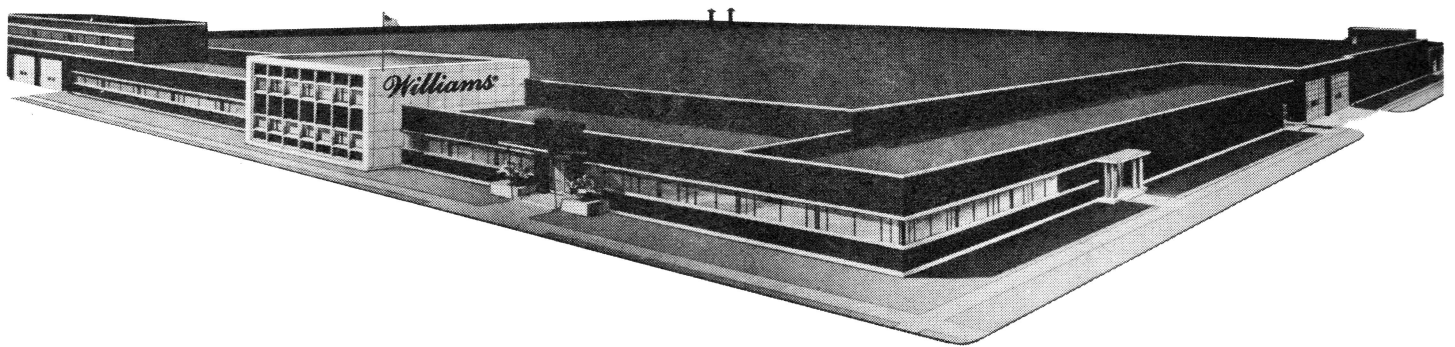


Instruction Manual

for

CUE-T



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 REMOVED, 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

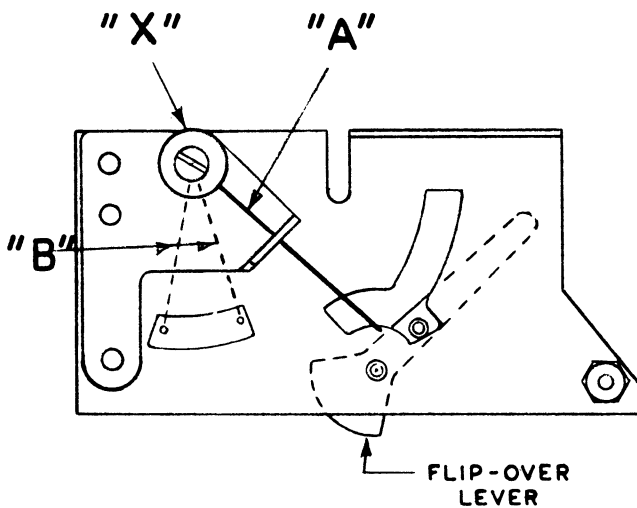
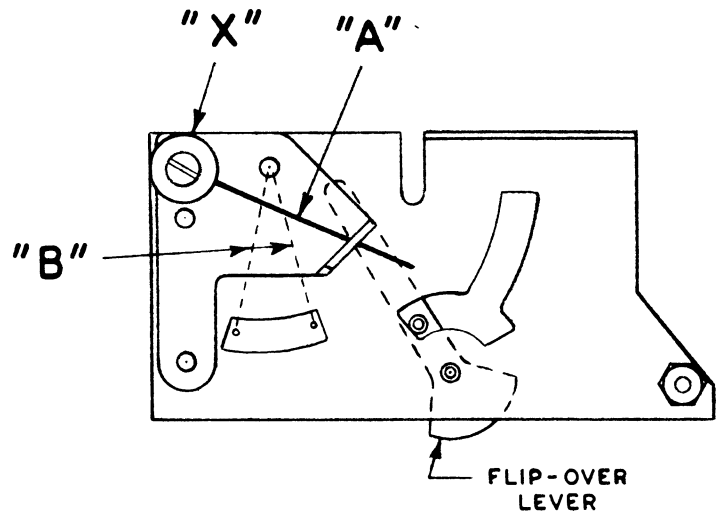


FIGURE 2



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.

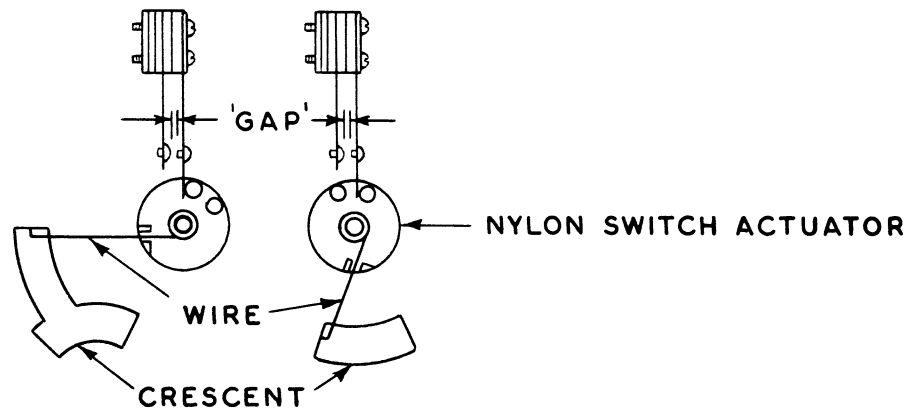
NOTE:

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 "CUE T"

UNIT NAME	CONTACT DISC	WIPER ASSEMBLY	RATCHET GEAR ASSEMBLY	MOTORS
BALL COUNT	C-6937	C-6520	A-6402-9	14A-7805 (60 CYCLE) 14A-7806 (60 CYCLE)
ADVANCE	C-6417	C-6520	A-6404-15	
TENS	B-6297	A-6294	3C-7128	
HUNDREDS	B-6297	A-6294	3C 7128	
THOUSANDS	-----	-----	3C 7128	
TEN THOUSANDS	B-6297	A-6294	3C-7128	

"CUE T" COIL CHART

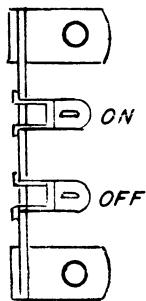
NOTICE:

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

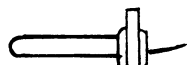
NUMBER	DESCRIPTION	LOCATION
14 A 7805	SCORE MOTOR - 60 CYCLE	MECH. PANEL
14 A 7806	SCORE MOTOR - 50 CYCLE	MECH. PANEL
15 A 6771	TRANSFORMER - 60 CYCLE	MECH. PANEL
15 A 6773	TRANSFORMER - 50 CYCLE	MECH. PANEL
B 6396	24 VOLT METER	MECH. PANEL
	<u>SOLENOID COILS</u>	
A 22-550	BALL COUNT UNIT STEP UP BALL RELEASE ADVANCE UNIT STEP UP	INSERT PLAYFIELD PLAYFIELD
A2-23-750	KNOCKER	CABINET
B 26-800	BALL COUNT UNIT RESET SCORE DRUM UNITS ... (4 req'd.) ADVANCE UNIT RESET	INSERT INSERT PLAYFIELD
C2-26-800	CHIME SMALL BELL	INSERT INSERT
G 22-550	JET BUMPER ... (4 req'd.)	PLAYFIELD
G 23-600	EJECT ... (2 req'd.)	PLAYFIELD
G 23-750	AUTO KICKERS ... (2 req'd.)	PLAYFIELD
FL 21-375/ 28-400	FLIPPERS ... (2 req'd.)	PLAYFIELD
	<u>RELAY COILS</u>	
M 25-400	5,000 (TRIP)	PLAYFIELD
M 29-1000	GAME OVER TRIP GAME TRIP	MECH. PANEL MECH. PANEL
M 29-1100	ADVANCE TARGET MYSTERY ADVANCE NO. 1 BUMPER NO. 2 BUMPER NO. 3 BUMPER 1 POINT 10 POINT 100 POINT 5,000 (LATCH)	PLAYFIELD PLAYFIELD PLAYFIELD PLAYFIELD PLAYFIELD PLAYFIELD INSERT INSERT INSERT PLAYFIELD
M 30-1400	CHANGE	PLAYFIELD
M1-31-1500	COIN LOCKOUT COIL	FRONT DOOR
Z 27-1000	OUTHOLE GAMEOVER LATCH EJECT COIN GAME LATCH RESET	MECH. PANEL MECH. PANEL MECH. PANEL MECH. PANEL MECH. PANEL MECH. PANEL
Z 28-1150	LOCK A RELAY B RELAY C RELAY D RELAY	MECH. PANEL PLAYFIELD PLAYFIELD PLAYFIELD PLAYFIELD
Z 28-1200	BALL INDEX EXTRA BALL	MECH. PANEL MECH. PANEL
XM 27-675	METER COIL	MECH. PANEL
	<u>SPECIAL GAMES ONLY</u>	
	<u>RELAY COILS</u>	
Z 27-1000	2 PLAY	MECH. PANEL
Z 28-1150	CREDIT	MECH. PANEL

LOCATED ON MECH. PANEL

Motor Service Jack



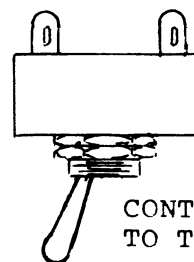
INSERT PHONE TIP IN
'OFF' POSITION - CAMS
CAN BE TURNED BY
HAND TO CHECK



ADJUSTMENT OF
SWITCHES.

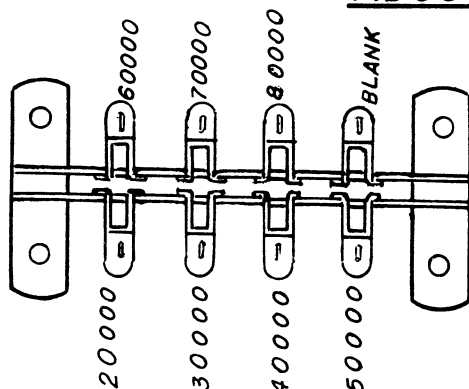
MASTER ON-OFF SW.

(Located under front of
Cabinet)

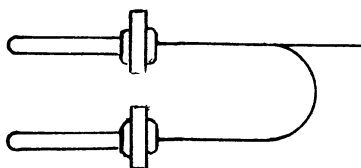


CONTROLS POWER
TO TRANSFORMER

ADJUSTMENTS IN BACKBOX



Hi-Score Adjustment



INSERT PLUGS INTO 8 POINT
FEMALE AT DESIRED POSITIONS.

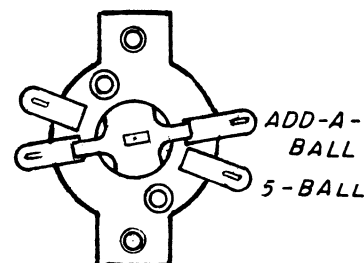
EXAMPLE:

PLUG INTO 3,000 POSITION
SCORES AT 3,000.

ADD-A-BALL POSITION:
SCORES EXTRA BALLS WHEN MAKING
"SPECIALS" OR HI-SCORES AS
INDICATED.

5 BALL POSITION
GAME SETS UP FOR 5 BALLS AND
SCORES 10,000 POINTS WHEN MAKING
"SPECIALS". IN THIS POSITION,
THERE ARE NO SPECIALS AWARDED
FOR HI-SCORE.

ADD-A-BALL ADJUSTMENT



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.

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.

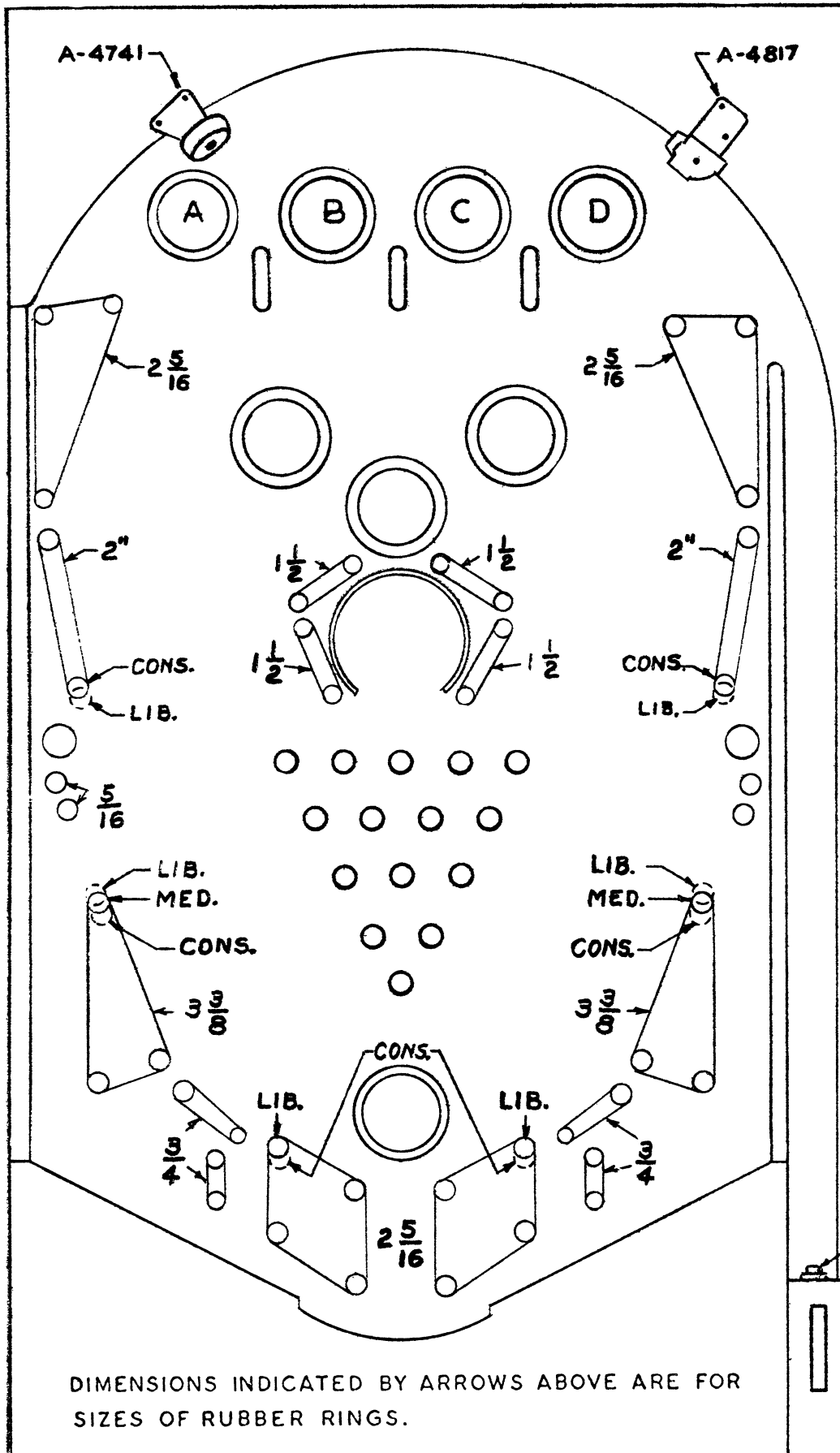
Solenoid Plungers should not have a lubricant of any kind. Should there be a sluggish tendency or if plungers are sticking, the parts should be cleaned with a solvent and flaked graphite applied on reassembly.

