

# Instruction Manual for

# GULFSTREAM

3/3  
5/5  
7



**Williams**<sup>®</sup> ELECTRONICS, INC.  
SUBSIDIARY OF THE SEEBURG CORPORATION

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# ***IMPORTANT NOTICE***

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**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.

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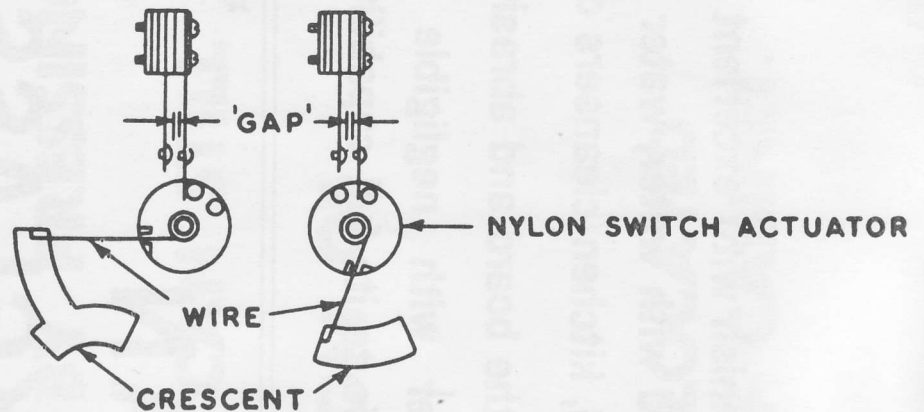
## SERVICEMAN TO REMOVE BACKGLASS:

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



# 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:

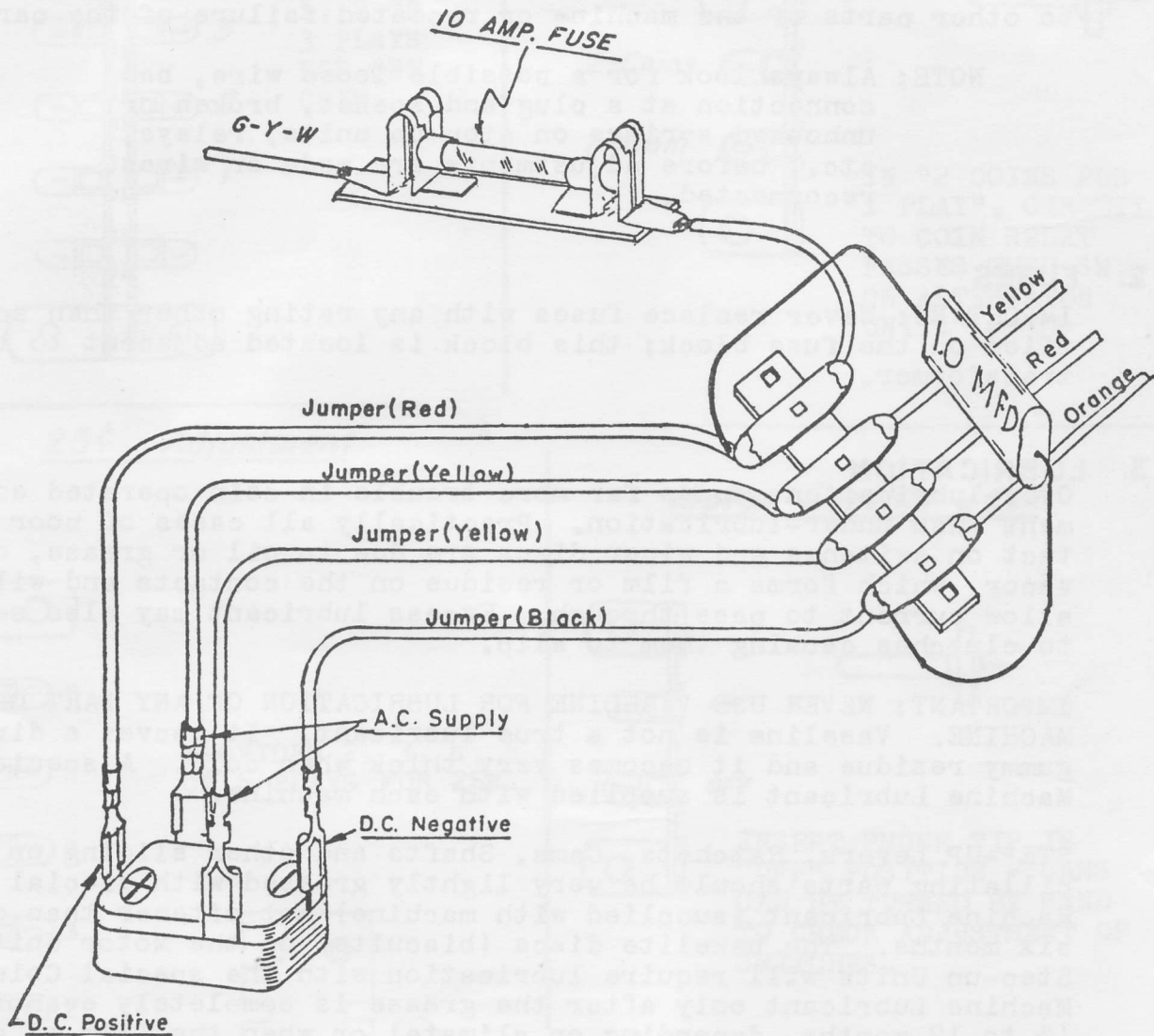
LOCATED ON MECHANISM PANEL, IT IS EQUIPPED WITH A SECONDARY TAP. IF YOUR GAME IS ON LOCATION WITH EXTREMELY LOW LINE VOLTAGE, REMOVE LEAD FROM LUG MARKED 24 VOLTS AND SOLDER TO ALTERNATE LUG MARKED "HIGH". THIS WILL BOOST SECONDARY VOLTAGE APPROXIMATELY 2-3 VOLTS.

## 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.



# 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.

## 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.

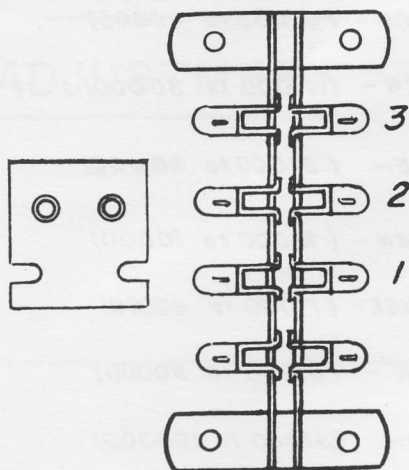
Solenoid Plungers should not have a lubricant of any kind. Should there be a sluggish tendency or if plungers are sticking, the parts should be cleaned with a solvent and flaked graphite applied on reassembly.

## 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.

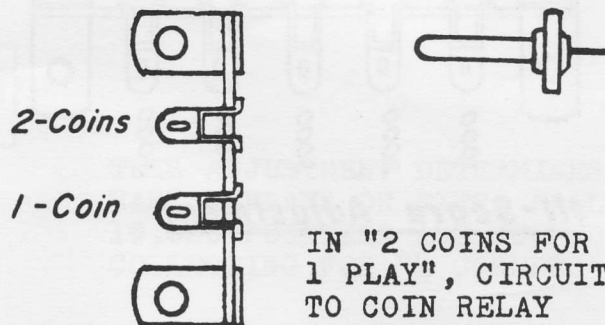
# ADJUSTMENTS ON MECHANISM PANEL

## 10¢ Adjustment



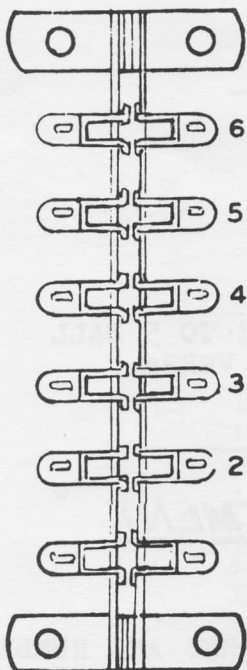
PROVIDES  
1, 2 OR  
3 PLAYS  
FOR ONE  
COIN.

## 5¢ Adjustment

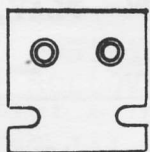


IN "2 COINS FOR  
1 PLAY", CIRCUIT  
TO COIN RELAY  
PASSES THRU SW.  
ON ALTERNATOR  
UNIT.

