

Bally[®]

BAHAMA BEACH

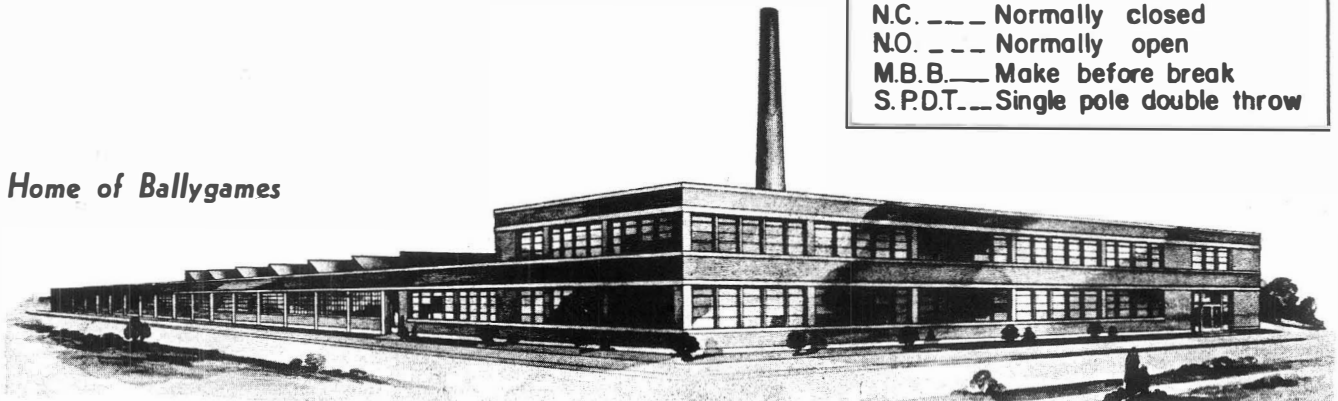
OPERATING INSTRUCTIONS AND PARTS CATALOG

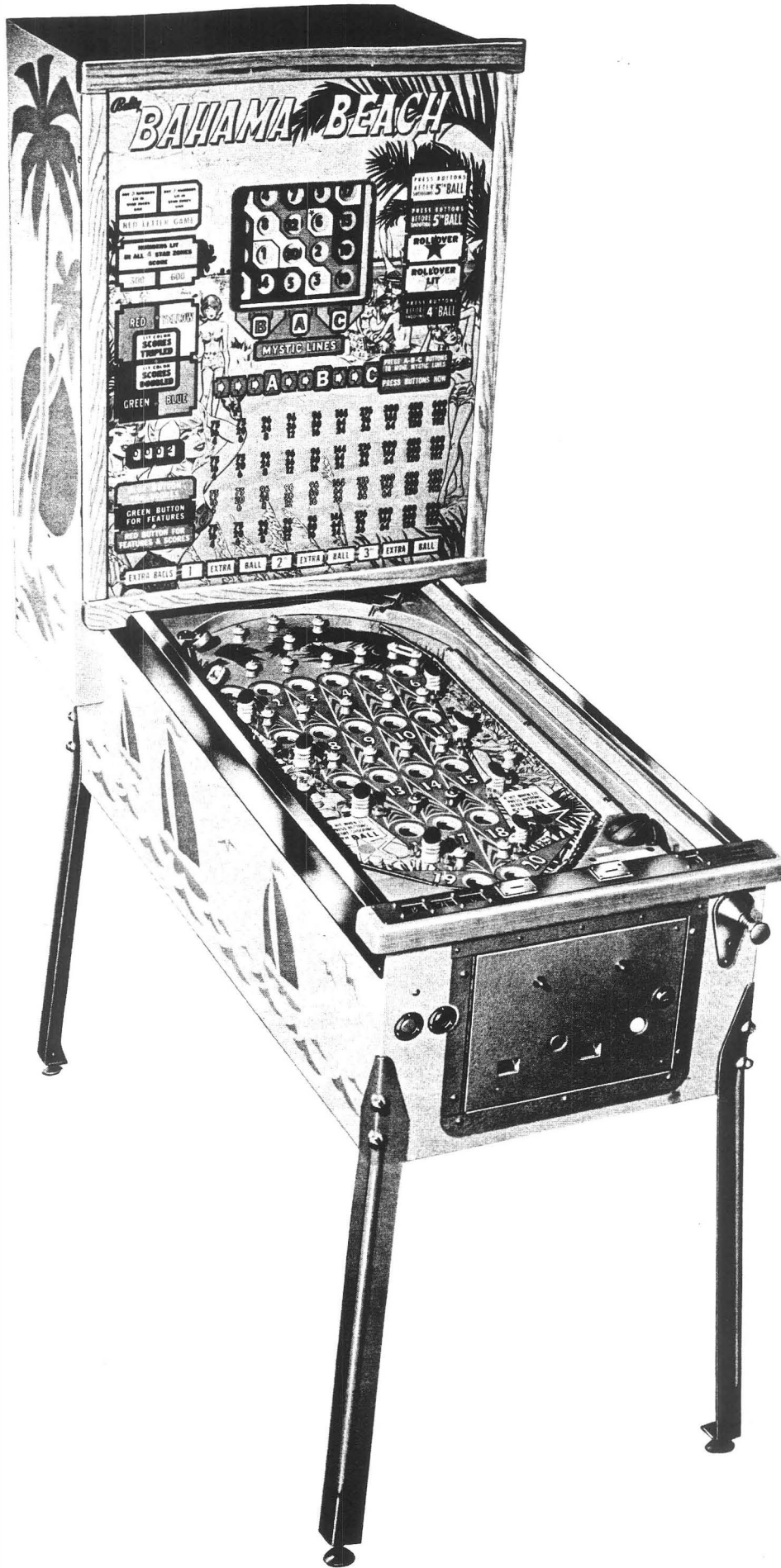
Part Numbers are marked on illustrations
and a list of miscellaneous parts appears
on back cover.

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

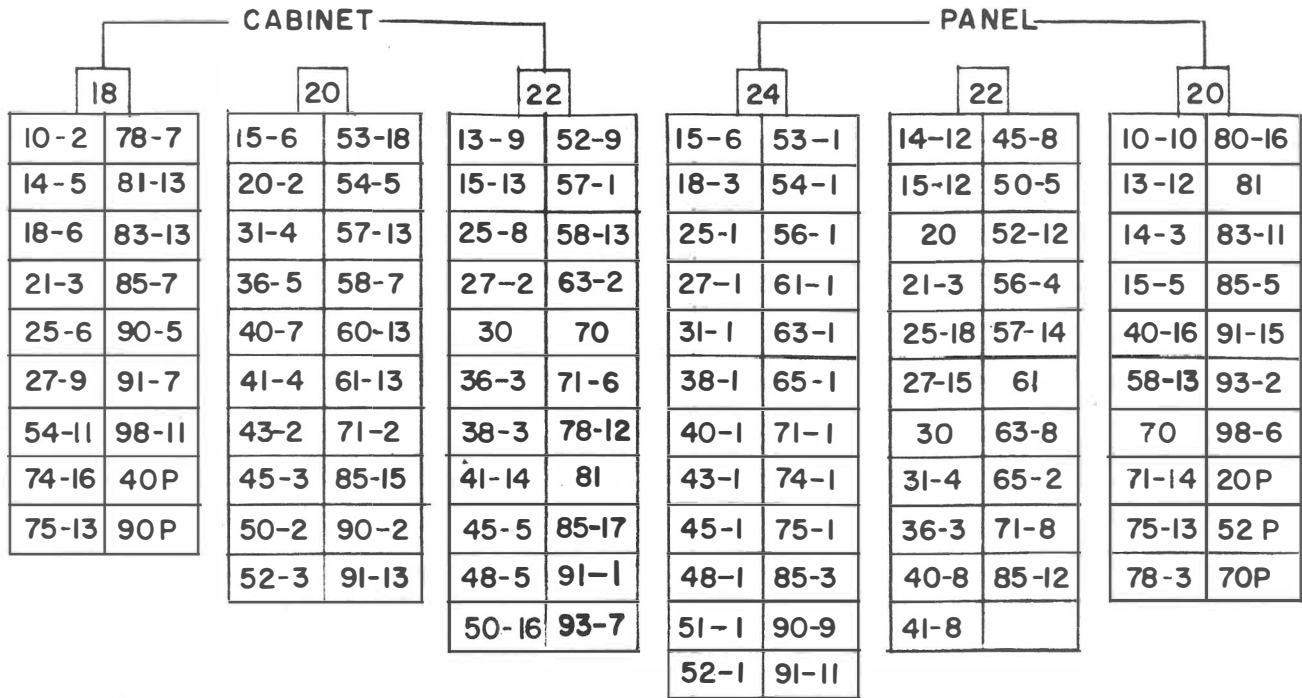
Code	
N.C. ___	Normally closed
N.O. ___	Normally open
M.B.B. ___	Make before break
S.P.D.T. ___	Single pole double throw

Home of Ballygames





CONNECTOR PLUGS CHART



TRANSFORMER

10	
20	81
30	20P
54-2	40P
70	50P
80-1	90P

FRONT DOOR

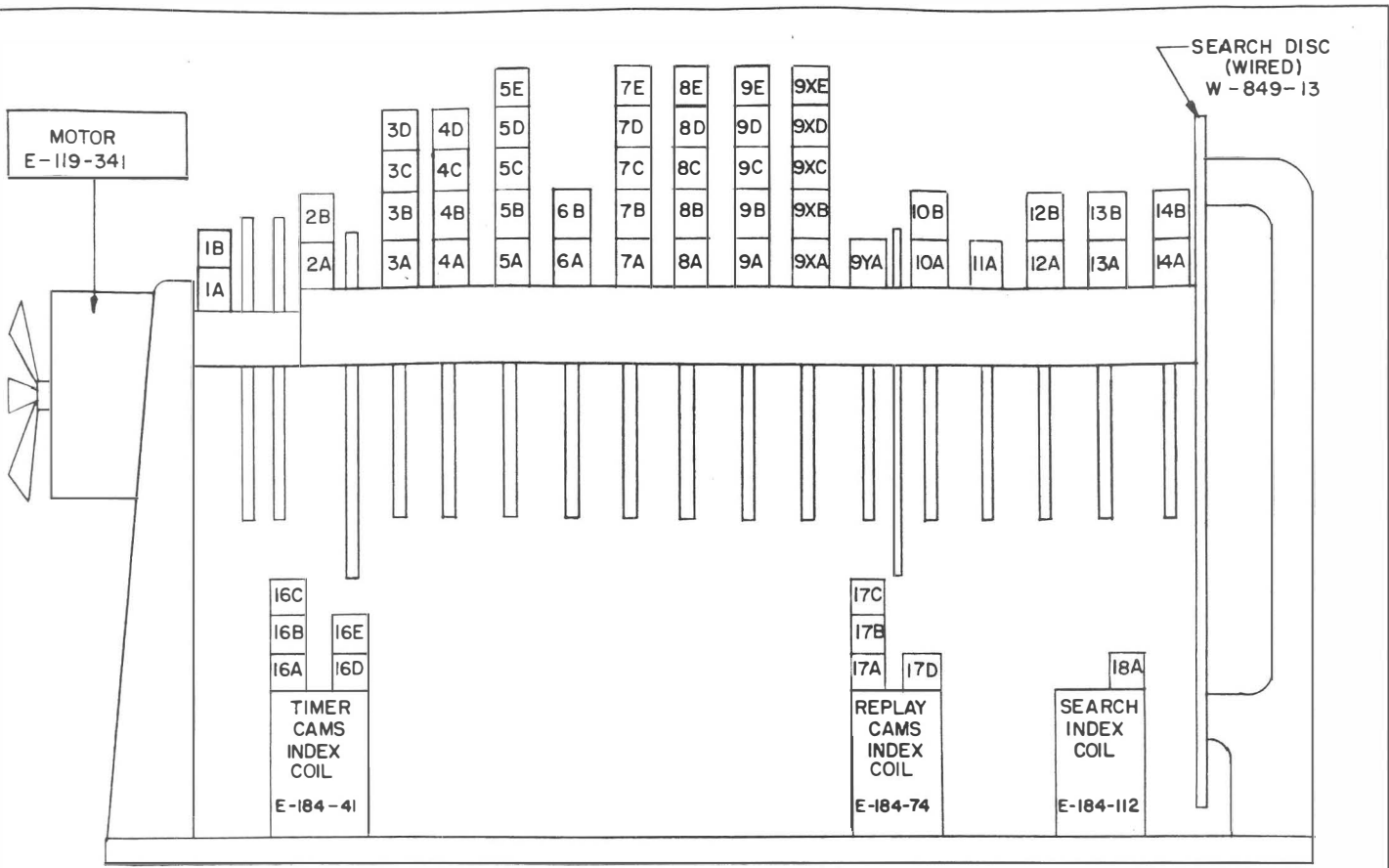
20	
10-2	50-2
13-9	52-3
14-5	63-2
15-13	70
18-6	71-2
20-2	75-13
21-3	80-13
25-8	85-7
27-9	90-2
40-7	91-13

AUXILIARY ASSEMBLY

10	
23-14	78-9
27-17	80-16
43-15	83-13
70	90-1
75-6	95

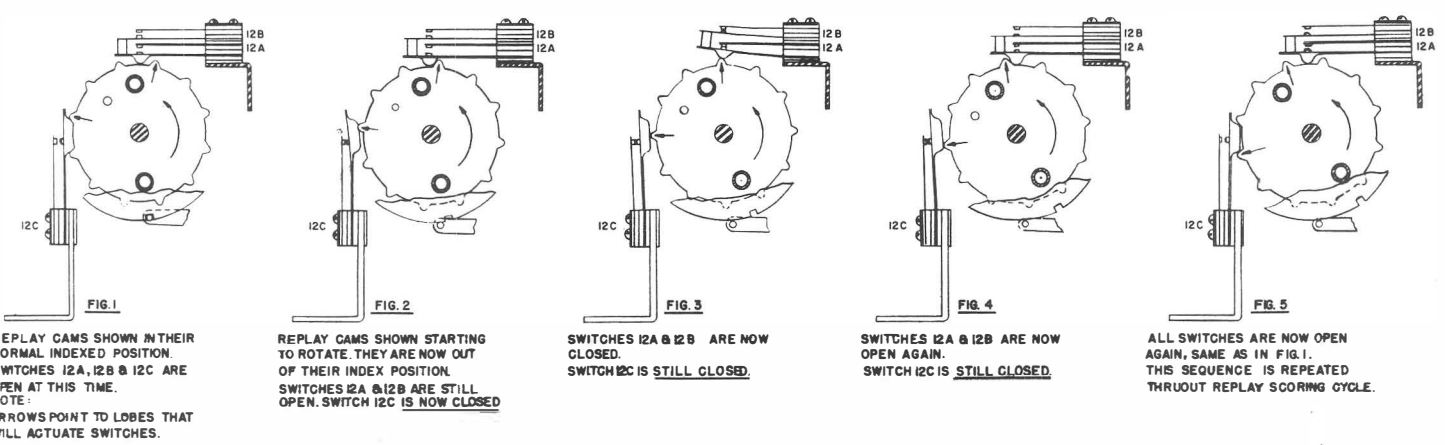
DISCS COMMENCE ON PAGE 9

CONTROL UNIT PICTORIAL VIEW NUMBERS CORRESPOND TO SWITCH CHART ON PAGE 5



Note:-
It is important that replay cams index switches 17A, 17B and 17D make only when replay cams index coil is energized.

CORRECT ADJUSTMENT: CONTROL UNIT SWITCHES 12A, 12B & 12C **NOTICE:** IMPORTANT PART OF ILLUSTRATION IS TO SHOW THAT SWITCH 12C CLOSES FIRST AND OPENS LAST. IF AN ADJUSTMENT IS NECESSARY, SWITCH 12C CAN BE MOVED UP OR DOWN. LOOSEN SCREWS THAT HOLD SWITCH, THEN MOVE UP OR DOWN.



