

1-2-13-24-25

Bally®

Silver Sails

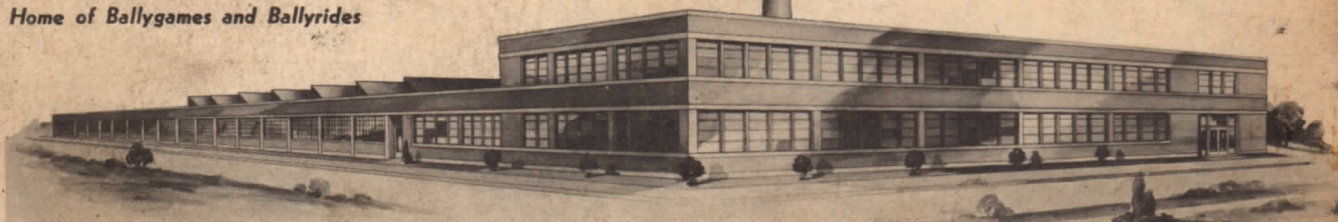
OPERATING INSTRUCTIONS AND PARTS CATALOG

Part Numbers are marked on illustrations
and a list of miscellaneous parts appears
on back cover.

**FOR QUICKEST SERVICE
STATE CORRECT PART NUMBER
WHEN ORDERING PARTS**

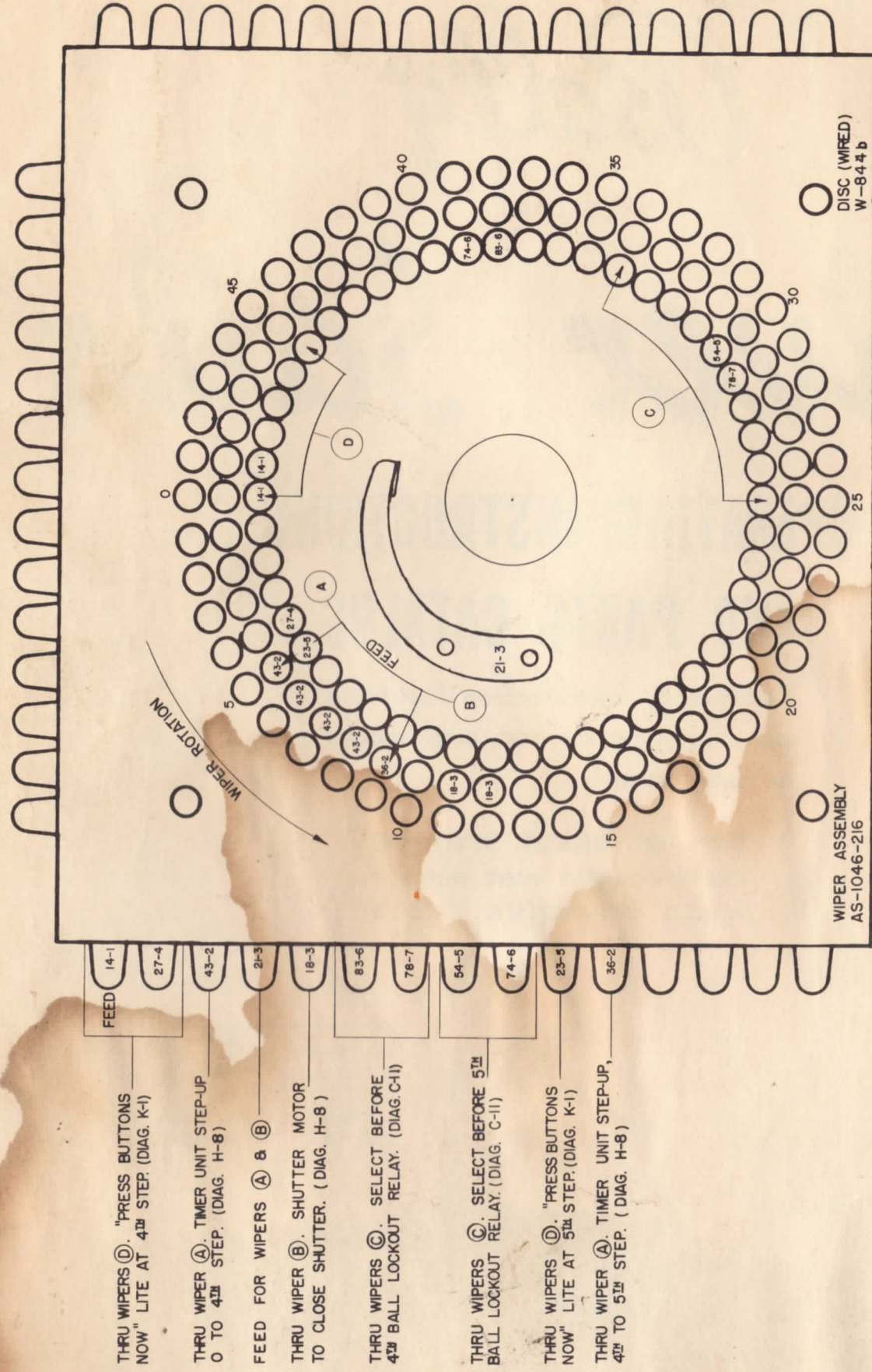
Code	
N.C. ---	Normally closed
N.O. ---	Normally open
M.B.B. ---	Make before break
S.P.D.T. ---	Single pole double throw

Home of Ballygames and Ballyrides



TIMER UNIT viewed from **BUTTON** or **WIPER** side

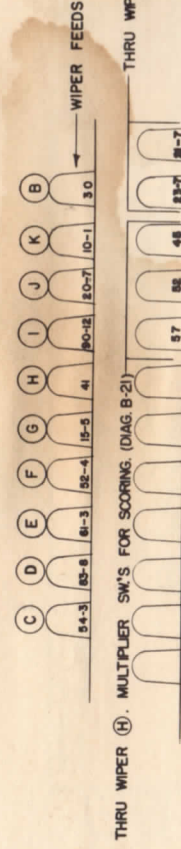
8 step unit. Wipers shown in zero or reset position



COMPLETE UNIT ---- AS-1110-29
 RESET COIL 28-R-15
 STEP-UP COIL 25-GG-7
 STEP-UP PLUNGER ---- S-496-100
 STEP-UP ARM ---- A-1765-4
 RATCHET & SHAFT ---- C-1050-8-43

YELLOW SCORE UNIT viewed from **BUTTON** or **WIPER** side

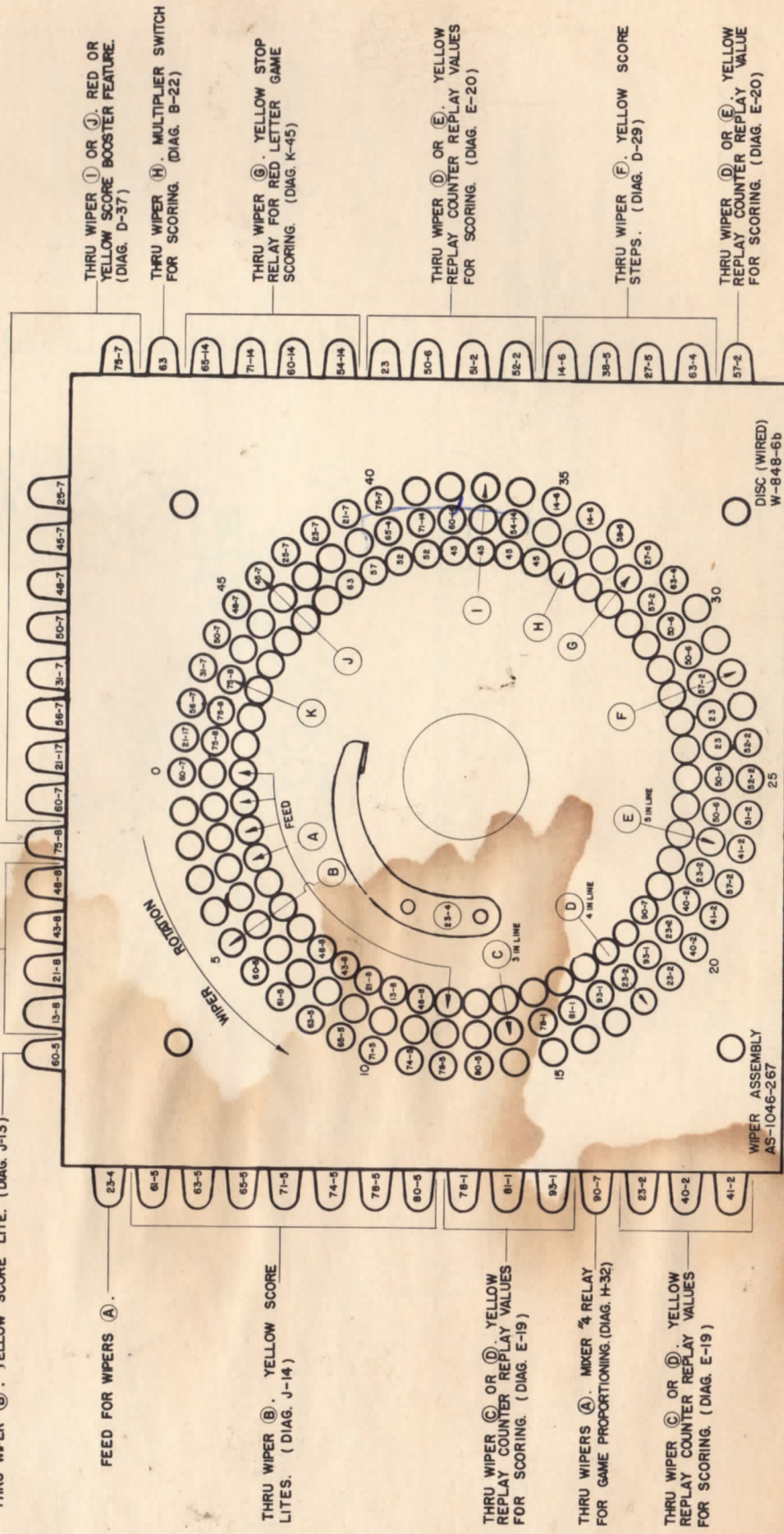
8 step unit. Wipers shown in zero or reset position



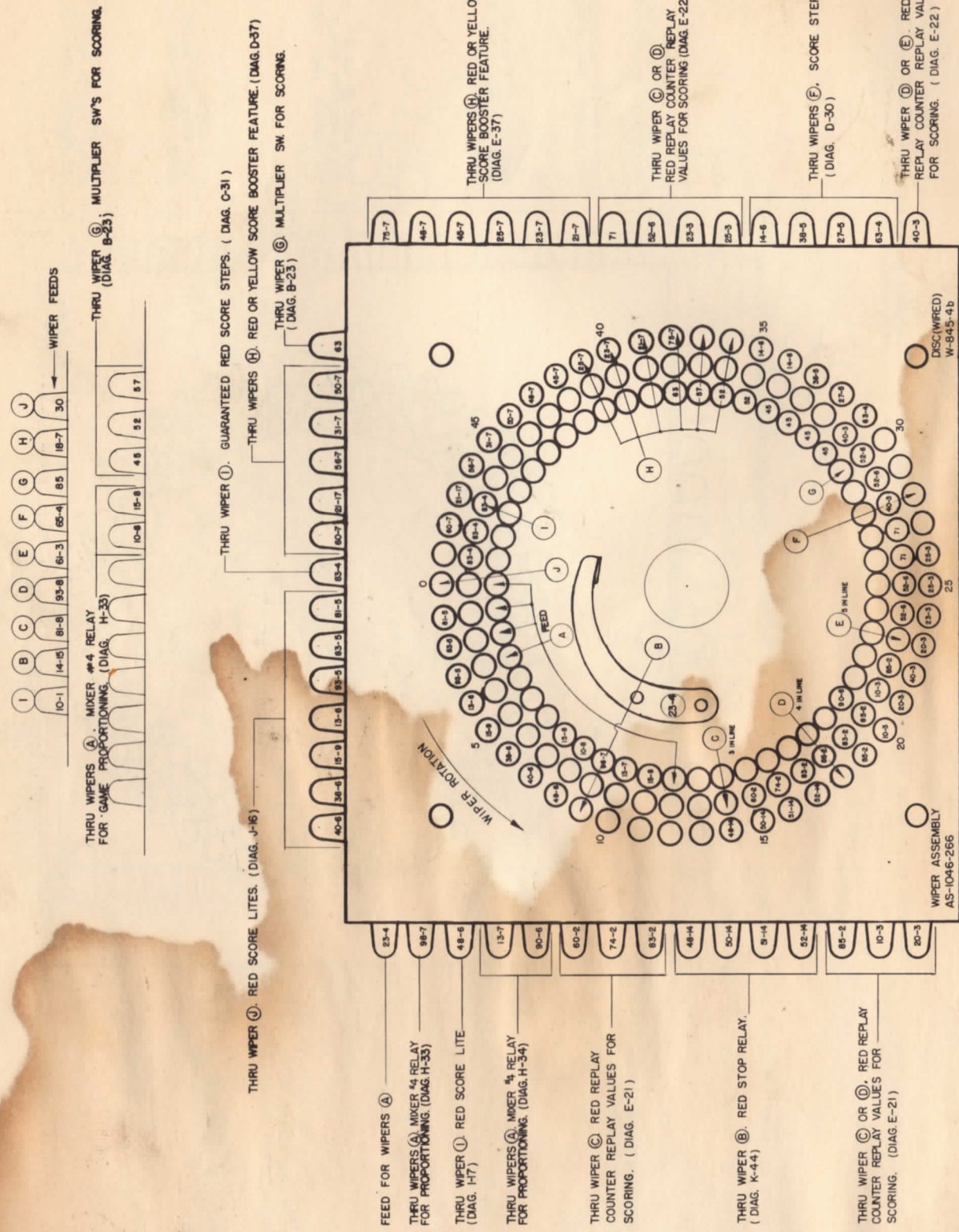
THRU WIPERS (A). MIXER $\frac{1}{4}$ RELAY FOR GAME PROPORTIONING. (DIAG. H-32)

THRU WIPER (B). YELLOW SCORE LITE. (DIAG. J-13)