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.

CUE T 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

RUBBER RING NUMBERS:

23A- 6300	5/16" I. D.
23A- 6301	3/4" I. D.
23A-6304	1 1/2" I. D.
23A-6305	2" I. D.
23A-6306	2 5/16" I. D.
23A-6308	3 3/8" I. D.

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

23A-6327- BALL SHOOTER
RUBBER TIP

"CUE T" OPERATES AS FOLLOWS:

FOUR TOP TARGETS, A-B-C AND D, LITE CORRESPONDING TOP BUMPERS. LITING ALL FOUR TOP BUMPERS WILL LITE CENTER HORSESHOE. BALL GOING THRU CENTER HORSESHOE, WHEN LIT, SCORES "SPECIAL".

TOP TARGET "A" WILL ALSO LITE TWO TOP JET BUMPERS FOR 100 SCORING.

TOP TARGET "D" WILL ALSO LITE BOTTOM JET BUMPER FOR 100 SCORING.

THE 15 PLAYFIELD BALL LITES ARE CONTROLLED BY ADVANCE UNIT. THIS UNIT WILL ADVANCE ONE STEP BY HITTING CENTER TARGET, WHEN LIT. IT ADVANCES TWO STEPS WHEN MAKING TOP CENTER OR BOTTOM CENTER ROLLOVER. BALL IN LEFT OR RIGHT EJECT HOLE, WHEN LIT, WILL ADVANCE THE UNIT 2, 3 OR 5 STEPS (DEPENDING ON THE POSITION OF 100 POINT DRUM UNIT.)

STEPPING UP THE ADVANCE UNIT 15 TIMES WILL LITE LEFT AND RIGHT BOTTOM ROLLOVERS FOR "SPECIAL".

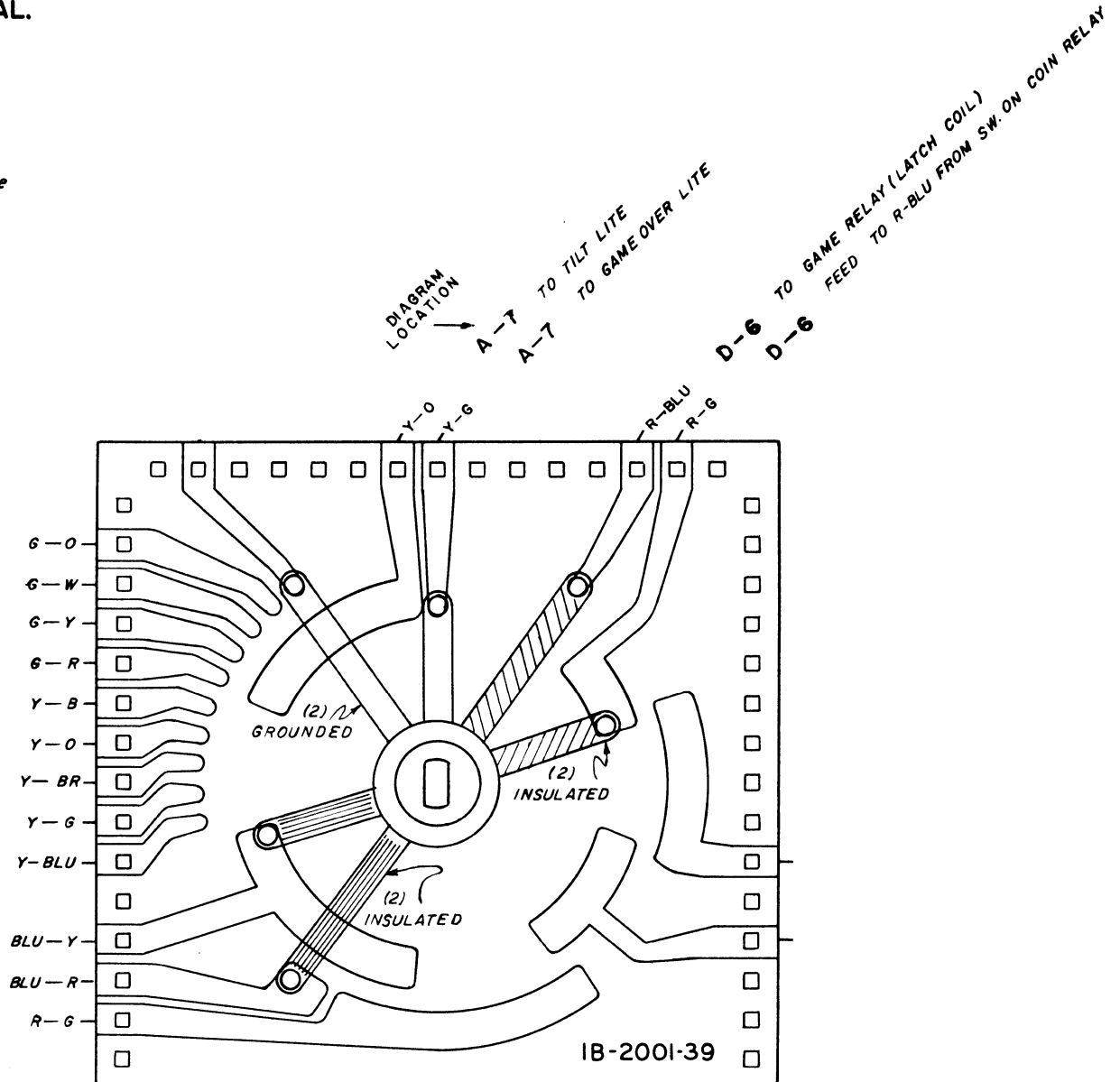
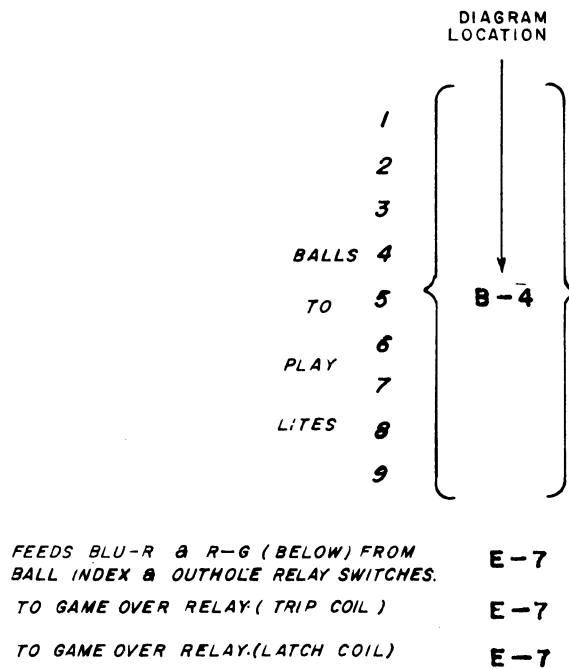
WHAT TO DO IF:

1. Lights are out, game is inoperative:
 - a. Check A.C. cord and plug for breaks, cuts or other damage.
 - b. Check fuses, located on mechanism panel.
 - c. Check master switch, located under the front end of cabinet.
 - d. Check plugs and jacks for proper installation.
2. Lights are on, game is inoperative:
 - a. Check the 15 Amp fuse, heavy Black wire.
 - b. Check plugs and jacks.
3. Lights are out, game operates:
 - a. Check switches on, and operation of, Lock Relay.
 - b. Check the 10 AMP fuses, heavy Brown and heavy Blu wires.
 - c. Check plugs and jacks.
 - d. Check lite bulbs.
4. Coin is accepted, game does not reset:
 - a. Check coin chute and coin switch.
 - b. Check Anti-Cheat switch, located on front door.
 - c. Check switch on Game Relay, Yellow-Red and Red-Orange.
 - d. Check Coin Relay Coil.

BALL COUNT S. U. DISC

THIS UNIT ADVANCES FIVE STEPS AT START OF NEW GAME. IT RESETS ONE STEP EACH TIME THE BALL LEAVES THE PLAYFIELD (MAKES THE OUTHOLE SWITCH). THIS UNIT ALSO ADVANCES ONE STEP THRU ADJUSTMENT JACKS, WHEN SCORING A 'SPECIAL' OR HIGH SCORE. THE ADJUSTMENT JACK EXPLANATIONS ARE FOUND IN THE FORWARD PART OF THIS MANUAL.

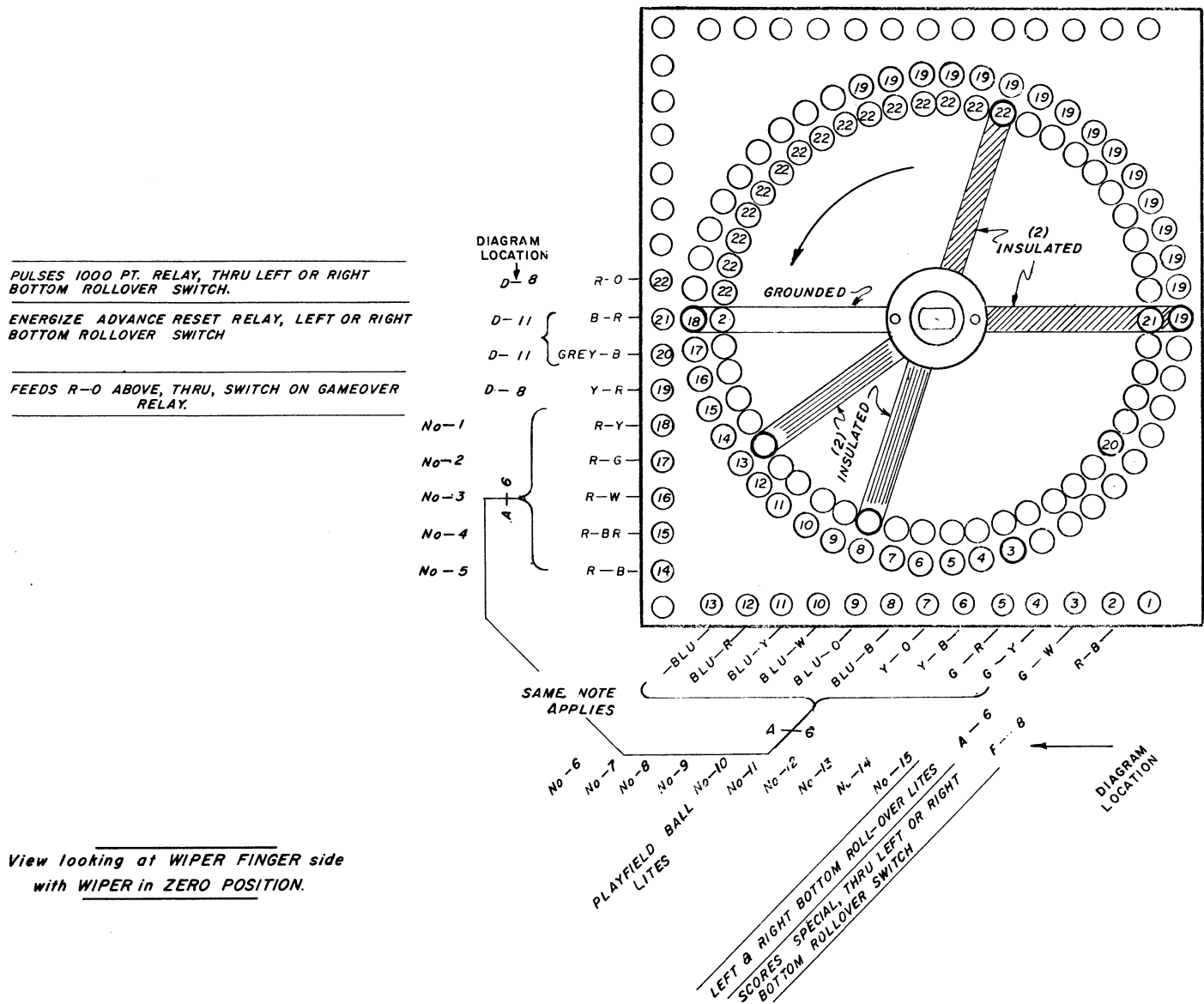
View looking at WIPER FINGERS side
with WIPER in ZERO position



ADVANCE S. U. DISC

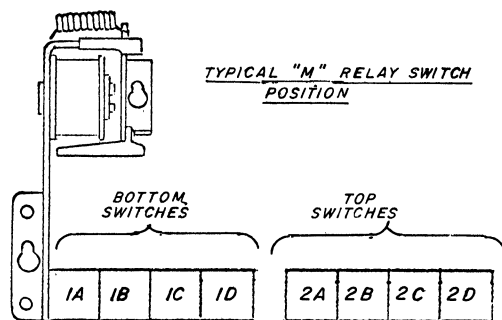
THIS UNIT RESETS COMPLETELY AT START OF NEW GAME. IT ALSO RESETS WHEN LEFT OR RIGHT BOTTOM ROLLOVER "SPECIAL" IS MADE, IN "ADD-A-BALL" POSITION.

THE UNIT ADVANCES ONE STEP IF CENTER TARGET IS HIT WHEN LIT --- TWO STEPS WHEN MAKING TOP CENTER OR BOTTOM CENTER ROLLOVER--- AND TWO, THREE, OR FIVE (DEPENDING ON POSITION OF 100 POINT DRUM UNIT) BY MAKING LEFT OR RIGHT EJECT SWITCH WHEN LIT.



A.C. RELAYS & SWITCHES

On Mechanism Panel



GAME RELAY (Interlock)

LATCH COIL IS ENERGIZED BY THE COIN RELAY, THRU THE BALL COUNT UNIT DISC.
TRIP COIL IS ENERGIZED BY THE 1000 POINT RELAY OR GAME-OVER RELAY.