CONTROL UNIT SWITCH CHART FOR POSITION OF SWITCHES REFER TO PICTORIAL VIEW ON PAGE 4

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
DRAG ARM SWITCH (Backside) N.O.	J-12	36-9 78-6	Yellow-Brown Orange-Black	(Not shown in pictorial view) completes timer unit step-up circuit.
1A N.O.	K-11	65-2 36-9	Brown-White Yellow-Brown	Pulses timer unit step-up coil thru select before 5th ball lockout relay circuit.
1B N.C.	B-9	85-1 93-2	Black-White Gray-Yellow	Opens circuit to mixer latch coil.
2A N.O.	G-76	78-11 56-7	Orange-Black White-Brown	Thru proportioning circuit, energizes triple scores feature relay.
2B N.C.	M-11	30 25-9	Yellow Blue-White	Opens 25¢ relay lock-in circuit.
3A N.C.	N-7	48-2 30	Green-Black Yellow	Opens start circuit.
3B S.P.D.T.	D-44	93-7 98-4 91-7	Gray-Yellow Gray-Black Gray-Red	Directs circuit to replay meter and total play meter.
3C S.P.D.T.	G-60	60-13 57-13 21-3	Brown White-Orange Blue-Red	Directs circuit to energize and lock-in play scores relay.
3D S.P.D.T.	F-59	74-16 81-13 21-3	Orange-Green Black-Red Blue-Red	Directs circuit to energize and lock-in play features relay.
4A N.O.	G-77	30 98-1	Yellow Gray-Black	Energizes spotting cams index coil.
4B N.O.	K-8	27-9 80-2	Blue-Orange Black	Pulses coin meter. (when meter is used to count coins)
4C N.O.	L-16	52-3 14-5	White-Blue Red-Green	Energizes tilt relay thru 25¢ arm switch circuit. (25¢ anti-coin cheat circuit)
4D S.P.D.T.	J ₂ -7	10-5 13-9 14-5	Red Red-Yellow Red-Green	Directs circuit from start relay to tilt relay. (5¢ anti-cheat circuit)
5A N.O.	C-31	23-7 38-4	Blue-Yellow Yellow-Black	Thru proportioning circuit, pulses extra-ball feature unit step-up coil.
5B N.O.	D-32	91-6 78-4	Gray-Red Orange-Black	Energizes anti-cheat relay.
5C N.O.	E-33	85-4 10-7	Black-White Red	Thru guaranteed step circuit, pulses mystic lines feature unit and selection feature unit step-up coils.
5D N.O.	D-40	21-3 50-3	Blue-Red White	Energizes cam #5 relay.
5E N.C.	G-59	21-3 40-15	Blue-Red Green	Opens lock-in circuit to features lock relay and scores lock relay.
6A N.C.	K-33	51-5 75-5	White-Red Orange-White	Opens scores advance and multiple score feature relay circuit or extra ball feature circuit during play cycles.
6B N.C.	H-35	40-4 18-16	Green Red-Black	Opens features circuit during play cycle.

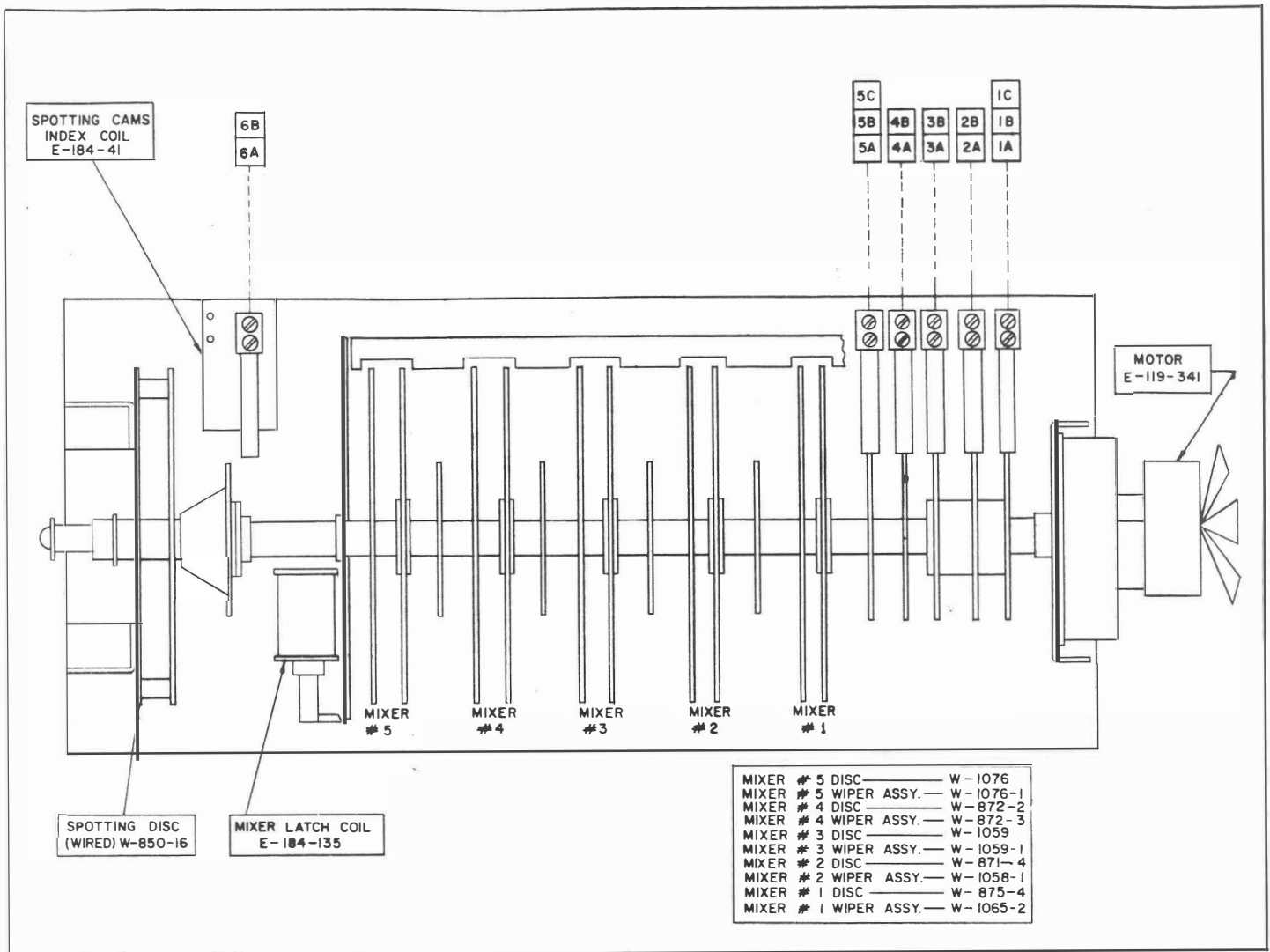
SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
7A N.O.	E-70	54-12 10-17	White-Green Red	Steps score units thru 0 to 4, 4 to 6, 6 to 8 score advance circuits.
7B N.O.	J-71	81-11 91-5	Black-Red Gray-Red	Thru proportioning circuit, energizes multiple score feature relays. Also steps score units thru 12 to 16 score advance circuit.
7C N.O.	N-25	21-3 14-8	Blue-Red Red-Green	Energizes mixer #2 relay thru feature and mixer #2 circuit.
7D N.O.	L-73	81-11 63-4	Black-Red Brown-Yellow	Thru proportioning circuit, energizes multiple score feature relays. Also steps score units thru 16 to 24, 24 to 36, 36 to 64, 64 to 120, 120 to 192 score advance circuits.
7E N.O.	L-4	90-5 30	Gray Yellow	Energizes cam #7 relay. Pulses total plays meter, reflex unit play magnet and replay register unit reset coil.
(BACKSIDE) 7YA N.O.	L-65	13-13 95-3	Red-Yellow Gray-White	(Not shown in pictorial view) thru scores proportioning circuit, energizes scores multiple feature relays and steps score units thru 8 to 12, 12 to 16, 16 to 24 score advance circuits.
(BACKSIDE) 7YB N.O.	L-68	13-13 75-7	Red-Yellow Orange-White	(Not shown in pictorial view) Same function as switch 7YA.
8A N.O.	C-32	25-4 38-4	Blue-White Yellow-Black	Thru guaranteed step circuit, pulses extra-ball unit step-up coil.
8B N.O.	J-70	81-11 27-8	Black-Red Blue-Orange	Energizes scores multiple feature relays and steps score units thru 8 to 16 score advance circuit.
8C N.O.	E-69	54-12 20-6	White-Green Blue	Steps score units thru 0 to 4, 4 to 6, 6 to 8 score advance circuits, during blue button play only.
8D N.O.	L-72	81-11 21-14	Black-Red Blue-Red	Thru proportioning circuit, energizes multiple score feature relays and steps score units thru 12 to 16, 16 to 24, 24 to 36, 36 to 64, 64 to 120, 120 to 192 score advance circuits, during blue button play only.
8E N.O.	J-62	15-14 13-13	Red-White Red-Yellow	Thru proportioning circuit, energizes multiple score feature relays and steps score units thru 16 to 24, 24 to 36 score advance circuits, during blue button play only.
(BACKSIDE) 8XA N.O.	C-23	21-3 15-9	Blue-Red Red-White	(Not shown in pictorial view) energizes mixer cam #2 relay.
(BACKSIDE) 8ZA N.O.	L-67	13-13 95-3	Red-Yellow Gray-White	(Not shown in pictorial view) same function as switch 7YA.

CONTROL UNIT SWITCH CHART FOR POSITION OF SWITCHES REFER TO PICTORIAL VIEW ON PAGE 4

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
ALTERNATOR 9A N.O.	J-33	15-7 54-8	Red-White White-Green	Proportioning circuit for extra-ball feature steps.
ALTERNATOR 9B N.O.	B-39	52-11 70	White-Blue Orange	Proportioning circuit for all 4 stars score 600 or 300 features.
ALTERNATOR 9C N.O.	C-38	31-14 50-11	Yellow-Red White	Proportioning circuit for any 2 stars score red letter game feature.
ALTERNATOR 9D N.O.	E-65	27-11 18-13	Blue-Orange Red-Black	Proportioning circuit for multiple score features.
ALTERNATOR 9E S.P.D.T.	D-26	63-9 71-10 58-2	Brown-Yellow Orange-Red White-Black	Directs blue score disc proportioning circuits to mixer #4 relay.
ALTERNATOR 9XA N.C.	F-75	90-4 31-9	Gray Yellow-Red	Proportioning circuit for blue and green score steps.
ALTERNATOR 9XB N.C.	F-71	23-9 75-8	Blue-Yellow Orange-White	Proportioning circuit for yellow score steps.
ALTERNATOR 9XC N.C.	F-74	83-4 81-9	Black-Yellow Black-Red	Proportioning circuit for red score steps.
ALTERNATOR 9XD N.C.	E-31	43-5 74-7	Green-Yellow Orange-Green	Proportioning circuit for extra-ball feature steps.
ALTERNATOR 9XE N.O.	H-35	85-12 40-4	Black-White Green	Proportioning circuit for mystic-lines feature steps, selection feature steps, any 2 star feature, any 3 star feature, all 4 stars 600 and 300 feature.
9YA N.O.	M-43	36-13 30	Yellow-Brown Yellow	Steps replay register unit thru 25¢ relay circuit.
12.1 MULTI-PLIER 10A N.O.	D-49	63 90-1	Brown-Yellow Gray	When yellow, red, blue and green scores are at 10th position, steps corresponding replay counter unit during 3-4-5 in a zone winners.
12.1 MULTI-PLIER 10B N.O.	D-45	23-17 27-17	Blue-Yellow Blue-Orange	Steps all 4 stars replay counter during all 4 stars 600 winner.
6.1 MULTI-PLIER 11A N.O.	D-49	57 90-1	White-Brown Gray	When yellow, red, green and blue scores are at 4th, 7th, and 9th position, steps corresponding replay counter unit during 3-4-5 in a zone winners.
1.1 MULTI-PLIER 12A N.O.	D-48	45 90-1	Green-White Gray	When yellow, red, green and blue scores are at 1st, 2nd, 3rd and 5th position, steps corresponding replay counter unit during 3-4-5 in a zone winners.
12B N.O.	F-43	41-14 81-10	Green-Red Black-Red	Steps replay register unit, operates reflex unit replay magnet and replay meter during all replay type winners.
(BACKSIDE) 12C N.O.	K-43	27 21-3	Blue-Orange Blue-Red	(Not shown in pictorial view) completes replay scoring lock-in circuit during all winners.
4.1 MULTI-PLIER 13A N.O.	D-48	52 90-1	White-Blue Gray	When yellow, red, blue and green scores are at 6th and 8th position, steps corresponding replay counter unit during 3-4-5 in a zone winners.
4.1 MULTI-PLIER 13B N.O.	E-45	10-16 27-17	Red Blue-Orange	Steps all 4 stars replay counter unit during all 4 stars 300 winner.
14A N.C.	E-11	27-2 58-5	Blue-Orange White-Black	Opens timer unit step-up circuit while winners are scoring.
14B N.C.	L-46	31-11 74	Yellow-Red Orange-Green	Opens initial winner search circuit, winner circuit then closed thru replay cams index switch 17B.

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
SEARCH WIPER LOCK MAGNET COIL	A-20	23-16 70	Blue-Yellow Orange	(Not shown in pictorial view) energized thru front rail "R" button circuit after shooting 4th ball, and releases search disc wipers to search for winners.
15A N.C.	H-20	14-4 41-5	Red-Green Green-Red	(Not shown in pictorial view) opens circuit to move mystic lines.
15B N.C.	D-7	83-3 13-16	Black-Yellow Red-Yellow	(Not shown in pictorial view) opens circuit to start relay.
15C N.C.	G-20	52-9 23-16	White-Blue Blue-Yellow	(Not shown in pictorial view) opens circuit to search wiper lock magnet coil.
TIMER CAMS INDEX COIL	A-10	93-2 70	Gray-Yellow Orange	Energized thru start circuit when playing coins or replays and releases timing cams for play cycle.
16A N.O.	N-2	20P 60P	Blue (Plastic) Brown (Plastic)	Completes a circuit to control unit and mixer-spotting unit motors.
16B N.C.	N-8	27-9 71-2	Blue-Orange Orange-Red	Opens circuit to 25¢ coin lock-out magnet.
16C N.C.	G-17	10-2 30	Red Yellow	Opens circuit to red button relay and extra-ball play relays.
16D N.O.	G-63	21-3 57-4	Blue-Red White-Orange	Completes lock-in circuit for score relays 8, 12, 16, 24 and 1st step relay.
16E N.C.	L-8	90-2 91-13	Gray Gray-Red	Opens circuit to 5¢ coin lock-out magnet.
CAM #5 RELAY COIL	A-40	50-3 70	White Orange	(Not shown in pictorial view) energized during play cycle by control unit cam 5D.
A N.O.	J-12	65-2 83-1	Brown-White Black-Yellow	(Not shown in pictorial view) resets timer unit during extra ball play.
B N.C.	C-24	21-3 18-7	Blue-Red Red-Black	(Not shown in pictorial view) opens lock-in circuit to mixer #4 relay.
C N.C.	J-27	21-3 13-3	Blue-Red Red-Yellow	(Not shown in pictorial view) opens lock-in circuit to mixer #2 relay.
D N.C.	E-64	57-4 36-16	White-Orange Yellow-Brown	(Not shown in pictorial view) opens lock-in circuit to score relays 8, 12, 16, 24 and 1st step relay.
REPLAY CAMS INDEX COIL	A-42	41-13 70	Green-Red Orange	Energized thru winner search circuit when replay winners are found and releases replay cams to score winners.
17A N.O.	J-44	27 80	Blue-Orange Black	Completes winner lock-in circuit while teplays are scoring.
17B N.O.	L-47	31-11 74	Yellow-Red Orange-Green	Completes winner scoring circuit.
17C N.C.	C-42	71-3 15-2	Orange-Red Red-White	Opens initial 50 volt pull-in circuit to search index coil, coil then holds in thru 15 ohm 10 watt resistor.
17D N.O.	G-43	81-10 80	Black-Red Black	Completes winner scoring circuit.
SEARCH INDEX COIL	A-42	15-2 70	Red-White Orange	Energized when any winner is found thru winner search circuit and stops search disc wipers to register each winner.
18A N.O.	E-42	60 41-13	Brown Green-Red	Completes circuit to replay cams index coil.

MIXER AND SPOTTING PICTORIAL VIEW NUMBERS CORRESPOND TO SWITCH CHART BELOW



MIXER AND SPOTTING SWITCH CHART

FOR POSITION OF SWITCHES REFER TO PICTORIAL VIEW ABOVE

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
16 PULSE 1A N.O.	G-35	95-9 45-6	Gray-White Green-White	Thru control circuit and spotting disc, steps mystic lines feature unit and selection feature unit. Also energizes any 2, any 3 red letter feature relays and all 4 300, all 4 600 feature relays.
16 PULSE 1B N.O.	Q-8	90 10-11	Gray Red	When mystic lines feature is in play, flashes press buttons now lite thru before 4th, 5th, or 6th ball circuit.
16 PULSE 1C N.O.	J-28	20-16 52-5	Blue White-Blue	Thru red letter game winner circuit, steps red letter unit, score and feature units, and energizes feature relays corresponding to guaranteed red letter games.

