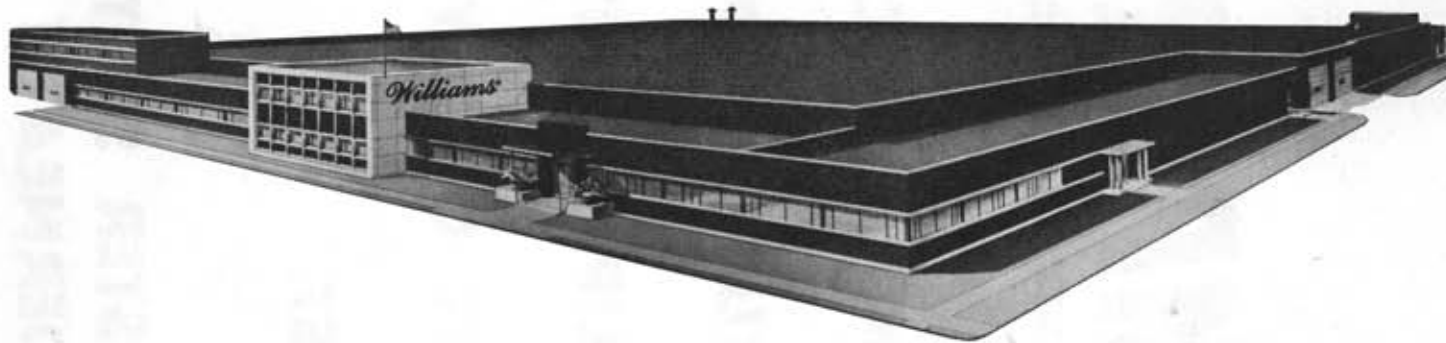


Instruction Manual

for

SUSPENSE



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

3401 N. California Ave.
Phone 267-2240

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

IMPORTANT NOTICE

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

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

CAUTION!

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

SERVICEMAN TO REMOVE BACKGLASS:

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

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

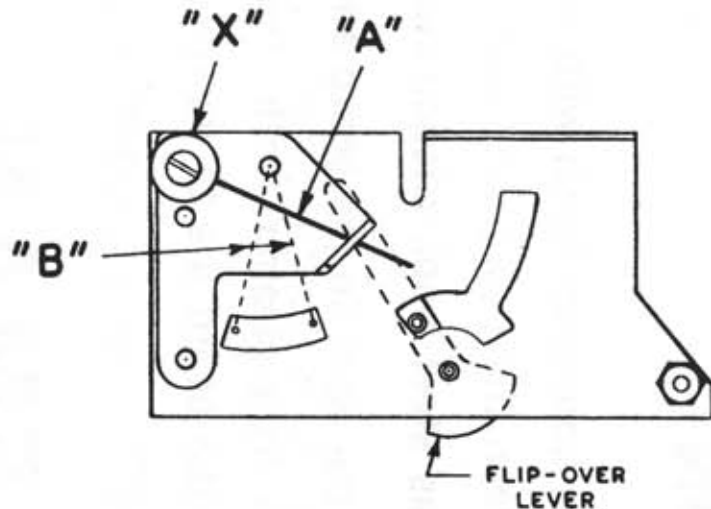
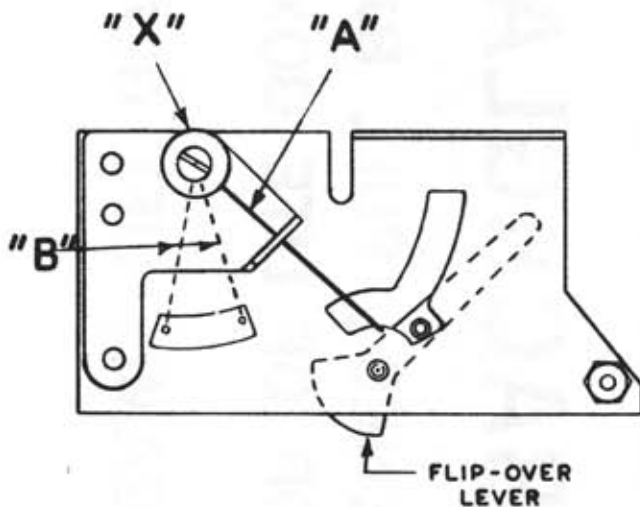
FOR 1 COIN - FOR 1 PLAY

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.

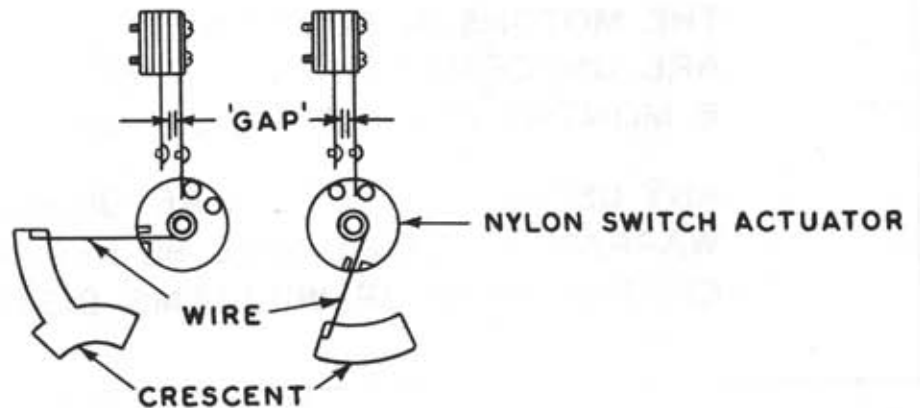
NOTE:

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.

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 "SUSPENSE"

UNIT NAME	CONTACT DISC	WIPER ASSEMBLY	RATCHET GEAR ASSEMBLY	MOTORS
REPLAY	-----	-----	A-6400	SPINNER MOTOR 14A-7807 (60 CYCLE) 14A-7808 (50 CYCLE)
BALL COUNT	C-6878	C-6520	A-6402-10	
BONUS	C-6417	C-6520	A-6401	
NO. MATCH	C-6879	C-6520	A-6401	SCORE MOTOR 14A-7805 (60 CYCLE) 14A-7806 (50 CYCLE)
0-9	B-6297	A-6294	3C-7128	
TENS	-----	-----	3C-7128	
HUNDREDS	B-6297	A-6294	3C-7128	
THOUSANDS	B-6297	A-6294	3C-7128	

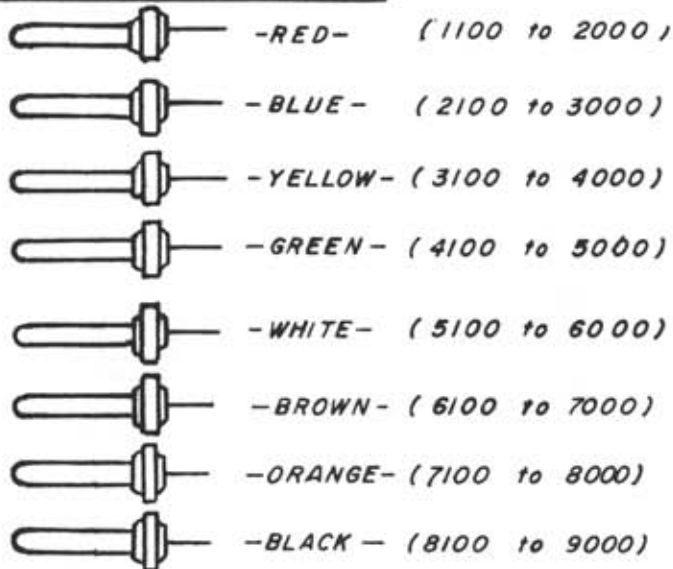
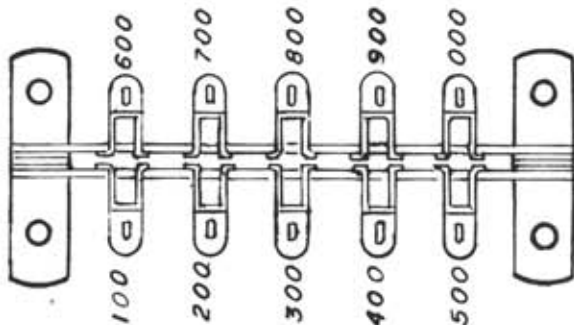
"SUSPENSE" COIL CHART

NOTICE:

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

NUMBER	DESCRIPTION	LOCATION
14A 7805	SCORE MOTOR - 60 CYCLE	MECH. PANEL
14A 7806	SCORE MOTOR - 50 CYCLE	MECH. PANEL
14A 7807	SPINNER MOTOR - 60 CYCLE	PLAYFIELD
14A 7808	SPINNER MOTOR - 50 CYCLE	PLAYFIELD
15A 6771	TRANSFORMER - 60 CYCLE	MECH. PANEL
15A 6773	TRANSFORMER - 50 CYCLE	MECH. PANEL
B 6396	24 VOLT METER	MECH. PANEL
<u>SOLENOID COILS</u>		
A 22-550	BALL RELEASE BALL COUNT UNIT STEP UP MATCH UNIT STEP UP BONUS UNIT STEP UP	PLAYFIELD INSERT INSERT PLAYFIELD
A 23-600	REPLAY UNIT STEP UP TIMER UNIT STEP UP	INSERT MECH. PANEL
A2-23-750	KNOCKER	CABINET
B 26-800	REPLAY UNIT RESET BALL COUNT UNIT RESET SCORE DRUM UNITS ... (8 req'd.) BONUS UNIT RESET TIMER UNIT RESET	INSERT INSERT INSERT PLAYFIELD MECH. PANEL
C2-26-800	CHIME	INSERT
FL 21-375/ 28-400	FLIPPERS ... (4 req'd.)	PLAYFIELD
G 22-550	JET BUMPERS ... (5 req'd.)	PLAYFIELD
G 23-600	BALL EJECTS (2 req'd.)	PLAYFIELD
G 23-750	AUTOMATIC KICKERS ... (2 req'd.)	PLAYFIELD
<u>RELAY COILS</u>		
M 29-1000	2nd COIN (TRIP) GAMEOVER TRIP SCORE RESET RE.	MECH PANEL MECH PANEL INSERT
M 29-1100	#1 BUMPER #2 BUMPER # 3 BUMPER #4 BUMPER #5 BUMPER 1 POINT 10 POINT 50 POINT 100 POINT 300 POINT 10¢ RELAY 25¢ RELAY SPIN BONUS DOUBLE BONUS DOUBLE BONUS SCORE ADVANCE RELAY	PLAYFIELD PLAYFIELD PLAYFIELD PLAYFIELD PLAYFIELD INSERT INSERT MECH. PANEL INSERT MECH. PANEL MECH. PANEL MECH. PANEL MECH. PANEL MECH. PANEL MECH. PANEL MECH. PANEL PLAYFIELD
M1-31-1500	COIN LOCKOUT COIL	DOOR
XM 27-675	METER COIL	MECH. PANEL
Z 27-1000	OUTHOLE RELAY RESET RELAY 2nd COIN RELAY (LATCH) GAMEOVER (LATCH) COIN RELAY REPLAY RELAY EJECT RE.	MECH. PANEL MECH. PANEL MECH. PANEL MECH. PANEL MECH. PANEL MECH. PANEL MECH. PANEL
Z 28-1150	LOCK RELAY PLAYER RELAY TILT RELAY CHANGE RELAY EXTRA BALL RE. "A" "B"	MECH. PANEL INSERT MECH. PANEL PLAYFIELD MECH PANEL PLAYFIELD PLAYFIELD
Z 28-1200	BALL INDEX	MECH. PANEL

