

Instruction Manual for GRAND PRIX



Williams[®] ELECTRONICS, INC.

A SUBSIDIARY OF
THE SEEBURG CORPORATION OF DELAWARE

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

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.

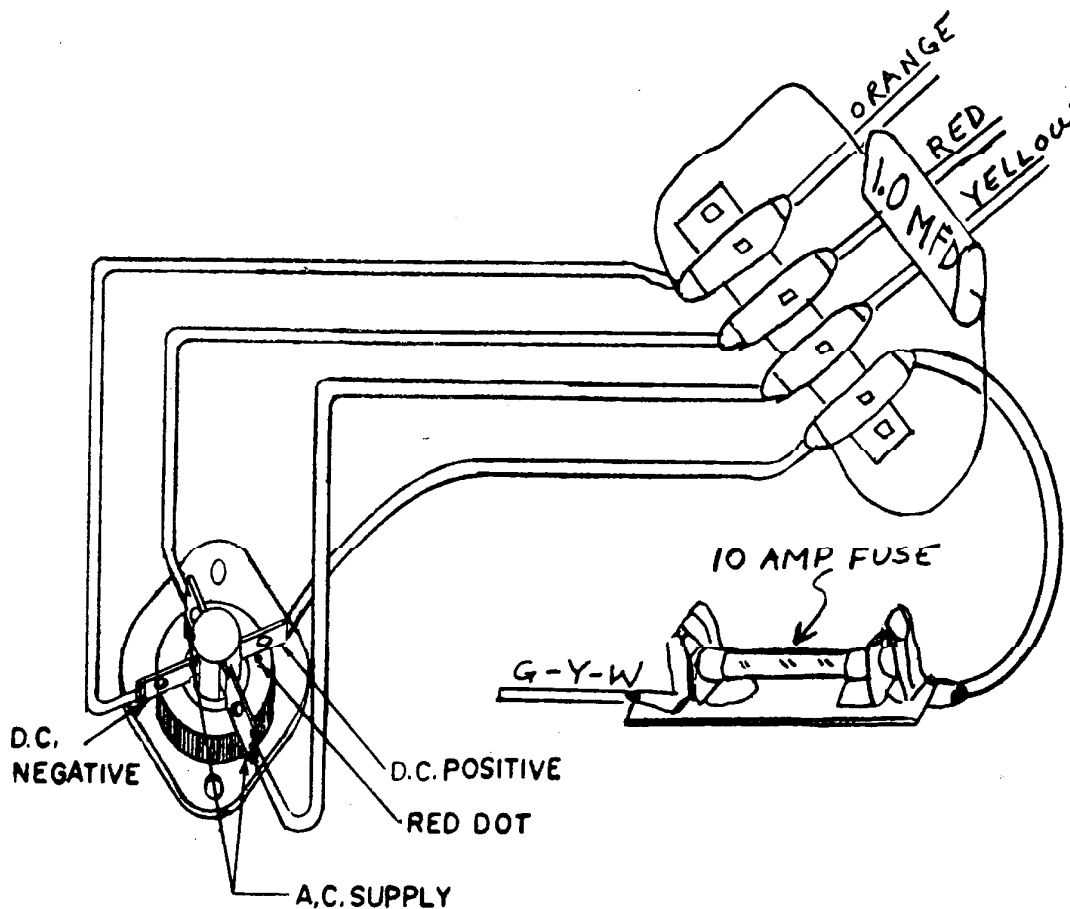
STEP-UP Levers, Ratchets, Cams, Shafts and other sliding or oscillating parts should be very lightly greased with special Coin Machine Lubricant (supplied with machine) not oftener than every six months. The bakelite discs (biscuits) on the Motor Units and Step-up Units will require lubrication with 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



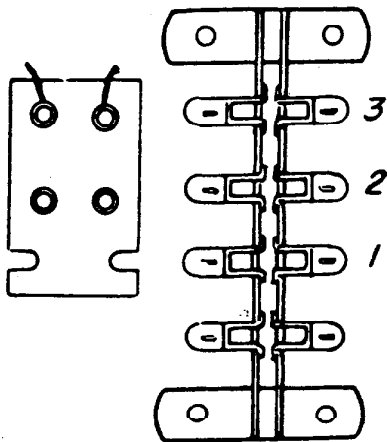
THE FUNCTION OF THE RECTIFIER AND CAPACITOR IS TO CONVERT THE ALTERNATING CURRENT (A.C.) TO DIRECT CURRENT (D.C.), SUPPLYING D.C. TO THE BUMPERS, KICKERS ETC.

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.

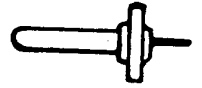
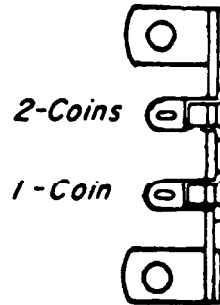
IF THE 10 AMP FUSE LOCATED NEXT TO THE RECTIFIER OPENS, CHECK ALL D.C. COMPONENTS I.E. BUMPERS, KICKERS ETC. FOR SHORTS.

10¢ Adjustment



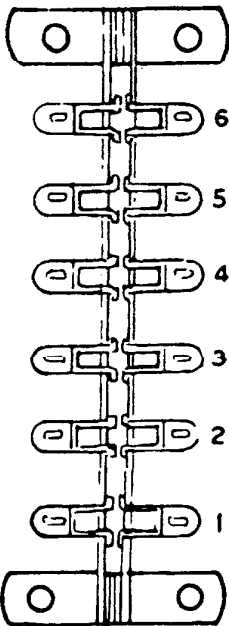
PROVIDES
1, 2 OR
3 PLAYS
FOR ONE
COIN.

5¢ Adjustment

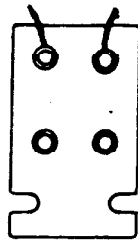


IN "2 COINS FOR
1 PLAY", CIRCUIT
TO COIN RELAY
PASSES THRU SW.
ON ALTERNATOR
UNIT.

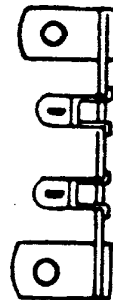
25¢ Adjustment



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



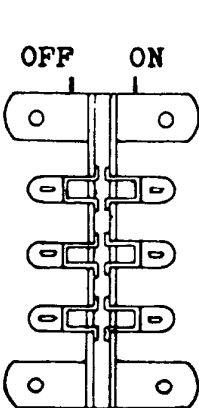
Motor Service Jack



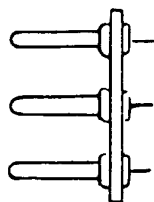
INSERT PHONE TIP IN
"OFF" POSITION - CAMS
CAN BE TURNED BY HAND
TO CHECK ADJUSTMENT OF
SWITCHES.

MASTER ON-OFF SW.

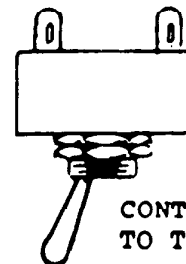
(Located under front of
Cabinet)



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 WHITE
WIRE FOR SCORES
510,000 TO 600,000

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

20,000 70,000

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

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

40,000 90,000

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

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

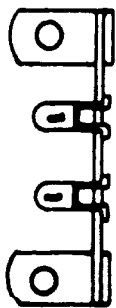
50,000 00,000

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

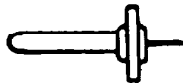


CREDIT

EXTRA BALL

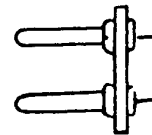
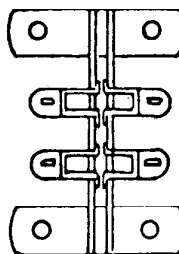
IN CREDIT POSITION: HI-SCORES & LEFT OR RIGHT BOTTOM ROLLOVER, WHEN LIT FOR "SPECIAL", WILL SCORE A CREDIT.

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



NUMBER MATCH ADJUSTMENT

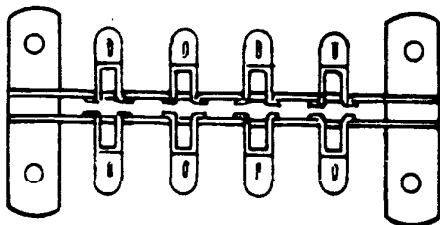
ON OFF



IN "ON" POSITION, A NUMBER MATCH LITE WILL APPEAR WHEN GAME IS OVER. TO AWARD CREDIT, WHEN NUMBER IS MATCHED, "PLAY" ADJUSTMENT MUST BE IN CREDIT POSITION.

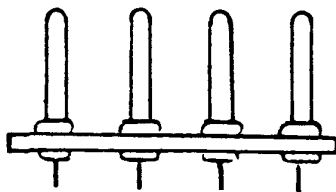
IN "OFF" POSITION, NUMBER MATCH IS INOPERATIVE.

No. of Balls Adjustment



5 BALL

3 BALL



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

SUGGESTED SCORE CARDS

CREDIT

5 BALL... 468-17

3 BALL... 468-30

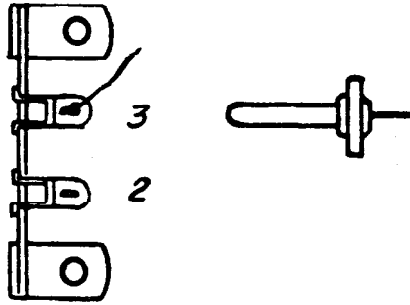
EXTRA BALL

5 BALL... 468-44

3 BALL... 468-40

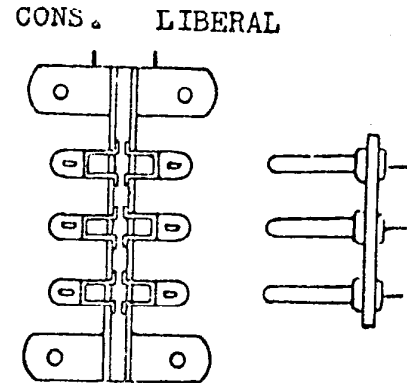
LOCATED ON PLAYFIELD

TOP EJECT ADJ.



CONTROLS THE NUMBER OF PULSES (2 OR 3) TO LEFT OR RIGHT BONUS UNIT S.U. COIL WHEN BALL MAKES TOP EJECT POCKET SWITCH.

FEATURE ADJ.



IN LIBERAL POSITION, LEFT AND RIGHT BOTTOM OUTSIDE ROLLOVERS WILL LIGHT FOR "SPECIAL" WHEN NO. 3 STAR RELAY IS ENERGIZED.
IN CONSERVATIVE POSITION, "SPECIAL" WILL LITE WHEN NO. 4 STAR RELAY IS 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 RESET LEFT & RIGHT BONUS UNITS TO ZERO.

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

WHEN RESET RELAY DROPS OUT, OUTHOLE RELAY IS ENERGIZED THRU ZERO SWITCH ON LEFT BONUS UNIT, SWITCH ON ALTERNATOR RELAY, OUTHOLE SWITCH, DELAY RELAY AND INDEX CAM SWITCH 'C'.

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

"GRAND PRIX"

GAME OPERATES AS FOLLOWS:

TOP EJECT HOLE ADVANCES LIT BONUS TWO OR THREE STEPS (ADJUSTABLE). TOP EJECT HOLE ALWAYS SCORES 5,000 POINTS.

LEFT SPINNER ADVANCES LEFT BONUS AND RIGHT SPINNER ADVANCES RIGHT BONUS. IN THREE BALL POSITION, THREE BONUS ADVANCES FOR EVERY TEN STEPS AND IN FIVE BALL POSITION, TWO BONUS ADVANCES FOR EVERY TEN STEPS. SPINNERS, WHEN LIT, SCORE 1,000'S. EACH SPINNER LIGHTS FOR 1,000'S WHEN RESPECTIVE BONUS REACHES 50,000.

JET BUMPER SCORE 1,000'S IN THREE BALL POSITION AND 100'S IN FIVE BALL POSITION.

LEFT EJECT HOLE SCORES LEFT BONUS AND RIGHT EJECT HOLE SCORES RIGHT BONUS.

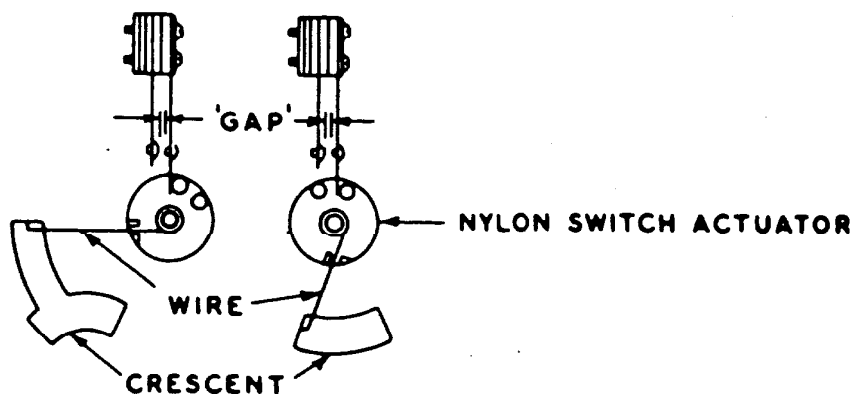
OUTHOLE SCORES LIT BONUS, DESIGNATED BY RED ARROWS.