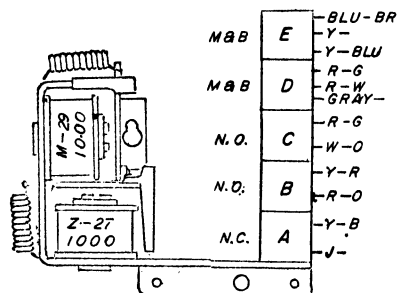


DIAGRAM LOCATION

D-3

F-8

F-8

D-3

E-11

OPERATION

IN HOLD CIRCUIT TO COIN RELAY---ALSO ENERGIZES RESET RELAY, THRU SWITCH ON LOCK RELAY.

ENERGIZES BALL COUNT RESET AND S.U. COILS. (DURING RESET CYCLE).

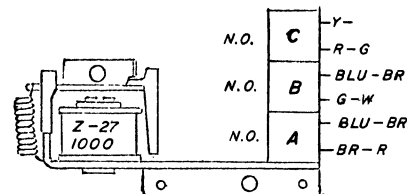
IN CIRCUIT TO BALL COUNT RESET COIL, WHEN BALL MAKES OUTHOLE SWITCH.

IN CIRCUIT TO COIN RELAY, THRU COIN SWITCHES OR REPLAY BUTTON.

IN CIRCUIT TO GAME RELAY (TRIP COIL), FROM SWITCH ON 1000 POINT RELAY.

2 PLAY RELAY

THIS RELAY IS USED ONLY ON GAMES WITH 2 PLAYS FOR 1 COIN FEATURE.
IT IS ENERGIZED BY 2 PLAY COIN SWITCH.



D-6

E-3

E-3

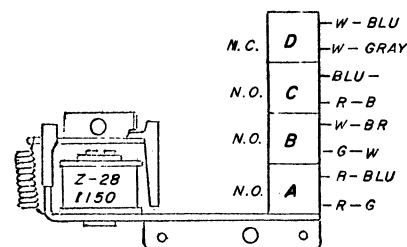
ENERGIZES CREDIT RELAY.

ENERGIZES COIN RELAY.

IN HOLD CIRCUIT TO THIS RELAY.

CREDIT RELAY

THIS RELAY IS USED ONLY ON GAMES WITH 2 PLAYS FOR 1 COIN FEATURE.
IT IS ENERGIZED BY THE 2 PLAY RELAY.



D-5

A-3

E-2

D-6

BREAKS CIRCUIT TO COIN LOCKOUT COIL

TO CREDIT LITE.

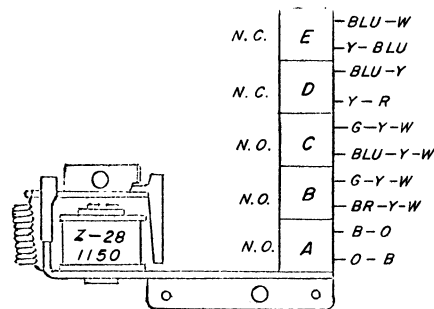
TO COIN RELAY, FROM REPLAY BUTTON SWITCH.

IN HOLD CIRCUIT TO THIS RELAY.

On Mechanism Panel

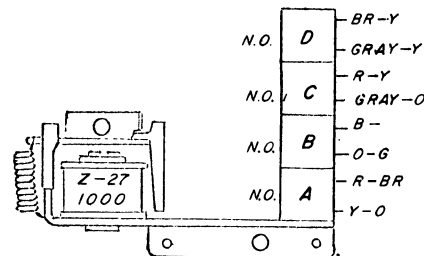
LOCK RELAY

IS ENERGIZED BY THE COIN RELAY OR LEFT FLIPPER SWITCH.



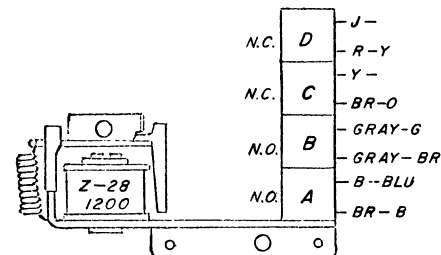
EJECT RELAY

IS ENERGIZED BY LEFT OR RIGHT EJECT SWITCH.



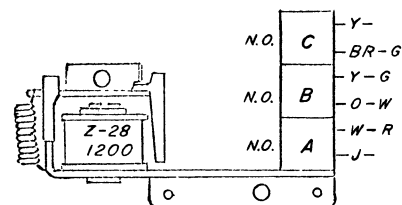
EXTRA BALL RELAY

IS ENERGIZED BY 5000 RELAY, THRU SWITCHES ON A, B, C AND D RELAYS.



BALL INDEX RELAY

IS ENERGIZED BY THE 1000 POINT RELAY.



OPERATION

- D-3** TO RESET RELAY, FROM SWITCH "E" ON GAME RELAY.
- D-7** ENERGIZES GAME-OVER RELAY (TRIP COIL).
- A-2** 6 VOLTS FROM TRANSFORMER TO LITES.
- A-2** 6 VOLTS FROM TRANSFORMER TO LITES.
- D-5** IN HOLD CIRCUIT TO THIS RELAY, THRU KICKOFF SWITCH.
-
- E-15** PULSES 1000 POINT RELAY, THRU CAM SWITCH 1B.
- E-11** ENERGIZES (2) EJECT COILS, THRU CAM SWITCH 4B.
- F-4** RUNS CONTROL MOTOR.
- E-10** IN HOLD CIRCUIT TO THIS RELAY.
-
- D-12** ENERGIZES BALL INDEX RELAY, THRU SWITCH 2B ON 1000 POINT RELAY.
- C-13** OPENS HOLD CIRCUIT TO A-B-C AND D RELAYS.
- F-9** ENERGIZES BALL COUNT S.U., THRU SWITCH "A" ON 5000 RELAY.
- F-14** IN HOLD CIRCUIT TO THIS RELAY.
-
- C-14** IN SERIES WITH SWITCH "A" ON EXTRA BALL RELAY.
- D-7** IN SERIES WITH SWITCH "C" ON GAME RELAY.
- E-12** IN HOLD CIRCUIT TO THIS RELAY.

On Mechanism Panel

OUTHOLE RELAY

IS ENERGIZED BY OUTHOLE SWITCH, THRU GAME-OVER RELAY OR BALL COUNT ZERO SWITCH.

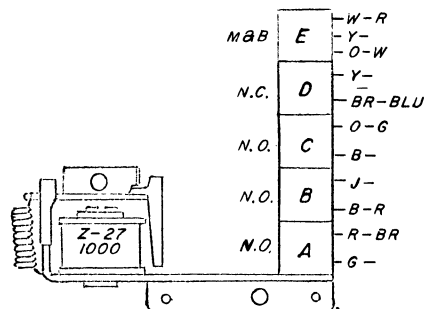


DIAGRAM
LOCATION

OPERATION

C-7 and C-12

IN SERIES WITH SWITCH "B" ON BALL INDEX RELAY. ALSO IN HOLD CIRCUIT TO BALL INDEX RELAY.

C-13

IN HOLD CIRCUIT TO A-B-C AND D RELAYS.

F-4

RUNS CONTROL MOTOR.