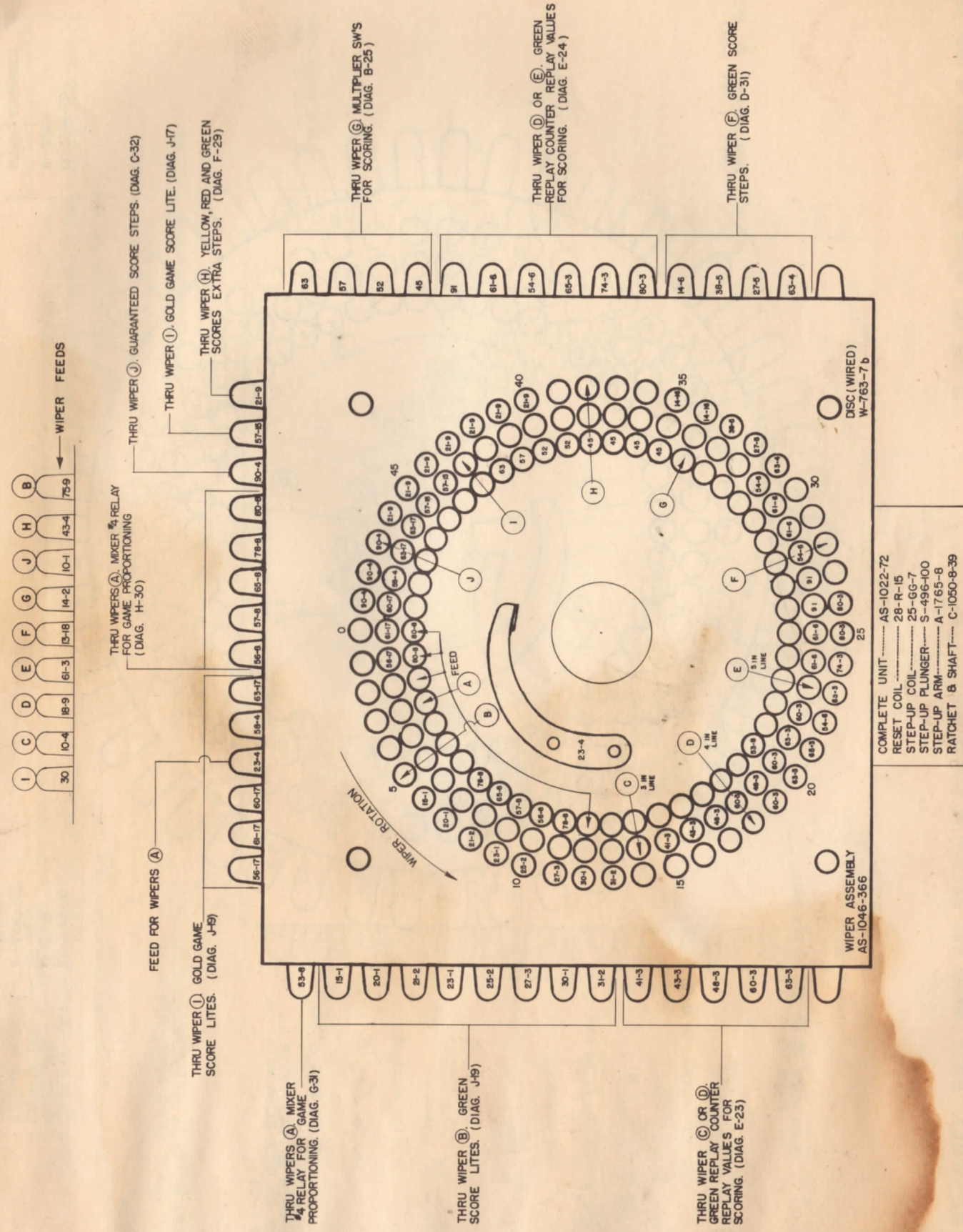
THRU WIPER (K). GUARANTEED YELLOW SCORE STEPS. (DIAG. C-29)

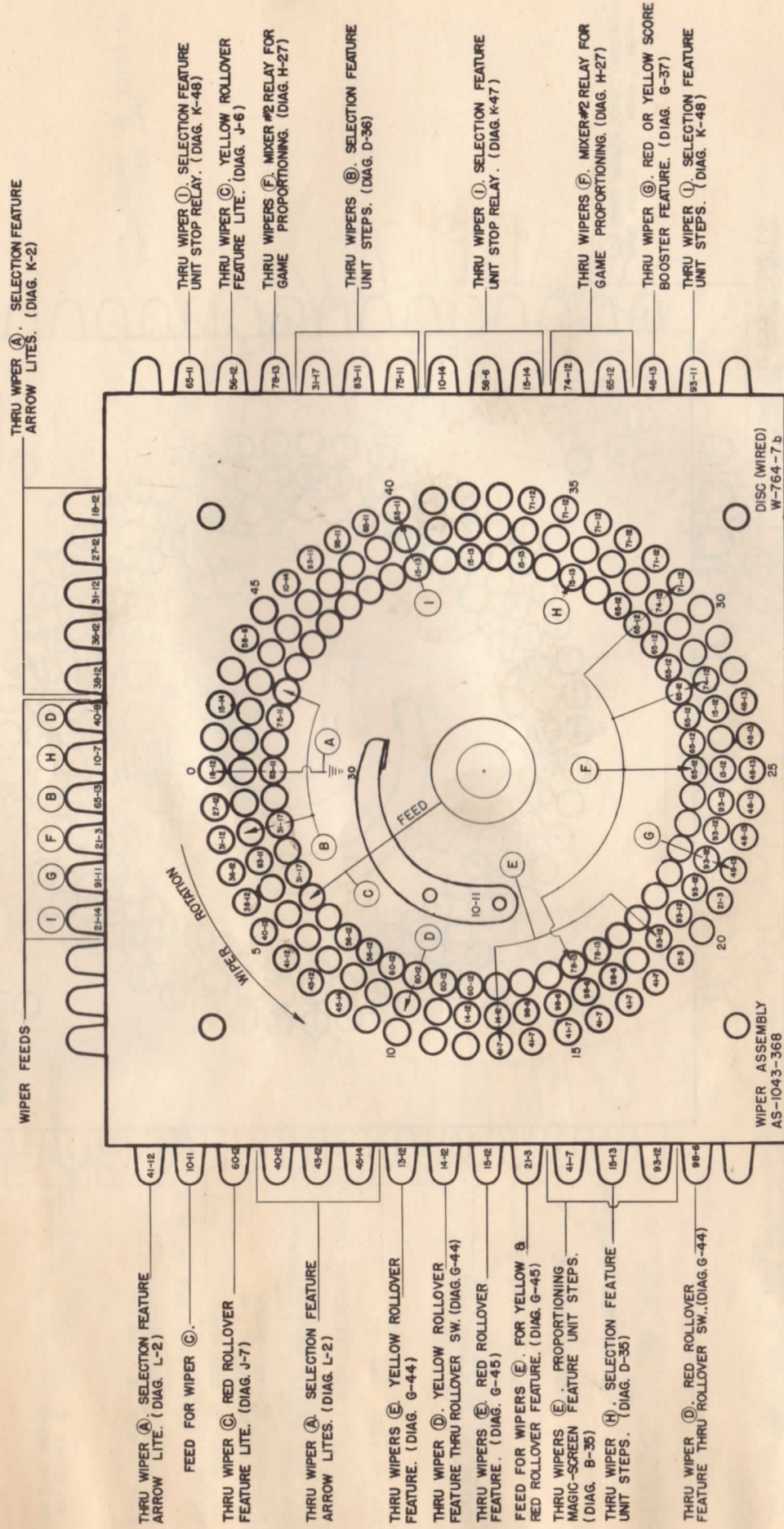


COMPLETE UNIT ---- AS-1022-73
 RESET COIL 28-R-15
 STEP-UP COIL 25-GG-7
 STEP-UP PLUNGER ---- S-496-100
 STEP-UP ARM ---- A-1765-8
 RATCHET & SHAFT ---- C-1050-8-39



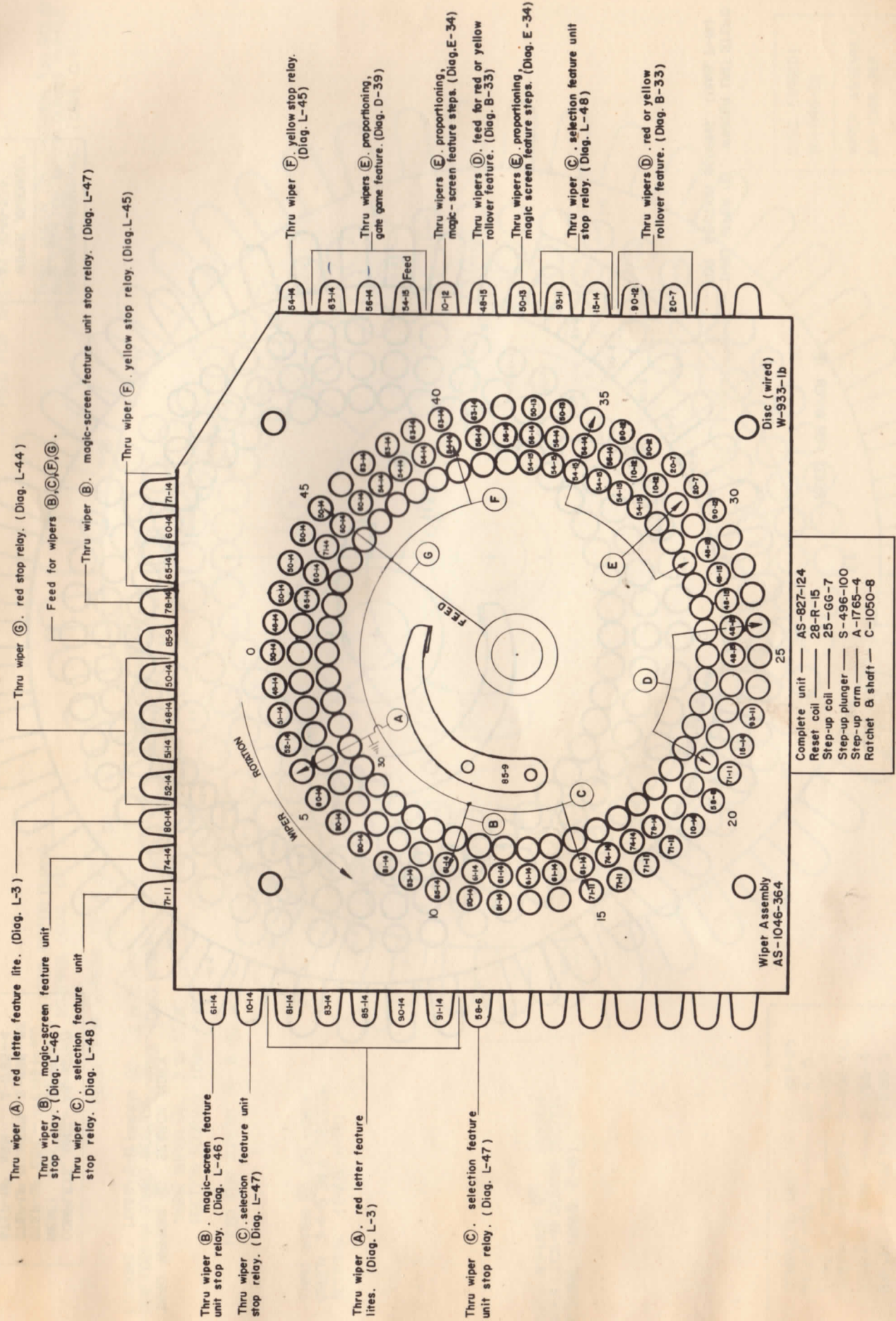
GREEN SCORE UNIT viewed from BUTTON or WIPER side

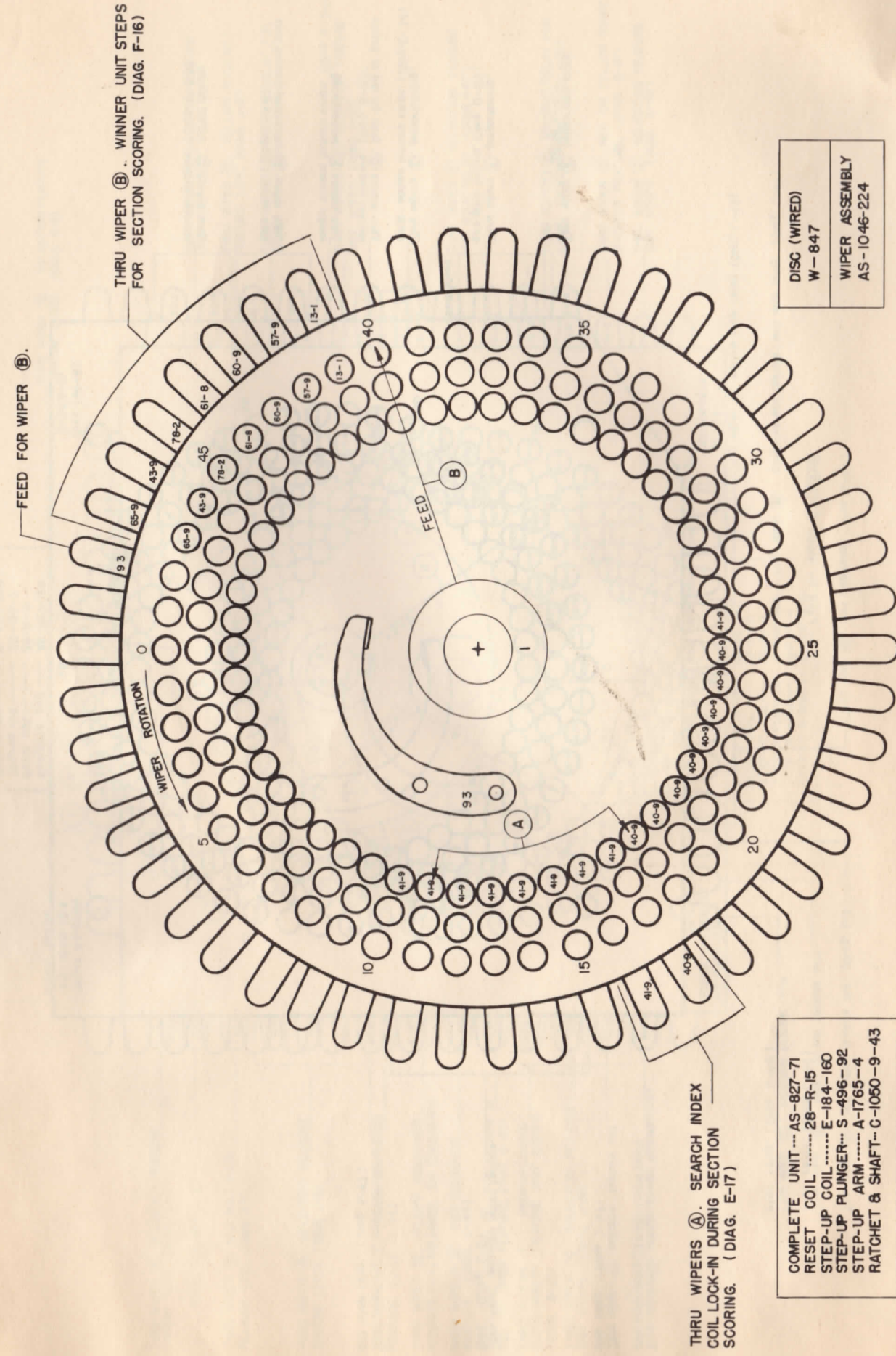




RED LETTER FEATURE UNIT viewed from BUTTON or WIPER side

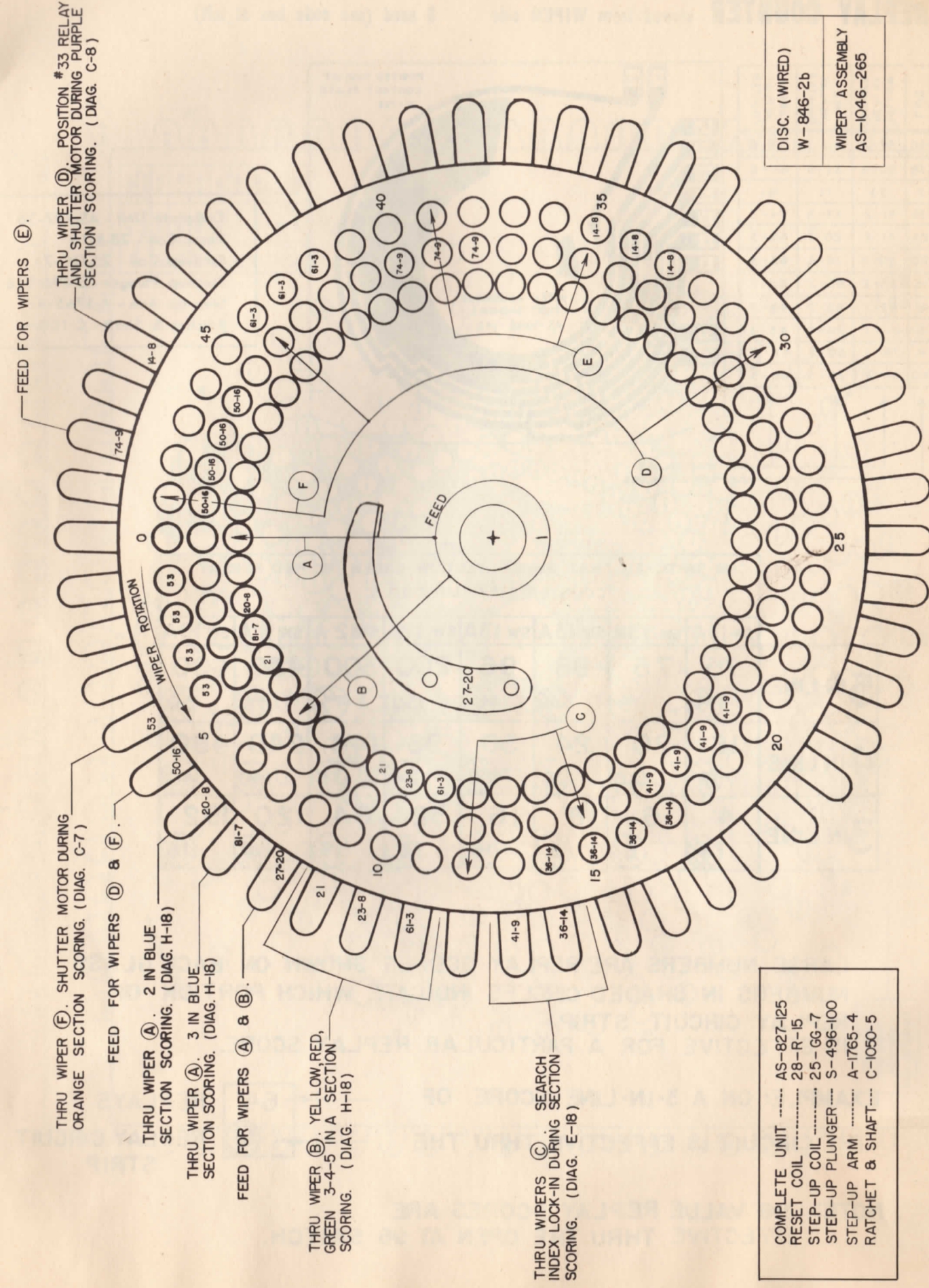
8 step unit. Wipers shown in zero or reset position