MAKING TWO DROP TARGETS, A AND B OR C AND D, LIGHTS #1 STAR FOR DOUBLE BONUS.

MAKING TWO DROP TARGETS, A AND B OR C AND D, AGAIN, LIGHTS #2 STAR AND ALSO LIGHTS TWO BOTTOM INSIDE ROLLOVER LANES, ALTERNATELY, FOR EXTRA BALL.

#3 STAR, WHEN LIT, LIGHTS TWO BOTTOM OUTSIDE ROLLOVER LANES, ALTERNATELY, FOR SPECIAL. (ADJUSTABLE TO #4 STAR)

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.

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	
(RIGHT SIDE)	B-7568	A-7614	A-7595	
NO. MATCH & L & R SPINNER	B-7569	A-7615	A-7595	SCORE MOTOR
(LEFT SIDE)				
PLAYER	C-6417	C-6521-9	A-6404-3	14A-7883 (60 CYCLE)
COIN	C-6414	B-7456-9	A-6402-3	
L & R BONUS	C-6417	B-7456-65	A-6402-10	14A-7884 (50 CYCLE)
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	-----	-----	A-7567	

CAUTION!

The playboard on this machine has an improved finish with excellent wear properties. Do not under any circumstances clean the board with water, water soap sponges 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

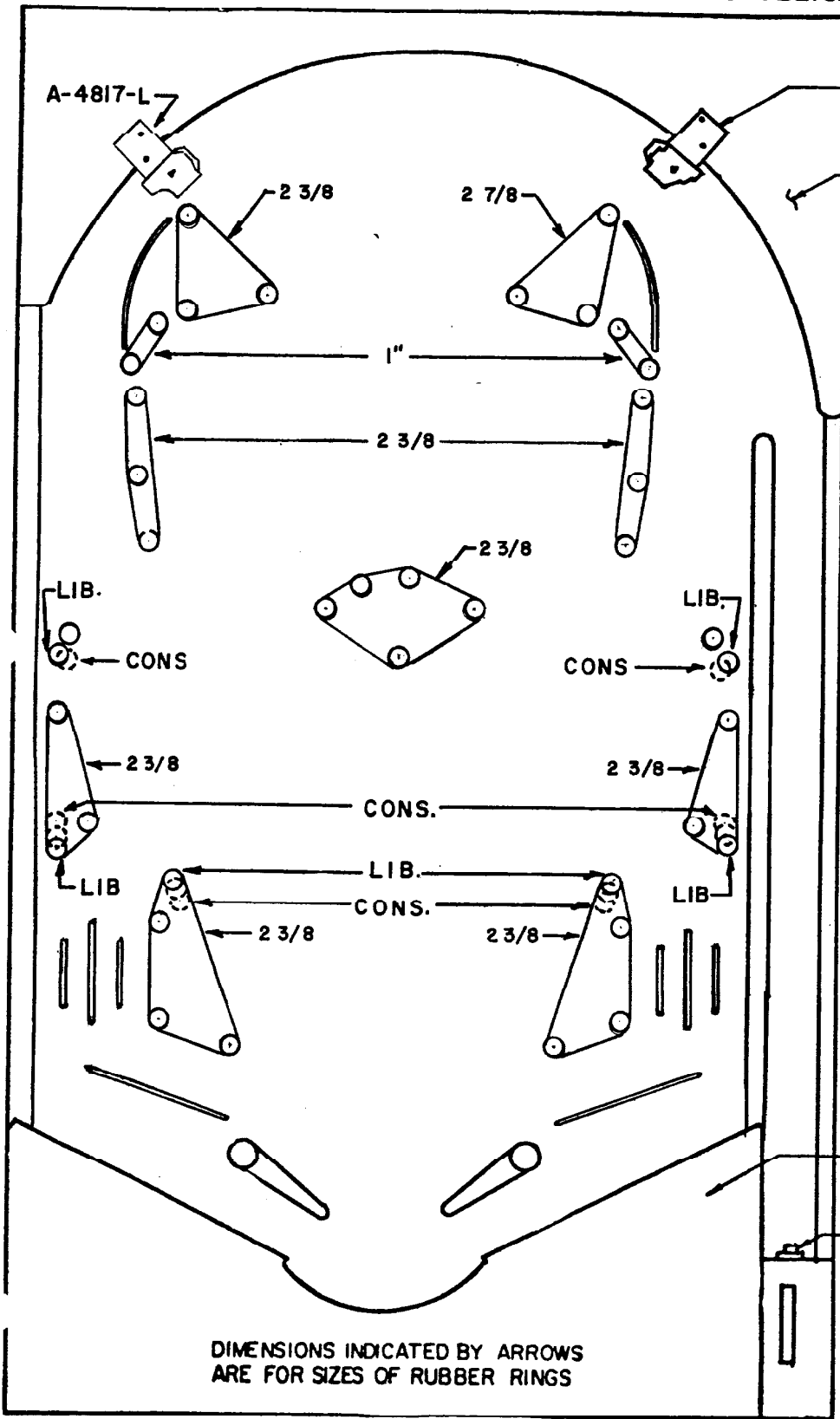
TO REMOVE BACKGLASS:

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

GRAND PRIX

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

IC-2852-467
TOP ARCH

ABBREVIATIONS:
CONS- CONSERVATIVE
LIB. - LIBERAL

RUBBER RING NUMBERS:

23A-6300	5/16 I.D.
23A-6302	1" I.D.
23A-6306	2 3/8 I.D.
23A-6307	2 7/8 I.D.

RUBBER RING-FLIPPERS
—— 23A-6519

D-7473
BOTTOM ARCH

23A-6327
BALL SHOOTER RUBBER TIP

DIMENSIONS INDICATED BY ARROWS
ARE FOR SIZES OF RUBBER RINGS

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

NUMBER	DESCRIPTION	LOCATION
<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	LEFT BONUS UNIT STEP UP RIGHT BONUS UNIT STEP UP BALL RELEASE COIL COIN UNIT STEP UP PLAYER UP UNIT STEP UP	PLAYFIELD PLAYFIELD PLAYFIELD MECH. PANEL INSERT
A 23-600	CREDIT UNIT STEP UP BALL COUNT UNIT STEP UP	INSERT MECH. PANEL
A2-23-750	KNOCKER	CABINET
A2-26-1300	TRIPLE CHIME COILS ... (3 req'd.)	CABINET
B1-26-800	SCORE DRUM UNITS ... (20 req'd.) CREDIT UNIT RESET PLAYER UP UNIT RESET BALL COUNT UNIT RESET LEFT BONUS UNIT RESET RIGHT BONUS UNIT RESET COIN UNIT RESET	INSERT INSERT INSERT MECH. PANEL PLAYFIELD PLAYFIELD MECH. PANEL
FL 20-300/ 28-400	FLIPPERS ... (2 req'd.)	PLAYFIELD
G 22-550	DROP TARGET RESET ... (4 req'd.)	PLAYFIELD
G 23-750	EJECT COILS ... (3 req'd.)	PLAYFIELD
G 23-750 D.C.	D.C. JET BUMPER COILS ... (2 req'd.) D.C. KICKER COILS ... (2 req'd.)	PLAYFIELD PLAYFIELD
M 28-700	GAME OVER RELAY TRIP	MECH. PANEL
M 29-900	NO. 3 SCORE RESET RELAY	INSERT
M 29-1000	NO. 1 SCORE RESET RELAY NO. 2 SCORE RESET RELAY	INSERT INSERT
M 29-1100	10¢ RELAY 25¢ RELAY 10 POINT RELAY 100 POINT RELAY 1,000 POINT RELAY 10,000 POINT RELAY LEFT ADVANCE RELAY RIGHT ADVANCE RELAY TARGET RELAY 500 POINT RELAY LEFT SPINNER RELAY RIGHT SPINNER RELAY LEFT BONUS RELAY RIGHT BONUS RELAY LEFT BONUS UNIT TOTAL RESET COIL RIGHT BONUS UNIT TOTAL RESET COIL	MECH. PANEL MECH. PANEL INSERT INSERT INSERT INSERT PLAYFIELD PLAYFIELD PLAYFIELD PLAYFIELD PLAYFIELD PLAYFIELD PLAYFIELD PLAYFIELD PLAYFIELD PLAYFIELD PLAYFIELD
M 30-1300	COIN SET UP RELAY	MECH. PANEL
M 30-1400	ALTERNATING RELAY	PLAYFIELD
M 36-5500 D.C.	DELAY RELAY	PLAYFIELD
MX 31-1500	COIN LOCKOUT COIL	FRONT DOOR
XM 27-675	TOTAL PLAY METER COIL	MECH. PANEL
XS 28-1000	ALTERNATOR UNIT NUMBER MATCH UNIT LEFT SPINNER UNIT RIGHT SPINNER UNIT	MECH. PANEL INSERT PLAYFIELD PLAYFIELD
Z 27-1000	COIN RELAY RESET RELAY PLAYER RESET RELAY OUTHOLE RELAY GAME OVER LATCH RELAY TOP EJECT RELAY EJECT RELAY	MECH. PANEL MECH. PANEL MECH. PANEL MECH. PANEL MECH. PANEL MECH. PANEL MECH. PANEL
Z 28-1150	CHANGE RELAY NO. 1 STAR RELAY NO. 2 STAR RELAY NO. 3 STAR RELAY NO. 4 STAR RELAY BALL INDEX RELAY TILT RELAY EXTRA BALL RELAY	PLAYFIELD MECH. PANEL MECH. PANEL MECH. PANEL MECH. PANEL MECH. PANEL MECH. PANEL MECH. PANEL
Z 29-1250	LOCK RELAY	MECH. PANEL

JACK LAYOUT

JACK LAYOUT

GAME GRAND PRIX

GAME GRAND PRIX

POSITION PAN - P.F. SIZE 14

POSITION P.F. - INS. SIZE 10

No. 3 STAR LITE R G-6	BLU R-BOT. R.O. W-4 LITE (OUTSIDE)	1	CREDIT LITE GRY Y-3	1	R/O 10,000 PT. RE.
No. 4 STAR LITE R W-6	Y/R-BOT. R.O.	2	BALL IND. RE. BR-4	2	BR/Y 1,000 " "
1000 PT. RE. GRY BR-4	R-3 LITE (OUTSIDE)	3	CHANGE RE. R-3	3	W/R 100 " "
ALT. RE. S R-2	GRY 10,000 PT. RE.	4	1000 PT. RE. R-6	4	S/B 10 " "
L-BOT. R.O. LITE (OUTSIDE) BW-6	L-BOT. R.O. LITE	5	R-ADV. RE. O-4	5	Y/BR-4 L-ADV. RE.
L-R BOT. R.O. LITES (INSIDE) G-5	W-5 L-FLIPPER	6			
BLANK	BR W-5 R- "	7			
	BLANK				
PAN. = PANEL			D.U. FEED W/O-5	1	BLU Y-3 PLAYER LITES
P.F. = PLAYFIELD			CREDIT S.U. B/W-1	2	GRY O-1 G-O-LITE
INS. = INSERT			COIN RE. R/BR.	3	Y/B-5 EX-BALL RE.
			CREDIT S.U. GRY BR.	4	BR/Y 1,000 PT. RE.
			G-O RE. TRIP BLU BR-4	5	R/O 10,000 " "
			BLANK	6	BLANK

POSITION PAN - INS. SIZE 12

JACK LAYOUT

JACK LAYOUT

GAME GRAND PRIX

GAME GRAND PRIX

POSITION PAN. - P.F. SIZE 22

POSITION PAN. - P.F. SIZE 18

1	FEED	W	G-3 TARGET RESET	W	L-BONUS RESET	W	W-2 BALL RELEA
2	"	R	BR-2 TOP EJECT COIL	W	R	"	R-3 STAR RELEA
3	MOTOR RUN	O	BR-3 EJECT RE.	BR	100 PT. RE.	W	BLU-6 STAR LITE
4	RESET RE.	G	L + R	B	EX-BALL RE.	W-4	BLU. LITE FEED
5	TOP EJECT RE.	BLU	Y-3 BONUS S.U.	BLU	L + R-BONUS RESET	B-3	G-4 ADV. RE.
6	"	BR-1	G-1 L-BONUS S.U.	B	OUTHOLE RE.	BLU-1	W-4 "
7	FEED	R	W-3 R	W	TILT RE.	BR-4	BR-4 "
8	L + R	BLU-2	G-4 SHOOT AGAIN	G-4	"	R-3	Y-4 TILT RE.
9	EJECT COILS	O-1	W-4 LITE	GRY	BONUS UNIT	R/W	GRY-3 10,000 PT. R
10	TARGET RESET	G-2	Y-4 10,000 PT. RE.	G-2	FEED		
11	A + B	G	BONUS TOTAL		BLANK		
	TARGET RESET	W-3	G-2 RESET COIL		BLANK		
	TARGET RE.	BR					