ADJUSTMENTS IN BACKBOX

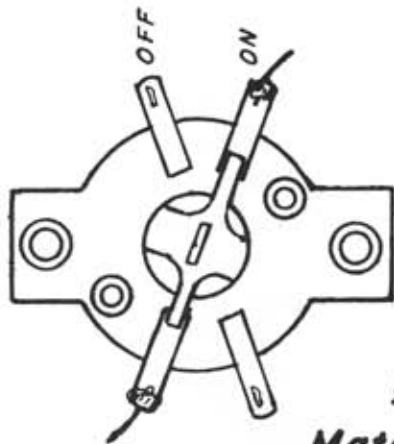


Hi-Score Adjustment

Insert plugs into 10 Point Female at desired positions.

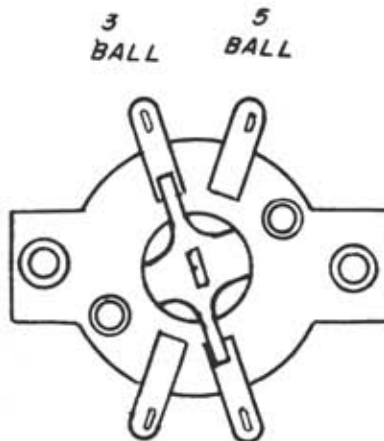
Examples:

Yellow wire into 300 position scores at 3300.
 Yellow wire into 000 position scores at 4000.



Number Match Adjustment

In "ON" position, number match lite will appear when game is over. This number will match the last number in point score, on the average, once every ten games. In "OFF" position, Number Match is inoperative.



No. of Balls Adjustment

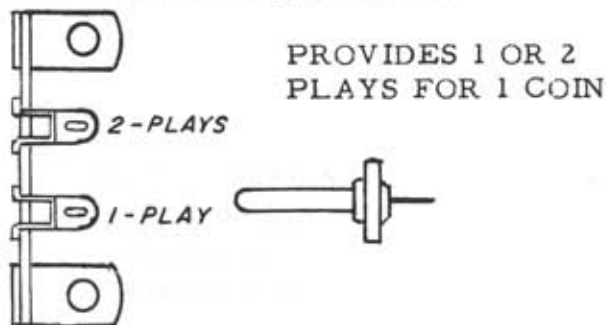
This switch changes 3 Ball to 5 Ball play, or vice versa.

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.

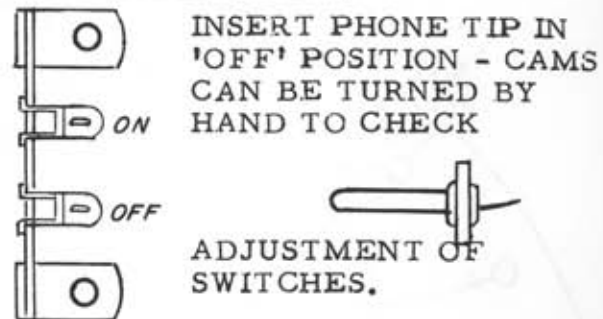
LEG LEVELERS: ARE PROVIDED FOR TWO PURPOSES, 1ST TO LEVEL GAME ON LOCATION, 2ND TO INCREASE PITCH FOR GAME PERCENTAGING. IF IT IS DESIRED TO SPEED UP PLAY AND DECREASE SCORES, RAISE REAR LEG LEVELERS TO INCREASE PITCH.

ADJUSTMENTS ON MECHANISM PANEL

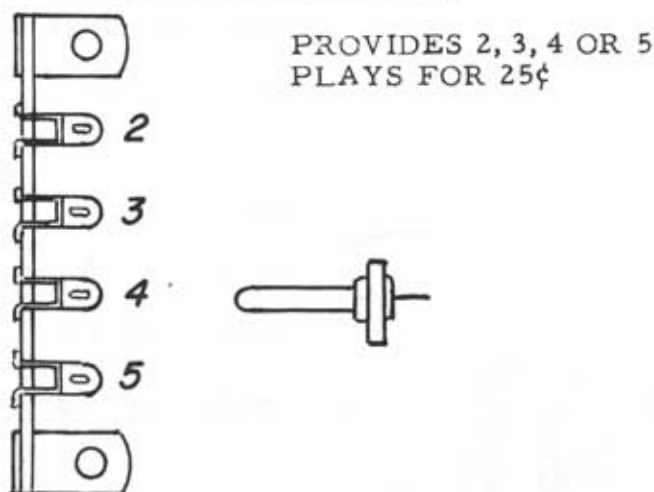
10¢ Adjustment



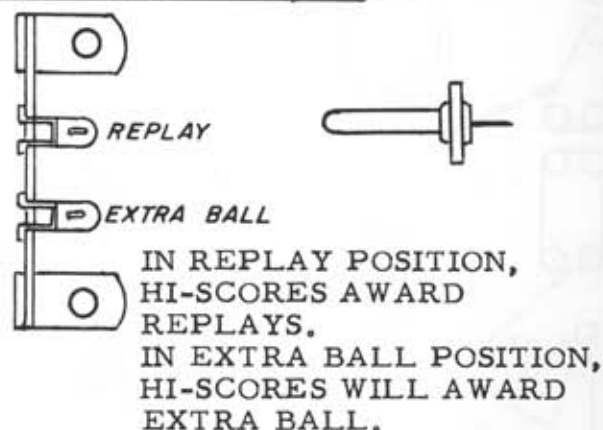
Motor Service Jack



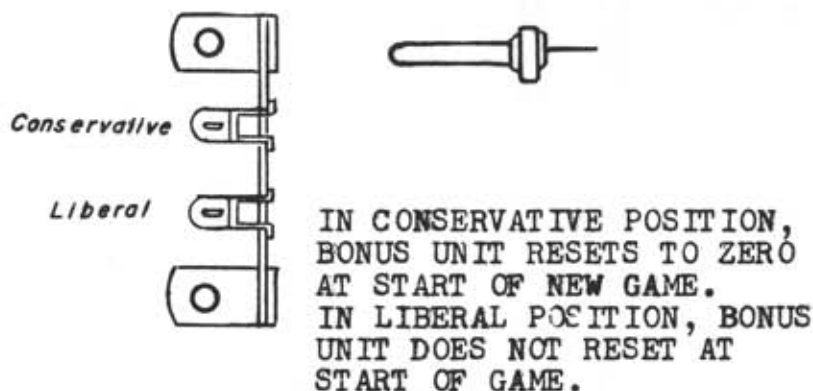
25¢ Adjustment



Extra Ball Jack Adj.

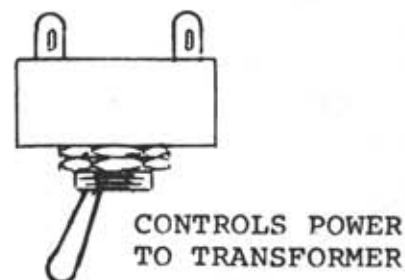


BONUS JACK ADJ.



MASTER ON-OFF SW.

(Located under front of Cabinet)