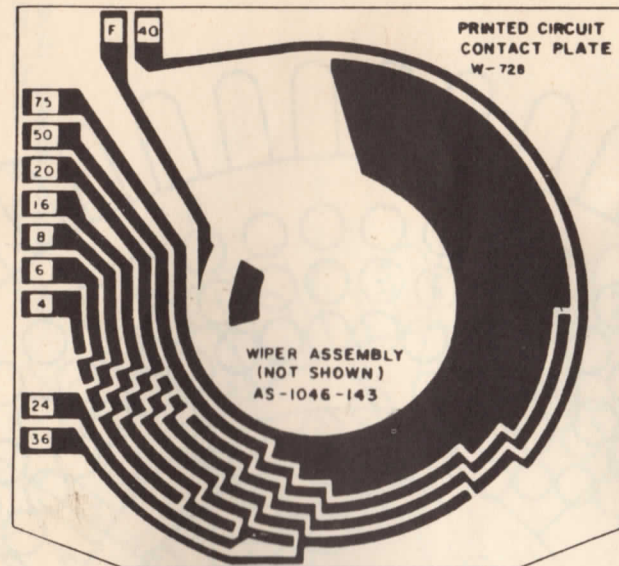
WINNER UNIT viewed from **BUTTON** or **WIPER** side

5 step unit. Wipers shown in zero or reset position



REPLAY COUNTER viewed from WIPER side 3 used (see code box at left)

LUG	YELLOW REPLAY COUNTER	RED REPLAY COUNTER	GREEN REPLAY COUNTER
50	57-2	40-3	54-6
75	50-6	52-6	61-6
F	23	71	91
36	51-2	23-3	74-3
24	41-2	20-3	65-3
20	40-2	10-3	63-3
16	23-2	85-2	60-3
8	93-1	83-2	48-3
6	81-1	74-2	43-3
4	78-1	60-2	41-3
40	52-2	25-3	80-3



WIRE COLORS
REPLAY VALUES

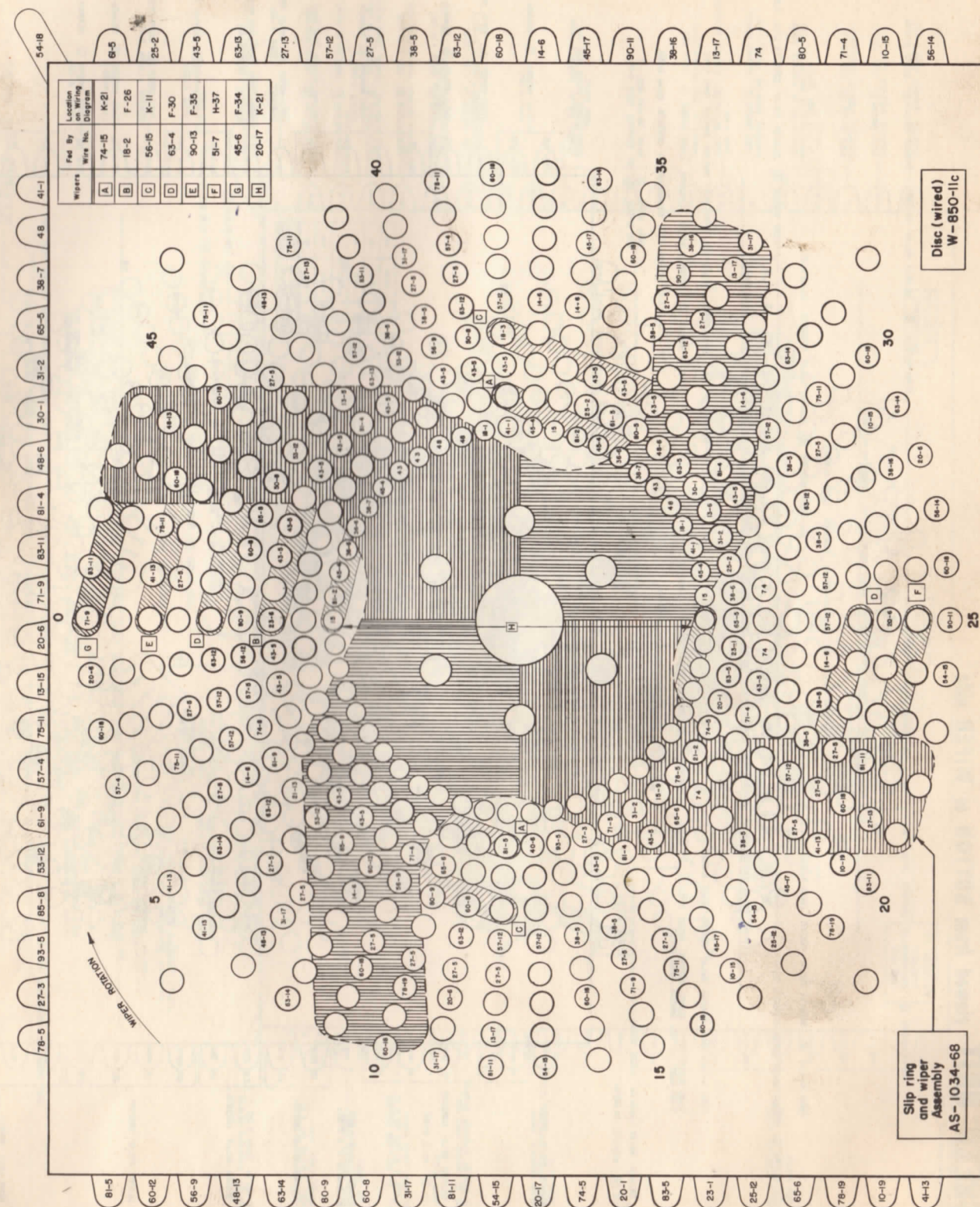
CAM SWITCHES THAT PULSE YELLOW, GREEN & RED REPLAY COUNTER STEP-UP COILS								
	SW 13A	SW 13A	SW 13A	SW 13A	SW 12A	SW 12 A	SW 11 A	SW 10A
5 IN LINE	75 	75 	96 	96 	200 	300 	450 	600 
4 IN LINE	16 	20 	24 	50 	96 	144 	240 	480 
3 IN LINE	4 	6 	8 	16 	32 	64 	120 	192 

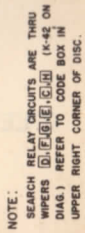
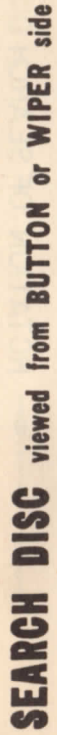
LARGE NUMBERS ARE REPLAY SCORES SHOWN ON BACK GLASS.
NUMBERS IN SHADED CIRCLES INDICATE WHICH PORTION OF
REPLAY CIRCUIT STRIP
IS EFFECTIVE FOR A PARTICULAR REPLAY SCORE.

EXAMPLE: ON A 3-IN-LINE SCORE OF REPLAYS
THE CIRCUIT IS EFFECTIVE THRU THE REPLAY CIRCUIT
STRIP

NOTE: 96 VALUE REPLAY SCORES ARE
EFFECTIVE THRU THE OPEN AT 96 SWITCH.

SPOTTING DISC viewed from BUTTON or WIPER side

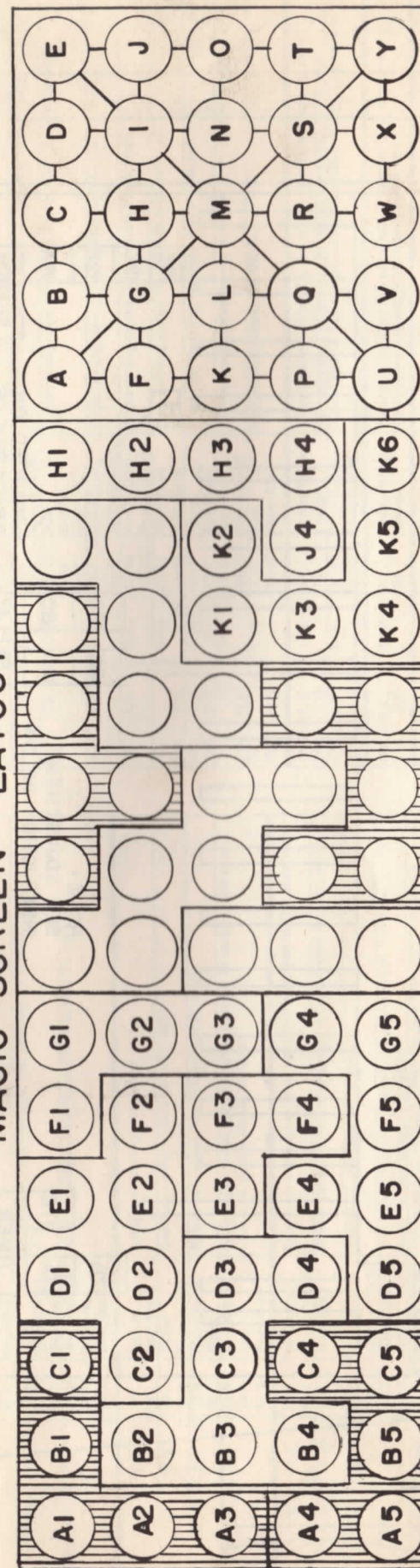


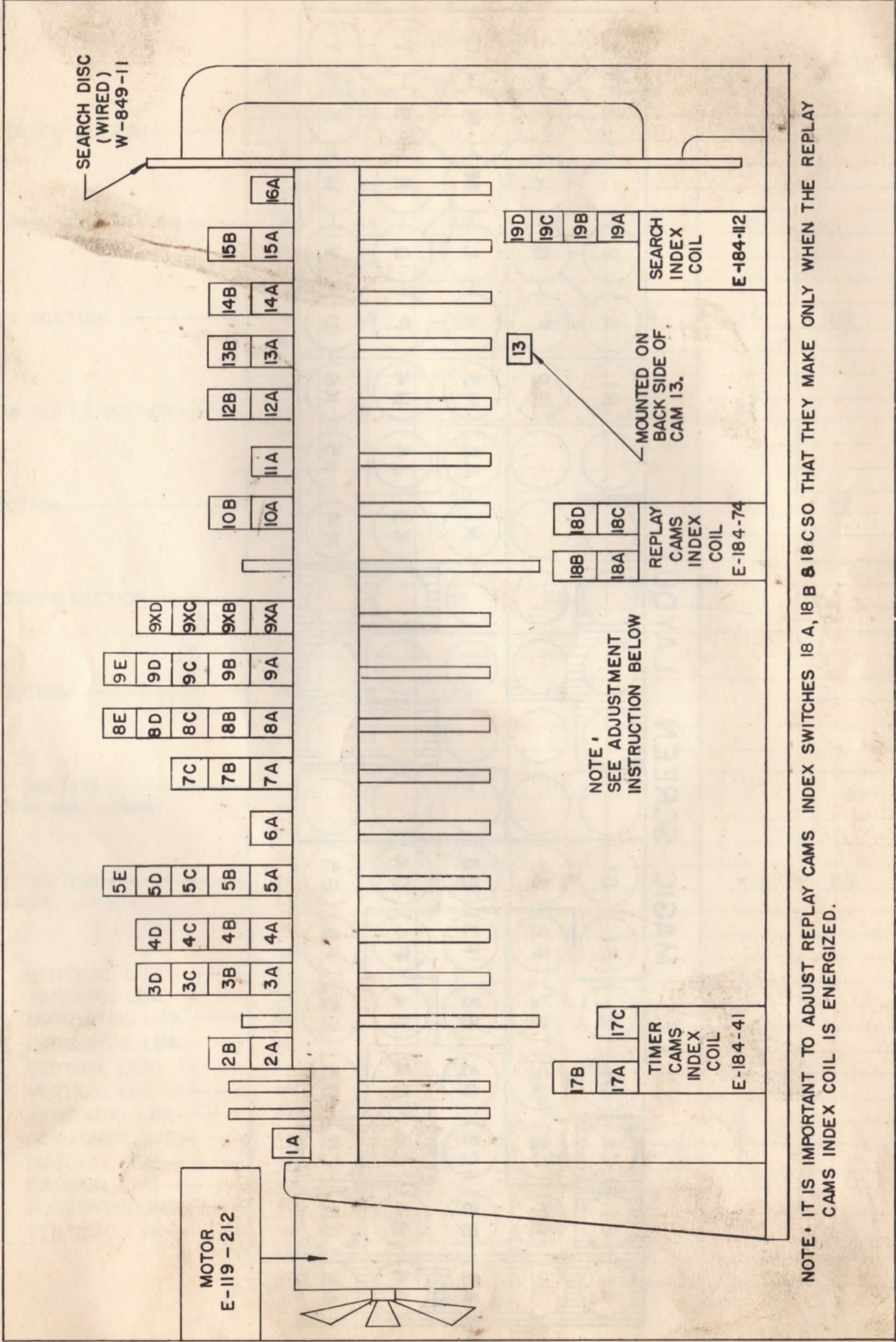


SEARCH POSITIONS CHART							
	RED WIPER AT POSITION	WIPER [D] ROW 4 SEARCH RE. # 1	WIPER [F] ROW 6 SEARCH RE. # 2	WIPER [G] ROW 8 SEARCH RE. # 3	WIPER [E] ROW 5 SEARCH RE. # 4	WIPER [C] ROW 2 SEARCH RE. # 5	WIPER [H] ROW 7 SEARCH RE. # 6
6 NO. GREEN SECTION	1	B2	B3	B4	C3	D3	D4
	2						
	3						
	4						
RED SUPER SECTION	5	A4	A5	B5	C4	C5	
	6						
	7						
	8						
YELLOW SECTION	9	D5	E4	E5	F5	G4	G5
	10						
	11						
	12						
YELLOW SUPER SECTION	13	A1	B1	C1	A2	A3	
	14						
	15						
	16						
RED SECTION	17	D1	E1	C2	D2	E2	F2
	18						
	19						
	20						
4 NO. GREEN SECTION	21	F1	G1	G2	G3		
	22						
	23						
	24						
BLUE SECTION	25	E3	F3	F4			
	26						
	27						
	28						
ORANGE SECTION (RED LETTER GAME SCORES)	29	H1	H2	H3	H4	J4	
	30						
	31						
	32						
PURPLE SECTION (GOLDEN GAME SCORES)	33	K1	K2	K3	K4	K5	K6
	34						
	35						
	36						
YELLOW	37	D	I	N	S	X	
	38	A	F	K	P	U	
	39	U	V	W	X	Y	
RED	40	F	G	H	I	J	
	41	E	J	O	T	Y	
	42	B	G	L	Q	V	
GREEN	43	P	Q	R	S	T	
	44	A	B	C	D	E	
	45	E	I	M	Q	U	
	46	A	G	M	S	Y	
	47	K	L	M	N	O	
	48	C	H	M	R	W	
	49						
	50						

