

Instruction Manual for **SUPER STAR**

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SUPER STAR

MAKING SU-P-ER, ON TOP ROLLOVER LANES, SCORES 5,000 POINTS AND LITES CENTER HOLE "SPECIAL". CHECK "GAME ADJUSTMENT" FOR AWARDS. NOTE: AN ADJUSTABLE PLUG ON MECHANISM PANEL, IN LIBERAL POSITION, TIES TOGETHER SU AND ER. LIBERAL POSITION IS RECOMMENDED IN 3 BALL PLAY.

ADVANCING 1-2-3-4-5 FOUR TIMES LITES CENTER HOLE "SPECIAL". CHECK "GAME ADJUSTMENT" FOR AWARDS. LIT ROLLOVER BUTTONS ADVANCE 1-2-3-4-5 AND BLUE STAR TARGETS ALSO ADVANCE 1-2-3-4-5. NOTE: BLUE STAR TARGETS ADJUSTMENT, LOCATED ON MECHANISM PANEL, CAN BE SET TO ADVANCE 1-2-3-4-5 FEATURE TWO, THREE OR FOUR TIMES.

RED STAR TARGETS WILL ALWAYS RAISE THE CORRESPONDING SIDE-POST. BOTH SIDE POSTS GO DOWN WHEN OUTHOLE RELAY OR SPECIAL RELAY ARE ENERGIZED. ALSO, BY HITTING BLUE STAR TARGET WHEN CENTER TARGET IS DOWN.

THE TWO SIDE REBOUND SWITCHES, WHEN LIT, WILL RAISE CENTER POST. WHEN LEFT SIDE POST IS UP, THEN THE LEFT REBOUND SWITCH LITE GOES OUT. WHEN THE RIGHT SIDE POST IS UP, THEN THE RIGHT REBOUND SWITCH LITE GOES OUT. IF THE CENTER POST IS UP WHEN BOTH SIDE POSTS COME UP, THEN THE CENTER POST REMAINS UP UNTIL THE "DOWN CENTER POST" ROLLOVER BUTTON IS MADE.

1. GENERAL

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

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

2. FUSES

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

3. LUBRICATION

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

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

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

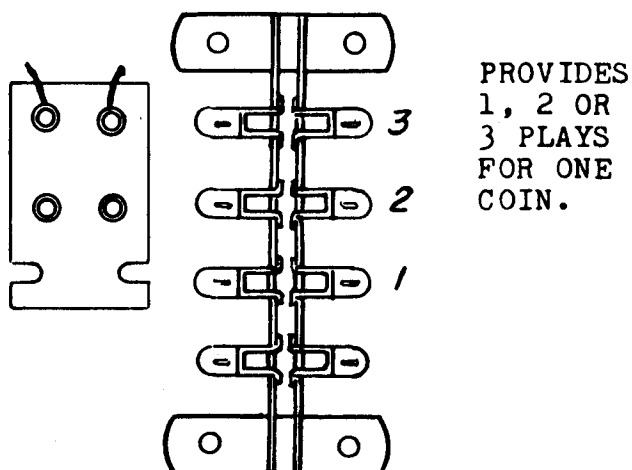
Solenoid Plungers should not have a lubricant of any kind. Should there be a sluggish tendency or if plungers are sticking, the parts should be cleaned with a solvent and flaked graphite applied on reassembly.

SWITCH ADJUSTMENT

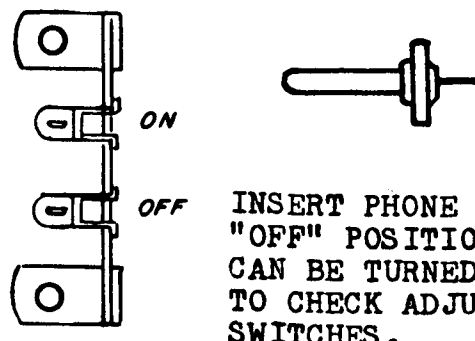
BEFORE ADJUSTING SWITCHES, MAKE CERTAIN THE SCREWS HOLDING THE SWITCH STACKS ARE DOWN TIGHTLY. BAKELITE SPACERS IN THE SWITCH STACKS, DUE TO EXCESSIVE MOISTURE, HAVE OCCASIONALLY SHRUNK BY DRYING OUT, CAUSING POOR ADJUSTMENT.

ADJUSTMENTS ON MECHANISM PANEL

10¢ Adjustment

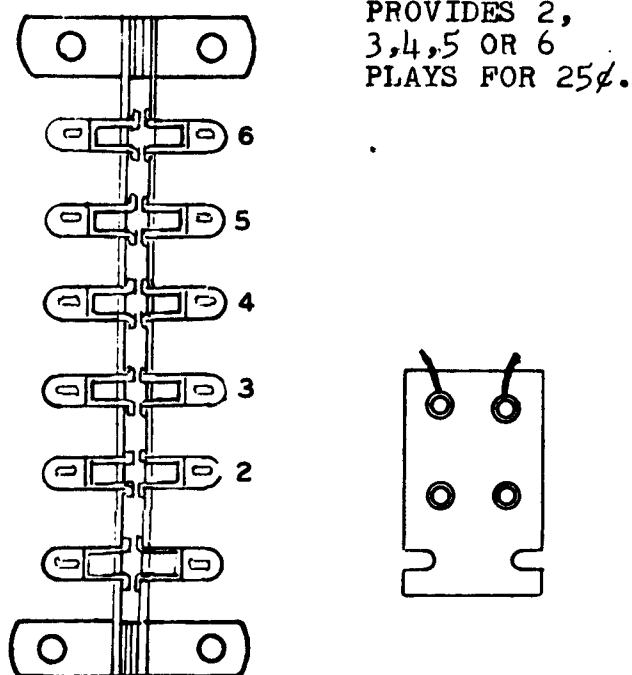
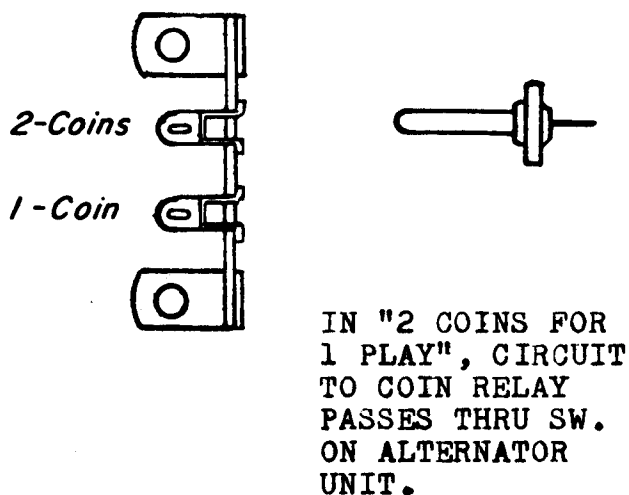


Motor Service Jack

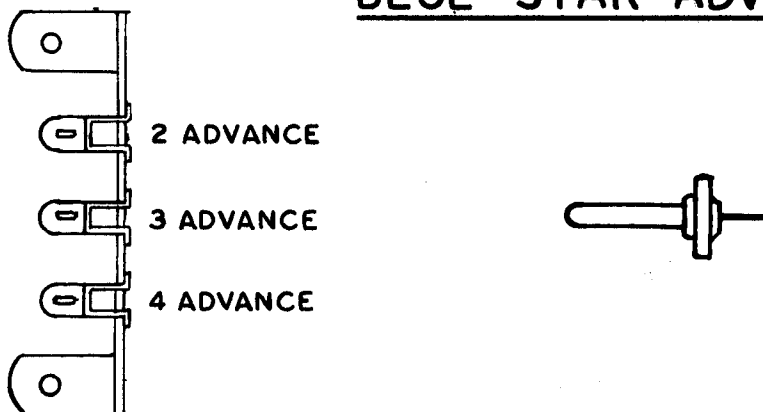


25¢ Adjustment

5¢ Adjustment



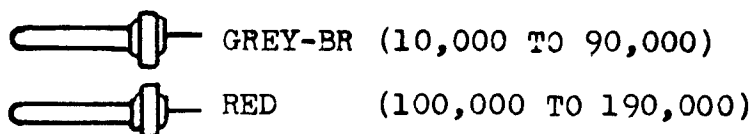
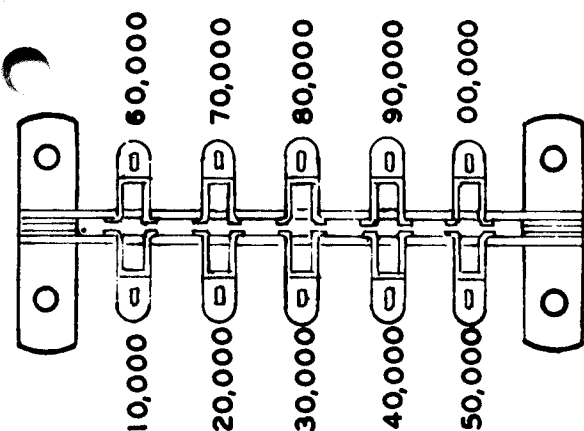
BLUE STAR ADVANCE ADJ.