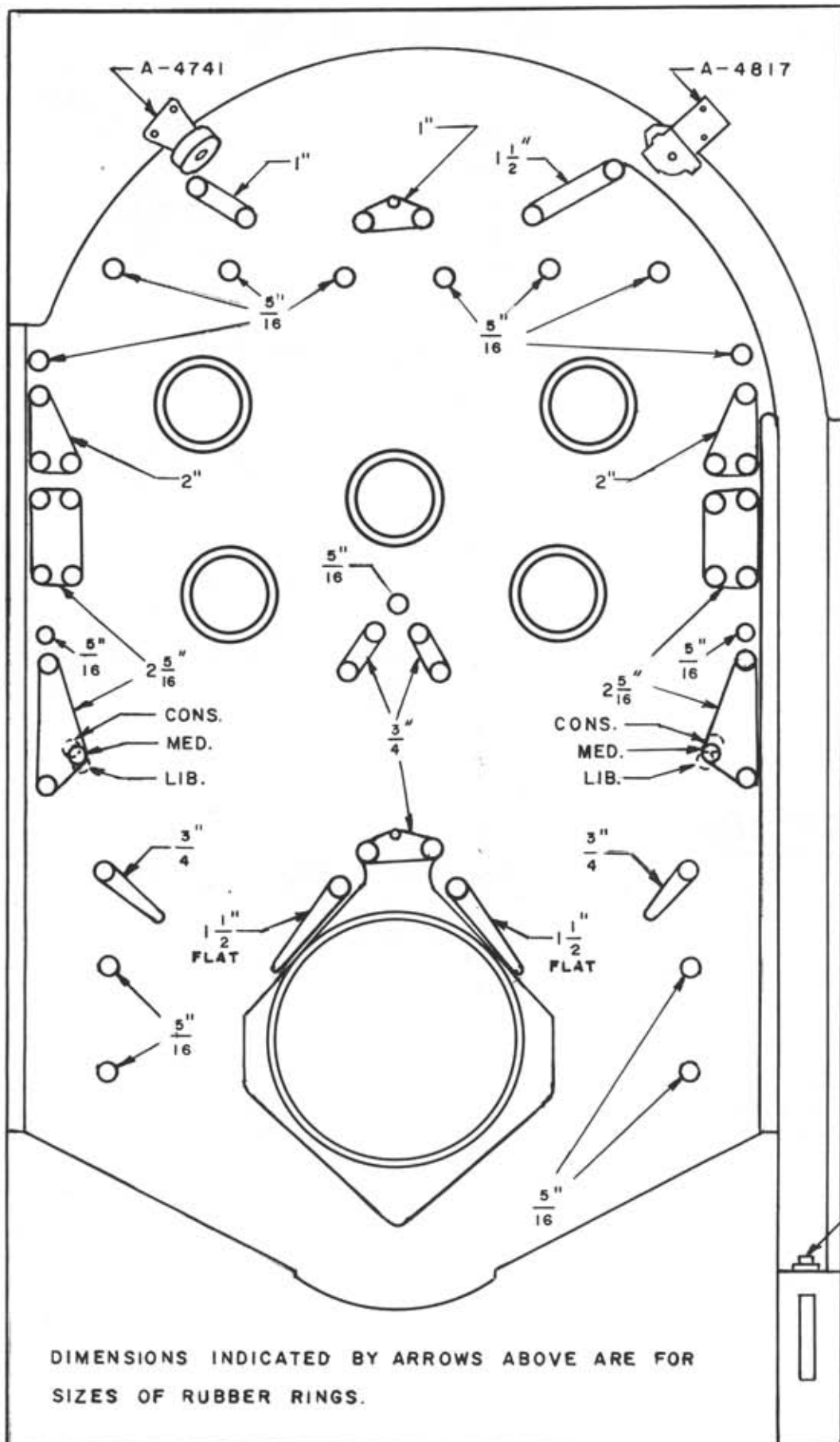
SUGGESTED SCORE CARDS:

5 BALL PLAY..... 361-1

3 BALL PLAY..... 361-5

"SUSPENSE"—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	$\frac{5}{16}$ " I. D.
23A-6301	$\frac{3}{4}$ " I. D.
23A-6302	1" I. D.
23A-6305	2" I. D.
23A-6306	$2\frac{5}{16}$ " I. D.
23A-6505-1	$1\frac{1}{2}$ " I. D.

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

23A-6327
 BALL SHOOTER
 RUBBER TIP

DIMENSIONS INDICATED BY ARROWS ABOVE ARE FOR SIZES OF RUBBER RINGS.

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.

4. RELAY and SWITCH ADJUSTMENT

Where relay adjustments are called for, before bending blades, in all cases, on any machine, make certain that the screws holding the switch stacks are down very tightly. This is suggested because the plastic spacers in the switch stacks have occasionally shrunk by drying out, causing a poor adjustment.

"SUSPENSE" OPERATES AS FOLLOWS:

BONUS LITES ARE CONTROLLED BY BONUS UNIT. HITTING TOP CENTER OR BOTTOM CENTER TARGET WILL ADVANCE BONUS UNIT ONE STEP. BONUS UNIT CAN ADVANCE A MAXIMUM OF 10 STEPS.

BONUS SCORE IS COLLECTED WHEN CAPTIVE BALL, IN SPINNER UNIT, FALLS INTO ONE OF TWO "BONUS" HOLES. DOUBLE BONUS SCORE IS COLLECTED WHEN CAPTIVE BALL FALLS INTO "DOUBLE BONUS" HOLE.

SPINNER UNIT MOTOR IS ENERGIZED BY SPIN RELAY. SPIN RELAY IS ENERGIZED BY LEFT OR RIGHT EJECT SWITCH, AND BY LEFT OR RIGHT BOTTOM ROLLOVER WHEN LIT FOR SPIN.

HITTING TOP LEFT TARGET "A" AND TOP RIGHT TARGET "B" WILL LITE LEFT OR RIGHT EJECT HOLES FOR EXTRA BALL. "EXTRA BALL WHEN LIT" LITES ALTERNATE THRU SWITCH ON CHANGE RELAY. BALL IN LEFT OR RIGHT EJECT HOLE, WHEN LIT, ENERGIZES EXTRA BALL RELAY.

Service Suggestions:

1. Lights are out, game is inoperative:
 - a. Check A.C. cord and plugs for breaks, cuts or other damage.
 - b. Check fuses, located behind cash box.
 - c. Check master switch, located under front of cabinet.
 - d. Check plugs and jacks for proper installation.
2. Lights are out, game operates:
 - a. Check two switches on Lock Relay: Blue-Yellow-White to Green-Yellow-White, and Brown-Yellow-White to Green-Yellow-White.
 - b. Check 10 AMP fuse-Blue wire, and 15 AMP Fuse-Brown wire.
3. Game resets but Game Over Relay trips immediately:
 - a. Check switch on Lock Relay Blu-Red and Yellow.
 - b. Check Ball Count Unit for proper resetting.
4. Game is over, replays are indicated, but the Replay Button fails to start a new game:
 - a. Check switch on Index Cam (Green-Red and Yellow).
 - b. Check Switch on Reset Relay (Green-Red and White-Gray).
 - c. Check Replay Button Switch.
 - d. Check Replay Unit Zero Switch.
 - e. Check Switch on Game Over Relay (White-Brown and Green-Orange).
 - f. Check Replay Relay Coil.

5. Sequence of operation when captive ball, in spinner unit, falls into "Bonus" hole:

Bonus switch energizes Bonus Relay.

Bonus Relay is held in until zero switch, (Yellow and Brown wires) on Bonus Unit opens.

100 Point Relay is pulsed by Impulse Cam Switch C, thru Switch 1B on Bonus Relay. Another zero switch on Bonus Unit (Yellow and White-Gray) is also in this circuit.

Bonus Unit Reset Coil is pulsed by Impulse Cam Switch B, thru Switch 1A on Bonus Relay.

6. Sequence of operation when captive ball, in Spinner Unit, falls into "Double Bonus" hole:

Double Bonus switch energizes Double Bonus Relay.

Double Bonus Relay is then held in until zero switch (Yellow and Brown wires) on Bonus Unit opens.

Double Bonus Score Relay is energized by switch on Double Bonus Relay, thru Index Cam Switch C.

Double Bonus Score Relay is then held in until Cam Switch 4C opens.

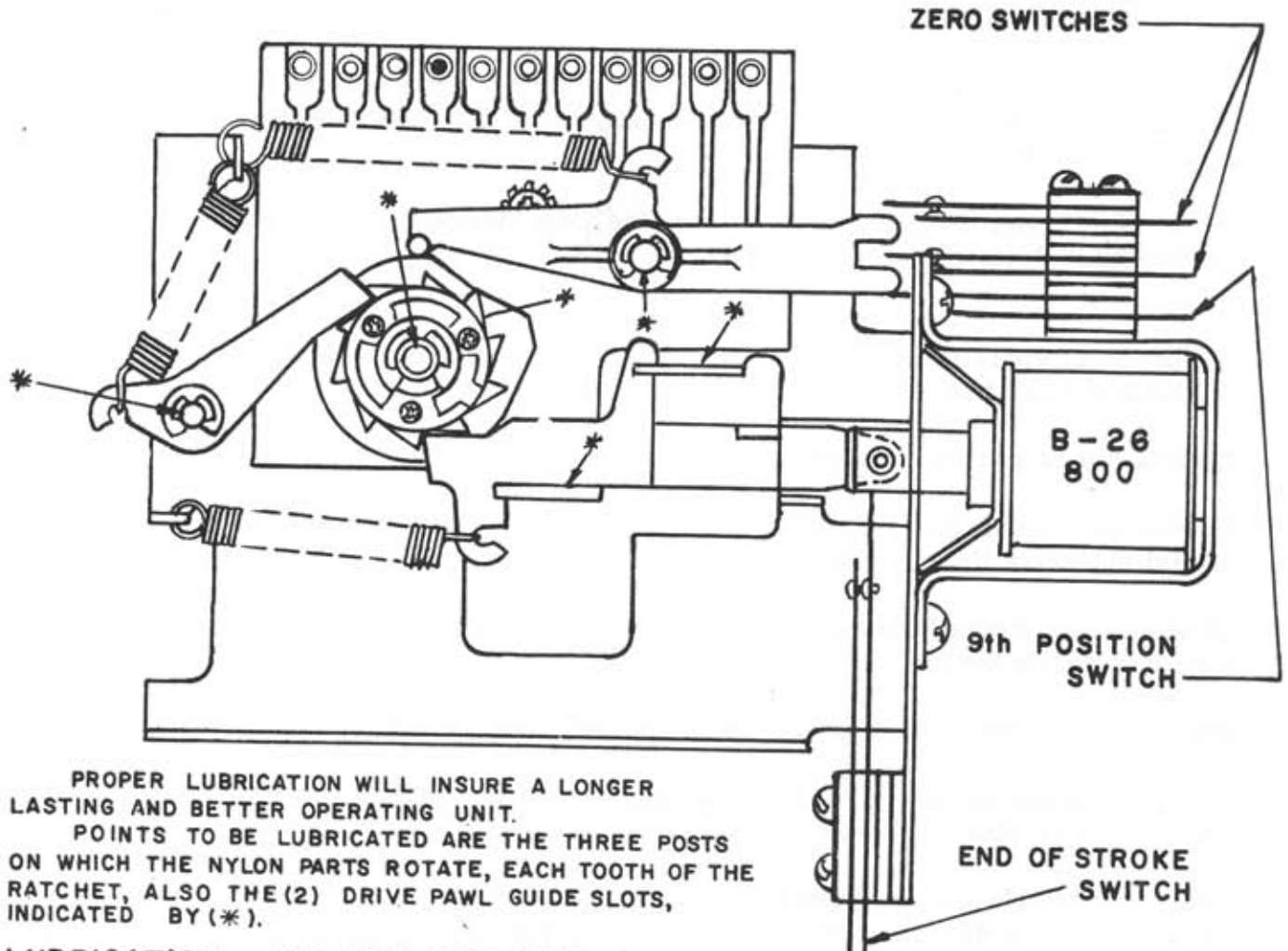
100 Point Relay is pulsed by Impulse Cam Switch C, thru Switch B on Double Bonus Score Relay.

