

Bally®

BEACH TIME

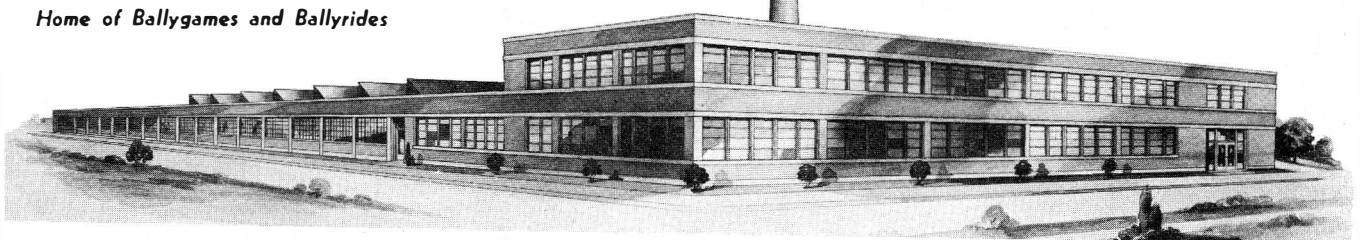
OPERATING INSTRUCTIONS AND PARTS CATALOG

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**

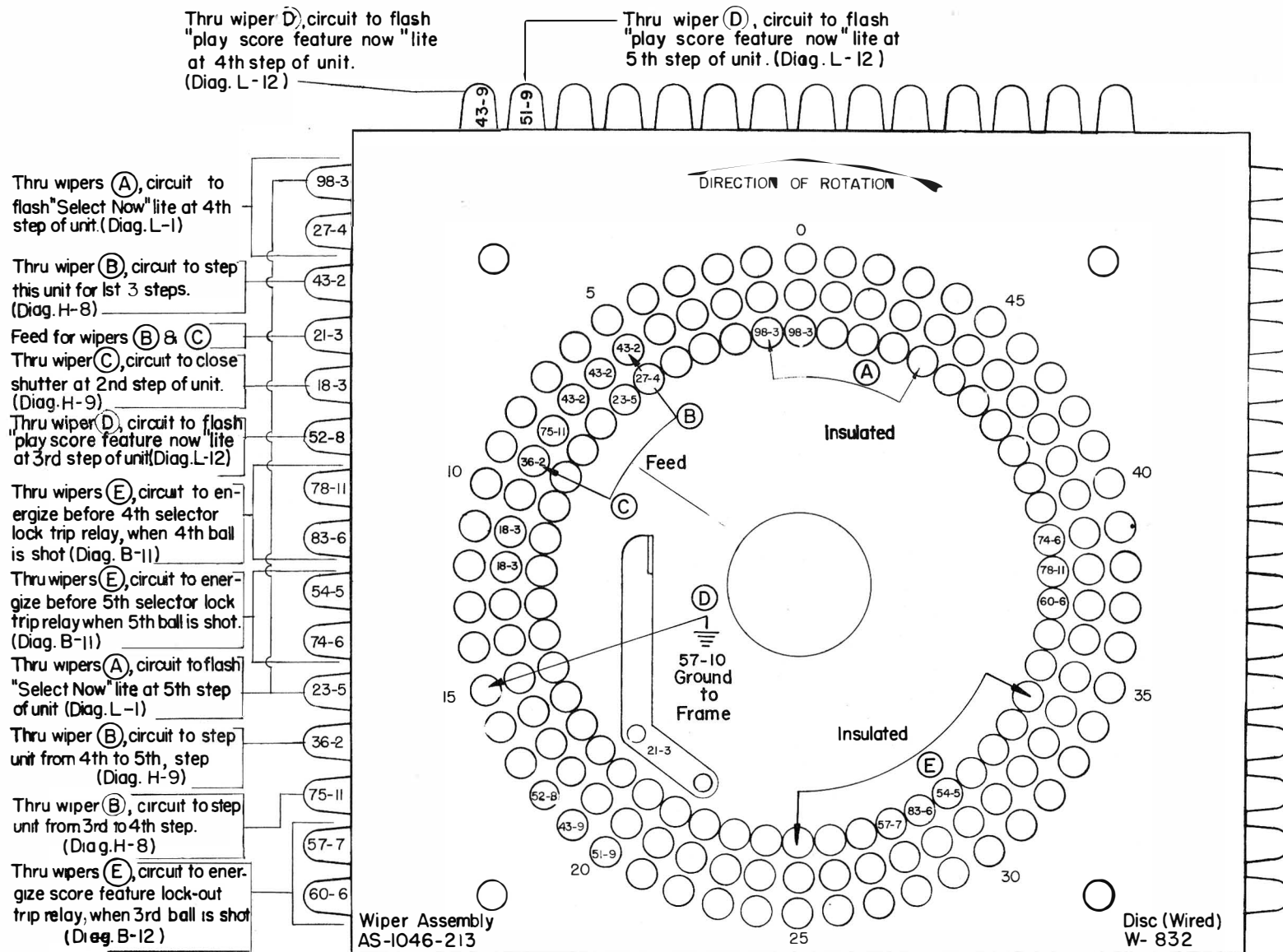
Code	
N.C. ___	Normally closed
N.O. ___	Normally open
M.B.B. ___	Make before break
S.P.D.T. ___	Single pole double throw

Home of Ballygames and Ballyrides



TIMER UNIT viewed from BUTTON or WIPER side

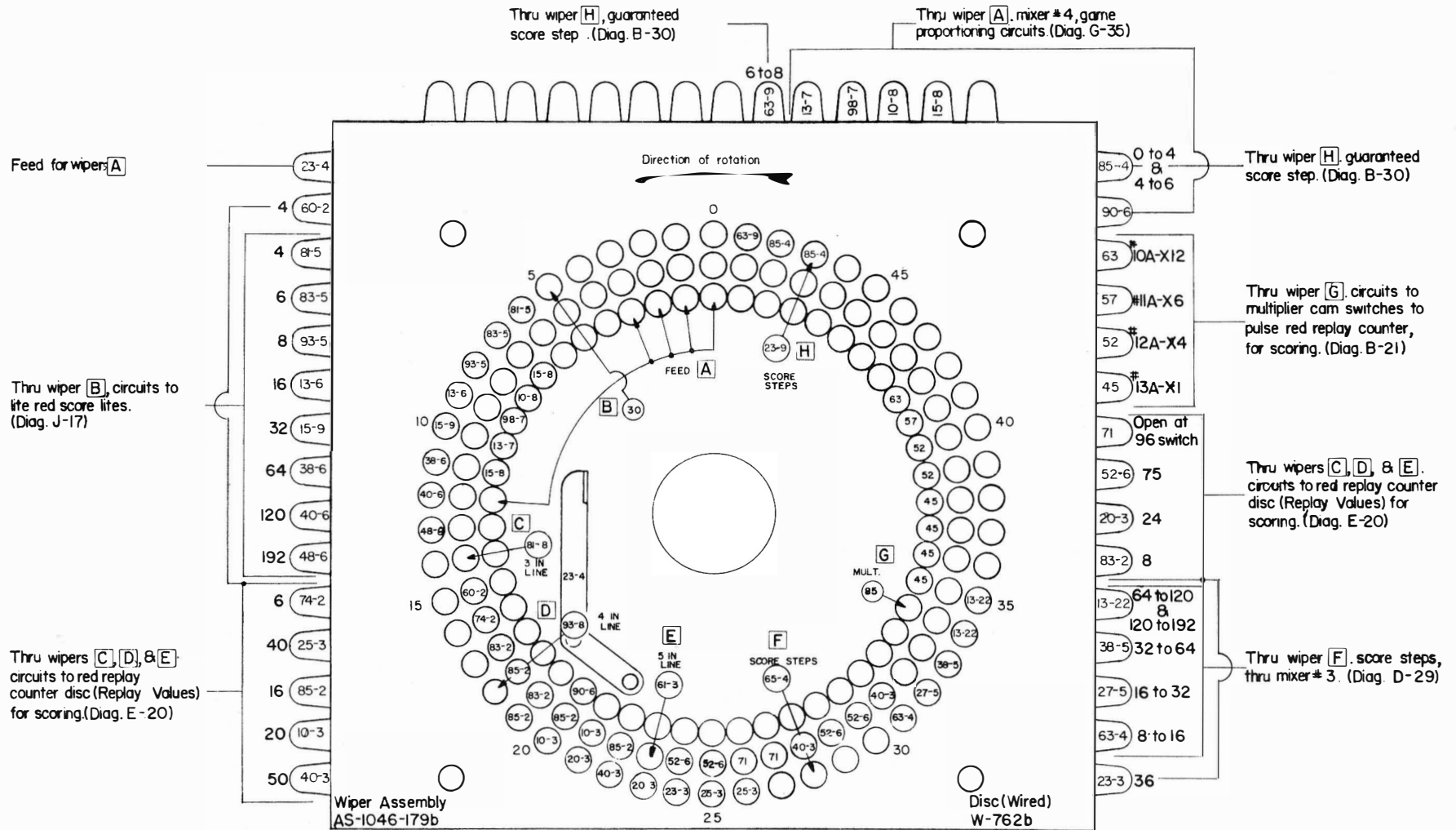
39 step unit. Wipers shown in zero or reset position



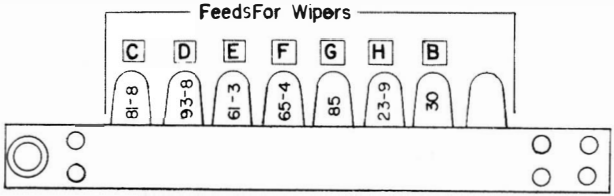
Complete Unit-AS-110-27
 Reset Coil-28-R-15
 Step-Up Coil-25-GG-7
 Step-Up Plunger-S-496-100
 Step-Up Arm-A-1765-4
 Ratchet & Shaft-C-1050-39-21

RED SCORE UNIT viewed from BUTTON or WIPER side

8 step unit. Wipers shown in zero or reset position

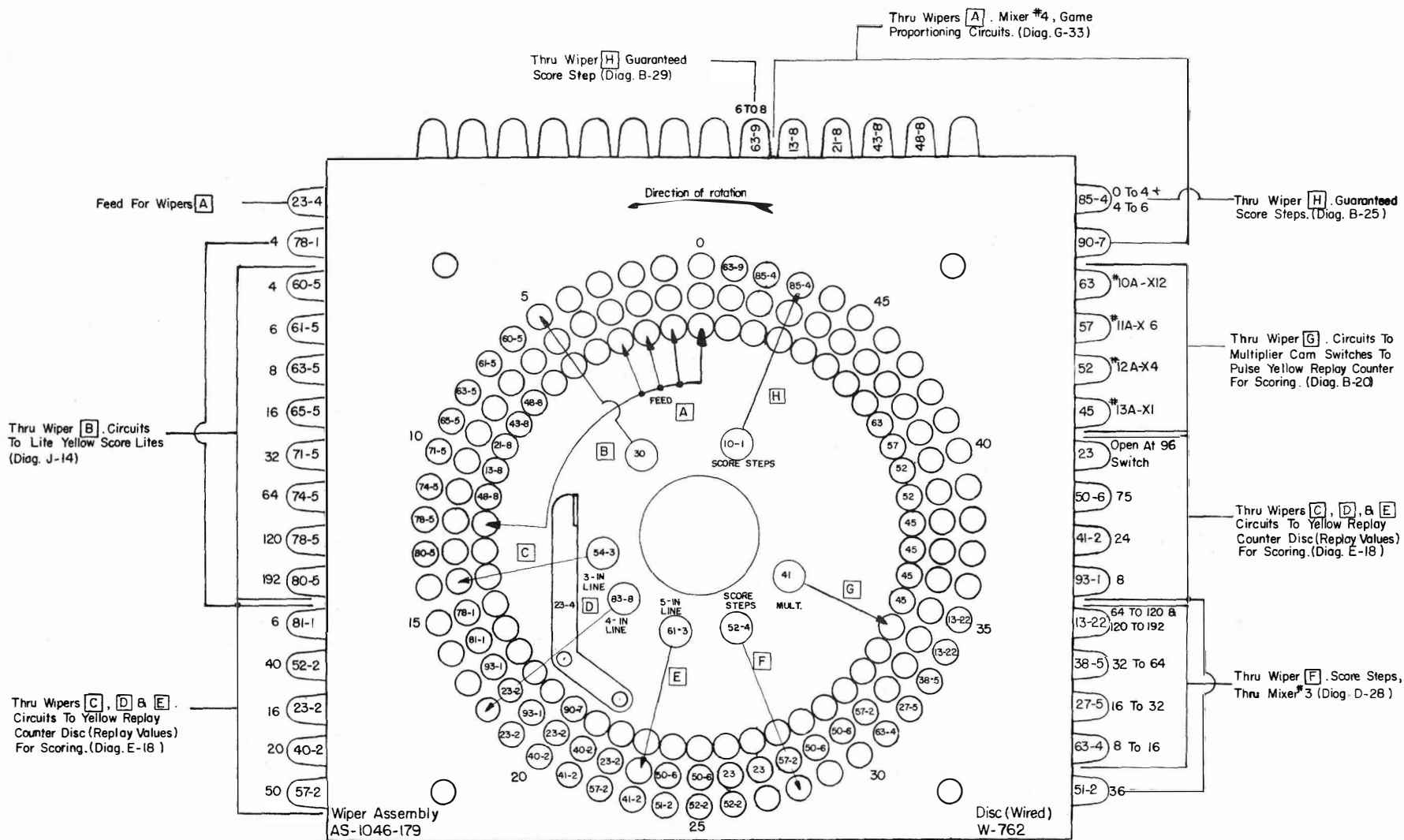


- Complete Unit-AS-1022-31
- Reset Coil-28-R-15
- Step-Up Coil-25-GG-7
- Step-Up Plunger-S-496-100
- Step-Up Arm-A-1765-3
- Ratchet & Shaft-C-1050-8-39

