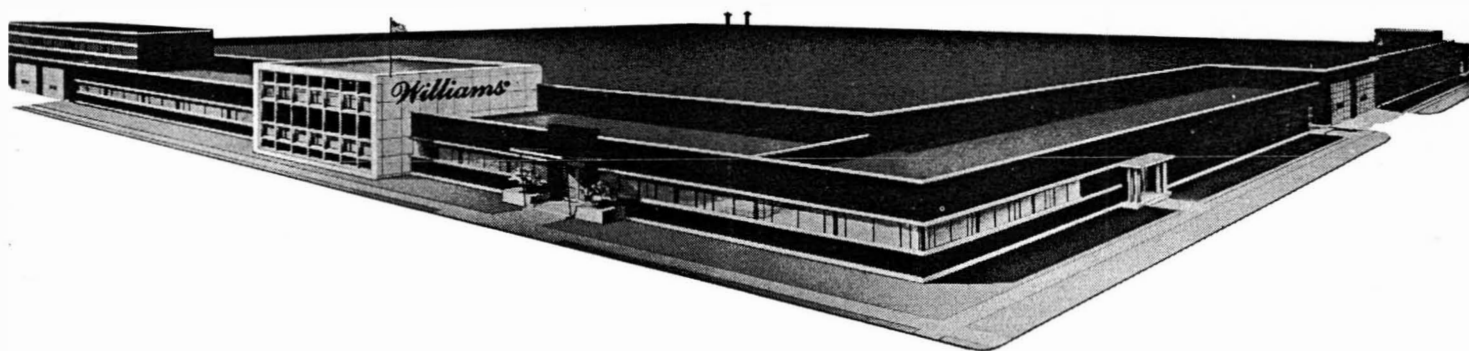


Instruction Manual

for

WINNER



Williams[®] ELECTRONICS, INC.
SUBSIDIARY OF THE SEEBURG CORPORATION

3401 N. California Ave.
Phone 267-2240

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

NOTES

CAUTION

UNDER NO CIRCUMSTANCE SHOULD THIS PLAYFIELD BE CLEANED WITH A WATER SOAP SOLUTION, HARSH ABRASIVES, KITCHEN CLEANSER OR STEEL WOOL. DO NOT USE ANY CLEANER CONTAINING ANY ABRASIVE.

THIS PLAYFIELD WILL LAST THE LIFE OF THE MACHINE IF PROPER PRECAUTIONS ARE TAKEN WHEN CLEANING. USE "Windex" OR "Lavacol," A RUBBING ALCOHOL, OR ANY SIMILAR GLASS CLEANER FOR BEST RESULTS.

"Winner"
161-2602

IMPORTANT

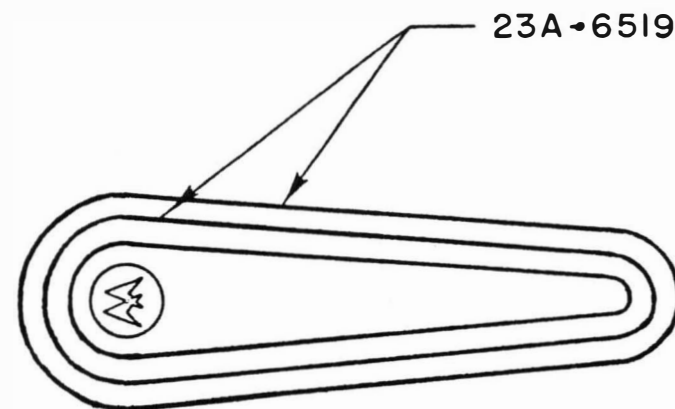
THERE ARE LEATHER WASHERS ON EACH SIDE OF THE SIX (6) NYLON RATCHETS WHICH DRIVE THE HORSES. THE TWELVE (12) LEATHER WASHERS ARE IMPREGNATED WITH NEETSFOOT OIL AT THE FACTORY.

FOR CONTINUED PROPER OPERATION OF THE HORSE UNIT, WE ENCLOSE A BOTTLE OF NEATSFOOT OIL, WITH A DROPPER, TO BE APPLIED ON THE LEATHER CLUTCH WASHERS WHENEVER THEY BECOME DRY.

"Winner"

"WINNER"

WHEN GAME IS SET FOR NOVELTY PLAY, USE TWO RUBBER RINGS (23A-6519) ON EACH BOTTOM FLIPPER.



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.

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	CONTROL MOTOR 14A-7805 (60 CYCLE) 14A-7806 (50 CYCLE) SHOOTER MOTOR 14A-7836 (60 CYCLE) 14A-7838 (50 CYCLE) HORSE UNIT MOTOR 14A-7837 (60 CYCLE) 14A-7839 (50 CYCLE)
SELECTOR	C-6417	B-7456-12	A-6401	
BALL COUNT	C-6417	B-7456-11	A-6402-10	
0-9	-----	-----	3C-7272	
TENS	-----	-----	3C-7272	
HUNDREDS	B-7253	A-6294	3C-7272	
THOUSANDS	B-7253	A-6294	3C-7272	

"WINNER" COIL CHART

NOTICE:

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

NUMBER	DESCRIPTION	LOCATION
14 A 7805	CONTROL MOTOR - 60 CYCLE	MECH. PANEL
14 A 7806	CONTROL MOTOR - 50 CYCLE	MECH. PANEL
14 A 7836	SHOOTER MOTOR - 60 CYCLE	PLAYFIELD
14 A 7838	SHOOTER MOTOR - 50 CYCLE	PLAYFIELD
14 A 7837	HORSE UNIT MOTOR - 60 CYCLE	HORSE UNIT
14 A 7839	HORSE UNIT MOTOR - 50 CYCLE	HORSE UNIT
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	BALL COUNT UNIT STEP UP	INSERT
	SELECTION UNIT STEP UP	INSERT
A 23-600	CREDIT UNIT STEP UP	INSERT
A2-23-750	KNOCKER	CABINET
B 26-800	BALL COUNT UNIT RESET	INSERT
	CREDIT UNIT RESET	INSERT
B1-26-800	SCORE DRUM UNITS ... (8 req'd.)	INSERT
C2-26-800	SMALL BELL UNIT	CABINET
	CHIME UNIT	CABINET
D1-24-1150	RELAY BANK RESET (115 V.)	BACK DOOR
FL 20-300/ 28-400	FLIPPERS (BOTTOM) ... (2 req'd.)	PLAYFIELD
FL 21-375/ 28-400	FLIPPERS (TOP) ... (2 req'd.)	PLAYFIELD
G 21-400	BALL RELEASE	PLAYFIELD
G 23-600	KICKER COIL (2 req'd.)	PLAYFIELD
M 29-1000	SCORE RESET RELAY	INSERT
M2-29-1000	HORSE RELEASE RELAY ... (6 req'd.)	HORSE UNIT
M 29-1100	"A" RELAY	BACK DOOR
	"B" RELAY	BACK DOOR
	"C" RELAY	BACK DOOR
	"D" RELAY	BACK DOOR
	#1 RELAY	BACK DOOR
	#2 RELAY	BACK DOOR
	#3 RELAY	BACK DOOR
	#4 RELAY	BACK DOOR
	#5 RELAY	BACK DOOR
	#6 RELAY	BACK DOOR
	10¢ RELAY	BACK DOOR
	25¢ RELAY	BACK DOOR
	10 PT. RELAY	INSERT
	100 PT. RELAY	INSERT
	1,000 PT. RELAY	INSERT
M 30-1300	1st PLAYER 100,000 RELAY	INSERT
	2nd PLAYER 100,000 RELAY	INSERT
Z 27-1000	COIN RELAY	BACK DOOR
	START RELAY	BACK DOOR
Z 28-1150	1-2-3 ADVANTAGE RELAY	BACK DOOR
	2-4-6 ADVANTAGE RELAY	BACK DOOR
	RIGHT SIDE RELAY	BACK DOOR
	CONTROL MOTOR RELAY	BACK DOOR
	LEFT SIDE RELAY	BACK DOOR
	LOCK RELAY	BACK DOOR
	OUTHOLE RELAY	BACK DOOR
	TILT RELAY	BACK DOOR
	BALL RELEASE RELAY	PLAYFIELD
	SHOOTER MOTOR RELAY	PLAYFIELD
	PLAYER RELAY	INSERT
S 27-500	RELAY BANK COILS ... (11 req'd.)	BACK DOOR
M1-31-1500	COIN LOCKOUT RELAY	FRONT DOOR
XM 27-675	METER COIL	MECH. PANEL

