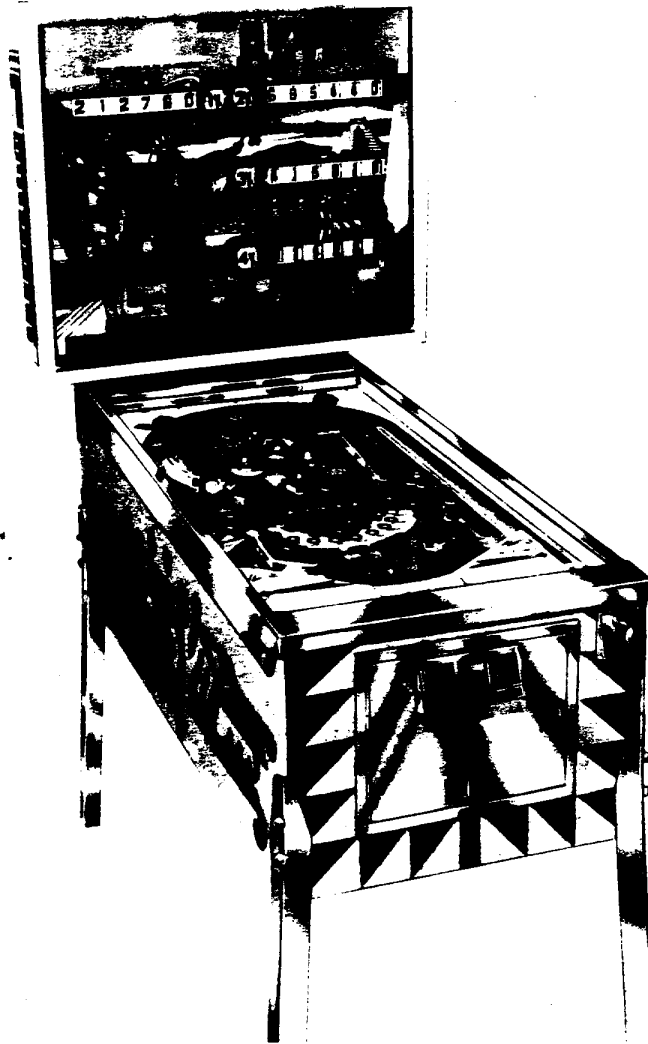


• Instruction Manual for **AZTEC**



Williams[®] ELECTRONICS, INC.

A SUBSIDIARY OF
THE SEEBURG CORPORATION OF DELAWARE

3401 N. California Ave.
(312) 267-2240

JULY
1976

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

1. 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.

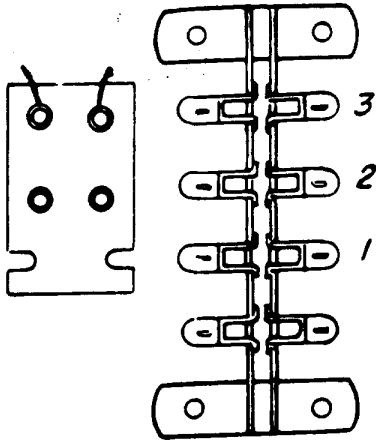
Solenoid Plungers should not have a lubricant of any kind. Should there be a sluggish tendency or if plungers are sticking, the parts should be cleaned with a solvent and flaked graphite applied on reassembly.

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.

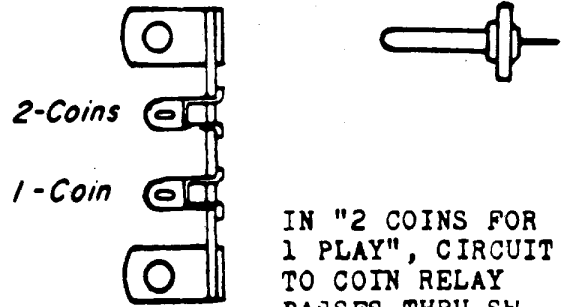
ADJUSTMENTS ON MECHANISM PANEL

10¢ Adjustment



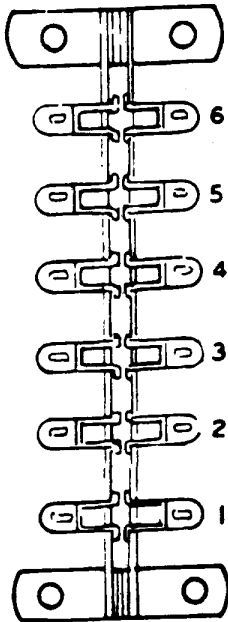
PROVIDES
1, 2 OR
3 PLAYS
FOR ONE
COIN.

5¢ Adjustment

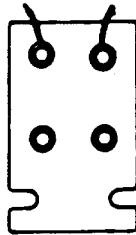


IN "2 COINS FOR
1 PLAY", CIRCUIT
TO COIN RELAY
PASSES THRU SW.
ON ALTERNATOR
UNIT.

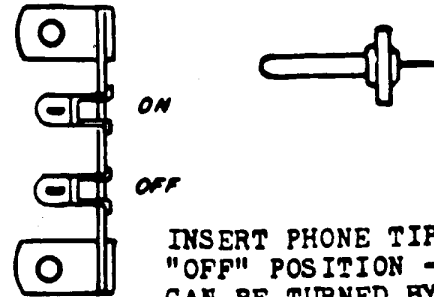
25¢ Adjustment



PROVIDES 1, 2, 3, 4, 5
OR 6 PLAYS FOR 25¢.



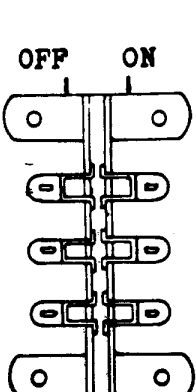
Motor Service Jack



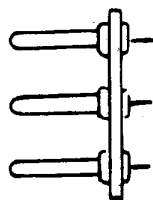
INSERT PHONE TIP IN
"OFF" POSITION - CAMS
CAN BE TURNED BY HAND
TO CHECK ADJUSTMENT OF
SWITCHES.

MASTER ON-OFF SW.

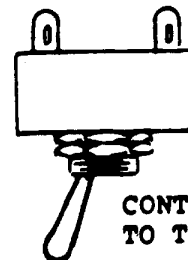
(Located under front of
Cabinet)



1 COIN- 1 PLAY
2 COINS- 3 PLAYS



IN "ON" POSITION, 10¢
ADJUSTMENT MUST BE IN #2 PO-
SITION & 25¢ ADJUSTMENT MUST
BE IN #6 POSITION. FIRST
COIN ADVANCES CREDIT UNIT 1
STEP. SECOND COIN WILL AD-
VANCE CREDIT UNIT 2 STEPS.
IN "OFF" POSITION, 25¢
ADJUSTMENT AND/OR 10¢ AD-
JUSTMENT SHOULD BE PUT IN
PROPER POSITION.



CONTROLS POWER
TO TRANSFORMER

ADJUSTMENTS IN BACKBOX

Hi-Score Adjustment

PLUG IN RED
WIRE FOR SCORES
110,000 TO 200,000

10,000 60,000

PLUG IN BLUE
WIRE FOR SCORES
210,000 TO 300,000

20,000 70,000

PLUG IN YELLOW
WIRE FOR SCORES
310,000 TO 400,000

30,000 80,000

40,000 90,000

50,000 00,000

PLUG IN WHITE
WIRE FOR SCORES
510,000 TO 600,000

PLUG IN BROWN
WIRE FOR SCORES
610,000 TO 700,000

PLUG IN ORANGE
WIRE FOR SCORES
710,000 TO 800,000

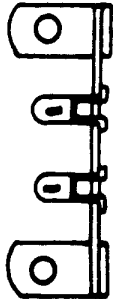
PLUG IN GREEN
WIRE FOR SCORES
410,000 TO 500,000

PLUG IN GRAY
WIRE FOR SCORES
910,000 TO 990,000

PLUG IN BLACK
WIRE FOR SCORES
810,000 TO 900,000

EXAMPLE: BLUE WIRE INTO 10,000 POSITION SCORES AT 210,000
OR BLUE WIRE INTO 00,000 POSITION SCORE AT 300,000.

PLAY ADJUSTMENT

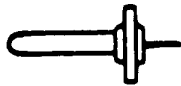


CREDIT

EXTRA BALL

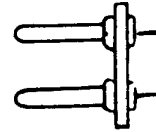
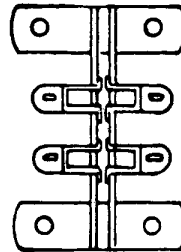
IN CREDIT POSITION: HI-SCORES & LEFT OR RIGHT BOTTOM ROLLOVER, WHEN LIT FOR "SPECIAL", WILL SCORE A CREDIT.

IN EXTRA BALL POSITION, THE ABOVE WILL PULSE EX. BALL RE.



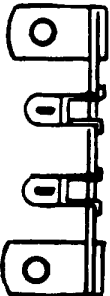
NUMBER MATCH ADJUSTMENT

ON OFF



IN "ON" POSITION, A CREDIT IS SCORED IF LAST TWO DIGITS IN POINT SCORE ARE IDENTICAL TO NUMBER MATCH LITE. IN "OFF" POSITION, NUMBER MATCH IS INOPERATIVE.

No. of Balls Adjustment



5 BALL

3 BALL



Plug changes 3 to 5 ball play, or vice versa.

SUGGESTED SCORE CARDS

CREDIT

5 BALL...466-1

3 BALL...466-2

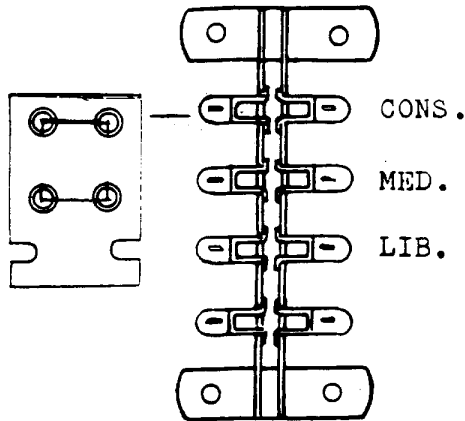
EXTRA BALL

5 BALL...466-45

3 BALL...466-41

LOCATED ON PLAYFIELD

FEATURE ADJ.



IN CONSERVATIVE POSITION, SET-UP RELAY WILL PULL IN WHEN A,Z,T,E AND C RELAYS ARE ENERGIZED. (SET-UP RELAY IS IN CIRCUIT TO LEFT & RIGHT BOTTOM ROLLOVER "SPECIALS").

IN MEDIUM POSITION, SET-UP RELAY WILL PULL IN WHEN A,Z AND T RELAYS ARE ENERGIZED.

IN LIBERAL POSITION, SET-UP RELAY WILL PULL IN WHEN A,Z AND T RELAYS OR A,E AND C RELAYS ARE ENERGIZED.

SEQUENCE OF OPERATION

RESET CYCLE

CREDIT UNIT RESET COIL IS ENERGIZED BY SWITCH ON RESET RELAY, THRU SCORE MOTOR INDEX CAM SWITCH A, CREDIT BUTTON, ZERO SWITCH ON CREDIT UNIT, AND SWITCH ON GAME-OVER RELAY OR COIN UNIT LAST POSITION BREAK SWITCH.

END-OF-STROKE SWITCH ON CREDIT UNIT RESET COIL WILL ENERGIZE COIN RELAY.

SWITCHES ON COIN RELAY WILL RUN SCORE MOTOR, TRIP GAME-OVER RELAY, AND ENERGIZE RESET RELAY.

SWITCHES ON RESET RELAY WILL OPEN CIRCUITS TO PLAYFIELD SWITCHES AND OUTHOLE RELAY, RUN SCORE MOTOR, ENERGIZE RESET COILS ON COIN UNIT-BALL COUNT UNIT-PLAYER UNIT AND GAME-OVER RELAY, PULSE NO. 1, NO. 2 AND NO. 3 RESET RELAYS, AND ENERGIZE BONUS RELAY.