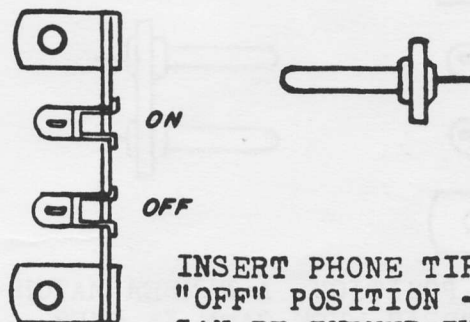
## 25¢ Adjustment



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



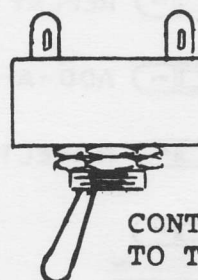
## Motor Service Jack



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

## MASTER ON-OFF SW.

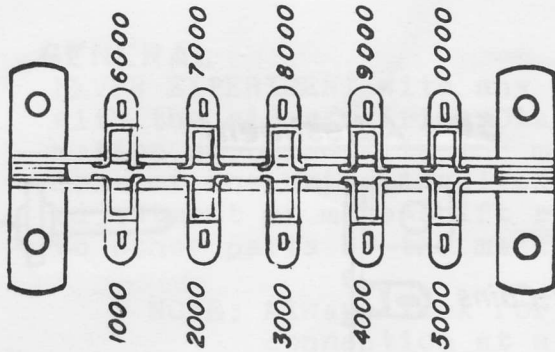
(Located under front of  
Cabinet)



CONTROLS POWER  
TO TRANSFORMER



## ADJUSTMENTS IN BACKBOX

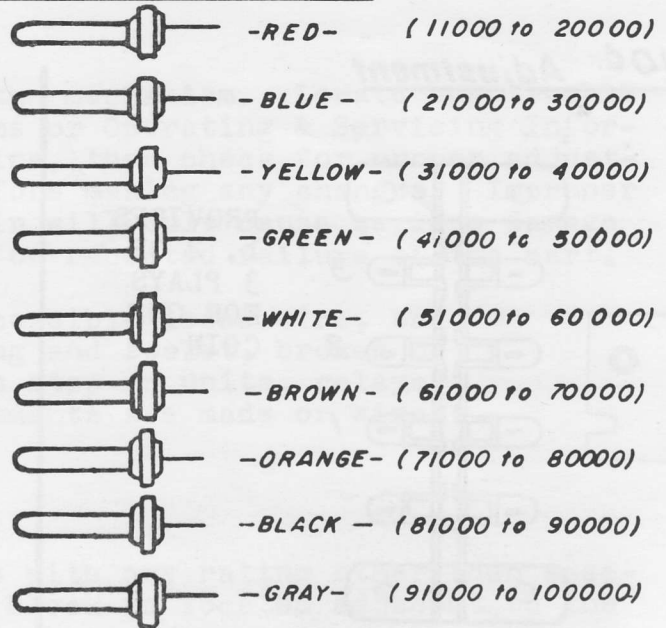


### Hi-Score Adjustment

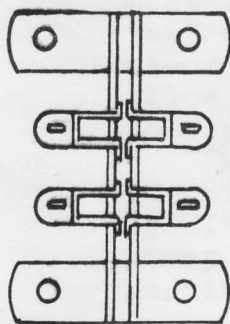
Insert plugs into 10 Point Female at desired positions.

Examples:

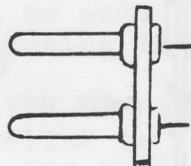
Yellow wire into 3000 position scores at 33000.  
Yellow wire into 0000 position scores at 40000.



ON — OFF



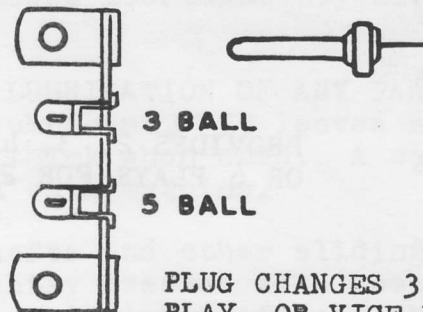
### NO. MATCH ADJ.



IN "ON" POSITION, A NUMBER MATCH LITE WILL APPEAR WHEN GAME IS OVER. TO AWARD REPLAYS, WHEN NUMBER IS MATCHED, "REPLAY-ADD A BALL-NOVELTY" ADJUSTMENT MUST BE IN REPLAY POSITION.

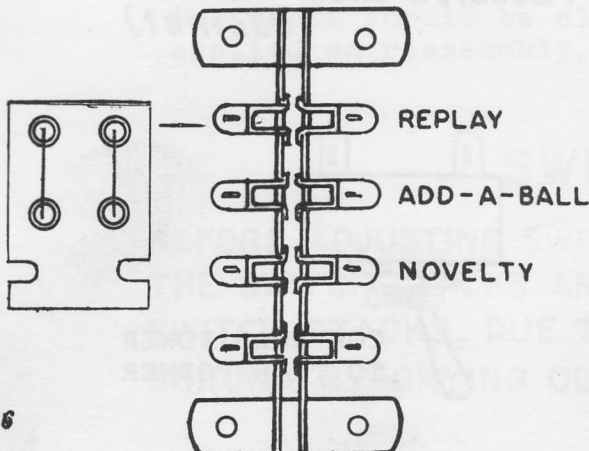
IF IT IS IN "ADD A BALL" POSITION, NUMBER MATCH ADJUSTMENT MUST BE TURNED TO "OFF".

### No. of Balls Adjustment



PLUG CHANGES 3 TO 5 BALL PLAY, OR VICE VERSA.

### GAME ADJUSTMENT



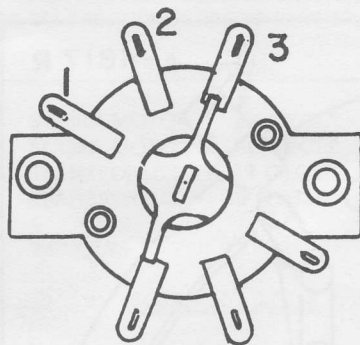
IN "REPLAY" POSITION; HI-SCORES AND NUMBER MATCH CIRCUITS WILL ADVANCE REPLAY UNIT. LITING (4) CORNERS WILL SCORE 1, 2 OR 3 REPLAYS (SEE 4 CORNERS ADJUSTMENT JACK). BALL IN LEFT OR RIGHT EJECT POCKET WHEN 3 IN LINE ARE LIT, OR, LEFT OR RIGHT BOTTOM INSIDE ROLLOVER WHEN S-P-E-C-I-A-L ARE LIT, SCORES ONE EXTRA BALL.

IN "ADD A BALL" POSITION; HI-SCORES, 4 CORNERS, 3 IN LINE AND S-P-E-C-I-A-L WILL ADVANCE BALL COUNT UNIT. NUMBER MATCH ADJUSTMENT MUST BE IN "OFF" POSITION.

IN "NOVELTY" POSITION; 4 CORNERS, 3 IN LINE AND S-P-E-C-I-A-L WILL PULSE THE 10,000 POINT DRUM UNIT. (REMOVE ALL PHONE TIPS FROM HI-SCORE ADJUSTMENT JACK).

LOCATED IN BACKBOX

4-CORNERS  
ADJUSTMENT



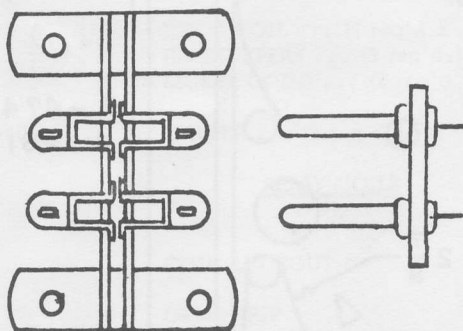
THIS ADJUSTMENT DETERMINES HOW MANY REPLAYS OR EXTRA BALLS OR 10,000 POINTERS ARE SCORED WHEN COLLECTING FOR "4 CORNERS".

*Conservative*  
↓

*Liberal*  
↓

NAME  
ADJ.

LOCATED ON PLAYFIELD



IN LIBERAL POSITION: MAKING 'P' OR 'C' ROLLOVER WILL TRIP BOTH 'P' & 'C' RELAYS; ALSO, MAKING 'A' OR 'L' ROLLOVER WILL TRIP BOTH 'A' AND 'L' RELAYS.