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

FOR 1 COIN - FOR 1 PLAY

OR

2 COINS - FOR 1 PLAY

FIGURE 1

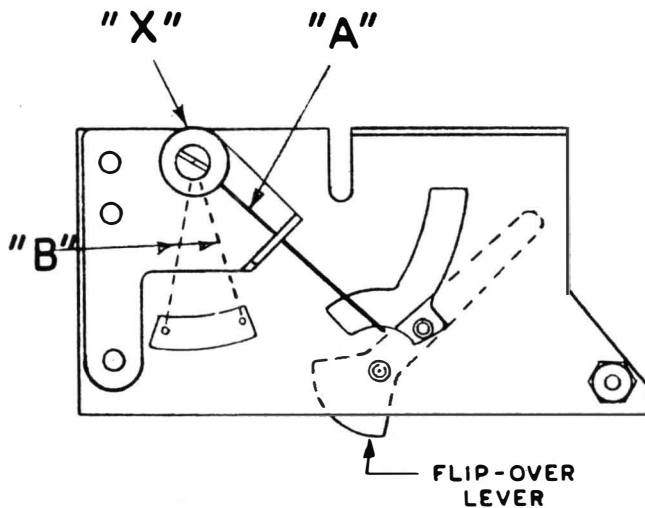
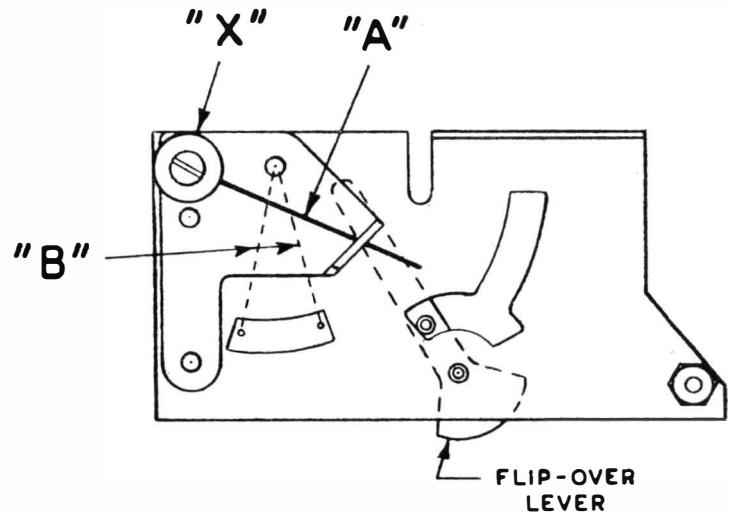


FIGURE 2



1 COIN - FOR 1 PLAY (FIGURE 1) :

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

2 COINS - FOR 1 PLAY (FIGURE 2) :

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

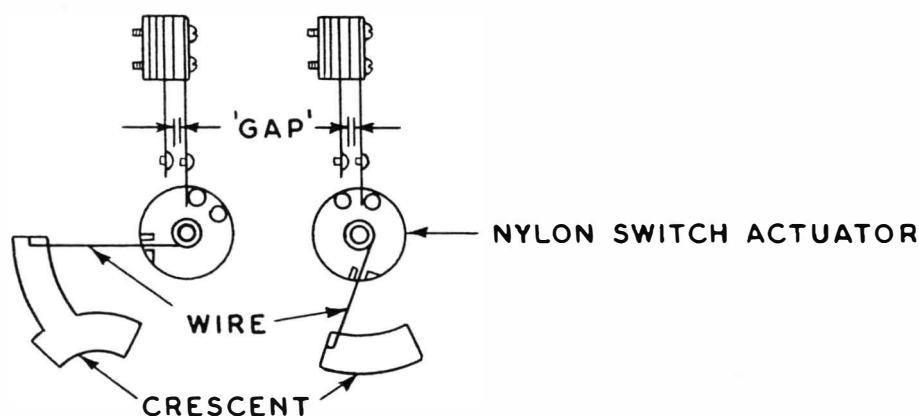
NOTE:

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

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

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.

SUGGESTED SCORE CARDS

5 BALL-REPLAY POSITION

#388-29 (48000-73000) OR #388-31 (54000-79000)
#388-5 (5-3-1-1-1) OR #388-6 (3-2-1-1-1)

3 BALL-REPLAY POSITION

#388-42 (29000-54000) OR #388-44 (33000-58000)
#388-9 (5-3-1) OR #388-10 (3-2-1)

5BALL NOVELTY

#388-18

3 BALL NOVELTY

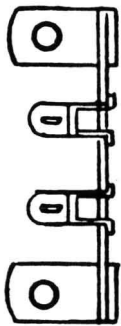
#388-22

EUROPEAN 5 BALL NOVELTY

#388-14

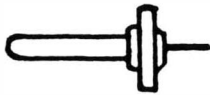
ADJUSTMENTS ON BACKDOOR

Motor Service Jack



ON

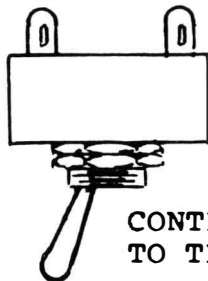
OFF



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)

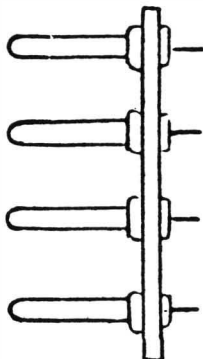
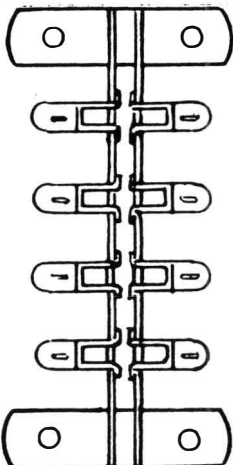


CONTROLS POWER
TO TRANSFORMER

LOCATED ON INSERT

No. of Balls Adjustment

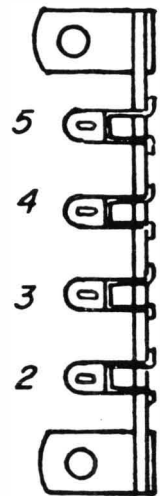
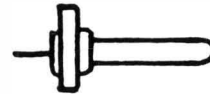
3 BALL — 5 BALL



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

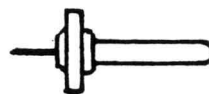
25¢ Adjustment

PROVIDES 2, 3, 4 OR 5
PLAYS FOR 25¢



10¢ Adjustment

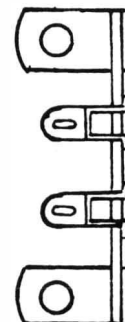
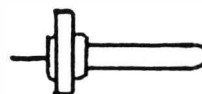
PROVIDES 1 OR 2
PLAYS FOR 1 COIN



2-PLAYS

1-PLAY

NOVELTY - CREDIT ADJ.

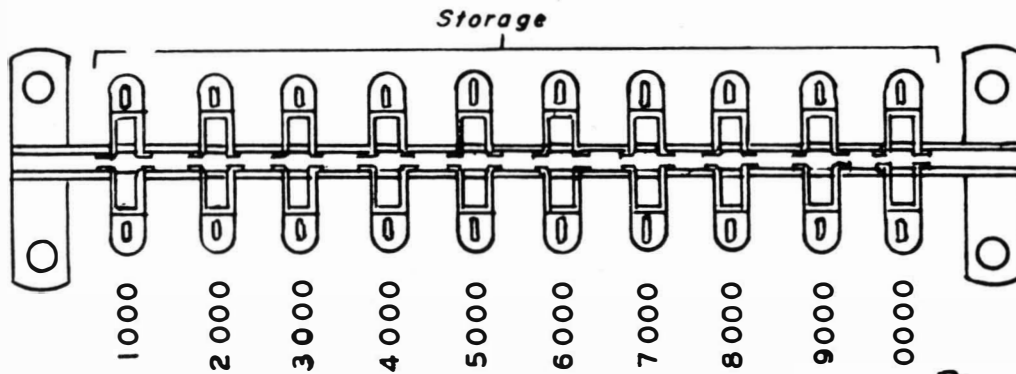


NOVELTY

CREDIT

IN CREDIT POSITION, HI SCORES AS IN-
DICATED, AND SELECTED WINNING HORSE,
WILL ADVANCE CREDIT UNIT.
IN NOVELTY POSITION, SELECTED WIN-
NING HORSE WILL ADVANCE 10,000 POINT
DRUM UNIT. (SEE WINNING HORSE AD-
JUSTMENT).

ADJUSTMENTS IN BACKBOX



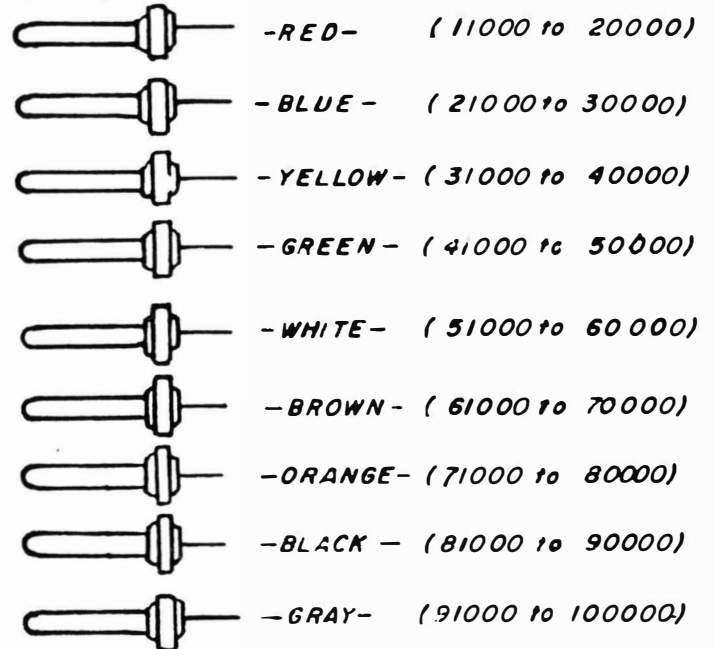
INSERT PLUGS INTO 20 POINT FEMALE AT DESIRED POSITIONS.

EXAMPLES:

RED WIRE INTO 9000 POSITION SCORES AT 19,000.

BLUE WIRE INTO 1000 POSITION SCORES AT 21,000.

BLUE WIRE INTO 0000 POSITION SCORES AT 30,000.



WINNING HORSE ADJUSTMENT

REPLAY OR POINTS ADJUSTMENT				BALL IN PLAY	
REPLAY	POINTS	☐	REPLAY	POINTS	☐
5 or	50,000	☐	5 or	50,000	☐
5 or	50,000	☐	5 or	50,000	☐
5 or	50,000	☐	5 or	50,000	☐
3 or	30,000	☐	3 or	30,000	☐
1 or	10,000	☐	2 or	20,000	☐
1 or	10,000	☐	1 or	10,000	☐
1 or	10,000	☐	1 or	10,000	☐
1 or	10,000	☐	1 or	10,000	☐

LIB.