JACK LAYOUT

GAME GRAND PRIX

POSITION PAN-INS. SIZE 24

1	<u>GRY</u> <u>Y-1</u>	BALL COUNT S.U.	
2	<u>R</u> <u>G-1</u>	" "	
3	<u>Y</u> <u>BR</u>	PLAYER S.U.	
4	<u>G</u> <u>Y</u>	PLAYER RESET	
5	<u>GRY</u> <u>Y-5</u>	EX-BALL RE.	
6	<u>B</u> <u>O</u>	NO.1 & NO.2 RESET RELAYS	
7	<u>GRY</u> <u>W</u>	CREDIT S.U.	
8	<u>-Y-</u>	FEED	
9	<u>W</u> <u>G-4</u>	SHOOT AGAIN LITE	
10	<u>B</u> <u>Y-6</u>	NO.2 BALL LITE	
11	<u>O</u> <u>R-5</u>	SMALL CHIME	
12	<u>B</u> <u>G-3</u>	LARGE "	

JACK LAYOUT

GAME GRAND PRIX

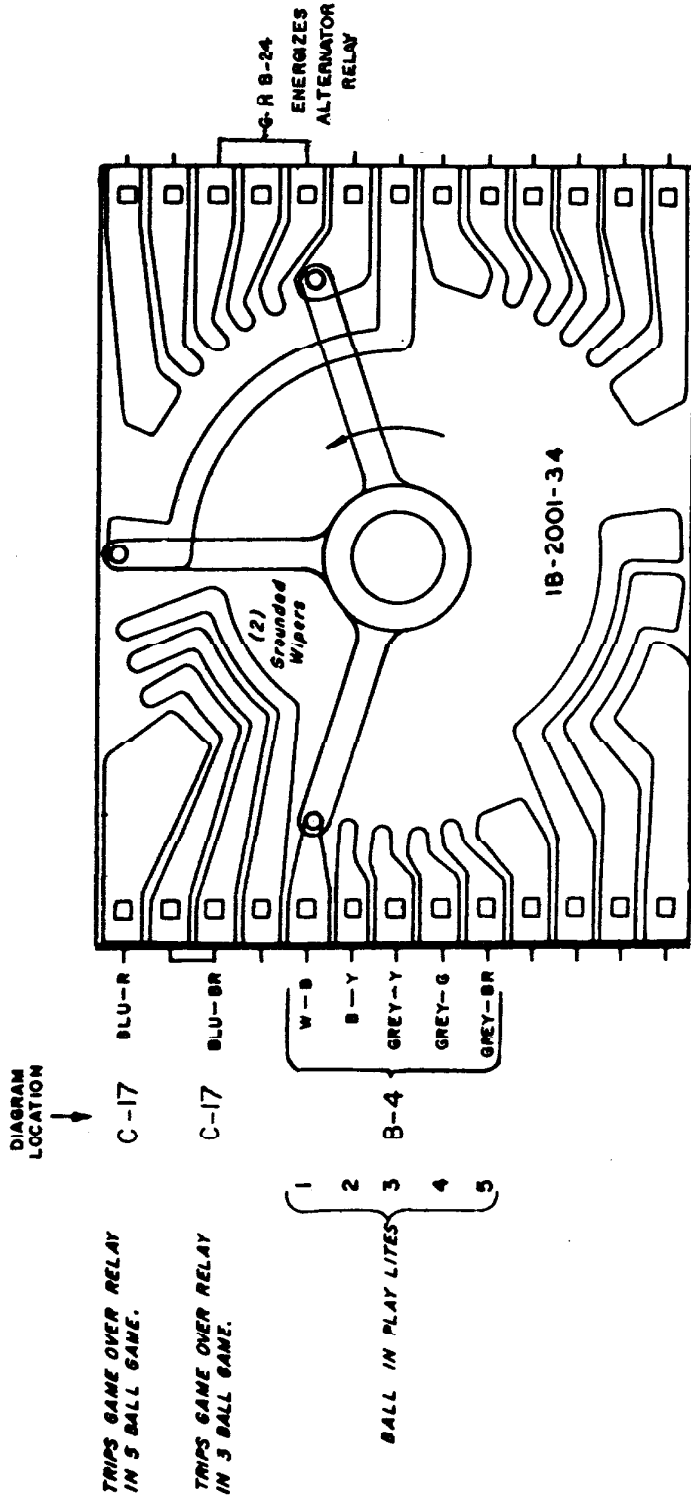
POSITION PAN-INS. SIZE

1	<u>GRY</u> <u>W-3</u>	1-CAN PLAY LI
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 LIT.
9	<u>GRY</u> <u>BR-2</u>	NO.5 " "
10		BLANK

BALL COUNT UNIT DISC

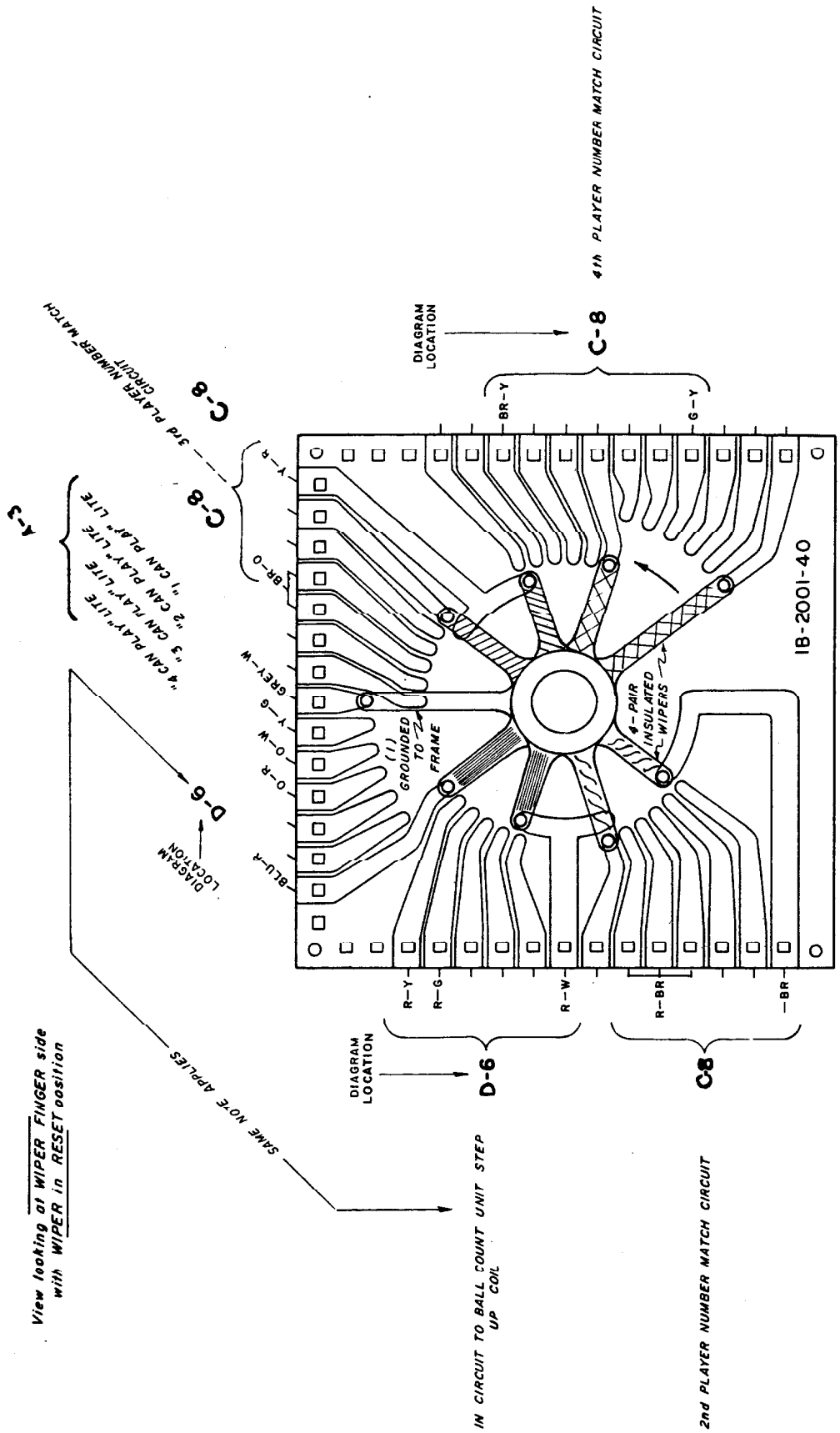
THIS UNIT RESETS AT THE START OF A NEW GAME, (DURING RESET CYCLE). IT ADVANCES ONE STEP EACH TIME THE LAST PLAYER COMPLETES HIS TURN.

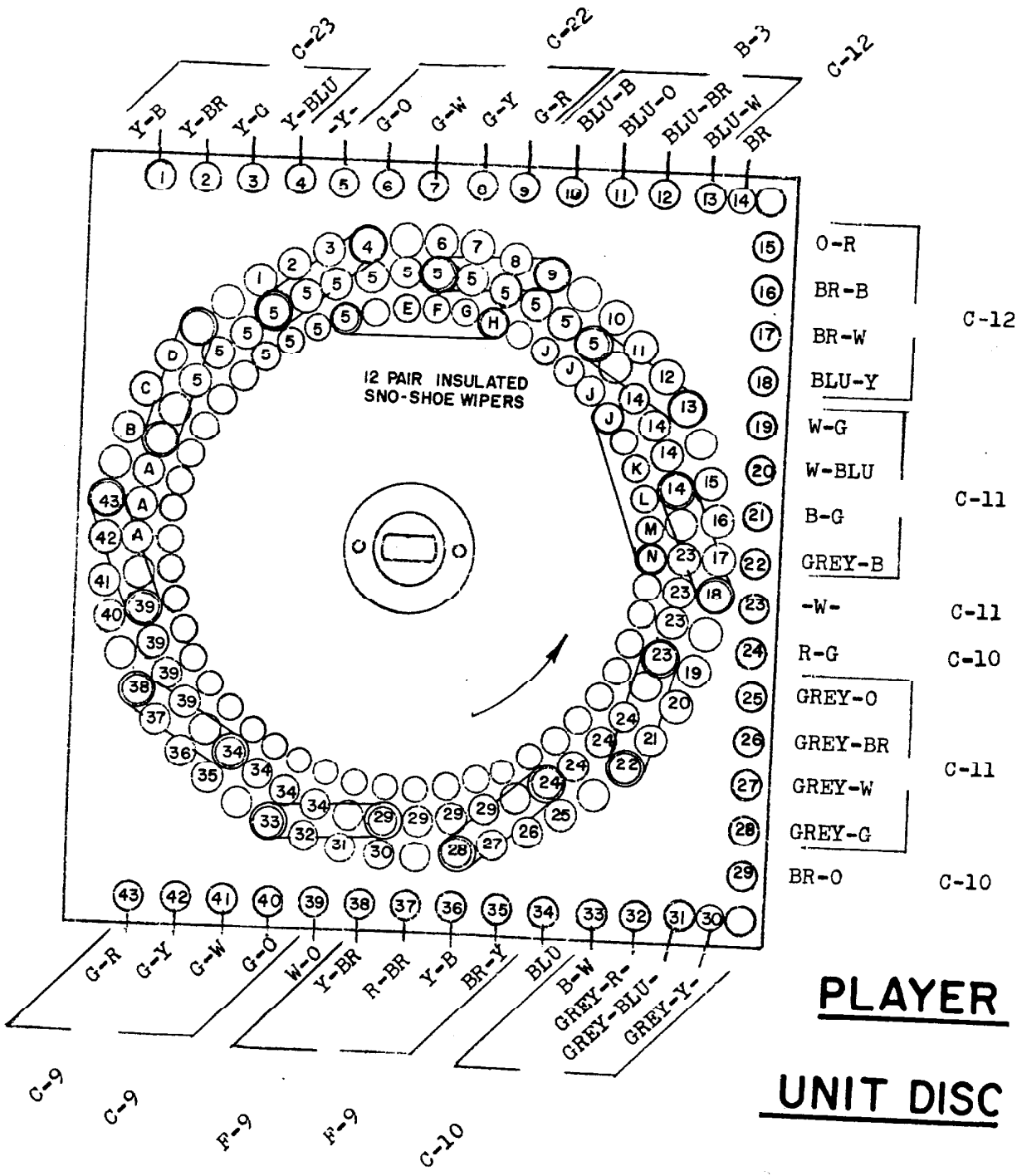
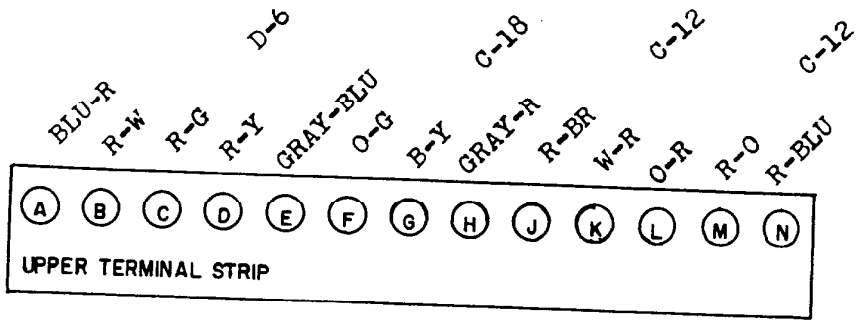
View looking at WIPER FINGER side with WIPER in ZERO position.