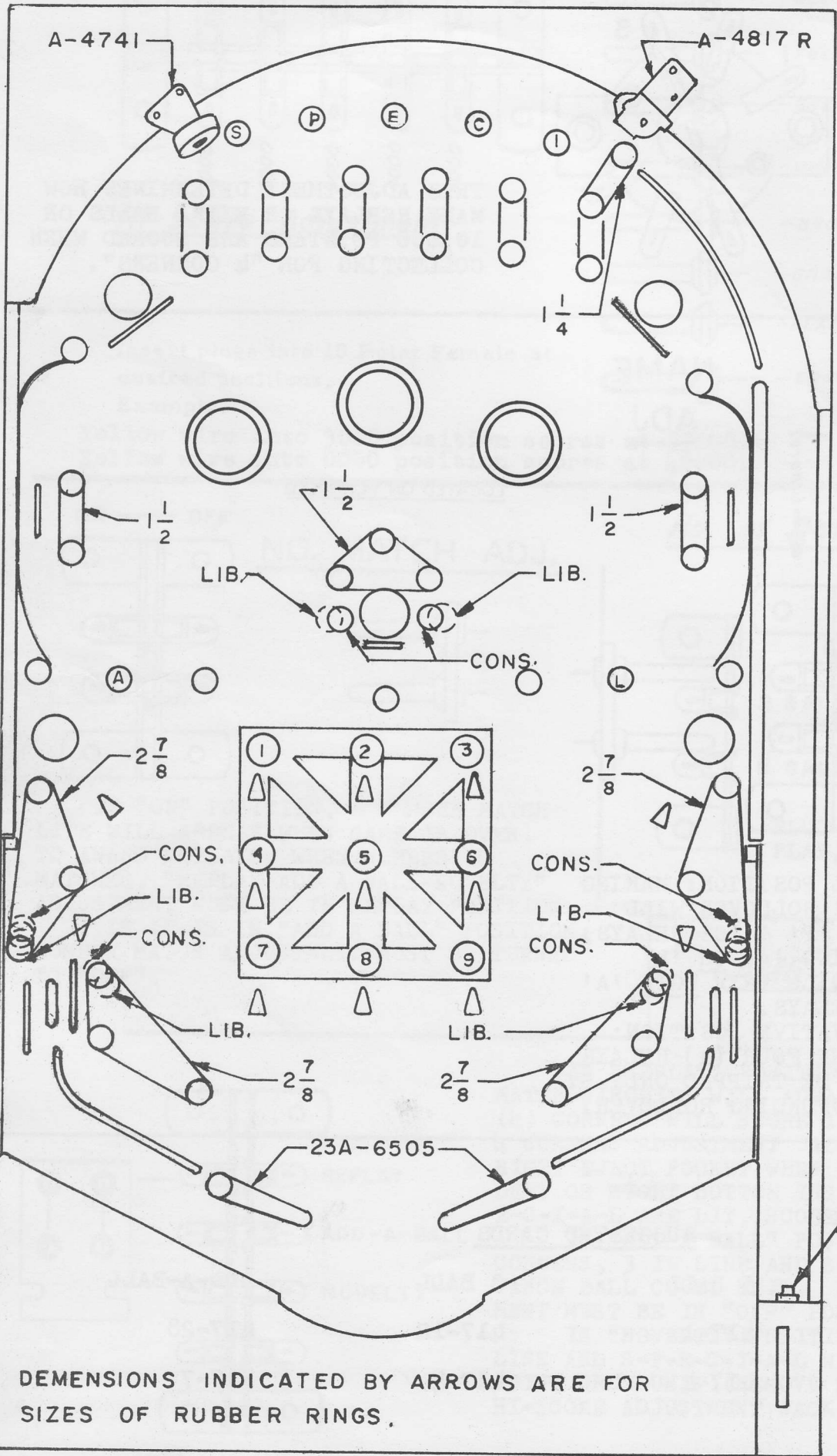
IN CONSERVATIVE POSITION: EACH OF THE FOUR (4) RELAYS ABOVE CAN BE TRIPPED ONLY BY THE CORRESPONDING ROLLOVER.

SUGGESTED CARDS

	5 BALL	3 BALL	ADD-A-BALL
SCORE CARD	417-1	417-12	417-28
INSTRUCTION CARD	417-4	417-4	417-7

# "GULFSTREAM"-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	$\frac{5}{16}$ " I. D.
23A-6303	$1\frac{1}{4}$ " I. D.
23A-6304	$1\frac{1}{2}$ " I. D.
23A-6307	$2\frac{7}{8}$ " I. D.

A-4741 REBOUND ASS'Y.  
 A-4817R BALL GATE ASS'Y.

23A-6327 BALL SHOOTER RUBBER TIP.

DEMENSIONS INDICATED BY ARROWS ARE FOR SIZES OF RUBBER RINGS.



"GULF STREAM" COIL CHART

NOTICE:

THIS GAME OPERATES 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>
14 A-7883	SCORE MOTOR - 60 CYCLE	MECH. PANEL
14 A-7884	SCORE 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 VOLTS METER	MECH. PANEL

SOLENOID COILS

A 23-600	MATCH UNIT STEP UP	INSERT
A 22-550	BALL COUNT UNIT STEP UP	INSERT
	BALL RELEASE	PLAYFIELD
A 23-600	REPLAY UNIT STEP UP	INSERT
A2-23-600	KNOCKER	CABINET
B 26-800	ALTERNATOR UNIT	MECH. PANEL
	BALL COUNT UNIT RESET	INSERT
	REPLAY UNIT RESET	INSERT
	SCORE DRUM UNIT ... (4 req'd.)	INSERT
A2-26-1025	CHIME ... (3 req'd.)	CABINET
D1-24-1600	RELAY BANK RESET ... (2 req'd.)	PLAYFIELD
G 23-750	EJECT COIL ... (2 req'd.)	PLAYFIELD
	JET BUMPERS ... (3 req'd.)	PLAYFIELD
	KICKER COILS ... (2 req'd.)	PLAYFIELD
FL 20-300/28-400	FLIPPER ... (2 req'd.)	PLAYFIELD

RELAY COILS

M1-31-1500	COIN LOCKOUT	DOOR
M 29-1000	GAME TRIP	MECH. PANEL
	GAME OVER TRIP	MECH. PANEL
M 29-1100	5¢ RELAY	MECH. PANEL
	10¢ RELAY	MECH. PANEL
	25¢ RELAY	MECH. PANEL
	10 PT. RELAY	INSERT
	100 PT. RELAY	INSERT
	1,000 PT. RELAY	INSERT
	SCORE RESET RELAY	INSERT
	500 RELAY	PLAYFIELD
	SPECIAL RESET	PLAYFIELD
	3 IN LINE RESET	PLAYFIELD
	CENTER TARGET	PLAYFIELD
M 30-1300	100,000 RELAY	INSERT
S 27-500	RELAY BANK ... (18 req'd.)	PLAYFIELD
Z 27-1000	GAME LATCH	MECH. PANEL
	GAME OVER LATCH	MECH. PANEL
	EJECT RELAY	MECH. PANEL
	COIN RELAY	MECH. PANEL
	OUTHOLE RELAY	MECH. PANEL
	RESET RELAY	MECH. PANEL
Z 28-1150	BALL INDEX RELAY	MECH. PANEL
Z 28-1200	ON BUMPER RELAY	PLAYFIELD
Z 29-1250	LOCK RELAY	MECH. PANEL
XM 27-675	METER COIL	B 6396

# 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	
NO. MATCH	C-6417	C-6521	A-6401	
BALL COUNT	C-6414	B-7456-3	A-6402-10	SCORE MOTOR
10 POINT	B-7253	A-6294	3C-7272	14A-7883 (60 CYCLE)
100 POINT	-----	-----	3C-7272	14A-7884 (50 CYCLE)
1000 POINT	B-7253	A-6294	3C-7272	
100000 POINT	B-7253	A-6294	3C-7272	

# BALL COUNT UNIT DISC

DURING RESET CYCLE, THIS UNIT RESETS TO ZERO AND THEN ADVANCES 5 STEPS.

DURING PLAY, IT RESETS ONE STEP EACH TIME THE BALL MAKES OUTHOLE SWITCH.

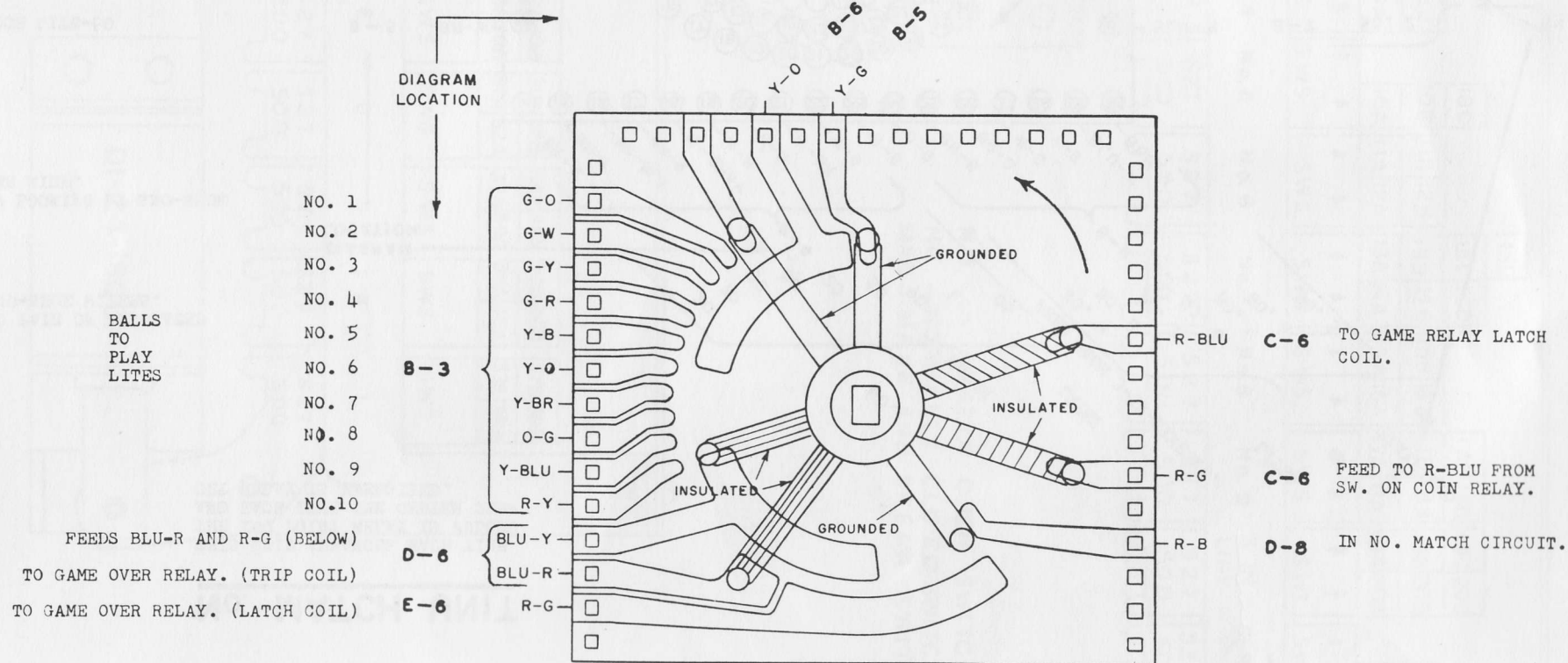
IT ADVANCES ONE STEP WHEN "SPECIAL RESET RELAY" OR "3-IN-LINE-RESET RELAY" ARE ENERGIZED.