THIS ADJUSTMENT DETER-
MINES HOW MANY STEPS
THE BONUS UNIT WILL
ADVANCE (2,3,OR 4)
WHEN BALL HITS THE
BLUE STAR TARGET.

ADJUSTMENTS IN BACKBOX

Hi-Score Adjustment

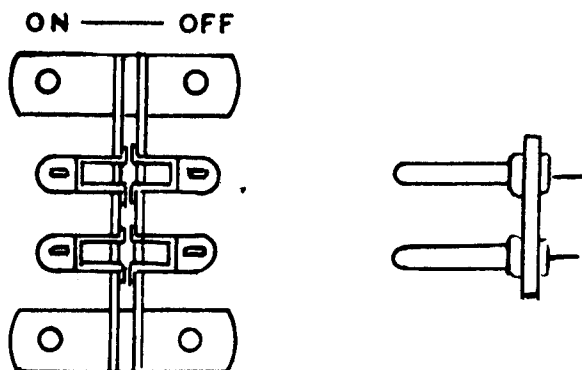


INSERT PLUGS INTO 10 POINT FEMALE AT DESIRED POSITIONS.

EXAMPLES:

GREY-BR INTO 30,000 SCORES AT 30,000.
RED INTO 00,000 SCORES AT 100,000.
RED INTO 30,000 SCORES AT 130,000.
RED INTO 90,000 SCORES AT 190,000.

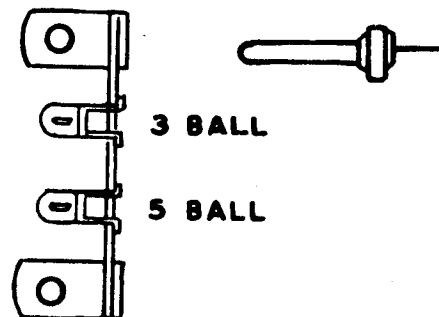
NO. MATCH ADJ.



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

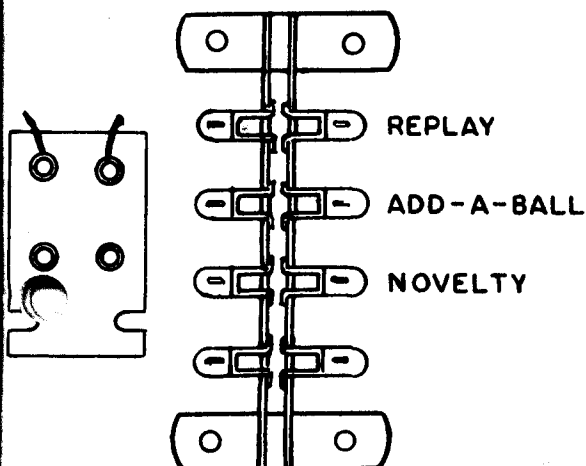
IF IT IS IN "ADD A BALL" POSITION, NUMBER MATCH ADJUSTMENT MUST BE TURNED TO "OFF".

No. of Balls Adjustment



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

GAME ADJUSTMENT



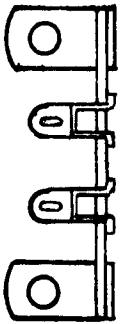
IN "REPLAY" POSITION, HI-SCORES AND NUMBER MATCH CIRCUITS WILL ADVANCE REPLAY UNIT. BALL IN CENTER EJECT POCKET, WHEN "SUPER SPECIAL" OR 1-5 "SPECIAL" LITE IS LIT, WILL ADVANCE BALL COUNT UNIT (ONE STEP IF EITHER ONE IS LIT AND TWO STEPS IF BOTH ARE LIT).

IN "ADD-A-BALL" POSITION, HI-SCORES AND CENTER EJECT POCKET, WHEN "SPECIAL" OR "SUPER SPECIAL" ARE LIT, WILL ADVANCE BALL COUNT UNIT. NUMBER MATCH ADJUSTMENT MUST BE IN "OFF" POSITION.

IN "NOVELTY" POSITION, CENTER EJECT POCKET, WHEN "SPECIAL" OR "SUPER SPECIAL" ARE LIT, WILL ADVANCE 10,000 POINT DRUM UNIT.

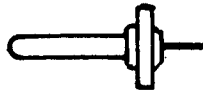
SUPER ROLLOVER ADJ.

LOCATED IN BACKBOX



← LIB. SU & ER
TOGETHER

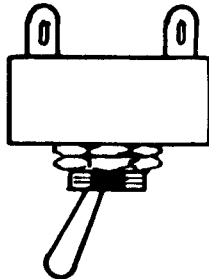
← CONS.



IN CONSERVATIVE POSITION:
"SU", "P" AND "ER" MUST BE MADE INDIVUALLY
BY ACTUATING THE 3 TOP ROLLOVER SWITCHES.

IN LIBERAL POSITION:
EITHER "SU" OR "ER" ROLLOVER WILL ENERGIZE
"SU RELAY" AND "ER RELAY" TOGETHER.

Located under front of Cabinet



Master On-Off Switch

CONTROLS POWER TO
TRANSFORMER

SUGGESTED SCORE CARDS

REPLAY

3 BALL — 378-8

5 BALL — 378-15

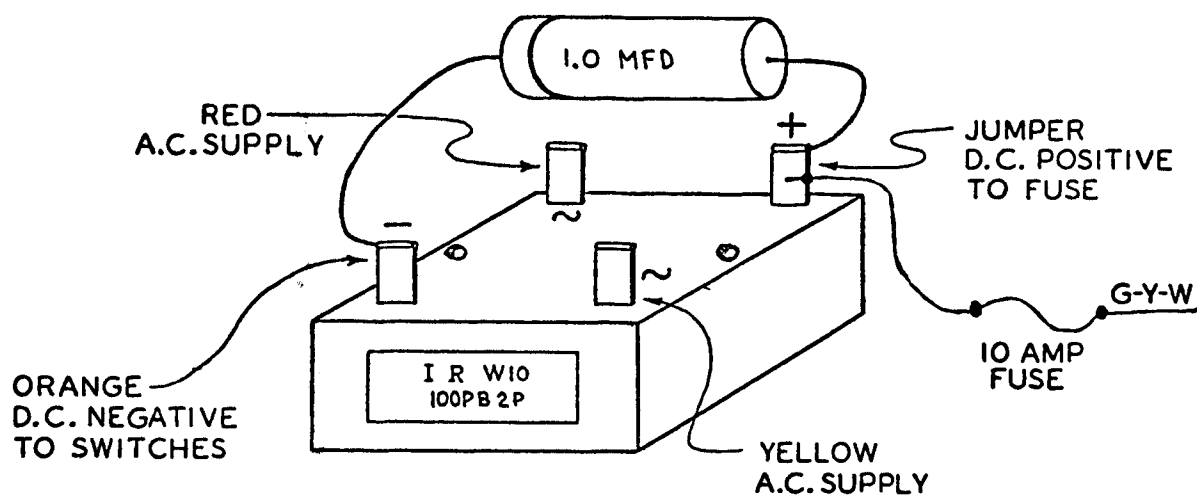
ADD-A-BALL

3 BALL — 378-24

5 BALL — 378-29

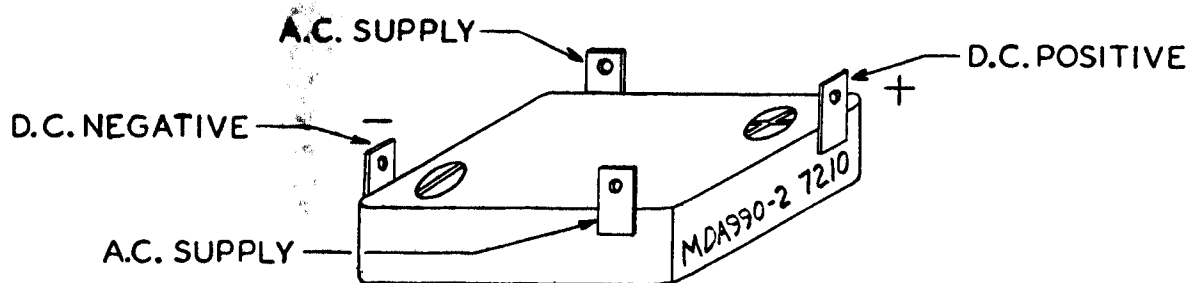
SILICON BRIDGE RECTIFIER

PART NO. 5A-8741



SILICON BRIDGE RECTIFIER

5A-8749



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

THE BRIDGE RECTIFIER SHOULD PRACTICALLY NEVER NEED REPLACING, AS IT IS RATED WELL OVER THE VOLTAGE AND CURRENT REQUIREMENTS OF THE COMPONENTS IT SUPPLIES.