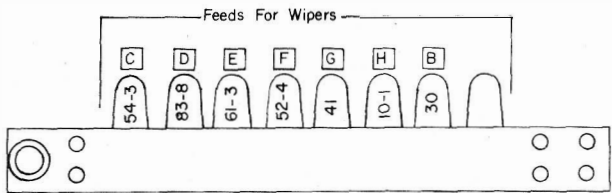


YELLOW SCORE UNIT viewed from BUTTON or WIPER side

8 step unit. Wipers shown in zero or reset position

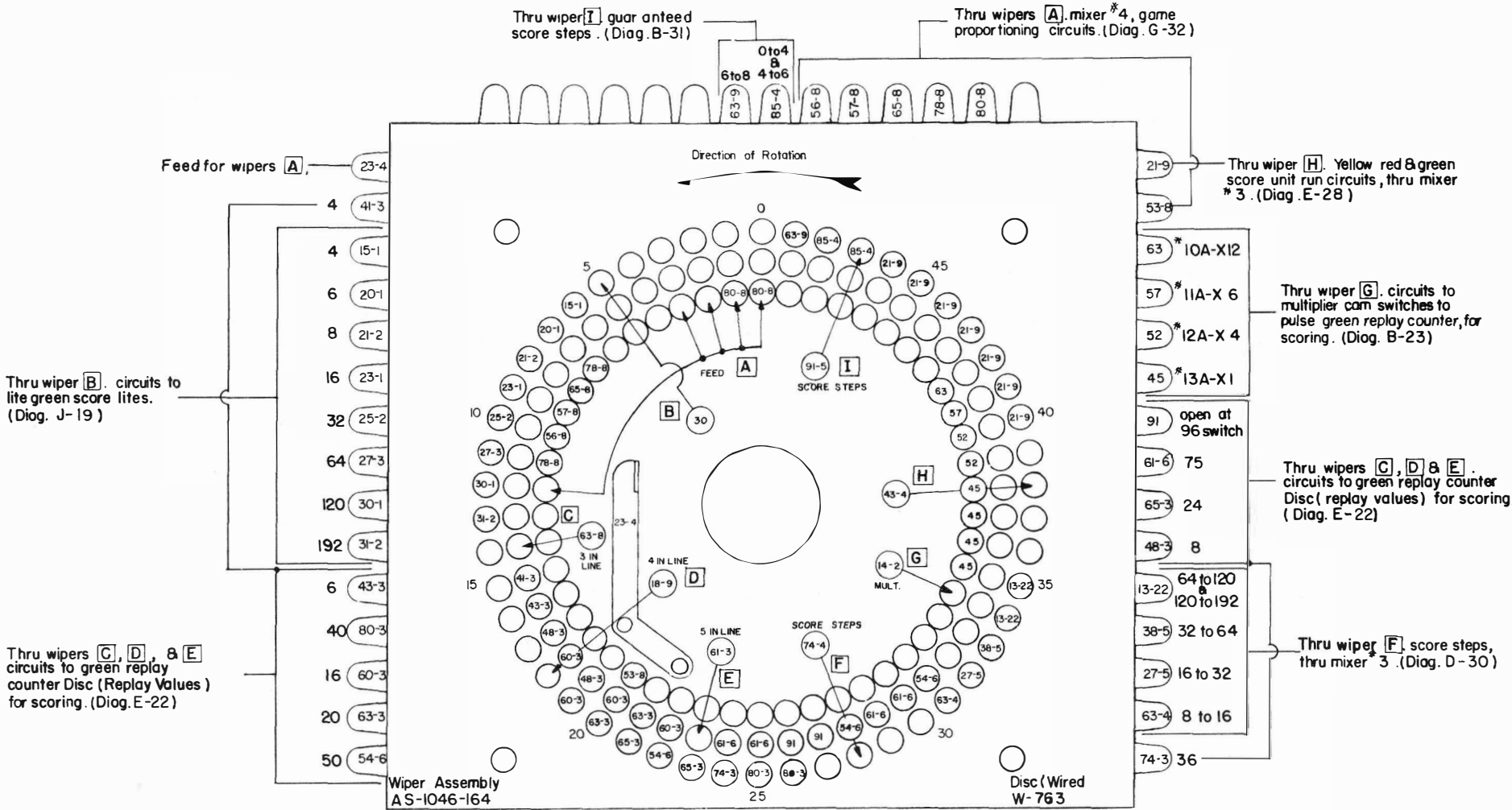


- COMPLETE UNIT - AS-1022-31
- RESET COIL - 28-R-15
- STEP-UP COIL - 25-GG-7
- STEP-UP PLUNGER - S-496-100
- STEP-UP ARM - A-176 -3
- RATCHET & SHAFT-C-1050-8-39

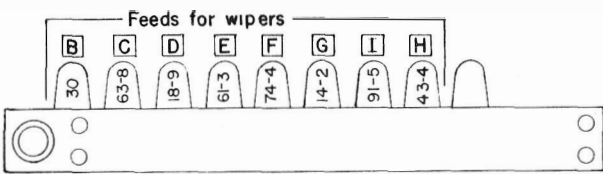


GREEN SCORE UNIT viewed from BUTTON or WIPER side

8 step unit. Wipers shown in zero or reset position

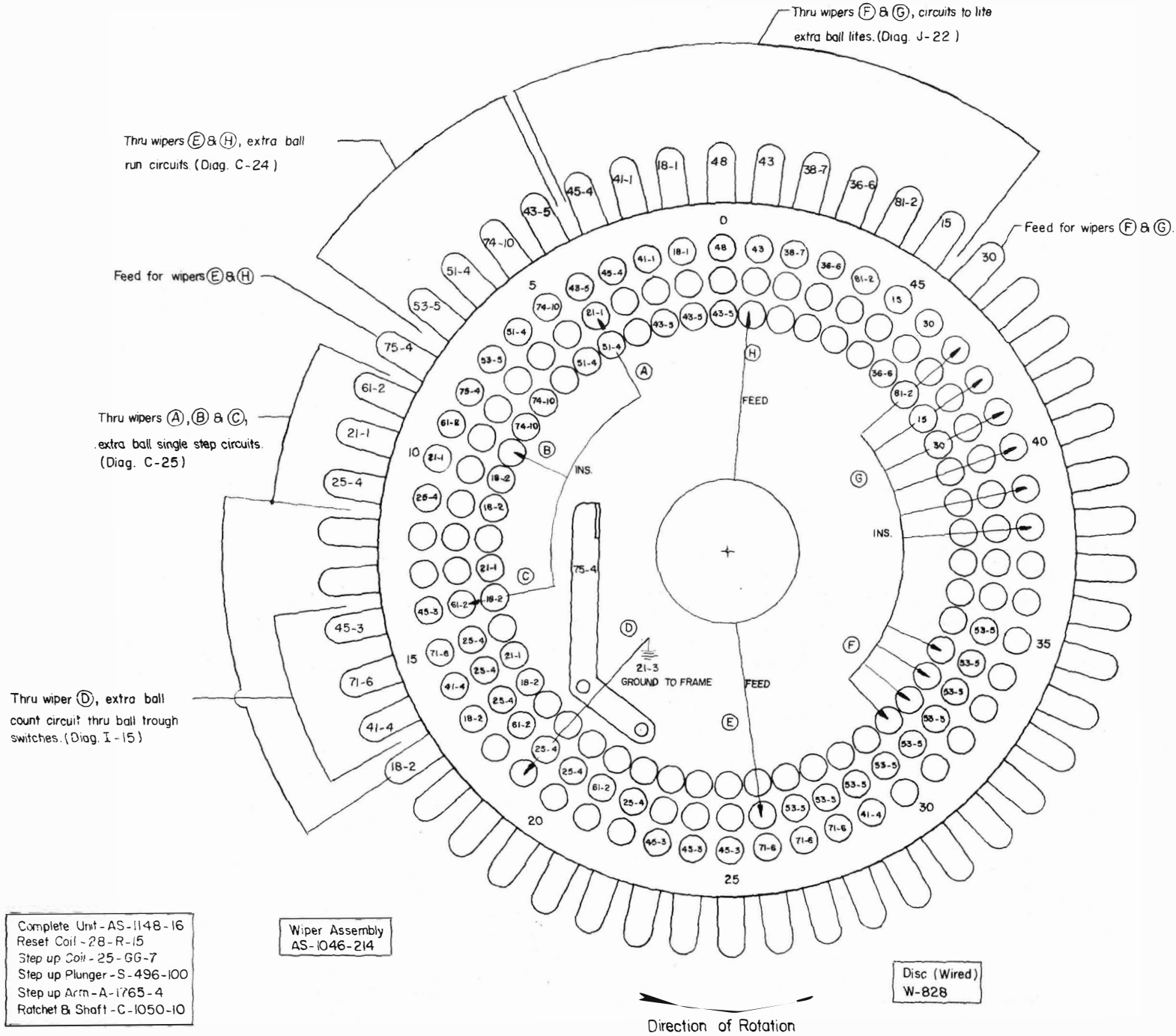


- Complete unit - AS-1022-32
- Reset coil-28-R-15
- Step-up coil-25-GG-7
- Step-up plunger-S-496-100
- Step-up arm-A-1765-3
- Ratchet & shoft-C-1050-8-39



EXTRA BALL UNIT viewed from BUTTON or WIPER side

10 step unit. Wipers shown in zero or reset position



- Complete Unit - AS-1148-16
- 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-1050-10