ROTATION OF SEARCH DISC WIPERS FROM 50 TO 1

MAGIC-SCREEN LAYOUT





CONTROL UNIT CAM SWITCH CHART FOR POSITION OF SWITCHES REFER TO PICTORIAL VIEW ON PAGE 18

CAM SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
1A	N.O.	65-2	Brown-White	Pulses timer unit step-up coil after 5th ball is shot.
2A	N.O.	36-9	Yellow-Brown	
2B	N.O.	90-5	Gray	Pulses reflex play magnet coil, replay register reset coil and total plays meter when playing coins and replays.
3A	N.C.	61-7	Brown-Red	Energizes red or yellow score booster feature trip relay.
3B	S.P.D.T.	10-2	Red	
3C	S.P.D.T.	48-2	Green-Black	Opens circuit to start relay.
3D	S.P.D.T.	18-20	Red-Black	
4A	N.O.	93-7	Gray-Yellow	Directs circuit to replay meter or total plays meter.
4B	N.O.	98-4	Gray-Black	
4C	N.O.	91-7	Gray-Red	Directs circuit to energize and lock-in play scores relay.
4D	S.P.D.T.	60-13	Brown	Directs circuit to energize and lock-in play features relay.
5A	N.O.	57-13	White-Orange	
5B	N.O.	21-3	Blue-Red	
5C	N.O.	74-16	Orange-Green	
5D	N.O.	81-13	Black-Red	
5E	N.O.	21-3	Blue-Red	
6A	N.C.	30	Yellow	Energizes spotting cams index coil.
6B	N.O.	98-1	Gray-Black	Energizes score extra step index coil.
6C	N.O.	30	Yellow	Pulses coin meter (when coin meter is used).
6D	S.P.D.T.	56-5	White-Brown	Opens start circuit and completes a circuit to energize tilt relay, when coin switch closed too long.
6E	N.O.	27-9	Blue-Orange	
7A	N.O.	80-2	Black	Completes a circuit to reset timer unit when playing for extra-balls.
7B	N.O.	13-9	Red-Yellow	Pulses extra ball unit step-up coil for guaranteed step circuit.
7C	N.O.	90-9	Gray	Energizes anti-cheat relay coil.
7D	N.O.	14-5	Red-Green	Pulses magic-screen feature unit and selection feature unit step-up coils for guaranteed step circuit.
7E	N.C.	65-2	Brown-White	Opens lock-in circuit for features lock relay and scores lock relay.
7F	N.O.	83-1	Blue-Red	Opens circuit for game features during play cycle.
7G	N.O.	21-1	Blue-Red	
7H	N.O.	38-4	Yellow-Black	
7I	N.O.	91-6	Gray-Red	
7J	N.O.	78-4	Orange-Black	
7K	N.O.	85-4	Black-White	
7L	N.O.	10-7	Red	
7M	N.O.	21-3	Blue-Red	
7N	N.O.	40-15	Green	
7O	N.O.	51-5	White-Red	
7P	N.O.	75-5	Orange-White	
7Q	N.O.	54-12	White-Green	
7R	N.O.	10-1	Red	
7S	N.O.	21-3	Blue-Red	
7T	N.O.	43-14	Green-Yellow	
7U	N.O.	60-6	Brown	
7V	N.O.	63-4	Brown-Yellow	

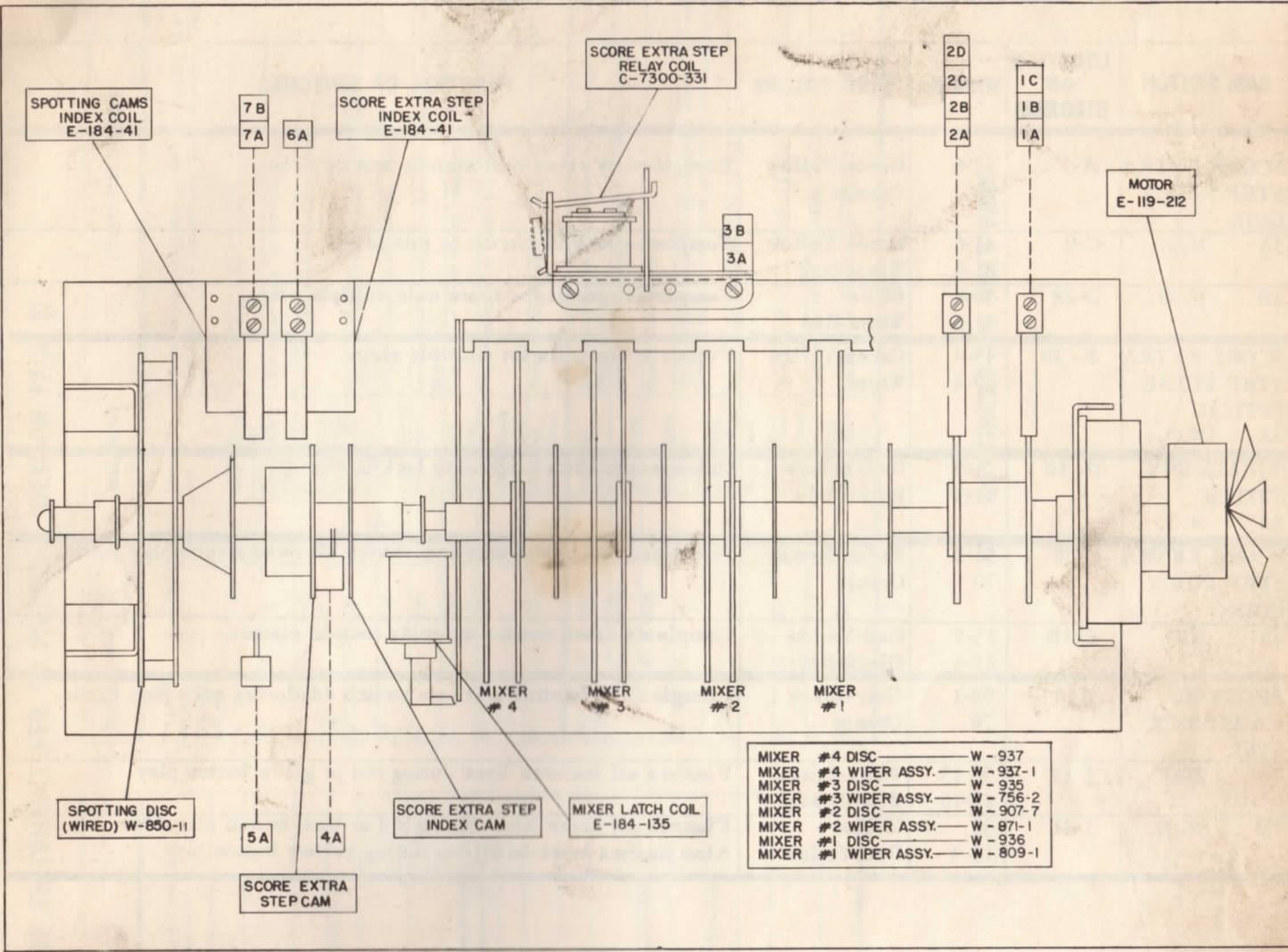
CAM SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
8A	N.O.	25-4	Blue-White	Pulses extra-ball unit step-up coil for single steps.
8B	N.O.	38-4	Yellow-Black	Energizes red or yellow score booster feature trip relay.
8C	N.O.	61-7	Brown-Red	Energizes OK feature trip relay.
8D	N.O.	27-13	Blue-Orange	Pulses yellow, red, and green score unit step-up coils for single steps, when playing for scores only.
8E	N.O.	20-6	Blue	Pulses yellow, red, and green score unit step-up coils for single steps, when playing for scores only.
9A	Alt.	56-11	White-Brown	Proportioning circuit for extra-ball unit steps.
9B	Alt.	63-4	Brown-Gray	Proportioning circuit for magic-screen feature unit steps.
9C	Alt.	90-12	Gray	Proportioning circuit for red or yellow score booster feature.
9D	Alt.	10-2	Red	Proportioning circuit for extra-ball unit steps.
9E	Alt.	20-7	Blue	Proportioning circuit for green score unit steps.
9F	Alt.	15-7	Red-White	Proportioning circuit for super blue feature.
9G	Alt.	13-18	Red-Yellow	Proportioning circuit for selection feature unit steps.
9H	Alt.	51-12	White-Red	Proportioning circuit for red or yellow score booster feature.
9I	Alt.	14-13	Red-Green	Proportioning circuit for OK feature.
9J	Alt.	50-17	White	
9K	Alt.	15-13	Red-White	
9L	Alt.	91-11	Gray-Red	
9M	Alt.	48-13	Green-Black	
9N	Alt.	20-6	Blue	
9O	Alt.	52-16	White-Blue	
10A	MULT.	63	Brown-Yellow	Pulses yellow, red and green replay counter unit step-up coils when scoring with yellow, red and green scores at 8th step.
10B	MULT.	70	Orange	Pulses blue replay counter coil when scoring 600 for blue section score.
11A	MULT.	23-17	Blue-Yellow	Pulses yellow, red and green replay counter units when scoring with yellow, red and green scores at 7th step.
11B	MULT.	27-17	Blue-Orange	Pulses yellow, red and green replay counter unit step-up coils when scoring with red, yellow and green scores at 5th or 6th step.
11C	MULT.	57	Orange	Pulses blue replay counter unit when scoring 300 for blue section score.
11D	MULT.	70	White-Blue	
11E	MULT.	52	Orange	
11F	MULT.	70	Red	
11G	MULT.	10-16	Blue-Orange	
11H	MULT.	27-17	Blue-Orange	

CONCLUDED ON NEXT PAGE

CAM SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
1.1 MULT. 13A N.O.	A-20	45 70	Green-White Orange	Pulses yellow, red and green replay counter unit step-up coils when scoring with yellow, red and green scores at 1st, 2nd, 3rd or 4th step.
13B N.O.	D-17	80	Black	Pulses replay register unit step-up coil, reflex unit replay magnet coil, and replay meter when scoring.
BACKSIDE 13 N.O.	H-17	21-3 27	Blue-Red Blue-Orange	Completes in-line or section replay scoring lock-in circuit, see control unit pictorial view for important adjustment instructions.
14A N.C.	I-15	18	Red-Black	In series with in-line and section scoring circuit.
14B N.C.	C-8	27-2 90-2	Red-Green Blue-Orange Gray	Opens timer unit step-up circuit while scoring.
CHANGE-OVER 15A S.P.D.T.	H-17	56 18	White-Brown Red-Black	Directs in-line or section scoring circuit.
CHANGE-OVER 15B S.P.D.T.	E-15	54 80 51-8 41-9	White-Green Black White-Red Green-Red	Directs circuit to energize search index coil for in-line or section scoring.
16A N.O.	I-48	31-6 21-3	Yellow-Red Blue-Red	Pulses sequence unit and winner unit reset coils.
TIMER CAMS INDEX COIL 17A N.O.	A-6	93-2 70	Gray-Yellow Orange	Energized thru start relay circuit and releases timer cams for cycle.
17B N.C.	H-2	20P 60P	Blue(Plastic) Brown(Plastic)	Completes a circuit to control unit and mixer-spotting unit motors.
17C N.C.	G-5	27-9 71-2	Blue-Orange Orange-Red	Opens circuit to coin lockout magnet coil.
	F-12	13 30	Red-Yellow Yellow	Opens circuit to red button relay, and extra ball trip relays.

CAM SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
REPLAY CAMS INDEX COIL 18A N.O.	A-17	40-4 70	Green	Energized by search index switch 19B when a score is made and releases replay cams to register score.
18B N.O.	G-18	27 80	Blue-Orange Black	In series with in-line or section scoring lock-in circuits. See control unit pictorial view for adjustment instructions of switches 18A, 18B, 18C.
18C N.O.	H-15	14	Red-Green	Same function as switch 18A.
18D N.C.	F-18	80	Black	In series with section scoring lock-in circuit.
	B-16	36-14 91-8 15-2	Yellow-Brown Gray-Red Red-White	Opens direct 50 volt pull-in circuit to search index coil, coil then holds in thru resistor.
SEARCH INDEX COIL 19A N.O.	A-16	15-2 70	Red-White Orange	Energized for all types of scoring and stops search wipers at proper position to record scores.
19B N.O.	E-43	98-13 10-9	Gray-Black Red	Completes circuit to position 29 relay for red letter game scoring.
19C N.O.	C-16	58-2 40-4	White-Black Green	Completes circuit to replay cams index coil.
19D N.O.	H-18	54 91-16	White-Green Gray-Red	In series with all section scoring circuits.
	C-8	21-6 48-18	Blue-Red Green-Black	Completes circuit to position 33 relay for gold section scoring.
SEARCH INDEX LOCK MAGNET COIL	A-40	23-16 70	Blue-Yellow Orange	(Not shown on pictorial view) Energized by front rail "R" button and releases search wipers to search for scores.
SEARCH WIPER CAM 20A N.C.	H-41	14-4 20-2	Red-Green Blue	Opens circuit to magic-screen buttons during search for scores.
SEARCH WIPER CAM 20B N.C.	C-5	83-3 13-16	Black-Yellow Red-Yellow	Opens start relay circuit during search for scores.
SEARCH WIPER CAM 20C N.C.	D-40	52-9 23-16	White-Blue Blue-Yellow	Opens circuit to search index lock magnet coil.