Since the Double Bonus Score Relay is energized at the Index Cam and drops out at the 4th Cam, the 100 Point Relay receives 4 pulses per one cycle of Score Motor.

The Bonus Unit Reset Coil is energized by Cam Switches 2D and 4B, thru Switch 1A on the Double Bonus Relay. Therefore, the Bonus Unit Reset Coil receives two pulses per one cycle of Score Motor.

SCORE DRUM UNIT

WITH PRINTED CIRCUIT AND CONTACT RING



PROPER LUBRICATION WILL INSURE A LONGER LASTING AND BETTER OPERATING UNIT.
 POINTS TO BE LUBRICATED ARE THE THREE POSTS ON WHICH THE NYLON PARTS ROTATE, EACH TOOTH OF THE RATCHET, ALSO THE (2) DRIVE PAWL GUIDE SLOTS, INDICATED BY (*).

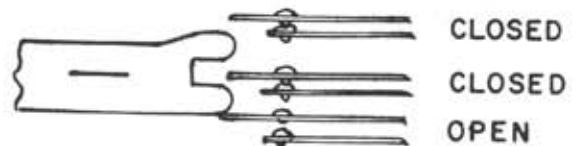
LUBRICATION: DO NOT PUT LUBRICANT ON DRIVE ARMATURE

SWITCH ADJUSTMENT

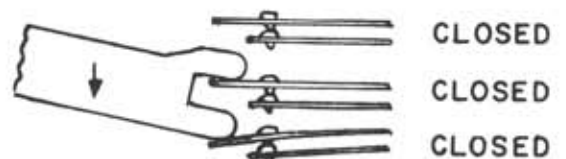
AT "0" OR INDEX POSITION ALL SWITCHES ARE OPEN AS SHOWN.



AT 1st. TO 8th. POSITION TOP SWITCHES ARE CLOSED—BOTTOM SWITCH REMAINS OPEN.



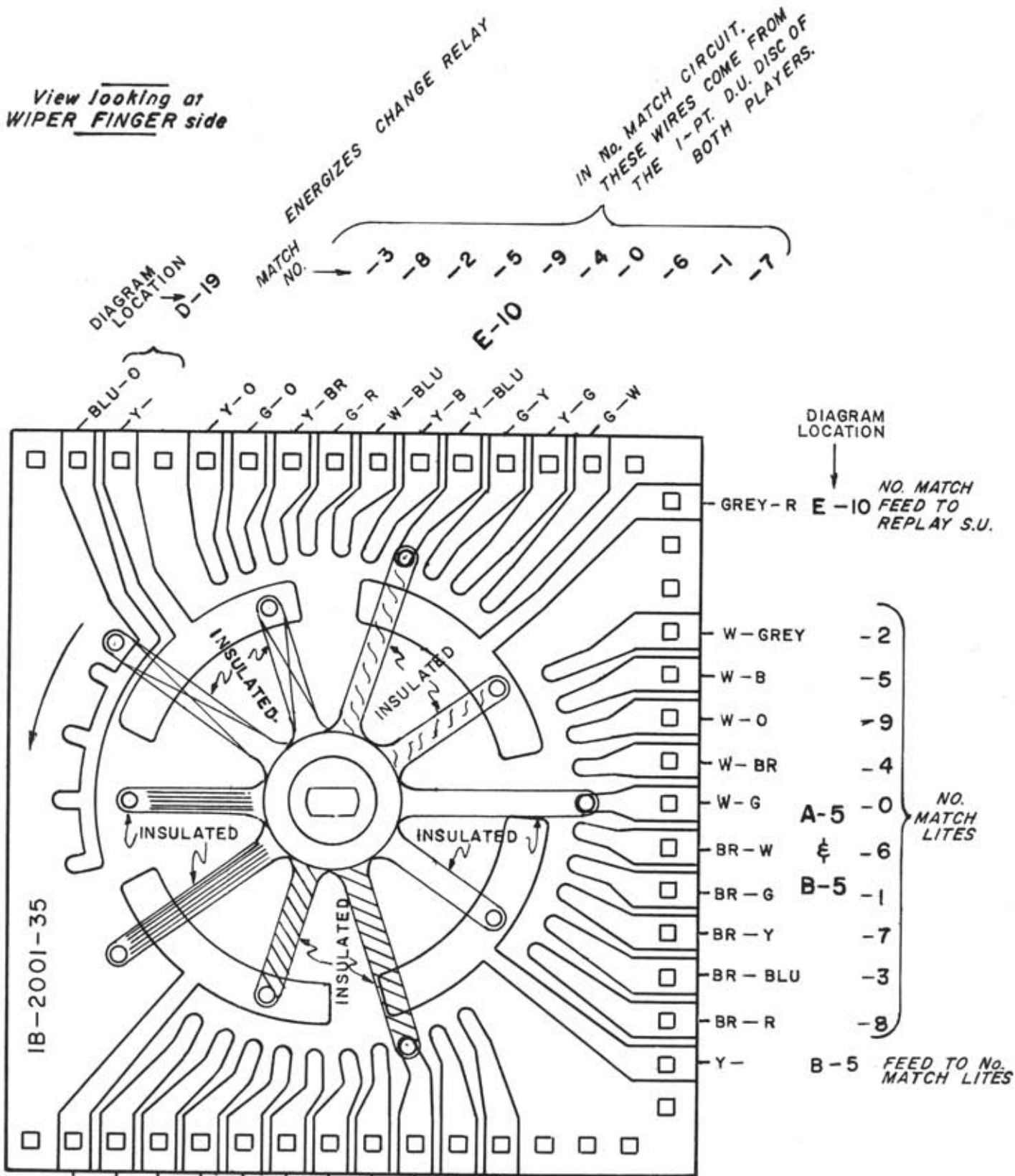
AT 9th POSITION ALL SWITCHES ARE CLOSED AS SHOWN



No. MATCH UNIT

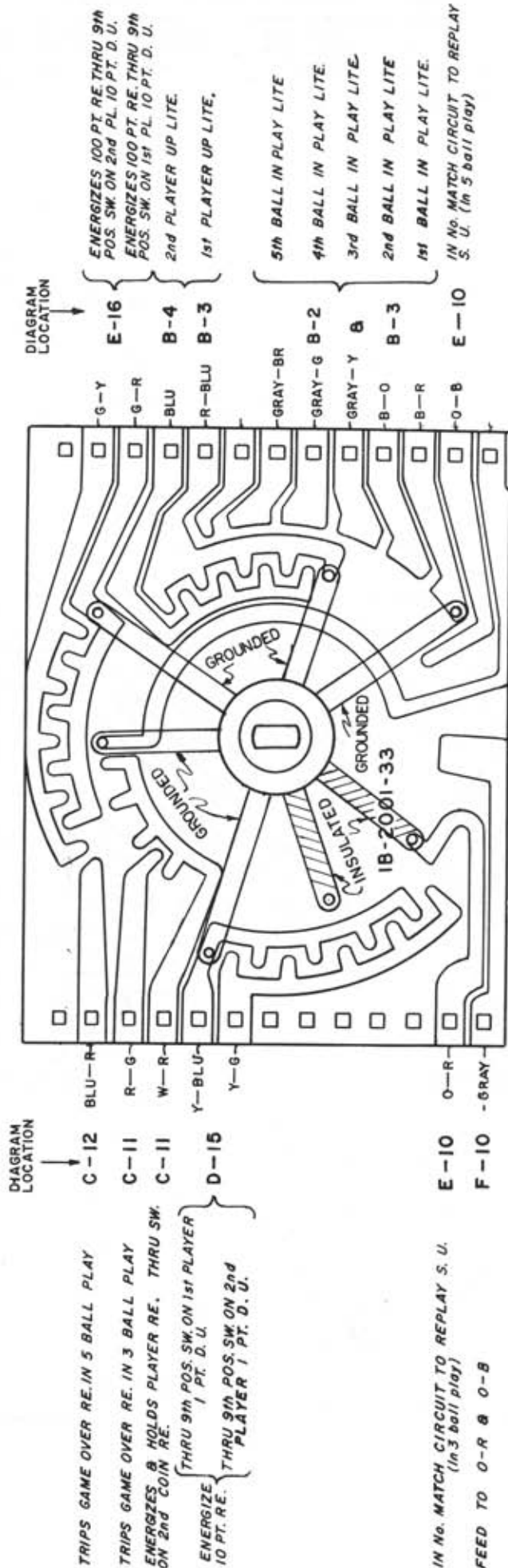
THIS UNIT ADVANCES ONE STEP EACH TIME THE ONE POINT RELAY IS PULSED.

View looking at
WIPER FINGER side



BALL COUNT UNIT

THIS UNIT RESETS AT THE START OF A NEW GAME. IT ADVANCES ONE STEP AT A TIME WHEN TWO PERSONS ARE PLAYING & TWO STEPS IF ONLY ONE IS PLAYING.