IT ADVANCES ONE, TWO OR THREE STEPS WHEN 4 CORNERS ARE MADE. (NO. 1, 3, 7 AND 9 RELAYS).

IT ALSO ADVANCES THRU HI-SCORE CIRCUIT.

THESE CIRCUITS PASS THRU THE "REPLAY-ADD-A-BALL-NOVELTY" ADJUSTMENT JACK.

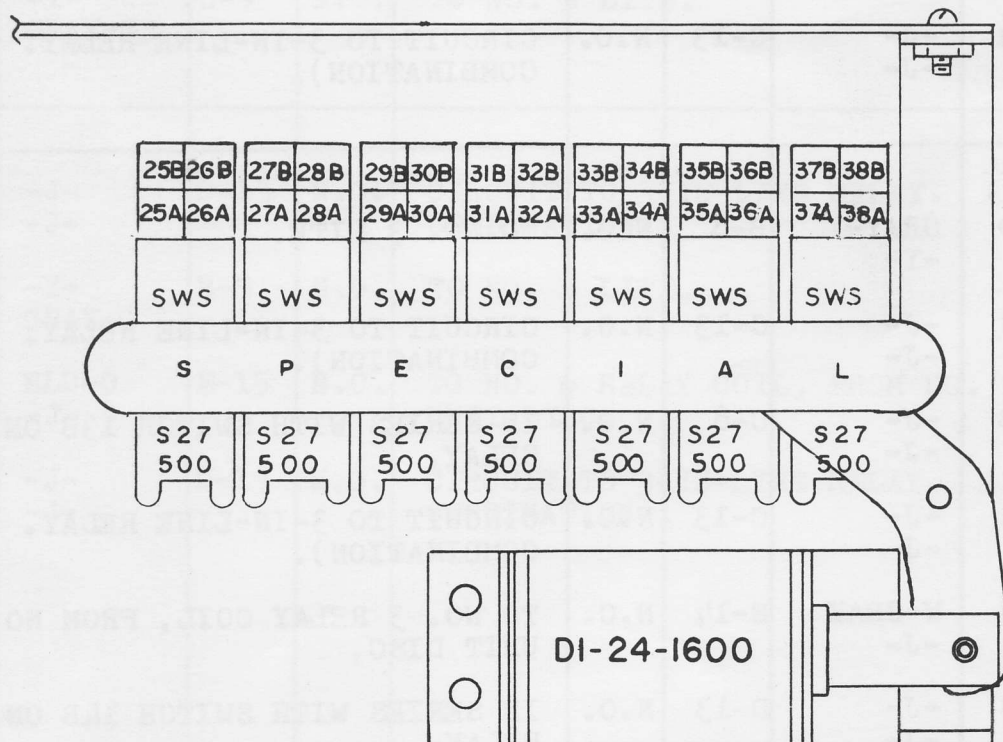
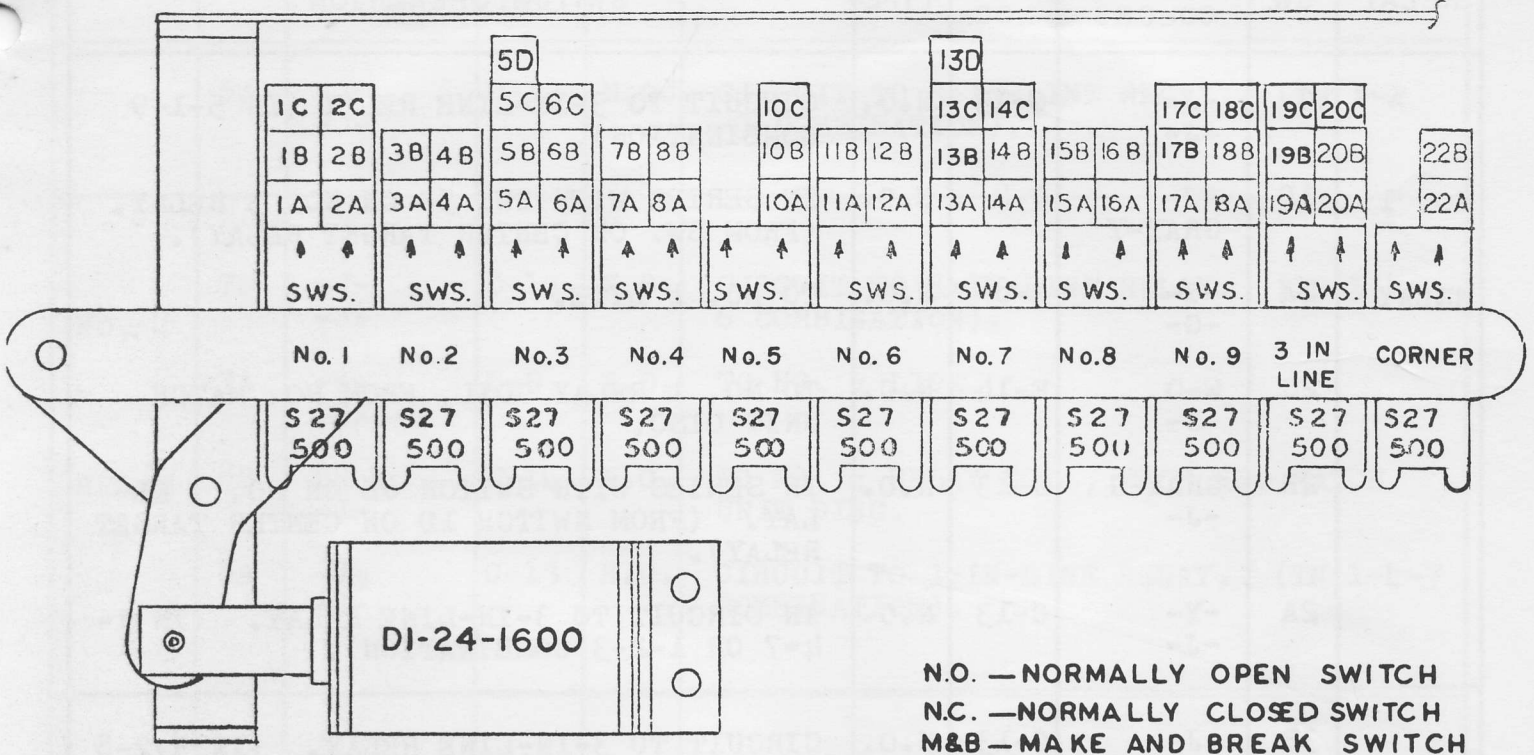
VIEW LOOKING AT WIPER FINGERS, WITH WIPER IN RESET POSITION.







# RELAY BANK SWS.



RELAY	SW.	WIRE COLORS	DIAG. LOC.	TYPE	SWITCH OPERATION
NO. 1 RELAY	1C	-J- -J-	C-13	N.O.	CIRCUIT TO 3-IN-LINE RELAY (IN 5-1-9 COMBINATION).
	1B	-J- GRAY-Y	C-8	N.O.	IN SERIES WITH SW. 5B ON NO. 3 RELAY. (FROM SW. ON CENTER TARGET RELAY).
	1A	-Y- -G-	B-8	N.O.	TO NO. 1 LITE.
	2C	W-O -J-	E-14	N.C.	TO NO. 1 RELAY COIL, FROM NO. MATCH UNIT DISC.
	2B	GRAY-G -J-	D-13	N.O.	IN SERIES WITH SWITCH 6B ON NO. 3 RELAY. (FROM SWITCH 1D ON CENTER TARGET RELAY).
	2A	-Y- -J-	C-13	N.O.	IN CIRCUIT TO 3-IN-LINE RELAY. (IN 1-4-7 OR 1-2-3 COMBINATION).
NO. 2 RELAY	3B	-J- -J-	C-13	N.O.	CIRCUIT TO 3-IN-LINE RELAY. (IN 5-2-8 COMBINATION).
	3A	-Y- BR-O	B-8	N.O.	TO NO. 2 LITE.
	4B	W-B -J-	E-14	N.C.	TO NO. 2 RELAY COIL, FROM NO. MATCH UNIT DISC.
	4A	-J- -J-	C-13	N.O.	CIRCUIT TO 3-IN-LINE RELAY. (IN 1-2-3 COMBINATION).
NO. 3 RELAY	5D	GRAY-Y -Y-	B-8	N.O.	TO NO. 3 LITE.
	5C	-J- -J-	C-13	N.O.	CIRCUIT TO 3-IN-LINE RELAY. (IN 5-3-7 COMBINATION).
	5B	-J- -J-	C-8	N.O.	IN SERIES WITH SWITCH 13B ON NO. 7 RELAY.
	5A	-J- -J-	C-13	N.O.	CIRCUIT TO 3-IN-LINE RELAY. (IN 9-3-6 COMBINATION).
	6C	W-GRAY -J-	E-14	N.C.	TO NO. 3 RELAY COIL, FROM NO. MATCH UNIT DISC.
	6B	-J- -J-	D-13	N.O.	IN SERIES WITH SWITCH 14B ON NO. 7 RELAY.