↑

↓

CONS.

1st BALL
GREY-BLUE

2nd BALL
GREY-YELLOW

3rd BALL
GREY-GREEN

4th BALL
YELLOW-RED

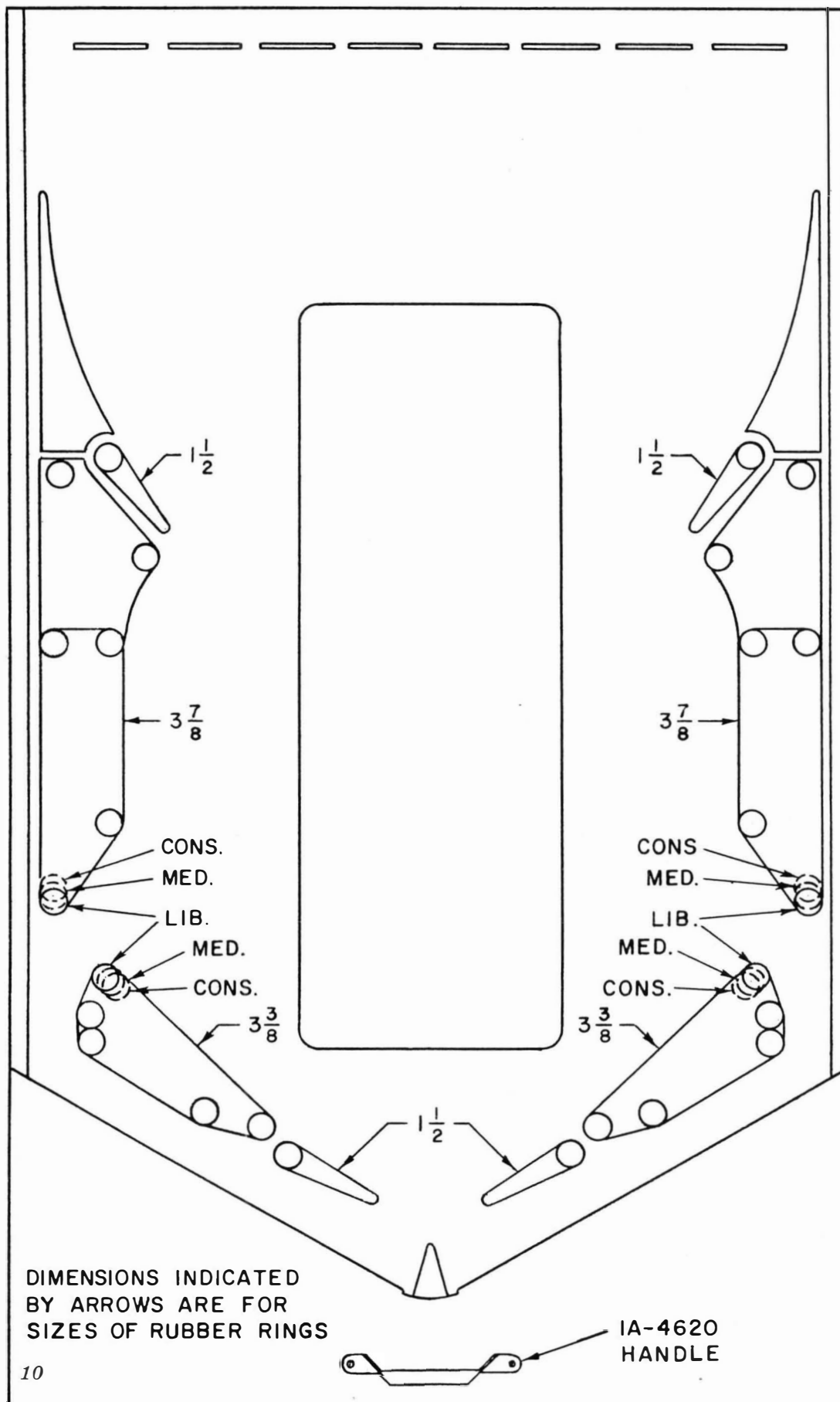
5th BALL
ORANGE-RED

EXAMPLE:-

JACK PLUGGED IN AS SHOWN GIVES 5-REPLAYS OR 50,000 POINTS IF SELECTED HORSE COMES IN ON 1st BALL, 3 OR 30,000 ON 2nd BALL 2 or 20,000 ON 3rd, BALL ETC.

"WINNER" — POST ADJUSTMENT SHEET

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



ABBREVIATIONS:

CONS. — CONSERVATIVE

LIB. — LIBERAL

MED. — MEDIUM

RUBBER RING NUMBERS:

23A-6300 5/16" I.D.

23A-6519 1 1/2" I.D.

23A-6308 3 3/8" I.D.

23A-6309 3 7/8" I.D.

DIMENSIONS INDICATED
BY ARROWS ARE FOR
SIZES OF RUBBER RINGS

1A-4620
HANDLE

30D-5327
PLAYFIELD ARCH

I. GENERAL

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

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

2. FUSES

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

3. LUBRICATION

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

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

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

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

SWITCH ADJUSTMENT

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

IMPORTANT

**LOCK-IN SWITCHES, ON ANY RELAY, SHOULD BE
ADJUSTED TO MAKE BEFORE ANY OTHER
SWITCH IS ACTUATED.**

The sequence of operation when ball returns to oscillating unit is as follows:

Ball closes contacts on Ball Rest Switch which, in turn, energizes Outhole Relay. Switch D of Outhole Relay runs Control Motor. Switch C on Outhole Relay energizes Shooter Motor Relay, thru Cam Switch 4C. Shooter Motor Relay remains locked in until player presses Push-Button. Push-Button switch energizes Ball Release Relay. Switch B of Ball Release Relay, in series with Switch A on Shooter Motor Relay, should energize the Ball Release Solenoid.

A. Shooter Motor Relay does not energize when ball returns to oscillating unit:

1. Check switch on Lock Relay; Red-White and White Blu.
2. Check switch on Outhole Relay; White-Blu and Yellow-Blu.
3. Check Cam Switch 4C on Control Motor; Yellow-Blu and Yellow.

B. Shooter Motor Relay does not remain locked in:

1. Check Switch on Shooter Motor Relay; White-Blu and Blu-Red.
2. Check Ball Release Solenoid end-Of-Stroke switch; Blu-Red and Yellow.

C. Ball Release Relay does not energize when player presses Push-Button:

1. Check Switch E on Shooter Motor Relay (this relay should be energized).
2. Check Push-Button Switch.
3. Check Switch on Index Cam of Control Motor---Yellow and Brown-White.
4. Check Ball Release Relay Coil.

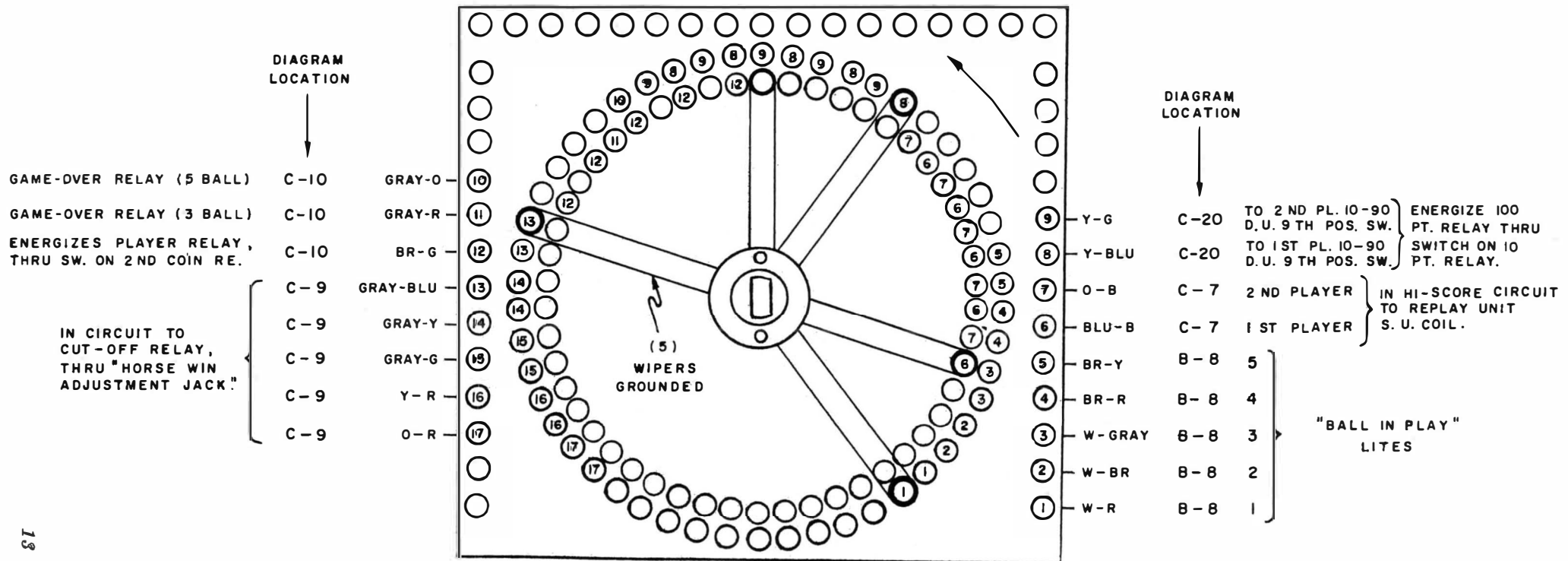
NOTE: When ball is propelled onto playfield and returns to Ball Rest Switch without having made any contacts, player is not charged for a ball.