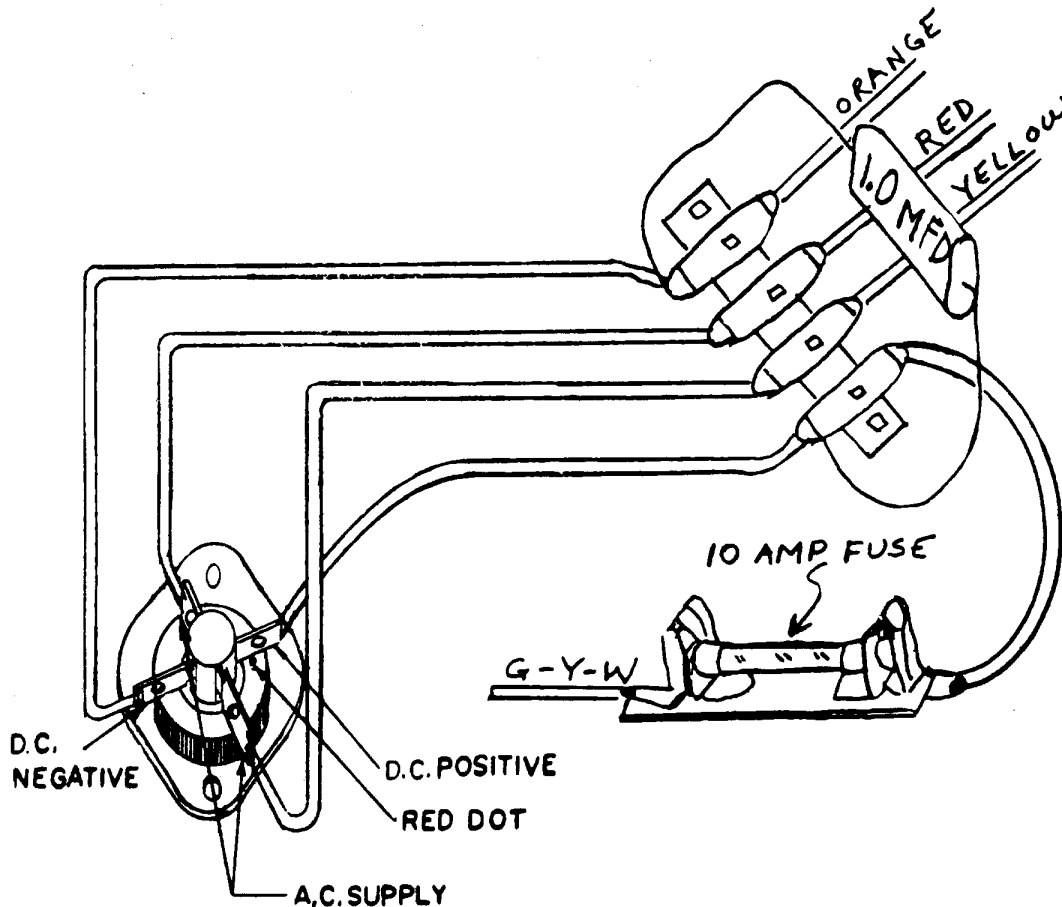
SWITCHES ON NO. 1, NO. 2 AND NO. 3 RESET RELAYS, WILL PULSE THE (20) SCORING DRUM UNITS UNTIL THEY REACH ZERO.

SWITCHES ON BONUS RELAY WILL RUN SCORE MOTOR, HOLD RESET RELAY IN AND PULSE BONUS UNIT RESET COIL, (BONUS RELAY IS HELD IN BY ZERO SWITCH ON BONUS UNIT).

WHEN BONUS RELAY DROPS OUT, OUTHOLE RELAY IS ENERGIZED THRU ZERO SWITCH ON BONUS UNIT AND INDEX CAM SWITCH C.

SWITCHES ON OUTHOLE RELAY WILL RUN SCORE MOTOR, PULSE BONUS UNIT S.U. COIL, AND PULSE BALL RELEASE COIL TO PROPEL BALL TOWARD PLUNGER.

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.

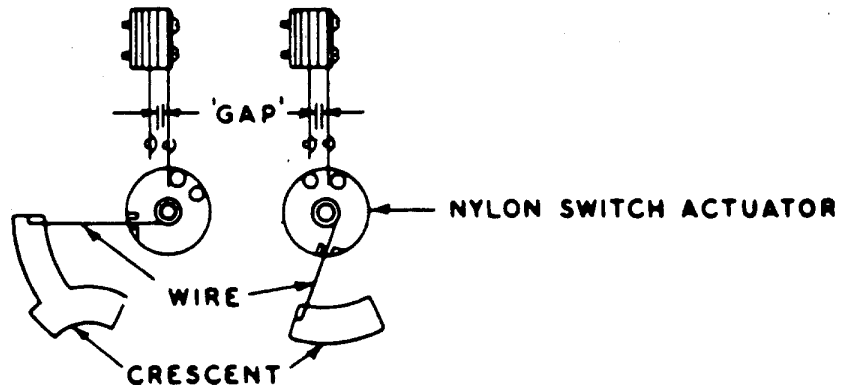
THE BRIDGE RECTIFIER SHOULD PRACTICALLY NEVER NEED REPLACING, AS IT IS RATED WELL OVER THE VOLTAGE AND CURRENT REQUIREMENTS OF THE COMPONENTS IT SUPPLIES.

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.

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.

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.**

IMPORTANT NOTICE

**KINDLY INFORM LOCATIONS THAT THEY
CAN TURN DISPLAY LIGHTS ON BY FLIPPING
MASTER SWITCH ON.**

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

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.

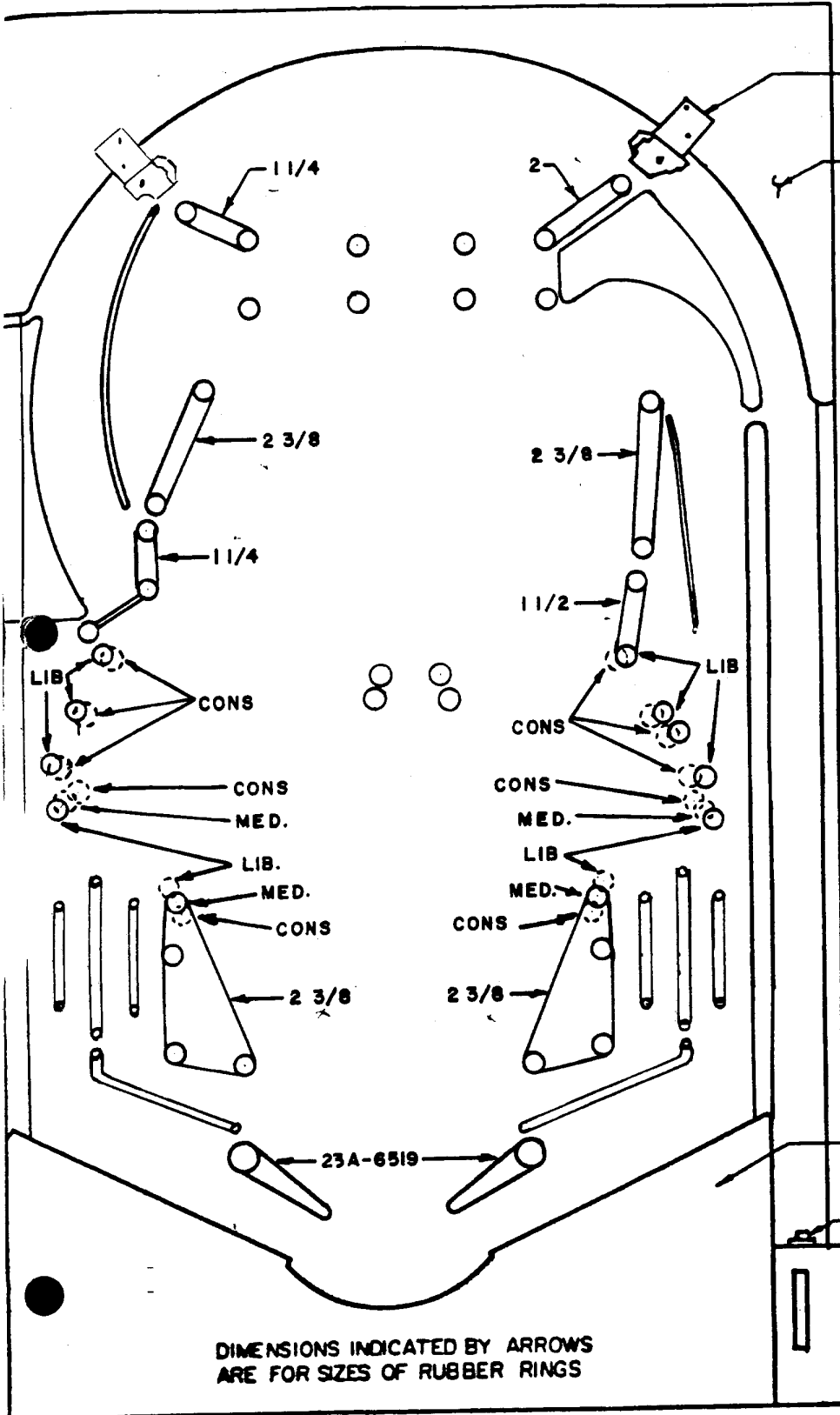
UNIT PARTS LIST

UNIT NAME	CONTACT DISC	WIPER ASSEMBLY	RATCHET GEAR ASSEMBLY	MOTORS
REPLAY BALL COUNT	----- C-6414	----- B-7456-6	A-6400 A-6402-5	SCORE MOTOR
(RIGHT SIDE)	B-7568	A-7614	A-7548-1	
NO. MATCH (LEFT SIDE)	B-7569	A-7615		
PLAYER	C-6417	C-6521-9	A-6404-3	14A-7883 (60 CYCLE)
COIN	C-6414	B-7456-9	A-6402-3	14A-7884 (50 CYCLE)
BONUS	C-6417	B-7456-64	A-6402-10	
10 POINT	B-7253	A-6294	3C-7272	
100 POINT	-----	-----	3C-7272	
1000 POINT	-----	-----	3C-7272	
10000 POINT	B-7253	A-6294	3C-7272	
100000 POINT	B-7253	A-6294	3C-7272	
ALTERNATOR	-----	-----	3C-7272	

AZTEC

POST ADJUSTMENT SHEET

TO MAKE GAME MORE "CONSERVATIVE" OR "LIBERAL" - MOVE POST 3/16" AS SHOWN IN SKETCH BELOW. SPOTTING HOLES ARE PROVIDED AND CAN BE SEEN ON REMOVAL OF POSTS.



A-4817
BALL GATE ASSEMBLY

1C-2852-416
TOP ARCH

ABBREVIATIONS:
CON. - CONSERVATIVE
LIB. - LIBERAL

RUBBER RING NUMBERS:

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

FLIPPER RUBBER - 23A-6519

D-7473
BOTTOM ARCH

23A-6327
BALL SHOOTER RUBBER TIP

DIMENSIONS INDICATED BY ARROWS
ARE FOR SIZES OF RUBBER RINGS

"AZTEC" COIL CHART

NOTICE:

THIS GAME OPERATES ON 24 VOLTS. WHEN ORDERING REPLACEMENT TRANSFORMERS, MOTORS, COILS OR METERS ... MAKE SURE TO SPECIFY CORRECT PART NUMBER.