CONTINUED ON NEXT PAGE

MIXER AND SPOTTING UNIT CAM SWITCH CHART

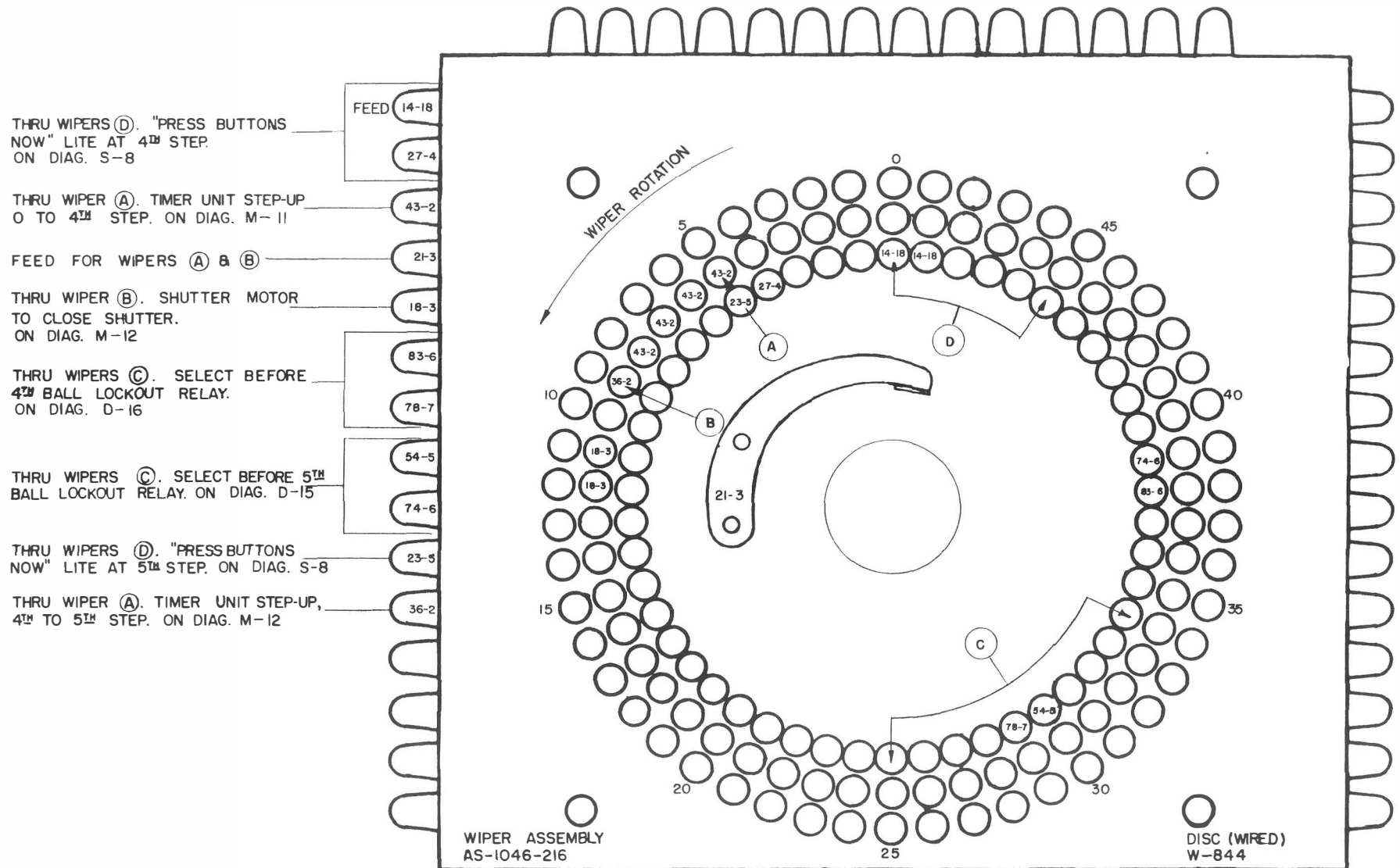
FOR POSITION OF SWITCHES REFER TO PICTORIAL VIEW ON PAGE 7

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
MIXER CAM #2 2A N.O.	B-23	15-9 93-11	Red-White Gray-Yellow	Completes circuit to mixer cam #2 relay.
MIXER CAM #2 2B S.P.D.T.	L-77	78-11 83-12	Orange-Black Black-Yellow	(Only normally open phase of switch used) Completes proportioning circuit for triple feature.
MIXER CAM #3 3A N.O.	J-71	63-4 85-20	Brown-Yellow Black-White	Completes proportioning circuits from control unit cam switch 7D or 8D for yellow, red, blue, green score steps and score multiple feature relays.
MIXER CAM #3 3B N.O.	H-62	54-16 78-17	White-Green Orange-Black	Completes proportioning circuit from control unit cam switch 8E for yellow, red, blue, green score steps and score multiple feature relays.
MIXER CAM #4 4A N.O.	K-67	18-15 83-19	Red-Black Black-Yellow	Completes proportioning circuits from control unit cam switch 7YA or 8ZA for yellow, red, blue, green score steps and score multiple feature relays.
MIXER CAM #4 4B N.O.	K-65	95-3 81-17	Gray-White Black-Red	Same function as switch 4A.
16 PULSE 5A N.O.	G-5	75-2 53-7	Orange-White White-Yellow	When replay reset relay is energized, resets replay register unit.
16 PULSE 5B N.O.	C-30	78 38-4	Orange-Black Yellow-Black	Thru control circuit and spotting disc, steps extra ball unit during extra ball play.
16 PULSE 5C N.O.	D-46	30 40-16	Yellow Green	Resets all 4 stars replay counter unit and multiple unit thru homing circuits to these units.
1st STEP RELAY COIL A N.O.	B-69 C-69	71-13 83-17 83-17 36-16	Orange-Red Black-Yellow Black-Yellow Yellow-Brown	(Not shown in pictorial view) energized thru yellow score unit disc during score steps. (Not shown in pictorial view) completes lock-in circuit for this relay.
B N.O.	M-71	13-13 81-11	Red-Yellow Black-Red	(Not shown in pictorial view) completes proportioning circuit for yellow, red, blue, green score steps and score multiple feature relays.
MIXER LATCH COIL	A-9	85-1 70	Black-White Orange	Energized thru start relay circuit during each play cycle and releases mixer disc wipers.
SPOTTING CAMINDEX COIL 6A N.O.	H-78 P-12	98-1 70 81-6 30	Gray-Black Orange Black-Red Yellow	Energized by control unit cam switch 4A during each play cycle and releases spotting disc wipers. Completes spotting disc lite flash circuit for selection feature, any 3 and any 2 red letter feature, all 4 300 and all 4 600 feature, and mystic lines feature lites during red or green button play.
6B N.O.	P-35	30 13-4	Yellow Red-Yellow	Completes spotting disc lite flash circuit for yellow, red, green and blue scores and scores multiple features during red or blue button play. Completes spotting disc lite flash circuit to extra ball lites during yellow button play.

**OTHER SWITCHES AND RELAYS
APPEAR ON PAGE 25
AND FOLLOWING PAGES**

TIMER UNIT DISC viewed from BUTTON or WIPER side

8 step unit. Wipers shown in zero or reset position



THRU WIPERS (D). "PRESS BUTTONS NOW" LITE AT 4TH STEP. ON DIAG. S-8

THRU WIPER (A). TIMER UNIT STEP-UP 0 TO 4TH STEP. ON DIAG. M-11

FEED FOR WIPERS (A) & (B)

THRU WIPER (B). SHUTTER MOTOR TO CLOSE SHUTTER. ON DIAG. M-12

THRU WIPERS (C). SELECT BEFORE 4TH BALL LOCKOUT RELAY. ON DIAG. D-16

THRU WIPERS (C). SELECT BEFORE 5TH BALL LOCKOUT RELAY. ON DIAG. D-15

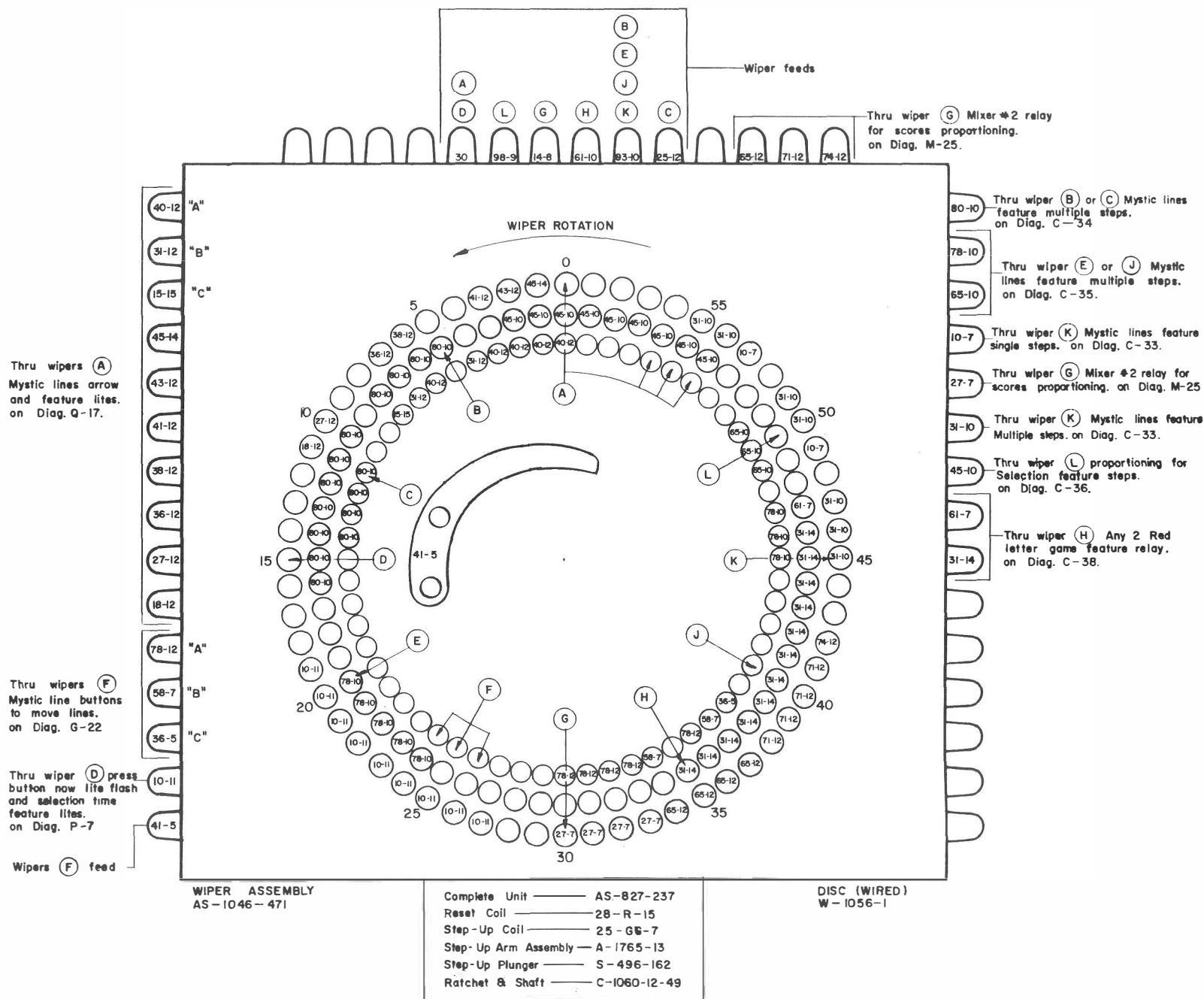
THRU WIPERS (D). "PRESS BUTTONS NOW" LITE AT 5TH STEP. ON DIAG. S-8

THRU WIPER (A). TIMER UNIT STEP-UP, 4TH TO 5TH STEP. ON DIAG. M-12

WIPER ASSEMBLY
AS-1046-216

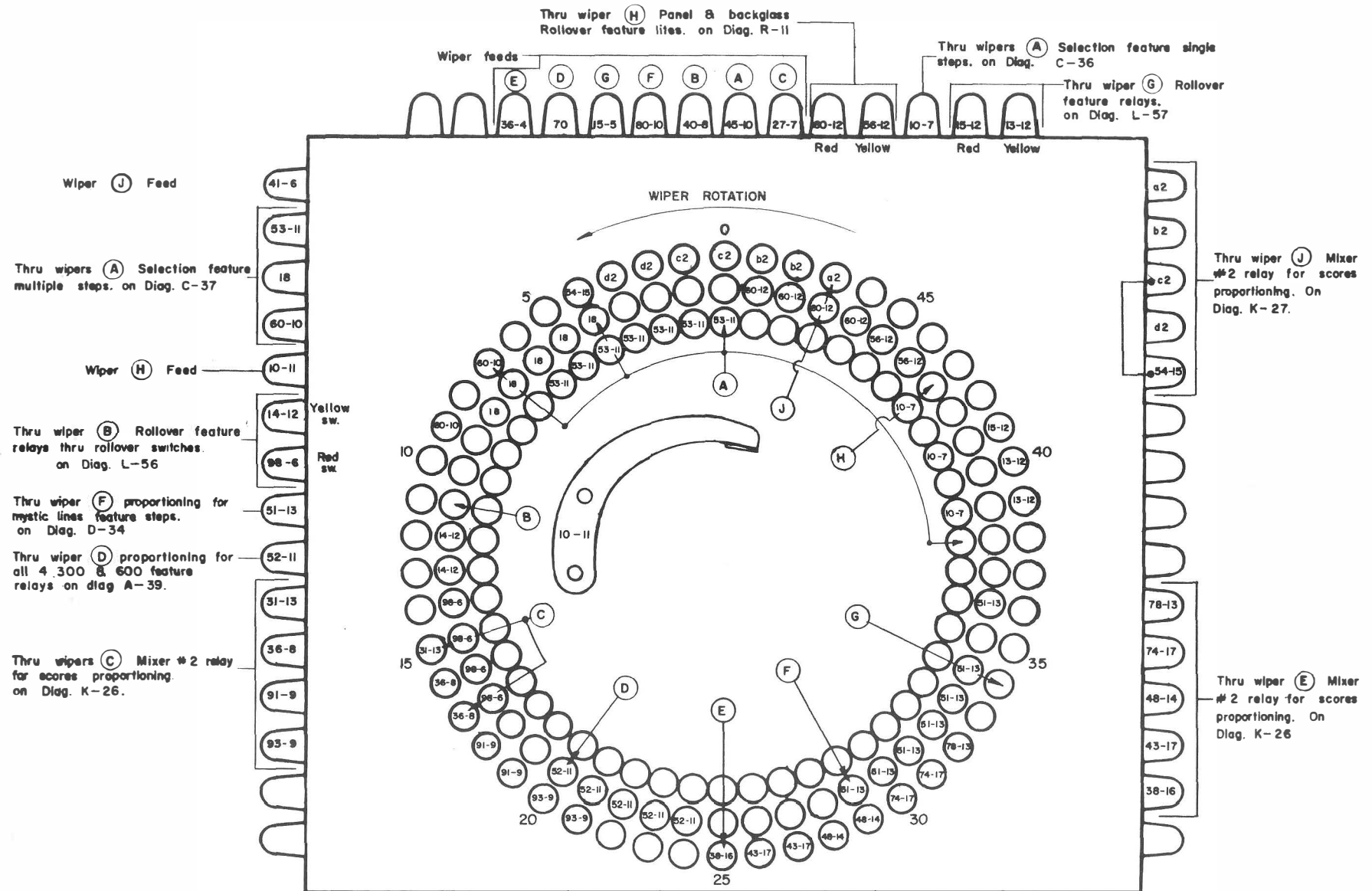
DISC (WIRED)
W-844

- 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 ASSY:- A-1765-4
- RATCHET & SHAFT --- C-1050-8-43