BALL COUNT UNIT DISC

THIS UNIT RESETS AT CONTROL MOTOR CAM SWITCH 2B, THRU COIN RELAY AND GAME-OVER RELAY. IT ADVANCES WHEN OUTHOLE RELAY IS ENERGIZED, THRU SWITCH ON BALL RELEASE RELAY.

NOTE: IF BALL RETURNS TO OUTHOLE SWITCH WITHOUT MAKING ANY SCORE, THIS UNIT WILL NOT ADVANCE. (UNLESS GAME IS TILTED)

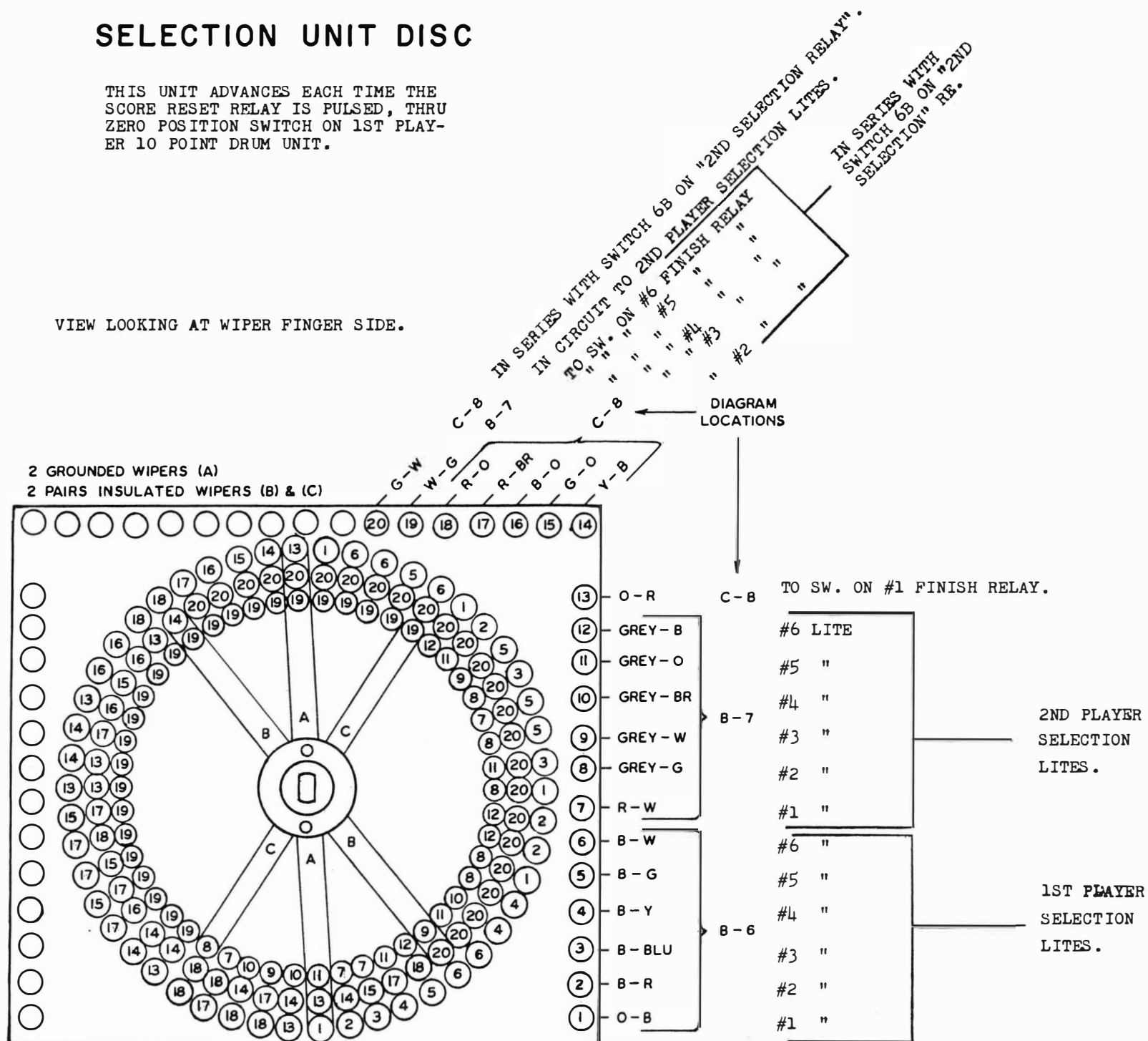
VIEW LOOKING AT WIPER FINGERS, WITH WIPER IN RESET POSITION.



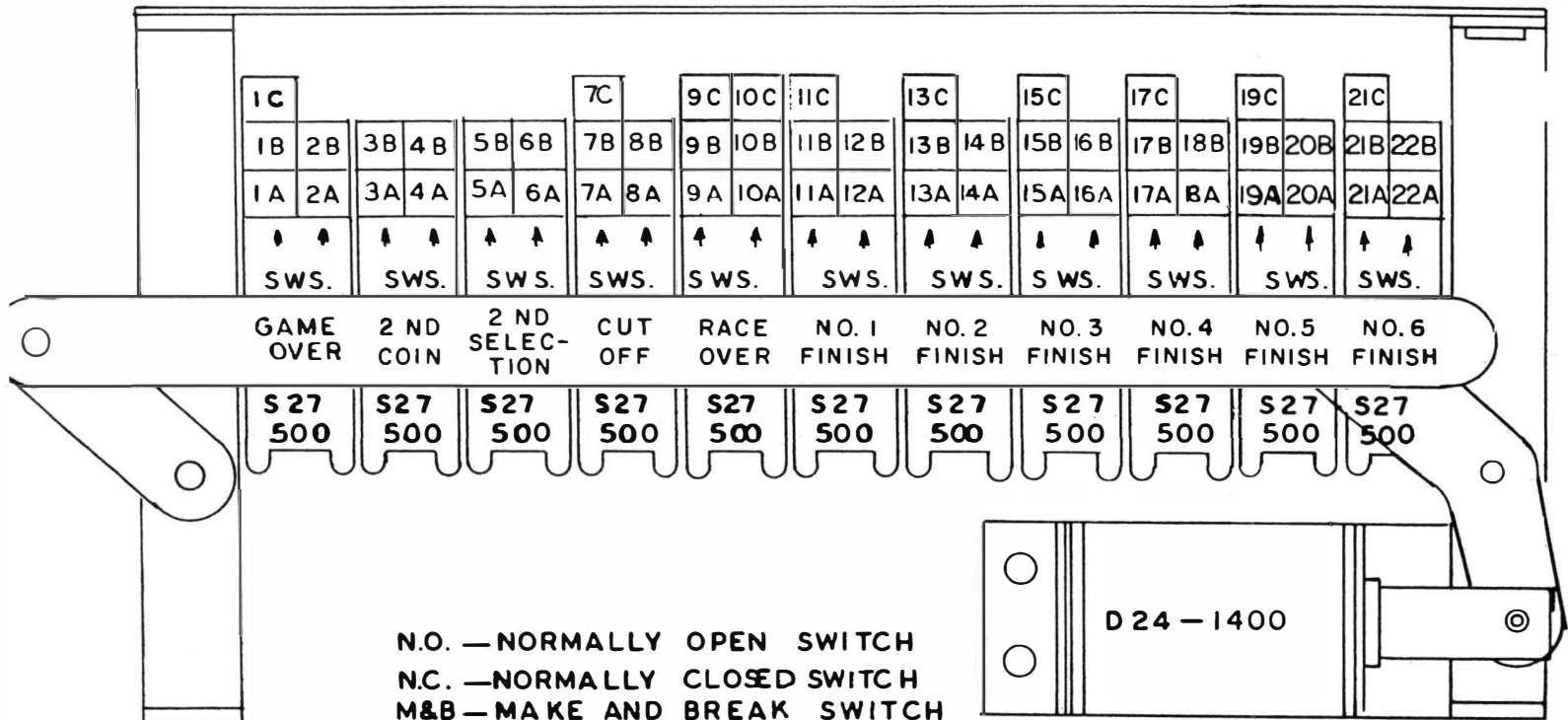
SELECTION UNIT DISC

THIS UNIT ADVANCES EACH TIME THE SCORE RESET RELAY IS PULSED, THRU ZERO POSITION SWITCH ON 1ST PLAYER 10 POINT DRUM UNIT.

VIEW LOOKING AT WIPER FINGER SIDE.



RELAY BANK SWS.



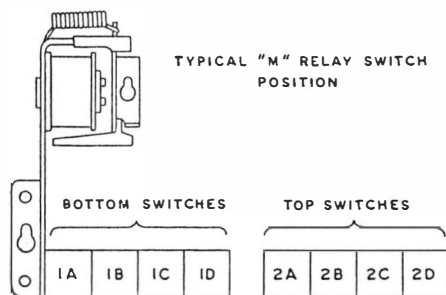
RELAY	SW.	WIRE COLORS	DIAG. LOC.	TYPE	SWITCH OPERATION
GAME OVER RELAY	1C	Y-BLU Y-G	E-8	N.C.	OPENS CIRCUITS TO NOVELTY-CREDIT ADJUSTMENT JACK. (HI-SCORES AND WINNING HORSE).
	1B	BR-B BLU-W	D-2	N.O.	ENERGIZES START RELAY, THRU SWITCH ON COIN RELAY.
	1A	BLU-Y-W -BR- GREY-B	A-7	M&B	OPENS IN CIRCUIT TO "BALL IN PLAY", "COIN" AND "PLAYER" LITES AND CLOSES TO "GAME OVER" LITE.
	2B	B-Y-W R-Y-W	F-10	N.C.	OPENS CIRCUITS TO PLAYFIELD SWITCHES.
	2A	R-G BLU-R	D-3	N.O.	IN CIRCUIT TO COIN RELAY, THRU REPLAY BUTTON.