RELAY	SW.	WIRE COLORS	DIAG. LOC.	TYPE	SWITCH OPERATION
	6A	-J- -J-	D-13	N.O.	CIRCUIT TO 3-IN-LINE RELAY. (IN 1-2-3 COMBINATION).
NO. 4	7B	-J- -J-	C-13	N.O.	CIRCUIT TO 3-IN-LINE RELAY. (IN 5-4-6 COMBINATION).
RELAY	7A	-Y- GRAY-W	B-9	N.O.	TO NO. 4 LITE.
	8B	BR-R -J-	E-14	N.O.	TO NO. 4 RELAY COIL, FROM NO. MATCH UNIT DISC.
	8A	-J- -J-	C-13	N.O.	CIRCUIT TO 3-IN-LINE RELAY. (IN 1-4-7 COMBINATION).
NO. 5	10C	BR-BLU -J-	E-14	N.C.	TO NO. 5 RELAY COIL, FROM NO. MATCH DISC.
RELAY	10B	-J- -Y-	C-13	N.O.	CIRCUITS TO 3-IN-LINE RELAY. (IN 5-1-9, 5-2-8, 5-3-7, OR 5-4-6 COMBINATIONS).
	10A	-Y- GRAY-BR	B-9	N.O.	TO NO. 5 LITE.
NO. 6	11B	-J- -J-	D-13	N.O.	CIRCUIT TO 3-IN-LINE RELAY. (IN 5-4-6 COMBINATION).
RELAY	11A	-Y- GRAY-O	B-9	N.O.	TO NO. 6 LITE.
	12B	BLU-O -J-	E-15	N.C.	TO NO. 6 RELAY COIL, FROM NO. MATCH UNIT DISC.
	12A	-J- -J-	D-13	N.O.	CIRCUIT TO 3-IN-LINE RELAY. (IN 9-3-6 COMBINATION).

RELAY	SW.	WIRE COLORS	DIAG. LOC.	TYPE	SWITCH OPERATION
NO. 7 RELAY	13D	Y-BR -Y-	B-9	N.O.	TO NO. 7 LITE.
	13C	-J- -J-	D-13	N.O.	CIRCUIT TO 3-IN-LINE RELAY. (IN 5-3-7 COMBINATION).
	13B	-J- -J-	D-8	N.O.	IN SERIES WITH SWITCH 17B ON NO. 9 RELAY.
	13A	-J- -J-	D-13	N.O.	CIRCUIT TO 3-IN-LINE RELAY. (IN 9-8-7 COMBINATION).
	14C	Y-O -J-	E-15	N.C.	TO NO. 7 RELAY COIL, FROM NO. MATCH UNIT DISC.
	14B	-J- -J-	D-13	N.O.	IN SERIES WITH SWITCH 18B ON NO. 9 RELAY.
	14A	-J- -J-	D-13	N.O.	CIRCUIT TO 3-IN-LINE RELAY. (IN 1-4-7 COMBINATION).
NO. 8 RELAY	15B	-J- -J-	D-13	N.O.	CIRCUIT TO 3-IN-LINE RELAY. (IN 5-2-8 COMBINATION).
	15A	-Y- G-R	B-9	N.O.	TO NO. 8 LITE.
	16B	Y-B -J-	E-15	N.C.	TO NO. 8 RELAY COIL, FROM NO. MATCH UNIT DISC.
	16A	-J- -J-	D-13	N.O.	CIRCUIT TO 3-IN-LINE RELAY. (IN 9-8-7 COMBINATION).
NO. 9 RELAY	17C	-J- -J-	D-13	N.O.	CIRCUIT TO 3-IN-LINE RELAY. (IN 5-1-9 COMBINATION).
	17B	-J- -J-	D-8	N.O.	IN SERIES WITH SWITCH 22A ON CORNER RELAY.
	17A	-Y- W-BLU	B-9	N.O.	TO NO. 9 LITE
	18C	O-W -J-	E-15	N.C.	TO NO. 9 RELAY COIL, FROM NO. MATCH UNIT DISC.
	18B	-J- -J-	E-13	N.O.	IN SERIES WITH SWITCH 22B ON CORNER RELAY.
	18A	-Y- -J-	C-13	N.O.	CIRCUIT TO 3-IN-LINE RELAY. (IN 9-3-6 AND 9-8-7 COMBINATIONS).

RELAY	SW.	WIRE COLORS	DIAG. LOC.	TYPE	SWITCH OPERATION
3-IN LINE RELAY	19C	GRAY-R Y-BLU Y-R	E-12	M&B	OPENS IN CIRCUIT TO 500 RELAY AND CLOSSES TO "3-IN-LINE-RESET" RELAY.
	19B	R-G -Y-	B-7	N.C.	TO NO. 1 THRU NO. 9 ARROW LITES, THRU NO. MATCH UNIT DISC.
	19A	R-W BLU-R	C-14	N.C.	OPENS CIRCUITS TO NO. 1 THRU NO. 9 RELAY COILS.
	20C	Y-G G-R BR-R	C-16	M&B	IN CIRCUIT TO 1,000 POINT RELAY.
	20B	-J- -J-	E-13	N.C.	TO COIL ON THIS RELAY.
	20A	-Y- GRAY-BLU	B-7	N.O.	TO LEFT AND RIGHT EJECT POCKET LITES AND TO CENTER TARGET LITE.
CORNER RELAY	22B	-J- -J-	E-13	N.C.	TO COIL ON THIS RELAY. (SEE SWITCH 2B ON NO. 1 RELAY).
	22A	-J- W-G	D-8	N.C.	IN CIRCUIT TO REPLAY S.U., THRU ADJUSTMENT JACK (SEE SWITCH 1B ON NO. 1 RELAY).
'S' RELAY	25B	GRAY-R BLU-W; -J-	C-12	M&B	OPENS TO 500 RELAY AND CLOSSES IN SERIES WITH SWITCH 27B ON 'P' RELAY.
	25A	-Y- -J-	B-7	N.O.	IN SERIES WITH SWITCH 27A ON 'P' RELAY.
	26B	-J- R-BLU GRAY-R	E-10	M&B	OPENS TO 'S' RELAY COIL AND CLOSSES TO 500 RELAY.
	26A	-Y- O-G	B-6	N.O.	TO 'S' LITE.



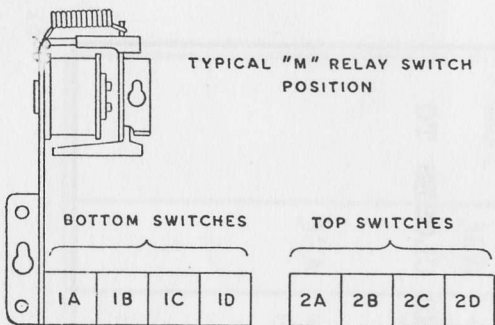
RELAY	SW.	WIRE COLORS	DIAG. LOC.	TYPE	SWITCH OPERATION
'P' RELAY	27B	GRAY-R -J- -J-	D-12	M&B	OPENS TO 500 RELAY AND CLOSSES IN SERIES WITH SWITCH 29B ON 'E' RELAY.
	27A	-J- -J-	B-7	N.O.	IN SERIES WITH SWITCH 29A ON 'E' RELAY.
	28B	-J- R-Y GRAY-R	E-11	M&B	OPENS TO 'P' RELAY COIL AND CLOSSES TO 500 RELAY.
	28A	-Y- O-W	B-6	N.O.	TO 'P' LITE.
'E' RELAY	29B	GRAY-R -J- -J-	D-12	M&B	OPENS TO 500 RELAY AND CLOSSES IN SERIES WITH SWITCH 31B ON "C" RELAY.
	29A	-J- -J-	B-7	N.O.	IN SERIES WITH SWITCH 31A ON 'C' RELAY.
	30B	-J- R-G GRAY-R	E-11	M&B	OPENS TO 'E' RELAY COIL AND CLOSSES TO 500 RELAY.
	30A	-Y- O-B	B-6	N.O.	TO 'E' LITE.
'C' RELAY	31B	GRAY-R -J- -J-	D-12	M&B	OPENS TO 500 RELAY AND CLOSSES IN SERIES WITH SWITCH 33B ON 'I' RELAY.
	31A	-J- -J-	B-7	N.O.	IN SERIES WITH SWITCH 33A ON 'I' RELAY.
	32B	-J- R-W GRAY-R	E-11	M&B	OPENS TO 'C' RELAY COIL AND CLOSSES TO 500 RELAY.
	32A	-Y- B-Y	B-6	N.O.	TO 'C' LITE.