E-12

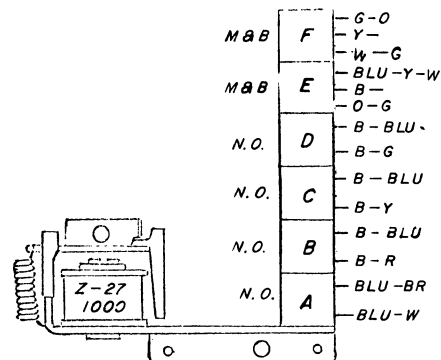
IN CIRCUIT TO BALL INDEX RELAY.

E-12

IN HOLD CIRCUIT TO THIS RELAY.

RESET RELAY

IS ENERGIZED BY THE COIN RELAY.



C-10

IN SERIES WITH SWITCHES D, C AND B ON THIS RELAY. (DURING RESET CYCLE).

G-5 and G-12

OPENS CURRENT TO ALL PLAYFIELD SWITCHES. ALSO RUNS CONTROL MOTOR.

D-11

PULSES 10,000 POINT DRUM UNIT.

D-10

PULSES 1000 POINT DRUM UNIT.

D-10

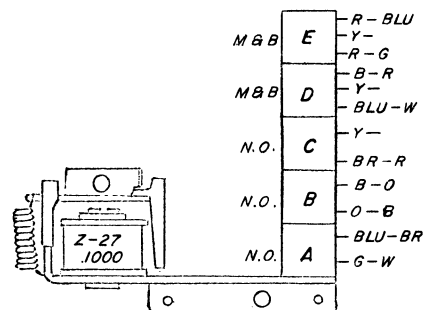
PULSES 10 POINT DRUM UNIT.

D-3

IN HOLD CIRCUIT TO THIS RELAY.

COIN RELAY

IS ENERGIZED BY THE COIN SWITCH OR 2 PLAY RELAY. ALSO BY THE REPLAY BUTTON WHEN A CREDIT IS AVAILABLE.



C-7

ENERGIZES GAME-OVER RELAY (LATCH COIL.)

D-4

IN CIRCUIT TO KNOCKER COIL---ALSO ENERGIZES RESET RELAY.

C-11

ENERGIZES ADVANCE UNIT RESET COIL, THRU CAM SWITCH 14C.

D-5

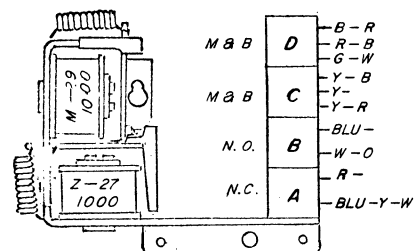
ENERGIZES LOCK RELAY.

E-3

IN HOLD CIRCUIT TO THIS RELAY.

GAME-OVER RELAY (Interlock)

LATCH COIL IS ENERGIZED BY COIN RELAY, DURING RESET CYCLE. DURING PLAY, IT IS ENERGIZED BY OUTHOLE AND BALL INDEX RELAYS THRU THE BALL COUNT UNIT DISC. TRIP COIL IS ENERGIZED BY TILT SWITCHES OR WHEN LOCK RELAY DROPS OUT.



C-12
C-7 and
C-11
A-6
G-12

OPERATION

IN CIRCUIT TO BALL INDEX RELAY, THRU SWITCH "B" ON OUTHOLE RELAY.

ENERGIZES GAME RELAY (TRIP COIL.)

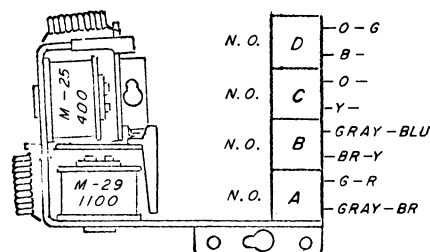
TO TILT AND GAME-OVER LITES.

OPENS CIRCUIT TO ALL PLAYFIELD SWITCHES.

Located on Playfield

5000 RELAY

IS ENERGIZED BY CENTER HORSESHOE ROLLOVER BUTTON SWITCH.



G-4
C-14
E-15
E-9

RUNS CONTROL MOTOR.

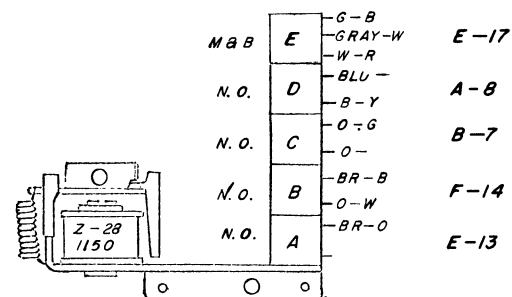
ENERGIZES EXTRA BALL RELAY, THRU SWITCHES ON A-B-C AND D RELAYS.

IN CIRCUIT TO 1000 POINT RELAY, THRU IMPULSE CAM SWITCH "B".

IN SERIES WITH SWITCH "B" ON EXTRA BALL RELAY.

"D" RELAY

IS ENERGIZED BY "D" TARGET SWITCH.



E-17
A-8
B-7
F-14
E-13

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

TO "D" BUMPER AND BOTTOM JET BUMPER LITES.

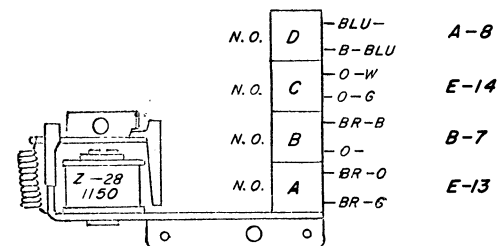
TO EXTRA BALL LITES AT CENTER HORSESHOE.

IN SERIES WITH SWITCH "C" ON 5000 RELAY.

IN HOLD CIRCUIT TO THIS RELAY.

"C" RELAY

IS ENERGIZED BY "C" TARGET SWITCH.



A-8
E-14
B-7
E-13

TO "C" BUMPER LITE.

IN SERIES WITH SWITCH "B" ON "D" RELAY.

IN SERIES WITH SWITCH "C" ON "D" RELAY.

IN HOLD CIRCUIT TO THIS RELAY.

Located On Playfield

"B" RELAY

IS ENERGIZED BY "B" TARGET SWITCH.

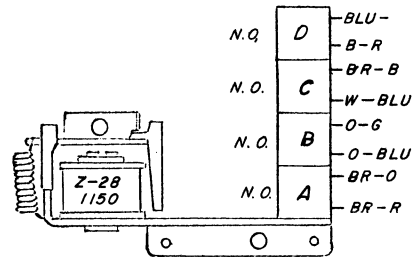


DIAGRAM LOCATION

A-9
A-7
D-14
E-13

TO "B" BUMPER LITE.

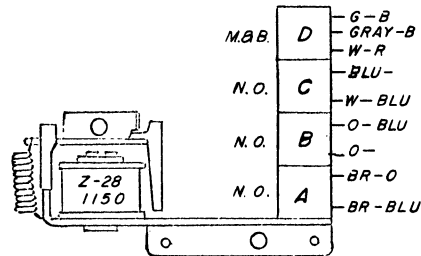
IN SERIES WITH SWITCH "B" ON "C" RELAY.

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

IN HOLD CIRCUIT TO THIS RELAY.

"A" RELAY

IS ENERGIZED BY "A" TARGET SWITCH.



E-17
A-7
D-14
E-13

OPENS CIRCUIT TO 10 POINT RELAY AND CLOSES TO 100 POINT RELAY.