SELECTION FEATURE UNIT DISC viewed from BUTTON or WIPER side

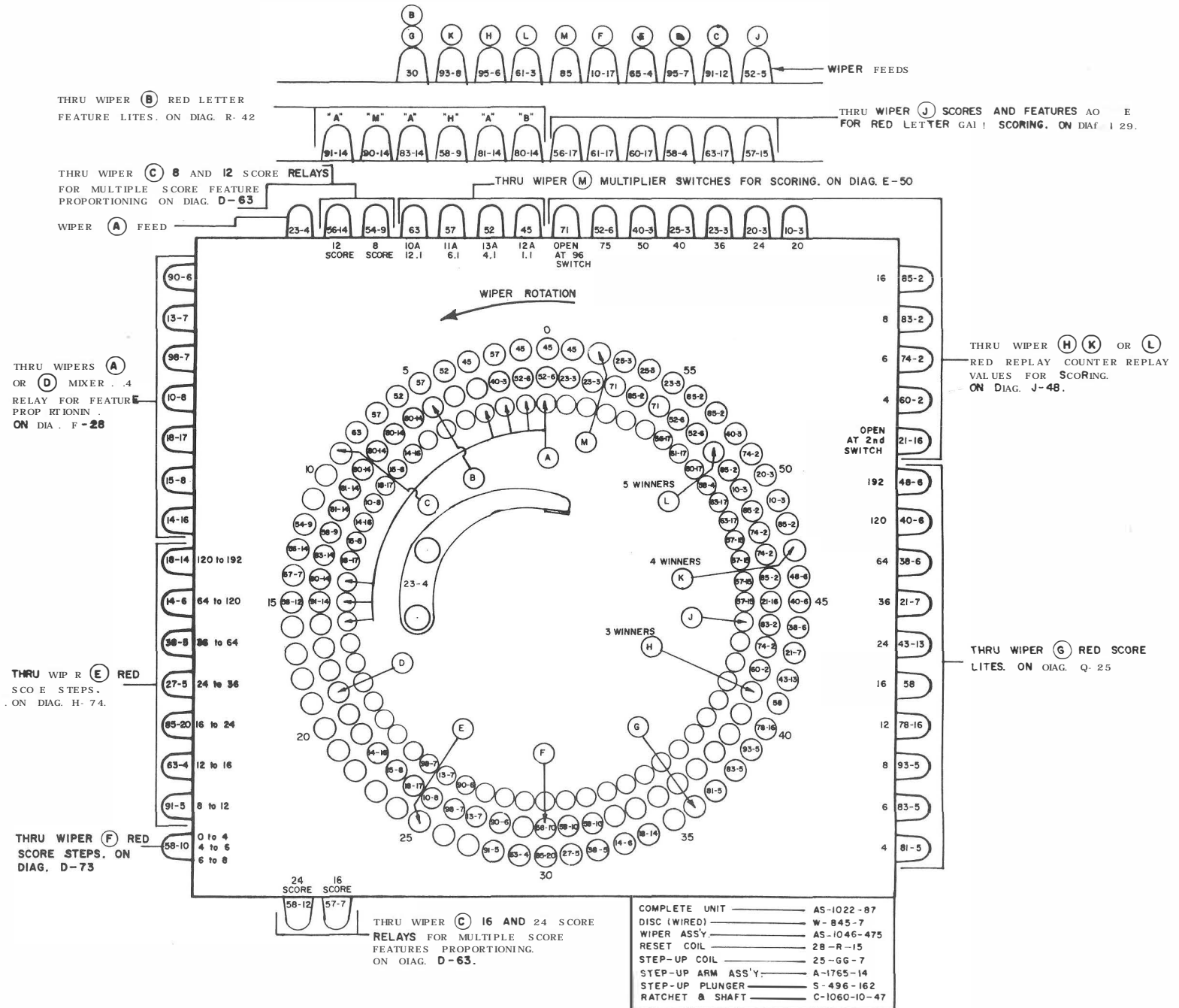
7 step unit. Wipers shown in zero or reset position



WIPER ASSEMBLY
AS-1046-473

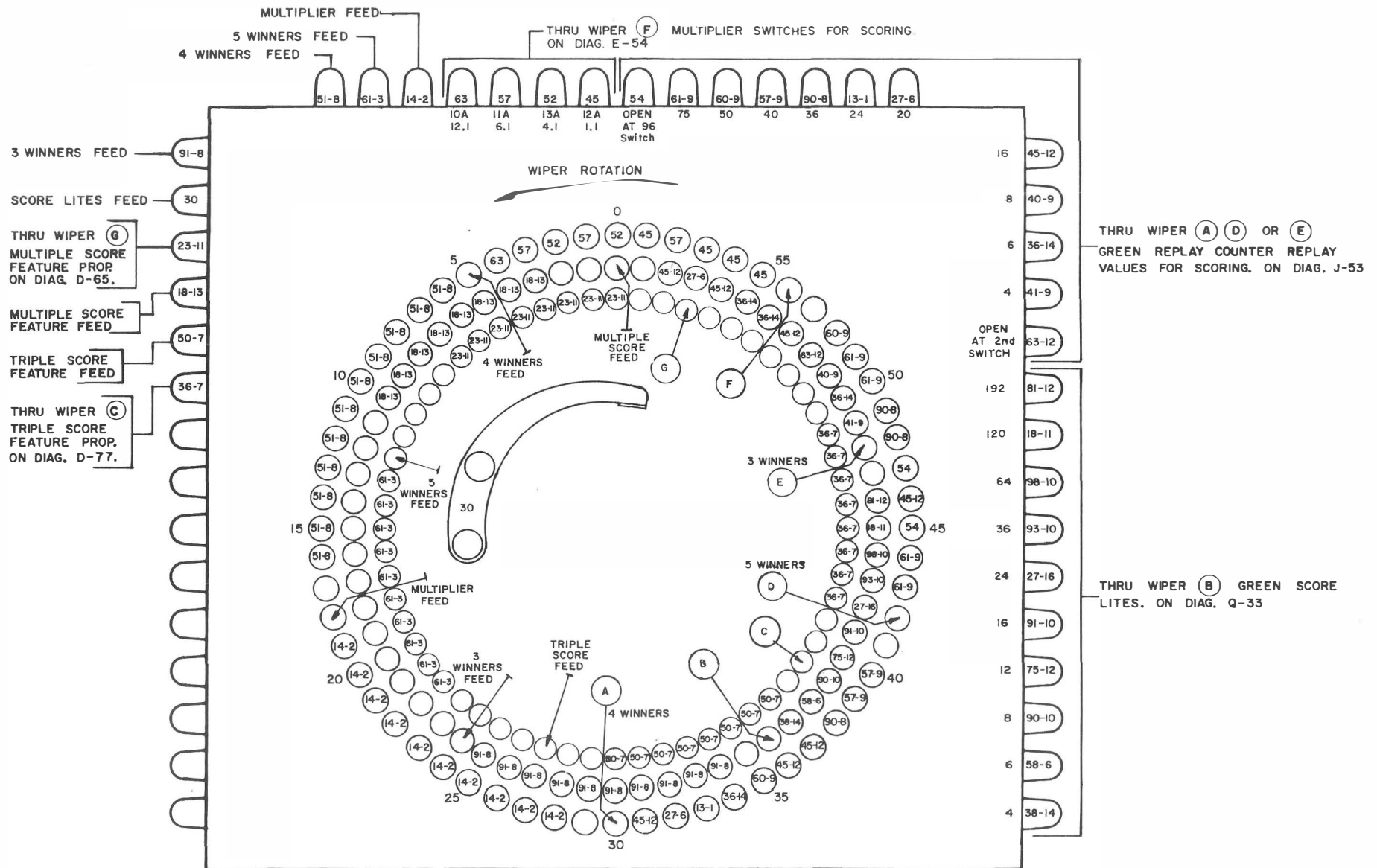
Complete Unit — AS-827-236
Reset Coil — 28-R-15
Step-Up Coil — 25-GG-7
Step-Up Arm Assembly — A-1765-8
Step-Up Plunger — S-496-100
Ratchet & Shaft — C-1050-7-40

DISC (WIRED)
W-764-10

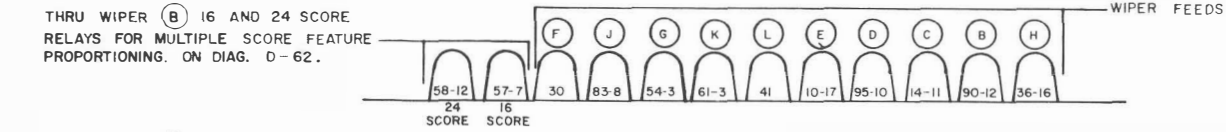


GREEN SCORE UNIT DISC viewed from BUTTON or WIPER side

10 step unit. Wipers shown in zero or reset position

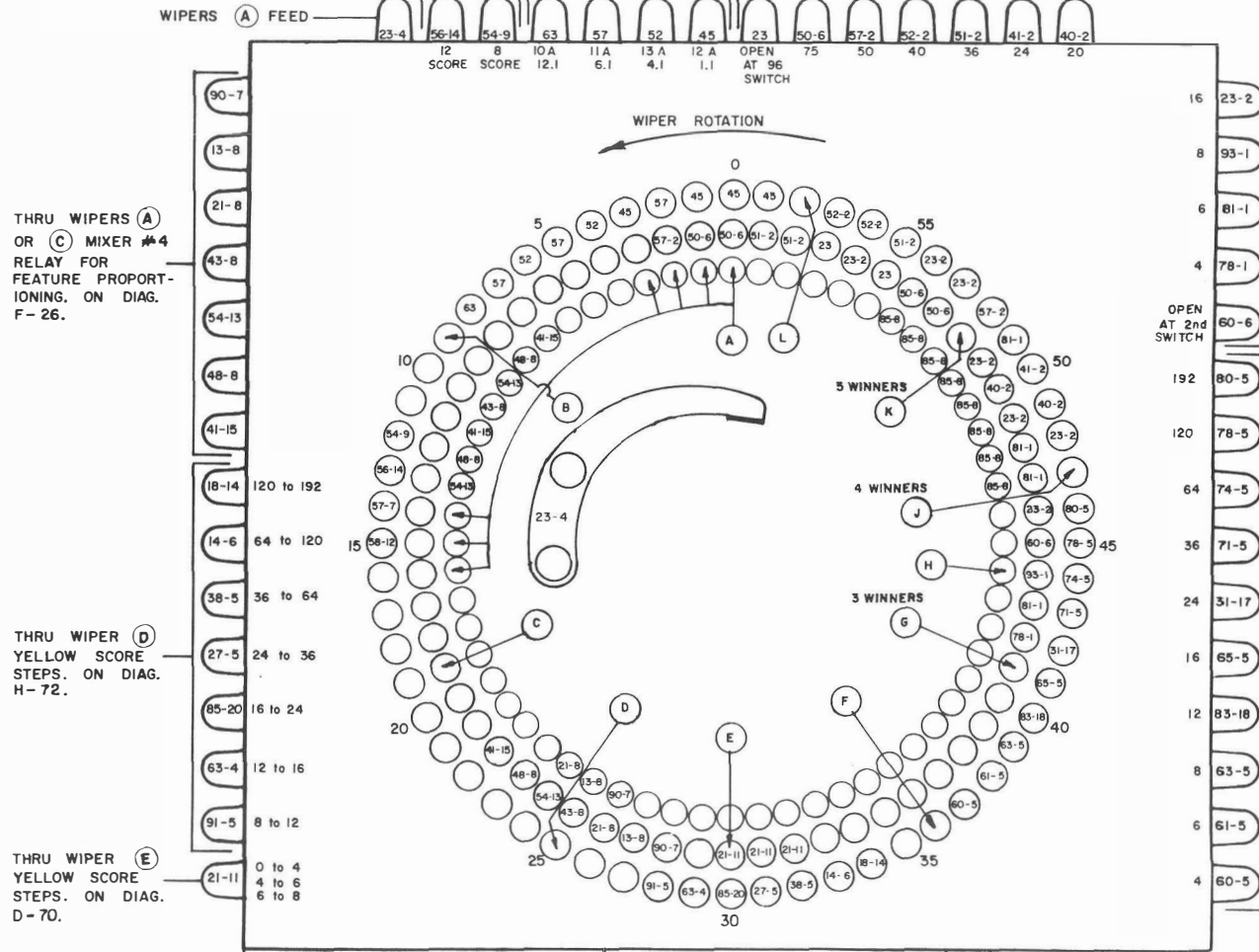


COMPLETE UNIT	AS-1022-90
DISC (WIRED)	W-763-10
WIPER ASS'Y.	AS-1046-472
RESET COIL	28-R-15
STEP-UP COIL	25-GG-7
STEP-UP ARM ASS'Y.	A-1765-14
STEP-UP PLUNGER	S-496-162
RATCHET & SHAFT	C-1060-10-47



THRU WIPER (B) 8 AND 12 SCORE RELAYS FOR MULTIPLE SCORE FEATURE PROPORTIONING. ON DIAG. D-62.

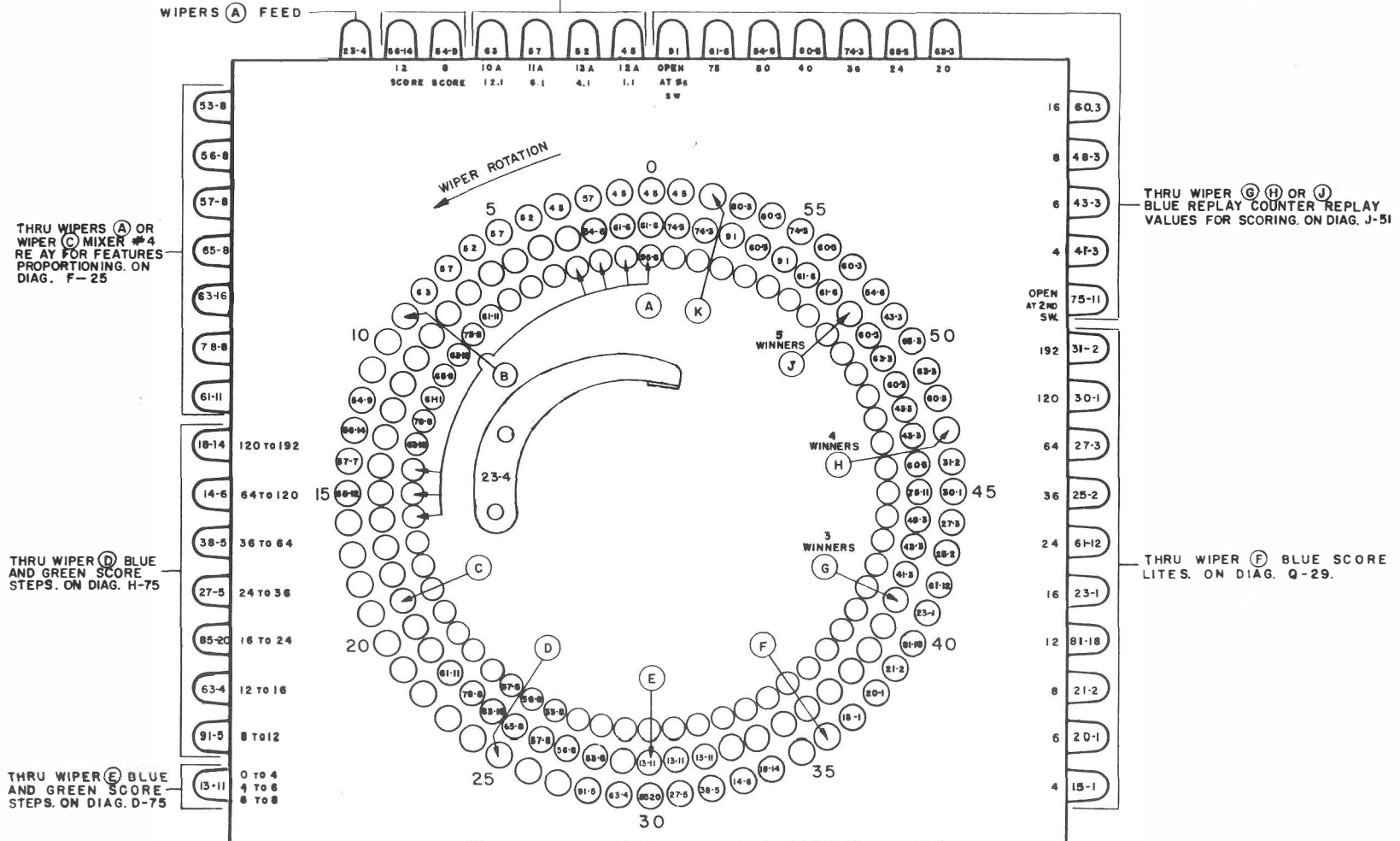
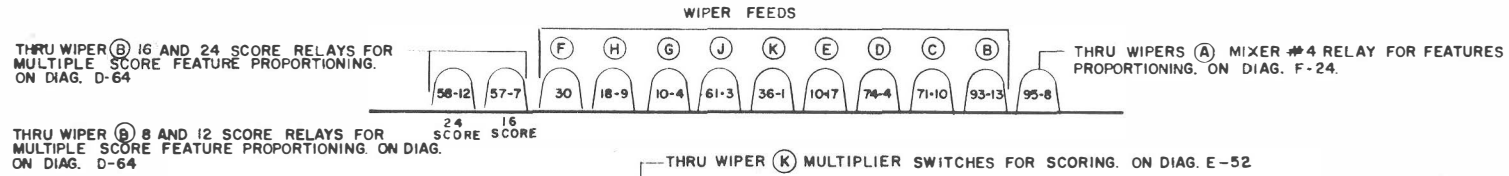
THRU WIPER (L) MULTIPLIER SWITCHES FOR SCORING. ON DIAG. E-48.