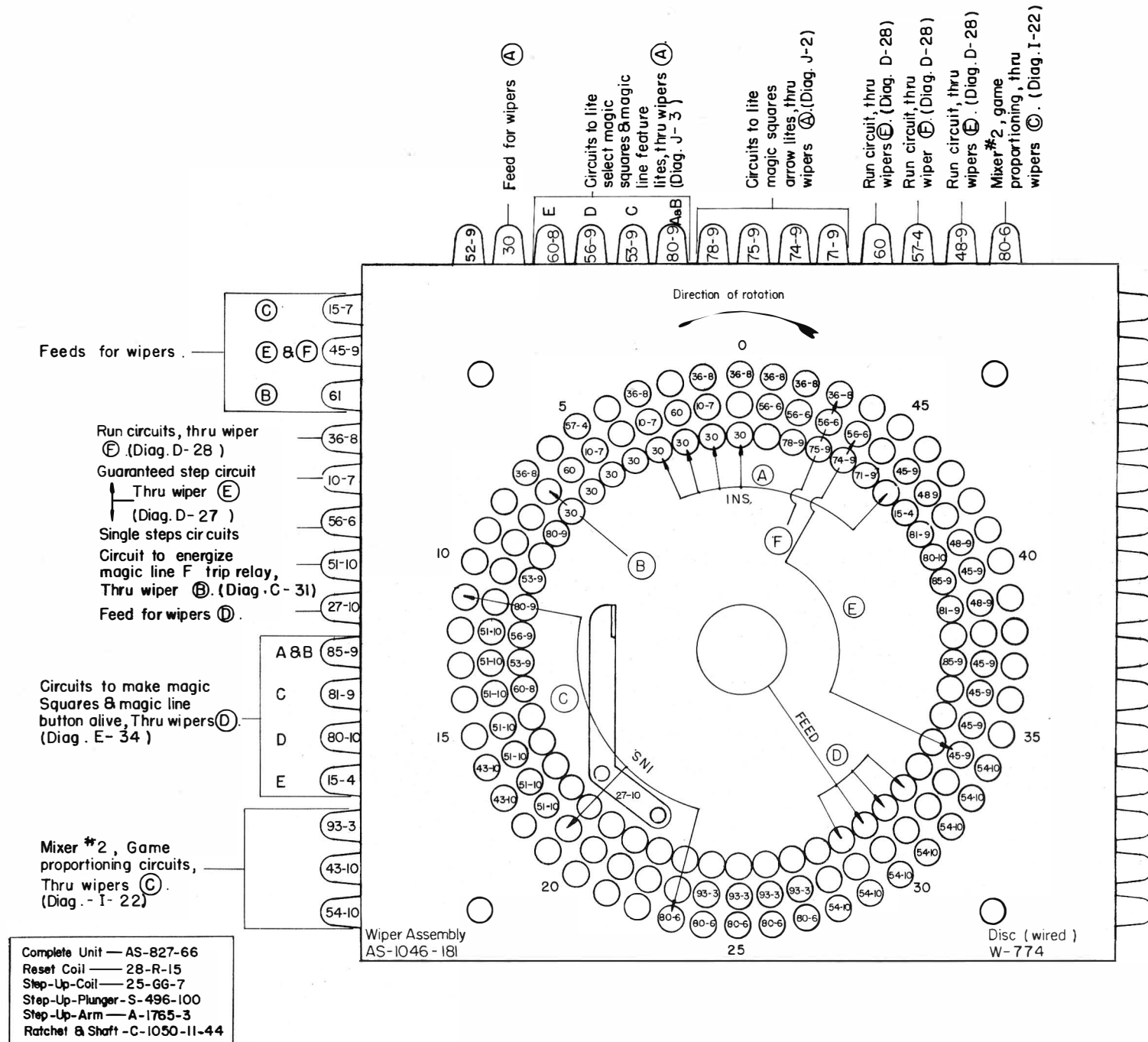
Wiper Assembly
AS-1046-214

Disc (Wired)
W-828

Direction of Rotation

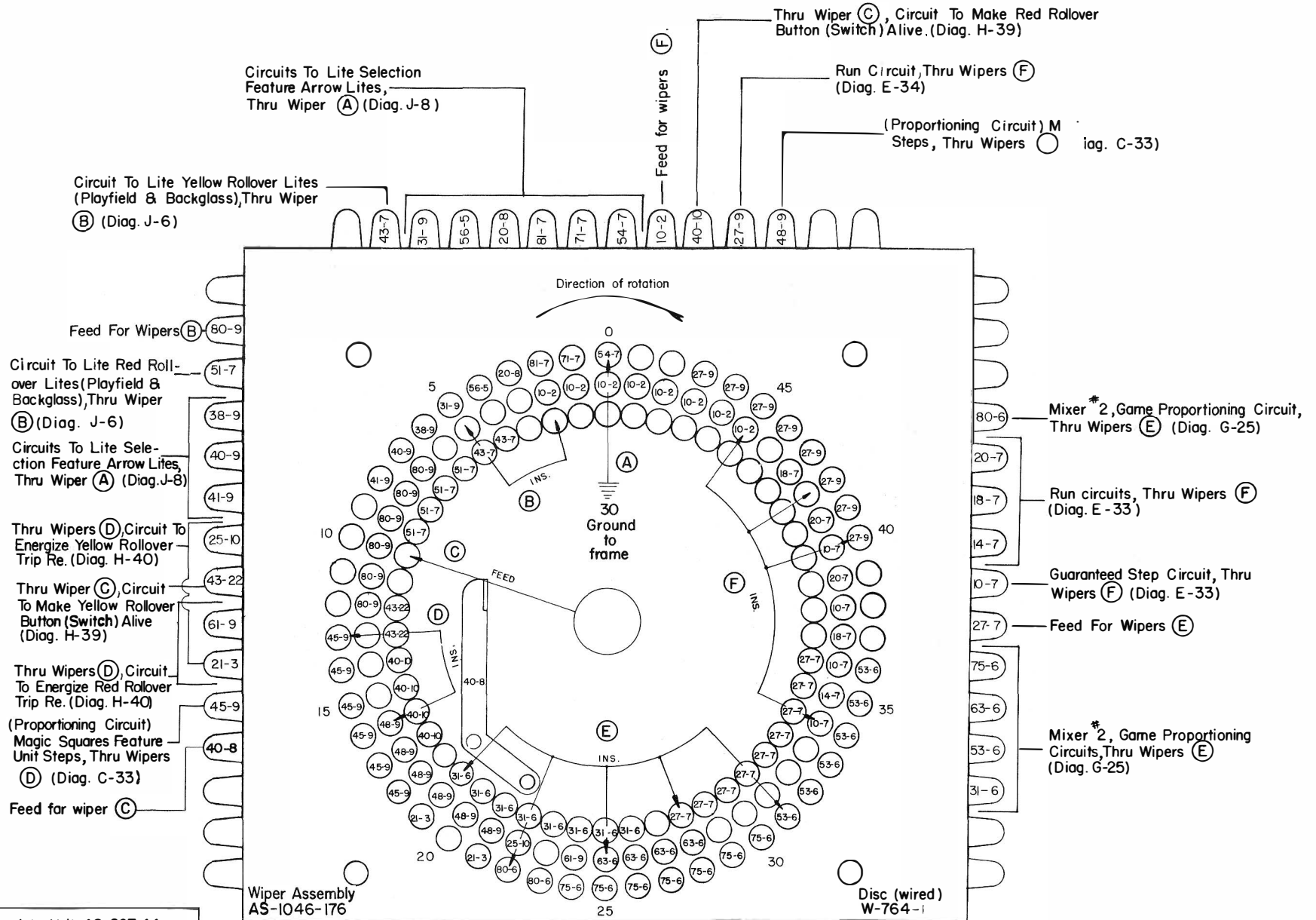
MAGIC SQUARES FEATURE UNIT viewed from BUTTON or WIPER side

11 step unit. Wipers shown in zero or reset position



SELECTION FEATURE UNIT viewed from BUTTON or WIPER side

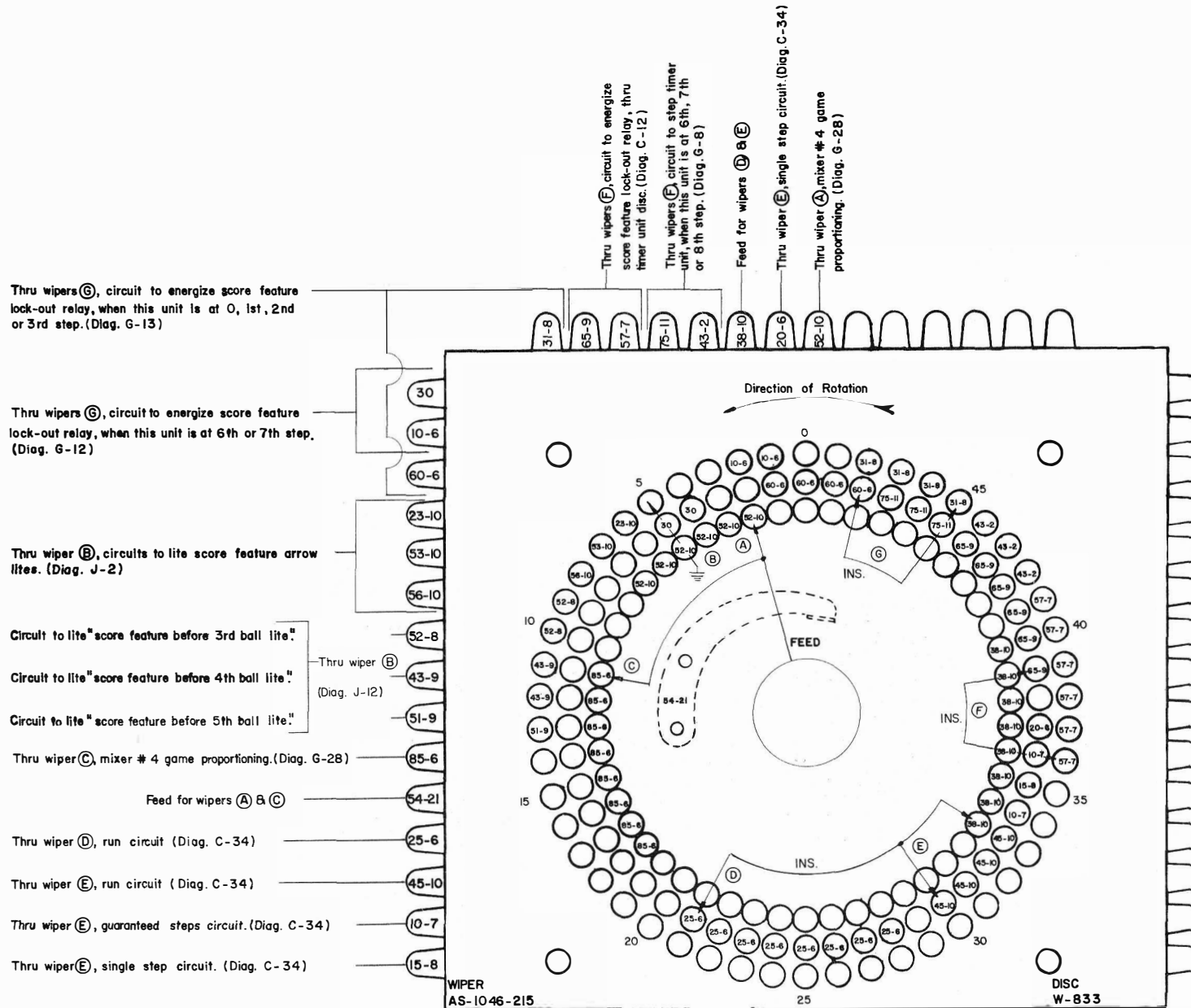
8 step unit. Wipers shown in zero or reset position



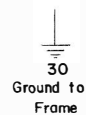
- Complete Unit-AS-827-44
- Reset Coil - 28-R-15
- Step Up Coil - 25-GG-7
- Step Up Plunger-S-496-100
- Step Up Arm - A-1765-3
- Ratchet & Shaft-C-1050-8

SCORE FEATURE UNIT viewed from BUTTON or WIPER side

8 step unit. Wipers shown in zero or reset position

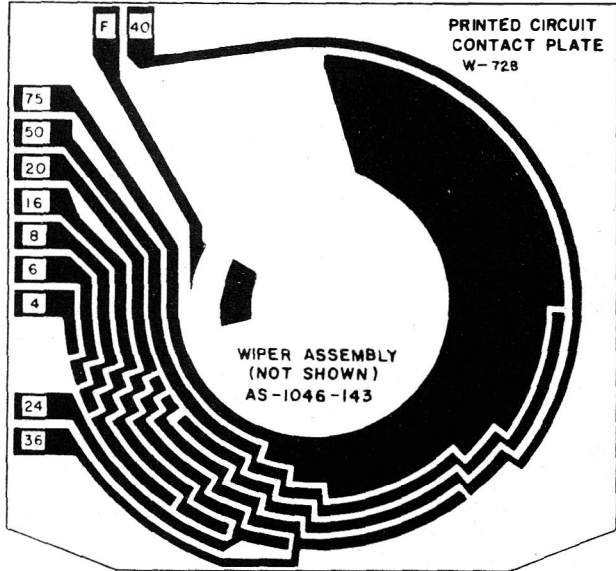


Complete Unit	AS-1022-41
Reset Coil	28-R-15
Step-Up Coil	25-GG-7
Step-Up Plunger	S-496-100
Step-Up Arm	A-1765-8
Ratchet & Shaft	C-1050-8

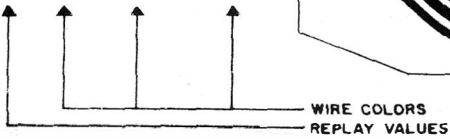


REPLAY COUNTER viewed from WIPER side 3 used (see code box at left)

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



- Complete Unit - AS-797-36
- Reset Coil - 28-R-15
- Step-up Coil - 25-GG-7
- Step-up Plunger - S-496-116
- Step-up Arm - A-1765-49
- Ratchet & Shaft - C-100