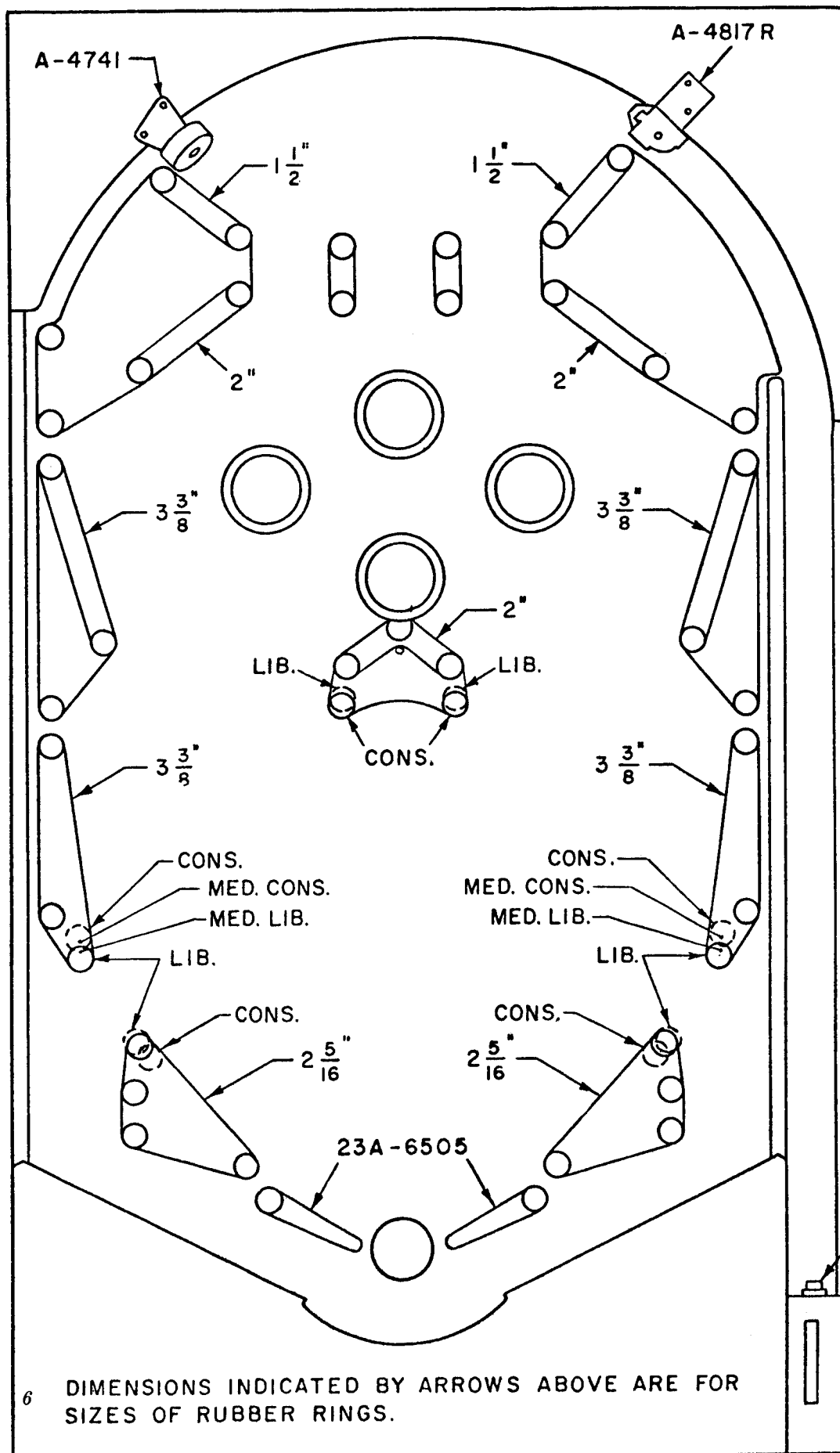
IF, HOWEVER, THE 15 AMP 24 VOLT FUSE ON THE MECHANISM PANEL OPENS, IT COULD BE DUE TO A FAULTY RECTIFIER. DISCONNECT THE A.C. INPUT TO RECTIFIER, REPLACE FUSE, AND RECHECK.

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

EITHER ONE OF THE ABOVE RECTIFIERS MAY BE USED.

"SUPER STAR"—POST ADJUSTMENT SHEET

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



ABBREVIATIONS:

CONS.—CONSERVATIVE

LIB.—LIBERAL

MED.—MEDIUM

RUBBER RING NUMBERS:

23A-6300	5/16" 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.
23A-6505	1 1/2" I.D.

A-4741 REBOUND ASS'Y.

A-4817 R BALL GATE ASS'Y.

23A-6327 BALL SHOOTER
RUBBER TIP

"SUPER STAR" COIL CHART

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

<u>NUMBER</u>	<u>DESCRIPTION</u>	<u>LOCATION</u>
14 A 7883	SCORE MOTOR - 60 CYCLE	MECH. PANEL
14 A 7884	SCORE MOTOR - 50 CYCLE	MECH. PANEL
15 A 6771	TRANSFORMER - 60 CYCLE	MECH. PANEL
15 A 6782-1	TRANSFORMER - 50 CYCLE	MECH. PANEL
B 6396	24 VOLT METER	MECH. PANEL
<u>SOLENOID COILS</u>		
A 22-550	MATCH UNIT STEP UP	INSERT
	BALL COUNT UNIT STEP UP	INSERT
	BALL RELEASE	PLAYFIELD
	BONUS UNIT STEP UP	PLAYFIELD
	EJECT COIL	PLAYFIELD
A 23-600	REPLAY UNIT STEP UP	INSERT
A2-23-750	KNOCKER	CABINET
B 26-800	ALTERNATOR UNIT	MECH. PANEL
	BALL COUNT UNIT RESET	INSERT
	SCORE DRUM UNITS ... (4 req'd.)	INSERT
	REPLAY UNIT RESET	INSERT
	BONUS UNIT RESET	PLAYFIELD
A2-26-1025	CHIME (3 REQ'D)	CABINET
G 22-550	CENTER TARGET UP COIL	PLAYFIELD
G 23-750	DROP POST LATCH COIL ... (3 req'd.)	PLAYFIELD
	JET BUMPERS ... (4 req'd.)	PLAYFIELD
	KICKER COILS ... (2 req'd.)	PLAYFIELD
FL 21-375/ 28-400	FLIPPERS ... (2 req'd.)	PLAYFIELD
<u>RELAY COILS</u>		
M1-31-1500	COIN LOCKOUT	DOOR
M 29-1000	GAME TRIP	MECH. PANEL
	GAME OVER TRIP	MECH. PANEL
	DROP POST TRIP COIL ... (3 req'd.)	PLAYFIELD
M 29-1100	5 ¢ RELAY	MECH. PANEL
	10 ¢ RELAY	MECH. PANEL
	25 ¢ RELAY	MECH. PANEL
	10 POINT RELAY	INSERT
	100 POINT RELAY	INSERT
	1,000 POINT RELAY	INSERT
	SCORE RESET RELAY	INSERT
	ADVANCE RELAY	PLAYFIELD
	BLUE STAR RELAY	PLAYFIELD
	CENTER POST RELAY	PLAYFIELD
M 30-1300	100,000 POINT RELAY	INSERT
Z 27-1000	GAME LATCH	MECH. PANEL
	GAME OVER LATCH	MECH. PANEL
	COIN RELAY	MECH. PANEL
	RESET RELAY	MECH. PANEL
	OUTHOLE RELAY	MECH. PANEL
	SUPER RELAY	PLAYFIELD
	SPECIAL RELAY	PLAYFIELD
	EJECT RELAY	PLAYFIELD
Z 28-1150	BALL INDEX RELAY	MECH. PANEL
	SU RELAY	PLAYFIELD
	P RELAY	PLAYFIELD
	ER RELAY	PLAYFIELD
Z 28-1200	SUPER SPECIAL RELAY	PLAYFIELD
Z 29-1250	LOCK RELAY	MECH. PANEL

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!