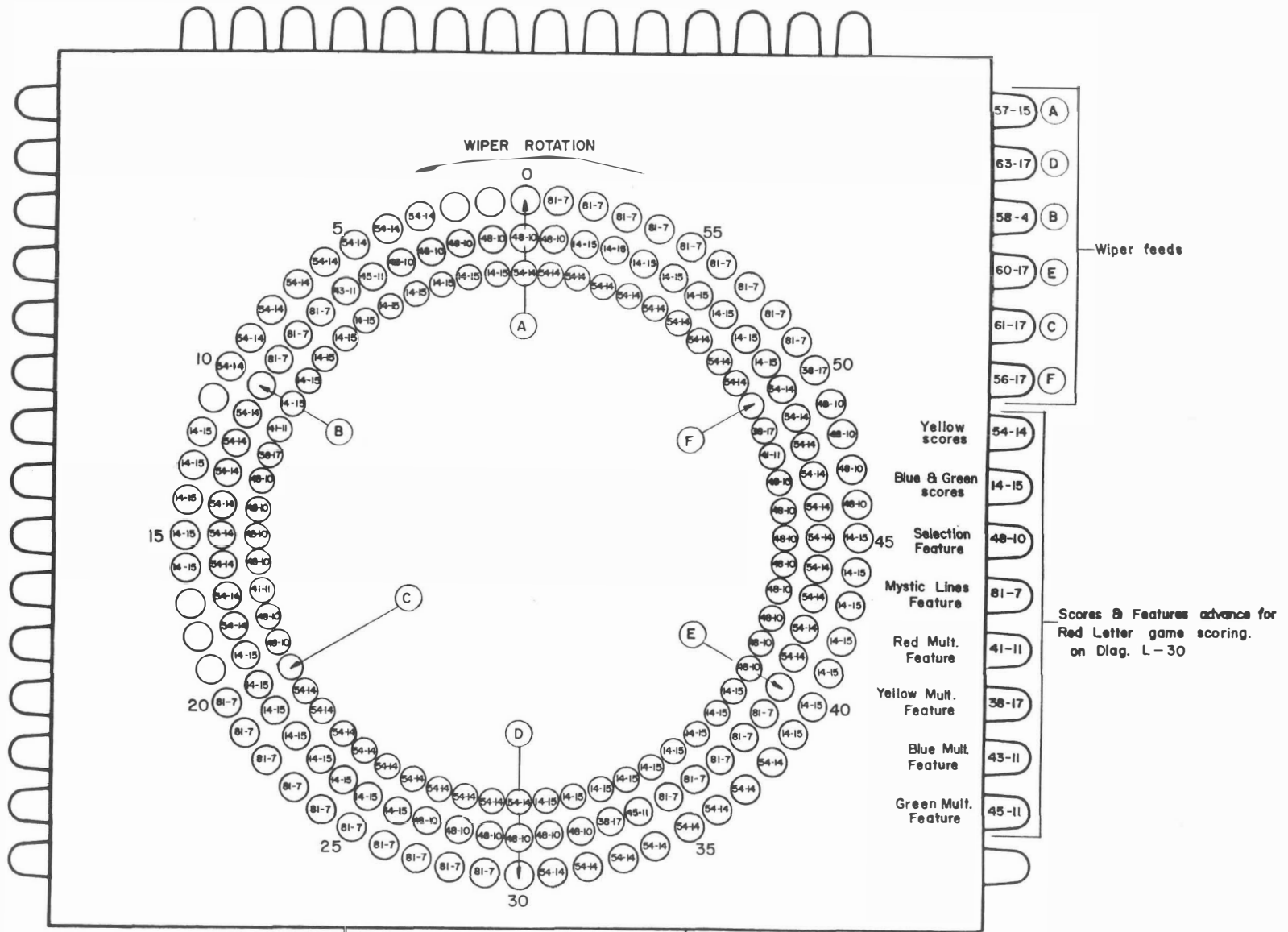
COMPLETE UNIT	AS-1022-89
DISC (WIRED)	W-848-10
WIPER ASS'Y.	AS-1046-477
RESET COIL	28-R-15
STEP-UP COIL	25-GG-7
STEP-UP ARM ASS'Y.	A-1765-14
STEP-UP PLUNGER	S-496-162
RATCHET & SHAFT	C-1060-10-47

BLUE SCORE UNIT DISC viewed from BUTTON or WIPER side

10 step unit. Wipers shown in zero or reset position



COMPLETE UNIT	AS-1022-88
DISC (WIRED)	W-1055-1
WIPER ASS'Y.	AS-1048-476
RESET COIL	28-R-15
STEP-UP COIL	28-68-7
STEP-UP ARM ASS'Y	A-1765-13
STEP-UP PLUNGER	B-498-162
RATCHET & SHAFT	C-1060-10



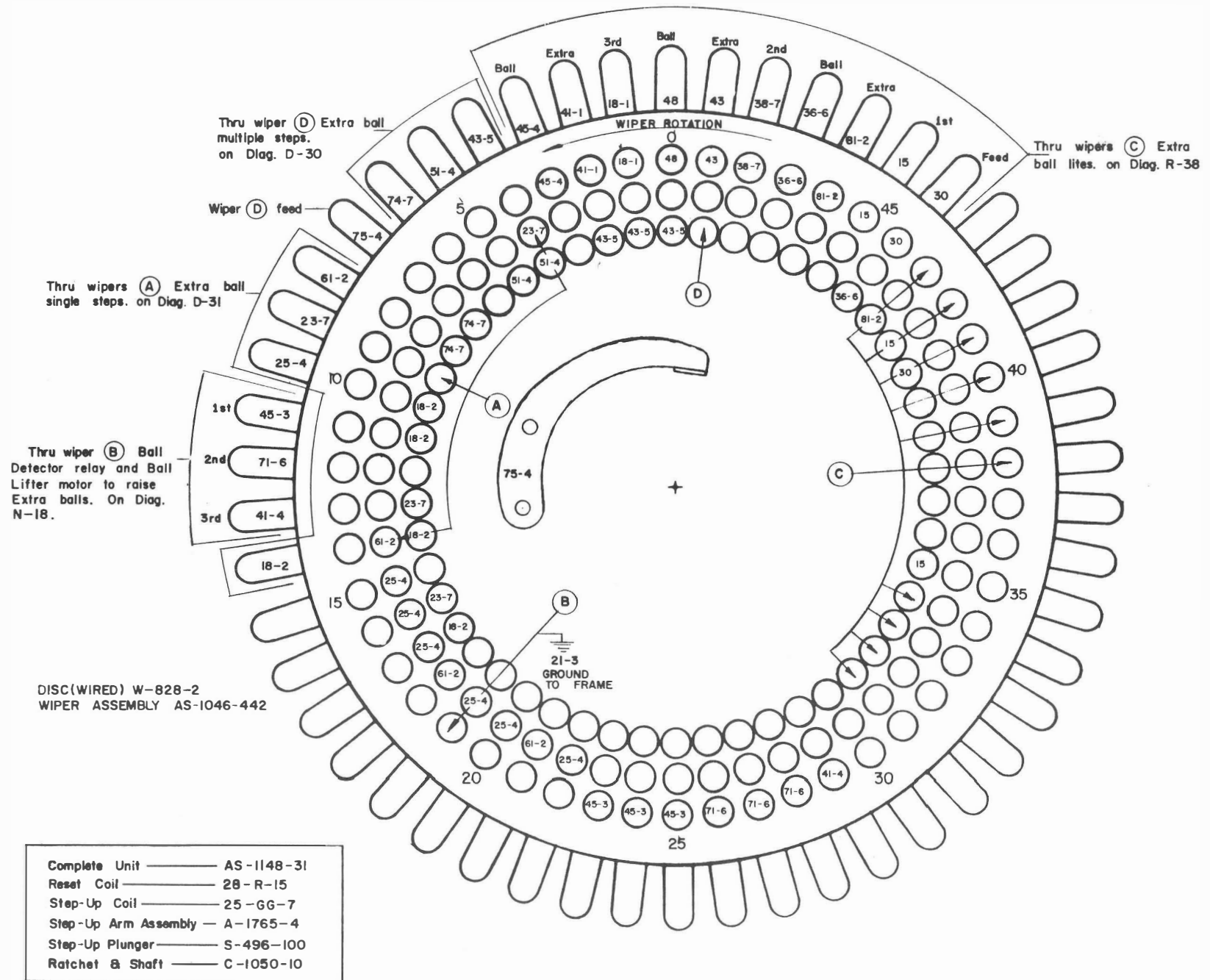
WIPER ASSEMBLY
AS-1046-443

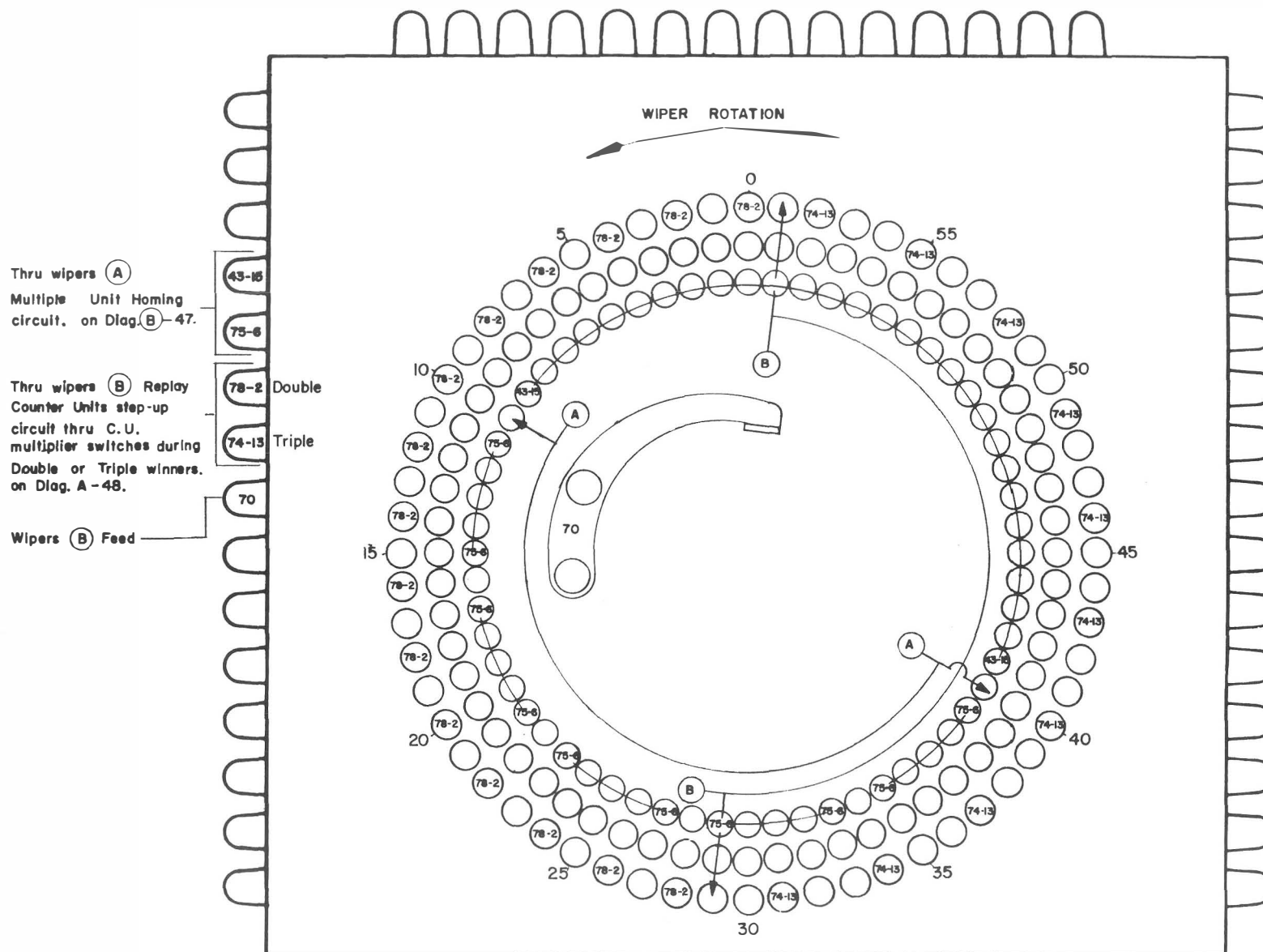
Complete Unit ——— AS-1022-91
 Reset Coil ——— 28-R-15
 Step-Up Coil ——— 25-GG-7
 Step-Up Arm Assembly — A-1765-13
 Step-Up Plunger — S-496-162
 Ratchet & Shaft ——— C-1060-29-7

DISC (WIRED)
W-933-3

EXTRA BALL UNIT DISC viewed from BUTTON or WIPER side

10 step unit. Wipers shown in zero or reset position





WIPER ASSEMBLY
AS-1046-445

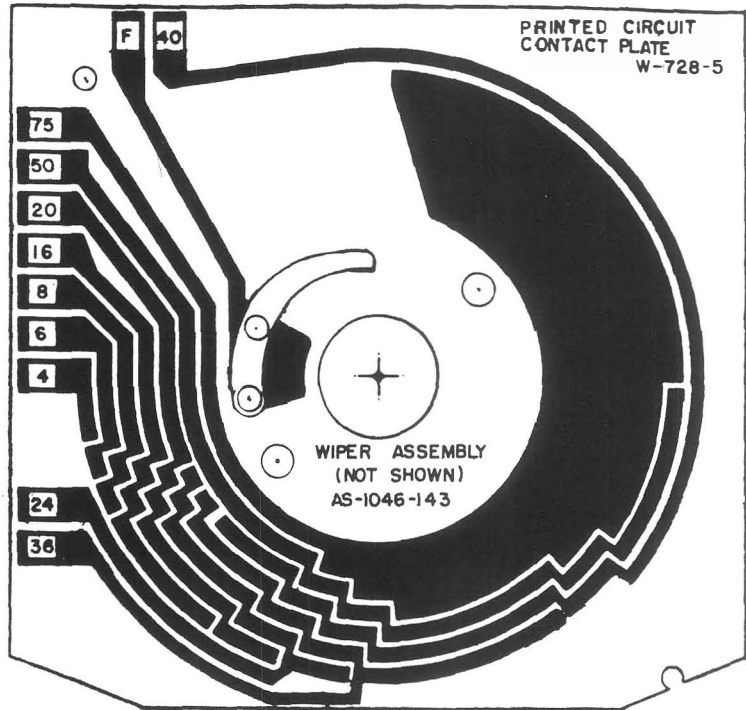
Complete Unit	AS-827-194
Step-Up Coil	E-184-205
Step-Up Arm Assembly	A-1765-19
Step-Up Plunger	S-496-162
Ratchet & Shaft	C-1060

DISC (WIRED)
W-1064

REPLAY COUNTER UNIT DISC viewed from WIPER side

4 used (see code box at left)

LUG No.	GREEN REPLAY COUNTER	RED REPLAY COUNTER	YELLOW REPLAY COUNTER	BLUE REPLAY COUNTER
F	54	71	23	91
75	61-9	52-6	50-6	61-6
50	60-9	40-3	57-2	54-6
40	57-9	25-3	52-2	80-3
36	90-8	23-3	51-2	74-3
24	13-1	20-3	41-2	65-3
20	27-6	10-3	40-2	63-3
16	45-12	85-2	23-2	60-3
8	40-9	83-2	93-1	48-3
6	36-14	74-2	81-1	43-3
4	41-9	60-2	78-1	41-3



WIRE COLOR NUMBERS
REPLAY VALUES

- | | |
|-------------------|------------|
| COMPLETE UNIT | AS-797-111 |
| RESET COIL | 28-R-15 |
| STEP-UP COIL | 25-GG-7 |
| STEP-UP PLUNGER | S-496-116 |
| STEP-UP ARM ASSY. | A-1765-8 |
| RATCHET & SHAFT | C-100 |

Control Unit Multiplier Cam Switches That Pulse Green, Red, Yellow And Blue Replay Counter Unit Step-Up Coils During 3-4-5 In A Zone Winners. During Double or Triple Winners, Switches Double or Triple Their Ratio Thru Multiple Unit Disc.