MIXING AND SPOTTING UNIT ASSEMBLY NUMBERS CORRESPOND TO SWITCH CHART BELOW



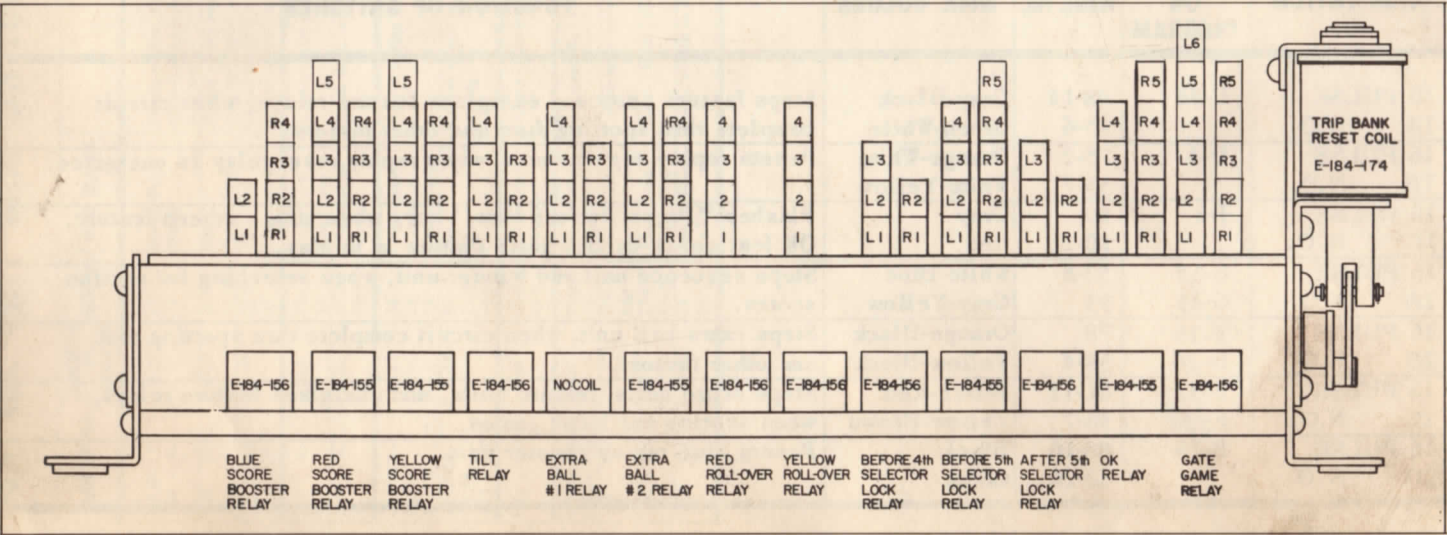
MIXER AND SPOTTING UNIT CAM SWITCH CHART
FOR POSITION OF SWITCHES REFER TO PICTORIAL VIEW ABOVE

CAM SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
16 PULSE 1A N.O.	G-34	98-14 45-6	Gray-Black Green-White	Steps feature units and energizes feature relays, when circuit complete thru spotting disc and other factors.
16 PULSE 1B N.O.	D-4	75-2 53-7	Orange-White White-Yellow	Resets replay register unit, when replay reset relay is energized.
16 PULSE 1C N.O.	J-1	90 10-11	Gray Red	Flashes "Press Buttons Now" lite, when magic screen feature, OK feature, or Golden game feature is in play.
16 PULSE 2A N.O.	G-15	52-8 93	White-Blue Gray-Yellow	Steps sequence unit and winner unit, when searching for section scores.
16 PULSE 2B N.O.	B-26	78 38-4	Orange-Black Yellow-Black	Steps extra ball unit, when circuit complete thru spotting disc and other factors.
16 PULSE 2C N.O.	F-32	61-12 36-7	Brown-Red Yellow-Brown	Steps score units, feature units, and energizes feature relays, when scoring red letter games.
16 PULSE 2D N.O.	B-18	80-16 40-16	Black Green	Resets blue replay counter unit.

MIXER AND SPOTTING UNIT CAM SWITCH CHART
FOR POSITION OF SWITCHES REFER TO PICTORIAL VIEW ON PAGE 21

Table with 5 columns: CAM SWITCH, LOCATION ON DIAGRAM, WIRE No., WIRE COLORS, FUNCTION OF SWITCHES. Rows include SCORE EXTRA STEP RELAY COIL, SQUARE PIN SWITCH, SCORE EXTRA STEP INDEX COIL, SPOTTING CAMS INDEX COIL, and various N.O. switches (3A, 3B, 7A, 7B).

TRIP RELAY BANK PICTORIAL VIEW NUMBERS CORRESPOND TO SWITCH CHART ON PAGE 23



TRIP RELAY BANK CHART FOR POSITION OF SWITCHES REFER TO PICTORIAL VIEW ON PAGE 22

Table with 5 columns: RELAY SWITCH, LOCATION ON DIAGRAM, WIRE No., WIRE COLORS, FUNCTION OF SWITCHES. Rows include BLUE SCORE BOOSTER RELAY COIL, RED SCORE BOOSTER RELAY COIL, and various N.O. switches (L1-L16).

Table with 5 columns: RELAY SWITCH, LOCATION ON DIAGRAM, WIRE No., WIRE COLORS, FUNCTION OF SWITCHES. Rows include YELLOW SCORE BOOSTER RELAY COIL, TILT RELAY COIL, and various N.C. switches (L1-L16).

CONTINUED ON NEXT PAGE

TRIP RELAY BANK CHART FOR POSITION OF SWITCHES REFER TO PICTORIAL VIEW ON PAGE 22

RELAY SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
EXTRA BALL #1 RELAY				
L1 N.C.	E-27	85-4 91-6	Black-White Gray-Red	Trips with extra ball #2 relay.
L2 N.O.	G-9	83-1	Black-Yellow	Opens circuit to anti-cheat relay.
L3 S.P.D.T.	E-26	85-4 30	Orange-Red Black-White	Completes circuit to reset timer unit when playing extra balls.
L4 S.P.D.T.	G-28	60-6 61-2 56-6 18-2	Yellow Brown White-Brown Red-Black	Opens anti-cheat relay circuit and score steps circuit, and completes extra-ball steps circuit.
R1 N.C.	J-11	27-16 81-6	Brown White-Orange	Opens score steps circuit, and completes extra-ball steps circuit.
R2 S.P.D.T.	I-27	75-5 15-7	Black-Red Orange-White	Opens circuit to flash other features lites.
R3 N.O.	F-5	50-2 58-5	Red-White Green-White	Opens circuit for score steps, and completes circuit for extra-ball steps.
EXTRA BALL #2 RELAY				
L1 N.C.	B-13	40-17 40-17	White White-Black	Completes a circuit to start relay.
L2 N.C.	D-14	91-1	Green	Energized thru yellow button when circuit complete thru other factors.
L3 S.P.D.T.	D-6	14-3 61	Gray-Red Brown-Red	Opens circuit to coil.
L4 S.P.D.T.	K-21	31-5 13-4	Red-Green Yellow-Black	Completes circuit to ball lifter motor.
R1 N.C.	I-28	45-2 85-16	Gray-Black Black-White	Directs circuit to shutter motor or mixer latch and timer cams index coils.
R2 N.O.	J-27	21-4	Yellow-Red	Opens score lites flash circuit, and flashes extra-ball lites.
R3 N.O.	H-28	36-19 56-6	Blue White-White	Opens circuit for other game features.
R4 S.P.D.T.	H-30	63-15 80-8 78-8	Yellow-Brown White-Brown Brown-Yellow	Completes extra-balls feature line circuit.

RELAY SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
RED ROLL-OVER TRIP RELAY				
1 N.C.	A-45	25-13 70	Blue-White Orange	Energized directly thru selection feature disc or by red roll-over button, thru selection feature disc.
2 N.O.	B-45	25-13	Blue-Yellow	Opens circuit to coil.
3 S.P.D.T.	H-41	93-3 21-12	Blue-Yellow Blue-Red	Completes circuit to move magic-screen.
4 S.P.D.T.	J-1	51-12 90	White-Red Gray	Directs flash of press buttons now lite, before 4th, before 5th after 5th ball.
YELLOW ROLLOVER RELAY COIL				
1 N.C.	J-5	52-13 31-8 10-11 53-12	White-Blue Yellow-Red Red White-Yellow	Directs feature line circuit before 4th, before 5th, after 5th ball.
2 N.O.	A-44	38-13 70	Yellow-Black Orange	Energized directly thru selection feature disc. Also by yellow roll-over button, thru selection feature disc.
3 S.P.D.T.	B-44	38-13	Yellow-Black	Opens circuit to coil.
4 S.P.D.T.	G-40	98-3	Yellow-Black	Completes circuit to move magic screen.
BEFORE 4th BALL SELECTOR RELAY COIL				
L1 N.C.	J-1	50-12 51-12	White White-Red	Directs flash of "Press Buttons Now" lite, before 4th or before 5th ball.
L2 S.P.D.T.	K-5	37-5 31-8 74-8	Blue-Yellow White-Orange Yellow-Red	Directs feature line circuit, before 4th or before 5th ball.
L3 N.O.	A-11	83-6 70	Black-Yellow Orange	Energized thru timer disc when 4th ball is shot.
L4 S.P.D.T.	B-11	83-6	Black-Yellow	Opens circuit to coil.
L5 N.O.	H-40	85-6	Black-Black	Directs circuit from magic-screen buttons to (R) collect scores button.
R1 N.C.	H-8	93-3 53-18	Gray-Black Gray-Yellow	Completes circuit to step timer unit from 4th to 5th step.
R2 N.O.	K-1	36-2 43-2	White-Yellow Green-Yellow	Opens "Press Buttons Now Lite" flash circuit.
	D-16	50-12	Blue-Orange	Completes circuit to search index coil.

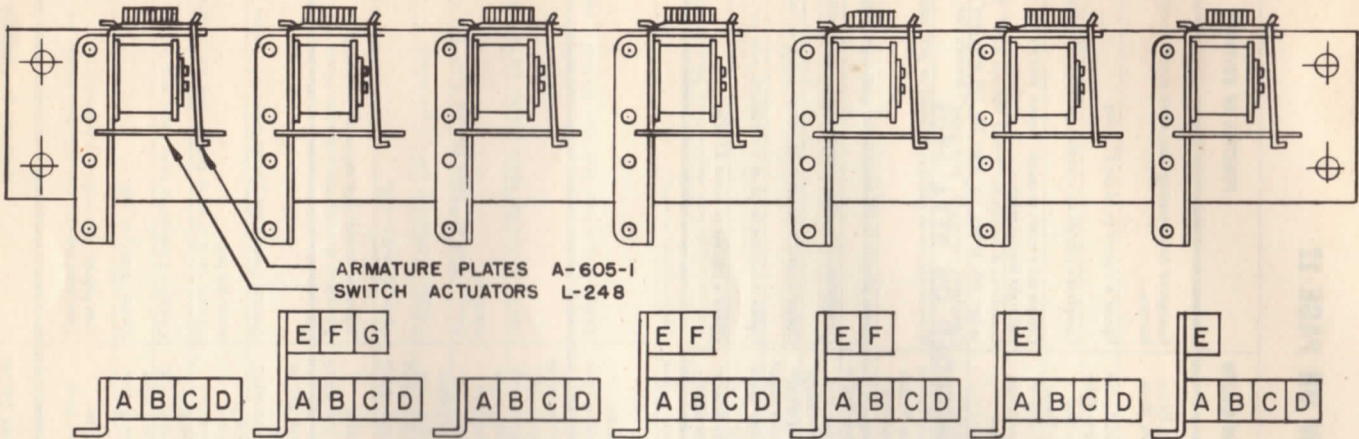
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TRIP RELAY BANK CHART FOR POSITION OF SWITCHES REFER TO PICTORIAL VIEW ON PAGE 22

RELAY SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
BEFORE 5th BALL SELECTOR RELAY COIL				
L1 N.C.	A-11	74-6 70	Orange-Green Orange	Energized thru timer unit disc when 5th ball is shot.
L2 N.O.	B-11	74-6	Orange-Green	Opens circuit to coil.
L3 N.O.	C-13	74-6	Orange-Green	Completes circuit to extra-ball trip relays.
L4 S.P.D.T.	E-5	58-5 18-6	Yellow-Red White-Black	Completes circuit to start relay.
R1 N.C.	L-1	14-1 48-12	Red-Green Green-Black	Directs flash of "Press Buttons Now Lite" before 4th, before 5th or after 5th ball.
R2 N.C.	L-6	52-12 55-2	White-Blue White-Yellow	Opens yellow rollover panel line circuit.
R3 N.O.	C-44	56-12 13-12	White-Brown Red-Yellow	Opens circuit to yellow rollover trip relay.
R4 N.O.	G-10	54-11 71-8	White-Green Orange-Red	Completes a circuit to reset timer unit, thru "g" button.
R5 N.C.	F-9	78-6 27-2	Orange-Black Blue-Orange	Completes timer unit step-up circuit.
AFTER 5th BALL SELECTOR RELAY COIL				
L1 N.C.	H-40	98-3	Gray-Black	Opens circuit to magic-screen buttons.
L2 N.C.	A-11	98-11 70	Blue-Red Gray-Black	Completes timer unit step-up circuit.
L3 N.C.	B-11	74-6	Orange-Green	Energized when 6th ball (1st extra-ball) is shot.
L4 N.C.	C-45	74-6	Orange-Green	Opens circuit to magic-screen buttons.
L5 N.C.	K-1	55-2	White-Yellow	Opens circuit to red rollover trip relay.
R1 N.C.	A-11	98-11	Gray-Black	Opens "Press Buttons Now Lite" flash circuit.
R2 N.C.	L-7	41-8 60-12	Gray-Black Brown	Opens circuit to coil.
OK FEATURE RELAY COIL				
L1 N.C.	B-39	52-16 85-13	White-Blue Black-White	Opens red rollover panel lite circuit.
L2 N.O.	L-9	50-8 30	White Yellow	Energized thru spotting disc when circuit complete thru other factors.
L3 S.P.D.T.	B-41	18-19 57-14	Red-Black White-Orange	Open circuit to this coil. Also opens circuit to gate game feature trip relay.
L4 N.C.	I-26	54-13 65-12	White-Green Brown-White	Completes circuit to "OK" feature lite.
R1 N.C.	H-27	45-19 74-12	Green-White Orange-Green	Directs circuit to magic-screen motor unit index coil.
R2 N.O.	J-6	10-11 30	Red Yellow	Opens a circuit to mixer #2 relay.
R3 S.P.D.T.	C-42	15-18 98-12	Red-White Gray-Black	Opens a circuit to mixer #2 relay.
R4 N.C.	I-26	27-15	Blue-Orange	Completes a circuit to "Press Buttons Now Lite" select before 4th, before 5th, after 5th, yellow or red rollover lites.
R5 N.C.	F-35	90-11	Gray	Directs circuit to magic-screen index coil, move right motor winding, and right button relay.

RELAY SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
GATE GAME FEATURE RELAY COIL				
L1 N.C.	B-39	54-15 85-13	White-Green Black-White	Energized thru spotting disc when circuit complete thru other factors.
L2 N.O.	H-26	43-13 65-12	Green-Yellow Brown-White	Opens a circuit to mixer #2 relay.
L3 N.O.	B-8	21-6 18-18	Blue-Red Red-Black	Completes circuit to energize position 33 relay.
L4 N.O.	D-42	98-12 27-15	Gray-Black Blue-Orange	Completes circuit to magic-screen index coil, move right motor, and right button relay.
L5 N.O.	J-5	30 10-11	Yellow Red	Completes a circuit to "Press Buttons Now" lite and select before 4th, before 5th, after 5th, red or yellow rollover lites.
L6 S.P.D.T.	J-8	13-15 53-18 41-18	Red-Yellow White-Yellow Green-Red	Completes circuit to "gate game" feature lite.
R1 N.C.	A-39	70	Orange	Directs circuit to position 29 relay or gold game relays (3).
R2 N.O.	B-41	61-16 71-7	Brown-Red Orange-Red	Opens circuit to OK feature and gate game feature trip relays.
R3 N.C.	H-25	57-14 45-19	White-Orange Green-White	Completes a circuit to magic-screen motor unit index coil.
R4 N.C.	G-26	53-13 78-13	White-Yellow Orange-Black	Opens a circuit to mixer #2 relay.
R5 N.C.	G-25	20-11 56-13 57-11	Blue White-Brown White-Orange	Opens a circuit to mixer #2 relay.