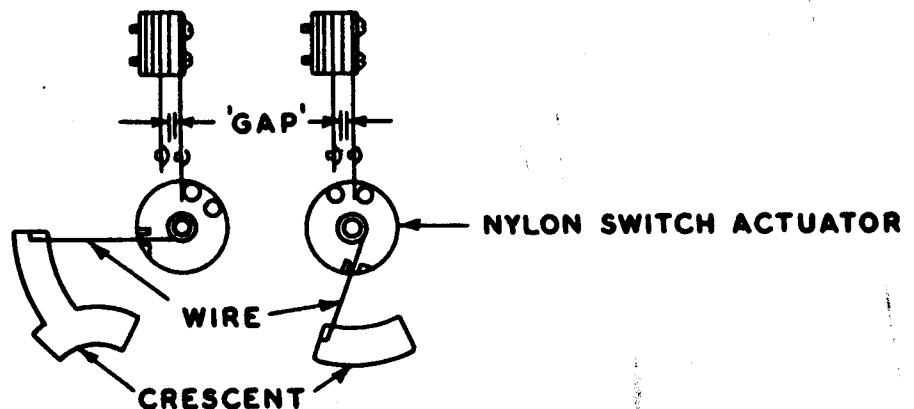
The playboard on this machine has an improved finish with excellent wearing properties. Do not under any circumstances clean the board with water, water soap solutions or harsh abrasives. Avoid such things as steel wool, kitchen cleansers or abrasive hand soap. Water will weaken the adhering of the paint 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 COIN TRIP SWITCH ADJUSTMENT

WIRE SHOULD BE IN CONTACT WITH END OF CRESCENT OPENING WHEN BLADE ADJUSTMENT IS MADE.



Long blade should be in contact with nylon switch actuator and have a maximum overtravel of $1/32$.

or

Using a gram gauge, tension of long blade should not exceed 10 grams.

SWITCH ADJUSTMENT

1. For small coins, such as dimes, adjust short blade so that the 'gap' between the silver contacts is .045 to .055.
2. For larger & heavier coins the 'gap' should be .045 to .060.
3. Do not adjust 'gap' closer than .040.

POWER TRANSFORMER:

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

LEG LEVELERS:

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

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

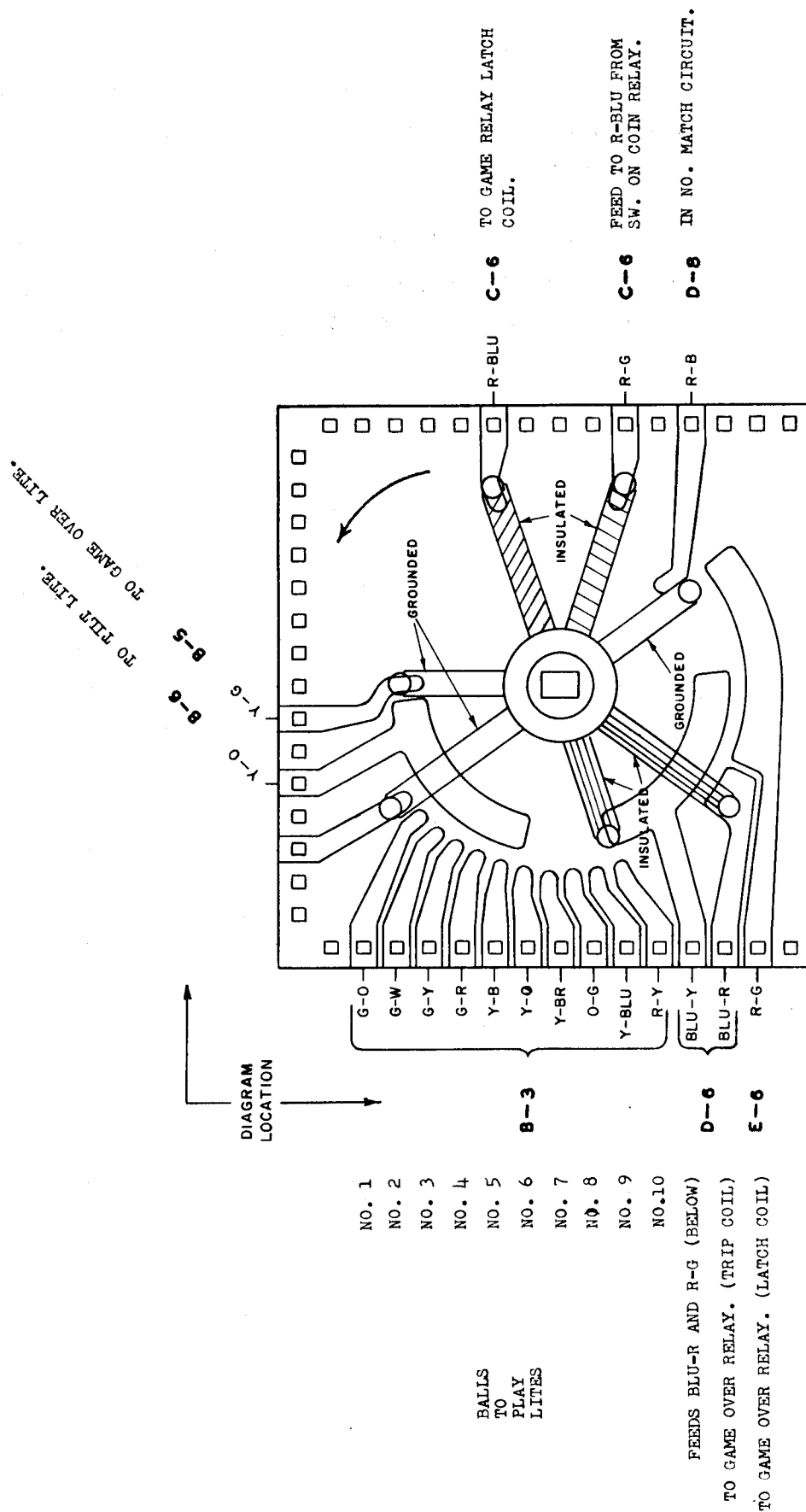
WHEN ORDERING PARTS ALWAYS SPECIFY NAME OF UNIT, GAME AND SERIAL NUMBER, IN ADDITION TO A CLEAR DESCRIPTION OF THE PART AND PART NUMBER IF POSSIBLE.

UNIT NAME	CONTACT DISC	WIPER ASSEMBLY	RATCHET GEAR ASSEMBLY	MOTORS
REPLAY	-----	-----	A-6400	
NO. MATCH	C-6414	B-7456-2	A-6401	
BONUS	C-6417	B-7456 -18	A-6402-21	
BALL COUNT	C-6414	B-7456-3	A-6402-10	SCORE MOTOR
10 POINT	B-7253	A-6294	3C-7272	14A-7883 (60 CYCLE)
100 POINT	-----	-----	3C-7272	14A-7884 (50 CYCLE)
1000 POINT	-----	-----	3C-7272	
10000 POINT	B-7253	A-6294	3C-7272	

BALL COUNT UNIT DISC

DURING RESET CYCLE, THIS UNIT RESETS TO ZERO AND THEN ADVANCES 5 STEPS. DURING PLAY, IT ADVANCES ONE STEP EACH TIME THE "SPECIAL RELAY" OR "SUPER SPECIAL RELAY" IS ENERGIZED. IT ALSO ADVANCES WHEN INDICATED HI-SCORE IS MADE. THESE CIRCUITS PASS THRU THE "REPLAY-ADD A BALL-NOVELTY" ADJUSTMENT JACK.