COIN S. U. DISC

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





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	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.		

LEFT BONUS UNIT

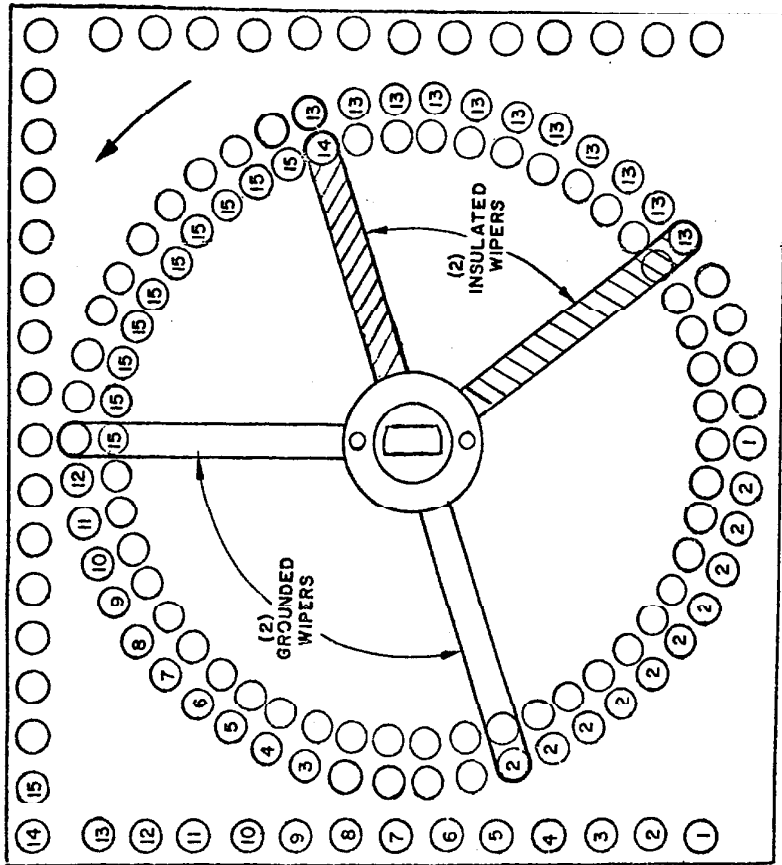
THE STEP-UP COIL IS PULSED BY THE LEFT ADVANCE RELAY OR BY EJECT RELAY THRU LEFT EJECT SWITCH. ALSO, AFTER THE UNIT HAS BEEN RESET TO ZERO, THE STEP-UP COIL IS PULSED ONCE BY SCORE MOTOR CAM SWITCH 2A, THRU SWITCH ON OUTHOLE RELAY.

THE SINGLE STEP RESET COIL AND THE TOTAL RESET COIL ARE ENERGIZED BY OUTHOLE RELAY OR RESET RELAY. THE SINGLE STEP RESET COIL IS ALSO PULSED BY LEFT BONUS RELAY.

BLU-BR (D-15) FROM LEFT EJECT SWITCH.		LEFT	BONUS	LITES
GRAY-W B-6	5000			
GRAY-BR	10000			
GRAY-O	15000			
GRAY-B	20000			
O-BLU	25000			
O-G	30000			
O-W	35000			
O-B	40000			
B-R	45000			
B-BLU B-7	50000			
R-BLU C-23	IN CIRCUIT TO 100 POINT RELAY.			
R-Y D-23	CIRCUIT TO 1,000 POINT RELAY.			

BR-BLU (D-35) IN CIRCUIT TO EJECT RELAY.
W-B (D-15) IN CIRCUIT TO LEFT BONUS RELAY.

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



RIGHT BONUS UNIT

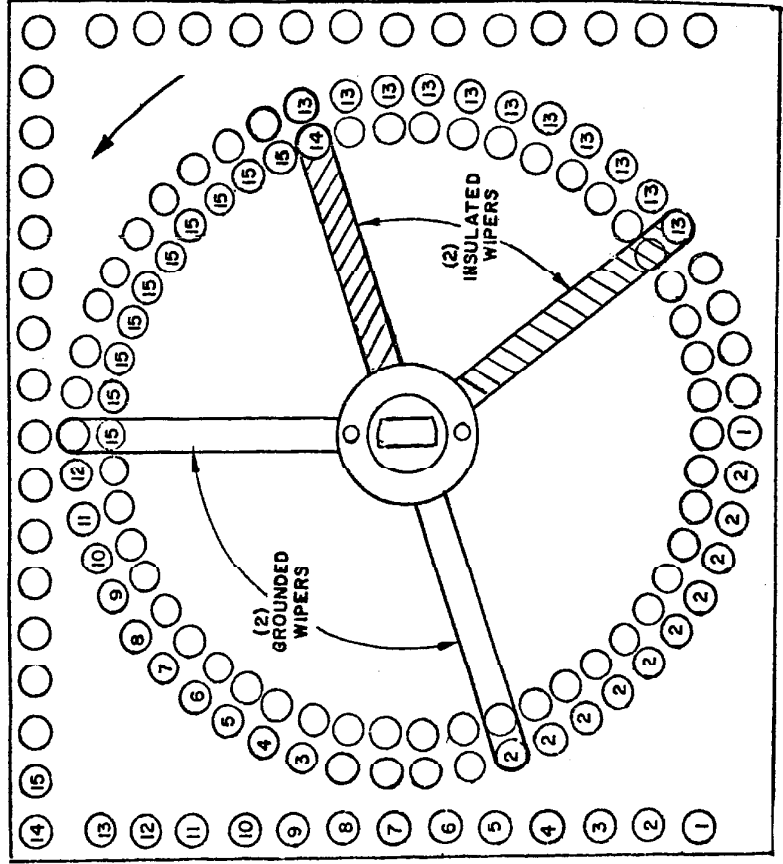
THE STEP-UP COIL IS PULSED BY THE RIGHT ADVANCE RELAY OR BY EJECT RELAY THRU RIGHT EJECT SWITCH. ALSO, AFTER THE UNIT HAS BEEN RESET TO ZERO, THE STEP-UP COIL IS PULSED ONCE BY SCORE MOTOR CAM SWITCH 3A, THRU SWITCH ON OUTHOLE RELAY.

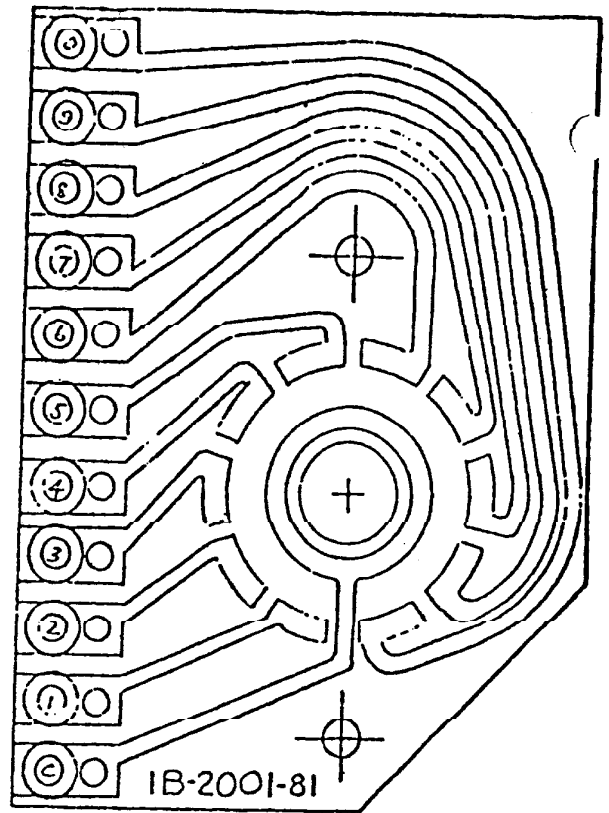
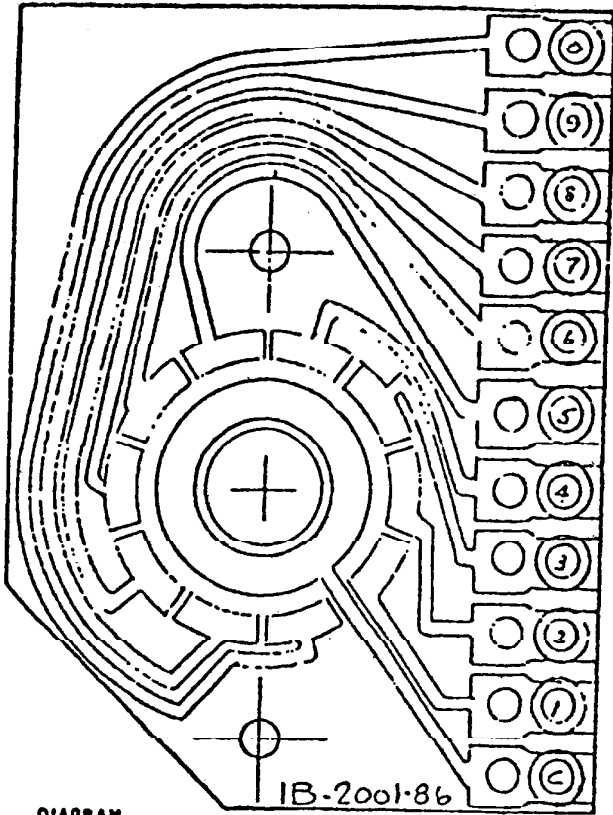
THE SINGLE STEP RESET COIL AND THE TOTAL RESET COIL ARE ENERGIZED BY OUTHOLE RELAY OR RESET RELAY. THE SINGLE STEP RESET COIL IS ALSO PULSED BY RIGHT BONUS RELAY.

BLU-	(D-15) FROM RIGHT EJECT SWITCH.	RIGHT	BONUS	LITES
BR-B	B-7	5000		
-O-		10000		
O-BLU		15000		
B-O		20000		
BLU-Y		25000		
BLU-W		30000		
BLU-BR		35000		
BLU-O		40000		
BLU-B		45000		
Y-R	B-8	50000		
R-B	C-23	IN CIRCUIT TO 100 POINT RELAY.		
R-W	C-23	CIRCUIT TO 1,000 POINT RELAY.		

BR-BLU (D-15) IN CIRCUIT TO EJECT RELAY.
 BR-G (D-15) IN CIRCUIT TO RIGHT BONUS RELAY.

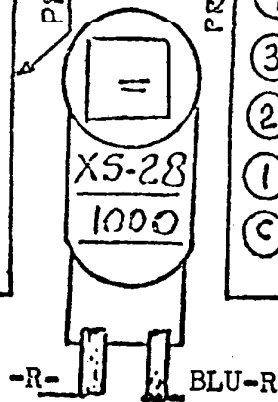
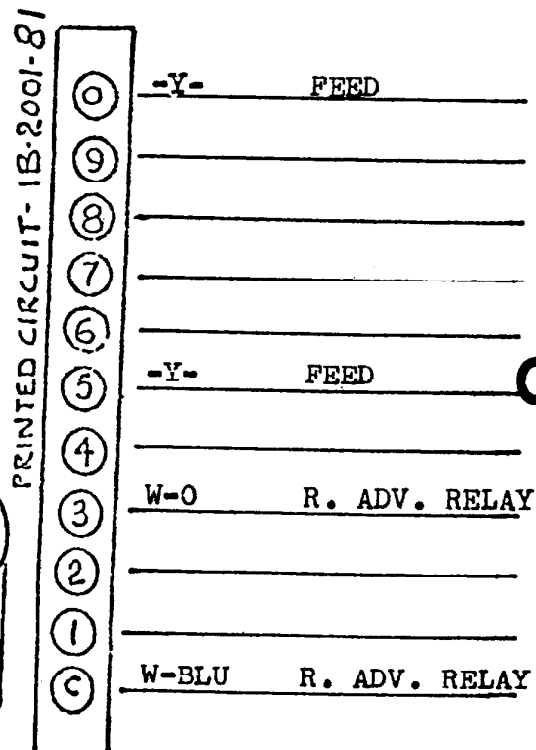
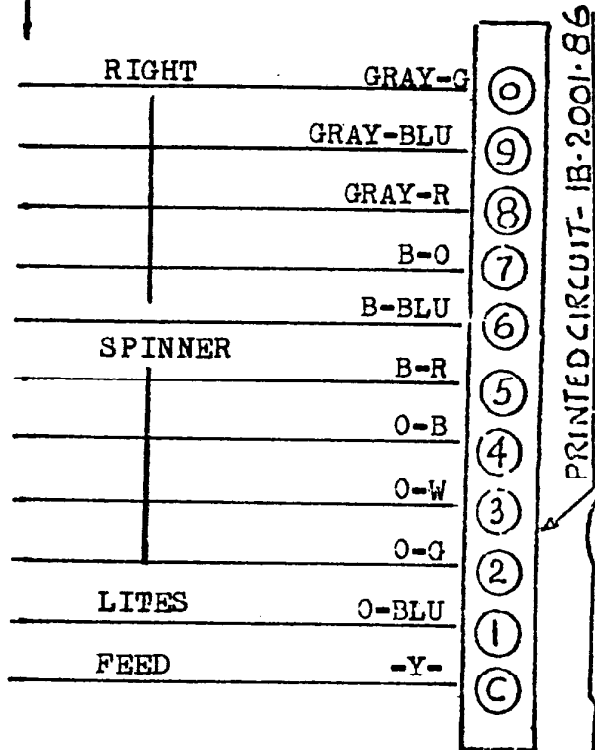
VIEW LOOKING AT WIPER FINGERS
SIDE WITH WIPERS IN ZERO POSITION.