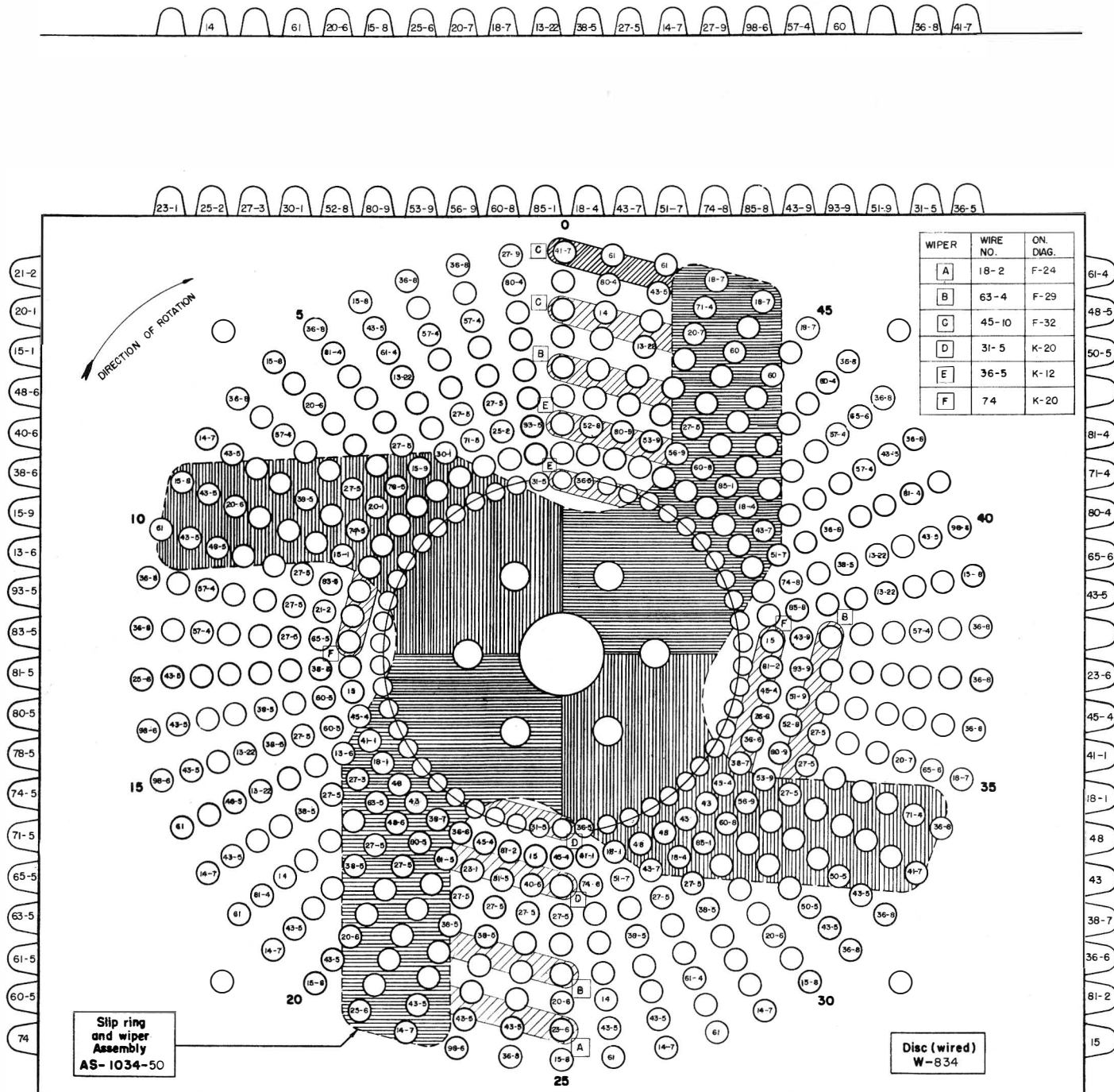
CAM SWITCHES THAT PULSE YELLOW, GREEN & RED REPLAY COUNTER STEP-UP COILS								
	sw.13A	sw.13A	sw.13A	sw.13A	sw.12A	sw.12A	sw.11A	sw.10A
5 IN LINE	75 	75 	96 	96 	200 	300 	450 	600
4 IN LINE	16 	20 	24 	50 	96 	144 	240 	480
3 IN LINE	4 	6 	8 	16 	32 	64 	120 	192

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.

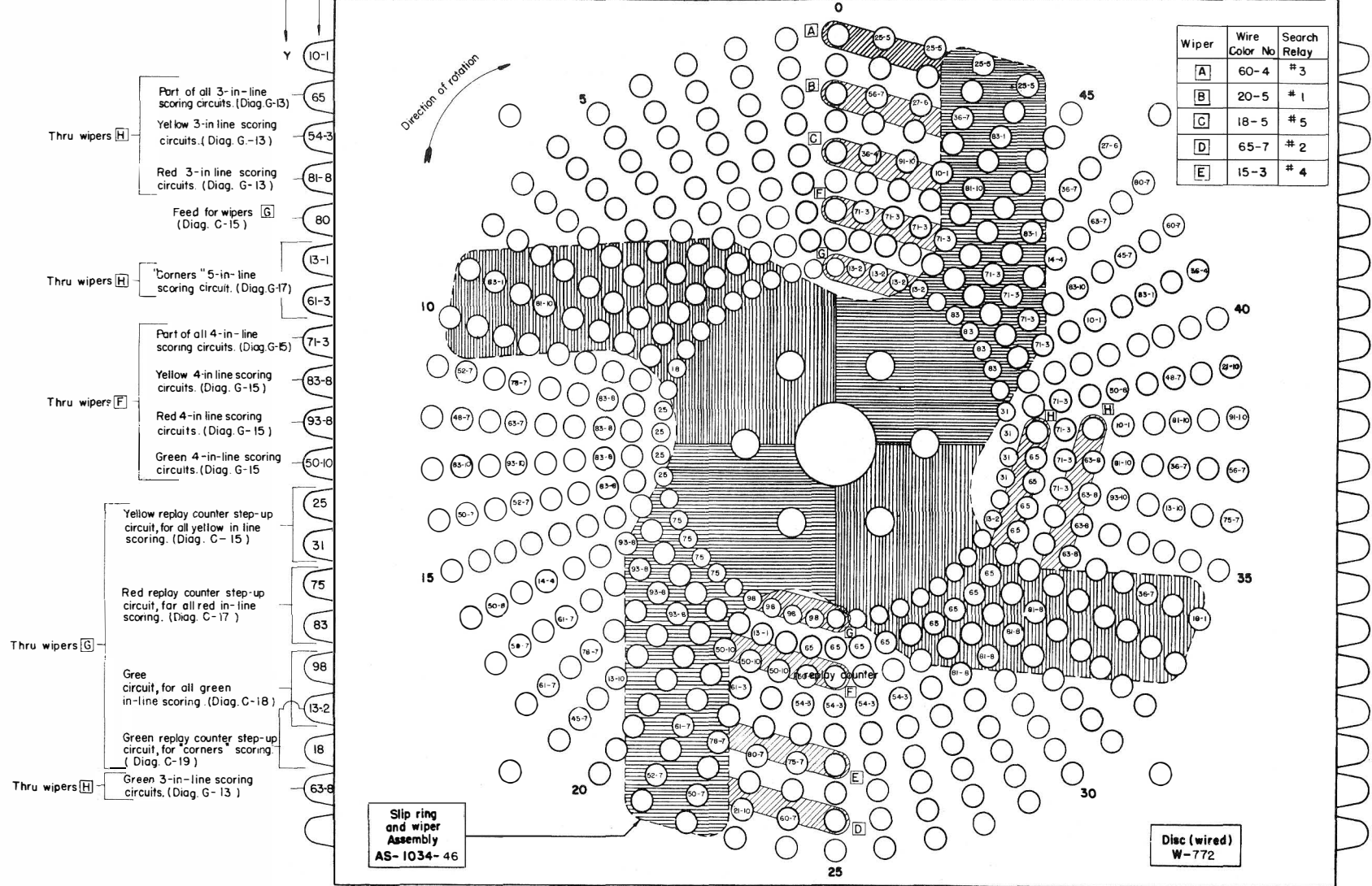
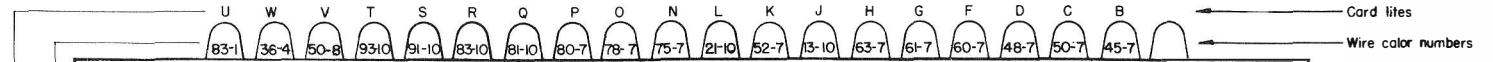
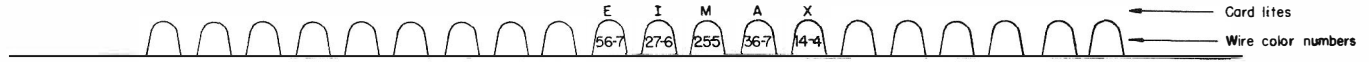
EXAMPLE: ON A 3-IN-LINE SCORE OF REPLAYS THE CIRCUIT IS EFFECTIVE THRU THE REPLAY CIRCUIT STRIP