RELAY	SW.	WIRE COLORS	DIAG. LOC.	TYPE	SWITCH OPERATION
2ND COIN RELAY	3B	R-G BLU-R	D-3	N.C.	IN CIRCUIT TO COIN RELAY, THRU REPLAY BUTTON.
	3A	GREY-O -Y- GREY-BR	B-9	M&B	OPENS TO "1 CAN PLAY" LITE, AND CLOSES TO "2 CAN PLAY" LITE.
	4B	BLU-Y R-BLU	C-5	N.C.	IN CIRCUIT TO BALL COUNT S.U. COIL, THRU CONTROL MOTOR COIN SWITCH 2D.
	4A	R-Y-W BR-O	F-11	N.O.	ENERGIZES PLAYER RELAY, THRU WIPER ON BALL COUNT UNIT DISC.
2ND SELEC- TION RELAY	5B	W-G -Y-	B-7	N.O.	IN CIRCUIT TO 2ND PLAYER HORSE SELECTION LITES.
	5A	B-O -J- GREY-G	D-16	M&B	IN HOLD CIRCUIT TO #1, #3 AND #5 RELAYS, WHICH CONTROLS DISTANCE THAT HORSE TRAVELS.
	6B	G-W -Y-	C-8	N.O.	IN CIRCUIT TO "NOVELTY-CREDIT" ADJ. JACK THRU ANY (6) FINISH RELAYS AND WIPER ON SELECTION UNIT. (SEE SWITCH 10B ON RACE OVER RE).
	6A	G-B -J- W-BLU	D-16	M&B	IN HOLD CIRCUIT TO #2, #4 AND #6 RELAYS, WHICH CONTROLS DISTANCE THAT HORSE TRAVELS.
CUT- OFF RELAY	7C	Y-BLU G-Y	E-8	N.C.	IN SERIES WITH SWITCH 1C ON GAME-OVER RELAY. THIS CIRCUIT ORIGINATES AT SWITCH 6B ON 2ND SELECTION RELAY.
	7B	O-G -J-	C-5	N.C.	RUNS CONTROL MOTOR, THRU SWITCH 10A ON RACE-OVER RELAY.
	7A	-J- GREY-W B-Y	E-16	M&B	IN HOLD CIRCUIT TO #1, #3 AND #5 RELAYS.
	8B	-J- -J-	E-9	N.C.	IN CIRCUIT TO COIL ON THIS RELAY.
	8A	-J- -GREY- B-Y	E-16	M&B	IN HOLD CIRCUIT TO #2, #4 AND #6 RELAYS.

RELAY	SW	WIRE COLORS	DIAG. LOC.	TYPE	SWITCH OPERATION
RACE OVER RELAY	9C	-R- W-G	F-14	N.C.	OPENS CIRCUIT TO 1-3-5 ADVANTAGE RELAY AND 2-4-6 ADVANTAGE RELAY.
	9B	BR-O -J-	E-9	N.O.	IN CIRCUIT TO CUTOFF RELAY, THRU "HORSE WIN" ADJUSTMENT JACK.
	9A	BR-B -J-	E-18	N.O.	IN CIRCUIT TO 1000 POINT RELAY, THRU WINNING HORSES "FINISH RELAY".
	10C	-J- -J-	E-17	N.C.	IN CIRCUIT TO COIL ON THIS RELAY, THRU WINNING HORSES "FINISH RELAY".
	10B	Y-G -J-	D-8	N.O.	IN SERIES WITH SWITCH 7C ON CUTOFF RELAY.
	10A	-J- -Y-	C-5	N.O.	IN SERIES WITH SWITCH 7B ON CUTOFF RELAY.
NO.1 FINISH RELAY	11C	-J- -Y-	C-12	N.C.	IN SERIES WITH SWITCH 13C ON #2 FINISH RELAY.
	11B	O-R -J-	C-8	N.O.	IN SERIES WITH SWITCH 10B ON RACE-OVER RELAY.
	11A	W-R BR-R -J-	D-18	M&B	OPENS IN CIRCUIT TO 100 POINT RELAY AND CLOSES TO 1000 POINT RELAY.
	12B	R-BLU -J-	D-17	N.O.	ENERGIZES RACE-OVER RELAY.
	12A	R-B -Y-	B-4	N.O.	TO PLAYFIELD AND INSERT "#1 WINNER" LITE.

RELAY	SW.	WIRE COLORS	DIAG. LOC.	TYPE	SWITCH OPERATION
NO.2 FINISH RELAY	13C	-J- -J-	C-12	N.C.	IN SERIES WITH SWITCH 15C ON #3 FINISH RELAY.
	13B	Y-B -J-	C-8	N.O.	IN SERIES WITH SWITCH 10B ON RACE-OVER RELAY.
	13A	W-R -O- -J-	D-18	M&B	OPENS IN CIRCUIT TO 100 POINT RELAY AND CLOSSES TO 1000 POINT RELAY.
	14B	R-BLU -J-	D-17	N.O.	ENERGIZES RACE-OVER RELAY.
	14A	G-Y -Y-	B-4	N.O.	TO PLAYFIELD AND INSERT "#2 WINNER" LITE.
NO.3 FINISH RELAY	15C	-J- -J-	C-12	N.O.	IN SERIES WITH SWITCH 17C ON #4 FINISH RELAY.
	15B	G-O -J-	C-8	N.O.	IN SERIES WITH SWITCH 10B ON RACE-OVER RELAY.
	15A	W-R O-W -J-	D-18	M&B	OPENS IN CIRCUIT TO 100 POINT RELAY AND CLOSSES TO 1000 POINT RELAY.
	16B	R-BLU -J-	D-17	N.O.	ENERGIZES RACE-OVER RELAY.
	16A	BLU-B -Y-	B-5	N.O.	TO PLAYFIELD AND INSERT "#3 WINNER" LITE.
NO.4 FINISH RELAY	17C	-J- -J-	C-12	N.C.	IN SERIES WITH SWITCH 19C ON #5 FINISH RELAY.
	17B	B-O -J-	C-8	N.O.	IN SERIES WITH SWITCH 10B ON RACE-OVER RELAY.
	17A	W-R B-BLU -J-	D-18	M&B	OPENS IN CIRCUIT TO 100 POINT RELAY AND CLOSSES TO 1000 POINT RELAY.
	18B	R-BLU -J-	D-17	N.O.	ENERGIZES RACE-OVER RELAY.
	18A	Y-R -Y-	B-5	N.O.	TO PLAYFIELD AND INSERT "#4 WINNER" LITE.

RELAY	SW.	WIRE COLORS	DIAG. LOC.	TYPE	SWITCH OPERATION
NO.5 FINISH RELAY	19C	-J- -J-	D-12	N.C.	IN SERIES WITH SWITCH 21C ON #16 FINISH RELAY
	19B	R-BR -J-	C-8	N.O.	IN SERIES WITH SWITCH 10B ON RACE-OVER RELAY.
	19A	W-R GREY-BR -J-	D-18	M&B	OPENS IN CIRCUIT TO 100 POINT RELAY AND CLOSES TO 1000 POINT RELAY.
	20B	R-BLU -J-	D-17	N.O.	ENERGIZES RACE-OVER RELAY.
	20A	Y-O -Y-	B-5	N.O.	TO PLAYFIELD AND INSERT "#5 WINNER" LITE.
NO.6 FINISH RELAY	21C	-J- R-W	D-12	N.C.	IN CIRCUIT TO (6) RELEASE COILS AND FINISH RELAYS. (THIS CIRCUIT ORIGINATES AT SWITCH 11C ON #1 FINISH RELAY.
	21B	R-O -J-	C-8	N.O.	IN SERIES WITH SWITCH 10B ON RACE-OVER RELAY.
	21A	W-R GREY-Y -J-	D-19	M&B	OPENS IN CIRCUIT TO 100 POINT RELAY AND CLOSES TO 1000 POINT RELAY.
	22B	R-BLU -J-	D-17	N.O.	ENERGIZES RACE-OVER RELAY.
	22A	O-B -Y-	B-5	N.O.	TO PLAYFIELD AND INSERT "#6 WINNER" LITE.

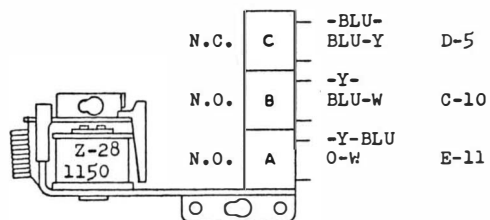


RELAYS & SWITCHES

LOCATED ON PLAYFIELD

BALL RELEASE RELAY

IS ENERGIZED BY SHOOT BUTTON SWITCH, THRU SWITCH E ON SHOOTER MOTOR RELAY.



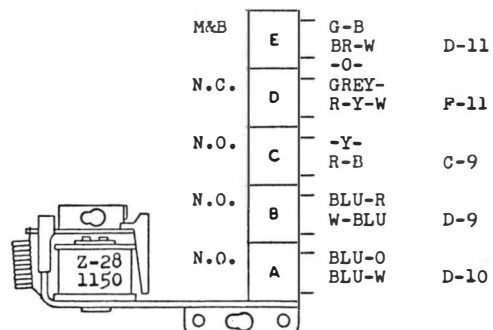
IN SERIES WITH SWITCH B ON OUTHOLE RELAY.

ENERGIZES BALL RELEASE SOLENOID, THRU SWITCH A ON "SHOOTER MOTOR RELAY".

IN HOLD CIRCUIT TO THIS RELAY, THRU SWITCH D ON TILT RELAY.

SHOOTER MOTOR RELAY

IS ENERGIZED BY CAM SWITCH 4C, THRU START RELAY OR OUTHOLE RELAY.



OPENS IN CIRCUIT TO OUTHOLE RELAY AND CLOSES TO BALL RELEASE RELAY.