	12A-1.1	12A-1.1	12A-1.1	11A-6.1	12A-1.1	13A-4.1	11A-6.1	13A-4.1	11A-6.1	10A-12.1
5 In A Zone	75 (75)	75 (75)	96 (*)	96 (16)	96 (*)	144 (36)	216 (36)	300 (75)	450 (75)	600 (50)
4 In A Zone	16 (16)	20 (20)	24 (24)	36 (6)	50 (50)	64 (16)	96 (16)	144 (36)	240 (40)	480 (40)
3 In A Zone	4 (4)	6 (6)	8 (8)	12 (**)	16 (16)	24 (6)	36 (6)	64 (16)	120 (20)	192 (16)

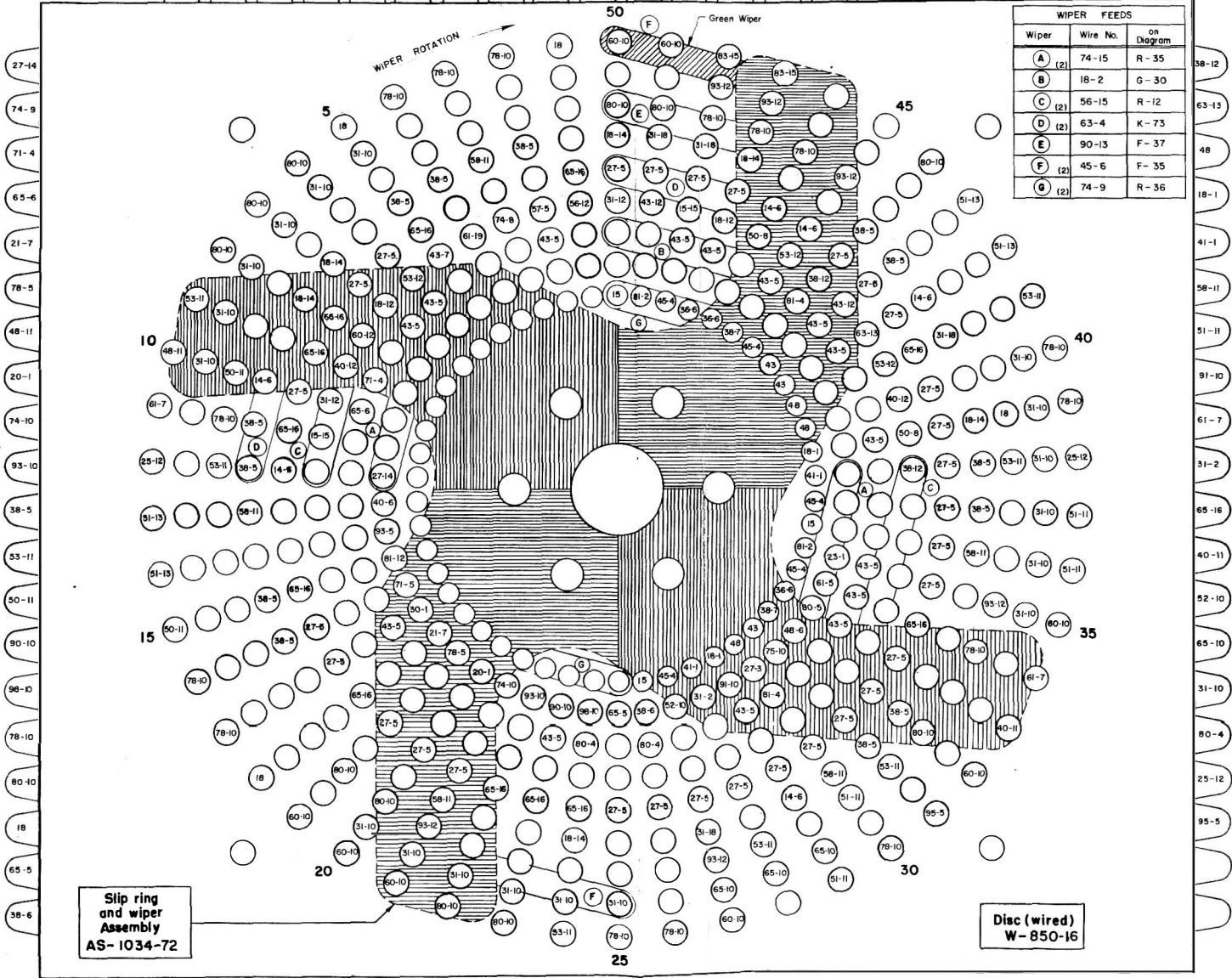
Large numbers are Green, Red, Yellow and Blue Replay Scores shown on backglass. Numbers in circles indicate the replay counter disc value each score is effective thru during winners.

- (*) Effective thru open at 96th step replay counter unit switches.
- (**) Effective thru open at 2nd step replay counter unit switches.

SPOTTING DISC viewed from WIPER side Wipers shown in zero position

30-1 71-5 81-12 53-12 43-7 61-19 74-8 57-5 56-12 50-8 45-4 81-2 36-6 38-7 43 81-4 43-5 31-18 18-14 83-15

93-5 40-6 15-15 31-12 40-12 60-12 18-12 27-5 14-6 60-10 43-12 93-12 51-13 23-1 61-5 80-5 48-6 75-10 27-5 15

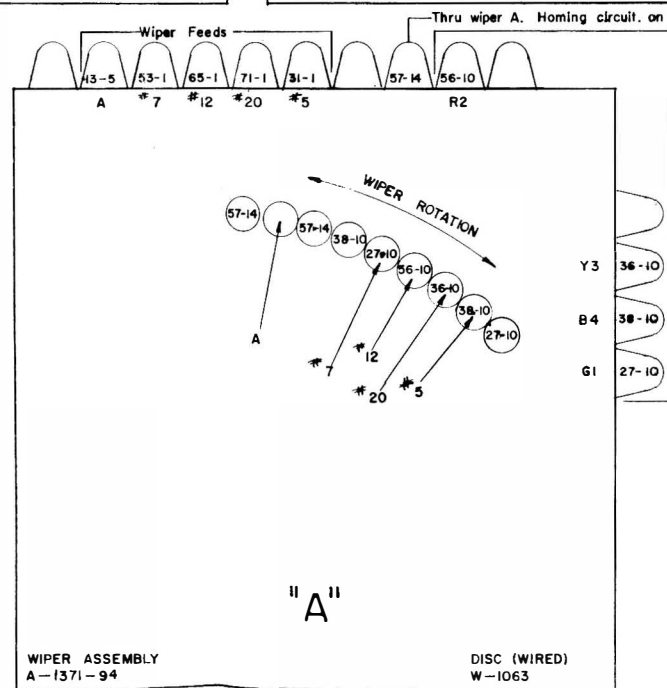
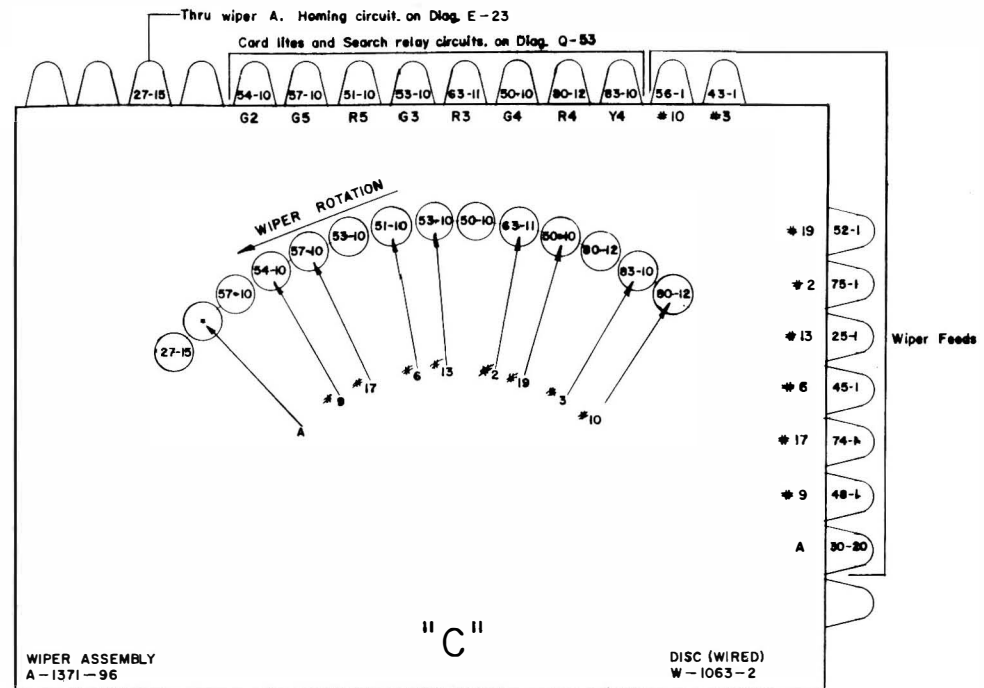
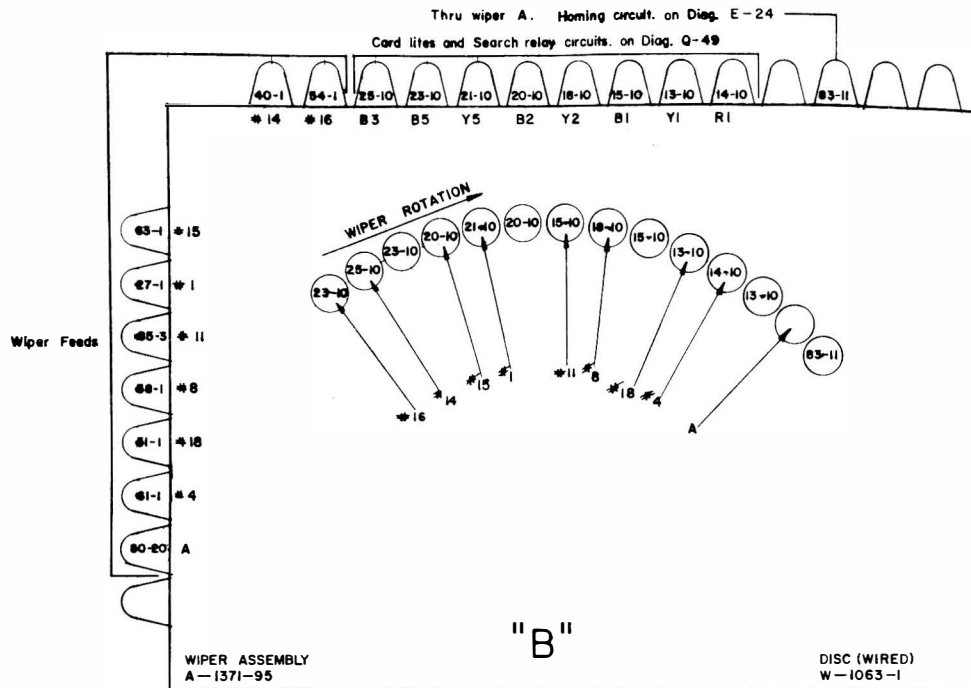


WIPER FEEDS		
Wiper	Wire No.	on Diagram
(A)	74-15	R-35
(B)	18-2	G-30
(C)	56-15	R-12
(D)	63-4	K-73
(E)	90-13	F-37
(F)	45-6	F-35
(G)	74-9	R-36

Slip ring and wiper Assembly
AS-1034-72

Disc (wired)
W-850-16

MYSTIC LINES MOTOR UNIT DISCS viewed from WIPER side Wipers shown in zero position



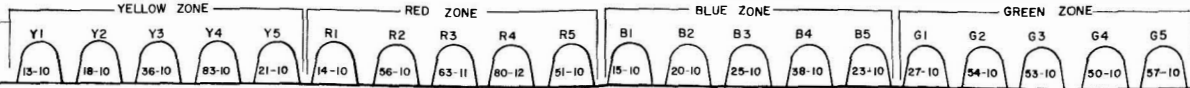
Card lites and Search relay circuits on Diag. Q-51

Complete Unit	AS-1809-7
Motor "A" Line	E-119-352
Motor "B" & "C" Lines	E-119-353
Relay "B" & "C" Cams	E-146-576
Plastic Overlay	M-1423
Cam & Hub Assembly "A" Line	A-800-130
Cam & Hub Assembly "B" & "C" Lines	A-800-131
Row #1 Plastic Slot Assembly	A-2988
Row #2 Plastic Slot Assembly	A-2989
Row #3 Plastic Slot Assembly	A-2990
Row #4 Plastic Slot Assembly	A-2991
Row #5 Plastic Slot Assembly	A-2992
Switch & Bracket Assembly "A" Cam	AS-982-579
Switch & Bracket Assembly "B" & "C" Cam	AS-982-535

SPOTTING DISC
on other side
of this sheet

SEARCH DISC viewed from WIPER side Wipers shown in zero position

Thru wipers ①②③④⑤ Search Relay circuits from
Mystic Line Disc. on Diag. R-55



Thru wipers (B) Red, Blue, Green 4 in zone winner circuits. on Diag. K-48,51,53

Thru wipers (A) Red Letter win relays circuit during Red Letter game winners. on Diag. G-55

Thru wipers (A) Search Index and replay Scoring circuit during big 4 winners. on Diag. G-45

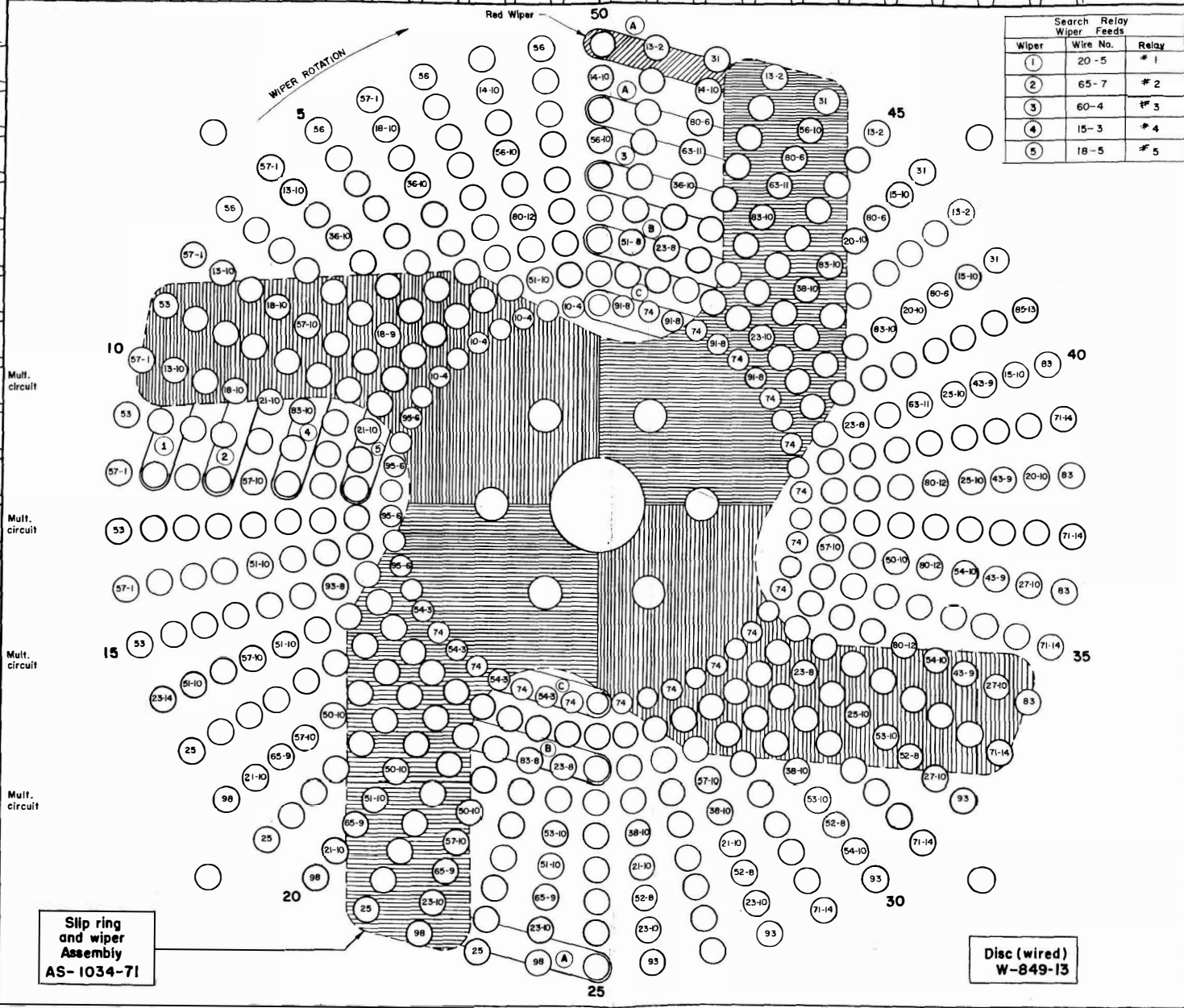
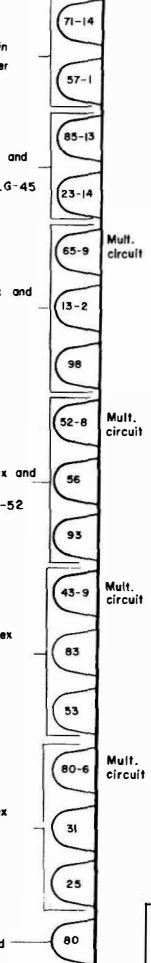
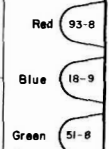
Thru wipers (A) Search Index and replay Scoring circuit during Green zone winners. on Diag. G-53.