<u>NUMBER</u>	<u>DESCRIPTION</u>	<u>LOCATION</u>
<u>MOTORS & TRANSFORMERS</u>		
14 A-7883	CONTROL MOTOR -- 60 CYCLE	MECH. PANEL
14 A-7884	CONTROL MOTOR - 50 CYCLE	MECH. PANEL
15 A-6771	TRANSFORMER - 60 CYCLE	MECH. PANEL
15 A-6782-1	TRANSFORMER - 50 CYCLE	MECH. PANEL
B 6396	24 VOLT METER	MECH. PANEL
<u>SOLENOID COILS</u>		
A 22-550	COIN UNIT STEP UP BONUS UNIT STEP UP BALL RELEASE COIL PLAYER UNIT STEP UP	MECH. PANEL PLAYFIELD PLAYFIELD INSERT
A 23-600	BALL COUNT UNIT STEP UP CREDIT UNIT STEP UP	MECH. PANEL INSERT
A2-23-750	KNOCKER	CABINET
A2-26-1300	TRIPLE CHIMES COILS ... (3 req'd.)	CABINET
B1-26-800	SCORE DRUM UNITS ... (20 req'd.) CREDIT UNIT RESET PLAYER UNIT RESET BALL COUNT UNIT RESET COIN UNIT RESET BONUS UNIT RESET	INSERT INSERT INSERT MECH. PANEL MECH. PANEL PLAYFIELD
FL 20-300/ 28-400	FLIPPERS ... (2 req'd.)	PLAYFIELD
G 23-750	SHOOTER COIL	PLAYFIELD
G 23-750 D.C.	D.C. JET BUMPER COILS ... (3 req'd.) D.C. KICKER COILS ... (2 req'd.)	PLAYFIELD PLAYFIELD
M 29-900	NO. 3 RESET RELAY	INSERT
M 28-700	GAME OVER RELAY TRIP	MECH. PANEL
M 29-1000	BONUS RELAY	PLAYFIELD
.M 29-1100	10¢ RELAY 25¢ RELAY 10 POINT RELAY 100 POINT RELAY 1,000 POINT RELAY 10,000 POINT RELAY ADVANCE RELAY CENTER TARGET RELAY 5,000 RELAY NO. 1 RESET RELAY NO. 2 RESET RELAY	MECH. PANEL MECH. PANEL INSERT INSERT INSERT INSERT PLAYFIELD PLAYFIELD PLAYFIELD INSERT INSERT
M 30-1300	COIN SET UP RELAY	MECH. PANEL
M 30-1400	SET UP RELAY	PLAYFIELD
M1-31-1500	COIN LOCKOUT COIL	FRONT DOOR
XM 27-675	TOTAL PLAY METER COIL	CABINET
XS 28-1000	ALTERNATOR UNIT NUMBER MATCH UNIT	MECH. PANEL INSERT
Z 27-1000	COIN RELAY RESET RELAY PLAYER RESET RELAY OUTHOLE RELAY GAME OVER RELAY LATCH SHOOTER RELAY	MECH. PANEL MECH. PANEL MECH. PANEL MECH. PANEL MECH. PANEL PLAYFIELD
Z 28-1150	CHANGE RELAY "A" RELAY "Z" RELAY "T" RELAY "E" RELAY "C" RELAY DOUBLE BONUS RELAY BALL INDEX RELAY TILT RELAY EXTRA BALL RELAY	PLAYFIELD PLAYFIELD PLAYFIELD PLAYFIELD PLAYFIELD PLAYFIELD PLAYFIELD MECH. PANEL MECH. PANEL MECH. PANEL
Z 29-1250	LOCK RELAY	MECH. PANEL

● JACK LAYOUT

GAME AZTEC

POSITION PAN-INS. SIZE 24

FEED	<u>B.</u>
"	<u>R.</u>
COIN LOCKOUT	<u>B/R</u> <u>R-A</u>
CREDIT RESET	<u>W</u> <u>O</u>
"	<u>W</u> <u>BLU.</u>
"	<u>W</u> <u>BR-1</u>
KNOCKER	<u>B</u> <u>W</u>
RESET RE.	<u>BLU</u> <u>BR-1</u>
BALL COUNT S.U.	<u>BLU</u> <u>R-1</u>
No. 1 BALL LITE	<u>W</u> <u>R-5</u>
FEED	<u>BR.</u>
No. 3 RESET RE.	<u>B</u> <u>BLU.</u>
PAN = PANEL	

1	<u>R/Y</u> <u>Y-1</u> BALL COUNT S.U.	<u>GRY</u> <u>Y-1</u> No. 3 BALL LITE
2	<u>R</u> <u>G-1</u> " " "	<u>BLU-2</u> <u>BLU-2</u> 1ST PL. MATCH
3	<u>Y</u> <u>BR</u> PLAYER S.U.	<u>R</u> <u>BR-2</u> " " "
4	<u>G</u> <u>Y</u> PLAYER RESET	<u>BR</u> <u>O</u> 3RD " " "
5	<u>GRY</u> <u>Y-A</u> EX-BALL RE.	<u>BR</u> <u>Y-5</u> 4TH " " "
6	<u>B</u> <u>O-1</u> #1 & #2 SCORE RESET RELAYS	<u>GRY</u> <u>B-2</u> CREDIT S.U.
7	<u>GRY</u> <u>O-2</u> CREDIT S.U.	<u>O-2</u> <u>O-2</u> MED. CHIME
8	<u>-Y.</u> <u>FEED</u>	<u>BLU</u> <u>B-2</u> TILT LITE
9	<u>W</u> <u>G-4</u> SHOOT AGAIN LITE	<u>BR</u> <u>G-4</u> BALL IND. RE.
10	<u>B</u> <u>Y-6</u> No. 2 BALL LITE	<u>G</u> <u>W</u> COIN RE.
11	<u>O</u> <u>R-5</u> 5TALL CHIME	
12	<u>B</u> <u>G-3</u> LARGE "	
PAN = INSERT		

● JACK LAYOUT

GAME AZTEC

POSITION PAN-INS. SIZE 20

1	<u>GRY</u> <u>W-3</u> 1-CAN PLAY LITE
2	<u>Y</u> <u>G-1</u> 2- " " "
3	<u>O</u> <u>W</u> 3- " " "
4	<u>O</u> <u>R-3</u> 4- " " "
5	<u>R</u> <u>W</u> BALL COUNT S.U.
6	<u>BLU</u> <u>R-4</u> G-O. RE. TRIP
7	<u>BLU</u> <u>Y-5</u> " " "
8	<u>GRY</u> <u>G-2</u> No. 4 BALL LITE
9	<u>GRY</u> <u>BR-2</u> No. 5 " " "
10	<u>BLANK</u>

JACK LAYOUT

GAME AZTEC

POSITION PAN - P.F. SIZE 16

		<u>B-A</u>	<u>SHOOTER RE.</u>	
<u>FEED</u>	<u>-B-</u>	<u>BR.</u>	" "	
"	<u>-R-</u>	<u>G-2</u>	" <u>COIL</u>	
<u>TOTOR RUN</u>	<u>0/G</u>	<u>GRY</u>	<u>BONUS RE.</u>	
<u>RESET RE.</u>	<u>BR-1</u>	<u>G-4</u>	" "	
<u>BONUS RESET</u>	<u>0-A</u>	<u>GRY</u>	" "	
"	"	<u>BLU-4</u>	" "	
"	"	<u>0/W-1</u>	<u>OUTHOLE RE.</u>	
<u>FEED</u>	<u>-Y-</u>	<u>W/G-4</u>	<u>SHOOT AGAIN</u>	
<u>ADVANCE RE.</u>	<u>BR-2</u>	<u>B/W-4</u>	<u>10,000 PT. RE.</u>	
<u>PAN. = PANEL</u>				

PAN. = PANEL

P.F. = PLAYFIELD

JACK LAYOUT

GAME AZTEC

POSITION PAN - P.F. SIZE 20

<u>FEED</u>	<u>Y/W</u>	<u>W/G-2</u>	<u>NO.1 RE.</u>
<u>BONUS S.U.</u>	<u>GRY</u>	<u>Y-2</u>	<u>EX-BALL RE.</u>
<u>BALL RELEASE</u>	<u>B</u>	<u>Y-2</u>	<u>1000 PT. RE.</u>
<u>TILT RE.</u>	<u>W/BR-4</u>		<u>LITE FEED</u>
"	<u>Y/R-2</u>		<u>BONUS S.U.</u>
<u>R-FLIPPER</u>	<u>BR</u>	<u>W-5</u>	<u>L-FLIPPER</u>
<u>10,000 PT. RE.</u>	<u>R/Y</u>	<u>0-1</u>	<u>10,000 PT. RE.</u>
"	"	<u>B/O</u>	" "
"	"	<u>BR/B-2</u>	<u>ADVANCE RE.</u>
<u>BLANK</u>			<u>BLANK</u>

BLANK

JACK LAYC

JACK LAYOUT

GAME AZTEC

GAME AZTEC

POSITION P.F. - INS. SIZE 12

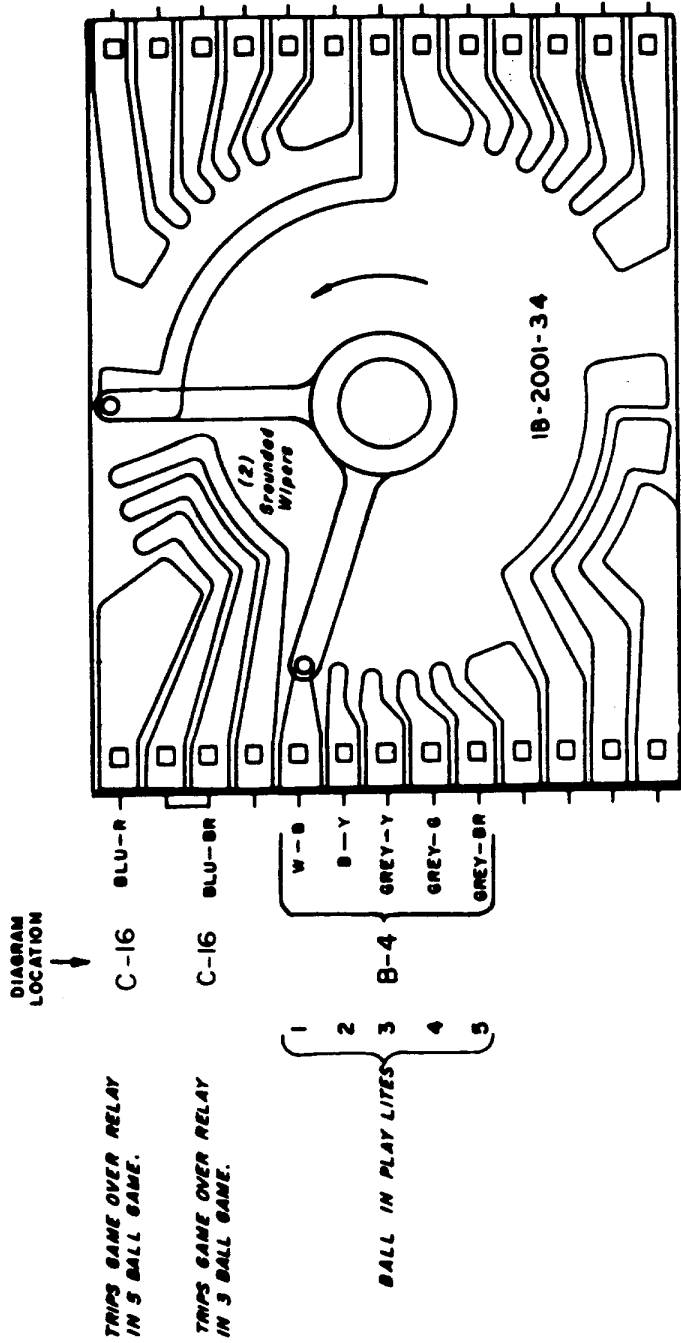
POSITION PAN - INS. SIZE 10

<u>GRY</u> Y-3	<u>BR</u> Y	<u>1000 PT. RE.</u>	<u>D.U. FEED</u> W-5	<u>BLU</u> Y-3	<u>PLAYER LITES</u>
<u>CREDIT LITE</u>	<u>100 PT. RE.</u>	<u>CREDIT S.U.</u>	<u>W-1</u>	<u>GRY</u> O-1	<u>G-O-LITE</u>
<u>BALL IND. RE.</u>	<u>10 PT. RE.</u>	<u>COIN RE.</u>	<u>R-1</u>	<u>Y</u> B-5	<u>EX-BALL RE.</u>
<u>CHANGE RE.</u>	<u>BLANK</u>	<u>CREDIT S.U.</u>	<u>BR</u>		<u>BLANK</u>
<u>CREDIT S.U.</u>	<u>BLANK</u>	<u>G-O. RE. TRIP</u>	<u>GRY</u> BR		<u>BLANK</u>
<u>10,000 PT. RE.</u>	<u>BLANK</u>		<u>BLU</u> BR-4		
<u>BLANK</u>					
<u>P.F. = PLAYFIELD</u>	<u>INS. = INSERT</u>				
		<u>PAN. = PANEL</u>			