OPENS CIRCUITS TO TILT RELAY AND ALL PLAYFIELDS SWITCHES.

RUNS SHOOTER MOTOR.

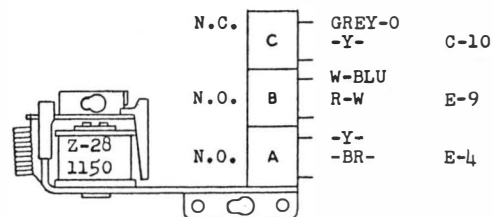
IN HOLD CIRCUIT TO THIS RELAY, THRU END-OF-STROKE SWITCH ON BALL RELEASE.

ENERGIZES BALL RELEASE SOLENOID, THRU SWITCH B ON BALL RELEASE RELAY.

LOCATED ON BACKDOOR

LOCK RELAY

IS ENERGIZED BY SWITCH C ON COIN RELAY.



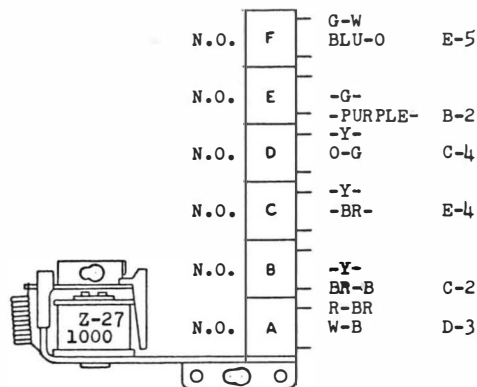
TRIPS GAME-OVER RELAY.

CIRCUIT TO SHOOTER MOTOR RELAY, THRU SWITCH ON START OR OUTHOLE RELAY.

HOLD CIRCUIT TO THIS RELAY, THRU BACK DOOR SLAM SWITCH.

COIN RELAY

IS ENERGIZED BY COIN SWITCH---ALSO BY RE-
PLAY BUTTON, THRU CREDIT UNIT ZERO SWITCH.



PULSES CREDIT UNIT RESET COIL AND TRIPS 2ND COIN RELAY,
THRU CONTROL MOTOR CAM SWITCH 1B.

ENERGIZES 110 VOLT BANK RESET COIL, THRU SWITCH D ON START
RELAY AND CAM SWITCH 4A.

RUNS CONTROL MOTOR.

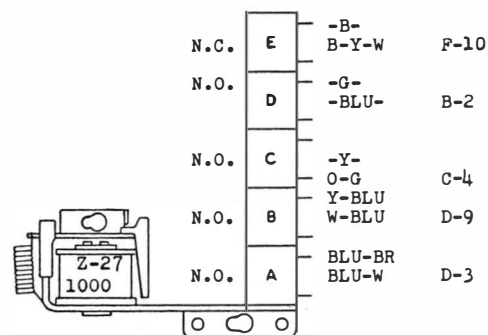
ENERGIZES LOCK RELAY.

ENERGIZES START RELAY, THRU BALL COUNT UNIT ZERO SWITCH
OR GAME-OVER RELAY.

HOLD CIRCUIT TO THIS RELAY, THRU CONTROL MOTOR CAM SWITCH 5D.

START RELAY

IS ENERGIZED BY COIN RELAY, THRU EITHER
THE BALL COUNT UNIT ZERO SWITCH OR GAME-
OVER RELAY.



OPENS CIRCUITS TO ALL PLAYFIELD SWITCHES.

IN SERIES WITH SWITCH E ON COIN RELAY.

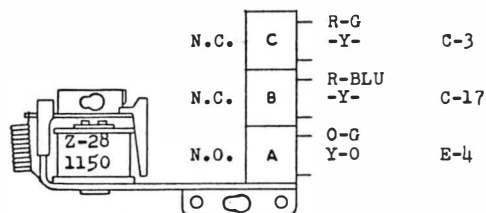
RUNS SCORE MOTOR.

IN SERIES WITH SWITCH B ON LOCK RELAY.

IN HOLD CIRCUIT TO THIS RELAY, THRU ZERO SWITCHES ON 8 DRUM
UNITS AND 6 HORSES.

CONTROL MOTOR RELAY

IS ENERGIZED BY SAME CIRCUITS THAT RUN
CONTROL MOTOR, THRU INDEX CAM SWITCH ON
CONTROL MOTOR.



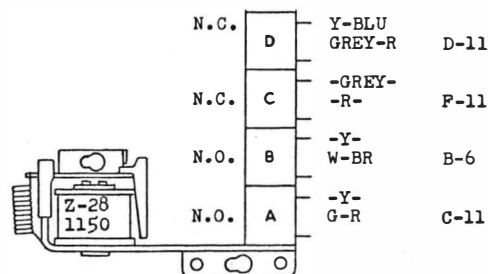
OPENS CIRCUIT TO COIN LOCKOUT COIL.

OPENS CIRCUIT TO RACE-OVER RELAY.

RUNS CONTROL MOTOR.

TILT RELAY

IS ENERGIZED BY TILT SWITCHES.



IN SERIES WITH SWITCH A ON BALL RELEASE RELAY.

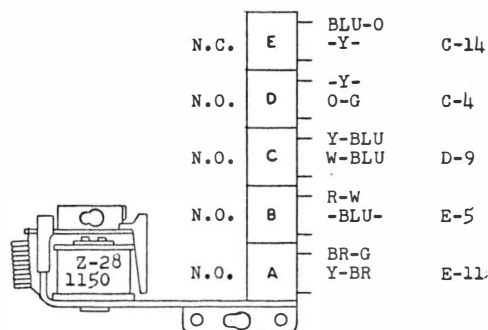
OPENS CIRCUITS TO ALL PLAYFIELD SWITCHES,

TO TILT LITE.

HOLD CIRCUIT TO THIS RELAY.

OUTHOLE RELAY

IS ENERGIZED BY "BALL REST" SWITCH, THRU SWITCH E ON SHOOTER MOTOR RELAY.



IN HOLD CIRCUIT TO LEFT SIDE AND RIGHT SIDE RELAYS AND TO 1-3-5 AND 2-4-6 ADVANTAGE RELAYS.

RUNS CONTROL MOTOR.

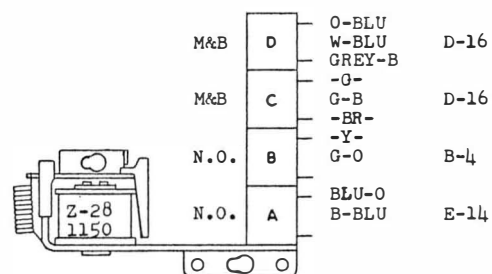
IN SERIES WITH SWITCH B ON LOCK RELAY.

TO BALL COUNT UNIT S.U. COIL, FROM SWITCH C ON BALL RELEASE RELAY.

HOLD CIRCUIT TO THIS RELAY, THRU CONTROL MOTOR CAM SWITCH 5C.

2-4-6 ADVANTAGE RELAY

IS ENERGIZED BY SWITCH D ON "C RELAY".



IN HOLD CIRCUIT TO #2, 4 AND 6 RELAYS IN TWO PLAYER GAME.

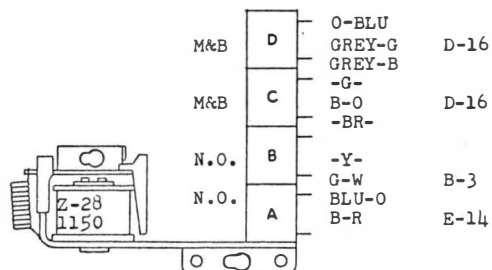
IN HOLD CIRCUIT TO #2, 4 AND 6 RELAYS IN ONE PLAYER GAME.

TO "2-4-6 HORSE RUNS FASTER" LITES.

IN HOLD CIRCUIT TO THIS RELAY.

1-3-5 ADVANTAGE RELAY

IS ENERGIZED BY SWITCH D ON "A RELAY".



IN HOLD CIRCUIT TO #1, 3 AND 5 RELAYS IN ONE PLAYER GAME.

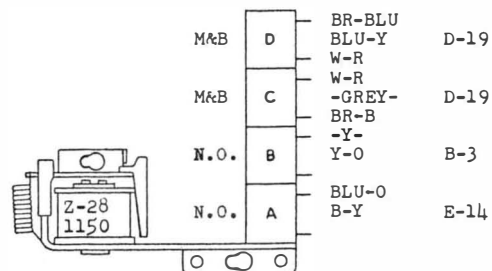
IN HOLD CIRCUIT TO #1, 3 AND 5 RELAYS IN TWO PLAYER GAME.

TO "1-3-5 HORSE RUNS FASTER" LITES.

IN HOLD CIRCUIT TO THIS RELAY.

LEFT SIDE RELAY

IS ENERGIZED BY LEFT SIDE TARGET.



OPENS IN CIRCUIT TO 10 POINT RELAY AND CLOSSES TO 100 POINT RELAY.

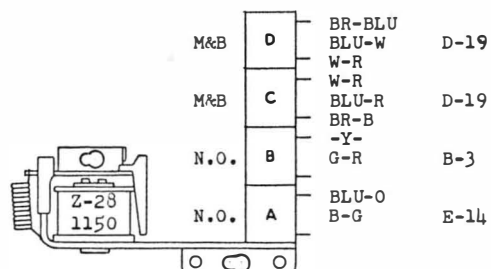
OPENS IN CIRCUIT TO 100 POINT RELAY AND CLOSSES TO 1000 POINT RELAY.

TO "A" TARGET LITE AND "B" RUBBER LITE.

IN HOLD CIRCUIT TO THIS RELAY.

RIGHT SIDE RELAY

IS ENERGIZED BY RIGHT SIDE TARGET.