RELAY	SW.	WIRE COLORS	DIAG. LOC.	TYPE	SWITCH OPERATION
'I' RELAY	33B	GRAY-R -J- -J-	E-12	M&B	OPENS TO 500 RELAY AND CLOSES IN SERIES WITH SWITCH 35B ON 'A' RELAY.
	33A	-J- -J-	B-7	N.O.	IN SERIES WITH SWITCH 35A ON 'A' RELAY.
	34B	-J- R-BR GRAY-R	E-11	M&B	OPENS TO 'I' RELAY COIL AND CLOSES TO 500 RELAY.
	34A	-Y- B-G	B-6	N.O.	TO 'I' LITE.
'A' RELAY	35B	GRAY-R -J- -J-	E-12	M&B	OPENS TO 500 RELAY AND CLOSES IN SERIES WITH SWITCH 37B ON 'L' RELAY.
	35A	-J- -J-	A-7	N.O.	IN SERIES WITH SWITCH 37A ON 'L' RELAY.
	36B	-J- R-O GRAY-R	E-11	M&B	OPENS TO 'A' RELAY COIL AND CLOSES TO 500 RELAY.
	36A	-Y- B-W	B-6	N.O.	TO 'A' LITE.
'L' RELAY	37B	GRAY-R -J- BLU-B	E-12	M&B	OPENS TO 500 RELAY AND CLOSES TO "SPECIAL RESET" RELAY, WHEN MAKING LEFT OR RIGHT BOTTOM ROLLOVER. (SEE SWITCH 25B 'S' RELAY).
	37A	-J- GRAY-R	A-7	NO.	TO LEFT AND RIGHT BOTTOM ROLLOVER LITES. (CIRCUIT ORIGINATES AT SWITCH 25A ON 'S' RELAY).
	38B	-J- R-B GRAY-R	E-11	M&B	OPENS TO 'L' RELAY COIL AND CLOSES TO 500 RELAY.
	38A	-Y- B-O	B-6	N.O.	TO 'L' LITE.

# RELAYS & SWITCHES

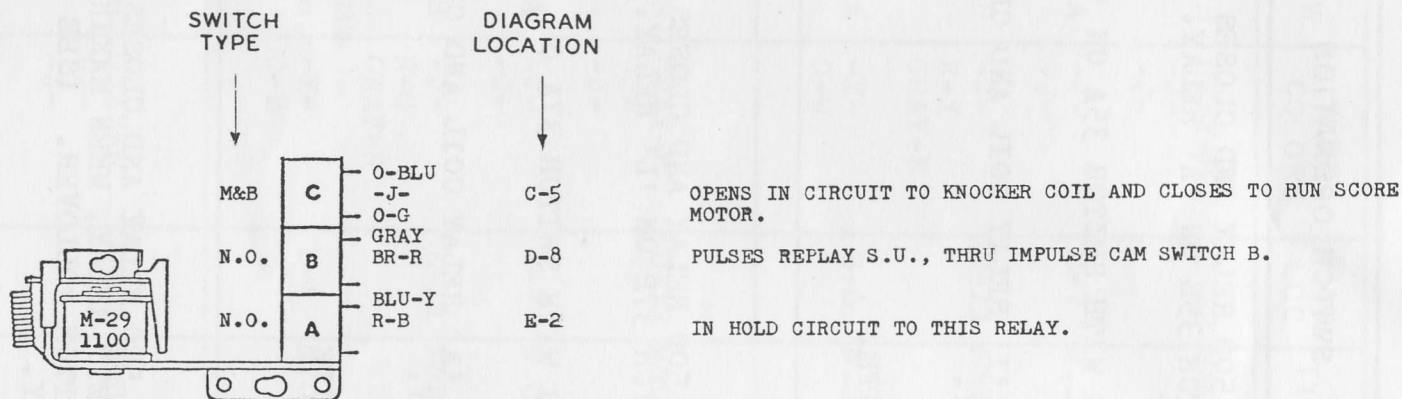
LOCATED ON MECHANISM PANEL

TYPICAL "M" RELAY SWITCH POSITION



## 10¢ RELAY

IS ENERGIZED BY 10¢ COIN SWITCH, IF 10¢ ADJUSTMENT JACK IS IN "2 PLAYS" OR "3 PLAYS" POSITION.



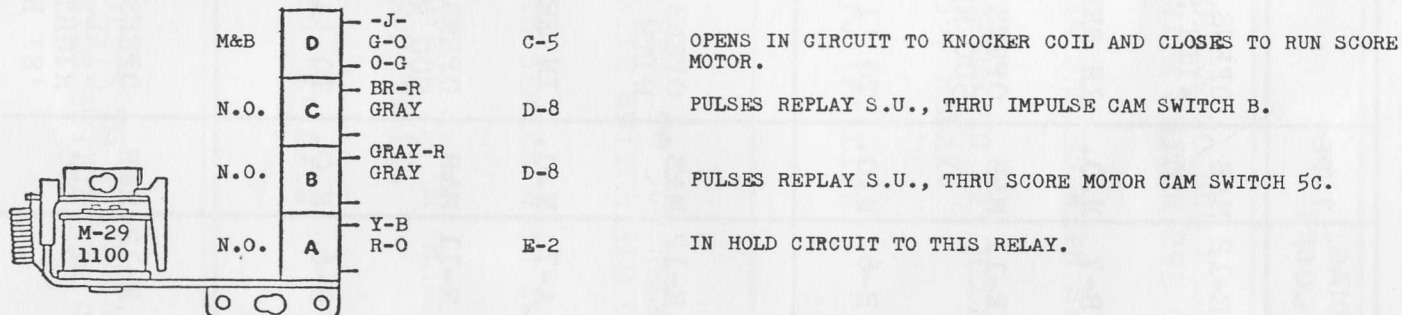
OPENS IN CIRCUIT TO KNOCKER COIL AND CLOSES TO RUN SCORE MOTOR.

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

IN HOLD CIRCUIT TO THIS RELAY.

## 25¢ RELAY

IS ENERGIZED BY 25¢ COIN SWITCH.



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

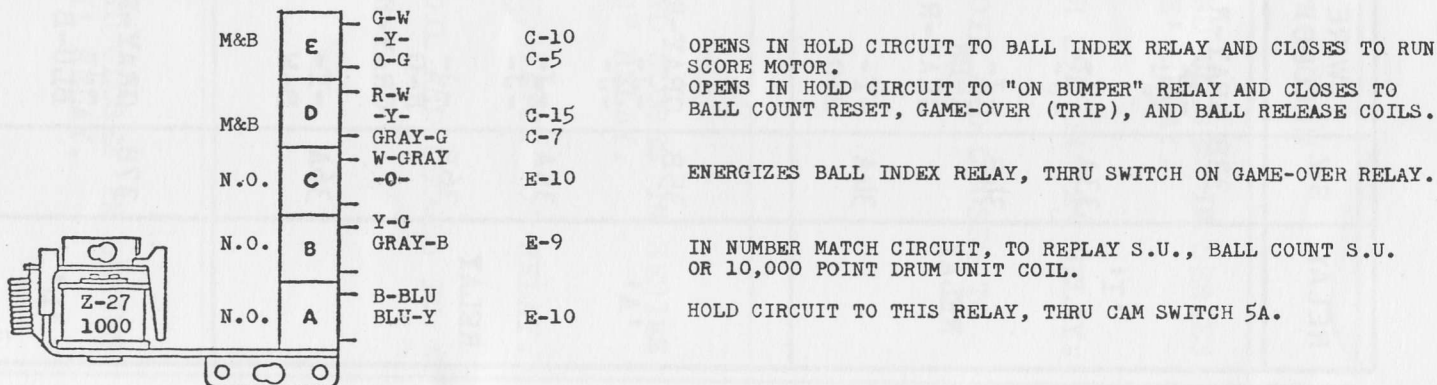
PULSES REPLAY S.U., THRU IMPULSE CAM SWITCH B.

PULSES REPLAY S.U., THRU SCORE MOTOR CAM SWITCH 5C.

IN HOLD CIRCUIT TO THIS RELAY.

## OUTHOLE RELAY

IS ENERGIZED BY OUTHOLE SWITCH, THRU BALL COUNT ZERO SWITCH.



OPENS IN HOLD CIRCUIT TO BALL INDEX RELAY AND CLOSES TO RUN SCORE MOTOR.

OPENS IN HOLD CIRCUIT TO "ON BUMPER" RELAY AND CLOSES TO BALL COUNT RESET, GAME-OVER (TRIP), AND BALL RELEASE COILS.

ENERGIZES BALL INDEX RELAY, THRU SWITCH ON GAME-OVER RELAY.

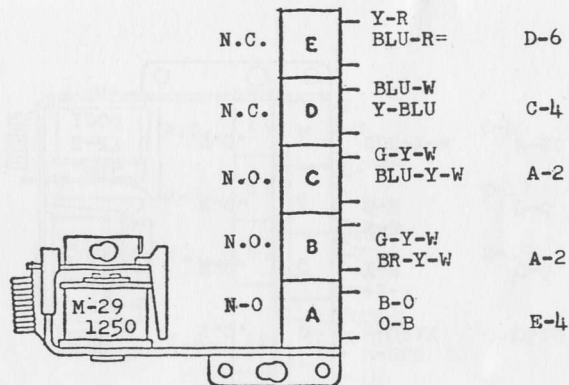
IN NUMBER MATCH CIRCUIT, TO REPLAY S.U., BALL COUNT S.U. OR 10,000 POINT DRUM UNIT COIL.

HOLD CIRCUIT TO THIS RELAY, THRU CAM SWITCH 5A.