BALL COUNT UNIT DISC

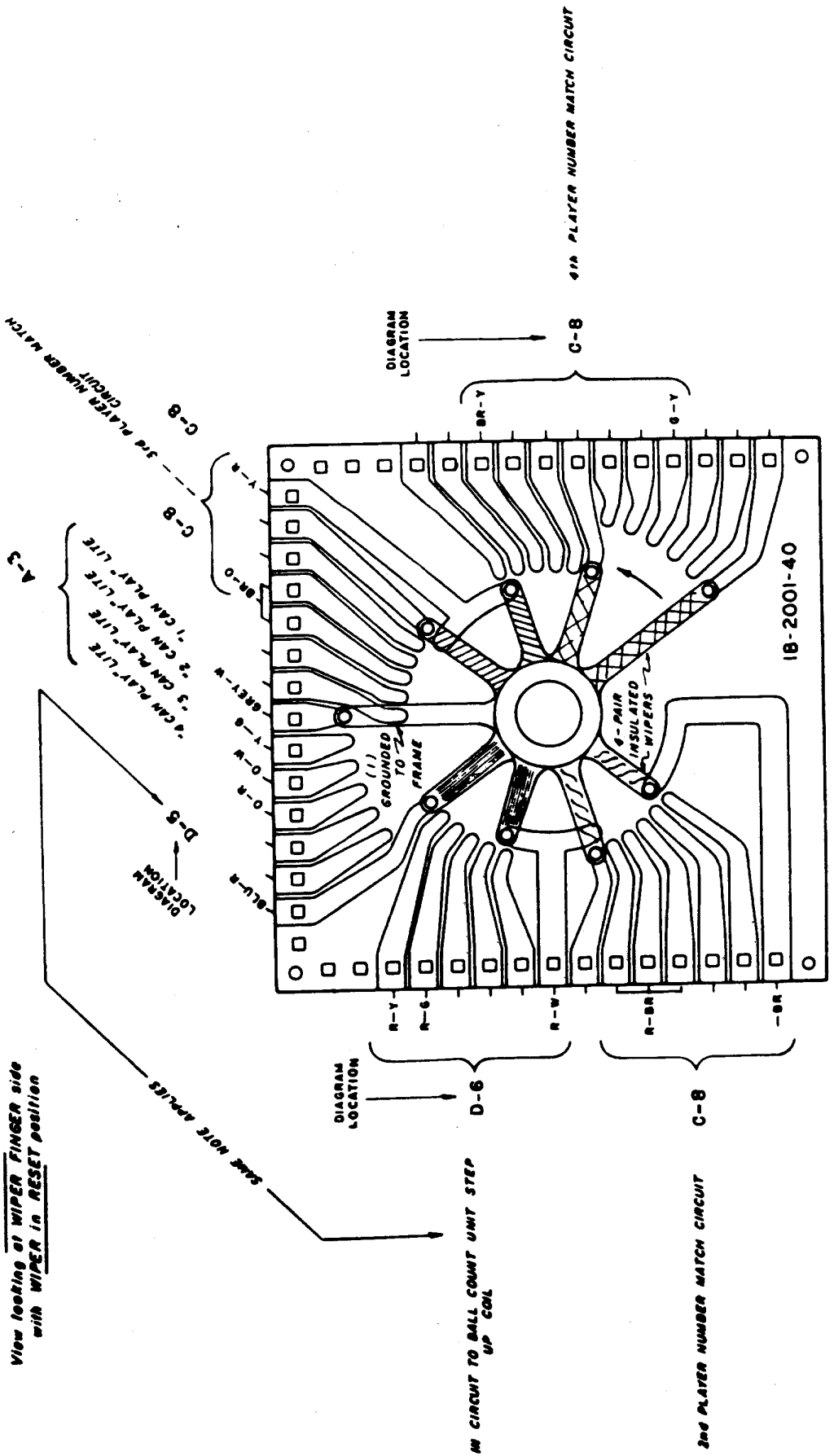
THIS UNIT RESETS AT THE START OF A NEW GAME, (DURING RESET CYCLE). IT ADVANCES ONE STEP EACH TIME THE LAST PLAYER COMPLETES HIS TURN.

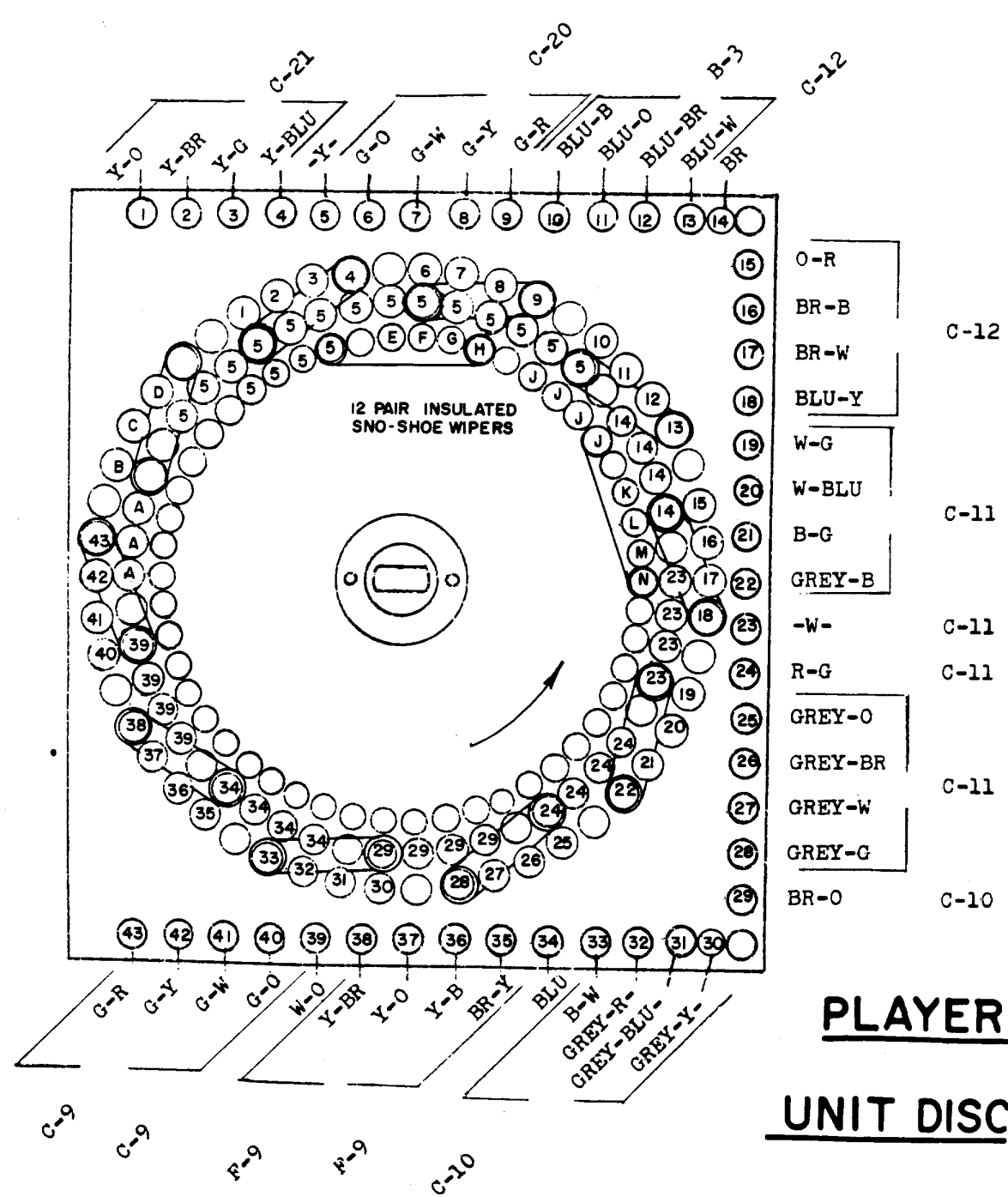
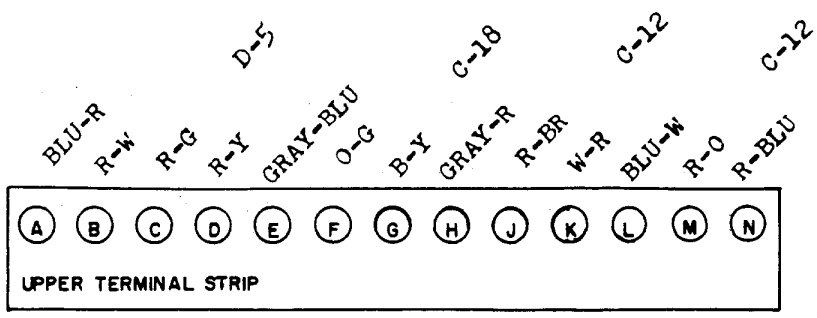
View looking at WIPER FINGER side with WIPER in ZERO position.



COIN S. U. DISC

THIS UNIT RESETS AT START OF A GAME (DURING RESET CYCLE). IT THEN ADVANCES ONE STEP EACH TIME THE COIN RELAY IS PULSED.