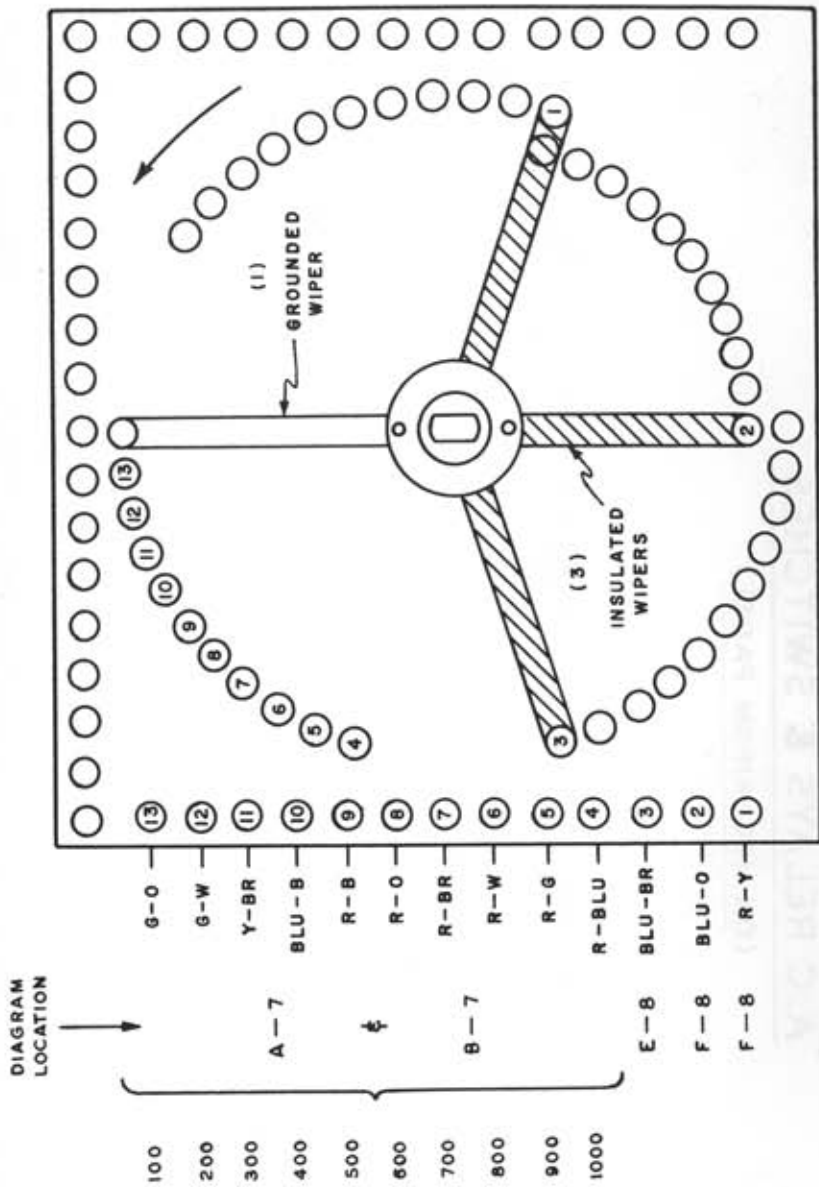


View looking at WIPER FINGERS with WIPER in RESET POSITION

BONUS S.U. DISC

THIS UNIT ADVANCES ONE STEP EACH TIME THE ADVANCE RELAY IS PULSED. IT RESETS TO ZERO POSITION (ONE STEP AT A TIME) WHEN BONUS RELAY OR DOUBLE BONUS RELAY IS ENERGIZED.

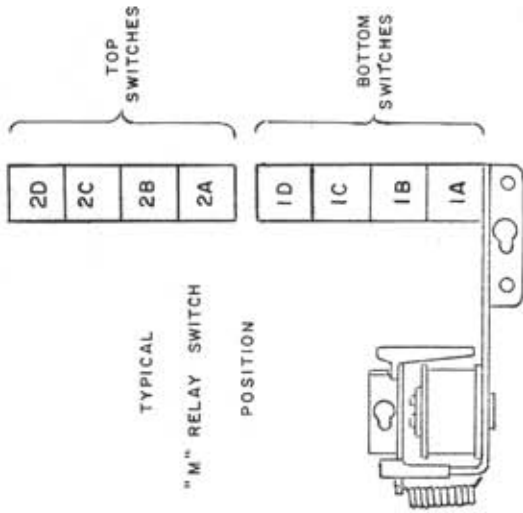
*View looking at WIPER FINGERS side
with wiper in ZERO position*



FEEDS BLU-O & R-Y FROM CAM SWITCH 6A
 TO BONUS S.U. COIL
 TO EJECT COILS

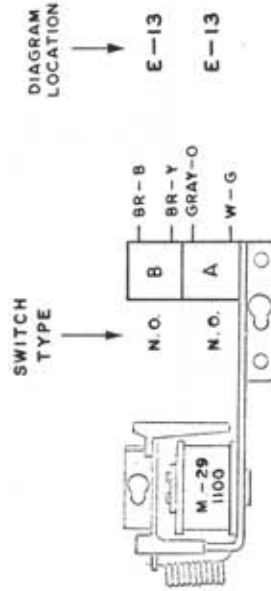
A. C. RELAYS & SWITCHES

(ON MECHANISM PANEL)



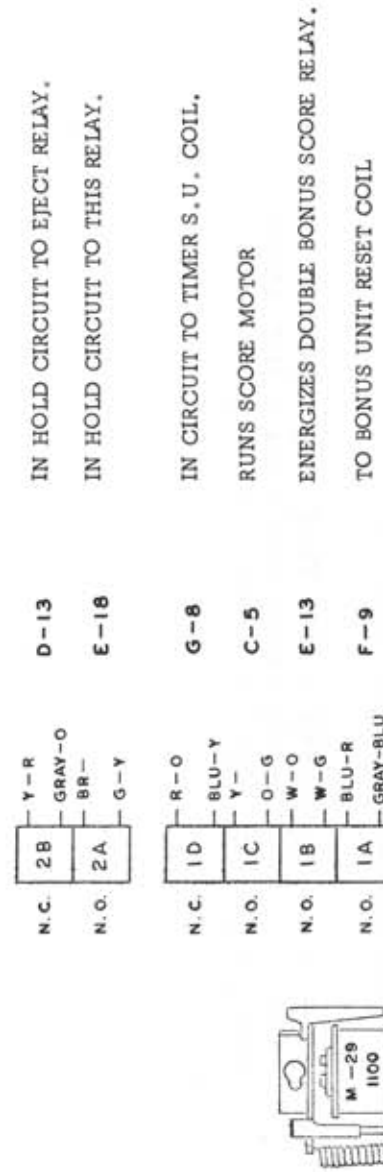
DOUBLE BONUS SCORE RELAY

IS ENERGIZED BY DOUBLE BONUS RELAY, THRU INDEX CAM SWITCH C



DOUBLE BONUS RELAY

IS ENERGIZED WHEN CAPTIVE BALL IN SPINNER UNIT MAKES DOUBLE BONUS SWITCH.
SWITCH B ON EJECT RELAY IS ALSO IN THIS CIRCUIT.



10¢ RELAY

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

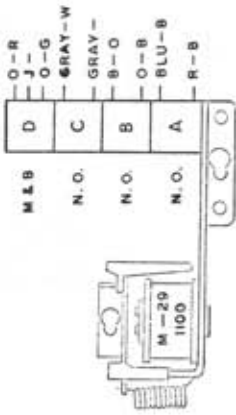
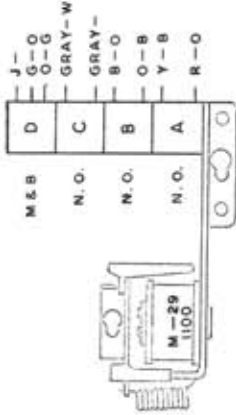


DIAGRAM
LOCATION

D-5 IN CIRCUIT TO KNOCKER COIL -- ALSO RUNS SCORE MOTOR,
E-9 PULSES REPLAY S.U. COIL, THRU IMPULSE CAM SWITCH B.
D-3 ENERGIZES LOCK RELAY.
E-2 IN HOLD CIRCUIT TO THIS RELAY.

25¢ RELAY

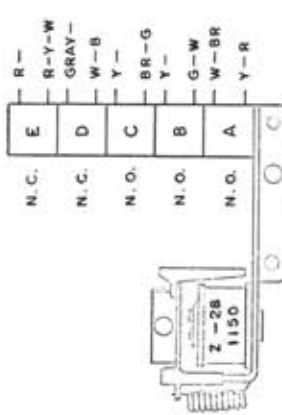
IS ENERGIZED BY 25¢ COIN SWITCH.



D-5 IN CIRCUIT TO KNOCKER COIL -- ALSO RUNS SCORE MOTOR,
E-9 PULSES REPLAY S.U. COIL, THRU IMPULSE CAM SWITCH B.
D-3 ENERGIZES LOCK RELAY.
E-2 IN HOLD CIRCUIT TO THIS RELAY.

TILT RELAY

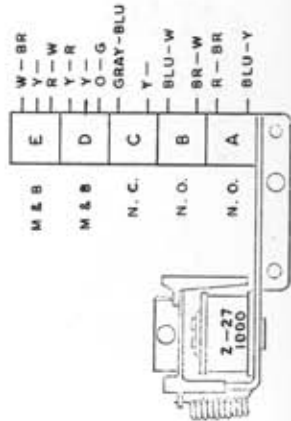
IS ENERGIZED BY TILT SWITCHES.
IT IS THEN HELD IN UNTIL OUTHOLE
RELAY PULLS IN.



G-12 OPENS CIRCUIT TO ALL PLAYFIELD SWITCHES.
G-10 OPENS HI-SCORE CIRCUIT TO REPLAY S.U. COIL.
C-12 ENERGIZES BALL INDEX RELAY
B-2 TO TILT LITE.
F-10 IN HOLD CIRCUIT TO THIS RELAY.

OUTHOLE RELAY

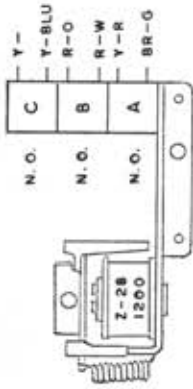
IS ENERGIZED BY OUTHOLE SWITCH,
THRU SWITCH D ON EJECT RELAY.