OPENS IN CIRCUIT TO 10 POINT RELAY AND CLOSSES TO 100 POINT RELAY.

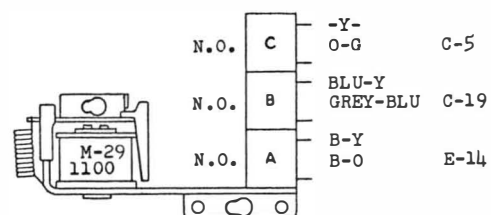
OPENS IN CIRCUIT TO 100 POINT RELAY AND CLOSSES TO 1000 POINT RELAY.

TO "C" TARGET LITE AND "D" RUBBER LITE.

IN HOLD CIRCUIT TO THIS RELAY.

'B' RELAY

IS ENERGIZED BY "B" RUBBER SWITCH".



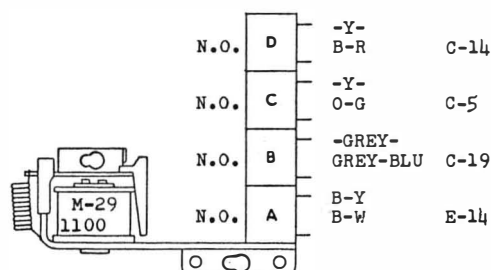
RUNS CONTROL MOTOR.

IN SERIES WITH SWITCH D ON "LEFT SIDE RELAY".

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

'A' RELAY

IS ENERGIZED BY "A" TARGET SWITCH.



ENERGIZES "1-3-5 ADVANCE RELAY".

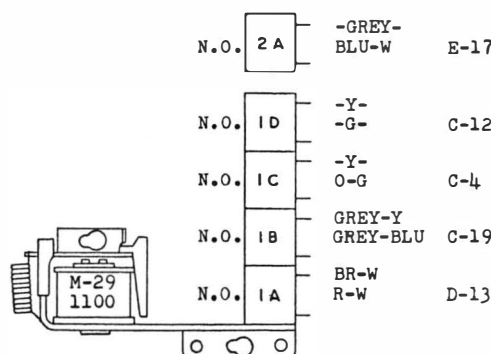
RUNS CONTROL MOTOR.

IN SERIES WITH SWITCH C ON "LEFT SIDE RELAY".

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

NO. 6 RELAY

IS ENERGIZED BY #6 TARGET.



IN HOLD CIRCUIT TO THIS RELAY.

RUNS "HORSE ADVANCE MOTOR".

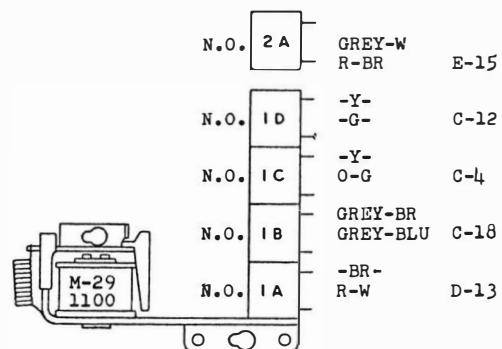
RUNS CONTROL MOTOR.

IN SERIES WITH SWITCH 21A ON "#6 FINISH RELAY".

TO #6 RELEASE COIL---ALSO IN CIRCUIT TO #6 FINISH RELAY.

NO. 5 RELAY

IS ENERGIZED BY #5 TARGET.



IN HOLD CIRCUIT TO THIS RELAY.

RUNS "HORSE ADVANCE MOTOR".

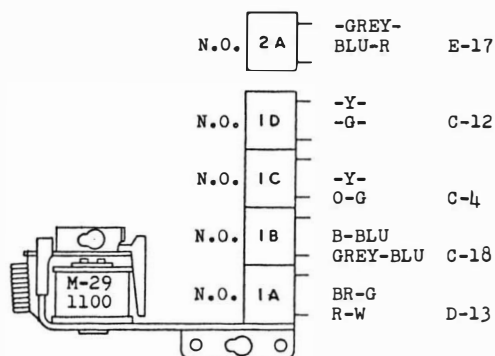
RUNS CONTROL MOTOR.

IN SERIES WITH SWITCH 19A ON "#5 FINISH RELAY".

TO #5 RELEASE COIL---ALSO IN CIRCUIT TO #5 FINISH RELAY.

NO. 4 RELAY

IS ENERGIZED BY #4 TARGET.



IN HOLD CIRCUIT TO THIS RELAY.

RUNS "HORSE ADVANCE MOTOR".

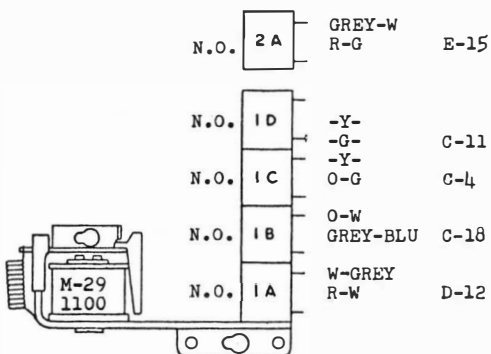
RUNS CONTROL MOTOR.

IN SERIES WITH SWITCH 17A ON #4 FINISH RELAY.

TO #4 RELEASE COIL---ALSO IN CIRCUIT TO #4 FINISH RELAY.

NO. 3 RELAY

IS ENERGIZED BY #3 TARGET.



IN HOLD CIRCUIT TO THIS RELAY.

RUNS "HORSE ADVANCE MOTOR".

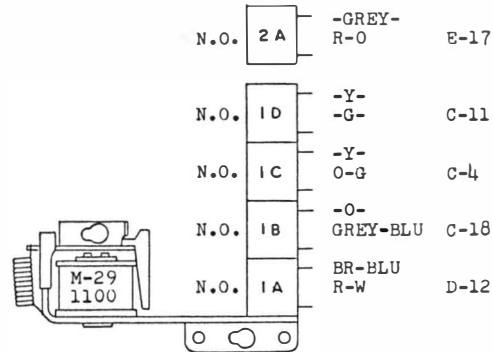
RUNS CONTROL MOTOR.

IN SERIES WITH SWITCH 15A ON #3 FINISH RELAY.

TO #3 RELEASE COIL---ALSO IN CIRCUIT TO #3 FINISH RELAY.

NO. 2 RELAY

IS ENERGIZED BY #2 TARGET.



IN HOLD CIRCUIT TO THIS RELAY.

RUNS "HORSE ADVANCE MOTOR".

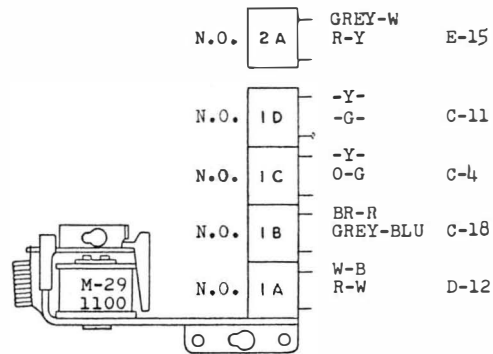
RUNS CONTROL MOTOR.

IN SERIES WITH SWITCH 13A ON #2 FINISH RELAY.

TO #2 RELEASE COIL---ALSO IN CIRCUIT TO #2 FINISH RELAY.

NO. 1 RELAY

IS ENERGIZED BY #1 TARGET.



IN HOLD CIRCUIT TO THIS RELAY.

RUNS "HORSE ADVANCE MOTOR".

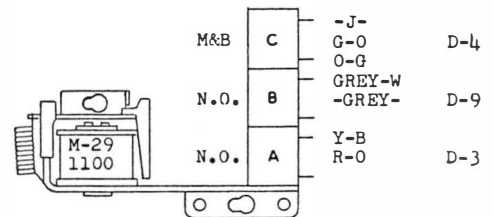
RUNS CONTROL MOTOR.

IN SERIES WITH SWITCH 11A ON #1 FINISH RELAY.

TO #1 RELEASE COIL---ALSO IN CIRCUIT TO #1 FINISH RELAY.

25¢ RELAY

IS ENERGIZED BY 25¢ COIN SWITCH, THRU FRONT DOOR SLAM SWITCH.



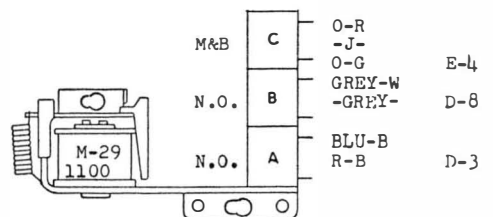
IN CIRCUIT TO KNOCKER COIL---ALSO RUNS CONTROL MOTOR.

PULSES CREDIT UNIT S.U. COIL, THRU IMPULSE CAM SWITCH 1A.

IN HOLD CIRCUIT TO THIS RELAY.

10¢ RELAY

IS ENERGIZED BY 10¢ COIN SWITCH IF 10¢ ADJUSTMENT JACK IS IN "2 PLAYS FOR 1 COIN" POSITION.



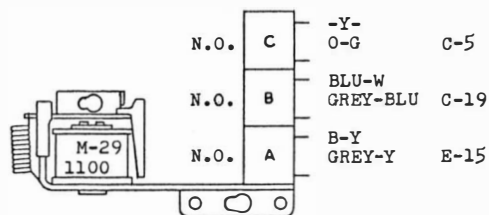
OPENS CIRCUIT TO KNOCKER COIL AND CLOSSES TO RUN CONTROL MOTOR.

PULSES CREDIT UNIT S.U. COIL, THRU IMPULSE CAM SWITCH 1A.

IN HOLD CIRCUIT TO THIS RELAY.

'D' RELAY

IS ENERGIZED BY "D RUBBER SWITCH".