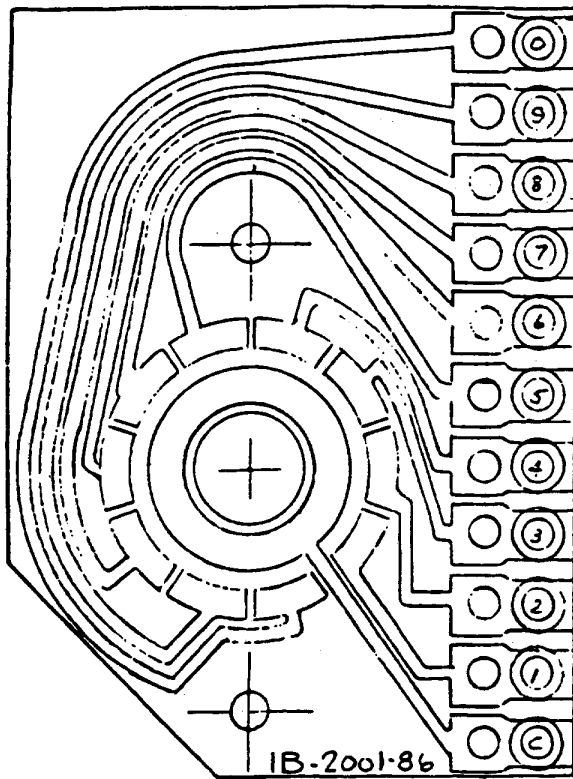




PLAYER
UNIT DISC

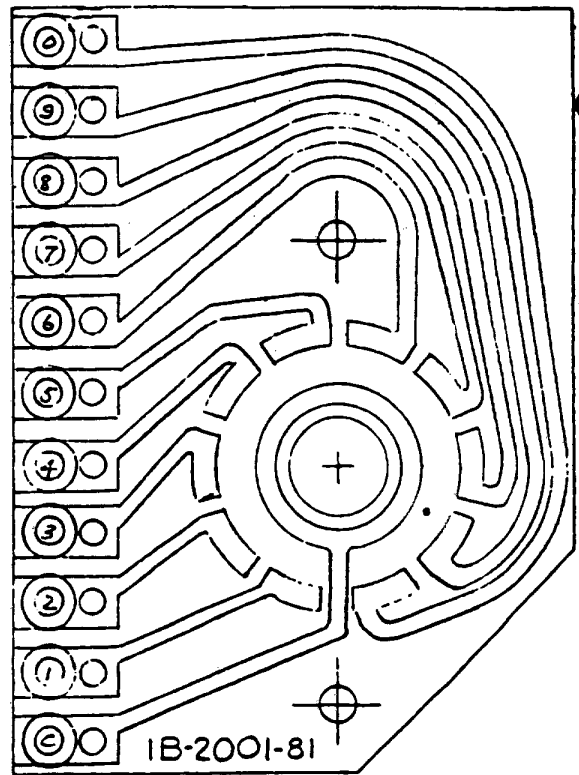
PLAYER UNIT DISC

LUG		LUG	
1	IN CIRCUIT TO 100 POINT RELAY THRU 9TH POS. SWS. ON CORRESPOND- ING 10-PT. DRUM UNITS.	30	TO 10 POINT DRUM UNIT COILS.
2		31	
3		32	
4		33	
5	FEED TO 6 V. A 24 V.	34	IN CIRCUIT TO CREDIT S.U. THRU SW. ON 1000 POINT RELAY.
6	IN CIRCUIT TO 1000 PT. RELAY, THRU 9TH POS. SWS. ON 100 POINT DRUM UNITS.	35	TO 100,000 POINT DRUM UNIT DISCS IN HIGH SCORE CIRCUIT.
7		36	
8		37	
9	38		
10	"PLAYER UP LITES"	39	24 V. FEED FROM TILT RELAY.
11		40	TO 10,000 PT. DRUM UNIT DISCS IN HIGH SCORE CIRCUIT.
12		41	
13		42	
14	TO SWITCH ON 10,000 PT. RELAY.	43	
15	TO 10,000 POINT DRUM UNIT COILS.	A	IN CIRCUIT TO BALL COUNT S.U. COIL AFTER LAST PLAYER COM- PLETES HIS TURN.
16		B	
17		C	
18		D	
19	TO 1000 POINT DRUM UNIT COILS.	E	IN CIRCUIT TO 10,000 POINT RE- LAY, THRU 9TH POSITION SWITCHES ON 1,000 POINT DRUM UNITS.
20		F	
21		G	
22		H	
23	TO SWITCH ON 1000 POINT RELAY.	J	TO SWITCH ON 10,000 POINT RELAY.
24	TO SWITCH ON 100 POINT RELAY.	K	IN CIRCUIT TO 100,000 POINT DRUM UNIT COILS, THRU 9TH POSI- TION SWITCHES ON 10,000 POINT DRUM UNITS.
25	TO 100 POINT DRUM UNIT COILS.	L	
26		M	
27		N	
28			
29	TO SWITCH ON 10 POINT RELAY.		



IB-2001-86

DIAGRAM LOCATION



IB-2001-81

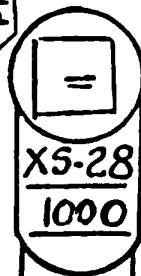
No. MATCH UNIT

00 LITE W/G	⑩
60 " BR/W	⑨
10 " BR/G	⑧
70 " BR/Y	⑦
30 " BR/BLU	⑥
80 " BR/R	⑤
20 " W/GRY	④
50 " W/B	③
90 " W/O	②
40 " W/BR	①
FEED -Y-	⑥

PRINTED CIRCUIT- IB-2001-86

PRINTED CIRCUIT- IB-2001-81

Y/BLU	00-MATCH
G/Y	60 "
Y/G	10 "
G/W	70 "
Y/O	30 "
G/O	80 "
Y/BR	20 "
G/R	50 "
W/BLU	90 "
Y/B	40 "
GRY/R	FEED



-R- R-O

DRIVE SPRING 10A-324-1

B-5

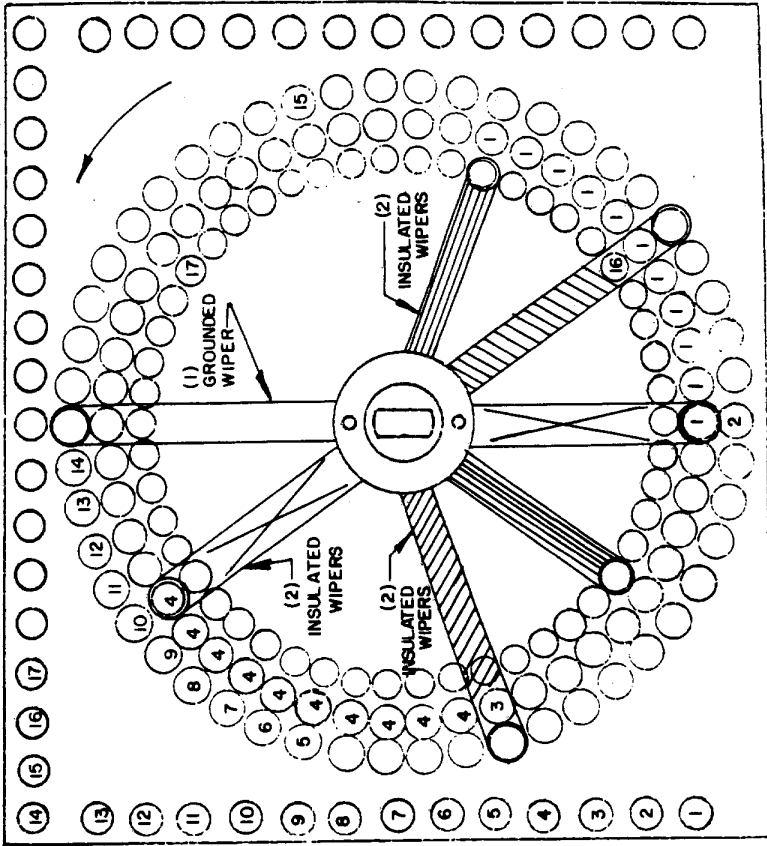
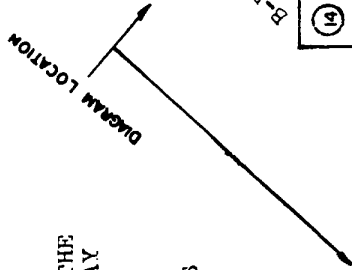
E-8

BONUS UNIT

THIS UNIT ADVANCES EACH TIME THE CENTER TARGET RELAY OR ADVANCE RELAY IS PULSED---ALSO, AFTER COLLECTING BONUS, BY OUTHOLE RELAY THRU CAM SWITCH 3B.

THIS UNIT RESETS THRU SWITCHES ON BONUS RELAY, DOUBLE BONUS RELAY AND SCORE MOTOR.

B-R R-6 TO 5000 BONUS LITE.
 R-BR A-8 TO LEFT BOTTOM 'SPECIAL' LITE.
 R-BLU A-8 TO LEFT BOTTOM 'SPECIAL' LITE.
 G-W A-8 TO RIGHT BOTTOM 'SPECIAL' LITE.



10,000	R-Y
15,000	R-W
20,000	R-BR
25,000	G-R
30,000	R-B
35,000	BLU-R
40,000	BLU-Y
45,000	BLU-W
50,000	BLU-BR
	R-O
	GRAY-B
	R-Y
	G-O

BONUS

LITES

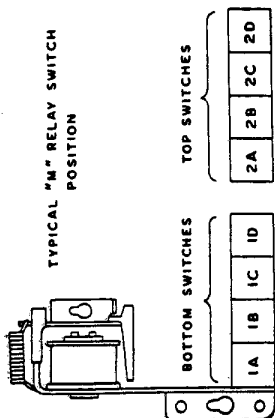
CIRCUIT TO 10,000 POINT RELAY. D-19

IN SERIES WITH SW. 1B ON SET-UP RELAY. E-19

FEED FROM CHANGE RELAY. B-8

FEED TO #3 AND #4. D-19

TYPICAL "M" RELAY SWITCH POSITION

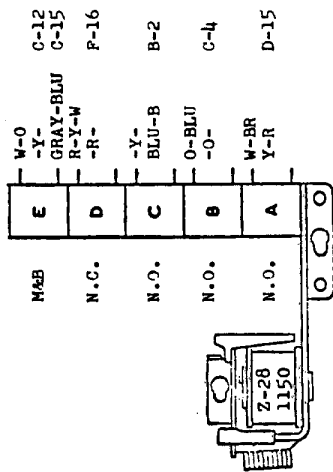


TILT

IS ENERGIZED BY PLUMB BOB TILT, BALL ROLL DOWN TILT OR PLAYFIELD VIBRATION TILT SWITCHES---ALSO BY LEFT SIDE SPINNER LANE ROLLER SWITCH.

RELAYS & SWITCHES
LOCATED ON MECHANISM PANEL

SWITCH TYPE | DIAGRAM LOCATION



OPENS IN HI-SCORE AND ALL (16) SCORE DRUM UNIT COILS CIRCUITS, AND CLOSSES TO ENERGIZE BALL INDEX RELAY.

OPENS CIRCUITS TO MOST PLAYFIELD SWITCHES.

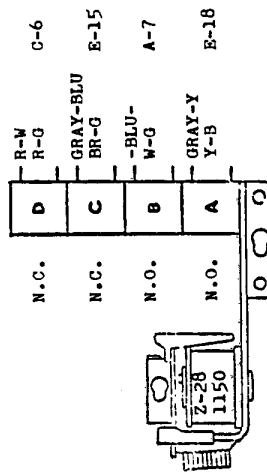
TO "TILT" LITE.

IN SERIES WITH SWITCH 'A' ON COIN SET-UP RELAY.

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

EXTRA BALL

IS ENERGIZED BY CENTER TARGET RELAY, THRU SWITCH ON SET-UP RELAY. ALSO, WITH "CREDIT-EXTRA BALL" ADJUSTMENT IN "EXTRA BALL" POSITION, BY HI-SCORES.



IN SERIES WITH SWITCH 'B' ON BALL INDEX RELAY.

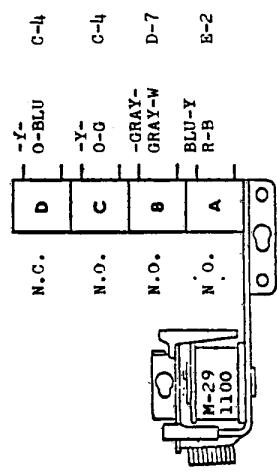
IN CIRCUIT TO BALL INDEX RELAY.

TO "SHOOT AGAIN" LITES.

IN HOLD CIRCUIT TO THIS RELAY.

10¢

IS ENERGIZED BY 10¢ COIN SWITCH, IF 10¢ ADJUSTMENT JACK IS IN "2 PLAYS" OR "3-PLAYS" POSITION---ALSO BY 25¢ COIN SWITCH, THRU SWITCH ON COIN SET-UP RELAY, IF "2 GOINS FOR 3 PLAYS" ADJUSTMENT IS IN "ON" POSITION.



IN HOLD CIRCUIT TO COIN SET-UP RELAY.

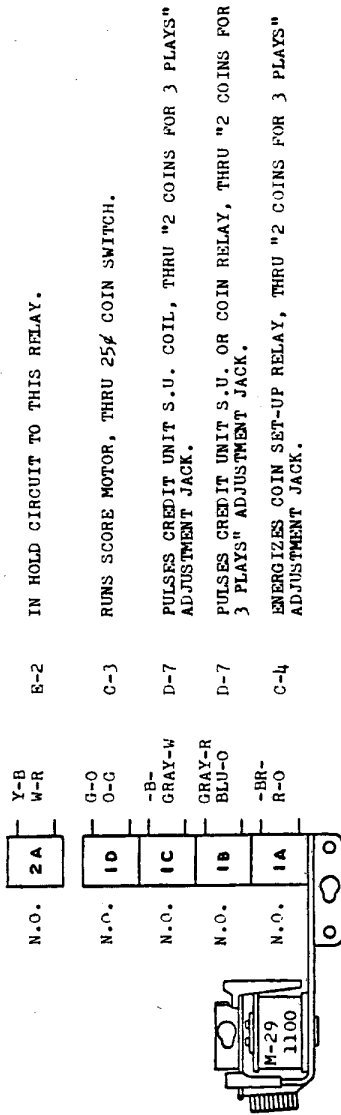
RUNS SCORE MOTOR.

PULSES CREDIT UNIT S.U. COIL, THRU IMPULSE CAM SWITCH C.