C-9 OPENS HOLD CIRCUIT TO TILT RELAY, AND MAKES IN CIRCUIT TO BALL COUNT S.U. COIL.
D-5 OPENS HOLD CIRCUIT TO BALL INDEX RELAY -- ALSO RUNS SCORE MOTOR.
C-12 IN HOLD CIRCUIT TO "A" AND "B" RELAYS.
D-12 ENERGIZES BALL RELEASE COIL, THRU CAM SWITCH 4C.
C-10 IN HOLD CIRCUIT TO THIS RELAY.

BALL INDEX RELAY

IS ENERGIZED BY TILT RELAY OR 100 POINT RELAY.



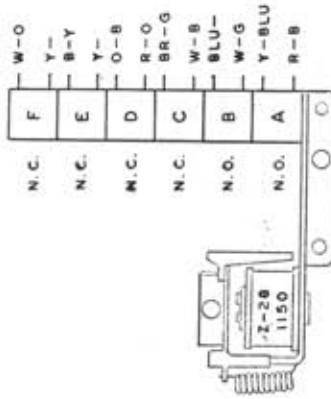
IN SERIES WITH SWITCH A ON EXTRA BALL RELAY.
IN CIRCUIT TO BALL COUNT S.U. COIL, THRU SWITCH E ON OUTHOLE RELAY.
IN HOLD CIRCUIT TO THIS RELAY.

DIAGRAM LOCATION

C-13
C-9
D-12

EXTRA BALL RELAY

IS ENERGIZED BY LEFT OR RIGHT EJECT SWITCH (WHEN LIT), THRU "A" AND "B" RELAY SWITCHES.
IT IS ALSO ENERGIZED BY HI-SCORE CIRCUITS, IF "REPLAY - EXTRA BALL" ADJUSTMENT JACK IS IN EXTRA BALL POSITION.

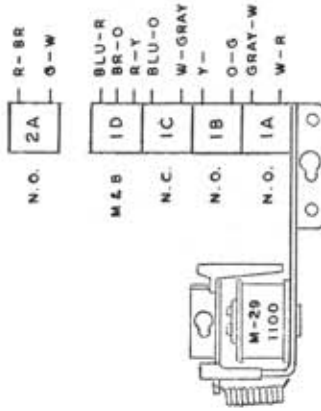


TO "EXTRA BALL WHEN LIT" LITE AT RIGHT EJECT HOLE.
TO "EXTRA BALL WHEN LIT" LITE AT LEFT EJECT HOLE.
IN SERIES WITH SWITCH B ON BALL INDEX RELAY.
PULSES BALL INDEX RELAY, THRU SWITCH 2B ON 100 POINT RELAY.
TO "SAME PLAYER SHOOTS AGAIN" LITES.
IN HOLD CIRCUIT TO THIS RELAY.

B-8
B-8
D-9
D-13
A-6
E-13

50 POINT RELAY

IS ENERGIZED WHEN CAPTIVE BALL IN SPINNER UNIT MAKES ANY OF (6) 50 SWITCHES.
SWITCH B ON EJECT RELAY IS ALSO IN THIS CIRCUIT.

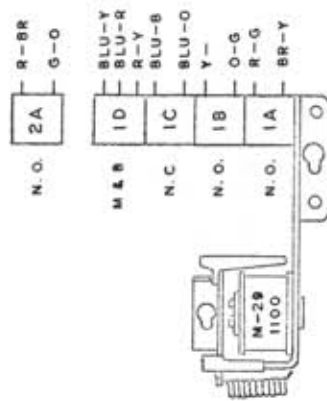


IN HOLD CIRCUIT TO THIS RELAY.
OPENS CIRCUIT TO TIMER S.U., AND CLOSES TO EJECT COILS.
IN SERIES WITH SWITCH 1C ON 300 POINT RELAY.
RUNS SCORE MOTOR.
PULSES 10 POINT RELAY, THRU IMPULSE CAM SWITCH B.

E-18
E-8
D-13
C-4
C-14

300 POINT RELAY

IS ENERGIZED BY ANY OF (3) 300 SWITCHES ON SPINNER UNIT, THRU SWITCH B ON EJECT RELAY.
IT ALSO IS ENERGIZED BY LEFT OR RIGHT TOP ROLLOVER, WHEN LIT.

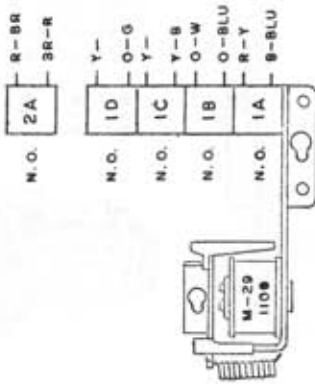


IN HOLD CIRCUIT TO THIS RELAY.
SAME AS SWITCH 1D ON 50 POINT RELAY.
IN SERIES WITH SWITCH A ON EJECT RELAY.
RUNS SCORE MOTOR.
IN CIRCUIT TO PULSE 100 POINT RELAY.

E-17
F-8
E-13
D-4
E-14

SPIN RELAY

IS ENERGIZED BY LEFT OR RIGHT EJECT SWITCH.
IT IS ALSO ENERGIZED BY LEFT BOTTOM OR RIGHT BOTTOM (OUTSIDE) ROLLERS, WHEN LIT.



IN HOLD CIRCUIT TO THIS RELAY.

RUNS SCORE MOTOR.

RUNS SPIN MOTOR.

ENERGIZES EXTRA BALL RELAY, THRU LEFT OR RIGHT EJECT SWITCH "WHEN LIT".

ENERGIZES EJECT RELAY, THRU CAM SWITCH 1C.

DIAGRAM LOCATION

E-17

D-4

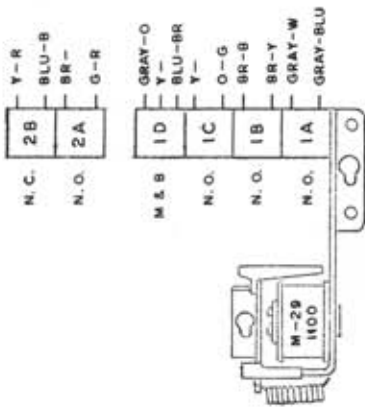
C-9

C-13

E-13

BONUS RELAY

IS ENERGIZED BY ANY OF (2) BONUS SWITCHES ON SPINNER UNIT, THRU SWITCH B ON EJECT RELAY.
IT IS ALSO ENERGIZED BY SWITCH C ON COIN RELAY.



IN SERIES WITH SWITCH 2B ON DOUBLE BONUS RELAY.

IN HOLD CIRCUIT TO THIS RELAY.

OPENS CIRCUIT TO EJECT COILS, AND MAKES IN HOLD CIRCUIT TO RESET RELAY.

RUNS SCORE MOTOR.

PULSES 100 POINT RELAY.

TO BONUS UNIT RESET COIL.

E-13

E-18

C-4

C-8

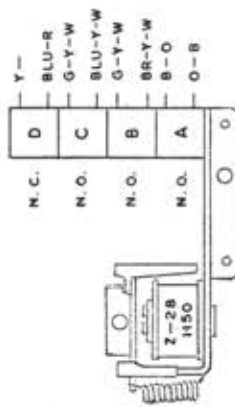
D-4

E-13

F-9

LOCK RELAY

IS ENERGIZED BY COIN RELAY OR LEFT FLIPPER SWITCH.



ENERGIZES GAME OVER RELAY (TRIP COIL).

6 VOLTS FROM TRANSFORMER TO LITES.

6 VOLTS FROM TRANSFORMER TO LITES.

IN HOLD CIRCUIT TO THIS RELAY.

C-12

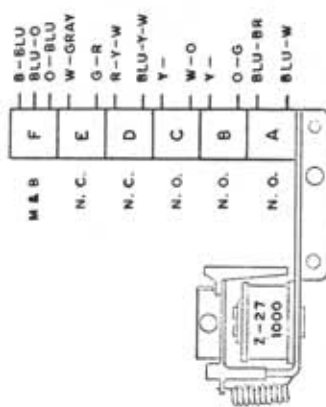
A-1

A-1

D-3

RESET RELAY

IS ENERGIZED BY COIN RELAY, THRU SWITCH C OF GAME OVER RELAY.



OPENS CIRCUIT TO 2ND COIN RELAY (TRIP COIL) AND MAKES TO LATCH COIL.

OPEN CIRCUIT TO REPLAY RELAY DURING RESET CYCLE.

OPENS CIRCUIT TO ALL PLAYFIELD SWITCHES.

ENERGIZES BONUS RELAY, THRU "LIBERAL - CONSERVATIVE" ADJUSTMENT JACK.

RUNS SCORE MOTOR.

IN HOLD CIRCUIT TO THIS RELAY.

E-4

C-3

G-10

C-18

C-5

D-4

EJECT RELAY

IS ENERGIZED BY SWITCH 1A ON SPIN RELAY.

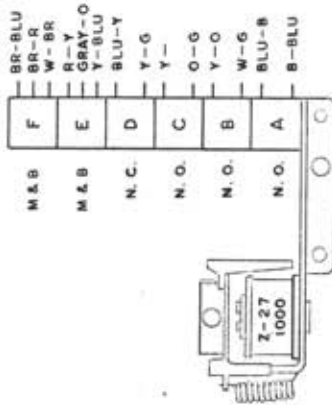
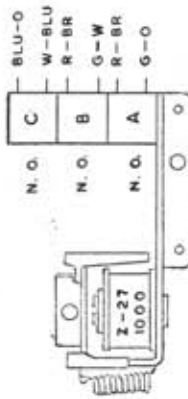


DIAGRAM
LOCATION

E-17 IN CIRCUIT TO SPIN RELAY.
D-8 OPENS CIRCUIT TO BONUS S. U. -- CLOSES IN SERIES WITH SWITCH 1D ON 50' POINT RELAY.
D-11 IN CIRCUIT TO OUTHOLD RELAY, THRU OUTHOLE SWITCH.
C-4 RUNS SCORE MOTOR.
D-17 FEED TO ALL SWITCHES ON SPINNER UNIT.
F-13 IN HOLD CIRCUIT TO THIS RELAY.