7 RELAY BANK PICTORIAL VIEW
LETTERS CORRESPOND TO SWITCH CHART ON PAGE 27



Name	Position 33 Re.	Position 29 Re.	Super Blue Re.	Play Features Re.	Features Lock Re.	Play Scores Re.	Scores Lock Re.
Coil turns & wire gauge	1800 # 33	1800 # 33	2300 # 33	2300 # 33	2300 # 33	2300 # 33	2300 # 33
Coil resistance (nominal)	65 Ω	65Ω	85 Ω	85 Ω	85Ω	85 Ω	85Ω
Operating voltage	50 v.	50 v.	50 v.	50 v.	50 v.	50 v.	50v.
Test voltage	37 v.	37 v.	37 v.	37 v.	38 v.	37 v.	37 v.
Extension spring load	CLEAR	GREEN	CLEAR	CLEAR	YELLOW	CLEAR	CLEAR
Sw. actuator stroke	3/32	3/32	3/32	3/32	3/32	3/32	3/32
Additional information			Thermalize wire or equivalent No wrap on coil		Thermalize wire or equivalent No wrap on coil		Thermalize wire or equivalent No wrap on coil

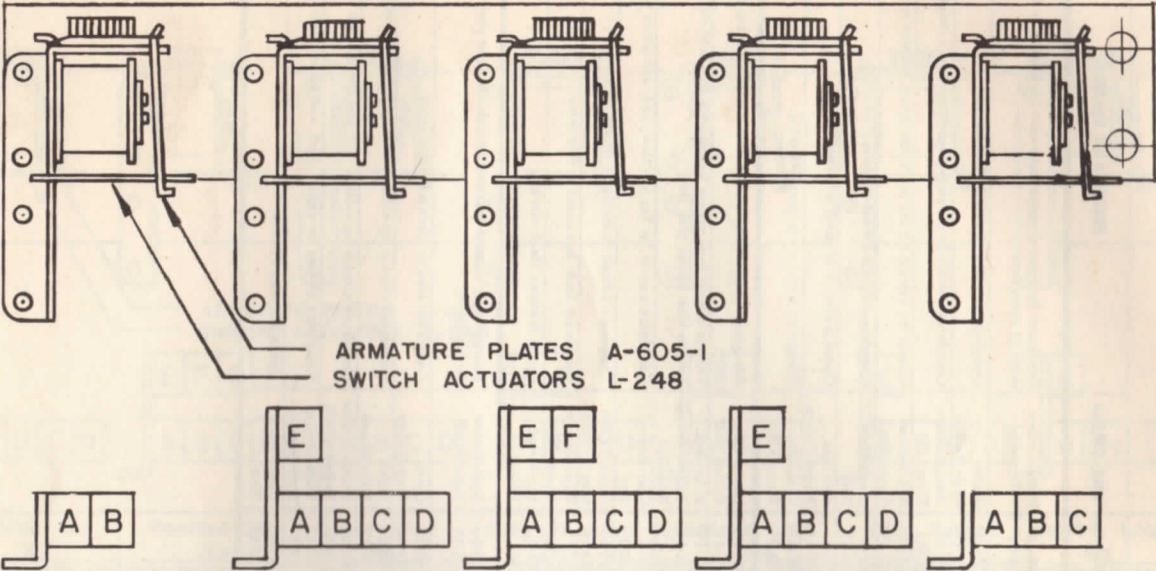
SPRING CODE		
COLOR	PART NO.	LOAD
CLEAR	SP-199-13	13 oz. at 15/16
BLUE	SP-199-14	21 oz. at 15/16
YELLOW	SP-199-15	15 oz. at 15/16
RED	SP-199-16	9 oz. at 15/16
GREEN	SP-199-17	17 oz. at 15/16

7 RELAY BANK SWITCH CHART FOR POSITION OF SWITCHES REFER TO PICTORIAL VIEW ON PAGE 26

RELAY SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
POSITION 33 RELAY COIL A N.O.	A-8	27-14	Blue-Orange	Energized thru search disc when circuit complete thru other factors. (Purple section scoring) Completes a circuit to shutter motor.
B N.O.	B-8	14-3	Red-Green	Completes circuit to gold game relays (3).
C N.O.	D-43	20-16	Blue	Completes lock-in circuit to this relay.
D N.C.	A-7	93-15	Gray-Yellow	Opens circuit to replay cams index coil.
POSITION 29 RELAY COIL A N.C.	C-16	18-20	Blue-Black	Energized thru search disc when circuit complete thru other factors. (Orange section scoring) Opens green score unit and red letter feature unit reset circuit.
B N.C.	B-43	25-18	Yellow-Black	Opens regular game features circuit.
C N.C.	H-48	43-19	Red	Opens regular green score unit step-up circuit.
D N.O.	G-29	83-9	Red-Yellow	Completes lock-in circuit to this relay.
E N.O.	B-32	18-16	Orange-Green	Completes circuit for guaranteed scores and feature of red letter games.
F N.O.	D-44	74-13	Red-White	Completes circuit to stop relays as scores and features advance to guaranteed level.
G N.O.	F-33	15-4	Brown-Yellow	Completes a circuit to shutter motor.
POSITION 33 RELAY COIL A N.O.	M-44	85-9	Black-White	Energized thru spotting disc when circuit complete thru other factors.
B M.B.B.	C-7	14-3	Red-Green	Completes a circuit to blue score booster trip relay.
C S.P.D.T.	G-39	31-15	Yellow-Red	Completes lock-in circuit, and opens pull-in circuit to this relay.
D N.O.	E-39	21-3	Blue-Red	Directs circuit from blue 3 score 600 feature lite, to blue 2 scores 600 feature lite.
PLAY FEATURES RELAY COIL A S.P.D.T.	L-11	13-13	Red-Yellow	Completes circuit for 2 in blue section replay scoring.
B N.O.	G-18	20-8	Blue	Energized by green play features button when playing for features only.
C N.O.	B-47	61-13	Brown-Red	Directs circuit from yellow button play lite, red button play lite, blue button play lite, to green button play lite.
D N.O.	K-12	36-15	Yellow-Brown	Completes circuit to features lock relay.
E N.C.	C-46	23-15	Blue-Yellow	Completes circuit to OK feature.
F N.C.	G-36	27-13	White-Yellow	Completes lock-in circuit to this relay.
G N.C.	B-48	81-13	Black-Red	Opens yellow, red, and green score unit step-up circuit.
H N.C.	A-29	70	Orange	Opens yellow, red, and green score lites flash circuit.

RELAY SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
FEATURES LOCK RELAY COIL A N.O.	B-46	53-14	White-Yellow	Energized by control unit cam switch 7B when play features relay is energized.
B N.O.	B-46	31-15	Yellow-Red	Completes lock-in circuit to this relay.
C N.O.	F-34	40-15	Green	Completes circuit for magic-screen feature unit steps.
D N.O.	I-38	53-14	White-Yellow	Completes circuit for red or yellow score booster feature.
E N.C.	G-35	74-19	Orange-Green	Completes circuit for all features.
F N.O.	H-29	50-13	White	Opens a circuit to mixer #4 relay.
G N.O.	H-30	48-13	Red-Yellow	Completes a circuit to mixer #4 relay.
PLAY SCORES RELAY COIL A S.P.D.T.	B-49	65-15	Brown-White	Energized by blue play scores button when playing for scores only.
B N.O.	K-12	31-15	Yellow-Red	Directs circuit from yellow button play lite, and red button play lite, to blue button play lite.
C N.O.	D-28	51-15	White-Red	Completes circuit for 1st 3 yellow, red, and green score steps.
D N.O.	C-47	36-15	Yellow-Brown	Completes circuit to energize scores lock relay.
E N.C.	C-49	21-15	Gray-Red	Completes lock-in circuit to this relay.
F N.O.	J-11	93-14	Gray-Yellow	Opens features flash circuit.
G N.O.	B-47	57-13	White-Orange	Energized by control unit cam switch 7B when play scores relay is energized.
H N.C.	B-47	65-15	Brown-White	Completes lock-in circuit for this relay.
I N.O.	G-30	40-15	Green	Completes circuit for yellow, red, and green score steps.
J N.O.	F-30	60-6	Brown	Completes circuit for yellow, red, and green score steps.
K N.O.	F-30	63-12	White-Brown	Completes circuit for yellow, red, and green score steps.
L N.C.	F-30	38-5	Yellow-Black	Completes circuit for yellow, red, and green score steps.
M N.C.	H-28	57-12	White-Orange	Opens features circuit.
N N.C.	H-28	27-5	Black-White	
O N.C.	H-28	85-16	Blue	

(VERTICAL) 5 RELAY BANK PICTORIAL VIEW
LETTERS CORRESPOND TO SWITCH CHART ON PAGE 29



Name	Right Button Re.	Replay Reset Re.	Anti-cheat Re.	Start Re.	Red Button Re.
Coil turns & wire gauge	2300 #33	2300 #33	2300 #33	1800 #33	2000 #33
Coil resistance (nominal)	85 Ω	85 Ω	85 Ω	65 Ω	75 Ω
Operating voltage	50 v.	50 v.	50 v.	50 v.	50 v.
Test voltage	37 v.	37 v.	39 v.	32 v.	32 v.
Extension spring load	CLEAR	YELLOW	YELLOW	YELLOW	CLEAR
Sw. actuator stroke	3/32	3/32	3/32	3/32	3/32
Additional information			Thermaleze wire or equivalent No wrap on coil		Thermaleze wire or equivalent No wrap on coil

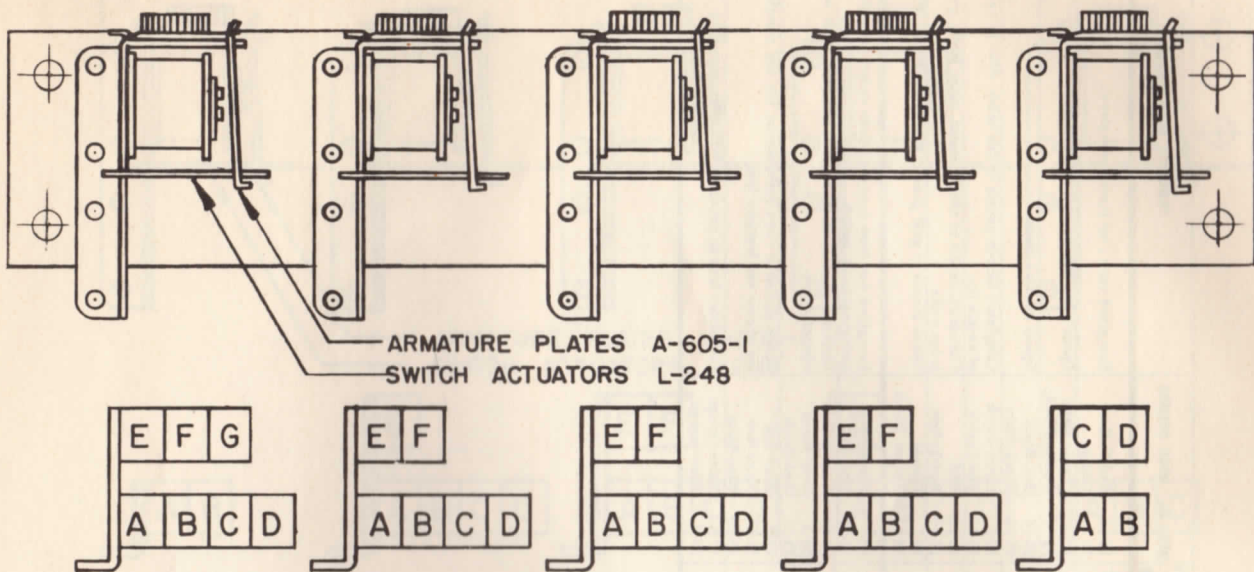
SPRING CODE		
COLOR	PART NO.	LOAD
CLEAR	SP-199-13	13 oz. at 15/16
BLUE	SP-199-14	21 oz. at 15/16
YELLOW	SP-199-15	15 oz. at 15/16
RED	SP-199-16	9 oz. at 15/16
GREEN	SP-199-17	17 oz. at 15/16

(VERTICAL) 5 RELAY BANK SWITCH CHART
FOR POSITION OF SWITCHES REFER TO PICTORIAL VIEW ON PAGE 28

RELAY SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
RIGHT BUT-TON RELAY COIL	A-42	45-5 70	Green-White Orange	Energized by right button switch when circuit complete thru other factors.
A S.P.D.T.	C-43	48-5 25-6 45-5 31-16 36-4	Green-Black Blue-White Green-White Yellow-Red Yellow-Brown	Directs move left or right magic-screen motor circuit. Also lock-in circuit for this relay.
B N.C.	F-43			Opens move left magic-screen index coil circuit.
REPLAY RE-SET RELAY COIL	A-4	75-2 70	Orange-White	Energized when anti-cheat relay drops out.
A S.P.D.T.	C-4	90-5 41-6 53-7 20P 60P	Gray Green-Red White-Yellow Blue(Plastic) Brown(Plastic)	Directs replay register reset circuit thru control unit cam switch 2A, or mixer-spotting 16 pulse switch 1B.
B N.O.	G-1			Completes circuit to control unit and mixer-spotting unit motors.
C N.O.	G-4	56-2 75-2	White-Brown Orange-White	Completes lock-in circuit for this relay.
D N.C.	C-4	13-9 83-3	Red-Yellow Black-Yellow	Opens start relay circuit.
F N.O.				Not used.
ANTI-CHEAT RELAY COIL	A-27	78-4 70	Orange-Black Orange	Energized by control unit cam switch 5C. Says energized during play.
A S.P.D.T.	G-4	75-2 56-2 50-2	Orange-White White-Brown White	Opens start relay circuit and completes circuit to replay reset relay, when this relay drops out.
B N.O.	M-28	20-4	Blue	Opens 17 volt circuit when this relay drops out.
C N.O.	E-27	78-4 80-1 30	Orange-Black Black Yellow	Completes lock-in circuit to this relay when energized.
D N.C.	I-7	14-14 30	Red-Green Yellow	Completes circuit to close shutter when this relay drops out while shutter is open.
E S.P.D.T.	M-26	91-2 38 40	Gray-Red Yellow-Black Green	Opens 6 volt lite circuit and completes circuit to tilt lite, when relay drops out.
F N.C.	F-13	57-6 85-7	White-Orange Black-White	Completes a circuit to red button relay when this relay drops out.

RELAY SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
START RELAY COIL	A-5	13-16 70	Red-Yellow Orange	Energized each play (coins or replays).
A N.C.	B-26	75-4 78	Orange-White Orange-Black	Opens extra-ball unit step-up circuit.
B N.C.	G-29	18-16 85-12	Red-Black Black-White	Opens features circuit.
C N.O.	F-6	48-2 13-16	Green-Black Red-Yellow	Completes lock-in circuit to this relay. Also in series with function of switch D.
D N.O.	E-6	10-10 13-16	Red Red	Completes circuit to shutter motor, mixer latch, and timer cams index coils.
E N.C.	A-43	70 38-15	Orange Yellow-Black	Opens circuit to gold game relays and position 29 relay.
RED BUTTON RELAY COIL	B-12	85-7 91-15	Black-White Gray-Red	Energized thru front door red button switch, tilt relay switch, or anti-cheat relay switch.
A S.P.D.T.	B-6	93-2 98-2	Gray-Yellow Gray-Black	Directs circuit from mixer latch and timer cams index coils to shutter motor.
B S.P.D.T.	L-14	14-3 21-4 51-15 25-15	Red-Green Blue-Red White-Red Blue-White	Opens circuit to extra-balls feature lite and completes circuit to red scores and features lite.
C N.O.	D-12	57-6 27-8	White-Orange Blue-Orange	Completes lock-in circuit to this relay.

