

IN CIRCUIT TO EJECT COILS.

3000 RELAY

IS ENERGIZED BY 3,000 SWITCHES ON SPINNER UNIT, THRU SWITCH B ON EJECT RELAY.



PULSES 1,000 POINT RELAY, THRU CAM SWITCH 3B.

HOLD CIRCUIT TO THIS RELAY, THRU SCORE MOTOR CAM SWITCH 5B.

IN SERIES WITH SWITCH 1D ON STAR SET-UP RELAY. (PHONE BONUS UNIT ZERO SWITCH).

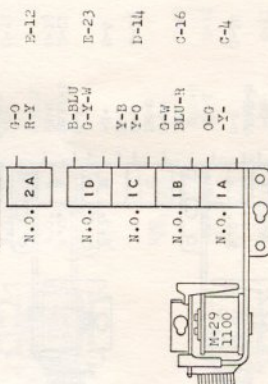
RUNS SCORE MOTOR.

IN CIRCUIT TO 1,000 POINT RELAY.

IN CIRCUIT TO EJECT COILS.

SPIN RELAY

IS ENERGIZED BY EJECT POCKET SWITCHES, THRU NORMALLY CLOSED SWITCH ON EJECT RELAY. IT ALSO IS ENERGIZED BY EJECT POCKET SWITCHES, THRU SWITCH ON DELAY RELAY.



HOLD CIRCUIT TO THIS RELAY, THRU SCORE MOTOR CAM SWITCH 5B.

ENERGIZES DELAY RELAY.

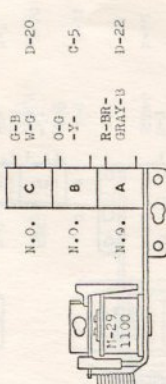
ENERGIZES EJECT RELAY, THRU SCORE MOTOR CAM SWITCH 1A.

RUNS SPINNER UNIT MOTOR, THRU SWITCH 2C ON BONUS ADVANCE RELAY.

RUNS SCORE MOTOR.

50 POINT RELAY

IS ENERGIZED BY (1) ROLLOVER BUTTON SWITCHES, CENTER TARGET SWITCH, OR ADVANCE RELAY.



PULSES 10 POINT RELAY, THRU IMPULSE CAM SWITCH D.

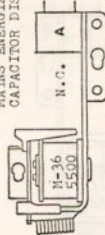
RUNS SCORE MOTOR.

IN HOLD CIRCUIT TO THIS RELAY.

DELAY RELAY

IS ENERGIZED WHEN TRANSISTOR (2H-4J.01) IS CONDUCTING.
SWITCH 1D ON SPIN RELAY CAUSES TRANSISTOR TO CONDUCT AND ALSO CHARGES CAPACITOR (50MFD-50V.)

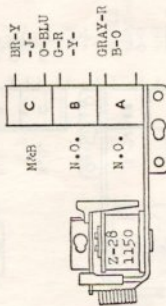
WHEN SPIN RELAY DROPS OUT, TRANSISTOR KEEPS CONDUCTING (AND THEREFORE DELAY RELAY REMAINS ENERGIZED) UNTIL SUCH TIME THAT THE CAPACITOR DISCHARGES.



E-12 IN CIRCUIT TO SPIN RELAY. (SEE SWITCH A ON GAMB-OVER RELAY).

GATE RELAY

IS ENERGIZED BY GATE SET-UP RELAY.



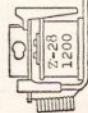
O-13 OPENS IN CIRCUIT TO 1,000 POINT RELAY AND CLOSSES TO ENERGIZE 3,000 RELAY.

B-7 TO RIGHT BOTTOM ROLLOVER LIFE.

C-20 HOLD CIRCUIT TO THIS RELAY, THRU TROUGH SWITCH.

ON BUMPER RELAY

IS ENERGIZED BY LEFT TOP OR RIGHT TOP TARGET SWITCH.



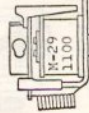
D-19 OPENS TO 10 POINT RELAY AND CLOSSES TO 100 POINT RELAY.

B-6 TO (3) JET BUMPER LITES.