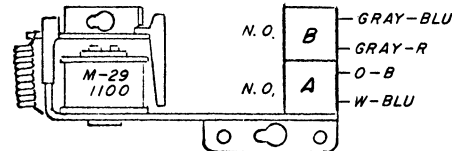
TO "A" BUMPER LITE. ALSO TO TOP LEFT AND TOP RIGHT JET BUMPER LITES.

IN SERIES WITH SWITCH "B" ON "B" RELAY.

IN HOLD CIRCUIT TO THIS RELAY.

MYSTERY ADVANCE RELAY

IS ENERGIZED BY LEFT OR RIGHT EJECT SWITCH, THRU SWITCH "B" ON CHANGE RELAY.



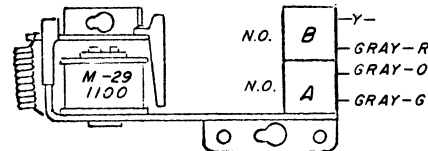
E-15
F-18

PULSES ADVANCE UNIT S.U., THRU IMPULSE CAM SWITCH "B".

IN HOLD CIRCUIT TO THIS RELAY, THRU 100 POINT DRUM UNIT DISC.

TARGET RELAY

IS ENERGIZED BY CENTER TARGET SWITCH, THRU SWITCH "A" ON CHANGE RELAY.



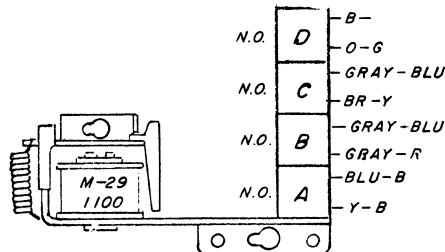
E-15
F-20

PULSES ADVANCE UNIT S.U.

IN HOLD CIRCUIT TO THIS RELAY.

ADVANCE RELAY

IS ENERGIZED BY TOP CENTER OR BOTTOM CENTER ROLLOVER SWITCH.



G-4
E-15
E-15
F-14

RUNS CONTROL MOTOR.

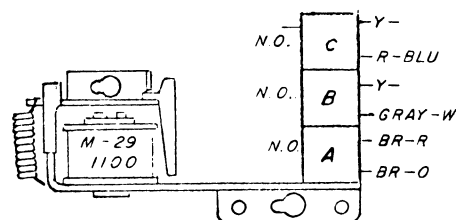
PULSES 1000 POINT RELAY.

PULSES ADVANCE UNIT S.U.

IN HOLD CIRCUIT TO THIS RELAY.

NO 3 BUMPER RELAY

IS PULSED BY BOTTOM JET BUMPER SWITCH.



Located On Playfield

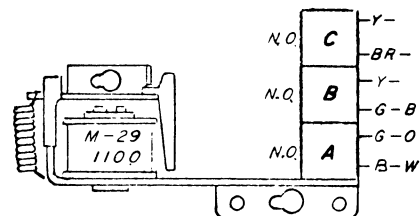
DIAGRAM
LOCATION

OPERATION

- C-6** ENERGIZES BOTTOM JET BUMPER.
- C-17** IN SERIES WITH SWITCH "E" ON "D" RELAY.
- F-21** IN HOLD CIRCUIT TO THIS RELAY.

NO 2 BUMPER RELAY

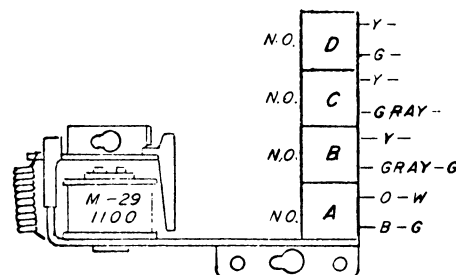
IS PULSED BY TOP CENTER JET BUMPER SWITCH.



- C-6** ENERGIZES CENTER JET BUMPER.
- C-17** PULSES 10 POINT RELAY.
- F-20** IN HOLD CIRCUIT TO THIS RELAY.

NO. 1 BUMPER RELAY

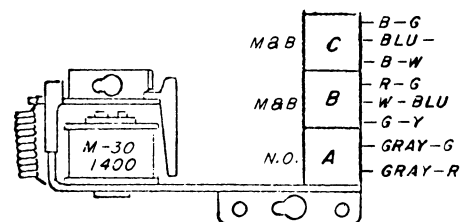
IS PULSED BY LEFT OR RIGHT JET BUMPER SWITCH.



- C-5** ENERGIZES RIGHT TOP JET BUMPER.
- C-5** ENERGIZES LEFT TOP JET BUMPER.
- C-17** IN SERIES WITH SWITCH "D" ON "A" RELAY.
- F-20** IN HOLD CIRCUIT TO THIS RELAY.

CHANGE RELAY

IS ENERGIZED BY THE 10 POINT DRUM UNIT DISC (EVERY OTHER STEP).



- A-5** OPENS CIRCUIT TO RIGHT EJECT LITE, AND CLOSES TO LEFT EJECT AND CENTER TARGET LITES.
- F-18** IN CIRCUIT TO MYSTERY ADVANCE RELAY.
- F-20** ENERGIZES TARGET RELAY, THRU CENTER TARGET SWITCH.

Located In Back-Box1000 POINT RELAY

IS PULSED BY ADVANCE RELAY,
5000 RELAY, EJECT RELAY AND
PLAYFIELD ROLLOVER SWITCH
AS INDICATED.

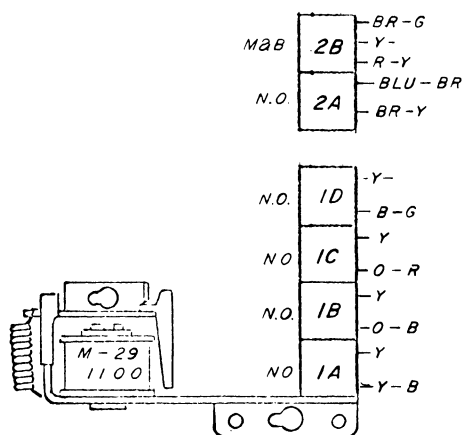


DIAGRAM
LOCATION

*C-12 and
C-14*

E-18

OPERATION

OPENS CIRCUIT TO EXTRA BALL RELAY AND CLOSES
TO BALL INDEX RELAY.

IN HOLD CIRCUIT TO THIS RELAY.

C-21

PULSES CHIME COIL.

D-11

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

D-10

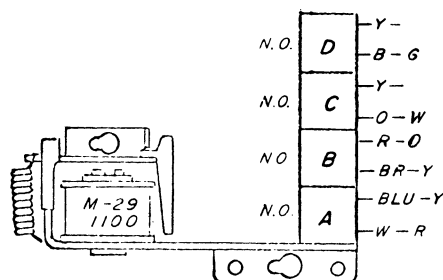
PULSES 1000 POINT DRUM UNIT.

C-11

ENERGIZES GAME RELAY (TRIP COIL.)

100 POINT RELAY

IS PULSED BY NO. 1 AND NO. 2
BUMPER RELAYS. ALSO BY 4 TOP
TARGETS AND 4 TOP BUMPERS.



C-21

PULSES CHIME COIL.

D-10

PULSES 100 POINT DRUM UNIT.