REPLAY RELAY

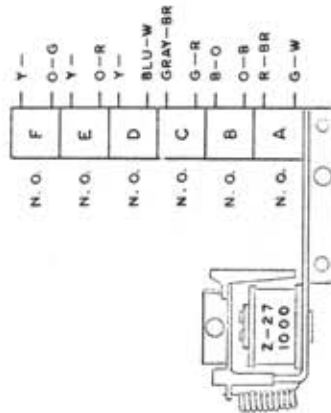
IS ENERGIZED BY REPLAY BUTTON SWITCH, THRU ZERO BREAK SWITCH ON REPLAY S. U.



F-4 PULSES REPLAY UNIT RESET COIL.
D-3 ENERGIZES COIN RELAY.
E-3 IN HOLD CIRCUIT TO THIS RELAY.

COIN RELAY

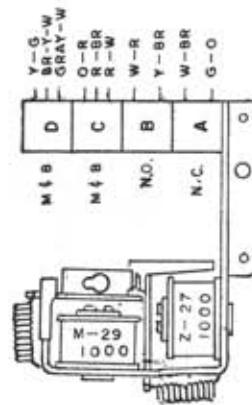
IS ENERGIZED BY COIN SWITCH OR BY REPLAY RELAY.



D-5 RUNS SCORE MOTOR.
C-4 ENERGIZES RESET RELAY, THRU SWITCH C ON GAME OVER RELAY.
C-12 ENERGIZES GAME OVER RELAY (TRIP COIL), THRU BALL COUNT ZERO SWITCH.
E-18 IN SERIES WITH SWITCH C ON RESET RELAY.
D-3 ENERGIZES LOCK RELAY.
D-3 IN HOLD CIRCUIT TO THIS RELAY.

2 ND COIN RELAY

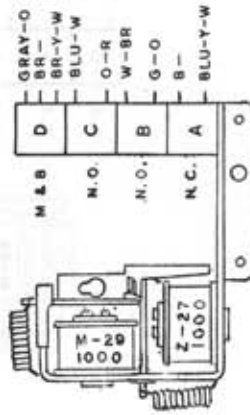
LATCH AND TRIP COILS ARE ENERGIZED BY SWITCH E OF COIN RELAY, THRU SWITCH F OF RESET RELAY.



A-3 OPENS "1 CAN PLAY" LITE, AND CLOSES TO "2 CAN PLAY" LITE.
D-10 PULSES BALL COUNT UNIT, THRU CAM SWITCH 1B.
E-12 ENERGIZES PLAYER RELAY, THRU BALL COUNT DISC.
E-3 OPENS CIRCUIT TO REPLAY RELAY.

GAME OVER RELAY

LATCH COIL IS ENERGIZED BY SWITCH E ON COIN RELAY, THRU CAM SWITCH 1A.
TRIP COIL IS ENERGIZED BY LOCK RELAY OR BALL COUNT UNIT DISC. ALSO BY SWITCH D ON COIN RELAY.

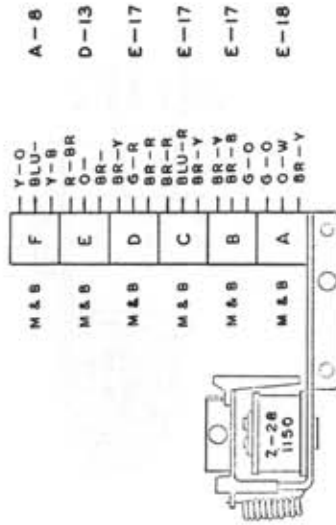


OPENS "BALL IN PLAY" LITES, AND CLOSES TO "GAME OVER" AND "NUMBER MATCH" LITES. IN SERIES WITH SWITCH E ON COIN RELAY. TO REPLAY RELAY, THRU REPLAY BUTTON SWITCH. IN SERIES WITH SWITCH D ON RESET RELAY.

LOCATED ON PLAYFIELD

CHANGE RELAY

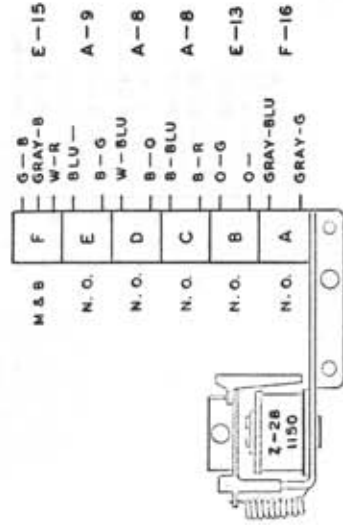
IS ENERGIZED BY NUMBER MATCH UNIT DISC (EVERY OTHER STEP).



TO LEFT OR RIGHT EJECT POCKET "EXTRA BALL WHEN LIT" LITES. IN CIRCUIT TO EXTRA BALL RELAY, THRU SWITCH ON "A" AND "B" RELAYS. TO SPIN RELAY OR 100 POINT RELAY, THRU RIGHT BOTTOM (OUTSIDE) ROLLOVER. TO SPIN RELAY OR 100 POINT RELAY, THRU LEFT BOTTOM (OUTSIDE) ROLLOVER. TO 100 POINT RELAY OR 300 RELAY, THRU LEFT TOP ROLLOVER. TO 100 POINT RELAY OR 300 RELAY, THRU RIGHT TOP ROLLOVER.

"A" RELAY

IS ENERGIZED BY LEFT TOP TARGET SWITCH (OUTSIDE).



TO 1 POINT OR 10 POINT RELAY, THRU SWITCH B ON NO. 1 OR NO. 5 BUMPER RELAY. TO LEFT TOP AND RIGHT BOTTOM JET BUMPER LITES. TO RIGHT EJECT "EXTRA BALL WHEN LIT" LITE. TO LEFT EJECT "EXTRA BALL WHEN LIT" LITE. IN SERIES WITH SWITCH E ON CHANGE RELAY. IN HOLD CIRCUIT TO THIS RELAY.

"B" RELAY

IS ENERGIZED BY RIGHT TOP TARGET SWITCH (OUTSIDE).

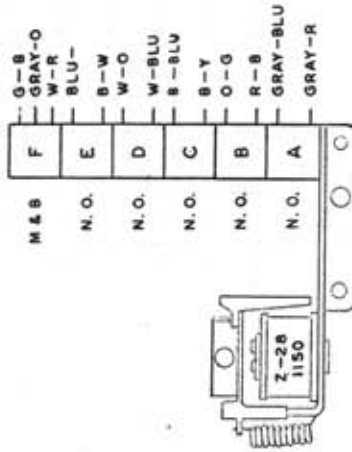
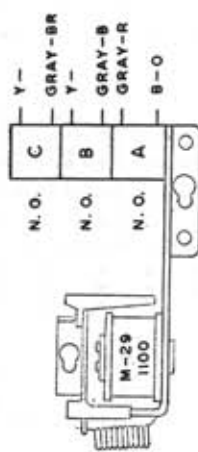


DIAGRAM LOCATION

E-15 TO 1 POINT OR 10 POINT RELAY, THRU SWITCH B ON NO. 2 OR NO. 4 BUMPER RELAY.
 A-9 TO RIGHT TOP AND LEFT BOTTOM JET BUMPER LITES
 B-8 IN SERIES WITH SWITCH D ON "A" RELAY.
 B-6 IN SERIES WITH SWITCH C ON "A" RELAY.
 F-13 IN SERIES WITH SWITCH B ON "A" RELAY.
 F-16 IN HOLD CIRCUIT TO THIS RELAY.

NO. 1 BUMPER RELAY

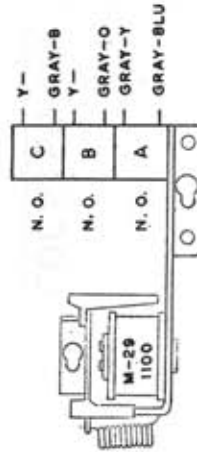
IS PULSED BY LEFT TOP JET BUMPER.



C-5 PULSES LEFT TOP JET BUMPER.
 C-15 IN SERIES WITH SWITCH F ON "A" RELAY
 F-18 IN HOLD CIRCUIT TO THIS RELAY.

NO. 2 BUMPER RELAY

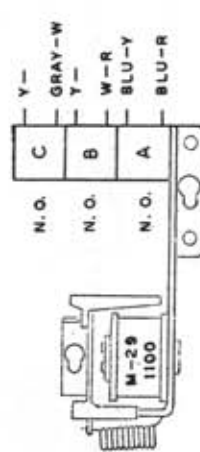
IS PULSED BY RIGHT TOP JET BUMPER



C-6 PULSES RIGHT TOP JET BUMPER
 C-15 IN SERIES WITH SWITCH F ON "B" RELAY.
 F-19 IN HOLD CIRCUIT TO THIS RELAY.

NO. 3 BUMPER RELAY

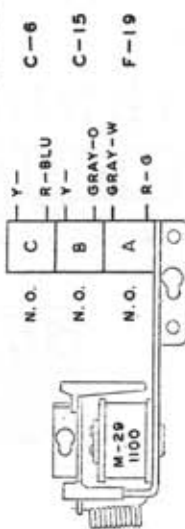
IS PULSED BY CENTER JET BUMPER.



C-6 PULSES CENTER JET BUMPER.
 C-14 PULSES 10 POINT RELAY
 F-19 IN HOLD CIRCUIT TO THIS RELAY.

NO. 4 BUMPER RELAY

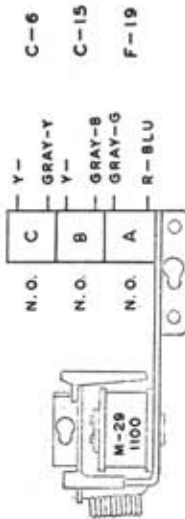
IS PULSED BY LEFT BOTTOM JET BUMPER.



PULSES LEFT BOTTOM JET BUMPER.
IN SERIES WITH SWITCH F ON "B" RELAY.
IN HOLD CIRCUIT TO THIS RELAY.