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



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

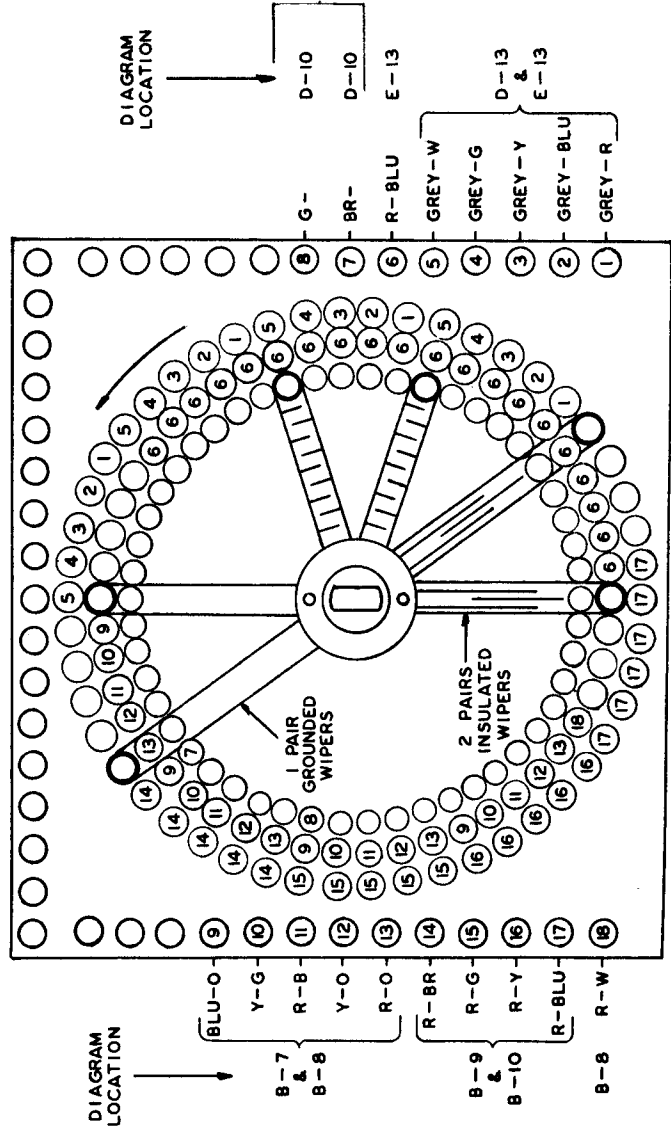
IN NO. MATCH CIRCUIT.
THESE WIRES COME FROM
10 PT. D.U. DISC.



BONUS UNIT DISC

THIS UNIT RESETS TO ZERO, ONE STEP AT A TIME, THRU SWITCH ON EJECT RELAY AND IMPULSE CAM SWITCH C.
IT THEN ADVANCES ONE STEP, THRU CAM SWITCH 6A AND ZERO SWITCH ON BONUS UNIT.
DURING PLAY, IT ADVANCES ONE STEP WHEN ADVANCE RELAY IS PULSED-IT ADVANCES 2, 3 OR 4 STEPS WHEN BLUE STAR RELAY IS ENERGIZED.

View looking at WIPER FINGERS, with WIPER in ZERO position

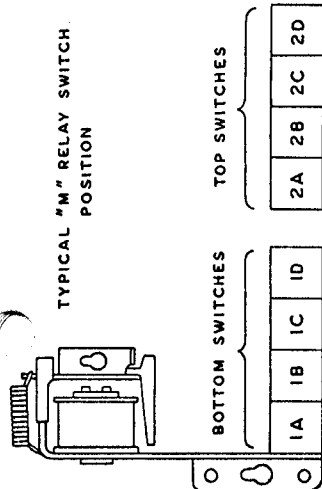


TO #1 ROLLOVER BUTTON LITE.
TO #2 ROLLOVER BUTTON LITE.
TO #3 ROLLOVER BUTTON LITE.
TO #4 ROLLOVER BUTTON LITE.
TO #5 ROLLOVER BUTTON LITE.
TO 5,000 LITE.
TO 10,000 LITE.
TO 15,000 LITE.
TO 20,000 LITE.
TO 1-5 "SPECIAL" LITE.

ENERGIZES SPECIAL RELAY THRU EJECT SWITCH
TO ADVANCE RELAY COIL.
TO #5 ROLLOVER BUTTON SWITCH.
TO #4 ROLLOVER BUTTON SWITCH.
TO #3 ROLLOVER BUTTON SWITCH.
TO #2 ROLLOVER BUTTON SWITCH.
TO #1 ROLLOVER BUTTON SWITCH.

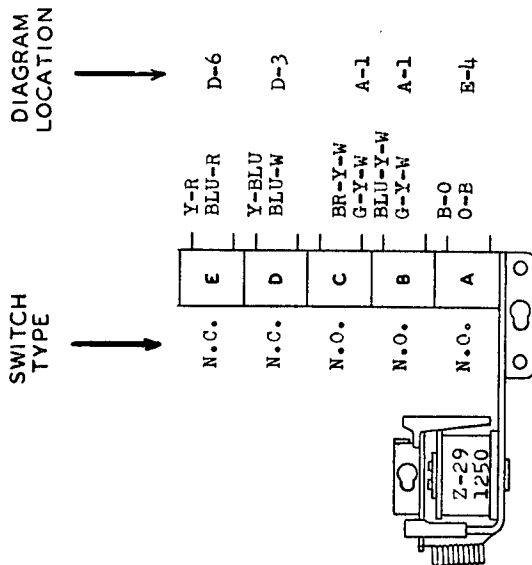
RELAY & SWITCHES

LOCATED ON MECHANISM PANEL



LOCK RELAY

IS ENERGIZED BY 5¢ RELAY, 10¢ RELAY, 25¢ RELAY, COIN RELAY OR LEFT FLIPPER BUTTON SWITCH.



ENERGIZES GAME-OVER RELAY. (TRIP COIL).

IN CIRCUIT TO RESET RELAY.

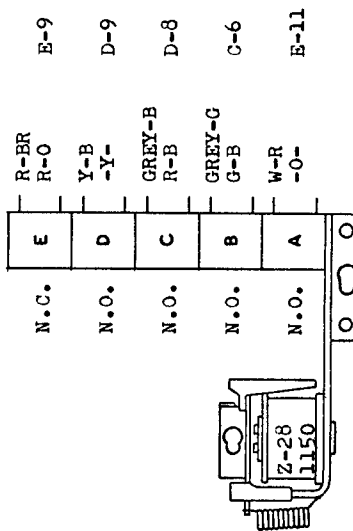
6 VOLTS FROM TRANSFORMER TO LITES.

6 VOLTS FROM TRANSFORMER TO LITES.

IN HOLD CIRCUIT TO THIS RELAY.

BALL INDEX RELAY

IS ENERGIZED BY 100 POINT RELAY---ALSO BY OUTHOLE RELAY, THRU SWITCH ON GAME-OVER RELAY.



ENERGIZES POST RELAY, THRU END-OF-STROKE SWITCH ON CENTER BOTTOM POST UNIT.

ENERGIZES GAME RELAY (TRIP COIL).

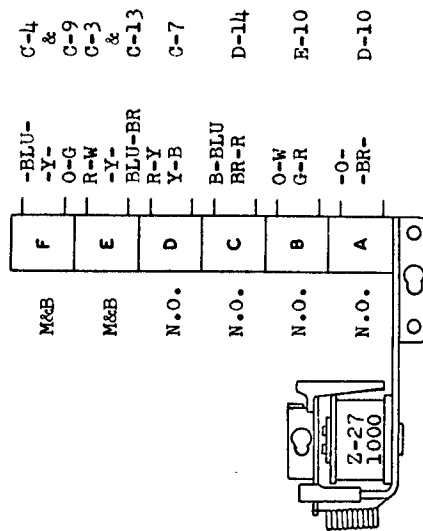
IN SERIES WITH SWITCH B ON OUTHOLE RELAY.

IN CIRCUIT TO BALL COUNT RESET COIL AND GAME-OVER RELAY (TRIP AND LATCH COIL).

IN HOLD CIRCUIT TO THIS RELAY.

EJECT RELAY

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



OPENS IN CIRCUIT TO "CENTER TARGET UP" COIL AND CLOSES TO RUN SCORE MOTOR.

OPENS IN HOLD CIRCUIT TO "SUPER SPECIAL RELAY" AND CLOSES IN CIRCUIT TO RESET RELAY.

IN CIRCUIT TO BALL COUNT UNIT, THRU SWITCH ON "SPECIAL RELAY" OR "SUPER SPECIAL RELAY".

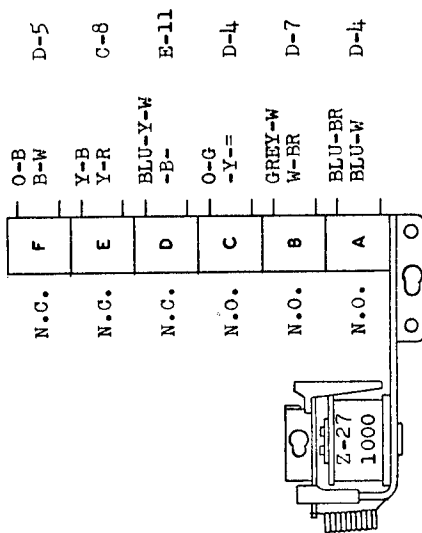
IN CIRCUIT TO PULSE 1,000 POINT RELAY, THRU SWITCH F ON SPECIAL RELAY.

PULSES BONUS UNIT RESET COIL, THRU IMPULSE CAM SWITCH C.

HOLD CIRCUIT TO THIS RELAY, THRU BONUS UNIT ZERO SWITCH OR SCORE MOTOR CAM SWITCH 5B.