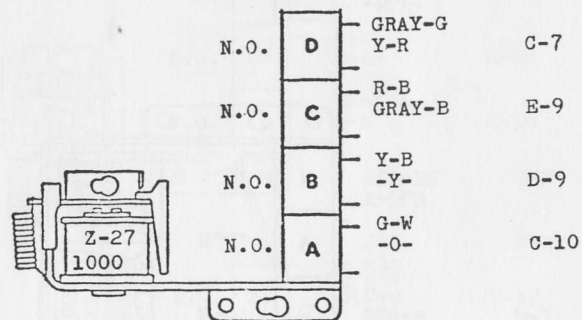
## LOCK RELAY

IS ENERGIZED BY 5¢ RELAY, COIN RELAY, LEFT FLIPPER SWITCH OR SCORE MOTOR CAM SWITCH 1C.



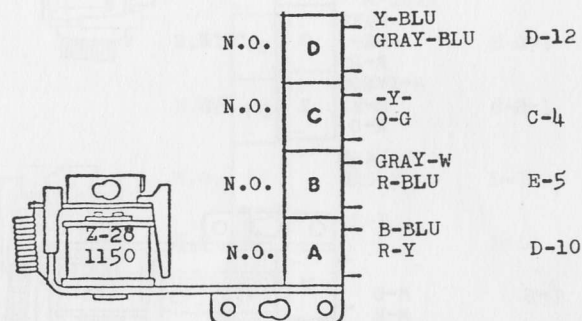
## BALL INDEX RELAY

IS ENERGIZED BY 100 POINT RELAY OR 1,000 POINT RELAY---ALSO BY OUTHOLE RELAY, THRU GAME-OVER RELAY.



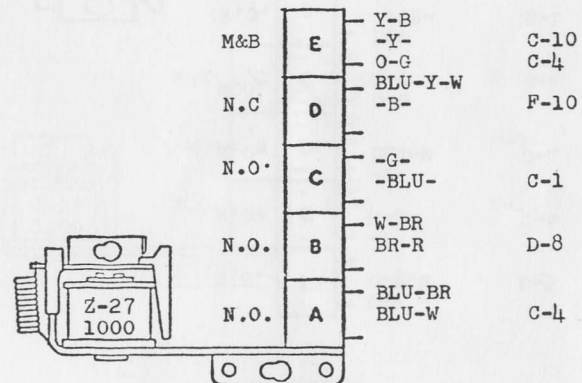
## EJECT RELAY

IS ENERGIZED BY EJECT POCKET SWITCHES, THRU SCORE MOTOR INDEX CAM SWITCH F.



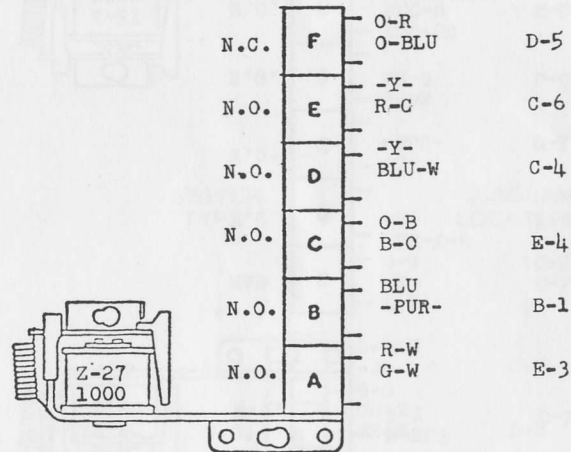
## RESET RELAY

IS ENERGIZED BY COIN RELAY.



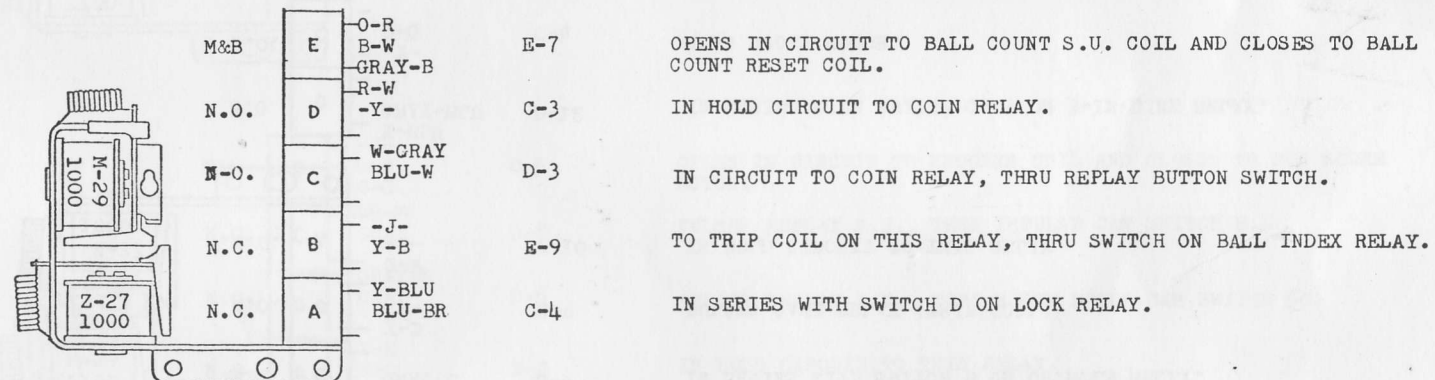
## COIN RELAY

IS ENERGIZED BY COIN SWITCH, IF 10¢ ADJUSTMENT JACK IS IN "1PLAY" POSITION--- ALSO BY REPLAY BUTTON, THRU ZERO SWITCH ON REPLAY UNIT.



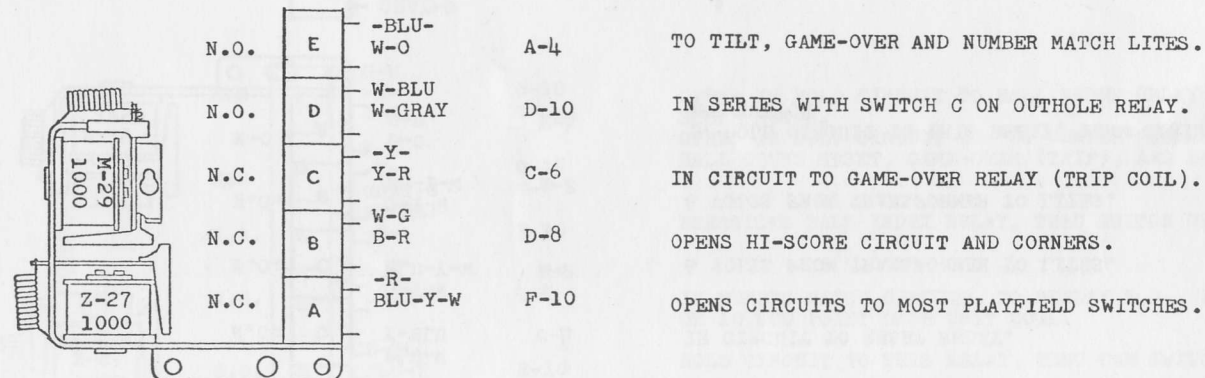
## GAME RELAY INTERLOCK

LATCH COIL IS ENERGIZED BY SWITCH E ON COIN RELAY, THRU WIPER FINGER ON BALL COUNT UNIT (AT ZERO POSITION). TRIP COIL IS ENERGIZED BY BALL INDEX RELAY.



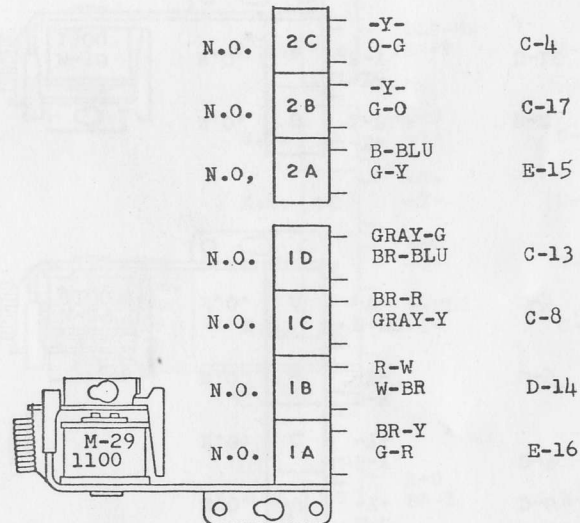
## GAME-OVER RELAY INTERLOCK

LATCH COIL IS ENERGIZED BY SWITCH E ON COIN RELAY---ALSO BY SERIES CIRCUIT THRU OUTHOLE RELAY, BALL INDEX RELAY AND BALL COUNT UNIT DISC. TRIP COIL IS ENERGIZED BY LOCK RELAY OR TILT SWITCHES---ALSO BY SERIES CIRCUIT THRU OUTHOLE RELAY, BALL INDEX RELAY AND BALL COUNT UNIT DISC (IN ZERO OR FIRST POSITION).



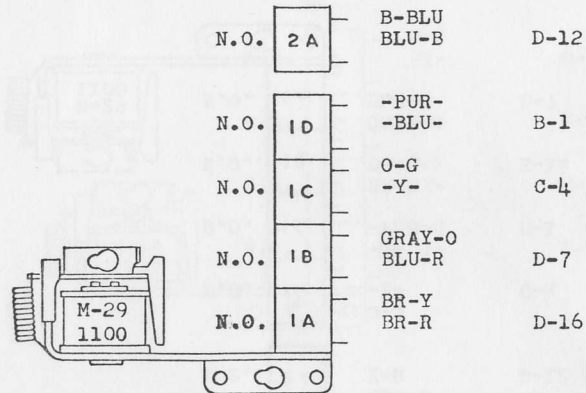
## CENTER TARGET

IS ENERGIZED BY CENTER TARGET SWITCH.