NO. 5 BUMPER RELAY

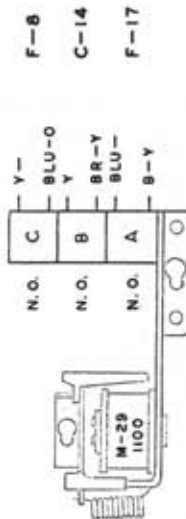
IS PULSED BY RIGHT BOTTOM JET BUMPER.



PULSES RIGHT BOTTOM JET BUMPER.
IN SERIES WITH SWITCH F ON "A" RELAY.
IN HOLD CIRCUIT TO THIS RELAY.

ADVANCE RELAY

IS PULSED BY CENTER TOP TARGET OR CENTER BOTTOM TARGET

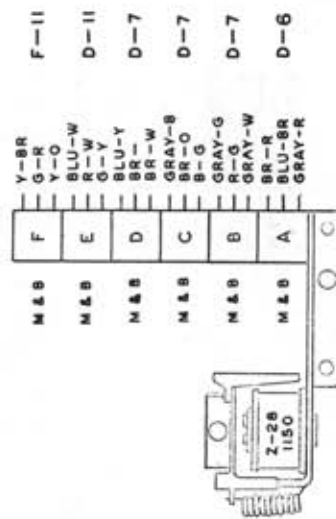


ENERGIZES BONUS S. U. COIL.
PULSES 100 POINT RELAY.
IN HOLD CIRCUIT TO THIS RELAY.

LOCATED IN BACK BOX

PLAYER RELAY

IS ENERGIZED BY SWITCH B ON 2ND COIN RELAY.

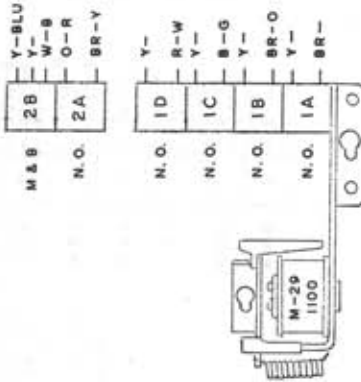


IN HI-SCORE CIRCUITS TO "REPLAY - EXTRA BALL" ADJUSTMENT JACK.
IN SERIES WITH SWITCH F ON THIS RELAY.
TO 1ST AND 2ND PLAYER 1000 POINT DRUM UNIT COILS, THRU 9TH POSITION SWS. ON 100 POINT DRUM UNITS.
TO 1ST AND 2ND PLAYER 100 POINT DRUM UNIT COILS.
TO 1ST AND 2ND PLAYER 10 POINT DRUM UNIT COILS.
TO 1ST AND 2ND PLAYER 1 POINT DRUM UNIT COILS.

100 POINT RELAY

IS PULSED BY THE FOLLOWING:

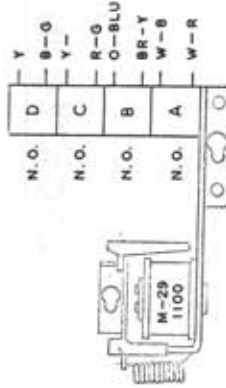
1. SWITCH 1B ON BONUS RELAY.
2. SWITCH B ON DOUBLE BONUS SCORE RELAY.
3. SWITCH 1A ON 300 RELAY.
4. SWITCH B ON ADVANCE RELAY.
5. TOP CENTER AND BOTTOM CENTER TARGET.
6. LEFT BOTTOM AND RIGHT BOTTOM (OUTSIDE) ROLLERS.
7. LEFT TOP AND RIGHT TOP ROLLERS.



10 POINT RELAY

IS PULSED BY:

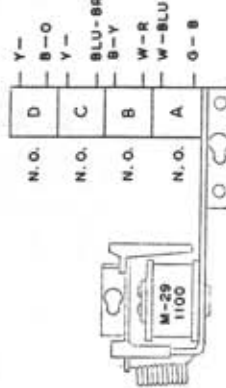
1. LEFT AND RIGHT TOP TARGETS.
2. ALL (5) BUMPER RELAYS.
3. (2) BOTTOM (INSIDE) ROLLERS.
4. SWITCH 1A ON 50 POINT RELAY.



1 POINT RELAY

IS PULSED BY:

1. STANDUP SWITCHES.
2. KICKER SWITCHES.
3. BUMPER RELAYS AS INDICATED ON JET BUMPER.



SCORE RESET RELAY

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

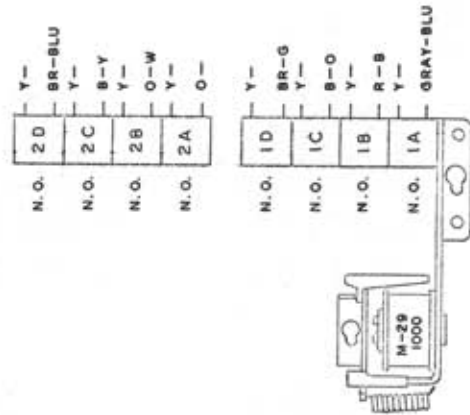


DIAGRAM LOCATION

OPENS HOLD CIRCUIT TO EXTRA BALL RELAY AND MAKES TO BALL INDEX RELAY.

IN HOLD CIRCUIT TO THIS RELAY.

IN SERIES WITH SWITCH E ON PLAYER RELAY.

ENERGIZES CHIME COIL

IN SERIES WITH SWITCH C ON PLAYER RELAY.

IN SERIES WITH SWITCH D ON PLAYER RELAY.

ENERGIZES CHIME COIL.

IN SERIES WITH SWITCH B ON PLAYER RELAY.

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

IN HOLD CIRCUIT TO THIS RELAY.

ENERGIZES NUMBER MATCH S. U. COIL.

IN SERIES WITH SWITCH A ON PLAYER RELAY.

PULSES 10 POINT RELAY THRU 9TH POSITION SWITCHES ON 1 POINT DRUM UNITS.

IN HOLD CIRCUIT TO THIS RELAY.

PULSES 1ST PLAYER 1000 POINT DRUM UNIT, THRU ZERO SWITCH.

PULSES 1ST PLAYER 100 POINT DRUM UNIT, THRU ZERO SWITCH.

PULSES 1ST PLAYER 10 POINT DRUM UNIT, THRU ZERO SWITCH.

PULSES 1ST PLAYER 1 POINT DRUM UNIT, THRU ZERO SWITCH.

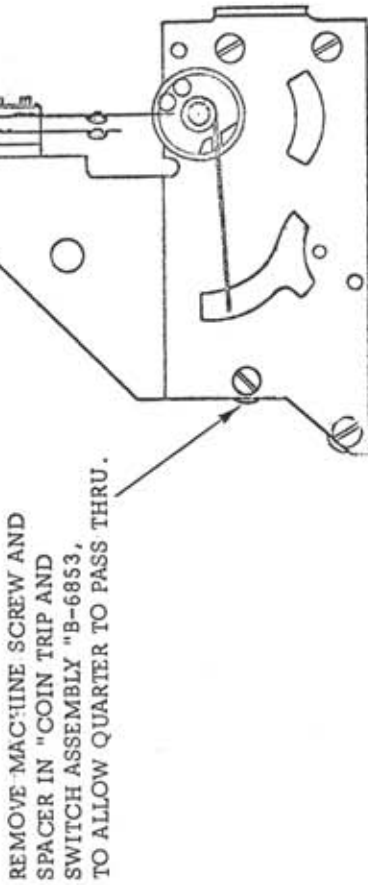
PULSES 2ND PLAYER 1000 POINT DRUM UNIT, THRU ZERO SWITCH.

PULSES 2ND PLAYER 100 POINT DRUM UNIT, THRU ZERO SWITCH.

PULSES 2ND PLAYER 10 POINT DRUM UNIT, THRU ZERO SWITCH.

PULSES 2ND PLAYER 1 POINT DRUM UNIT, THRU ZERO SWITCH.

CONVERTING FROM (10¢-25¢) PLAY TO (2/25¢ - 2/25¢) PLAY
 REPLACE 10¢ COIN CHUTE WITH 25¢ COIN CHUTE.
 REPLACE 10¢ COIN INSERT PLATE WITH (1A-4215) 25¢ COIN INSERT
 PLATE.
 REPLACE 10¢ IDENTIFICATION PLATE WITH (16C-8640-100) 2 PLAYS-
 QUARTER.
 REPLACE 10¢ COIN SWITCH WITH 25¢ COIN SWITCH (3M-3)



B-6853 COIN TRIP & SWITCH ASS'Y

TO CONVERT FROM (5¢ 5¢ - 10¢ - 25¢) TO (2/25¢ - 2/25¢)

REPLACE (5¢ 5¢) COIN TRIP AND SWITCH ASSEMBLY WITH B-6853 (10¢)
 COIN TRIP AND SWITCH ASSEMBLY.
 REPLACE 5¢ COIN CHUTE WITH 25¢ COIN CHUTE.
 REPLACE 5¢ COIN INSERT PLATE WITH (1A-4215) 25¢ COIN INSERT PLATE.
 REPLACE 5¢ IDENTIFICATION PLATE WITH (16C-8640-100) 2 PLAYS -
 QUARTER.
 MAKE CHANGES ON B-6853 "COIN TRIP AND SWITCH ASSEMBLY" AS
 SHOWN ABOVE.
 USE PART NO. 16A-8636 (DUMMY COIN ENTRY COVER) ON CENTER
 CHUTE.

WIRING INSTRUCTIONS

AT ORIGINAL 25¢ COIN SWITCH, UNSOLDER GREEN-ORANGE
 WIRE (A) AND TAPE IT. REMOVE TAPE FROM WHITE-BLUE WIRE
 AND SOLDER IN ITS PLACE.
 AT NEW 25¢ COIN SWITCH, REMOVE TAPE FROM GREEN-ORANGE,
 WHITE-BLUE AND RED-ORANGE WIRES AND SOLDER AS SHOWN BY
 DOTTED LINES (A), (B) AND (C).

INSERT 25¢ ADJUSTMENT JACK INTO "2 PLAYS FOR QUARTER" POSITION.