IN HOLD CIRCUIT TO THIS RELAY.

25¢

IS ENERGIZED BY 25¢ COIN SWITCH.



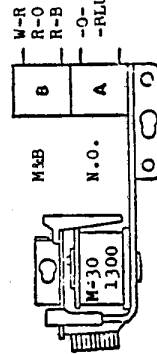
E-2 IN HOLD CIRCUIT TO THIS RELAY.

C-3 RUNS SCORE MOTOR, THRU 25¢ COIN SWITCH.

D-7 PULSES CREDIT UNIT S.U. COIL, THRU "2 COINS FOR 3 PLAYS" ADJUSTMENT JACK.

D-7 PULSES CREDIT UNIT S.U. OR COIN RELAY, THRU "2 COINS FOR 3 PLAYS" ADJUSTMENT JACK.

C-4 ENERGIZES COIN SET-UP RELAY, THRU "2 COINS FOR 3 PLAYS" ADJUSTMENT JACK.

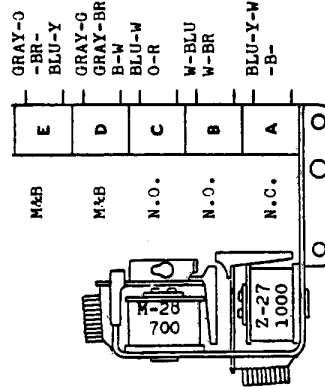


E-2 OPENS TO 25¢ RELAY AND CLOSSES TO 10¢ RELAY.

E-4 IN HOLD CIRCUIT TO THIS RELAY.

COIN SET-UP

IS ENERGIZED BY 25¢ RELAY, ONLY IF "2 COINS FOR 3 PLAYS" ADJUSTMENT IS IN "ON" POSITION.



A-3 OPENS TO "PLAYER UP" AND "BALL IN PLAY" LITES, AND CLOSSES TO NO. MATCH & GAME-OVER LITES.

E-7 OPENS IN HI-SCORE CIRCUITS AND CLOSSES IN NUMBER MATCH CIRCUITS TO "CREDIT-EXTRA BALL" ADJUSTMENT.

D-5 IN CIRCUIT TO RESET RELAY, THRU SWITCH ON COIN RELAY.

E-3 IN CIRCUIT TO CREDIT UNIT RESET COIL.

F-14 OPENS CIRCUITS TO PLAYFIELD SWITCHES.

GAME-OVER

LATCH COIL IS ENERGIZED BY SCORE MOTOR CAM SWITCH 1B, THRU SWITCHES ON COIN RELAY AND RESET RELAY.
TRIP COIL IS ENERGIZED BY COIN RELAY, THRU A ZERO SWITCH ON PLAYER UNIT OR BALL COUNT UNIT---ALSO BY LOCK RELAY OR WIPER FINGER ON BALL COUNT UNIT DISC.

E-18 OPENS IN CIRCUIT TO TILT RELAY AND CLOSSES TO ADVANCE RELAY (WHEN MAKING LEFT SIDE LANE ROLLOVER SWITCH).

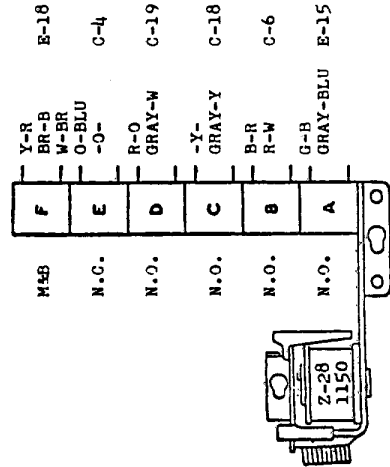
C-4 IN SERIES WITH SWITCH 'A' ON COIN SET-UP RELAY.

C-19 IN SERIES WITH SWITCH '1A' ON BONUS RELAY.

C-18 IN HOLD CIRCUIT TO EXTRA BALL RELAY.

C-6 IN CIRCUIT TO BALL COUNT UNIT S.U. COIL---ALSO IN SERIES WITH SWITCH 'C' ON PLAYER RESET RELAY.

E-15 IN HOLD CIRCUIT TO THIS RELAY.

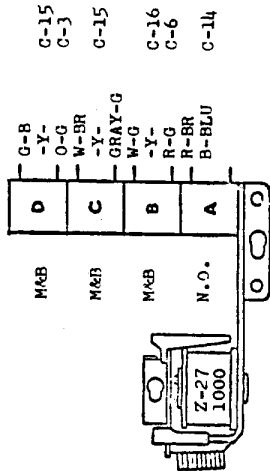


BALL INDEX

IS ENERGIZED BY 10 POINT OR 1,000 POINT RELAY---ALSO BY TILT RELAY.

OUTHOLE

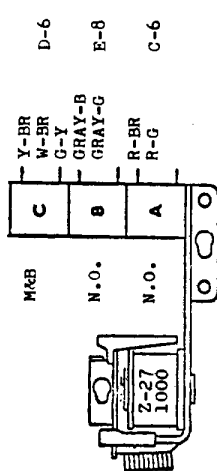
IS ENERGIZED BY ZERO SWITCH ON BONUS UNIT, THRU SWITCH ON BONUS RELAY.



OPENS IN HOLD CIRCUIT TO BALL INDEX RELAY AND CLOSSES TO RUN SCORE MOTOR.
 OPENS IN HOLD CIRCUIT TO TILT RELAY AND CLOSSES IN CIRCUIT TO BALL RELEASE COIL AND BONUS UNIT S.U. COIL.
 OPENS IN HOLD CIRCUIT TO 'A', 'Z', 'T', 'E' AND 'C' RELAYS AND CLOSSES IN SERIES WITH SWITCH 'D' ON EXTRA BALL RELAY.
 IN HOLD CIRCUIT TO THIS RELAY.

PLAYER RESET

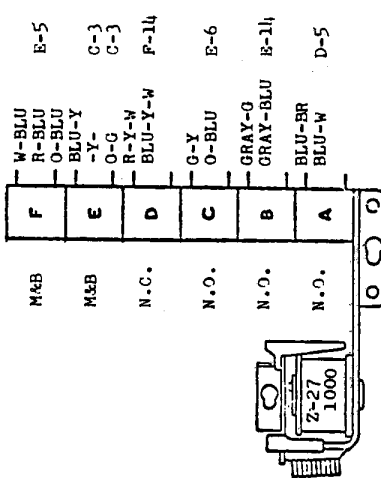
IS ENERGIZED BY BALL COUNT UNIT END-OF-STROKE SWITCH. IT THEN HOLDS IN THRU SCORE MOTOR INDEX CAM SWITCH 'B'.



OPENS IN CIRCUIT TO PLAYER UNIT S.U. COIL AND CLOSSES TO PLAYER UNIT RESET COIL.
 IN NO. MATCH CIRCUIT TO CREDIT UNIT S.U.
 HOLD CIRCUIT TO THIS RELAY, THRU SCORE MOTOR INDEX CAM SWITCH 'B'.

RESET

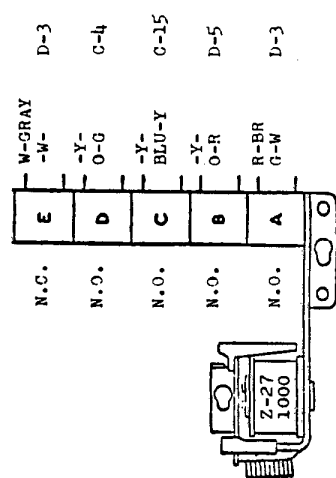
IS ENERGIZED BY COIN RELAY, THRU SWITCH ON GAME-OVER RELAY.



OPENS IN CIRCUIT TO COIN UNIT S.U. COIL AND CLOSSES TO RESET COILS ON COIN UNIT, BALL COUNT UNIT AND GAME-OVER RELAY.
 OPENS IN CIRCUIT TO CREDIT UNIT RESET COIL AND CLOSSES TO RUN SCORE MOTOR.
 OPENS CIRCUITS TO MOST PLAYFIELD SWITCHES.
 IN CIRCUIT TO PLAYER UNIT RESET COIL.
 ENERGIZES BONUS RELAY, THRU ZERO SWITCH ON BONUS UNIT.
 IN HOLD CIRCUIT TO THIS RELAY.

COIN

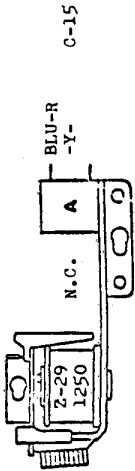
IS ENERGIZED BY COIN SWITCH OR BY CREDIT UNIT RESET COIL END-OF-STROKE SWITCH. ALSO BY 25¢ RELAY IF GAME IS ADJUSTED TO "1 PLAY FOR 25¢" OR "6 PLAYS FOR 25¢".



OPENS CIRCUIT TO COIN LOCKOUT COIL.
 RUNS SCORE MOTOR.
 ENERGIZES GAME-OVER RELAY TRIP COIL, THRU BALL COUNT UNIT OR PLAYER UNIT ZERO SWITCHES.
 ENERGIZES RESET RELAY, THRU SWITCH ON GAME-OVER RELAY.
 IN HOLD CIRCUIT TO THIS RELAY.

LOCK

IS ENERGIZED WHEN POWER IS SUPPLIED TO TRANSFORMER.



ENERGIZES GAME-OVER RELAY TRIP COIL.

C-15

LOCATED ON PLAYFIELD

Label	Relay	Terminal	Function
"C"	M&B	E	GRAY-G
	N.C.	D	-Y- GRAY-BR
	N.O.	C	-J- BR-O
	N.O.	B	BLU-R R-Y
	N.O.	A	O-B O-W
"E"	M&B	E	W-G GRAY-R
	N.C.	D	B-Y -Y- GRAY-Y
	N.O.	C	-J- -J-
	N.O.	B	BLU-R B-W
	N.O.	A	O-W GRAY-B
"T"	M&B	F	W-O Y-R
	N.C.	D	Y-BLU -Y- W-B
	N.O.	C	Y-O B-W
	N.O.	B	-Y- -J-
	N.O.	A	BLU-R O-B

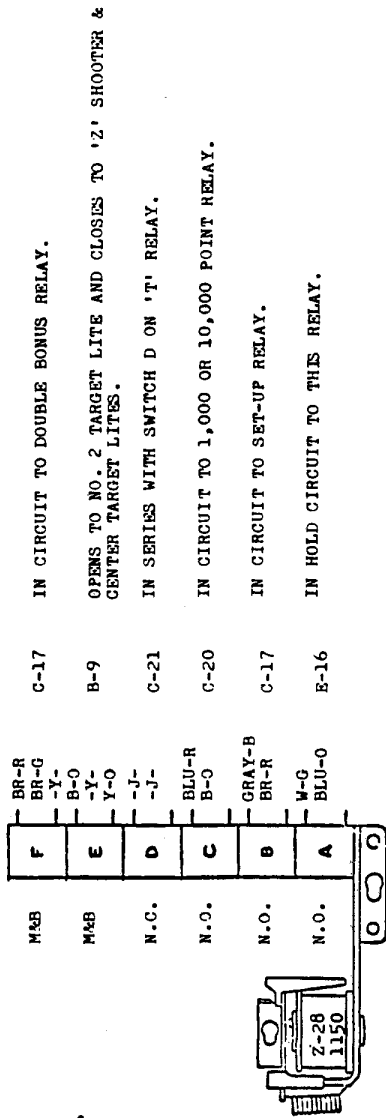
OPENS TO NO. 5 TARGET LITE AND CLOSSES TO 'C' SHOOTER LITE AND 'C' CENTER TARGET LITE.
 IN CIRCUIT TO 1000 POINT RELAY OR 100 POINT RELAY.
 IN CIRCUIT TO 1000 OR 10,000 POINT RELAY.
 IN CIRCUIT TO SET-UP RELAY, IN CONSERVATIVE POSITION.
 IN HOLD CIRCUIT TO THIS RELAY.