Thru wipers (A) Search Index and replay Scoring circuit during Blue zone winners. on Diag. G-52

Thru wipers (A) Search Index and replay Scoring circuit during Red zone winners. on Diag. G-50.

Thru wipers (A) Search Index and replay Scoring circuit during Yellow zone winners. on Diag. G-47.

Wipers (A) Feed



Wiper	Search Relay Feeds	Relay
①	20-5	# 1
②	65-7	# 2
③	60-4	# 3
④	15-3	# 4
⑤	18-5	# 5

74 Thru wipers (C) Yellow, Red, Blue, Green 3 in zone winner feed. on Diag. K-46, 48, 50, 52.

54-3 Yellow

95-6 Red

10-4 Blue

91-8 Green

23-8 Thru wipers (B) Yellow, Red, Blue Green 4 in zone winner feed. on Diag. K-46, 49, 51, 53.

83-8 Thru wipers (B) Yellow, 4 in zone winner circuit. on Diag. K-46.

Slip ring and wiper Assembly AS-1034-71

Disc (wired) W-849-13

WINNER SEARCH POSITIONS CHART and MYSTIC LINES LAYOUT on other side of this sheet

WINNER SEARCH POSITIONS CHART

Red Wiper at Position	Wiper 1 Search Relay # 1	Wiper 2 Search Relay # 2	Wiper 3 Search Relay # 3	Wiper 4 Search Relay # 4	Wiper 5 Search Relay # 5
1					
2					
3					
4	R5	G5			
5					
6	Y5	G5			
7					
8	Y5	R5	G5		
9					
10	B5	G5	Y5		
11					
12	B5	R5	G5		
13					
14	B5	Y5	R5		
15					
16	B5	Y5	R5	G5	
17					
18	G2	G3	G4		
19					
20	G1	G3	G4		
21					
22	G1	G2	G4		
23					
24	G1	G2	G3	G4	G5
25					
26	B2	B3	B4		
27					
28	B1	B3	B4		
29					
30	B1	B2	B4		
31					
32	B1	B2	B3	B4	B5
33					
34	R2	R3	R4		
35					
36	R1	R3	R4		
37					
38	R1	R2	R4		
39					
40	R1	R2	R3	R4	R5
41					
42	Y2	Y3	Y4		
43					
44	Y1	Y3	Y4		
45					
46	Y1	Y2	Y4		
47					
48	Y1	Y2	Y3	Y4	Y5
49					
50					

2 Star - 3 Star
Red Letter
Game Winners

All 4 Star
300 - 600
Winners

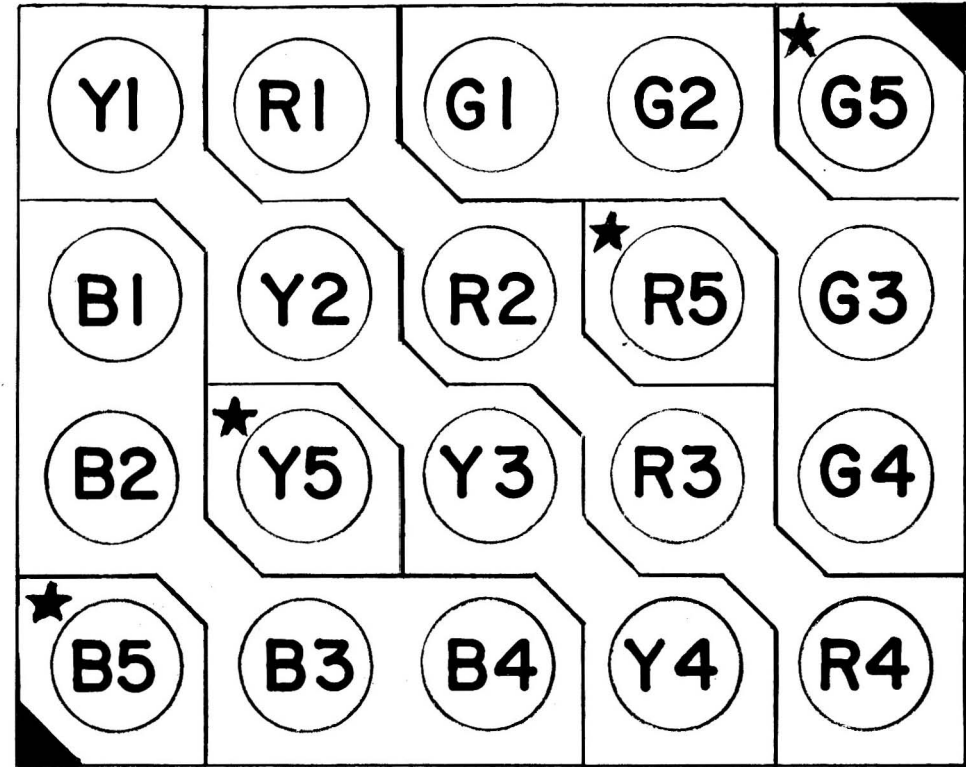
Green Zone
Winners

Blue Zone
Winners

Red Zone
Winners

Yellow Zone
Winners

MYSTIC LINES LAYOUT



When checking out any winner, refer to winner search positions chart to find position on search disc where that winner is scored.

MISCELLANEOUS SWITCHES

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
RED BUTTON N.O.	E-17	10-2 85-7	Red Black-White	Completes a circuit to red button relay.
RED BUTTON N.O.	K-6	50-2 63-2	White Brown-Yellow	Completes a circuit to start relay.
RED BUTTON N.C.	J-60	75-13 80-13	Orange-White Black	Opens pull-in and lock-in circuit to play scores relay and play features relay.
BLUE BUTTON N.C.	G-60	80-13 81-13	Black Black-Red	Opens pull-in and lock-in circuit to play features relay.
BLUE BUTTON N.O.	D-60	60-13 85-15	Brown Black-White	Completes pull-in circuit to play scores relay.
BLUE BUTTON N.O.	K-5	50-2 63-2	White Brown-Yellow	Completes a circuit to start relay.
GREEN BUTTON N.C.	H-60	80-13 57-13	Black White-Orange	Opens pull-in and lock-in circuit to play features relay.
GREEN BUTTON N.O.	D-59	74-16 61-13	Orange-Green Brown-Red	Completes pull-in circuit to play features relay.
GREEN BUTTON N.O.	L-5	50-2 63-2	White Brown-Yellow	Completes a circuit to start relay.
YELLOW BUTTON N.O.	E-18	10-2 25-8	Red Blue-White	Completes circuit to extra-ball trip relays.
YELLOW BUTTON N.O.	K-7	18-6 63-2	Red-Black Brown-Yellow	Completes a circuit to start relay.
YELLOW BUTTON N.C.	D-17	20-2 85-7	Blue Black-White	Opens lock-in circuit to red button relay.
"A" BUTTON N.O.	F-21	45-5 78-12	Green-White Orange-Black	Completes mystic-lines feature circuit to "A" motor.
"B" BUTTON N.O.	F-22	48-5 58-7	Green-Black White-Black	Completes mystic-lines feature circuit to "B" motor.
"C" BUTTON N.O.	F-23	25-6 36-5	Blue-White Yellow-Brown	Completes mystic-lines feature circuit to "C" motor.
"R" BUTTON N.O.	J-54	50-16 57-1	White White-Orange	Completes red letter games winner search circuit to red letter win relays.
"R" BUTTON N.O.	J-20	53-18 52-9	White-Yellow White-Blue	Completes circuit to search wiper lock magnet coil.
"R" BUTTON N.O.	N-14	54-11 21-3	White-Green Blue-Red	Completes a circuit to timer unit reset coil.

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
"A" MOTOR CAM N.O.	F-21	13-5 21-3	Red-Yellow Blue-Red	Completes mystic-line "A" motor carry-over circuit.
"A" MOTOR CAM N.C.	T-48	50-14 18-4	White Red-Black	Opens 17 volt circuit to card lites and search relays.
"B" MOTOR CAM N.O.	F-22	80-20 21-3	Black Blue-Red	Completes mystic-line "B" motor carry-over circuit.
"C" MOTOR CAM N.O.	F-22	21-3 30-20	Blue-Red Yellow	Completes mystic-line "C" motor carry-over circuit.
PANEL YELLOW ROLLOVER N.O.	K-56	14-12 13-12	Red-Green Red-Yellow	Completes a circuit to yellow rollover trip relay.
PANEL RED ROLLOVER N.O.	H-56	98-6 15-12	Gray-Black Red-White	Completes a circuit to red rollover trip relay.
SHUTTER-CLOSED WHEN OPEN	H-23	21-3 27-15	Blue-Red Blue-Orange	Completes mystic-line "C" homing circuit to "C" motor.
SHUTTER-CLOSED WHEN OPEN	H-24	21-3 83-11	Blue-Red Black-Yellow	Completes mystic-line "B" homing circuit to "B" motor.
SHUTTER-CLOSED WHEN OPEN	H-24	21-3 57-14	Blue-Red White-Orange	Completes mystic-line "A" homing circuit to "A" motor.
SHUTTER-OPEN WHEN OPEN	F-55	56-4 71-14	White-Black Orange-Red	Opens winner search circuit to red letter game relays.
SHUTTER-CLOSED WHEN OPEN	K-59	21-3 75-13	Blue-Red Orange-White	Completes pull-in and lock-in circuit to play features relay and play scores relay.
SHUTTER-OPEN WHEN OPEN	D-11	91-11 14-3	Gray-Red Red-Green	Opens red letter game winner circuit to shutter motor.
SHUTTER-CLOSED WHEN OPEN	L-28	90-3 25-18	Gray Blue-White	Completes red letter game winner circuit to advance red letter, score and feature units and energize feature relays.
TROUGH #1 N.O.	K-18	41-4 71-6	Green-Red Orange-Red	Opens ball lifter circuit after 7th ball is raised.
TROUGH #2 N.O.	L-18	71-6 45-3	Orange-Red Green-White	Opens ball lifter circuit after 6th ball is raised.
TROUGH #2 N.C.	E-15	98-11 85-6	Gray-Black Black-White	Completes circuit to select after 5th ball lockout relay when 6th ball is shot.
TROUGH #3 N.O.	M-18	21-3 45-3	Blue-Red Green-White	Opens ball lifter circuit after 5th ball is raised.
TROUGH #3 N.C.	F-15	85-6 54-5	Black-White White-Green	Completes circuit to select before 5th ball lockout relay when 5th ball is shot.
TROUGH #4 N.C.	H-16	83-7 78-7	Black-Yellow Orange-Black	Completes circuit to select before 4th ball lockout relay when 4th ball is shot.
TROUGH #8 N.O.	D-20	91-1 38-3	Gray-Red Yellow-Black	Opens ball lifter circuit after 1st ball is raised.

MISCELLANEOUS SWITCHES (CONCLUDED)

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
BALL LIFTER N.O.	E-19	91-1 36-3	Gray-Red Yellow-Brown	Completes ball lifter motor circuit.
MANUAL LIFT BUTTON N.O.	F-19	91-1 36-3	Gray-Red Yellow-Brown	(Safety Circuit) completes ball lifter motor circuit if automatic lifter circuit fails.
MANUAL LIFT BUTTON N.C.	K-57	31-4 30	Yellow-Red Yellow	(Safety circuit) opens lifter start relay lock-in circuit.
BALL GATE N.C.	J-57	31-4 36	Yellow-Red Yellow-Brown	Opens lifter start relay lock-in circuit.
BALL RUNWAY N.O.	H-58	38-8 30	Yellow-Black Yellow	Completes circuit to lifter start relay.

UNIT COIL & SWITCH CHART

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
RED SCORE UNIT STEP-UP COIL	B-74	52-19J 71-13	White-Blue Orange-Red	Energized thru red score control circuit during red or blue button play.
RESET COIL	A-78	15-4 70	Red-White Orange	Energized by shutter motor cam switch 3B.
STEP-UP ARM N.O.	E-63	91-12 56-9	Gray-Red White-Brown	Thru red score disc, completes circuit to 8, 12, 16, 24 score relays.
STEP-UP ARM N.O.	B-67	83-17 85-8	Black-Yellow Black-White	Thru yellow score disc, completes circuit to 1st step relay.
OPEN AT TOP N.C.	B-74	52-19 52-19J	White-Blue White-Blue	Opens circuit to red score unit step-up coil.
YELLOW SCORE UNIT STEP-UP COIL	B-71	54-14J 71-13	White-Green Orange-Red	Energized thru yellow score control circuit during red or blue button play. Also thru red letter game winner circuit.
RESET COIL	E-78	78-3 70	Orange-Black Orange	Energized by shutter motor cam switch 6B.
STEP UP ARM N.O.	E-62	90-12 56-9	Gray White-Brown	Thru yellow score disc, completes circuit to 8, 12, 16, 24 score relays.
STEP UP ARM N.O.	B-68	83-17 85-8	Black-Yellow Black-White	Thru yellow score disc, completes circuit to 1st step relay.
OPEN AT ZERO N.O.	A-60	31-15 70	Yellow-Red Orange	Completes the play features and play scores relay circuits.
OPEN AT ZERO N.O.	N-9	14-14 45-8	Red-Green Green-White	Completes anti-cheat relay circuit to shutter motor.
OPEN AT TOP N.C.	B-71	54-14 54-14J	White-Green White-Green	Opens circuit to yellow score unit step-up coil.
GREEN SCORE UNIT STEP-UP COIL	B-76	63-14 71-13	Brown-Yellow Orange-Red	Energized thru blue score control circuit during red or blue button play. Also thru red letter game winner circuit.
RESET COIL	F-78	78-3 70	Orange-Black Orange	Energized by shutter motor cam switch 6B.
STEP-UP ARM N.O.	E-64	93-13 56-9	Gray-Yellow White-Brown	Thru blue score disc, completes circuit to 8, 12, 16, 24 score relays.
STEP-UP ARM N.O.	B-68	83-17 85-8	Black-Yellow Black-White	Thru yellow score disc, completes circuit to 1st step relay.
CLOSED AT ZERO N.C.	J-19	57-6 85-7	White-Orange Black-White	Completes a circuit to red button relay.
OPEN AT TOP N.C.	B-75	14-15 63-14	Red-Green Brown-Yellow	Opens circuit to blue and green score unit step-up coils.
BLUE SCORE UNIT STEP-UP COIL	B-75	63-14 71-13	Brown-Yellow Orange-Red	Energized thru blue score disc control circuit during red or blue button play. Also thru red letter game winner circuit.
RESET COIL	F-78	78-3 70	Orange-Black Orange	Energized by shutter motor cam 6B.