D-21 HOLD CIRCUIT TO THIS RELAY, THRU SWITCH ON OUTHOLE RELAY.

ADVANCE RELAY

IS ENERGIZED BY LEFT OR RIGHT CENTER TARGET SWITCH, AND BY (2) ROLLOVER BUTTON SWITCHES.



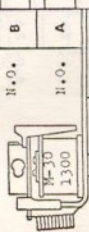
C-14 ENERGIZES BONUS UNIT S.U. COIL.

C-22 ENERGIZES 50 POINT RELAY.

C-20 HOLD CIRCUIT TO THIS RELAY, THRU BONUS UNIT END-OF-STROKE SWITCH.

A 8 B ROLLOVER RELAY

IS ENERGIZED BY A & B SET-UP RELAY.



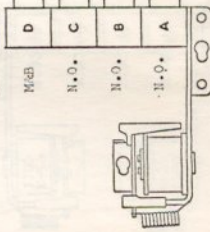
C-13 OPENS IN CIRCUIT TO 100 POINT RELAY AND CLOSSES TO ENERGIZE 3,000 RELAY.

B-7 TO LEFT & RIGHT TOP ROLLOVER LITES.

D-21 HOLD CIRCUIT TO THIS RELAY, THRU SWITCH ON OUTHOLE RELAY.

BALL RETURN RELAY

IS ENERGIZED BY CENTER TARGET SWITCH.



C-13 OPENS IN CIRCUIT TO 1,000 POINT RELAY AND CLOSSES TO ENERGIZE 3,000 RELAY.

D-20 ENERGIZES BALL RETURN COIL, THRU LEFT BOTTOM ROLLOVER SWITCH.

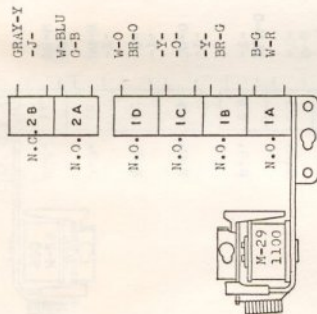
B-7 TO LEFT BOTTOM ROLLOVER LIFE.

E-21 IN HOLD CIRCUIT TO THIS RELAY.

10 POINT RELAY

IS PULSED BY:

1. LEFT, RIGHT AND BOTTOM JET BUMPER SWITCH, THRU SWITCH ON "ON BUMPER RELAY".
2. STAND-UP SWITCHES.
3. 50 POINT RELAY, THRU IMPULSE CAM SWITCH D.



C-20 IN HOLD CIRCUIT TO EXTRA BALL RELAY.

E-20 IN HOLD CIRCUIT TO THIS RELAY.

C-9 PULSES 10 POINT DRUM UNITS, THRU PLAYER UNIT DISC.

D-22 ENERGIZES MEDIUM CHIME COIL AND NUMBER MATCH S.U.

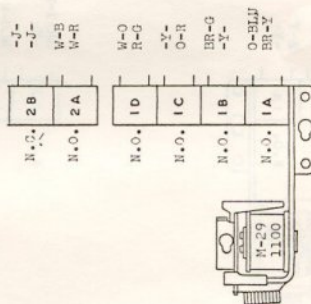
C-17 ENERGIZES BALL INDEX RELAY, THRU SWITCH ON EXTRA BALL RELAY.

E-19 PULSES 100 POINT RELAY, THRU 9TH POSITION SWITCHES ON 10 POINT DRUM UNITS.

100 POINT RELAY

IS PULSED BY:

1. TOP JET BUMPER SWITCH.
2. LEFT & RIGHT TOP TARGET SWITCHES.
3. BONUS ADVANCE RELAY.
4. A & B SET-UP RELAY.
5. STAND-UP RELAY.
6. STAR SET-UP RELAY.
7. LEFT & RIGHT TOP ROLLOVER SWITCH, THRU SWITCH ON A & B ROLLOVER RELAY.



C-20 IN SERIES WITH SWITCH 2B ON 10 POINT RELAY.

E-19 IN HOLD CIRCUIT TO THIS RELAY.

C-10 PULSES 100 POINT DRUM UNITS, THRU PLAYER UP DISC.

D-22 ENERGIZES SMALL CHIME COIL.