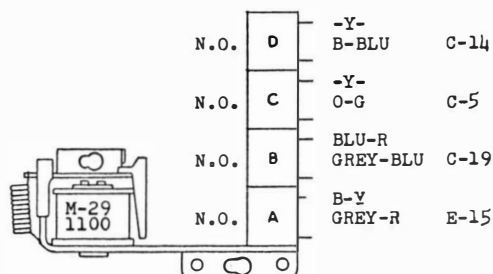
RUNS CONTROL MOTOR.

IN SERIES WITH SWITCH D ON "RIGHT SIDE RELAY".

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

'C' RELAY

IS ENERGIZED BY "C TARGET SWITCH".



ENERGIZES "2-4-6 ADVANCE RELAY".

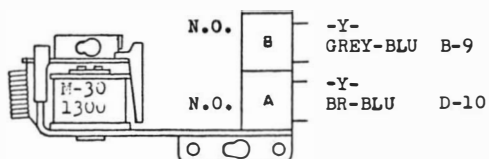
RUNS CONTROL MOTOR.

IN SERIES WITH SWITCH C ON "RIGHT SIDE RELAY".

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

2ND PLAYER 100,000 RELAY

IS ENERGIZED BY 2ND PLAYER 10,000 POINT DRUM UNIT END-OF-STROKE SWITCH, THRU 9TH POSITION SWITCH ON THAT UNIT.

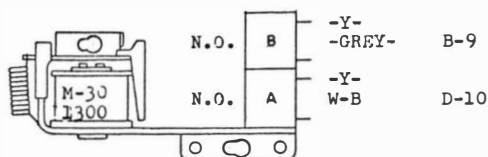


TO 2ND PLAYER "100,000" LITE.

HOLD CIRCUIT TO THIS RELAY.

1ST PLAYER 100,000 RELAY

IS ENERGIZED BY END-OF-STROKE SWITCH ON 1ST PLAYER 10,000 DRUM UNIT, THRU 9TH POSITION SWITCH ON THAT UNIT.

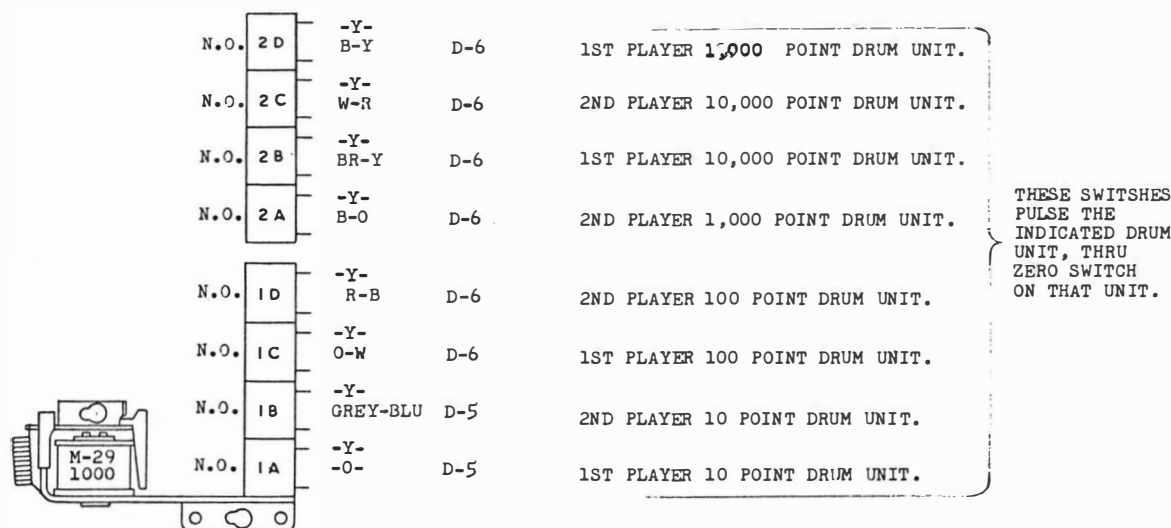


TO 1ST PLAYER "100,000" LITE.

HOLD CIRCUIT TO THIS RELAY.

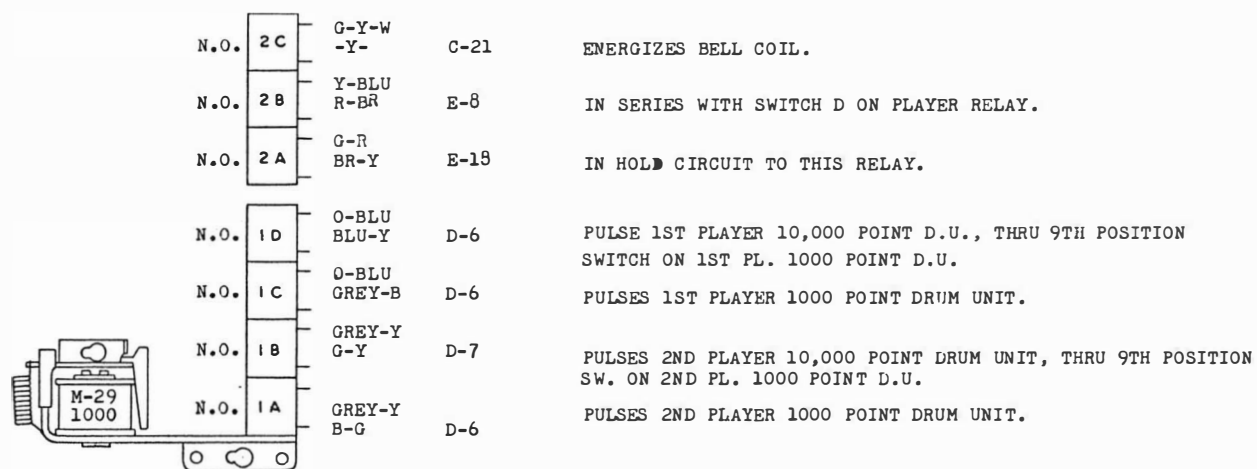
SCORE RESET RELAY

IS PULSED BY CONTROL MOTOR IMPULSE CAM SWITCH D, THRU START RELAY SWITCH A.



1000 POINT RELAY

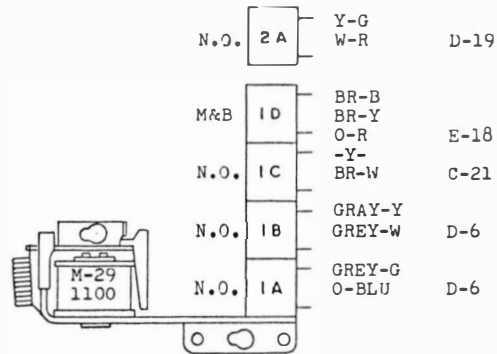
IS PULSED BY:
A-LEFT AND RIGHT BOTTOM ROLLOVERS.
B-SEE SWITCHES 1B ON #1 RELAY THRU #6 RELAY.
C-SEE SWITCH B ON "A RELAY" AND "C RELAY".



100 POINT RELAY

IS PULSED BY:

- A-LEFT SIDE AND RIGHT SIDE TARGET.
 B-SEE SWITCHES 1B ON #1 RELAY THRU #6 RELAY.
 C-SEE SWITCHES B ON "A", "B", "C" AND "D" RELAYS.



IN HOLD CIRCUIT TO THIS RELAY.

PULSES 1000 POINT RELAY, THRU EITHER 9TH POSITION SWITCH ON 100 POINT DRUM UNITS.

PULSES CHIME COIL.

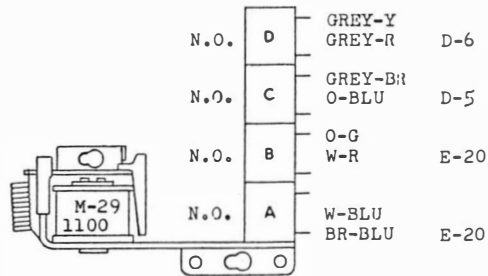
PULSES 2ND PLAYER 100 POINT DRUM UNIT.

PULSES 1ST PLAYER 100 POINT DRUM UNIT.

10 POINT RELAY

IS PULSED BY:

- A-LEFT AND RIGHT SIDE KICKER SWITCHES.
 B-SEE SWITCH B ON "B" AND "D" RELAYS.



PULSES 2ND PLAYER 10 POINT DRUM UNIT.

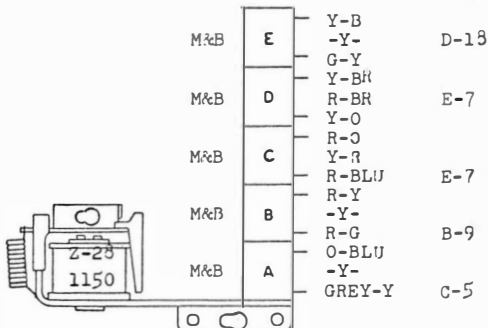
PULSES 1ST PLAYER 10 POINT DRUM UNIT.

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

IN HOLD CIRCUIT TO THIS RELAY.

PLAYER RELAY

IS ENERGIZED BY WIPER ON BALL COUNT UNIT (EVERY OTHER STEP), THRU SWITCH ON 2ND COIN RELAY.



IN SERIES WITH SWITCH 1D ON 100 POINT RELAY.

IN HI-SCORE CIRCUIT TO CREDIT UNIT S.U. OR 10,000 POINT.

TO 1ST OR 2ND PLAYER 100,000 POINT DRUM UNIT COIL, FROM "NOVELTY-CREDIT" ADJ. JACK.

OPENS TO "1ST PLAYER UP" LITE AND CLOSSES TO "2ND PLAYER UP" LITE.

IN CIRCUIT TO ALL 1ST AND 2ND PLAYER SCORING DRUMS.

NOTES