(HORIZONTAL) 5 RELAY BANK PICTORIAL VIEW
LETTERS CORRESPOND TO SWITCH CHART ON PAGE 31



Name	GOLD GAME #1 RE.	GOLD GAME #2 RE.	GOLD GAME #3 RE.	GOLD STRIPE RE.	MIXER # 2 RE.
Coil turns & wire gauge	2300 # 33	2300 # 33	2300 #33	2300 # 33	2300 # 33
Coil resistance (nominal)	85 Ω	85 Ω	85 Ω	85 Ω	85 Ω
Operating voltage	50 v.	50 v.	50 v.	50 v.	50 v.
Test voltage	37 v.	37 v.	37 v.	37 v.	37 v.
Extension spring load	RED	RED	RED	CLEAR	YELLOW
Sw actuator stroke	3/32	3/32	3/32	3/32	3/32
Additional information	NOTE: Thermaleze wire or equivalent No wrap on coil.	SEE NOTE	SEE NOTE	SEE NOTE	SEE NOTE

SPRING CODE		
COLOR	PART NO.	LOAD
CLEAR	SP-199-13	13 oz. at 15/16
BLUE	SP-199-14	21 oz. at 15/16
YELLOW	SP-199-15	15 oz. at 15/16
RED	SP-199-16	9 oz. at 15/16
GREEN	SP-199-17	17 oz. at 15/16

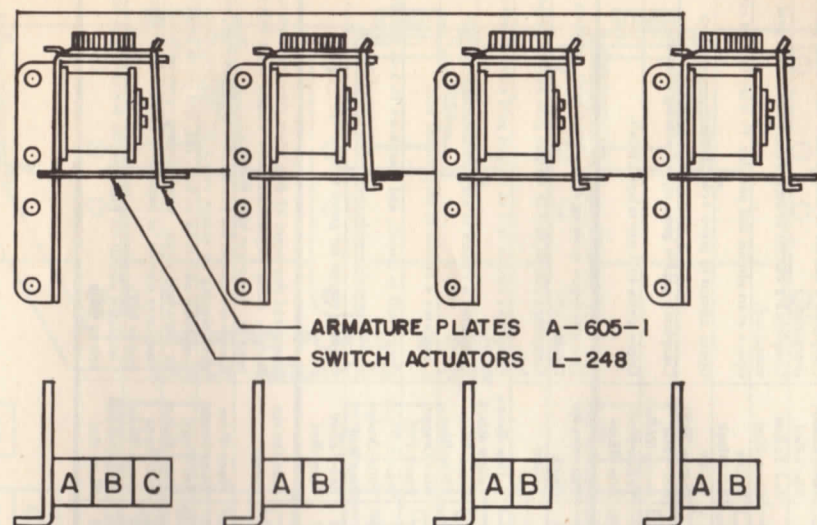
(HORIZONTAL) 5 RELAY BANK SWITCH CHART
LETTERS CORRESPOND TO SWITCH CHART ON PAGE 30

RELAY SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
GOLD GAME RELAY #1 COIL	B-43	38-15 93-15	Yellow-Black Gray-Yellow	Energized thru search disc when scoring in purple section.
	A N.C.	83-9 20-12	Black-Yellow Blue	Opens features circuit.
	B N.O.	30	Yellow	Completes lock-in circuit to this relay, and gold game relays #2 and #3.
	C N.O.	93-15 71-7	Gray-Yellow Orange-Red	Completes a circuit to magic-screen motor unit index coil.
	D N.O.	98-12 27-15	Gray-Black Blue-Orange	Completes a circuit to magic-screen motor unit index coil, move right magic-screen motor and right button relay.
	E N.C.	56	White-Brown	Opens in line scoring circuit.
	F N.C.	58	White-Black	Opens magic-screen motor unit homing circuit.
GOLD GAME RELAY #2 COIL	D-40	41-5 54-17	Green-Red White-Green	Completes a circuit to "Press Buttons Now" lite, select before 4th ball, 5th ball, after 5th ball, red or yellow rollover lites.
	J-5	10-11 30	Red Yellow	Energized thru search disc when scoring in purple section.
	B-43	38-15 93-15	Yellow-Black Gray-Yellow	Opens regular yellow, red, green, and blue section scoring circuits, and completes circuit for gold section scoring.
	G-17	78-9 91-16 74-9	Orange-Black Gray-Red Orange-Green	Opens search index circuit for in line scoring, and completes search index circuit for gold game scoring.
	D-20	25-9 80	Blue-White Black	Completes circuit to 3 in any gold section feature lite, and golden game panel lite.
	J-12	36-17 30	Yellow-Brown Yellow	Completes a circuit to magic-screen motor unit index coil, move right magic-screen motor, and right button relay.
	D-41	50-5 60-16	White Brown	Opens position 29 relay circuit.
GOLD GAME RELAY #3 COIL	F-43	51-18 83-16	White-Red Black-Yellow	Opens green score unit and red letter feature unit reset circuit.
	G-47	85-5 43-17	Black-White Green-Yellow	

RELAY SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
GOLD GAME RELAY #3 COIL	B-43	38-15 93-15	Yellow-Black Gray-Yellow	Energized thru search disc when scoring in purple section.
	A N.O.	13-1 81-15	Red-Yellow Black-Red	Completes a circuit to step winner unit, when gold stripe relay is energized.
	B N.O.	13-1 52-18	Red-Yellow White-Blue	Completes a circuit to step winner unit, when gold stripe relay is energized.
	C N.C.	30	Yellow	Opens start circuit and position 33 relay lock-in circuit.
	D N.C.	18-20	Red-Black	Opens circuit to green score lites.
	J-18	30	Orange-White	Completes golden game replay scoring circuits.
	E N.O.	15-19 63-9	Red-White Brown-Yellow	Opens extra-ball trip relays circuit.
GOLD STRIPE RELAY COIL	D-13	31-18 25-8	Yellow-Red Blue-White	Energized thru spotting disc when circuit complete thru other factors.
	A N.O.	57-16 80-15	White-Orange Black	Completes circuit to 2 in striped gold section indicator arrow lite.
	B N.O.	36-17	Yellow-Brown	Completes circuit to 2 in striped gold section feature lite.
	C N.O.	45-12 52-18	Green-White White-Blue	Completes a circuit to step winner unit.
	D N.O.	27-6 81-15	Blue-Orange Black-Red	Completes a circuit to step winner unit.
	E M.B.B.	78-19 57-16	Orange-Black White-Orange	Opens pull in circuit, and completes lock-in circuit for this relay.
	F N.C.	21-3 51-17	Blue-Red White-Red	Opens a circuit for green score steps.
MIXER #2 RELAY COIL	A-28	27-7 70	Blue-Orange Orange	Energized thru mixer #2 disc when circuit complete thru other factors. Relay proportions score steps, extra-ball steps, blue booster, and super blue features.
	A N.O.	85-4 54-12	Black-White White-Green	Completes circuit for 1st 3 steps of yellow, red, and green scores, when playing for scores only.
	B N.O.	15-7 56-6	Red-White White-Brown	Completes circuit for yellow, red, and green score steps. Also for extra-ball steps, when playing extra-balls.
	C N.O.	14-13 45-19	Red-Green Green-White	Completes circuit for super blue feature. (2 in blue section scores 600).
	D N.O.	38-16 51-19	Yellow-Black White-Red	Completes circuit for blue booster feature. (3 in blue section scores 600).

4 RELAY BANK PICTORIAL VIEW

LETTERS CORRESPOND TO SWITCH CHART ON PAGE 33



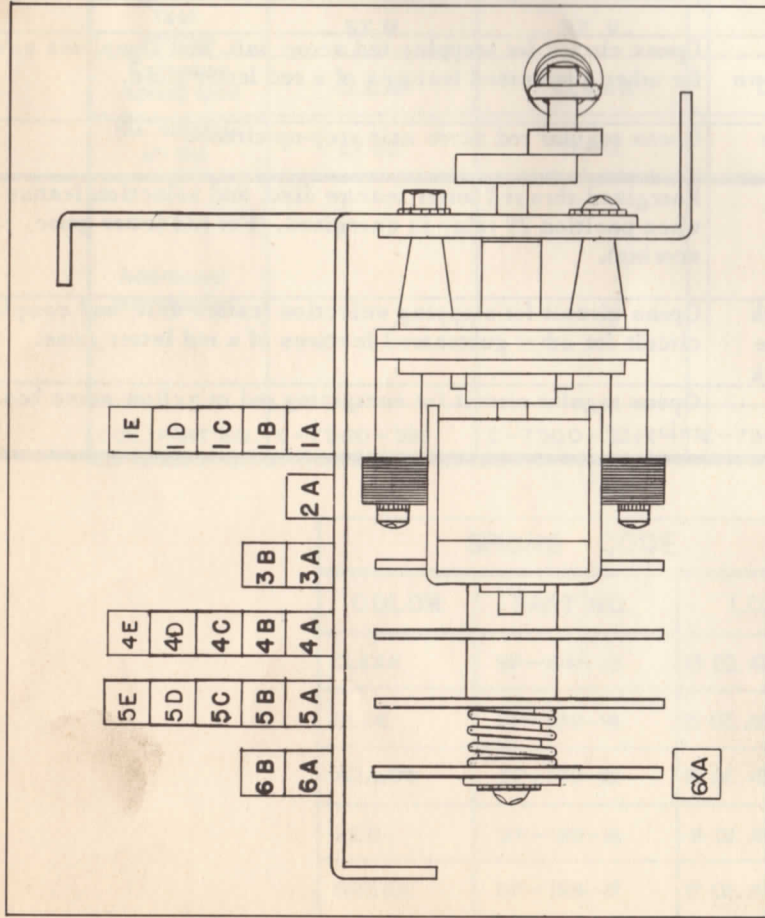
Name	MAGIC — SCREEN FEATURE UNIT STOP RE.	YELLOW SCORE STOP RE.	RED SCORE STOP RE.	SELECTION FEATURE UNIT STOP RE.
Coil turns & wire gauge	2300 # 33	2300 # 33	2300 # 33	2300 # 33
Coil resistance (nominal)	85 Ω	85 Ω	85 Ω	85 Ω
Operating voltage	50 V.	50 V.	50 V.	50 V.
Test voltage	37 V.	37 V.	37 V.	37 V.
Extension spring load	CLEAR	CLEAR	CLEAR	CLEAR
Sw actuator stroke	3/32	3/32	3/32	3/32
Additional information				
COIL PART NO.	C-7300-331	C-7300-331	C-7300-331	C-7300-331

SPRING CODE		
COLOR	PART NO.	LOAD
CLEAR	SP-199-13	13 OZ. AT 15/16
BLUE	SP-199-14	21 OZ. AT 15/16
YELLOW	SP-199-15	15 OZ. AT 15/16
RED	SP-199-16	9 OZ. AT 15/16
GREEN	SP-199-17	17 OZ. AT 15/16

4 RELAY BANK SWITCH CHART

FOR POSITION OF SWITCHES REFER TO PICTORIAL VIEW ON PAGE 32

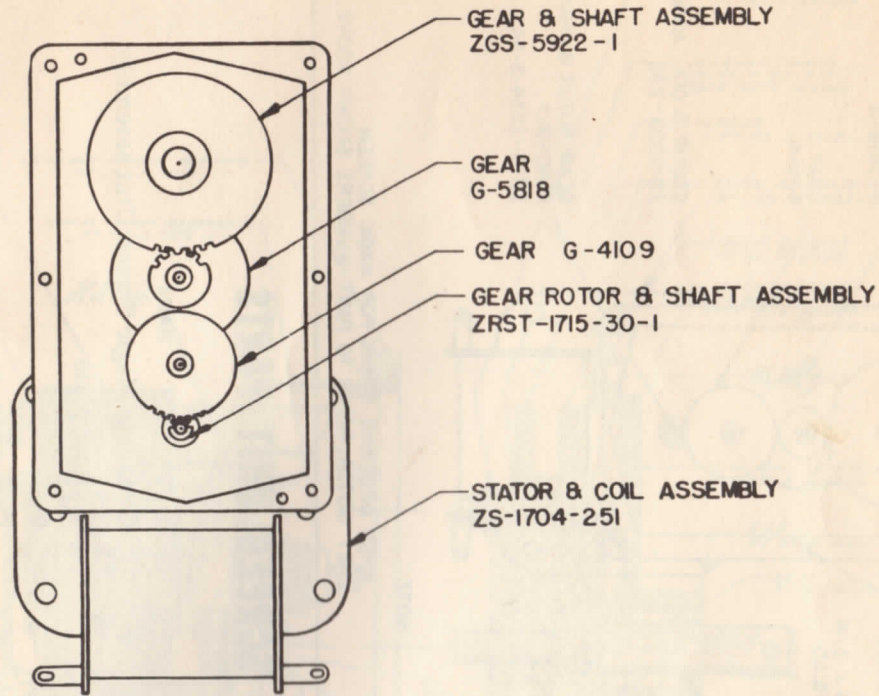
RELAY SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
MAGIC SCREEN FEATURE UNIT STOP RELAY COIL	J-46	18-15 70	Red-Black Orange	Energized thru red letter feature disc, and magic-screen feature disc, when position 29 relay is energized. (For red letter games scoring).
A S.P.D.T.	D-33	52-5 41-14 45-15	White-Blue Green-Red Green-White	Opens circuit for stepping magic-screen feature unit, and completes circuit for other guaranteed features of a red letter game.
B N.C.	B-36	15-13 78-15	Red-White Orange-Black	Opens regular selection feature unit step-up circuit.
C N.O.	K-48	65-11 71-11	Brown-White Orange-Red	Energized thru selection feature, and red letter feature discs, completes a circuit to energize selection feature unit stop relay.
YELLOW SCORE STOP RELAY COIL	J-45	15-15 70	Red-White Orange	Energized thru red letter feature disc, and yellow score disc when position 29 relay is energized. (For red letter games scoring).
A S.P.D.T.	D-33	56-3 40-13 41-14	White-Brown Green Green-Red	Opens circuit for stepping yellow score unit, and completes circuit for other guaranteed features of a red letter game.
B N.C.	B-34	52-5 93-12	White-Blue Gray-Yellow	Opens regular magic-screen feature unit step-up circuit.
RED SCORE STOP RELAY COIL	J-44	14-15 70	Red-Green Orange	Energized thru red letter feature disc, and red score disc when position 29 relay is energized. (For red letter game scoring).
A S.P.D.T.	E-33	81-16 36-7 40-13	Black-Red Yellow-Brown Green	Opens circuit for stepping red score unit, and completes circuit for other guaranteed features of a red letter game.
B N.C.	B-31	13-3 81-16	Red-Yellow Black-Red	Opens regular red score unit step-up circuit.
SELECTION FEATURE UNIT STOP RELAY COIL	J-47	21-14 70	Blue-Red Orange	Energized thru red letter feature disc, and selection feature disc when position 29 relay is energized. (For red letter game scoring).
A S.P.D.T.	B-33	78-15 45-15 48-15	Green-Black Green-White Green-Black	Opens circuit for stepping selection feature unit, and completes circuit for other guaranteed features of a red letter game.
B N.C.	F-37	61-7 91-11	Brown-Red Gray-Red	Opens regular circuit for energizing red or yellow score booster relay.