RIGHT SPINNER UNIT

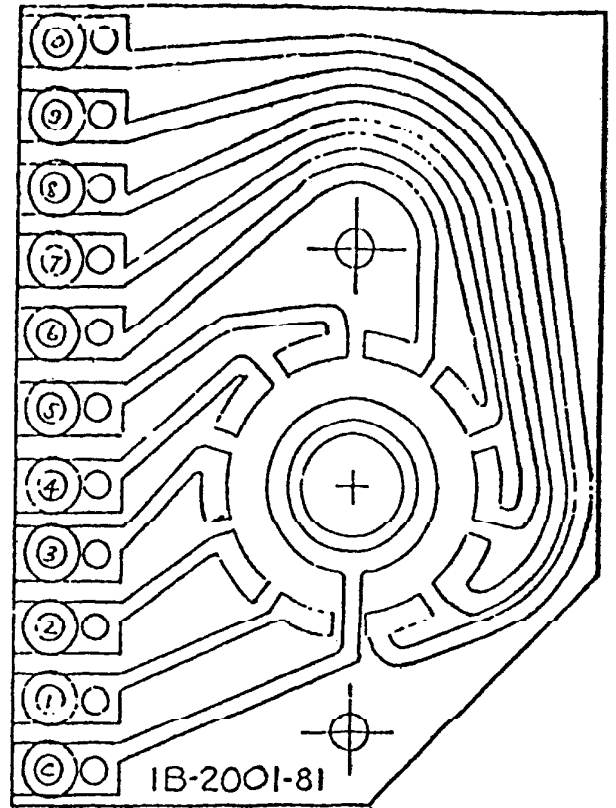
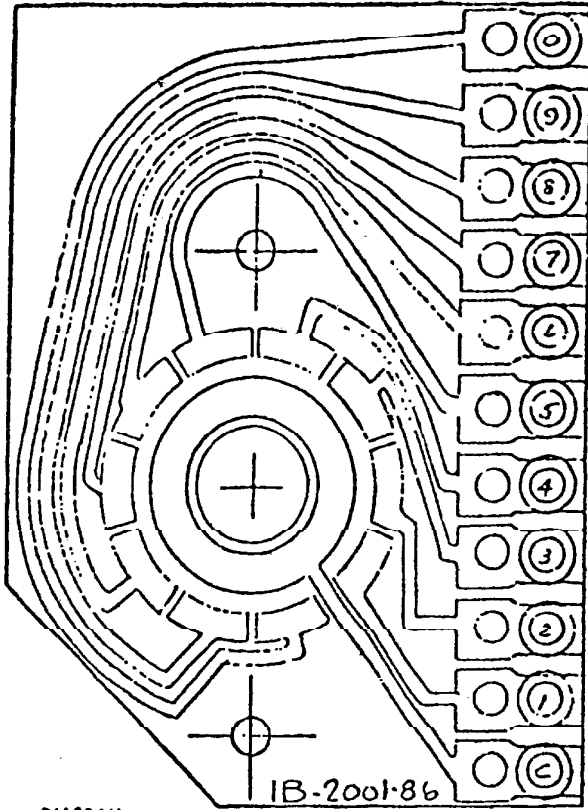
DIAGRAM LOCATION



DRIVE SPRING 10A-32A-1

-10

C-20



LEFT SPINNER UNIT

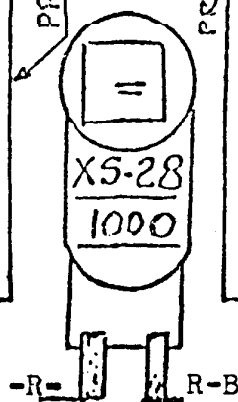
DIAGRAM LOCATION

LEFT	Q-R	⑩
	BR-B	⑨
	W-GRAY	⑧
	G-Y	⑦
	G-R	⑥
SPINNER	Y-BR	⑤
	Y-G	④
	Y-BLU	③
	Y-R	②
LITES	BLU-B	①
FEED	-Y-	ⓐ

B-9

PRINTED CIRCUIT- 13-2001-86

PRINTED CIRCUIT- 13-2001-81



-Y-	FEED	⑩
		⑨
		⑧
		⑦
		⑥
-Y-	FEED	⑤
		④
Y-BR	L. ADV. RELAY	③
		②
		①
Y-BLU	L. ADV. RELAY	ⓐ

C-19

DRIVE SPAIN 10A-32A-1

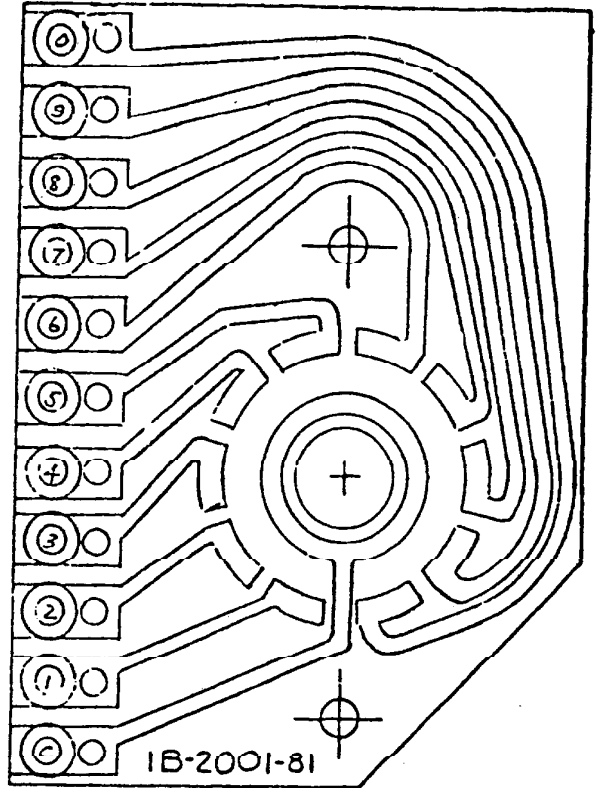
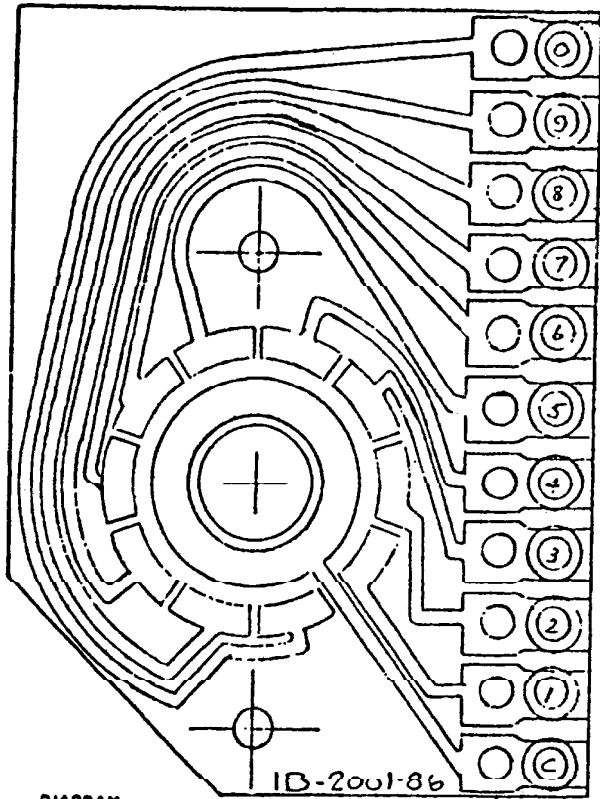


DIAGRAM
LOCATION

No. MATCH UNIT

PRINTED CIRCUIT - IB-2001-86

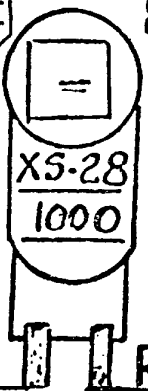
00 LITE W/G	0
60 " BR/W	9
10 " BR/G	8
70 " BR/Y	7
30 " BR/BLU	6
80 " BR/R	5
20 " W/GRY	4
50 " W/B	3
90 " W/O	2
40 " W/BR	1
FEED -Y-	C

PRINTED CIRCUIT - IB-2001-81

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

B-5

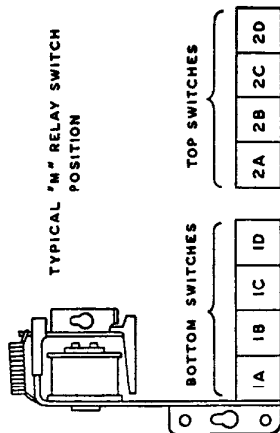
E-8



-R- R-O

DRIVE SPRING 10A-324-1

RELAYS & SWITCHES LOCATED ON MECHANISM PANEL

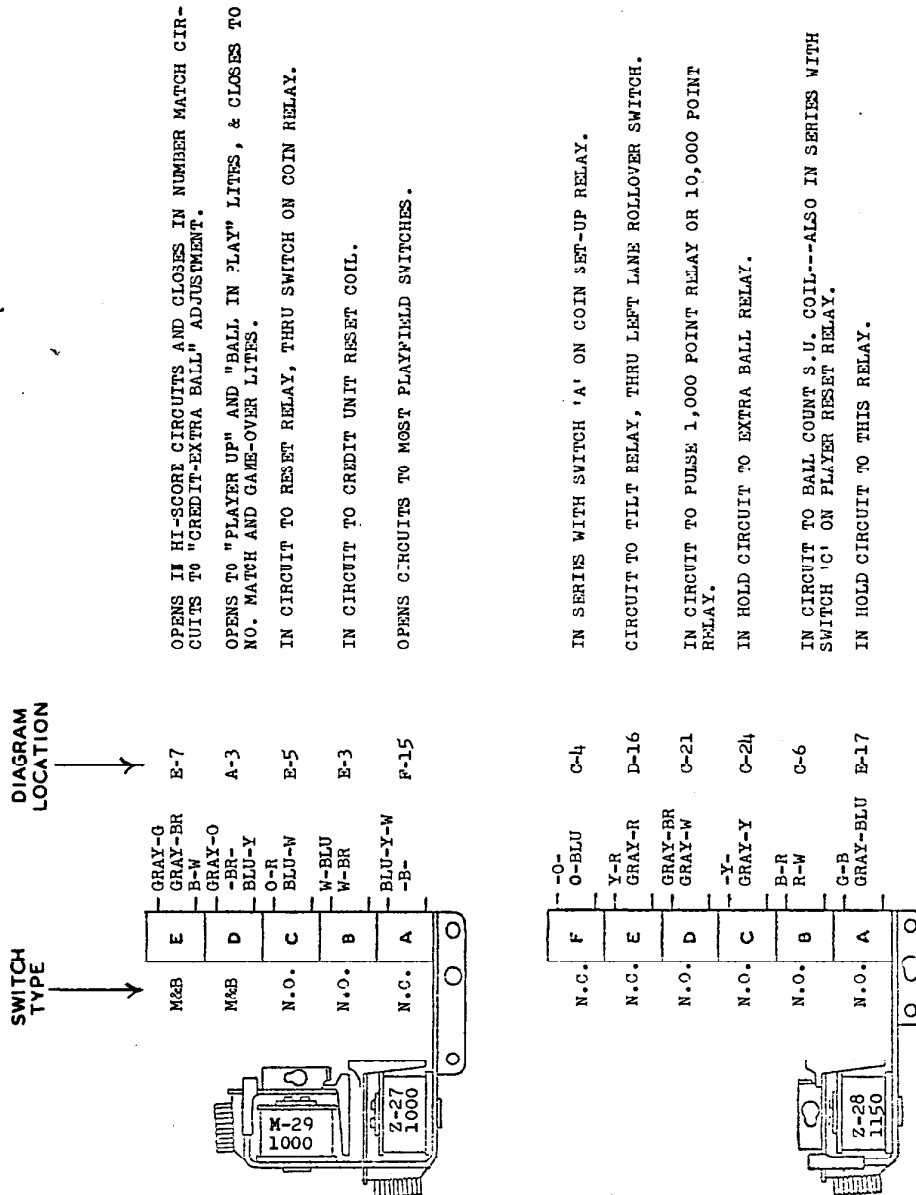


GAME-OVER

LATCH COIL IS ENERGIZED BY SCORE MOTOR CAM SWITCH 1A, THRU SWITCHES ON COIN RE-LAY 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.

BALL INDEX

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



OPENS II HI-SCORE CIRCUITS AND CLOSSES IN NUMBER MATCH CIR-CUITS TO "CREDIT-EXTRA BALL" ADJUSTMENT.