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

SPOTTING DISC viewed from BUTTON or WIPER side

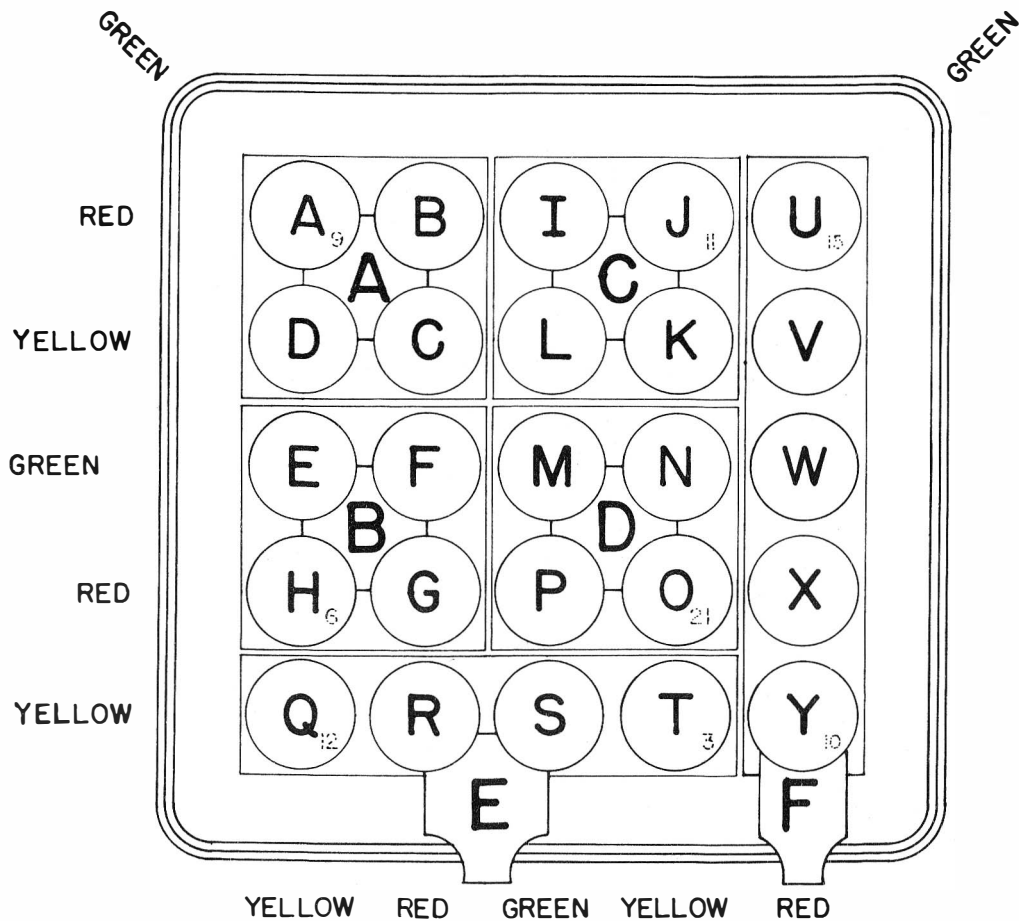


SEARCH DISC viewed from BUTTON or WIPER side



CARD LAYOUT

NEUTRAL POSITION

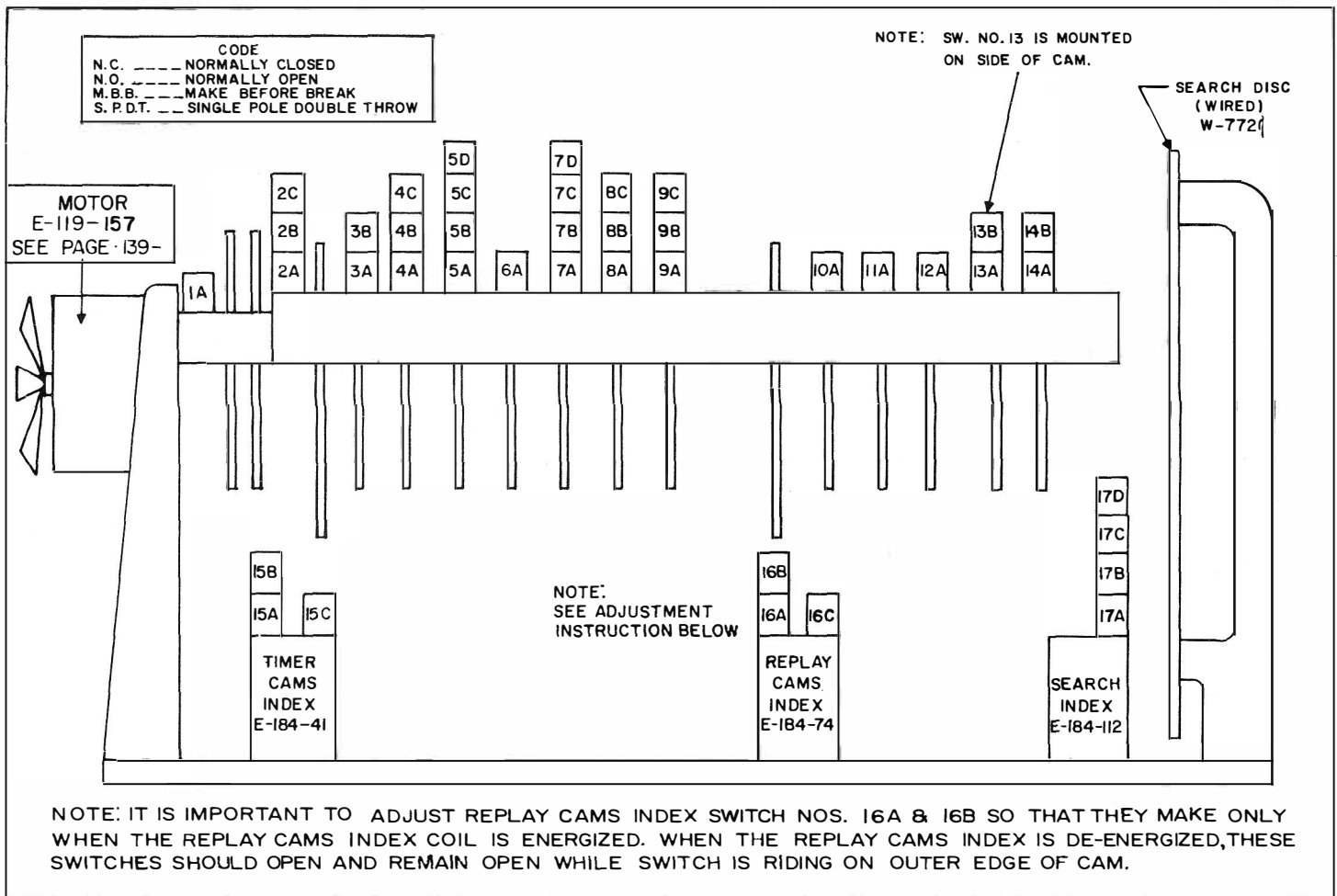


SEARCH POSITIONS						
WIPER (A) AT POSITION	WIPER (B) ROW 7 SEARCH RELAY #1	WIPER (D) ROW 8 SEARCH RELAY #2	WIPER (A) ROW 9 SEARCH RELAY #3	WIPER (E) ROW 6 SEARCH RELAY #4	WIPER (C) ROW 5 SEARCH RELAY #5	
1						
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32						
33						
CORNERS	34	A	U	Y	Q	
35						
VERTICAL	36	J	K	N	O	T
37	A	D	E	H	Q	
HORIZONTAL	38	Q	R	S	T	Y
39	D	C	L	K	V	
40						
VERTICAL	41	U	V	W	X	Y
42	B	C	F	G	R	
HORIZONTAL	43	H	G	P	O	X
44	A	B	I	J	U	
45						
DIAGONAL	46	U	K	M	G	Q
47	A	C	M	O	Y	
VERTICAL	48	I	L	M	P	S
HORIZONTAL	49	E	F	M	N	W
50						

ROTATION OF SEARCH DISC WIPERS
FROM 50 TO 1

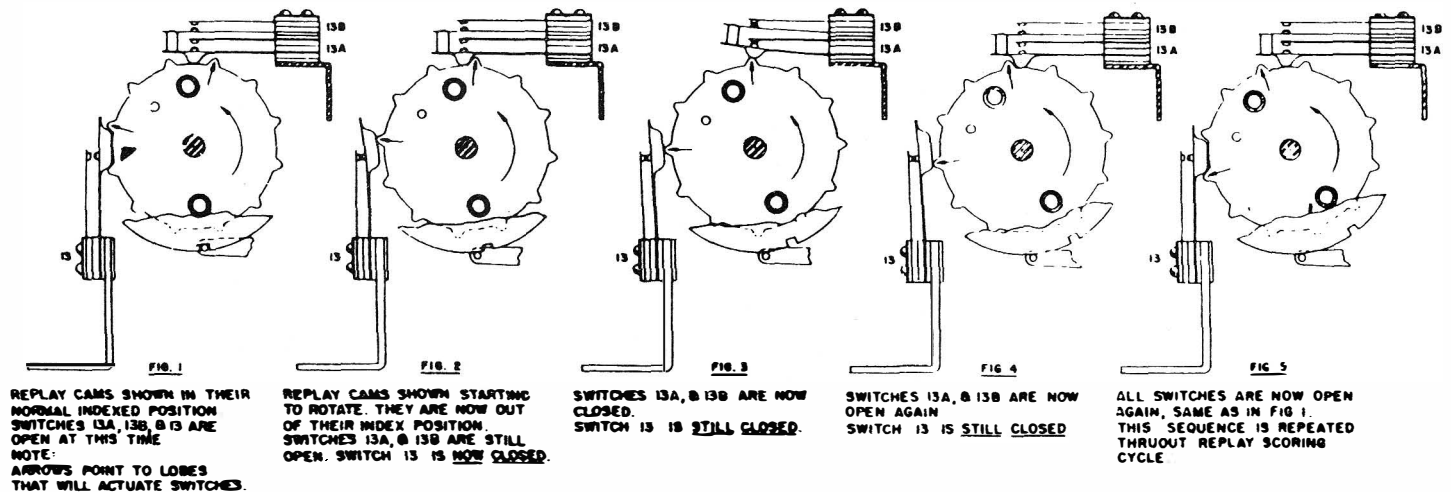
CONTROL UNIT PICTORIAL VIEW

NUMBERS CORRESPOND TO SWITCH CHART ON PAGE 131



CORRECT ADJUSTMENT: CONTROL UNIT CAM SWITCHES 13, 13A & 13B

NOTICE: IMPORTANT PART OF ILLUSTRATION IS TO SHOW THAT SWITCH 13 CLOSSES FIRST AND OPENS LAST. IF AN ADJUSTMENT IS NECESSARY, SWITCH 13 CAN BE MOVED UP OR DOWN. LOOSEN SCREWS THAT HOLD SWITCH, THEN MOVE UP OR DOWN.



CONTROL UNIT CAM SWITCH CHART FOR POSITION OF SWITCHES REFER TO PICTORIAL VIEW ON PAGE 130

CAM SWITCH		LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
1A	N. O.	F-10	65-2 36-9	Brown-White Yellow-Brown	Circuit to step timer unit, after shooting 5th ball.
2A	N. O.	I-3	90-5 30	Gray Yellow	Energizes reflex play magnet, and replay register reset coil. Also pulses total plays meter.
2B	N. O.	C-42	93-4 30	Gray-Yellow Yellow	Energizes coin kicker coil.
2C	N. C.	E-14	31-7 57-6	Yellow-Red White-Orange	Drops out red button relay.
3A	N. C.	I-4	48-2 83-3	Green-Black Black-Yellow	Drops out start relay, and acts as safety switch during spin.
3B	S. P. D. T.	B-18	93-7 98-4 91-7	Gray-Yellow Gray-Black Gray-Red	Directs circuit to replay meter, or total plays meter.
4A	N. O.	C-44	98-1 30	Gray-Black Yellow	Energizes spotting cams index coil.
4B	N. O.	B-40	25-9 30	Blue-White Yellow	Energizes score extra step index coil.
4C	N. O.	C-5	14-9 80-2	Red-Green Black	Used if coin meter is added in front cabinet.
5A	N. O.	G-10	65-2 83-1	Brown-White Black-Yellow	Energizes timer unit reset coil.
5B	N. O.	B-25	21-1 38-4	Blue-Red Yellow-Black	Energizes extra-ball unit step-up coil. (guaranteed step)
5C	N. O.	D-26	78-4 91-11	Orange-Black Gray-Red	Energizes anti-cheat relay.
5D	N. O.	F-31	10-7 85-4	Red Black-White	Magic squares, and selection feature unit single steps circuit. Also score feature unit single steps.
6A	N. C.	I-30	51-5 75-5	White-Red Orange-White	Opens game advantage circuits, during spin.
7A	N. O.	B-29	10-1 75-8	Red Orange-White	Energizes yellow score unit step-up coil. (guaranteed steps)
7B	N. O.	F-29	54-21 63-4	White-Green Brown-Yellow	Yellow, red, and green score unit single steps circuit.
7C	N. O.	B-30	23-9 83-4	Blue-Yellow Black-Yellow	Energizes red score unit step-up coil. (guaranteed steps)
7D	N. O.	B-31	90-4 91-5	Gray Gray-Red	Energizes green score unit step-up coil. (guaranteed steps)
8A	N. O.	G-31	14-8 56-6	Red-Green White-Brown	Magic-squares unit steps.
8B	N. O.	B-25	25-4 38-4	Blue-White Yellow-Black	Extra ball unit steps.
8C	N. O.	C-41	93-4 30	Gray-Yellow Yellow	(Safety circuit) energizing coin kicker coil.

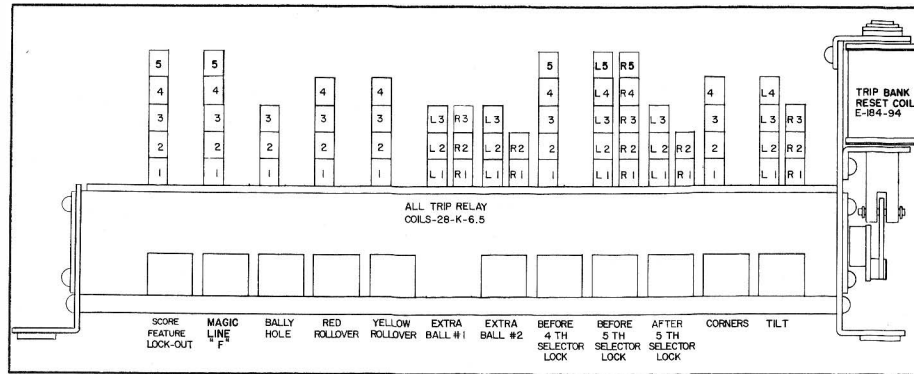
CONCLUDED ON NEXT PAGE

CONTROL UNIT CAM SWITCH CHART — CONCLUDED

CAM SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
9A Alt.	C-32	45-9 48-9	Green-White Green-Black	Proportioning circuit (magic squares unit steps).
9B Alt.	H-28	15-7 54-8	Red-White White-Green	Proportioning circuit (extra ball unit steps).
9C Alt.	D-25	43-5 74-10	Green-Yellow Orange-Green	Proportioning circuit (extra ball unit steps).
10A N.O.	A-21	63 70	Brown-Yellow Orange	Pulses replay counters, when score units are at 8th step.
11A N.O.	A-20	57 70	White-Orange Orange	Pulses replay counters, when score units are at 7th step.
12A N.O.	A-20	52 70	White-Blue Orange	Pulses replay counters, when score units are at 5th and 6th steps.
13A N.O.	A-19	45 70	Green-White Orange	Pulses replay counters, when score units are at 1st, 2nd, 3rd and 4th steps.
13B N.O.	C-17	48-4 80	Green-Black Black	Pulses replay register step-up coil, and reflex replay magnet.
13 (Backside) N.O.	H-17	21-3 27	Blue-Red Blue-Orange	Replay lock-in circuit (NOTE: see control unit pictorial view)
14A N.C.	I-18	56 93	White-Brown Gray-Yellow	Prevents the start of another replay scoring, when control unit cams are indexed.
14B N.C.	C-8	27-2 90-2	Blue-Orange Gray	Opens circuit to timer unit step-up coil, during replay winner.
TIMER CAMS INDEX COIL	B-6	70 93-2	Orange Gray-Yellow	Energized when playing coins or replays.
15A N.O.	G-1	20P 60P	Blue (Plastic) Brown (Plastic)	Operates control unit, and mixer and spotting unit motors.
15B N.C.	G-5	14-9 71-2	Red-Green Orange-Red	Opens circuit to coin lock-out magnet, during spin.
15C N.C.	D-14	13 30	Red-Yellow Yellow	Lock-in safety circuit for red button relay.
REPLAY CAMS INDEX COIL	A-17	40-4 70	Green Orange	Energizes when winning score is made, and releases replay cams.
16A N.O.	D-17	27 80	Blue-Orange Black	In series with replay lock-in circuit. NOTE: See control unit pictorial view for correct adjustment.
16B N.O.	H-18	56 93	White-Brown Gray-Yellow	In series with replay winner circuit. NOTE: See control unit pictorial view for correct adjustment.
16C N.C.	B-16	15-2 80	Red-White Black	Opens direct 50 volt circuit to search index coil, coil then held in thru resistor.
SEARCH INDEX COIL	A-17	15-2 70	Red-White Orange	Energized when 3-in-line or more is scored.
17A N.O.	K-36	10 71-10	Red Orange-Red	Completes circuit to energize #3 search relay.
17B N.O.	B-17	40-4 80	Green Black	Energizes replay cams index coil.
17C N.C.	G-38	45-5 91-6	Green-White Gray-Red	Opens circuit to magic-squares and lines buttons, during replay winner.
17D N.C.	I-4	83-3 15-5	Black-Yellow Red-White	Opens start circuit, and acts as safety switch.