CAM SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
1A N.C.	I-14	21-3	Blue-Red	When shutter is closed, completes in-line or section replay scoring circuit.
1B N.O.	G-6	14-3	Red-Green	Completes shutter motor carry-over circuit.
1C N.C.	I-9	21-3	Blue-Red	When shutter is closed, completes timer unit step-up circuit after shooting 5th ball. Also completes timer unit reset circuit when playing extra balls.
1D N.O.	G-44	30	Yellow	Completes lock-in circuit to position 29 relay.
1E N.C.	I-35	21-3	Blue-Red	When shutter is closed, completes circuit for scores and features when scoring red letter games.
2A N.C.	F-14	31-3	Yellow-Red	When shutter is closed, completes ball lifter motor circuit.
3A N.O.	F-47	30	Yellow	Resets selection feature, green replay counter, red replay counter, yellow replay counter, extra-ball, green score, and red letter feature units.
3B N.O.	H-2	20P	Blue- (Plastic) Orange- (Plastic)	Resets trip relay bank.
4A N.O.	F-7	14-3	Red-Green	When shutter is open, completes circuit to close shutter when game is tilted.
4B N.C.	I-38	21-3	Blue-Red	When shutter is closed, completes circuit to move magic-screen, collect scores, energize selector lock relays, and energize red or yellow rollover trip relays.
4C N.O.	H-7	45-8	Green-Black	When shutter is open, completes circuit to close shutter when game is tilted.
4D N.C.	I-11	40-8	Red-Black	When shutter is closed, completes circuit to energize select before 5th and select after 5th lockout relays.
4E N.O.	F-43	30	Yellow	Completes lock-in circuit to position 29 relay.
5A N.C.	H-9	98-8	Gray-Black	When shutter is closed, same function as switch 1C.
5B N.O.	F-46	65-2	Brown-White	When shutter is open completes lock-in circuit to lifter start relay.
5C N.O.	G-31	91-4	Gray-Red	When shutter is open, completes circuit for features.
5D N.O.	C-18	85-12	Black-White	When shutter is open, completes circuit to reset blue replay counter unit.
5E S.P.D.T.	E-6	80-16	Gray-Black	Directs circuits to shutter motor, and mixer latch, and timer cams index coils.
6A N.C.	A-13	61	Brown-Red	This switch mounted on bracket under cam 6. Open only during shutter cycle, completes circuit to red button relay.
6B N.O.	H-9	10-10	Red	Resets timer unit.
6B N.O.	H-47	78-3	Orange-Black	Resets magic-screen feature, yellow score, and red score unit.

SHUTTER MOTOR

(MOTOR PART NO. E-119-99)



NOTE:

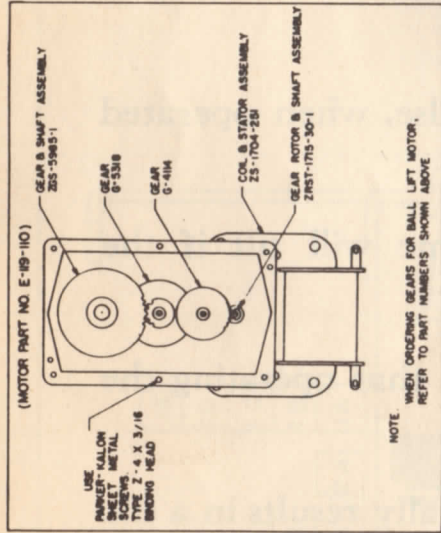
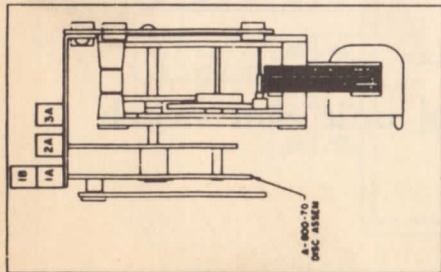
WHEN ORDERING GEARS FOR SHUTTER MOTOR, REFER TO PART NUMBERS SHOWN ABOVE.

ANTI-CHEAT COIN SWITCH CIRCUIT

The coin switch gives a very short pulse, when operated by a coin. With this circuit, the game will tilt if the pulse is not as short as from a coin, so that operating the coin switch with wire, strings, etc., usually results in a tilt.

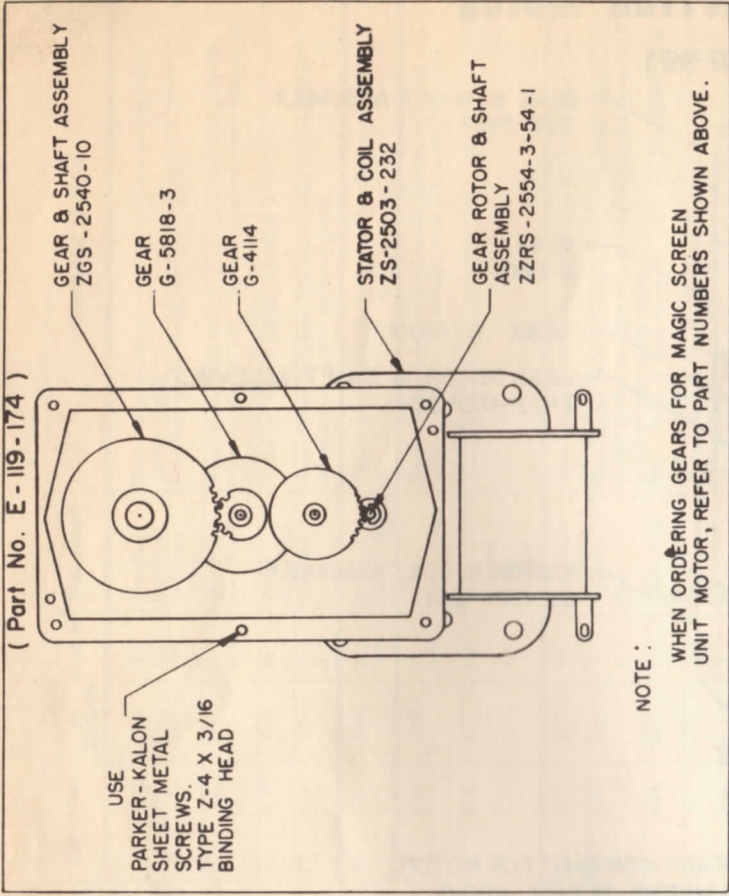
The circuit is completed thru control unit cam switch

#4D (on wiring diagram at G-5).



BALL LIFT MOTOR CAM SWITCH CHART
FOR POSITION OF SWITCHES SEE PICTORIAL VIEW

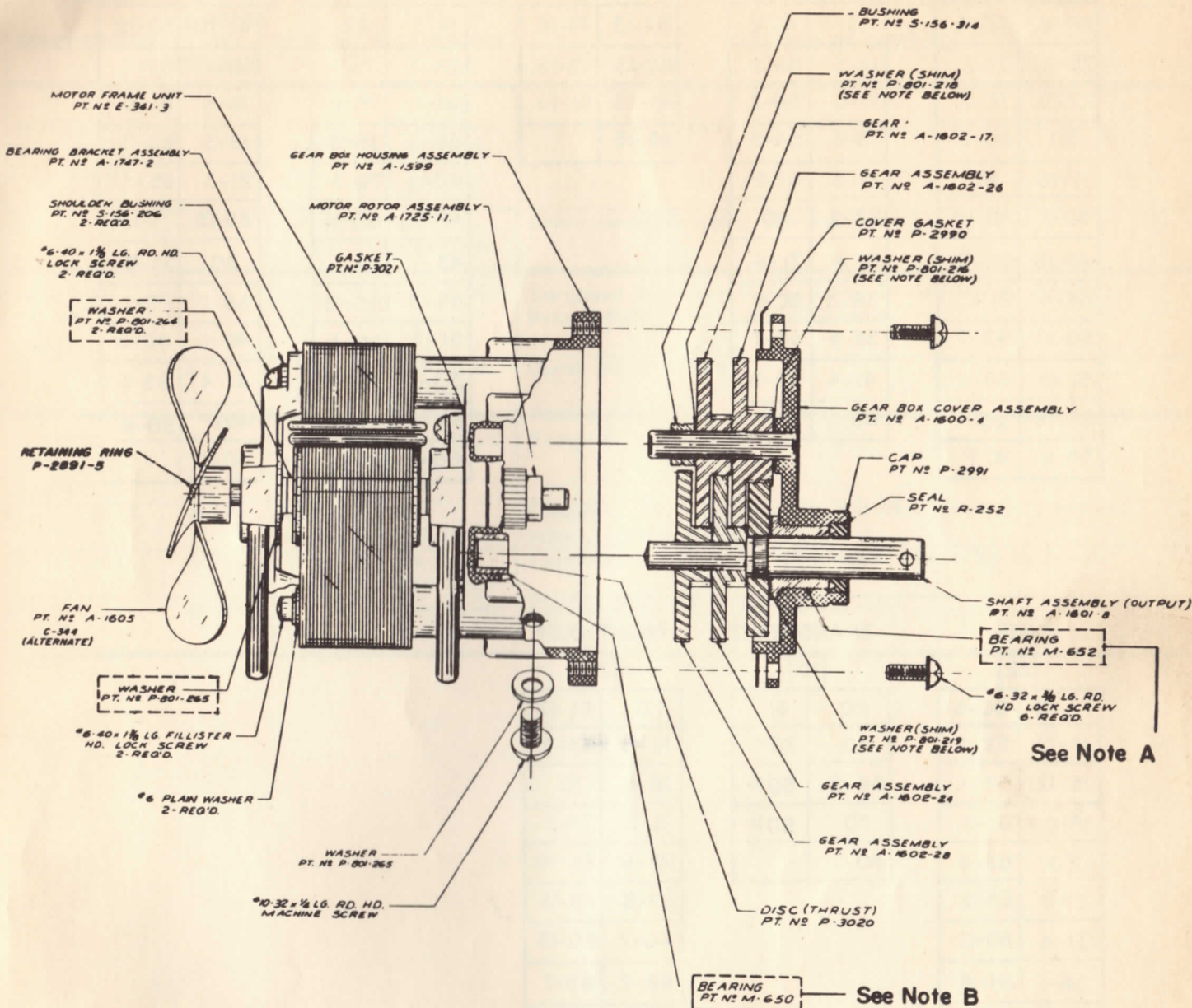
RELAY SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
1A	M.C.	15-6 85-6	Red-White Black-White	(Safety circuit) for before 8th selector lock trip relay.
1B	M.O.	91-1 30	Gray-Red Yellow	Completes carry-over circuit to ball lift motor.
2A	M.O.	27-2 43-2	Blue-Orange Green-Yellow	Completes circuit to energize timer unit step-up coil.
3A	M.O.	21-3 83-7	Blue-Red Black-Yellow	Completes circuit to energize before 4th selector lock relay, thru timer unit disc.



MAGIC SCREEN UNIT PARTS

PART No.	NAME
AS-1809-5	Complete Magic Screen Unit assembly
W-851-6	Contact plate
26-GG-10	Coil
S-1065-14	Core plug
AS-1846-1	Index Arm and plunger assembly
P-163-32	Key Washer
M-943	Ladder Chain
P-801-310	Leather Washer
E-119-174	Motor
S-496-152	Plunger only for AS-1846-1

MOTOR ASSEMBLY (Part No. E-119-212)



NOTE A: Bearing M-652 is part of Gear Box Cover Assembly A-1600-4 and cannot be ordered separately.

NOTE B: Bearing M-650 is part of Gear Box Housing Assembly A-1599 and cannot be ordered separately.

CABINET				PANEL			
24		22		8		24	
20-2	57-14	13	45-3	57-13	74-16	14-3	61
25-8	71-2	14-5	48-2	60-13	75-13	25-1	71-1
27-8	78-7	15-6	50-2	61-13	81-13	31-1	74-1
30	80-2	18-6	54-5	65-15		36-3	75-13
31-16	81	21-3	63-2			40-8	78-3
40-7	85-13	27-2	70			41-5	80-16
45-16	90-5	31-4	71-6			43-1	81
48-4	91-7	36-3	80-6			45-8	85-3
50-16	93-7	38-3	85-7			51-1	90-1
52-9	98-11	41-4	90-9			53-1	91-15
53-18	20 P	43-2	91-1			54-1	93-2
54-11	90 P					60-1	98-12

PANEL		TRANSFORMER		FRONT DOOR	
22		10		20	
13-12	50-5	20	81	13	61-13
14-12	52-1	30	20 P	14-5	63-2
15-12	56-1	54-2	50 P	18-6	70
18-20	61-1	70	90 P	21-3	71-2
20	63-8	80-1		25-8	74-16
27-1	65-2			27-8	75-13
31-4	85-12			40-7	80-13
38-1	91-4			48-2	85-7
41-8	98-14			50-2	90-9
45-16	20 P			57-13	
48-1	70 P				

PLUG SHEET FOR SILVER SAILS

MISCELLANEOUS RELAYS SWITCH CHART

RELAY SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
POSITION 29 & 33 HOLD SCORES RE-LAY COIL	C-23	38-15 58-1	Yellow-Black White-Black	Energized thru search disc when scoring in purple section.
A N.C.	C-16	80 75-15	Black Orange-White	Opens circuit to replay cams index coil.
MIXER #4 RELAY COIL	A-32	23-4 70	Blue-Yellow Orange	Energized thru mixer #4 disc when circuit complete thru other factors. Relay proportions all features.
A N.C.	I-29	45-2 51-5	Green-White White-Red	Opens features circuit.
LIFTER START RE-LAY COIL	A-45	38-3 70	Yellow-Black Orange	Energized by ball runway switch.
A N.C.	H-11	10-13 15-6	Red Red-White	Completes circuit to before 5th and after 5th selector lock-out relays, when relay drops out.
B N.C.	G-14	41-4 31-3	Green-Red Yellow-Red	Completes circuit to ball lifter motor, when relay drops out.
C N.O.	D-45	36 38-8	Yellow-Brown Yellow-Black	Completes lock-in circuit for this relay.

MISCELLANEOUS PARTS

Back Cabinet Assembly:

Part No.	Name of Part
G-292-19	Back glass
M-281-14	Lock and keys (2) Keyed alike
E-122-69	Transformer

Back Door Assembly:

M-281-24	Lock and keys (2) keyed alike
SW-100-106	Lock switch
E-300-115	Search relay bank assembly

Front Cabinet Assembly:

M-168-15	Ball
AS-187-17	Ball shooter assembly
AS-1835	Ball shooter housing
A-100-7	Ball shooter rod
SP-200-24	Ball shooter spring (long)
SP-243	Ball shooter spring (short)
R-108-3	Ball shooter tip
P-711-1	Cigarette holder
P-1900-47	Coin box
A-2304-2	Coin box cover
E-130-10	Counter — 48 volt
A-2618	Legs
M-106-1	Leg bolt
M-163-4	Leg adjuster
A-1729-6	Push button
P-2768-15	Ring—blue
G-213	Top glass 21" x 40"
E-108-57	Toggle switch

Front Door Assembly:

A-1538-3	Armature plate (AS-277-50)
A-1729-6	Button—metal
E-101-45	Coil for coin lock out
AS-277-50	Coin switch assembly 5¢ or 10¢
CA-567-138	Front door only

Front Door Assembly (Continued):

Part No.	Name of Part
AS-2041-12	Front door assembly (Specify 5¢ or 10¢)
A-254-33	Hinge and bracket
M-281-6	Lock and keys
E-108-14	Micro switch for coin switch assembly 5¢ or 10¢
P-2768-5	Ring—red
P-2768-6	Ring—yellow
P-2768-16	Ring—green
P-2768-7	Ring for M-281-6
M-280-15	Slug rejector 5¢
M-280-16	Slug rejector 10¢

Front Moulding Assembly:

A-2359-2	Coin slide 5¢ or 10¢
AS-1305-25	Front moulding assembly complete
A-1272-29	"R" Button
A-1272-30	Right Button
A-1272-31	Left Button
P-2210-8	5¢ plate
P-2210-9	10¢ plate
P-2210-112	Plate—Moulding
CA-1119-2	Front moulding only

Panel Assembly:

AS-1315	Ball Gate and Switch Assembly
C-326-9	Light Shield post
R-115-4	Rebound Rubber
M-170	Rebound spring—double post
C-387-1	Roll over button—red
C-387-2	Roll over button—yellow
R-243	Rubber ring for yellow post
R-243-2	Rubber ring for red post

Bally pin game lubricant now available in one half-pint
(8 Oz.) containers with plastic spout and screw cap.