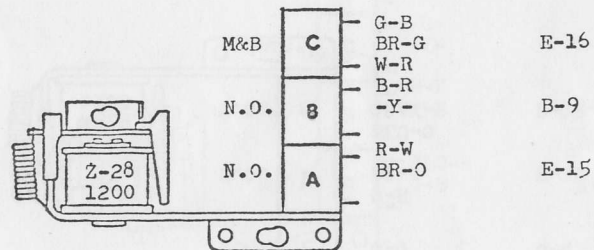
## SPECIAL RESET

IS ENERGIZED BY LEFT OR RIGHT BOTTOM ROLLOVER, THRU SWITCHES ON S-P-E-C-I-A-L RELAYS.



## ON BUMPER

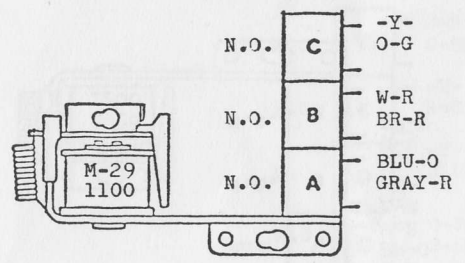
IS ENERGIZED BY LEFT OR RIGHT TARGET SWITCH.





### 500 RELAY

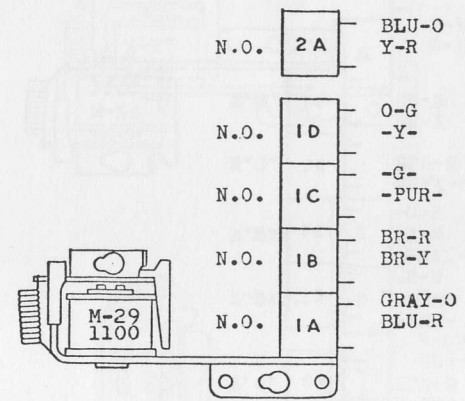
IS ENERGIZED BY LEFT OR RIGHT BOTTOM ROLLOVER, S-P-E-C-I-A OR L ROLLOVERS, OR BY EJECT RELAY THRU SWITCH ON 3-IN-LINE RELAY.



- C-4 RUNS SCORE MOTOR.
- E-16 PULSES 100 POINT RELAY, THRU IMPULSE CAM SWITCH B.
- D-12 HOLD CIRCUIT TO THIS RELAY, THRU CAM SWITCH 5B.

### 3-IN-LINE RESET RELAY

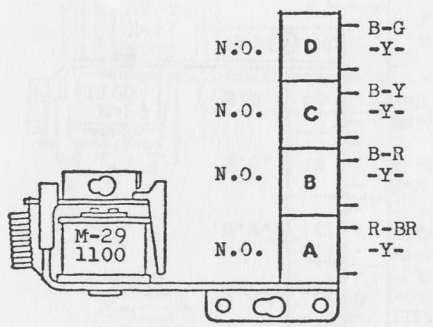
IS ENERGIZED BY EJECT RELAY, THRU SWITCH ON 3-IN-LINE RELAY.



- D-12 HOLD CIRCUIT TO THIS RELAY, THRU SCORE MOTOR CAM SWITCH 5B.
- C-4 RUNS SCORE MOTOR.
- B-1 ENERGIZES "3-IN-LINE RELAY BANK RESET COIL," THRU CAM SWITCH 1B.
- E-16 PULSES 1,000 POINT RELAY, THRU IMPULSE CAM SWITCH B.
- D-7 ENERGIZES BALL COUNT S.U. AT SCORE MOTOR INDEX CAM SWITCH D.

### SCORE RESET RELAY

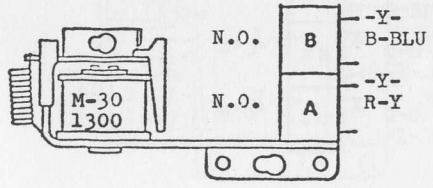
IS PULSED BY IMPULSE CAM SWITCH B, THRU SWITCH B ON RESET RELAY.



- D-6 PULSES 10,000 POINT DRUM UNIT, THRU ZERO SWITCH ON THAT UNIT.
- D-5 PULSES 1,000 POINT DRUM UNIT, THRU ZERO SWITCH ON THAT UNIT.
- D-5 PULSES 10 POINT DRUM UNIT, THRU ZERO SWITCH ON THAT UNIT.
- D-5 PULSES 100 POINT DRUM UNIT, THRU ZERO SWITCH ON THAT UNIT.

### 100,000 RELAY

IS ENERGIZED BY 10,000 POINT DRUM UNIT END-OF-STROKE SWITCH, THRU 10,000 POINT DRUM UNIT 9TH POSITION SWITCH.

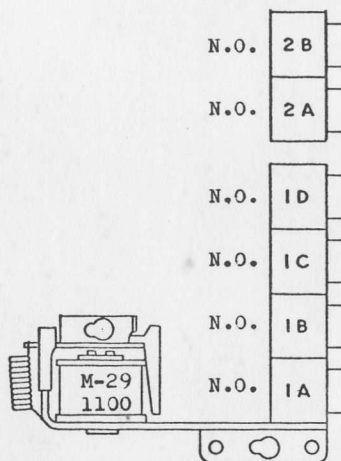


- B-2 TO 100,000 LITE.
- D-10 HOLD CIRCUIT TO THIS RELAY.

## 1,000 POINT

IS PULSED BY:

1. CENTER TARGET RELAY.
2. LEFT & RIGHT BOTTOM ROLLOVER SWITCHES.
3. SPECIAL RESET RELAY.
4. 3-IN-LINE-RESET RELAY.



N.O.	2 B	BR-B -Y-	C-8
N.O.	2 A	BLU-BR BR-Y	E-17
N.O.	1 D	O-B -Y-	C-6
N.O.	1 C	-O- -Y-	C-10
N.O.	1 B	B-G -Y-	C-17
N.O.	1 A	W-BLU -Y-	C-6

IN HI-SCORE CIRCUIT TO "REPLAY-ADD-A-BALL-NOVELTY" ADJUSTMENT JACK.

IN HOLD CIRCUIT TO THIS RELAY.

PULSES 1,000 POINT DRUM UNIT.

ENERGIZES BALL INDEX RELAY.

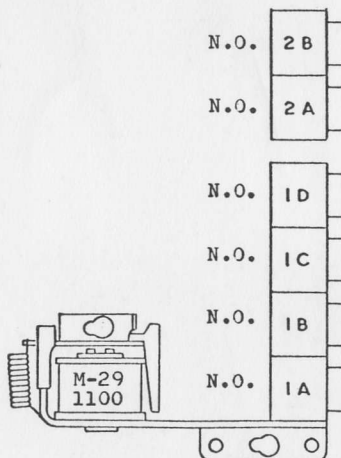
PULSES LARGE CHIME COIL.

PULSES 10,000 POINT DRUM UNIT, THRU 9TH POSITION SWITCH ON 1,000 POINT DRUM UNIT.

## 100 POINT

IS PULSED BY:

1. 500 RELAY.
2. (3) ROLLOVER BUTTONS.
3. LEFT & RIGHT TARGET SWITCHES.
4. (3) JET BUMPER SWITCHES, THRU "ON BUMPER" RELAY.



N.O.	2 B	R-O BR-Y	E-17
N.O.	2 A	BLU-Y W-R	E-17
N.O.	1 D	O-R -Y-	C-17
N.O.	1 C	-O- -Y-	C-10
N.O.	1 B	O-W -Y-	C-5
N.O.	1 A	W-G -Y-	C-17

PULSES 1,000 POINT RELAY, THRU 9TH POSITION SWITCH ON 100 POINT DRUM UNIT.

IN HOLD CIRCUIT TO THIS RELAY.

PULSES SMALL CHIME COIL.

ENERGIZES BALL INDEX RELAY.

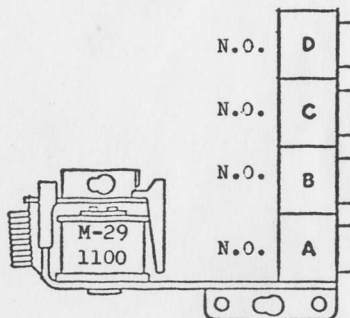
PULSES 100 POINT DRUM UNIT.

ENERGIZES NUMBER MATCH S.U. COIL.

## 10 POINT

IS PULSED BY:

1. (3) JET BUMPER SWITCHES THRU SWITCH ON "ON BUMPER" RELAY.
2. KICKER SWITCHES.
3. STANDUP SWITCHES.



N.O.	D	O-BLU -Y-	C-5
N.O.	C	-O- -Y-	C-17
N.O.	B	B-Y W-R	E-17
N.O.	A	BLU-R G-B	E-17

PULSES 10 POINT DRUM UNIT.

PULSES MEDIUM CHIME COIL.

PULSES 100 POINT RELAY, THRU 9TH POSITION SWITCH ON 10 POINT DRUM UNIT.

HOLD CIRCUIT TO THIS RELAY, THRU END-OF-STROKE SWITCH ON 10 POINT DRUM UNIT.