TRIP RELAY BANK PICTORIAL VIEW

NUMBERS CORRESPOND TO SWITCH CHART



TRIP RELAY BANK CHART

FOR POSITION OF SWITCHES REFER TO PICTORIAL VIEW

RELAY SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
SCORE FEATURE LOCK-OUT TRIP COIL	A-12	J 70	Jumper Orange	Energized thru score feature unit disc. Also when tilt relay is energized, or when anti-cheat relay drops out.
1 S.P.D.T.	E-6	93-2 13-3 61	Gray-Yellow Red-Yellow Brown-Red	Directs circuit from mixer latch, and timer cams index coils, to shutter motor.
2 N.C.	B-12	60-6 J	Brown Jumper	Breaks circuit to coil.
3 N.O.	G-8	43-2 75-11	Green-Yellow Orange-White	Completes circuit to step timer unit.
4 N.C.	L-12	54-9 57-10	White-Green White-Orange	Breaks circuit for flashing "play score feature now" lite.
5 N.C.	H-13	31-8 65-2	Yellow-Red Brown-White	Safety circuit. (Score feature lock-out relay)
MAGIC-LINE "F" TRIP COIL	A-34	53-1 70	White-Yellow Orange	Energized by mixer and spotting 16 pulse cam switch #1A, thru spotting unit disc. Also by mixer and spotting 16 pulse cam switch #2C, when next game feature trip relay is energized.
1 N.C.	B-34	51-10 53-1	White-Red White-Yellow	Breaks circuit to coil.
2 N.C.	I-26	54-10 90-3	White-Green Gray	(Game proportioning) thru mixer #2.
3 N.O.	J-5	93-9 30	Gray-Yellow Yellow	Completes circuit to lite "magic-line F" lite.
4 N.O.	E-39	21-11 27-10	Blue-Red Blue-Orange	Completes circuit to make magic-line "F" button alive.
5 N.C.	I-26	43-10 91-3	Green-Yellow Gray-Red	(Game proportioning) thru mixer #2.
BALLY-HOLE TRIP COIL	A-35	J 70	Jumper Orange	Energized thru spotting unit disc, when circuit complete thru other factors.
1 N.O.	K-9	18-4 30	Red-Black Yellow	Completes circuit to lite "Bally-Hole" lite.
2 N.O.	K-40	50-8 90-8	White Gray	Completes circuit to energize "next game feature" trip relay.
3 N.C.	B-35	14 J	Red-Green Jumper	Breaks circuit to coil.

TRIP RELAY BANK CHART

RELAY SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
RED ROLLOVER TRIP COIL	A-40	61-11 70	Brown-Red Orange	Energized direct thru "selection feature" disc. Also by red rollover button switch, thru "selection feature" disc.
1 N.O.	G-38	45-5 98-9	Green-White Gray-Black	Completes circuit to "magic-squares and lines" buttons.
2 N.C.	B-40	18-10 61-11	Red-Black Brown-Red	Breaks circuit to coil.
3 S.P.D.T.	J-1	53-2 90 78-2	White-Yellow Gray Orange-Black	Breaks circuit for flashing "select-now" lite before shooting 4th, or before shooting 5th ball, and completes circuit to flash "select now" lite after shooting 5th ball.
4 S.P.D.T.	J-10	41-8 80-9 85-8	Green-Red Black Black-White	Breaks circuit to "select before 4th" or "select before 5th" ball feature lites, and completes circuit to lite "select after 5th" feature lite.
YELLOW ROLLOVER TRIP COIL	A-39	25-11 70	Blue-White Orange	Energized direct thru "selection feature" disc. Also by yellow rollover button switch, thru "selection feature" disc.
1 N.O.	G-37	15-10 98-9	Red-White Gray-Black	Completes circuit to "magic-squares and lines" buttons.
2 N.C.	B-39	25-11 31-10	Blue-White Yellow-Red	Breaks circuit to coil.
3 S.P.D.T.	K-1	10-5 52-2 23-5	Red White-Yellow Blue-Yellow	Breaks circuit for flashing "select-now" lite before shooting 4th ball, and completes circuit to flash "select-now" lite before shooting 5th ball.
4 S.P.D.T.	J-10	57-5 41-8 74-8	White-Orange Green-Red Orange-Green	Breaks circuit to "select before 4th ball feature" lite and completes circuit to lite "select before 5th ball feature" lite.
EXTRA-BALL #1 TRIP COIL	A-14			Trips with extra ball #2 trip relay.
L1 N.C.	J-26	21-4 30	Blue-Red Yellow	Completes circuit to lite extra balls lite.
L2 S.P.D.T.	E-25	85-4 30 61-2	Black-White Yellow Brown-Red	Breaks guaranteed score steps circuit, and completes circuit to extra ball unit for 1st step.
L3 S.P.D.T.	F-27	52-10 27-7 18-2	White-Blue Blue-Orange Red-Black	Breaks circuit for score steps, and completes circuit for extra ball steps.
R1 N.O.	G-27	27 54-8	Blue-Orange White-Green	Proportioning circuit (extra ball steps)
R2 N.O.	G-10	71-8 83-1	Orange-Red Black-Yellow	Completes circuit to reset timer unit, after playing extra balls.
R3 N.C.	E-25	85-4 91-11	Black-White Gray-Red	Circuit to energize anti-cheat relay.
EXTRA BALL #2 TRIP COIL	A-14	25-7 70	Blue-White Orange	Energized by yellow button switch, thru before 5th selector lock trip relay switch. (Extra ball play)
L1 N.O.	C-16	38-3 91-1	Yellow-Black Gray-Red	Completes circuit to ball lifter motor.
L2 S.P.D.T.	J-20	31-5 13-4 74	Yellow-Red Red-Yellow Orange-Green	Breaks circuit for flashing other game advantage lites, and completes circuit to flash extra ball lites.
L3 S.P.D.T.	D-6	14-3 61 98-2	Red-Green Brown-Red Gray-Black	Breaks circuit to shutter motor, and completes circuit to energize timer cams, and mixer latch coils.
R1 S.P.D.T.	I-28	75-5 15-7 45-2	Orange-White Red-White Green-White	Game proportioning circuits.
R2 N.C.	B-14	25-7 38-2	Blue-White Yellow-Black	Breaks circuit to coil.

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TRIP RELAY BANK CHART

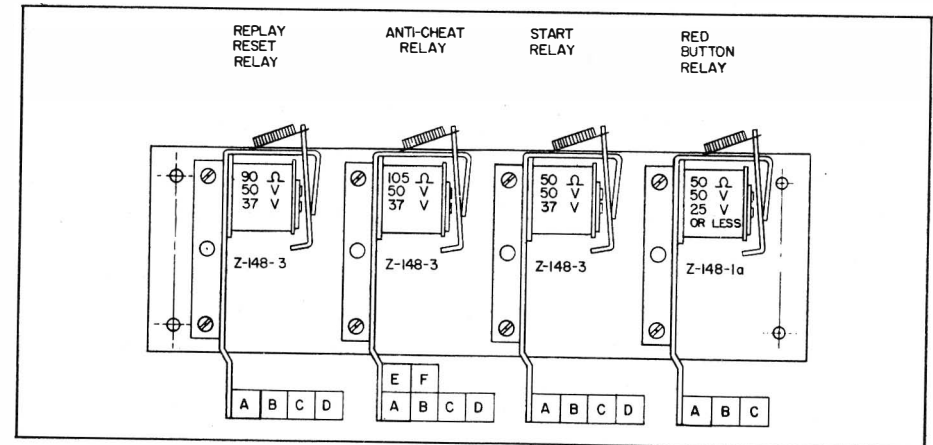
RELAY SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
BEFORE 4th SELECTOR LOCK TRIP COIL	A-11	J 70	Jumper Orange	Energized thru timer unit disc, when 4th ball is shot.
1	N.C.	B-11 83-6 J	Black-Yellow Jumper	Breaks circuit to coil.
2	N.C.	H-38 15-10 98-9	Red-White Gray-Black	Breaks circuit to "magic-squares and lines" buttons.
3	N.O.	H-9 36-2 43-2	Yellow-Brown Green-Yellow	Completes circuit to timer unit step-up coil.
4	N.O.	F-12 10-6 60-6	Red Brown	Completes a circuit to energize score feature lock-out trip relay.
5	N.C.	K-1 10-5 27-4	Red Blue-Orange	Breaks circuit to "select-now" lite.
BEFORE 5th SELECTOR LOCK TRIP COIL	A-11	J 70	Jumper Orange	Energized thru timer unit disc, when 5th ball is shot.
L1	S.P.D.T.	L1 98-3 14-1 75-3	Gray-Black Red-green Orange-White	Breaks circuit to flash "select-now" lite (for select before 5th ball), and completes circuit to flash "select-now" lite for (select after 5th ball).
L2	N.C.	B-11 74-6 J	Orange-Green Jumper	Breaks circuit to coil.
L3	N.O.	B-14 25-8 38-2	Blue-White Yellow-Black	Completes circuit to extra-ball trip relays, for extra-ball play.
L4	N.C.	B-39 25-10 31-10	Blue-White Yellow-Red	Breaks circuit for energizing yellow roll-over trip relay, (thru yellow rollover button switch).
L5	N.C.	K-6 20-2 43-7	Blue Green-Yellow	Breaks circuit to yellow rollover lite.
R1	N.O.	G-12 10-6 60-6	Red Brown	Completes a circuit to energize score feature lock-out relay.
R2	N.C.	F-38 45-5 15-10	Green-White Red-White	Breaks circuit to "magic-squares & lines buttons."
R3	N.O.	I-19 45-6 56	Green-White White-Brown	In series circuit for replay scoring.
R4	N.O.	D-9 27-2 78-6	Blue-Orange Orange-Black	Completes circuit to timer unit step-up coil.
R5	N.O.	E-4 18-6 50-6	Red-Black White	Completes circuit to make yellow button alive. (For extra ball play)
AFTER 5th SELECTOR LOCK TRIP COIL	A-10	J 70	Jumper Orange	Energized when 6th ball (1st extra ball) is shot.
L1	N.C.	K-1 75-3 78-2	Orange-White Orange-Black	Breaks circuit to "select-now" lite.
L2	N.C.	B-11 98-5 J	Gray-Black Jumper	Breaks circuit to coil.
L3	N.C.	K-6 10-9 51-7	Red White-Red	Breaks circuit to red rollover lite.
R1	N.C.	F-39 27-10 91-6	Blue-Orange Gray-Red	Breaks circuit to "magic-squares and lines" buttons.
R2	N.C.	C-40 18-10 61-9	Red-Black Brown-Red	Breaks circuit for energizing red rollover trip relay. (Thru red rollover button switch)
CORNERS TRIP COIL	A-35	J 70	Jumper Orange	Energized thru spotting unit disc, when circuit complete thru other factors.
1	N.O.	J-9 85-1 30	Black-White Yellow	Completes circuit to lite "corners" lite.
2	N.C.	B-35 61-4 J	Brown-Red Jumper	Breaks circuit to coil.
3	N.O.	G-20 13-1 71-3	Red-Yellow Orange-Red	Part of corners replay scoring circuit.
4	N.O.	C-22 18 98	Red-Black Gray-Black	Same as above.

TRIP RELAY BANK CHART

RELAY SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
TILT TRIP COIL	A-15	14-5 70	Red-Green Orange	Energized by any tilt switch or the plumb-bob tilt. Also at 39th step of timer unit.
L1	S.P.D.T.	I-7 21-3 30 45-8	Blue-Red Yellow Green-White	Breaks circuits for game advantages, replay scoring, ball counting, and completes circuit to shutter motor.
L2	N.C.	I-38 40-8 98-9	Green Gray-Black	Breaks circuit to "magic-squares and lines" buttons.
L3	N.C.	L-27 10 20-4	Red Blue	Breaks 17 volt circuit.
L4	S.P.D.T.	L-26 38 81 91-2	Yellow-Black Black-Red Gray-Red	Breaks 6 volt circuit, and lites tilt lite.
R1	N.O.	D-15 57-6 85-7	White-Orange Black-White	Safety circuit. (Red button relay)
R2	N.O.	G-12 60-6 30	Brown Yellow	Completes circuit to energize score feature lock-out relay.
R3	N.C.	G-1 20-P 60-P	Blue (Plastic) Brown (Plastic)	Breaks circuit to control unit, and mixer-spotting unit motors.