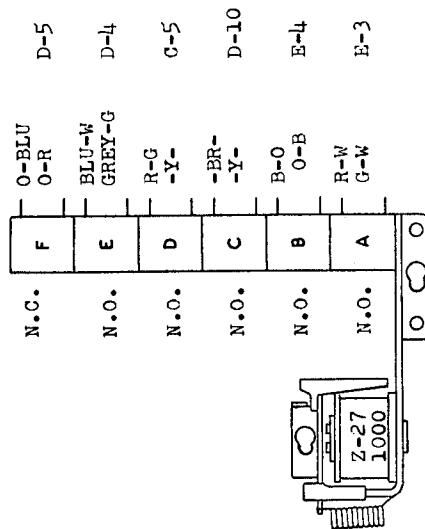
RESET RELAY

IS ENERGIZED BY SWITCH E ON COIN RELAY,
THRU INDEX CAM SWITCH C.



COIN RELAY

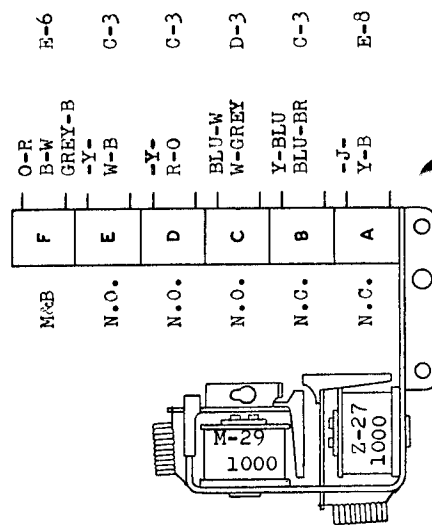
IS ENERGIZED BY COIN SWITCH---ALSO BY
REPLAY BUTTON SWITCH, THRU REPLAY UNIT
ZERO SWITCH.



GAME RELAY

INTERLOCK

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



IN CIRCUIT TO REPLAY UNIT RESET COIL, THRU SWITCH D ON
COIN RELAY.
IN HI-SCORE CIRCUIT TO REPLAY S.U. COIL---ALSO IN SERIES
WITH SWITCH D ON EJECT RELAY.

OPENS CIRCUITS TO PLAYFIELD SWITCHES.

RUNS SCORE MOTOR.

PULSES "SCORE RESET RELAY", THRU IMPULSE CAM SWITCH D.

IN HOLD CIRCUIT TO THIS RELAY.

OPENS CIRCUIT TO KNOCKER COIL.

ENERGIZES RESET RELAY AT SCORE MOTOR INDEX CAM SWITCH C.

IN CIRCUIT TO LATCH COILS ON GAME RELAY & GAME-OVER RELAY;
ALSO TO BALL COUNT UNIT S.U. & RESET COILS.

ENERGIZES EJECT RELAY.

ENERGIZES LOCK RELAY.

IN HOLD CIRCUIT TO THIS RELAY.

OPENS IN CIRCUIT TO BALL COUNT S.U. COIL AND CLOSES TO
BALL COUNT RESET COIL.

IN HOLD CIRCUIT TO COIN RELAY, THRU 3-5 BALL ADJUSTMENT
JACK.

IN HOLD CIRCUIT TO COIN RELAY, THRU 3-5 BALL ADJUSTMENT JACK.

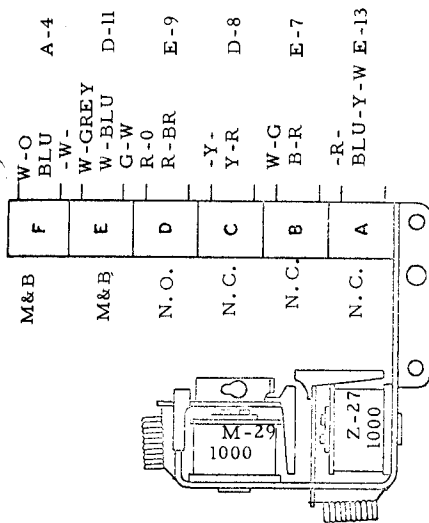
IN CIRCUIT TO COIN RELAY, THRU REPLAY BUTTON SWITCH.

IN SERIES WITH SWITCH D ON LOCK RELAY.

IN CIRCUIT TO TRIP COIL ON THIS RELAY.

GAME OVER RELAY INTERLOCK

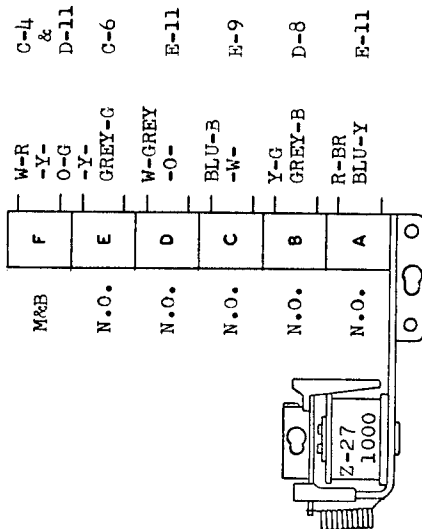
LATCH COIL IS ENERGIZED BY SWITCH D ON COIN RELAY---ALSO BY SERIES CIRCUIT THRU OUTHOLE RELAY, BALL INDEX RELAY AND BALL COUNT UNIT DISC.
TRIP COIL IS ENERGIZED BY LOCK RELAY OR TILT SWITCHES---ALSO BY SERIES CIRCUIT THRU OUTHOLE RELAY, BALL INDEX RELAY AND BALL COUNT UNIT DISC (ZERO AND FIRST POSITIONS).



OPENS IN CIRCUIT TO POST LITES AND CLOSSES TO TILT, GAME-OVER AND NUMBER MATCH LITES.
OPENS IN CIRCUIT TO OUTHOLE RELAY, AND CLOSSES IN CIRCUIT TO BALL INDEX RELAY.
ENERGIZES POST RELAY.
OPENS IN "HI-SCORE" & "SPECIAL" CIRCUITS TO REPLAY S.U.
OPENS "HI-SCORE" AND "NUMBER MATCH" CIRCUITS.
OPENS CIRCUITS TO MOST PLAYFIELD SWITCHES.

OUTHOLE RELAY

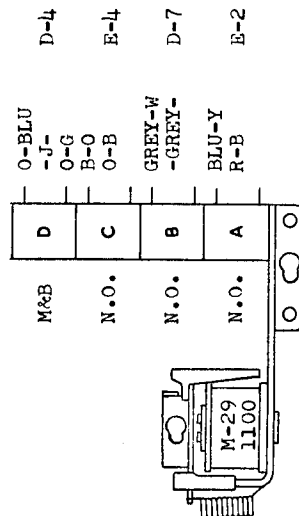
IS ENERGIZED BY OUTHOLE SWITCH, THRU BALL COUNT ZERO SWITCH OR GAME-OVER RELAY.



OPENS IN HOLD CIRCUIT TO BALL INDEX RELAY AND CLOSSES TO RUN SCORE MOTOR.
ENERGIZES BALL RELEASE COIL AT SCORE MOTOR CAM SWITCH 4A.
ENERGIZES BALL INDEX RELAY, THRU SWITCH ON GAME-OVER RELAY.
ENERGIZES LEFT AND RIGHT DOWN POST COILS, THRU LONG DWELL CAM SWITCH ON SCORE MOTOR.
IN NUMBER MATCH CIRCUIT TO REPLAY UNIT S.U. COIL.
IN HOLD CIRCUIT TO THIS RELAY.

10¢ RELAY

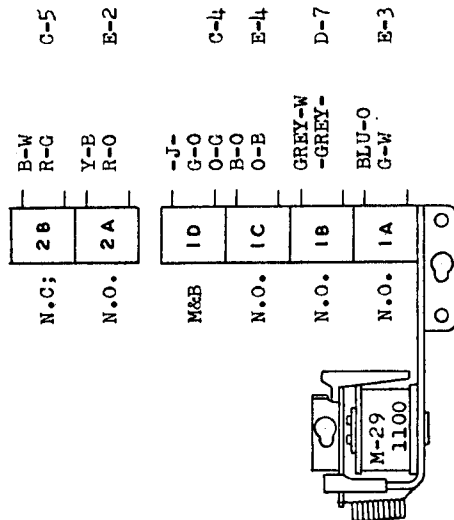
IS ENERGIZED BY 10¢ COIN SWITCH, IF 10¢ ADJUSTMENT JACK IS IN "2 PLAYS" OR "3 PLAYS" POSITION.