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

IN CIRCUIT TO RESET RELAY, THRU SWITCH ON COIN RELAY.

IN CIRCUIT TO CREDIT UNIT RESET COIL.

OPENS C:RCUITS TO MOST PLAYFIELD SWITCHES .

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

CIRCUIT TO TILT RELAY, THRU LEFT LANE ROLLOVER SWITCH.

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

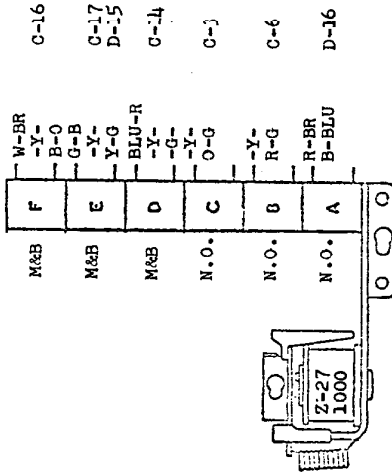
IN HOLD CIRCUIT TO EXTRA BALL RELAY.

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

IN HOLD CIRCUIT TO THIS RELAY.

OUTHOLE

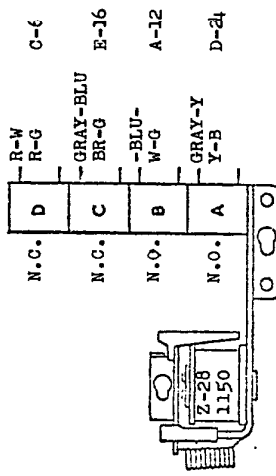
IS ENERGIZED BY OUTHOLE SWITCH, THRU LEFT BONUS RELAY AND ZERO SWITCH ON LEFT BONUS UNIT---ALSO BY OUTHOLE SWITCH, THRU RIGHT BONUS RELAY AND ZERO SWITCH ON RIGHT BONUS UNIT.



C-16 OPENS IN CIRCUIT TO TILT RELAY & BALL INDEX RELAY AND CLOSSES TO LEFT & RIGHT BONUS S.U. COILS & BALL RELEASE COIL.
 C-17 OPENS IN HOLD CIRCUIT TO BALL INDEX RELAY AND CLOSSES TO ENERGIZE A & B AND C & D TARGET RESET COILS.
 D-15 OPENS IN CIRCUIT TO LEFT AND RIGHT EJECT COILS & CLOSSES TO PULSE LEFT & RIGHT BONUS UNITS RESET COILS.
 C-14 RUNS SCORE MOTOR
 C-11 IN SERIES WITH SWITCH 'D' ON EXTRA BALL RELAY.
 C-6 IN HOLD CIRCUIT TO THIS RELAY.
 D-16 IN SERIES WITH SWITCH 'B' ON BALL INDEX RELAY.

EXTRA BALL

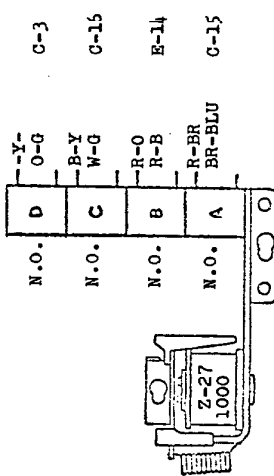
IS ENERGIZED BY LEFT BOTTOM INSIDE OR RIGHT BOTTOM INSIDE ROLLER, THRU SWITCH ON CHANGE RELAY AND NO. 2 STAR RELAY. ALSO, WITH ADJUSTMENT JACK IN "EXTRA BALL" POSITION, BY LEFT BOTTOM OUTSIDE OR RIGHT BOTTOM OUTSIDE ROLLER, THRU SWITCHES ON CHANGE RELAY AND NO. 3 STAR RELAY OR NO. 4 STAR RELAY---ALSO BY HI-SCORE CIRCUITS.



C-6 IN SERIES WITH SWITCH 'B' ON BALL INDEX RELAY.
 E-16 IN CIRCUIT TO BALL INDEX RELAY.
 A-12 TO "SHOOT AGAIN" LIFES.
 D-24 IN HOLD CIRCUIT TO THIS RELAY.

EJECT

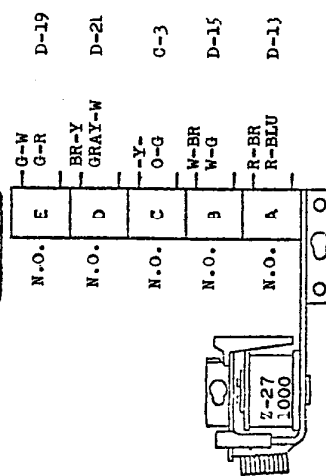
IS ENERGIZED BY LEFT EJECT SWITCH, THRU WIPER ON LEFT BONUS UNIT. ALSO BY RIGHT EJECT SWITCH, THRU WIPER ON RIGHT BONUS UNIT.



C-3 RUNS SCORE MOTOR.
 C-15 IN CIRCUIT TO PULSE LEFT AND RIGHT BONUS UNIT S.U. COILS.
 E-14 TO LEFT AND RIGHT EJECT COILS.
 C-15 IN HOLD CIRCUIT TO THIS RELAY.

TOP EJECT

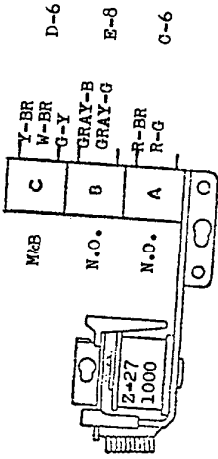
IS ENERGIZED BY TOP EJECT SWITCH, THRU SWITCH ON DELAY RELAY.



D-19 IN SERIES WITH SWITCH 'A' ON CHANGE RELAY.
 D-21 IN CIRCUIT TO PULSE 1,000 POINT RELAY.
 C-3 RUNS SCORE MOTOR.
 D-15 IN CIRCUIT TO PULSE TOP EJECT COIL.
 D-11 IN HOLD CIRCUIT TO THIS RELAY.

PLAYER RESET

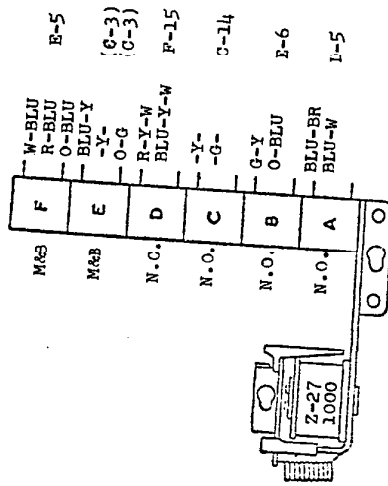
IS ENERGIZED BY BALL COUNT UNIT END-OF-STROKE SWITCH. IT THEN HOLDS IN THRU SCORE MOTOR INDEX CAM SWITCH 'C'.



OPENS IN CIRCUIT TO PLAYER UNIT S.U. COIL AND CLOSSES TO PLAYER UNIT RESET COIL.
 IN NUMBER MATCH CIRCUIT TO CREDIT UNIT S.U. COIL OR EXTRA BALL RELAY.
 HOLD CIRCUIT TO THIS RELAY, THRU SCORE MOTOR INDEX CAM SWITCH 'C'.

RESET

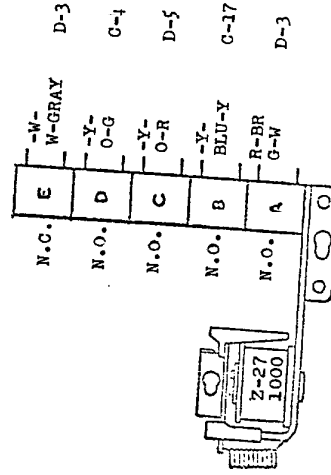
IS ENERGIZED BY COIN RELAY, THRU SWITCH ON GAME-OVER RELAY.



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

COIN

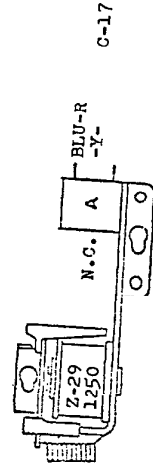
IS ENERGIZED BY COIN SWITCH OR BY CREDIT UNIT RESET COIL END-OF-STROKE SWITCH.



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

LOCK

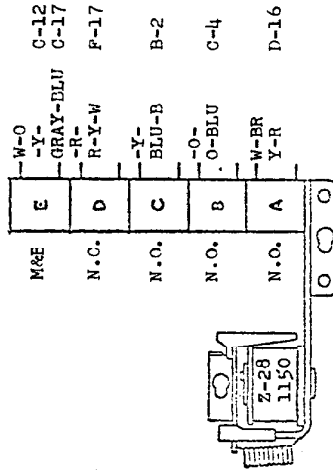
IS ENERGIZED WHEN POWER IS SUPPLIED TO TRANSFORMER.



ENERGIZES GAME-OVER RELAY TRIP COIL.

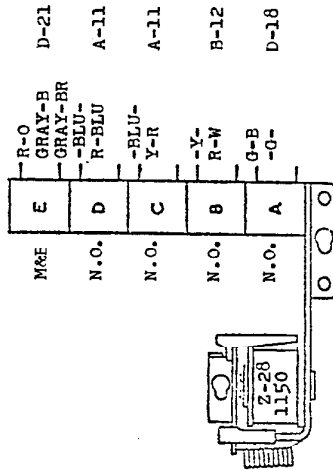
TILT

IS ENERGIZED BY PLUMB BOB TILT, BALL ROLL DOWN TILT OR PLAYFIELD VIBRATION TILT SWITCH---ALSO BY LEFT LANE ROLLOVER SWITCH, THRU BALL INDEX RELAY.



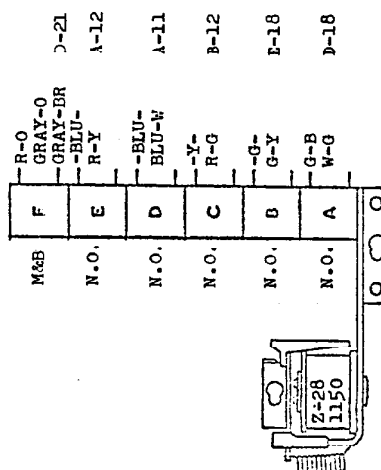
NO. 4 STAR

IS ENERGIZED BY TARGET RELAY, THRU SWITCH ON NO. 3 STAR RELAY.



NO. 3 STAR

IS ENERGIZED BY TARGET RELAY, THRU SWITCH ON NO. 2 STAR RELAY.



OPENS IN HI-SCORE CIRCUITS AND ALL (20) SCORE DRUM COILS, AND CLOSES 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.

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

TO LEFT BOTTOM (OUTSIDE) ROLLOVER LITE. (THRU FEATURE ADJUSTMENT JACK).

TO RIGHT BOTTOM (OUTSIDE) ROLLOVER LITE. (THRU FEATURE ADJUSTMENT JACK).

TO NO. 4 STAR LITE.

IN HOLD CIRCUIT TO THIS RELAY.

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

TO LEFT BOTTOM (OUTSIDE) ROLLOVER LITE. (THRU FEATURE ADJUSTMENT JACK).

TO RIGHT BOTTOM (OUTSIDE) ROLLOVER LITE. (THRU FEATURE ADJUSTMENT JACK).

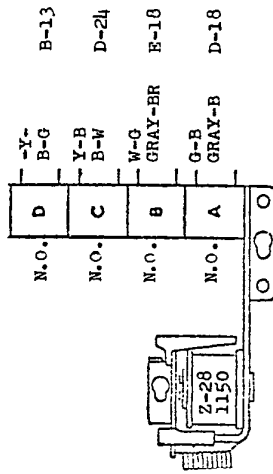
TO NO. 3 STAR LITE.

ENERGIZES NO. 4 STAR RELAY, THRU SWITCH ON TARGET RELAY.

IN HOLD CIRCUIT TO THIS RELAY.

NO. 2 STAR

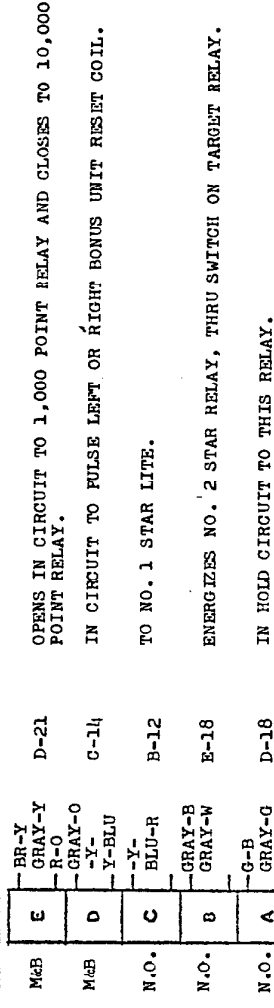
IS ENERGIZED BY TARGET RELAY, THRU SWITCH ON NO. 1 STAR RELAY.