OPENS TO NO. 4 TARGET LITE AND CLOSSES TO 'E' SHOOTER AND CENTER TARGET LITES.
 IN SERIES WITH SWITCH 'D' ON 'C' RELAY.
 IN CIRCUIT TO 1,000 OR 10,000 POINT RELAY.
 IN CIRCUIT TO SET-UP RELAY, IN CONSERVATIVE POSITION.
 IN HOLD CIRCUIT TO THIS RELAY.

OPENS TO NO. 3 TARGET LITE AND CLOSSES TO 'T' SHOOTER AND CENTER TARGET LITES.
 IN CIRCUIT TO "DOUBLE BONUS" LITE (AT LEFT SIDE LANE AND SHOOTER).
 IN SERIES WITH SWITCH 'D' ON 'E' RELAY.
 IN CIRCUIT TO 1,000 OR 10,000 POINT RELAY.
 IN CIRCUIT TO SET-UP RELAY, AND DOUBLE BONUS RELAY.
 IN HOLD CIRCUIT TO THIS RELAY.

"Z"

IS ENERGIZED BY 'Z' TARGET SWITCH.



IN CIRCUIT TO DOUBLE BONUS RELAY.

OPENS TO NO. 2 TARGET LITE AND CLOSES TO 'Z' SHOOTER & CENTER TARGET LITES.

IN SERIES WITH SWITCH D ON 'T' RELAY.

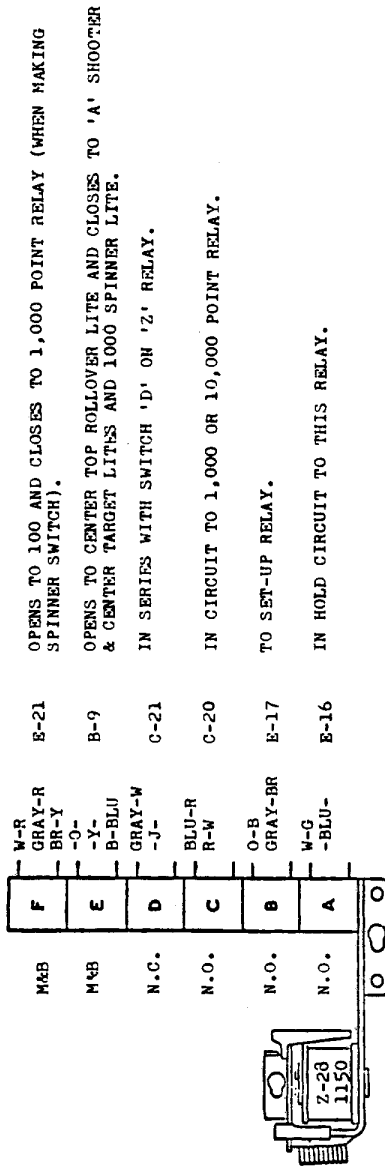
IN CIRCUIT TO 1,000 OR 10,000 POINT RELAY.

IN CIRCUIT TO SET-UP RELAY.

IN HOLD CIRCUIT TO THIS RELAY.

"A"

IS ENERGIZED BY CENTER TOP ROLLOVER SWITCH.



OPENS TO 100 AND CLOSES TO 1,000 POINT RELAY (WHEN MAKING SPINNER SWITCH).

OPENS TO CENTER TOP ROLLOVER LITE AND CLOSES TO 'A' SHOOTER & CENTER TARGET LITES AND 1000 SPINNER LITE.

IN SERIES WITH SWITCH 'D' ON 'Z' RELAY.

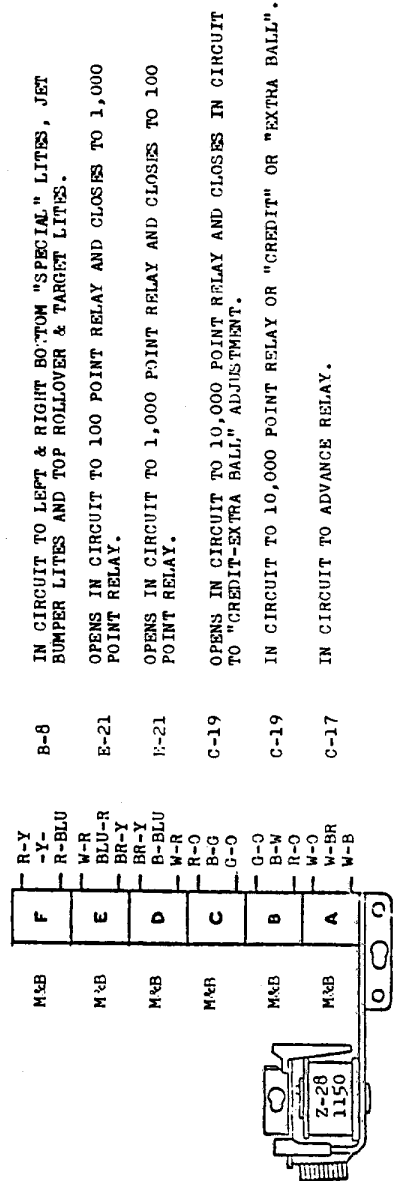
IN CIRCUIT TO 1,000 OR 10,000 POINT RELAY.

TO SET-UP RELAY.

IN HOLD CIRCUIT TO THIS RELAY.

CHANGE

IS ENERGIZED BY NUMBER MATCH UNIT ALTER-NATOR SWITCH.



IN CIRCUIT TO LEFT & RIGHT BOTTOM "SPECIAL" LITES, JET BUMPER LITES AND TOP ROLLOVER & TARGET LITES.

OPENS IN CIRCUIT TO 100 POINT RELAY AND CLOSES TO 1,000 POINT RELAY.

OPENS IN CIRCUIT TO 1,000 POINT RELAY AND CLOSES TO 100 POINT RELAY.

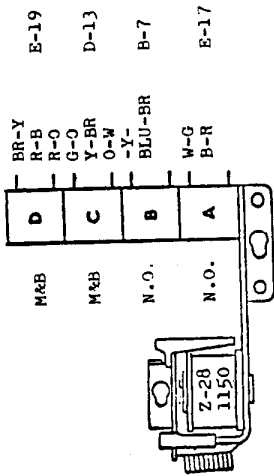
OPENS IN CIRCUIT TO 10,000 POINT RELAY AND CLOSES IN CIRCUIT TO "CREDIT-EXTRA BALL" ADJUSTMENT.

IN CIRCUIT TO 10,000 POINT RELAY OR "CREDIT" OR "EXTRA BALL".

IN CIRCUIT TO ADVANCE RELAY.

DOUBLE BONUS

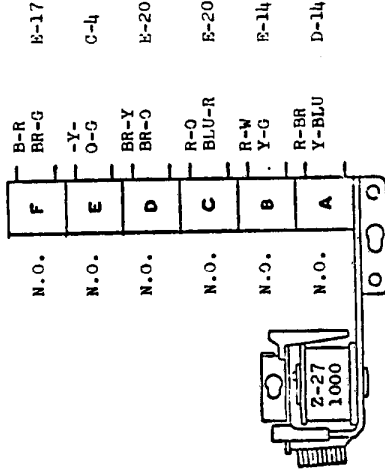
IS ENERGIZED BY SHOOTER RELAY OR LEFT LANE ROLLOVER SWITCH, THRU EITHER 'T' RELAY OR 'Z' RELAY.



IN CIRCUIT TO 1,000 POINT RELAY OR 10,000 POINT RELAY (WHEN COLLECTING BONUS).
 IN CIRCUIT TO BONUS UNIT RESET COIL (WHEN COLLECTING BONUS).
 TO "DOUBLE BONUS" LITE.
 IN HOLD CIRCUIT TO THIS RELAY.

SHOOTER

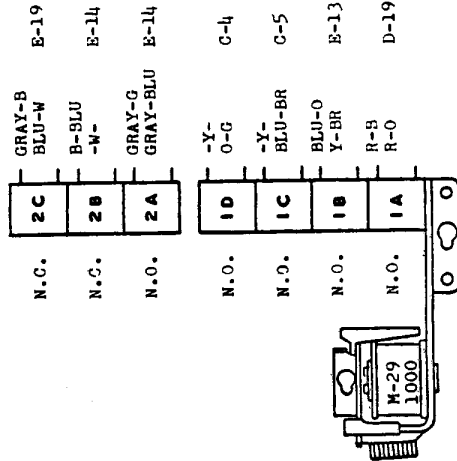
IS ENERGIZED BY SHOOTER SWITCH.



ENERGIZES DOUBLE BONUS RELAY, THRU SWITCH ON 'Z' RELAY.
 RUNS SCORE MOTOR.
 IN CIRCUIT TO PULSE 100 RELAY.
 IN CIRCUIT TO 10,000 POINT RELAY.
 PULSES SHOOTER COIL, THRU SWITCH ON CAM 4.
 IN HOLD CIRCUIT TO THIS RELAY.

BONUS

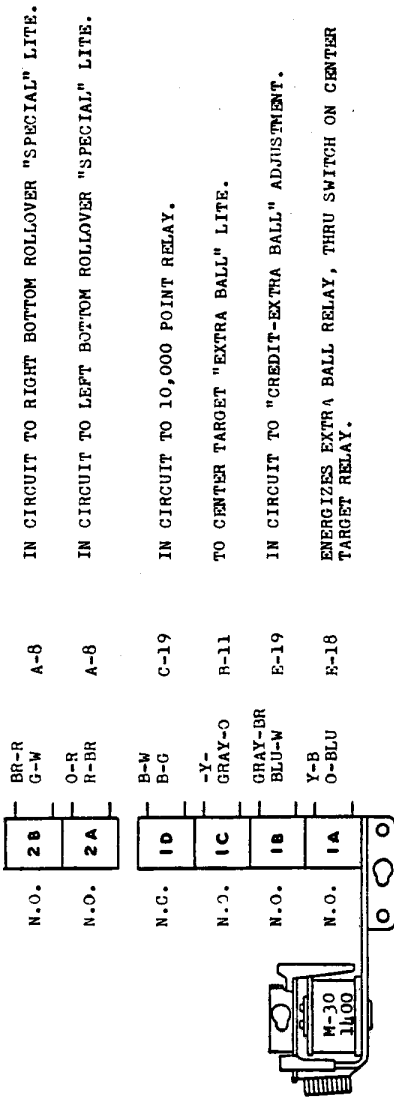
IS ENERGIZED BY RESET RELAY, THRU ZERO SWITCH ON BONUS UNIT---ALSO BY OUTHOLE SWITCH, THRU ANOTHER ZERO SWITCH ON BONUS UNIT.



IN SERIES WITH SWITCH 1B ON SET-UP RELAY.
 IN CIRCUIT TO OUTHOLE RELAY.
 IN HOLD CIRCUIT TO THIS RELAY.
 RUNS SCORE MOTOR.
 IN HOLD CIRCUIT TO RESET RELAY.
 IN CIRCUIT TO BONUS UNIT RESET COIL.
 IN SERIES WITH SWITCH D ON DOUBLE BONUS RELAY.

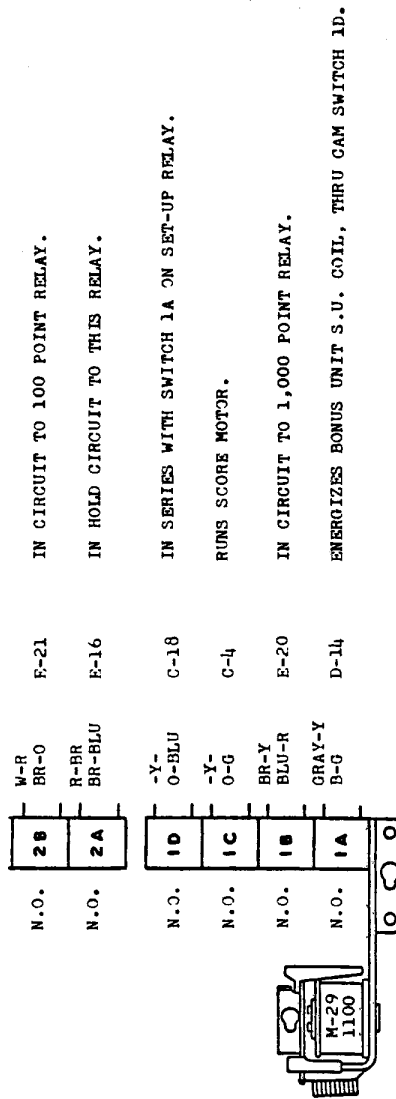
SET UP RELAY

WITH FEATURE ADJUSTMENT IN 'CONSERVATIVE' POSITION, THIS RELAY WILL ENERGIZE THRU SWITCHES ON 'A', 'Z', 'T', 'E' AND 'C' RELAYS. IN 'MEDIUM' POSITION, 'A', 'Z' AND 'T'. IN LIBERAL POSITION, 'A', 'Z', 'T' OR 'A', 'E' AND 'C'.