OPENS IN CIRCUIT TO KNOCKER COIL AND CLOSSES TO RUN SCORE MOTOR.
ENERGIZES LOCK RELAY.
PULSES REPLAY S.U. COIL, THRU IMPULSE CAM SWITCH D.
IN HOLD CIRCUIT TO THIS RELAY.

25¢ RELAY

IS ENERGIZED BY 25¢ COIN SWITCH.



IN SERIES WITH SWITCH F ON RESET RELAY.

IN HOLD CIRCUIT TO THIS RELAY.

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

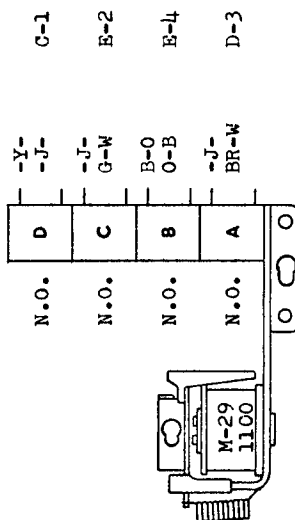
ENERGIZES LOCK RELAY.

PULSES REPLAY S.U. COIL, THRU IMPULSE CAM SWITCH D.

ENERGIZES COIN RELAY, IF 25¢ ADJUSTMENT JACK IS IN "6 PLAYS" POSITION.

5¢ RELAY

IS ENERGIZED BY 5¢ COIN SWITCH IF 5¢ ADJUSTMENT JACK IS IN "2 COINS FOR 1 PLAY" POSITION.



ENERGIZES ALTERNATOR UNIT COIL.

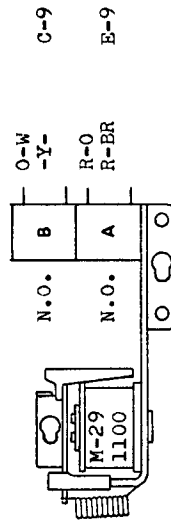
ENERGIZES COIN RELAY, THRU SWITCH ON ALTERNATOR UNIT.

ENERGIZES LOCK RELAY.

HOLD CIRCUIT TO THIS RELAY, THRU END-OF-STROKE SWITCH ON ALTERNATOR UNIT.

POST RELAY

IS ENERGIZED BY BALL INDEX RELAY, GAME-OVER RELAY, OR "DOWN POST ROLLOVER BUT-TON" SWITCH.

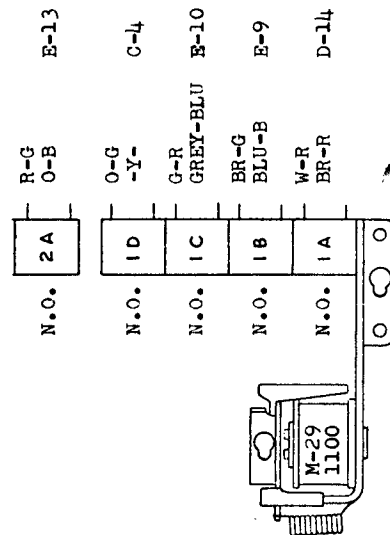


ENERGIZES "CENTER DOWN POST" COIL.

HOLD CIRCUIT TO THIS RELAY, THRU END-OF-STROKE SWITCH ON CENTER BOTTOM POST.

BLUE STAR RELAY

IS ENERGIZED BY (2) "BLUE STAR TARGET" SWITCHES.



HOLD CIRCUIT TO THIS RELAY, THRU "BLUE STAR ADVANCE ADJUSTMENT JACK".

RUNS SCORE MOTOR.

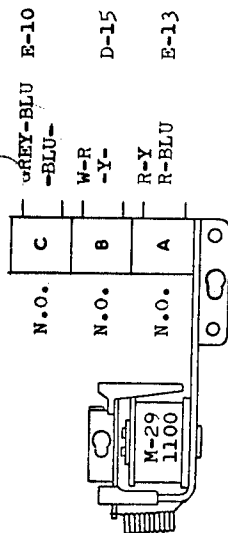
PULSES BONUS UNIT S.U. COIL, THRU IMPULSE CAM SWITCH C.

IN CIRCUIT TO LEFT & RIGHT "DOWN POST" COILS.

PULSES 100 POINT RELAY, THRU IMPULSE CAM SWITCH B.

ADVANCE RELAY

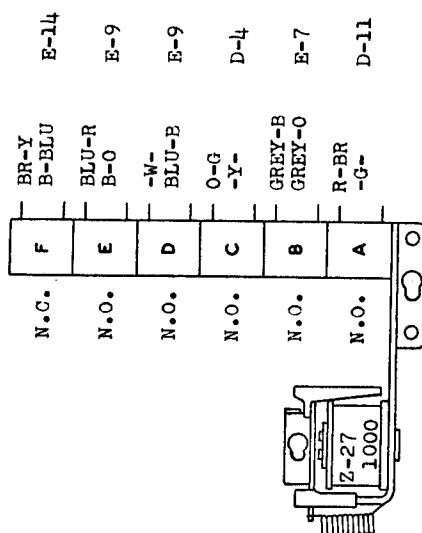
IS ENERGIZED BY NO. 1, 2, 3, 4 OR 5 ROLLOVER BUTTON SWITCHES, THRU BONUS UNIT DISC.



ENERGIZES BONUS UNIT S.U. COIL.
PULSES 100 POINT RELAY.
HOLD CIRCUIT TO THIS RELAY, THRU END-OF-STROKE SWITCH ON BONUS UNIT.

SPECIAL RELAY

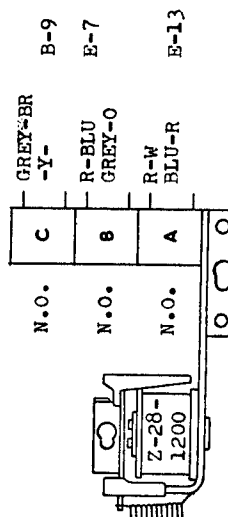
IS ENERGIZED BY EJECT SWITCH, THRU BONUS UNIT DISC (21st POSITION). ALSO BY CAM SWITCH 6B, THRU BONUS UNIT ZERO SWITCH.



IN CIRCUIT TO 1,000 POINT RELAY.
ENERGIZES "CENTER TARGET UP" COIL, THRU SCORE MOTOR LONG DWELL CAM SW. A AND SWITCH F ON EJECT RELAY.
ENERGIZES L & R "DOWN POST" COILS, THRU LONG DWELL CAM SW. B AND SWITCH F ON EJECT RELAY.
RUNS SCORE MOTOR.
ENERGIZES BALL COUNT S.U. COIL, THRU CAM SWITCH 3A AND SWITCH D ON EJECT RELAY.
IN HOLD CIRCUIT TO THIS RELAY.

SUPER SPECIAL RELAY

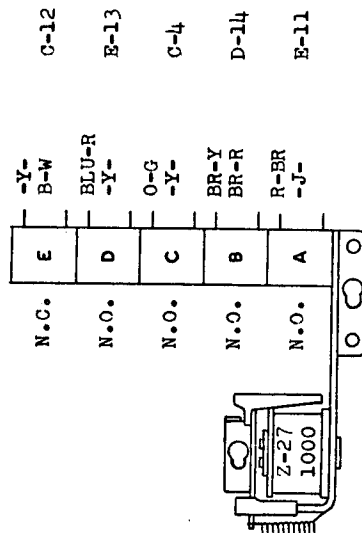
IS ENERGIZED BY SWITCH D ON SUPER RELAY.



TO "SUPER SPECIAL" LITE.
ENERGIZES BALL COUNT S.U. COIL, THRU CAM SWITCH 1B AND SWITCH D ON EJECT RELAY.
IN HOLD CIRCUIT TO THIS RELAY.

SUPER RELAY

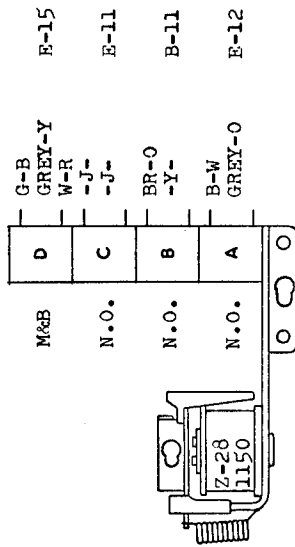
IS ENERGIZED BY SERIES CIRCUIT THRU "SU" RELAY, "P" RELAY AND "ER" RELAY.



IN HOLD CIRCUITS TO "SU", "P" AND "ER" RELAYS.
ENERGIZES "SUPER SPECIAL" RELAY.
RUNS SCORE MOTOR.
PULSES 1,000 POINT RELAY, THRU IMPULSE CAM SWITCH B.
IN HOLD CIRCUIT TO THIS RELAY.