B-13 TO LEFT BOTTOM (INSIDE) ROLLOVER LITE---ALSO IN SERIES WITH SWITCH 'B' ON CHANGE RELAY.
 D-24 IN CIRCUIT TO EXTRA BALL RELAY, THRU SWITCH ON CHANGE RELAY.
 E-18 ENERGIZES NO. 3 STAR RELAY, THRU SWITCH ON TARGET RELAY.
 D-18 IN HOLD CIRCUIT TO THIS RELAY.

NO. 1 STAR

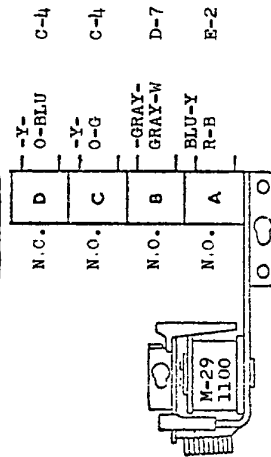
IS ENERGIZED BY TARGET RELAY, THRU SCORE MOTOR CAM SWITCH '1,1B'.



D-21 OPENS IN CIRCUIT TO 1,000 POINT RELAY AND CLOSURES TO 10,000 POINT RELAY.
 C-14 IN CIRCUIT TO PULSE LEFT OR RIGHT BONUS UNIT RESET COIL. TO NO. 1 STAR LITE.
 B-12 ENERGIZES NO. 2 STAR RELAY, THRU SWITCH ON TARGET RELAY.
 E-18 IN HOLD CIRCUIT TO THIS RELAY.
 D-18 IN HOLD CIRCUIT TO THIS RELAY.

10¢

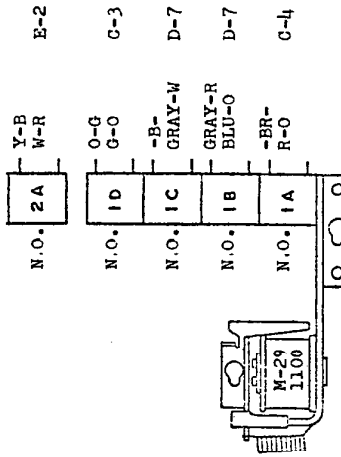
IS ENERGIZED BY 10¢ COIN SWITCH, IF 10¢ ADJUSTMENT JACK IS IN "2 PLAYS" OR "3 PLAYS" POSITION---ALSO BY 25¢ COIN SWITCH, THRU SWITCH ON COIN SET-UP RELAY IF "2 COINS FOR 3 PLAYS" ADJUSTMENT IS IN "ON" POSITION.



C-4 IN HOLD CIRCUIT TO COIN SET-UP RELAY.
 C-4 RUNS SCORE MOTOR.
 D-7 PULSES CREDIT UNIT S.U. COIL, THRU IMPULSE CAM SWITCH 'A'.
 E-2 IN HOLD CIRCUIT TO THIS RELAY.

25¢

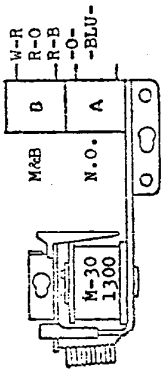
IS ENERGIZED BY 25¢ COIN SWITCH.



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. COIL 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.

COIN SET UP

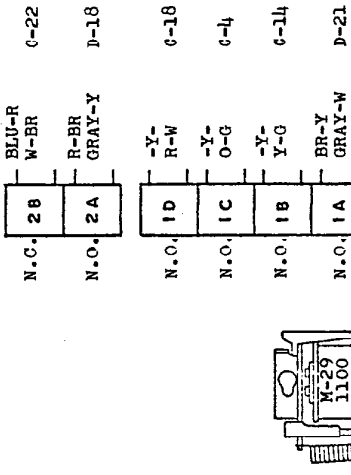
IS ENERGIZED BY 25¢ RELAY, ONLY IF "2" COINS FOR 3 PLAYS" ADJUSTMENT IS IN "ON" POSITION.



E-2 OPENS TO 25¢ RELAY AND CLOSES TO 10¢ RELAY.
E-4 IN HOLD CIRCUIT TO THIS RELAY.

TARGET

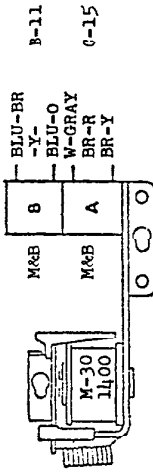
IS ENERGIZED BY 'A' AND 'B' TARGET SWITCHES OR BY 'C' AND 'D' TARGET SWITCHES.



C-22 IN CIRCUIT TO 1,000 POINT RELAY.
D-18 IN HOLD CIRCUIT TO THIS RELAY.
C-18 IN CIRCUIT TO ENERGIZE NO. 1, NO. 2, NO. 3 OR NO. 4 STAR RELAYS.
C-4 RUNS SCORE MOTOR.
C-14 ENERGIZES A & B AND C & D TARGET RESET COILS, THRU LONG DWELL CAM SWITCHES ON SCORE MOTOR.
D-21 PULSES 1,000 POINT RELAY, THRU IMPULSE CAM SWITCH.

ALTERNATING

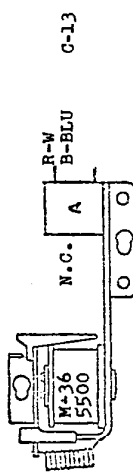
IS ENERGIZED BY WIPER ON BALL COUNT UNIT DISC.



B-11 OPENS TO LEFT BONUS ARROW LITE, AND CLOSES TO RIGHT BONUS ARROW LITE.
C-15 OPENS IN CIRCUIT TO LEFT BONUS RELAY AND CLOSES TO RIGHT BONUS RELAY---ALSO TO OUTHOLE RELAY.

DELAY

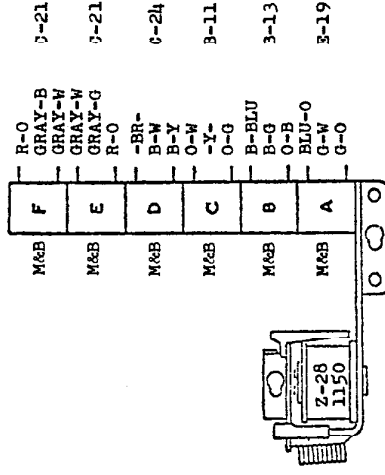
THIS RELAY OPERATES ON DIRECT CURRENT. IT IS PULSED BY THE LEFT OR RIGHT SPINNER RELAY.



C-13 OPENS CIRCUITS THAT ENERGIZE TOP EJECT RELAY, LEFT AND RIGHT BONUS RELAYS AND OUTHOLE RELAY.

CHANGE

IS ENERGIZED BY THE NUMBER MATCH UNIT ALTERNATING SWITCH.

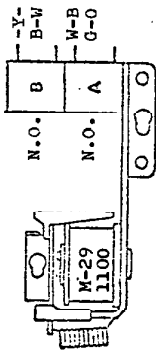


D-21 IN CIRCUIT TO 1,000 POINT RELAY OR TO "CREDIT-EXTRA BALL" ADJUSTMENT JACK. (WHEN MAKING RIGHT BOTTOM OUTSIDE ROLLOVER).
D-21 IN CIRCUIT TO 1,000 POINT RELAY OR TO "CREDIT-EXTRA BALL" ADJUSTMENT JACK. (WHEN MAKING LEFT BOTTOM OUTSIDE ROLLOVER).
C-24 IN CIRCUIT TO EXTRA BALL RELAY. (WHEN MAKING LEFT OR RIGHT BOTTOM INSIDE ROLLOVER).
B-11 OPENS TO L. BONUS ADVANCE LITE & L. BOTTOM OUTSIDE ROLL-OVER LITE, AND CLOSES TO R. BONUS ADVANCE & R. BOTTOM OUTSIDE ROLLOVER LITES.
B-13 OPENS TO RIGHT BOTTOM INSIDE ROLLOVER LITE, AND CLOSES TO L. BOTTOM INSIDE ROLLOVER LITE.
B-19 OPENS IN CIRCUIT TO LEFT ADVANCE RELAY AND CLOSES TO RIGHT ADVANCE RELAY.

RIGHT ADVANCE

IS PULSED BY:

1. RIGHT STAND-UP SWITCH.
2. RIGHT BOTTOM OUTSIDE ROLLOVER.
3. RIGHT SPINNER RELAY, THRU RIGHT SPINNER UNIT DISC.
4. TOP EJECT RELAY, THRU SWITCH ON CHANGE RELAY.

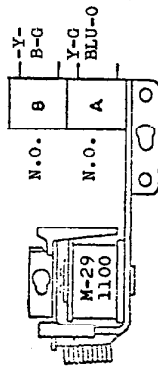


C-16 PULSES RIGHT BONUS UNIT S.U. COIL.
E-20 IN HOLD CIRCUIT TO THIS RELAY.

LEFT ADVANCE

IS PULSED BY:

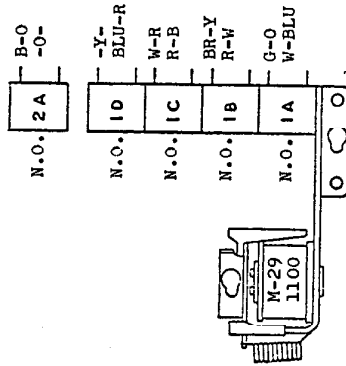
1. LEFT STAND-UP SWITCH.
2. LEFT BOTTOM OUTSIDE ROLLOVER.
3. LEFT SPINNER RELAY, THRU LEFT SPINNER UNIT DISC.
4. TOP EJECT RELAY, THRU SWITCH ON CHANGE RELAY.



C-16 PULSES LEFT BONUS UNIT S.U. COIL.
E-19 IN HOLD CIRCUIT TO THIS RELAY.

RIGHT SPINNER

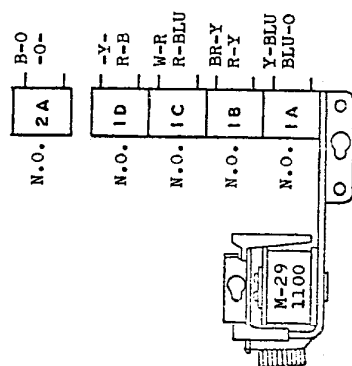
IS PULSED BY THE RIGHT SPINNER SWITCH.



B-22 ENERGIZES DELAY RELAY (D.C.).
C-19 PULSES RIGHT SPINNER UNIT COIL.
D-23 PULSES 100 POINT RELAY, THRU RIGHT BONUS UNIT DISC.
D-23 PULSES 1,000 POINT RELAY, THRU RIGHT BONUS UNIT DISC.
E-20 PULSES RIGHT ADVANCE RELAY, THRU RIGHT SPINNER UNIT DISC.

LEFT SPINNER

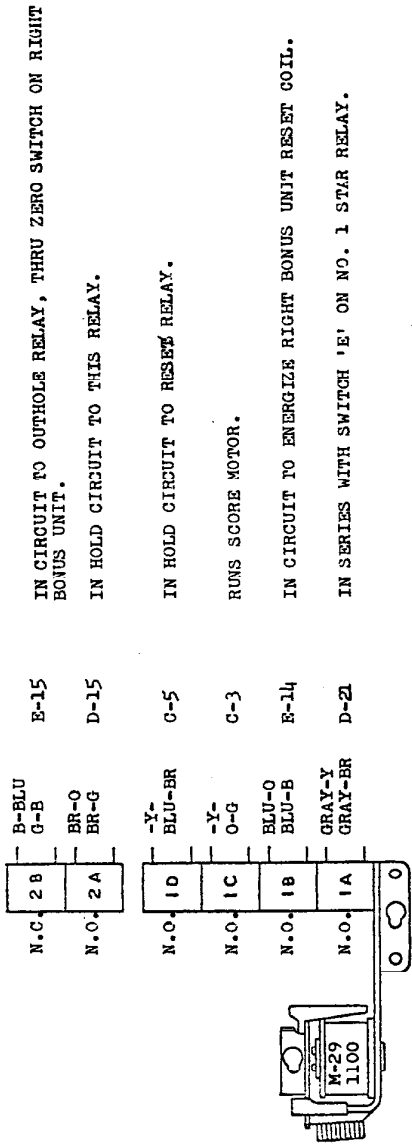
IS PULSED BY LEFT SPINNER SWITCH.



B-22 ENERGIZES DELAY RELAY (D.C.).
C-19 PULSES LEFT SPINNER UNIT COIL.
D-23 PULSES 100 POINT RELAY, THRU LEFT BONUS UNIT DISC.
D-23 PULSES 1,000 POINT RELAY, THRU LEFT BONUS UNIT DISC.
E-19 PULSES LEFT ADVANCE RELAY, THRU LEFT SPINNER UNIT DISC.