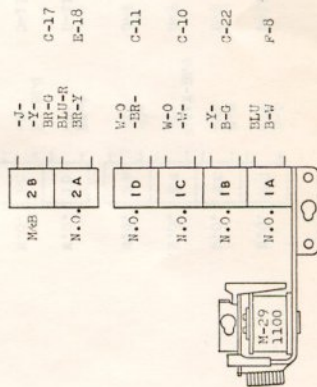
C-17 ENERGIZES BALL INDEX RELAY, THRU SWITCH ON EXTRA BALL RELAY.

E-19 PULSES 1,000 POINT RELAY, THRU 9TH POSITION SWITCHES ON 100 POINT DRUM UNITS.

1000 POINT RELAY

IS PULSED BY:

1. 5,000 RELAY.
2. TRIPLE BONUS, DOUBLES BONUS AND BONUS RELAYS.
3. LEFT BOTTOM ROLLOVER SWITCH.



C-17 CLOSING TO ENERGIZE BALL INDEX RELAY, AND OPENS IN SERIES CIRCUIT WITH SWITCH 2B ON 100 POINT RELAY.

E-19 IN HOLD CIRCUIT TO THIS RELAY.

C-11 PULSES 10,000 POINT DRUM UNITS, THRU 9TH POSITION SWITCHES ON 1,000 POINT DRUM UNITS.

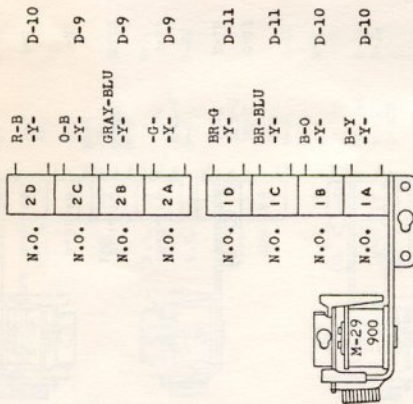
C-10 PULSES 1,000 POINT DRUM UNITS THRU PLAYER UP DISC.

C-22 ENERGIZES LARGE CHIME COIL.

F-8 IN HI-SCORE CIRCUIT TO REPLAY S.U. OR EXTRA BALL RELAY.

I-2 RESET RELAY

IS PULSED BY IMPULSE CAM SW. E, THRU SWITCH A ON RESET RELAY.

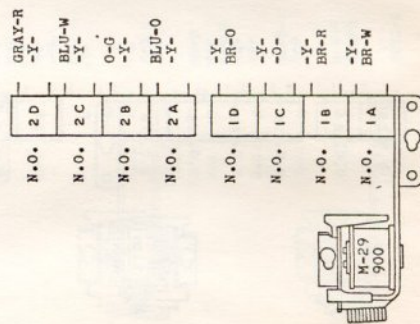


THESE SWITCHES PULSE THE INDICATED DRUM UNIT, THRU ZERO SWITCH ON THAT UNIT.

2ND PLAYER 100 POINT DRUM UNIT.
1ST PLAYER 100 POINT DRUM UNIT.
2ND PLAYER 10 POINT DRUM UNIT.
1ST PLAYER 10 POINT DRUM UNIT.
2ND PLAYER 10,000 POINT DRUM UNIT.
1ST PLAYER 10,000 POINT DRUM UNIT.
2ND PLAYER 1,000 POINT DRUM UNIT.
1ST PLAYER 1,000 POINT DRUM UNIT.

3-4 RESET RELAY

IS PULSED BY IMPULSE CAM SW. A, THRU SWITCH A ON RESET RELAY.



THESE SWITCHES PULSE THE INDICATED DRUM UNIT, THRU ZERO SWITCH ON THAT UNIT.

4TH PLAYER 100 POINT DRUM UNIT.
3RD PLAYER 100 POINT DRUM UNIT.
4TH PLAYER 10 POINT DRUM UNIT.
3RD PLAYER 10 POINT DRUM UNIT.
3RD PLAYER 10,000 POINT DRUM UNIT.
4TH PLAYER 10,000 POINT DRUM UNIT.
4TH PLAYER 1,000 POINT DRUM UNIT.
3RD PLAYER 1,000 POINT DRUM UNIT.