F-17

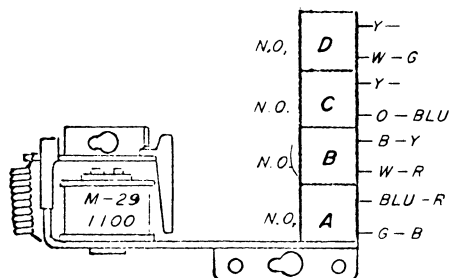
PULSES 1000 POINT RELAY, THRU 9TH POSITION
SWITCH ON 100 POINT DRUM UNIT.

E-18

IN HOLD CIRCUIT TO THIS RELAY.

10 POINT RELAY

IS PULSED BY NO. 1, NO. 2 OR
NO. 3 BUMPER RELAYS. ALSO BY
STAND-UP AND KICKER SWITCHES.



C-21

PULSES SMALL BELL CORD.

C-10

PULSES 10 POINT DRUM UNIT.

F-16 -

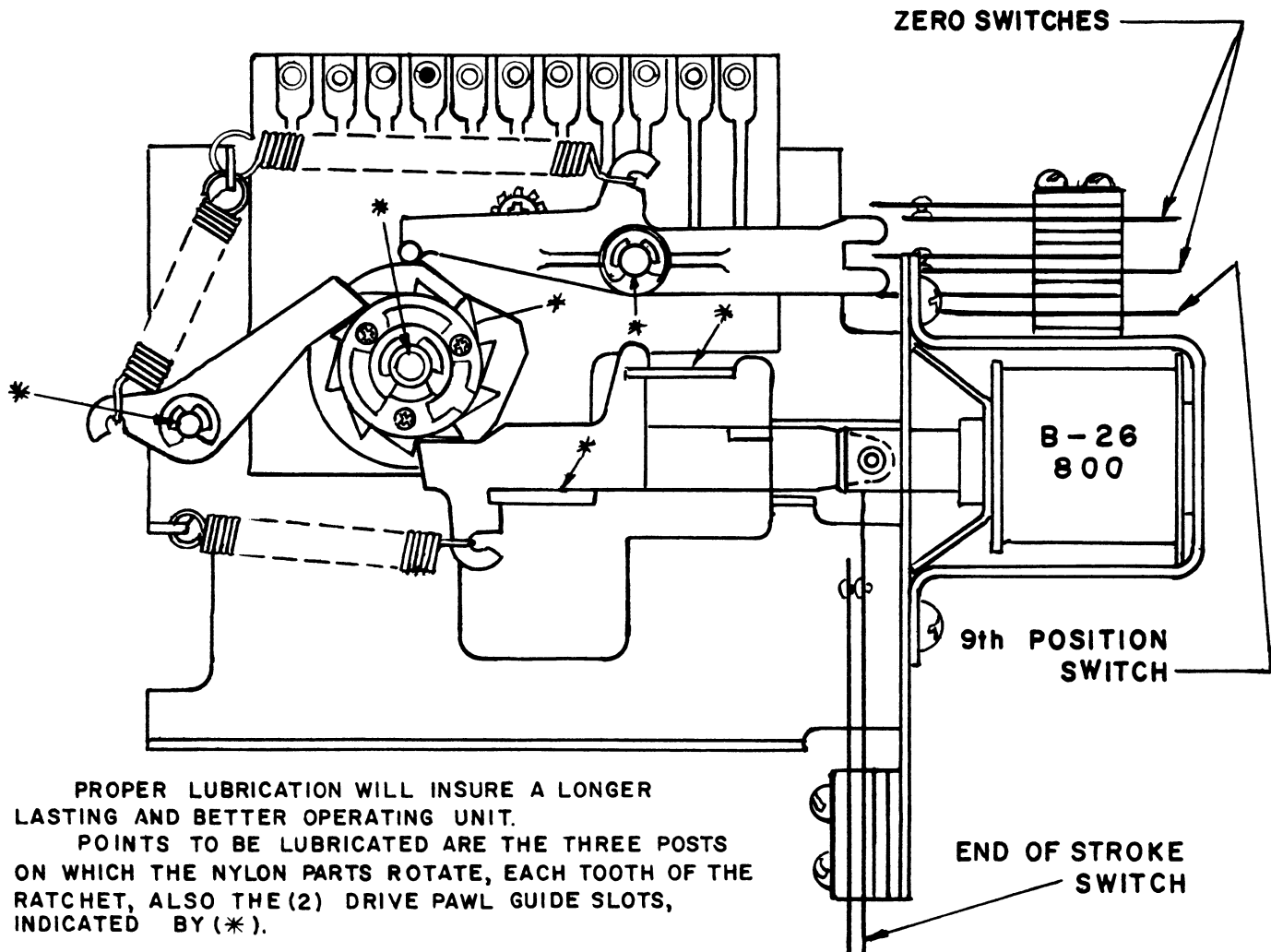
PULSES 100 POINT RELAY, THRU 9TH POSITION
SWITCH ON 10 POINT DRUM UNIT.

E-18

IN HOLD CIRCUIT TO THIS RELAY.

SCORE DRUM UNIT

WITH PRINTED CIRCUIT AND CONTACT RING



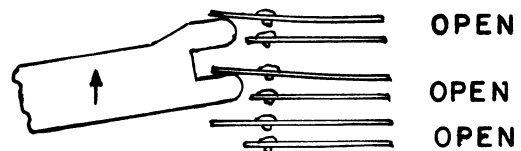
PROPER LUBRICATION WILL INSURE A LONGER LASTING AND BETTER OPERATING UNIT.

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 (*).

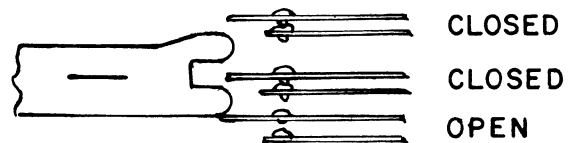
LUBRICATION: DO NOT PUT LUBRICANT ON DRIVE ARMATURE

SWITCH ADJUSTMENT

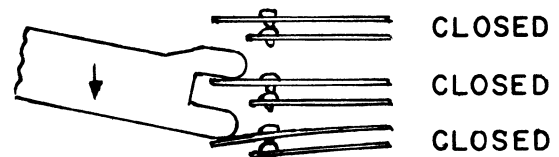
AT "0" OR INDEX POSITION ALL SWITCHES ARE OPEN AS SHOWN.



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



AT 9th POSITION ALL SWITCHES ARE CLOSED AS SHOWN



SUGGESTED TIPS FOR PEAK COLLECTIONS

1. CLEAN, NEAT EQUIPMENT:

- a. Playfields — clean semi-monthly or sooner if necessary.
- b. Cabinet — same as above.
- c. Glass — ask location to cooperate, clean daily.

2. PROPER WORKING EQUIPMENT:

- a. Replace lite bulbs if blown.
- b. Bring game into shop for periodical adjustment and thorough check-up.
- c. Rubbers — clean or replace often, keeps playfield live.

3. ROTATE GAMES:

- a. Cash box should indicate time for change, however eight weeks is the usual peak player interest.

Remember: to keep player interest high - **Rotate, Rotate Rotate**. Playing games is a habit. Don't let your players lose it.

4. SERVICE:

This is your business; carry a good supply of replacement parts such as:

- | | |
|--------------|------------------------------|
| a. fuses | e. Springs |
| b. coils | f. Contact blades & tips |
| c. Rubbers | g. Step-up or actuating arms |
| d. Litebulbs | h. Proper Tools |

Games Out-of-order cannot earn money.