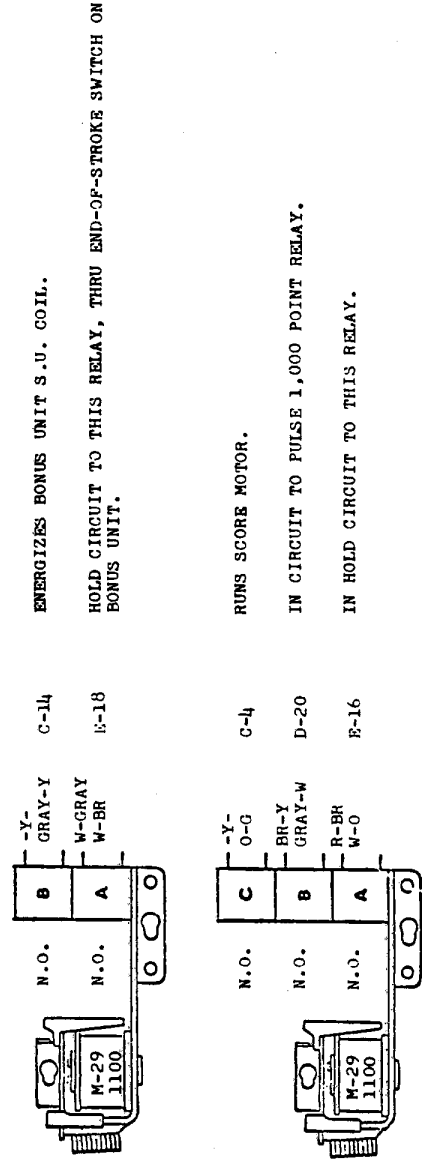
CENTER TARGET RELAY

IS ENERGIZED BY CENTER TARGET SWITCH.



ADVANCE RELAY

IS PULSED BY LEFT LANE ROLLOVER SWITCH-LEFT AND RIGHT BOTTOM (OUTSIDE) ROLLOVER SWITCH-CENTER TOP ROLLOVER BUTTON---- ALSO LEFT & RIGHT TOP ROLLOVER & LEFT TOP TARGET, THRU SWITCH ON CHANGE RELAY.



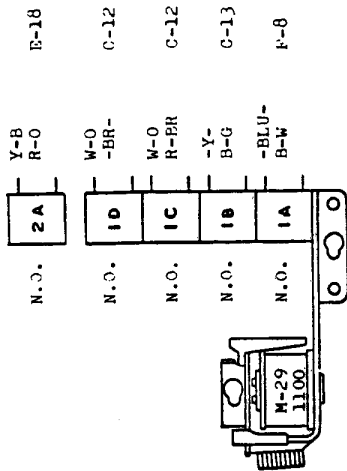
5000 RELAY

IS ENERGIZED BY LEFT AND RIGHT BOTTOM (INSIDE) ROLLOVERS.

LOCATED IN BACK-BOX

10,000 POINT RELAY

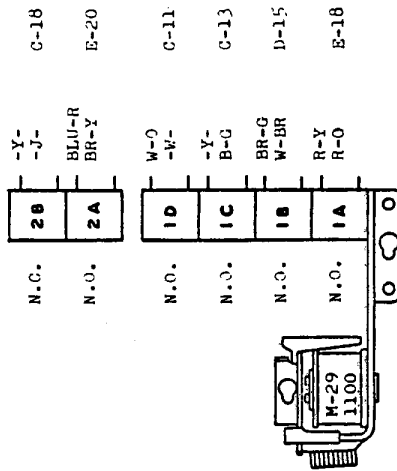
CAN BE ENERGIZED BY LEFT AND RIGHT BOTTOM (OUTSIDE) ROLLOVERS - BY THE SHOOTER RELAY - AND BY BONUS RELAY (WHEN COLLECTING BONUS).



E-18 IN HOLD CIRCUIT TO THIS RELAY.
 C-12 PULSES 10,000 POINT DRUM UNITS, THRU PLAYER UP UNIT DISC.
 C-12 PULSES 100,000 POINT DRUM UNITS, THRU 9TH POSITION SWITCHES ON 10,000 POINT DRUM UNITS.
 C-13 PULSES LARGE CHIME COIL.
 F-8 IN HI-SCORE CIRCUIT TO "CREDIT-EXTRA BALL" ADJUSTMENT.

1000 POINT

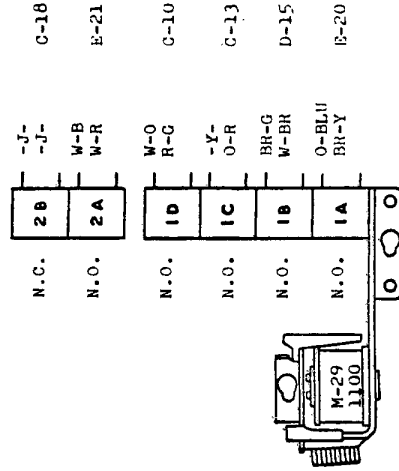
CAN BE ENERGIZED BY BONUS RELAY (WHEN COLLECTING BONUS) - BY CENTER TARGET RELAY - (5) TARGET SWITCHES - (3) TOP ROLLOVERS - 5000 RELAY - SPINNER SW. AND JET BUMPER SWITCHES.



C-18 IN SERIES WITH SWITCH 2B ON 100 POINT RELAY.
 E-20 IN HOLD CIRCUIT TO THIS RELAY.
 C-11 PULSES 1,000 POINT DRUM UNITS, THRU PLAYER UP UNIT DISC.
 C-13 PULSES LARGE CHIME COIL.
 D-15 IN SERIES WITH SWITCH C ON EXTRA BALL RELAY.
 E-18 PULSES 10,000 POINT RELAY, THRU 9TH POSITION SWITCHES ON 1,000 POINT DRUM UNITS.

100 POINT

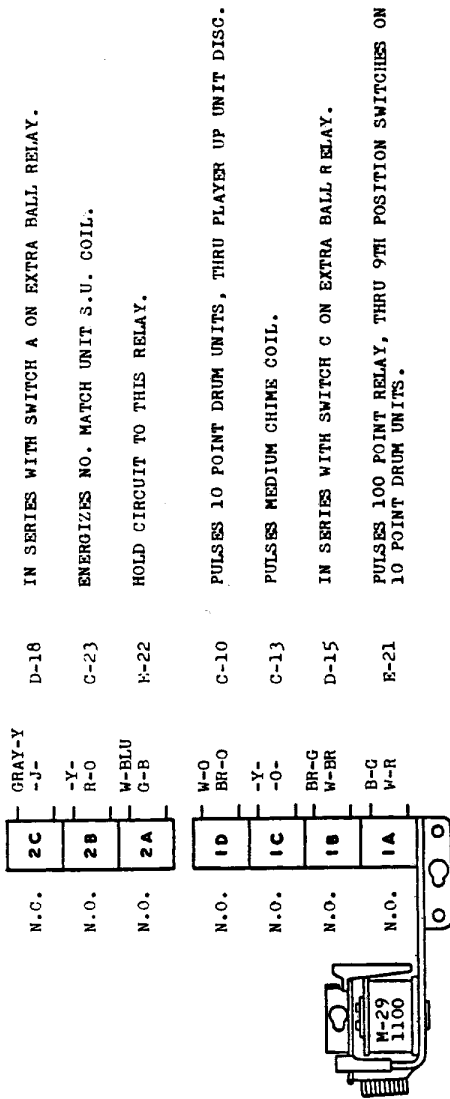
CAN BE ENERGIZED BY CENTER TARGET RELAY - LEFT & RIGHT TOP ROLLOVER BUTTONS - SPINNER SWITCH AND JET BUMPER SWITCHES.



C-18 IN SERIES WITH SWITCH 2C ON 10 POINT RELAY.
 E-21 IN HOLD CIRCUIT TO THIS RELAY.
 C-10 PULSES 100 POINT DRUM UNITS, THRU PLAYER UP UNIT DISC.
 C-13 PULSES SMALL CHIME COIL.
 D-15 IN SERIES WITH SWITCH C ON EXTRA BALL RELAY.
 E-20 PULSES 1,000 POINT RELAY, THRU 9TH POSITION SWITCHES ON 100 POINT DRUM UNITS.

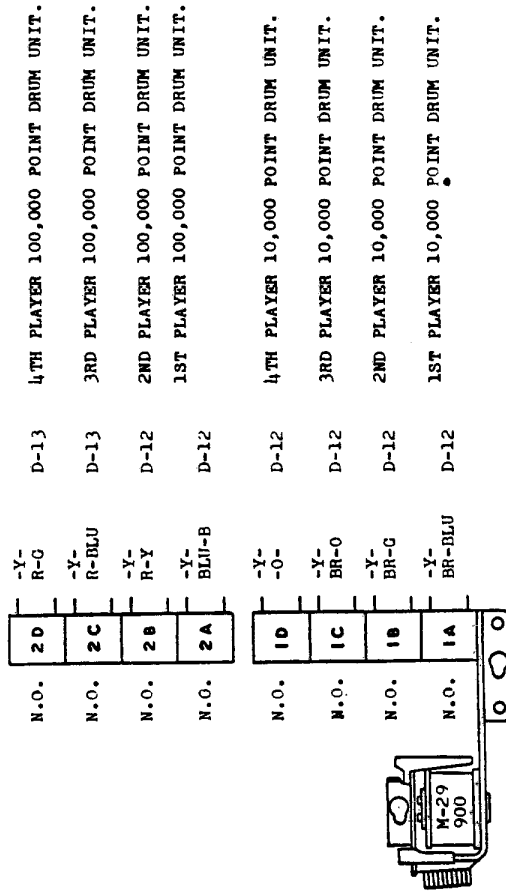
10 POINT

IS PULSED BY STAND-UP SWITCHES AND KICKER SWITCHES.



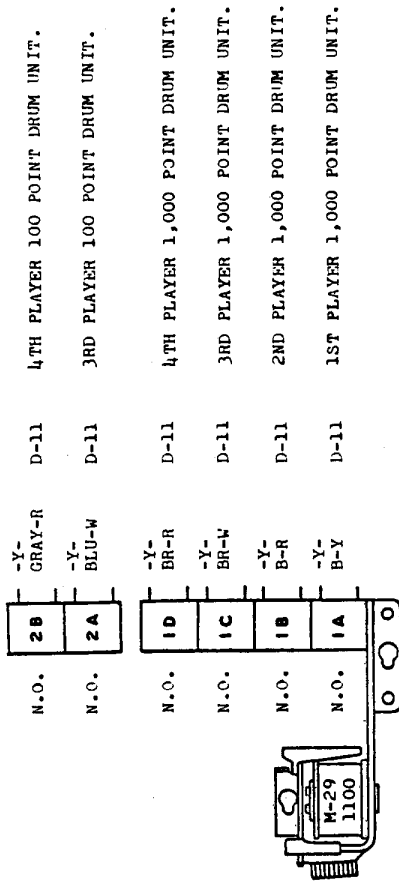
NO.3 RESET

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



NO.2 RESET

IS PULSED BY IMPULSE 'FORWARD' CAM SWITCH
D, THRU SWITCH ON RESET RELAY.



NO.1 RESET

IS PULSED THE SAME WAY AS NO. 2 RESET
RELAY.