RIGHT BONUS

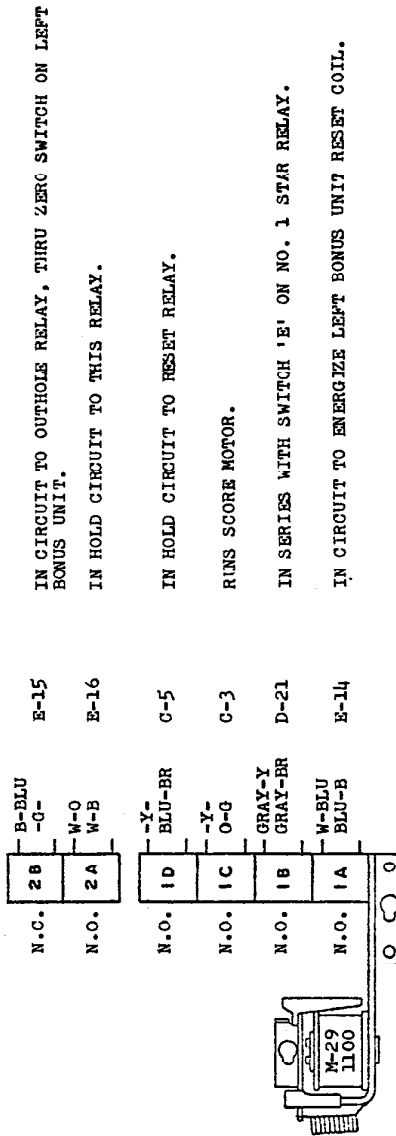
IS ENERGIZED BY RIGHT EJECT SWITCH, THRU WIPER FINGER ON RIGHT BONUS UNIT---ALSO BY OUTHOLE SWITCH, THRU ZERO POSITION SWITCH ON RIGHT BONUS UNIT.



IN CIRCUIT TO OUTHOLE RELAY, THRU ZERO SWITCH ON RIGHT BONUS UNIT.
 IN HOLD CIRCUIT TO THIS RELAY.
 IN HOLD CIRCUIT TO RESET RELAY.
 RUNS SCORE MOTOR.
 IN CIRCUIT TO ENERGIZE RIGHT BONUS UNIT RESET COIL.
 IN SERIES WITH SWITCH 'E' ON NO. 1 STAR RELAY.

LEFT BONUS

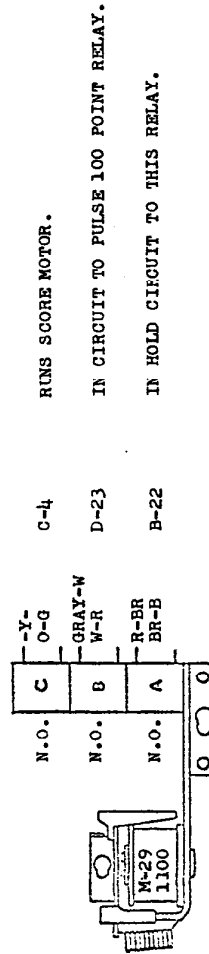
IS ENERGIZED BY LEFT EJECT SWITCH, THRU WIPER ON LEFT BONUS UNIT---ALSO BY OUTHOLE SWITCH, THRU ZERO POSITION SWITCH ON LEFT BONUS UNIT.



IN CIRCUIT TO OUTHOLE RELAY, THRU ZERO SWITCH ON LEFT BONUS UNIT.
 IN HOLD CIRCUIT TO THIS RELAY.
 IN HOLD CIRCUIT TO RESET RELAY.
 RUNS SCORE MOTOR.
 IN SERIES WITH SWITCH 'E' ON NO. 1 STAR RELAY.
 IN CIRCUIT TO ENERGIZE LEFT BONUS UNIT RESET COIL.

500

IS PULSED BY LEFT OR RIGHT STAND-UP SWITCH.

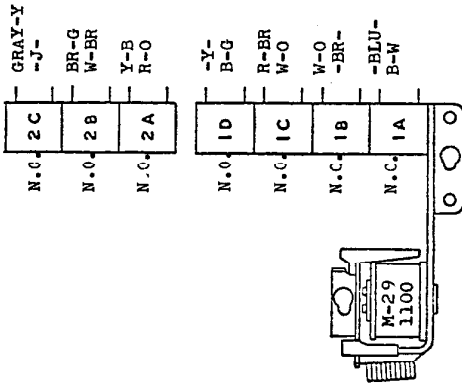


RUNS SCORE MOTOR.
 IN CIRCUIT TO PULSE 100 POINT RELAY.
 IN HOLD CIRCUIT TO THIS RELAY.

10,000 POINT

IS PULSED BY:

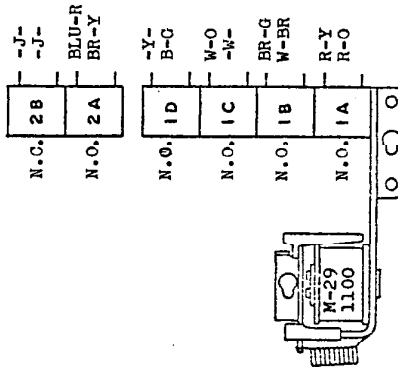
1. LEFT OR RIGHT BONUS RELAY, THRU SW. ON NO. 1 STAR RELAY.
2. LEFT OR RIGHT BOTTOM INSIDE ROLLOVER.
3. LEFT OR RIGHT BOTTOM OUTSIDE ROLLOVER, THRU SWITCHES ON CHANGE RELAY.



1,000 POINT

IS PULSED BY:

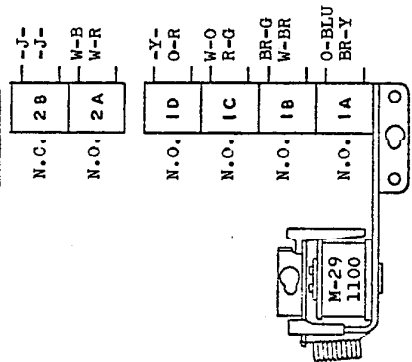
1. TOP EJECT RELAY.
2. TARGET RELAY.
3. LEFT OR RIGHT BONUS RELAY, THRU SW. ON NO. 1 STAR RELAY.
4. A, B, C OR D TARGET SWITCHES.
5. LEFT SPINNER RELAY, THRU WIPER ON LEFT BONUS UNIT.
6. RIGHT SPINNER RELAY, THRU WIPER ON RIGHT BONUS UNIT.
7. LEFT OR RIGHT JET BUMPER IN '3 BALL' GAME.



100 POINT

IS PULSED BY:

1. LEFT SPINNER RELAY, THRU WIPER ON LEFT BONUS UNIT.
2. RIGHT SPINNER RELAY, THRU WIPER ON RIGHT BONUS UNIT.
3. 500 RELAY.
4. LEFT OR RIGHT JET BUMPER IN '5 BALL' GAME.



D-24 IN HOLD CIRCUIT TO EXTRA BALL RELAY.

D-17 ENERGIZES BALL INDEX RELAY.

E-21 IN HOLD CIRCUIT TO THIS RELAY.

C-13 PULSES LARGE CHIME COIL.

C-12 PULSES 10,000 POINT DRUM UNITS, THRU 9TH POSITION SWITCHES ON 10,000 POINT DRUM UNITS.

C-12 PULSES 10,000 POINT DRUM UNITS, THRU PLAYER UNIT DISC.

E-8 IN HI-SCORE CIRCUITS TO "CREDIT-EXTRA BALL" ADJUSTMENT JACK.

C-24 IN SERIES WITH SWITCH 2C ON 10,000 POINT RELAY.

E-22 IN HOLD CIRCUIT TO THIS RELAY.

B-13 PULSES LARGE CHIME COIL.

B-11 PULSES 1,000 POINT DRUM UNITS, THRU PLAYER UNIT DISC.

D-17 ENERGIZES BALL INDEX RELAY.

B-22 PULSES 10,000 POINT RELAY, THRU 9TH POSITION SWITCHES ON 1,000 POINT DRUM UNITS.

C-24 IN SERIES WITH SWITCH 2B ON 1,000 POINT RELAY

B-23 IN HOLD CIRCUIT TO THIS RELAY.

C-13 PULSES SMALL CHIME COIL.

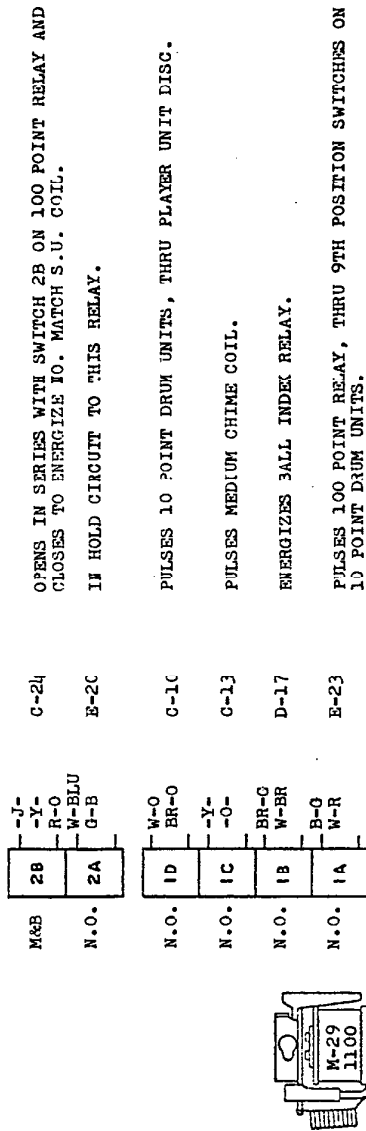
C-10 PULSES 100 POINT DRUM UNITS, THRU PLAYER UNIT DISC.

I-17 ENERGIZES BALL INDEX RELAY.

B-22 PULSES 1,000 POINT RELAY, THRU 9TH POSITION SWITCHES ON 100 POINT DRUM UNITS.

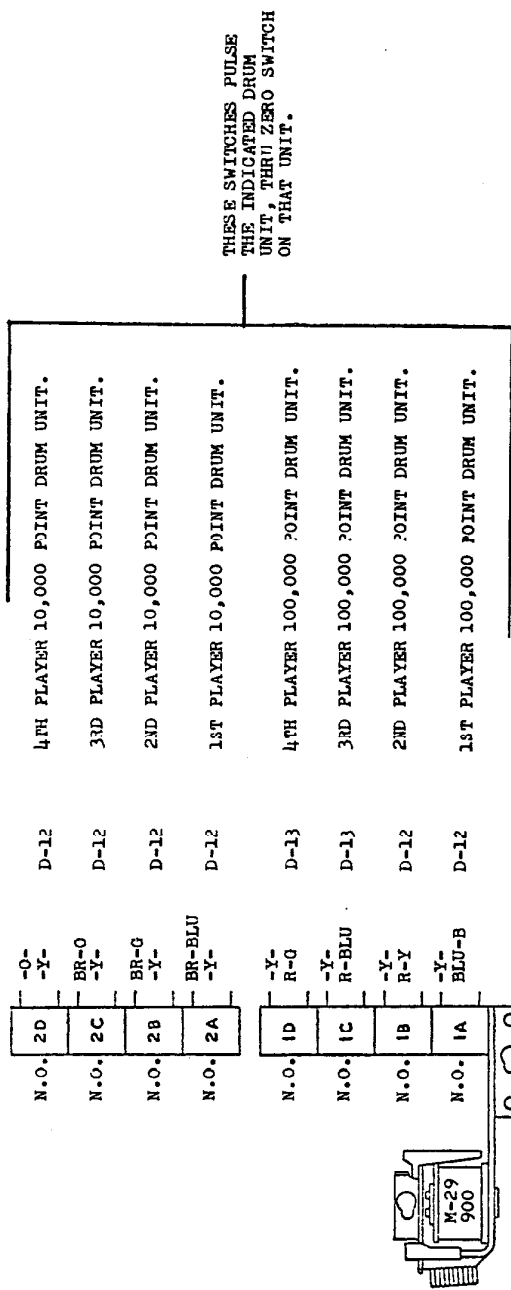
10 POINT

IS PULSED BY (2) STAND-UP SWITCHES OR (2) KICKER SWITCHES.



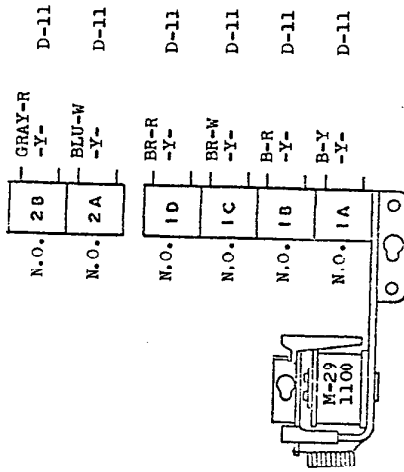
NO.3 RESET

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



NO.2 RESET

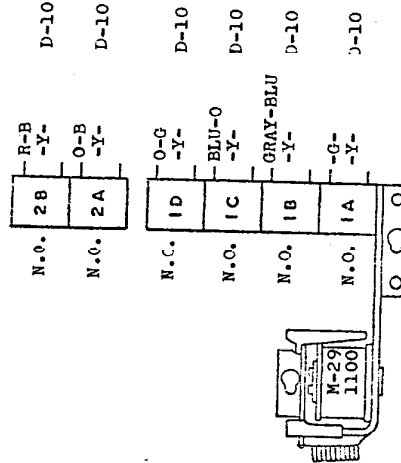
IS PULSED BY IMPULSE CAM SWITCH D (FORWARD), THRU SWITCH ON RESET RELAY.



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

NO.1 RESET

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



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