4 RELAY BANK PICTORIAL VIEW

NUMBERS CORRESPOND TO SWITCH CHART ON PAGE 135



Coil part numbers

50 Ω 50 V - C-2794-9
 90 Ω 50 V - C-2794-1
 105 Ω 50 V - C-2794-23

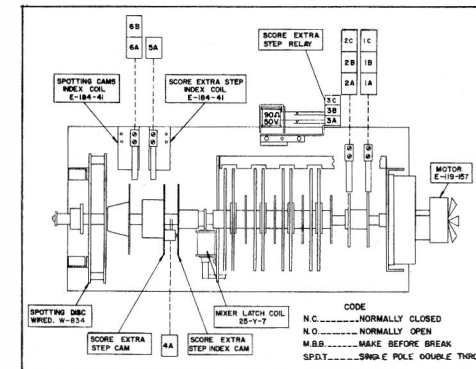
4 RELAY BANK SWITCH CHART

FOR POSITION OF SWITCHES REFER TO PICTORIAL VIEW ON PAGE 134

RELAY SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES	
REPLAY RESET RELAY COIL	A-4	75-2 70	Orange-White Orange	Energizes when anti-cheat relay drops out.	
A S.P.D.T.	C-3	90-5 13-9 53-7	Gray Red-Yellow White-Yellow	Directs replay register reset circuit thru control unit cam switch #2A, when replays are being played, or thru 16 pulse cam when replays are being cancelled.	
B	N.O.	G-3	56-2 75-2	White-Brown Orange-White	Lock-in switch for this relay.
C	N.O.	G-1	20-P 60-P	Blue (Plastic) Brown(Plastic)	Completes circuit to control unit, and mixer & spotting unit motors, when replays are being cancelled.
D	N.C.	C-4	21-6 63-2	Blue-Red Brown-Yellow	Opens start circuit during replay cancel.
ANTI-CHEAT RELAY COIL	A-26	78-4 70	Orange-Black Orange	Energized thru control unit cam switch #5C, its switches protect replay, game advantage, and lite circuits.	
A S.P.D.T.	G-4	75-2 56-2 50-2	Orange-White White-Brown White	Breaks start relay circuit, and completes circuit to replay reset relay when this relay drops out.	
B	N.O.	D-26	78-4 30	Orange-Black Yellow	Lock-in switch for this relay.
C	N.O.	M-27	20-4 80-1	Blue Black	Breaks 17 volt circuit, when relay drops out.
D	N.C.	D-14	57-6 85-7	White-Orange Black-White	Safety switch. (Red button relay circuit.)
E S.P.D.T.	L-25	91-2 38 54-2	Gray-Red Yellow-Black White-Green	Breaks 6 volt circuit, and lites tilt lite, when this relay drops out.	
F	N.C.	G-13	21 60-6	Blue-Red Brown	(Safety switch) Red button relay circuit.
START RELAY COIL	A-4	21-6 70	Blue-Red Orange	Energized every time a coin is played, or when red or yellow button is pressed.	
A	N.C.	B-24	75-4 78	Orange-White Orange-Black	Opens extra ball step-up circuit during spin.
B	N.C.	G-29	14-8 83-9	Red-Green Black-Yellow	Opens game advantage circuits during spin.
C	N.O.	F-6	13-3 90-9	Red-Yellow Black-White	Completes circuit to timer cams index, and mixer latch coils.
D	N.O.	F-4	48-2 63-2	Green-Black Brown-Yellow	Lock-in switch for this relay.
RED BUTTON RELAY COIL	A-14	85-7 70	Black-White Orange	Energizes when red button is pressed.	
A S.P.D.T.	C-6	93-2 98-2 14-3	Gray-Yellow Gray-Black Red-Green	Directs circuit from mixer latch, and timer cams index coils during extra ball play, to shutter motor when starting new game after extra ball play.	
B	N.O.	D-14	31-7 27-8	Yellow-Red Blue-Orange	Lock-in switch for this relay.
C	N.C.	K-25	50-9 21-4	White Blue-Red	Opens extra ball lite circuit.

MIXER AND SPOTTING UNIT ASSEMBLY

NUMBERS CORRESPOND TO SWITCH CHART BELOW

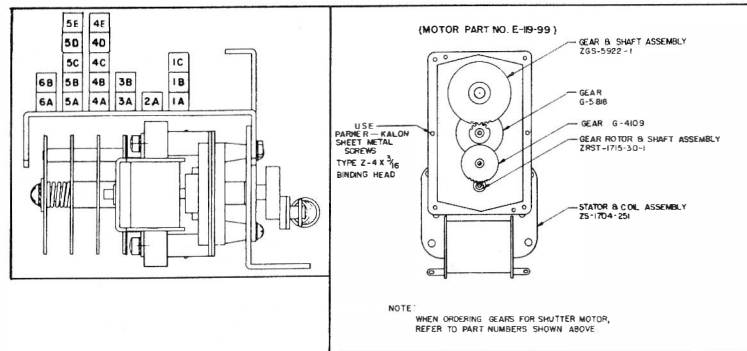


MIXER AND SPOTTING UNIT CAM SWITCH CHART

FOR POSITION OF SWITCHES REFER TO PICTORIAL VIEW ABOVE

CAM SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES	
1A	N.O.	F-31	14-8 45-10	Red-Green Green-White	Pulses magic-squares, selection feature, score feature for multiple steps. Also energizes corners, Bally-hole, and magic line "P" trip relays.
1B	N.O.	J-2	80-9 90	Black Gray	Flashes select-now lite.
1C	N.O.	L-12	54-9 91-9	White-Green Gray-Red	Flashes "play score feature now" lite.
2A	N.O.	D-3	53-7 75-2	White-Yellow Orange-White	Pulses replay register reset coil.
2B	N.O.	B-24	38-4 78	Yellow-Black Orange-Black	Pulses extra ball unit step-up coil, for multiple steps.
2C	N.O.	E-36	48-21 51-21	Green-Black White-Red	Pulses magic squares feature unit step-up coil. (Next game feature, when Bally-hole hit circuit.)
SCORE EXTRA STEP RELAY COIL	A-8	43-6 70	Green-Yellow Orange	Energized by yellow, red, or green score unit step-up arm switch.	
3A	N.O.	B-8	43-6 81-3	Green-Yellow Black-Red	Lock-in circuit for this relay.
3B	N.O.	C-27	50-4 51-6	White White-Red	Completes circuit for yellow, red, and green score unit multiple steps.
3C	N.C.	I-3	15-5 30	Red-White Yellow	(Safety switch) Opens start circuit.
4A	N.O.	D-27	43-4 50-4	Green-Yellow White	Pulses yellow, red, and green score units for multiple steps.
SCORE EXTRA STEP INDEX COIL	A-40	25-9 70	Blue-White Orange	Energized during timing cam cycle, by control unit cam switch #4B.	
5A	N.O.	C-9	13-5 81-3	Red-Yellow Black-Red	Lock-in circuit for score extra step relay.
SPOTTING CAMS INDEX COIL	A-44	98-1 70	Gray-Black Orange	Energized during timing cam cycle, by control unit cam switch #4A.	
6A	N.O.	J-20	13-4 30	Red-Yellow Yellow	Flashes game advantage lites, also flashes extra ball lites, during extra ball play.
6B	N.O.	J-13	61-8 30	Brown-Red Yellow	Flashes game advantage lites.

SHUTTER MOTOR PICTORIAL VIEW



SHUTTER MOTOR CAM SWITCH CHART

FOR POSITION OF SWITCHES SEE PICTORIAL VIEW

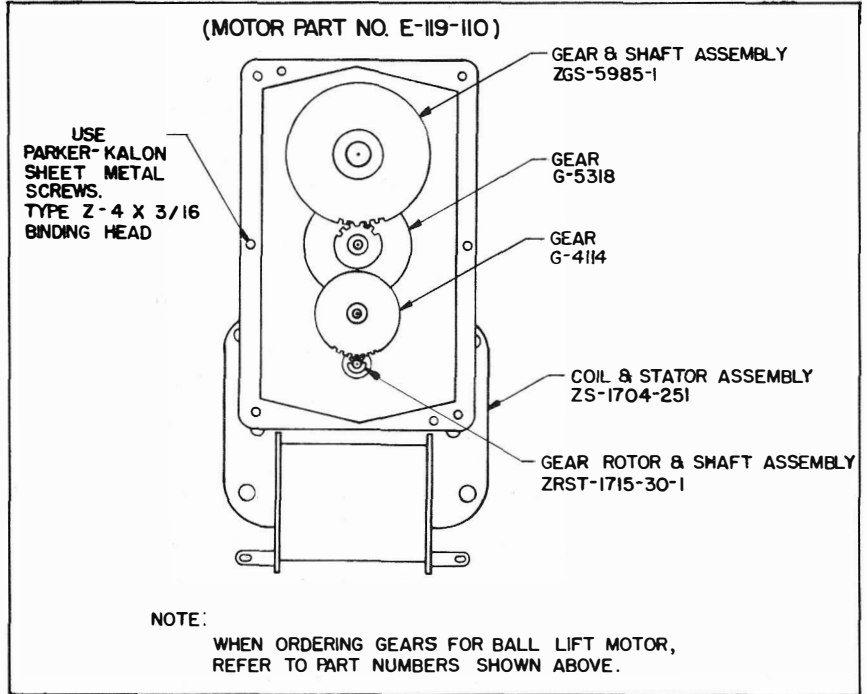
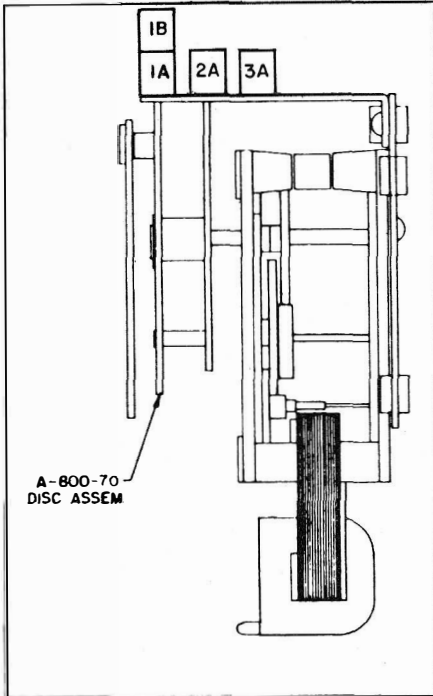
CAM SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
1A	N. C.	H-17	21-3 93	Blue-Red Gray-Yellow (Closed when shutter is closed) Completes circuit for replay scoring.
1B	N.O.	G-6	14-3 30	Red-Green Yellow Carry-over circuit for shutter motor.
1C	N. C.	H-10	21-3 98-8	Blue-Red Gray-Black Safety switch. (Timer unit reset circuit)
2A	N. C.	F-16	31-3 36-3	Yellow-Red Yellow-Brown (Closed when shutter is closed) Completes circuit to ball lifter motor.
3A	N. O.	C-43	85-5 30	Black-White Yellow Resets extra ball yellow, red, and green replay counter units.
3B	N.O.	H-2	20P 70P	Blue (Plastic) Orange (Plastic) Resets trip relay bank.
4A	N. O.	F-6	14-3 18-3	Red-Green Red-Black (Closed when shutter is open) Completes circuit to shutter motor.
4B	N. C.	I-37	21-3 40-8	Blue-Red Green Completes circuit to magic squares buttons.
4C	N. O.	H-6	18-3 45-8	Red-Black Green-White Starts shutter motor, if game is tilted, when shutter is open.
4D	N. O.	J-13	36-5 61-8	Yellow-Brown Brown-Red (Closed when shutter is open) Completes feature lites flash circuit.
4E	N. O.	H-36	21-3 93-21	Blue-Red Gray-Yellow (Closed when shutter is open) Completes circuit to step magic squares feature unit. (Part of next game feature circuit)
5A	N. C.	F-28	52-10 54-21	White-Blue White-Green Proportioning circuit. (Score step)
5B	N. C.	J-40	36-4 90-8	Yellow-Brown Gray (Closed when shutter is closed) Part of Bally-hole next game feature circuit.
5C	N. O.	D-40	31-4 91-4	Yellow-Red Gray-Red Safety circuit. (Lifter start relay)
5D	N. C.	G-10	65-2 98-8	Brown-White Gray-Black Safety switch. (Timer unit reset circuit)
5E	N. O.	H-29	45-2 83-9	Green-White Black-Yellow (Closed when shutter is open) completes game advantage circuits.
6A	N. O.	H-10	71-8 30	Orange-Red Yellow Resets timer unit.
6B	N. O.	C-43	78-3 30	Orange-Black Yellow Resets magic squares feature unit, yellow, red, green score units, selection feature unit, and score feature unit.

MISCELLANEOUS RELAYS SWITCH CHART

RELAY SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
NEXT GAME FEATURE TRIP COIL	L-40	J 10	Jumper Red	Energized by #16 hole switch, when Bally-hole trip relay is energized.
RESET COIL	A-36	40-5 70	Green Orange	Energized thru magic-squares unit switch, when unit is at 11th step.
A	N. C.	L-40	50-8 J	White Jumper Breaks circuit to step-up coil.
B	N. O.	J-11	13-21 30	Red-Yellow Yellow Completes circuit to lite "A-B-C-D-E next game feature lite."
C	N. C.	B-32	41-21 48-9	Green-Red Green-Black Breaks regular step-up circuit to magic squares unit.
D	N. C.	B-36	40-5 45-21	Green Green-White Breaks circuit to reset coil.
E	N. O.	G-36	51-21 93-21	White-Red Gray-Yellow Completes circuit for stepping magic squares unit to top. Also to reset next game feature trip relay.
LIFTER START COIL	A-41	38-8 70	Yellow-Black Orange	Energized when a ball is on ball runway switch. This relay controls ball lifter circuit.
A	N. C.	G-11	15-6 40-8	Red-White Green Safety circuit. (Selector lock, and score feature lock trip relays)
B	N. C.	G-16	31-3 41-4	Yellow-Red Green-Red Breaks ball lifter motor circuit.
C	N. O.	C-40	36 38-8	Yellow-Brown Yellow-Black Lock-in circuit for this relay.
MAGIC SQUARES MOTOR RELAY	A-12	78-10 70	Orange-Black Orange	Energized by magic squares index coil switches, when magic squares buttons are pressed.
A	N. C.	M-37	10 71-10	Red Orange-Red Safety circuit (Breaks circuit to #3 search relay)
B	N. O.	G-2	20-P 60-1P	Blue (Plastic) Brown (Plastic) Completes circuit to run magic squares motor.