-ER- RELAY

IS ENERGIZED BY 'ER' ROLLOVER SWITCH.
ALSO BY 'SU' ROLLOVER SWITCH, THRU
LIBERAL-CONSERVATIVE ADJUSTMENT JACK.



OPENS IN CIRCUIT TO 10 POINT RELAY AND CLOSSES TO 100 POINT RELAY, THRU RIGHT JET BUMPER SWITCH.

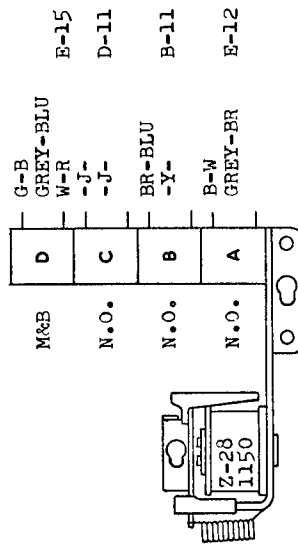
IN SERIES CIRCUIT TO ENERGIZE SUPER RELAY. (SEE SWITCH C ON "SU" RELAY).

TO "ER" LITE AND RIGHT JET BUMPER LITE.

IN SERIES WITH SWITCH E ON SUPER RELAY.

-P- RELAY

IS ENERGIZED BY 'P' ROLLOVER SWITCH.



OPENS IN CIRCUIT TO 10 POINT RELAY AND CLOSSES TO 100 POINT RELAY, THRU CENTER TOP JET BUMPER SWITCH.

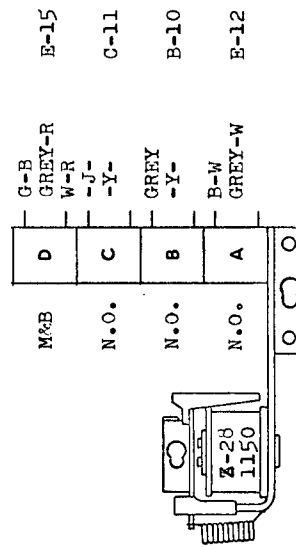
IN SERIES WITH SWITCH C ON "ER" RELAY.

TO "P" LITE AND CENTER TOP JET BUMPER LITE.

IN SERIES WITH SWITCH E ON SUPER RELAY.

-SU- RELAY

IS ENERGIZED BY 'SU' ROLLOVER SWITCH.
ALSO BY 'ER' ROLLOVER SWITCH, THRU
LIBERAL-CONSERVATIVE ADJUSTMENT JACK.



OPENS IN CIRCUIT TO 10 POINT RELAY AND CLOSSES TO 100 POINT RELAY, THRU LEFT JET BUMPER SWITCH.

IN SERIES WITH SWITCH C ON "P" RELAY.

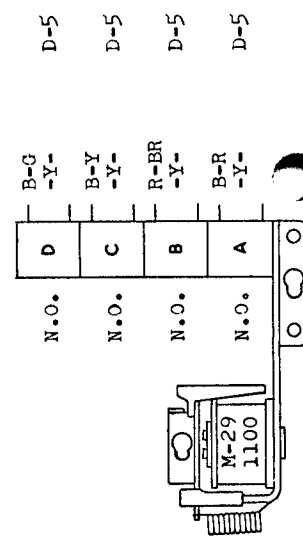
TO "SU" LITE AND LEFT JET BUMPER LITE.

IN SERIES WITH SWITCH E ON SUPER RELAY.

SCORE RESET RELAY

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

LOCATED IN BACKBOX



PULSES 10,000 POINT DRUM UNIT, THRU ZERO SWITCH ON THAT UNIT.

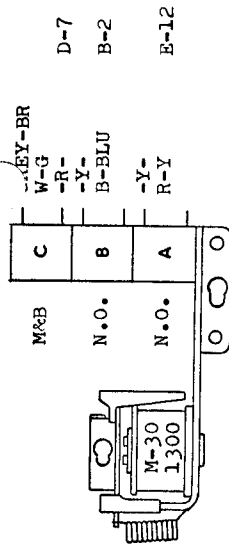
PULSES 1,000 POINT DRUM UNIT, THRU ZERO SWITCH ON THAT UNIT.

PULSES 100 POINT DRUM UNIT, THRU ZERO SWITCH ON THAT UNIT.

PULSES 10 POINT DRUM UNIT, THRU ZERO SWITCH ON THAT UNIT.

100,000 RELAY

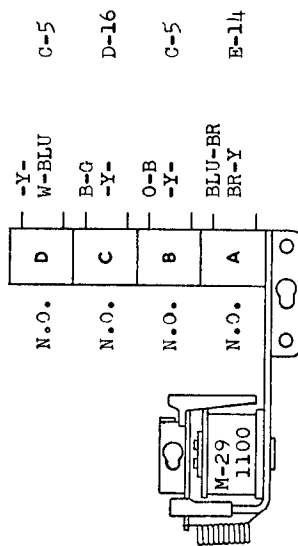
IS ENERGIZED BY END-OF-STROKE SWITCH ON 10,000 POINT DRUM UNIT, THRU 9TH POSITION SWITCH ON SAME UNIT.



IN HI-SCORE CIRCUITS TO ENERGIZE REPLAY S.U. OR BALL COUNT S.U.
TO 100,000 LITE.
HOLD CIRCUIT TO THIS RELAY.

1000 POINT RELAY

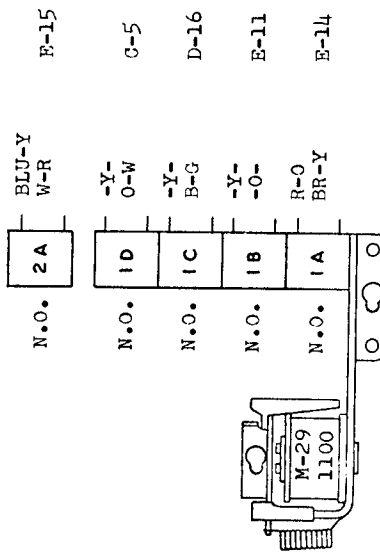
IS PULSED BY SUPER RELAY, (2) BOTTOM ROLLOVER SWITCHES OR CENTER DROP TARGET SWITCHES.
IT IS ALSO PULSED BY EJECT RELAY, THRU SWITCH ON SPECIAL RELAY.



PULSES 10,000 POINT DRUM UNIT, THRU 9TH POSITION SWITCH ON 1,000 POINT DRUM UNIT.
ENERGIZES CHIME COIL.
PULSES 1,000 POINT DRUM UNIT.
IN HOLD CIRCUIT TO THIS RELAY.

100 POINT RELAY

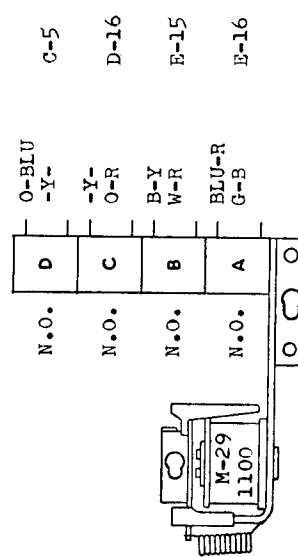
IS PULSED BY:
A. (3) TOP ROLLOVER SWITCHES.
B. (2) TOP RED STAR TARGET SWITCHES.
C. ADVANCE RELAY.
D. CENTER BOTTOM JET BUMPER SWITCH.
E. LEFT JET BUMPER SWITCH, THRU 'SU' RELAY.
F. CENTER TOP JET BUMPER SW., THRU 'P' RELAY.
G. RIGHT JET BUMPER SW., THRU 'ER' RELAY.
H. BLUE STAR RELAY, THRU IMPULSE CAM SW.B.



IN HOLD CIRCUIT TO THIS RELAY.
PULSES 100 POINT DRUM UNIT.
ENERGIZES CHIME COIL.
ENERGIZES BALL INDEX RELAY.
PULSES 1,000 POINT RELAY, THRU 9TH POSITION SWITCH ON 100 POINT DRUM UNIT.

10 POINT RELAY

IS PULSED BY STAND-UP SWITCHES, KICKER SWITCHES AND SAME AS E, F AND G ON 100 POINT RELAY.



PULSES 10 POINT DRUM UNIT.
ENERGIZES NUMBER MATCH UNIT S.U. COIL.
PULSES 100 POINT RELAY, THRU 9TH POSITION SWITCH ON 100 POINT DRUM UNIT.
IN HOLD CIRCUIT TO THIS RELAY.