BALL LIFT MOTOR PICTORIAL VIEW

NUMBERS CORRESPOND TO SWITCH CHART BELOW



BALL LIFT MOTOR SWITCH CHART

FOR POSITION OF SWITCHES REFER TO PICTORIAL VIEW ABOVE

CAM SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
1A	N.C.	F-11 15-6 85-21	Red-White Black-White	(Safety circuit) before 5th and after 5th selector lock trip relays.
1B	N.O.	G-16 91-1 30	Gray-Red Yellow	Carry-over switch for ball lifter motor.
2A	N.O.	E-8 27-2 43-2	Blue-Orange Green-Yellow	Energizes timer unit step-up coil.
3A	N.O.	G-12 83-21 21-3	Black-Yellow Blue-Red	Energizes before 4th selector lock trip relay at 4th step of timer unit. Also energizes score feature lock-out relay at 3rd step of timer unit.

MAGIC SQUARES & LINES UNIT PARTS LIST

Complete Unit — AS-1507-6

Wiper Assemblies (wired) for A, B, C, D, E corners — W-757

Contact Plates (wired) for A, B, C, D, E corners — W-766

NOTE: When ordering replacement contact plates W-766 specify for corners A, B, C, D, E (left) or E (right)

Wiper Assembly (wired) for magic line F — W-778

Contact Plate (wired) for magic line F — W-779

Slip Ring & Index Assembly (for A, B, C, D, E corners) — AS-579-23

Slip Ring & Index Assembly (for magic line F) — AS-579-24

Plastic No. Display Discs for

A. Corners — A-1980

B. Corners — A-1980-1

C. Corners — A-1980-2

D. Corners — A-1980-3

E. Corners (left) — A-1980-4

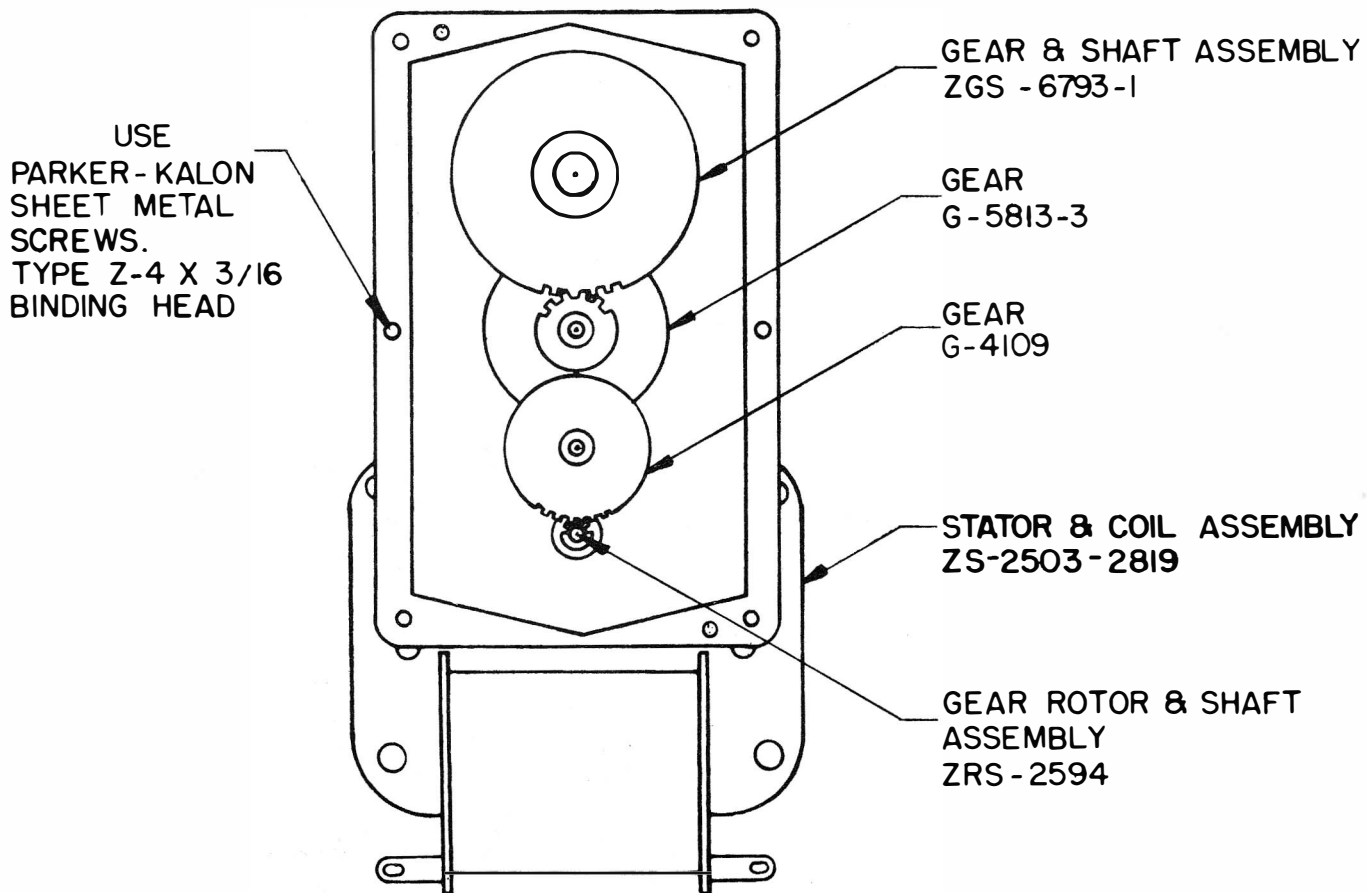
E. Corners (right) — A-1980-5

Plastic No. Display Strip (for Magic Line "F") — M-865-1

Index Coils — E-146-392

Motor E-119-130

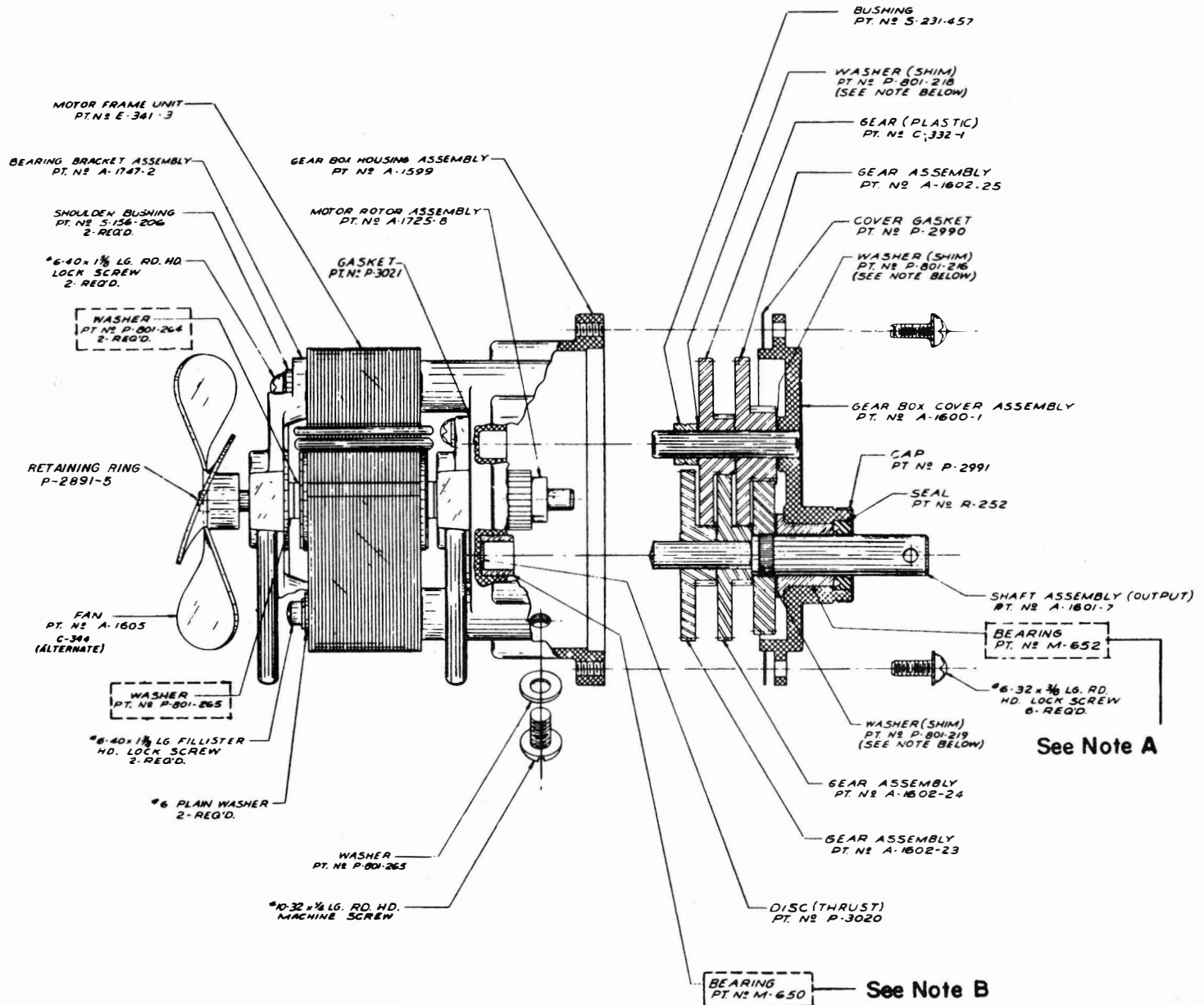
MAGIC SQUARES UNIT MOTOR (Part No. E - 119 - 130)



NOTE :

WHEN ORDERING GEARS FOR MAGIC SQUARES
UNIT MOTOR, REFER TO PART NUMBERS SHOWN ABOVE.

MOTOR ASSEMBLY (Part No. E-119-157)



NOTE

IN ORDER TO MAINTAIN PROPER CLEARANCES BETWEEN GEARS IT IS MOST IMPORTANT THAT WHEN REASSEMBLING GEAR TRAIN:

1. SHIMS BE REPLACED IN THEIR RESPECTIVE LOCATIONS.
2. SAME NUMBER OF SHIMS BE REPLACED IN EACH RESPECTIVE LOCATION.

CHECK PART NUMBER ON GEAR BEFORE ORDERING GEAR

NOTE A: Bearing M-652 is part of Gear Box Cover Assembly A-1600-1 and cannot be ordered separately.

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

MISCELLANEOUS PARTS

Back Cabinet Assembly:

Part No.	Name of Part
G-223-1	Back glass
M-281-14	Lock and keys (2) keyed alike
E-122-19	Transformer

Back Door Assembly:

M-281-24	Lock and Keys (2) keyed alike
E-300-73	Search relay bank assembly

Front Cabinet Assembly:

M-168-15	Ball
AS-187-13	Ball shooter assembly
A-1540	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-1900-18	Coin box
A-1726	Coin box cover
E-130-10	Counter—48 volt
P-4052	Legs
M-106-1	Leg bolt
M-163-4	Leg adjuster

Front Door Assembly:

Part No.	Name of Part
A-1729-4	Button—metal
C-2342-102	Coil for coin kicker assembly
E-101-45	Coil for coin lock out
AS-1316	Coin kicker assembly
AS-277-33	Coin switch assembly 5¢
AS-277-34	Coin switch assembly 10¢
CA-567-67	Front door only
AS-1801	Front door assembly 5¢
AS-1801-1	Front door assembly 10¢
A-254-33	Hinge and bracket
M-281-6	Lock and keys
E-108-32	Micro switch for coin switch assembly 5¢ and 10¢ play
P-2768-5	Ring-red for A-1729-4 button
P-2768-6	Ring-yellow for A-1729-4 button
P-2768-7	Ring for M-281-6 lock
M-280-15	Slug rejector 5¢
M-280-16	Slug rejector 10¢

Front Moulding Assembly:

AS-1305-11	Front moulding assembly complete
A-1272-23	"A" Button
A-1272-24	"B" Button
A-1272-25	"C" Button
A-1272-26	"D" Button
A-1272-27	"E" Button
A-1272-28	"F" Button
P-2210-8	5¢ Plate
P-2210-9	10¢ Plate
P-2210-36	Plate for A-B—C-D—E-F Buttons
CA-936-2	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
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.