CONCLUDED ON NEXT PAGE

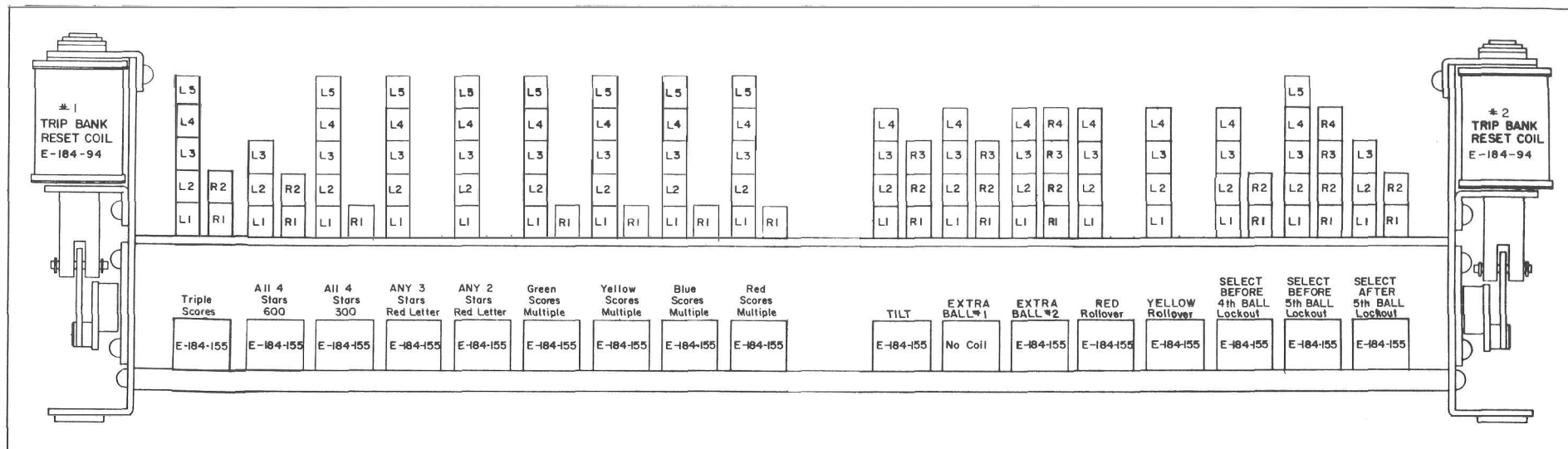
UNIT COIL & SWITCH CHART (CONCLUDED)

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
TIMER UNIT STEP-UP COIL	A-11	58-5J 70	White-Black Orange	Energized thru timer disc count circuit by ball lifter cam switch 2A for first 5 steps, then by control unit cam switch 1A for last 3 steps.
RESET COIL	A-12	71-8J 70	Orange-Red Orange	Energized by cam #5 relay switch during extra-ball play, shutter motor cam switch 6A when new game started, or "R" button switch during search for winners.
OPEN AT ZERO N.O.	F-12	71-8 71-8J	Orange-Red Orange-Red	Completes circuit to timer unit reset coil.
OPEN AT ZERO N.O.	D-19	91-1 38-3	Gray-Red Yellow-Black	Completes circuit to ball lifter motor to raise 2nd thru 5th balls.
OPEN AT ZERO N.O.	N-57	90-9 30	Gray Yellow	Opens lock-in circuit to lifter start relay.
OPEN AT TOP N.C.	N-2	20P 30P	Blue (Plastic) Yellow (Plastic)	Opens circuit to control unit and mixer-spotting unit motors.
OPEN AT TOP N.C.	B-11	58-5 58-5J	White-Black White-Black	Opens circuit to timer unit step-up coil.
ALL 4 STARS REPLAY COUNTER UNIT COIL	A-45	27-17 70	Blue-Orange Orange	Energized thru winner circuit during all 4 stars 300 and 600 winners. Also thru homing circuit to return unit to "0".
HOMING-OPEN AT ZERO N.O.	C-45	80-16 27-17	Black Blue-Orange	Completes homing circuit to all 4 stars replay counter unit.
OPEN AT 50 N.C.	J-44	83-13 23-14	Black-Yellow Blue-Yellow	Opens all 4 stars 600 winner circuit when 600 has been registered (50 steps)
OPEN AT 75 N.C.	J-45	95 23-14	Gray-White Blue-Yellow	Opens all 4 stars 300 winner circuit when 300 has been registered (75 steps)
MULTIPLE UNIT STEP-UP COIL	A-47	75-6 70	Orange-White Orange	Energized thru winner circuit during yellow, red, blue and green double and triple scoring. Also thru homing circuit to put unit in neutral position.
YELLOW REPLAY COUNTER UNIT STEP UP COIL	F-48	31 41	Yellow-Red Green-Red	Energized thru yellow winner circuit during yellow 3-4-5 in a zone winners.
RESET COIL	B-78	85-5 70	Black-White Orange	Energized by shutter motor cam switch 3B.
OPEN AT 2nd STEP N.C.	H-45	23 60-6	Blue-Yellow Brown	Opens circuit used to score yellow 3-in-a zone winners when yellow scores at 4th step.
OPEN AT 96 N.C.	G-47	23 25	Blue-Yellow Blue-White	Opens circuit used to score yellow 5-in-a zone winner when yellow scores at 3rd and 5th steps.
STEP-UP ARM N.O.	F-47	78-9 75-6	Orange-Black Orange-White	Completes circuit to advance multiple unit during yellow double and triple winners.
RED REPLAY COUNTER UNIT STEP-UP COIL	F-50	83 85	Black-Yellow Black-White	Energized thru red winner circuit during red 3-4-5 in a zone winners.
RESET COIL	D-78	85-5 70	Black-White Orange	Energized by shutter motor cam switch 3B.
OPEN AT 2nd STEP N.C.	H-48	71 21-16	Orange-Red Blue-Red	Opens circuit used to score red 3-in-a zone winners when red scores are at 4th step.
OPEN AT 96 N.C.	G-50	71 53	Orange-Red White-Yellow	Opens circuit used to score red 5-in-a zone winner when red scores at 3rd and 5th steps.
STEP-UP ARM N.O.	F-49	78-9 75-6	Orange-Black Orange-White	Completes circuit to advance multiple unit during red double and triple winners.
GREEN REPLAY COUNTER UNIT STEP UP COIL	F-54	13-2 14-2	Red-Yellow Red-Green	Energized thru green winner circuit during green 3-4-5 in a zone winners.
RESET COIL	C-78	85-5 70	Black-White Orange	Energized by shutter motor cam switch 3B.
OPEN AT 2nd STEP N.C.	H-52	54 63-12	White-Green Brown-Yellow	Opens circuit used to score green 3-in-a zone winners when green scores at 4th step.

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
OPEN AT 96 N.C.	G-54	54 98	White-Green Gray-Black	Opens circuit used to score green 5-in-a zone winner when green scores at 3rd and 5th steps.
STEP-UP ARM N.O.	F-53	78-9 75-6	Orange-Black Orange-White	Completes circuit to advance multiple unit during green double and triple winners.
BLUE REPLAY COUNTER UNIT STEP-UP COIL	F-52	56 36-1	White-Brown Yellow-Brown	Energized thru blue winner circuit during blue 3-4-5 in a zone winners.
RESET COIL	B-78	85-5 70	Black-White Orange	Energized by shutter motor cam switch 3B.
OPEN AT 2nd STEP N.C.	H-50	91 75-11	Gray-Red Orange-White	Opens circuit used to score blue 3-in-a zone winners when blue scores at 4th step.
OPEN AT 96 N.C.	G-51	91 93	Gray-Red Gray-Yellow	Opens circuit used to score blue 5-in-a zone winner when blue scores at 3rd and 5th steps.
STEP-UP ARM N.O.	F-51	78-9 75-6	Orange-Black Orange-White	Completes circuit to advance multiple unit during blue double and triple winners.
SELECTION FEATURE UNIT STEP-UP COIL	A-37	48-10J 70	Green-Black Orange	Energized thru feature control circuit during red or green button play. Also thru red letter game winner circuit.
RESET COIL	D-78	85-5 70	Black-White Orange	Energized by shutter motor cam switch 3B.
OPERATE AT ZERO S.P.D.T.	K-27	31-13 56-13 74-17	Yellow-Red White-Brown Orange-Green	Thru selection feature disc, directs circuits to mixer #2 relay.
OPEN AT TOP N.C.	H-36	85-12 40-4	Black-White Green	Opens a circuit for mystic-lines feature steps, selection feature steps, any 2, any 3, all 4 300 and all 4 600 feature relays.
OPEN AT TOP N.C.	B-37	48-10 48-10J	Green-Black Green-Black	Opens circuit to selection feature unit step-up coil.
MYSTIC LINES FEATURE UNIT STEP-UP COIL	A-35	81-7J 70	Black-Red Orange	Energized thru feature control circuit during red or blue button play. Also thru red letter game winner, circuit.
RESET COIL	G-79	78-3 70	Orange-Black Orange	Energized by shutter motor cam switch 6B.
OPEN AT TOP N.C.	B-35	81-7 81-7J	Black-Red Black-Red	Opens circuit to mystic-lines feature unit step-up coil.
RED LETTER UNIT STEP-UP COIL	A-29	52-5J 70	White-Blue Orange	Energized by mixer-spotting 16 pulse cam switch 1C during red letter game winners.
RESET COIL	G-78	78-3 70	Orange-Black Orange	Energized by shutter motor cam switch 6B.
OPERATE AT 29th STEP S.P.D.T.	J-29	52-5J 52-5 81-7	White-Blue White-Blue Black-Red	Directs circuit from red letter unit step-up coil to mystic-lines feature unit step-up coil.
EXTRA-BALL FEATURE UNIT STEP-UP COIL	A-30	38-4 70	Yellow-Black Orange	Energized thru extra-ball control circuit during yellow button play.
RESET COIL	E-78	78-3 70	Orange-Black Orange	Energized by shutter motor cam switch 6B.
REPLAY REGISTER UNIT STEP-UP COIL	A-42	75-9 70	Orange-White Orange	Energized thru replay winner circuit by control unit cam switch 12B. Also thru 25¢ credit circuit by control unit cam switch 9YA.
RESET COIL	A-5	45-9 70	Green-White Orange	Energized by mixer-spotting 16 pulse cam switch 5A when anti-cheat relay drops out with replays on register. Energized by control unit cam switch 7E when playing replays.
OPERATE AT ZERO S.P.D.T.	N-7	27-9 48-2 56-2	Blue-Orange Green-Black White-Brown	Directs play circuit thru coin switches when unit is at zero or thru red, blue, green and yellow replay buttons when unit is not at zero.
OPEN AT ZERO N.O.	J-7	63-2 10-5	Brown-Yellow Red	Completes circuit to start relay when playing replays.
REFLEX UNIT PLAY MAGNET COIL	A-4	90-5 70	Gray Orange	Energized during each play cycle from coin or replay by control unit cam switch 7E.
REPLAY MAGNET COIL	A-43	41-14 70	Green-Red Orange	Energized thru replay winner circuit by control unit cam switch 12B.

TRIP RELAY BANK PICTORIAL VIEW

NUMBERS CORRESPOND TO SWITCH CHART BELOW



TRIP RELAY BANK CHART

FOR POSITION OF SWITCHES REFER TO PICTORIAL VIEW ABOVE

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
#1 TRIP BANK RESET COIL	K-2	52P 50P	White-Blue (Plastic) White (Plastic)	Energized by shutter motor cam switch 6C.
TRIPLE SCORES FEATURE RELAY COIL	B-76	36-7J 71-13	Yellow-Brown Orange-Red	Energized thru mixer #1 disc proportioning circuit during red or blue button play.
L1	N.C.	B-76 36-7J	Yellow-Brown Yellow-Brown	Opens circuit to this relay coil.
L2	N.C.	D-71 23-9 21-11	Blue-Yellow Blue-Red	Opens a circuit for yellow score steps.
L3	S.P.D.T.	C-49 78-2 90-1 74-13	Orange-Black Gray Orange-Green	Directs yellow, red, blue, green replay counter unit step-up circuit during double or triple scoring.
L4	N.C.	E-66 27-11 18-13	Blue-Orange Red-Black	Opens a circuit to yellow, red, blue, green score multiple features.
L5	S.P.D.T.	Q-19 57-11 30 80-7	White-Orange Yellow Black	Directs circuit to lit color scores doubled or lit color scores tripled lite.
R1	N.C.	E-74 81-9 58-10	Black-Red White-Black	Opens a circuit for red score steps.
R2	N.C.	E-75 31-9 13-11	Yellow-Red Red-Yellow	Opens a circuit for blue and green score steps.

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
ALL 4 STARS 600 FEATURE RELAY COIL	C-39	31-6J 52-11	Yellow-Red White-Blue	Energized thru spotting disc circuit during red or green button play.
L1	N.C.	D-39 31-6 31-6J	Yellow-Red Yellow-Red	Opens circuit to this relay coil.
L2	S.P.D.T.	Q-14 71-15 30 63-13	Orange-Red Yellow Brown-Yellow	Directs circuit to all 4 stars 300 or 600 feature lite.
L3	N.O.	F-39 80-9 40-11	Black Green	Completes a circuit to all 4 stars 300 feature relay.
R1	S.P.D.T.	E-45 10-16 85-13 23-17	Red Black-White Blue-Yellow	Directs all 4 replay counter step-up circuit during 300 or 600 winners.
R2	S.P.D.T.	J-45 95 91-3 83-13	Gray-White Gray-Red Black-Yellow	In series with above, also completes all 4 stars 300 or 600 winner search circuit to register and record winner.

CONTINUED ON NEXT PAGE

TRIP RELAY BANK CHART FOR POSITION OF SWITCHES REFER TO PICTORIAL VIEW ON PAGE 28

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
ALL 4 STARS 300 FEATURE RELAY COIL	C-39	40-11J 52-11	Green White-Blue	Energized thru spotting disc circuit during red or green button play. Also thru all 4 star 600 relay circuit.
L1 N.C.	D-39	40-11 40-11J	Green Green	Opens circuit to this relay coil.
L2 N.C.	H-33	54-8 36-19	White-Green Yellow-Brown	Opens a circuit for extra-ball steps.
L3 N.O.	R-14	61-19 71-15	Brown-Red Orange-Red	Completes circuit to all 4 stars 300 feature lite.
L4 N.O.	K-45	91-3 23-8	Gray-Red Blue-Yellow	Completes all 4 stars 300 and 600 winner search circuit to register and record winners.
L5 N.O.	D-39	48-11 31-6	Green-Black Yellow-Red	(When used in circuit) completes spotting disc circuit for all 4 stars 600 features.
R1 N.C.	G-39	80-9 30	Black Yellow	Opens all 4 stars 600 feature relay circuit to this relay.
ANY 3 STARS RED LETTER FEATURE RELAY COIL	A-38	51-11J 70	White-Red Orange	Energized thru spotting disc circuit during red or green button play. Also thru any 2 stars feature relay circuit.
L1 N.C.	B-38	51-11 51-11J	White-Red White-Red	Opens circuit to this relay coil.
L2 N.C.	F-74	85-10 91-17	Black-White Gray-Red	Opens a circuit for red score steps.
L3 N.O.	R-13	50-8 58-3	White White-Black	Completes circuit to any 3 stars red letter game feature lite.
L4 N.O.	L-55	74-11 60-1	Orange-Green Brown	Completes winner search circuit to search index and red letter win relays to score red letter game winners.
L5 N.C.	G-38	38-2 30	Yellow-Black Yellow	Opens any 2 stars feature relay circuit to this relay.
ANY 2 STARS RED LETTER FEATURE RELAY COIL	A-38	61-10J 70	Brown-Red Orange	Energized thru spotting disc circuit during red or green button play.
L1 N.C.	B-38	61-10 61-10J	Brown-Red Brown-Red	Opens circuit to this relay coil.
L2 N.O.	F-38	38-2 51-11	Yellow-Black White-Red	Completes a circuit for any 3 stars red letter game feature.
L3 S.P.D.T.	Q-13	58-3 30 43-7	White-Black Yellow Green-Yellow	Directs circuit to any 3 stars or any 2 stars red letter game feature lite.
L4 S.P.D.T.	M-54	31-11 74-11 36-11	Yellow-Red Orange-Green Yellow-Brown	Directs winner search circuit to search index and red letter win relays to score red letter winners.
L5 N.C.	F-74	83-4 85-10	Black-Yellow Black-White	Opens a circuit for red score steps.

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
GREENSCORES MULTIPLE FEATURE RELAY COIL	B-66	45-11J 71-13	Green-White Orange-Red	Energized thru score control circuit during red or blue button play. Also thru red letter game winner circuit.
L1 N.C.	B-66	45-11 45-11J	Green-White Green-White	Opens circuit to this relay coil.
L2 N.C.	E-74	31-7 13-11	Yellow-Red Red-Yellow	Opens a circuit for blue and green score steps.
L3 N.O.	B-26	23-4 63-9	Blue-Yellow Brown-Yellow	Completes a circuit to mixer #4 relay.
L4 N.O.	Q-35	27-14 30	Blue-Orange Yellow	Completes circuit to green scores multiple lite.
L5 N.O.	F-53	78-9 65-9	Orange-Black Brown-White	Completes circuit to multiplier win relay #1 and multiple unit during green scores doubled and tripled winners.
R1 N.C.	M-72	15-11 81-11	Red-White Black-Red	Opens a circuit for yellow, red, blue, green score steps and multiple score features.
YELLOW SCORES MULTIPLE FEATURE RELAY COIL	B-65	38-17J 71-13	Yellow-Black Orange-Red	Energized thru score control circuit during red or blue button play. Also thru red letter game winner circuit.
L1 N.C.	B-65	38-17 38-17J	Yellow-Black Yellow-Black	Opens circuit to this relay coil.
L2 N.C.	D-71	21-11 75-8	Blue-Red Orange-White	Opens a circuit for yellow score steps.
L3 N.O.	B-27	23-4 14-11	Blue-Yellow Red-Green	Completes a circuit to mixer #4 relay.
L4 N.O.	Q-23	52-10 30	White-Blue Yellow	Completes circuit to yellow scores multiple lite.
L5 N.O.	F-47	78-9 80-6	Orange-Black Black	Completes circuit to multiple win relay #1 and multiple unit during yellow scores doubled and tripled winners.
R1 N.C.	M-74	90-11 10-15	Gray Red	Opens a circuit for yellow, red, blue, green score steps and multiple score features.
BLUE SCORES MULTIPLE FEATURE RELAY COIL	B-66	43-11J 71-13	Green-Yellow Orange-Red	Energized thru score control circuit during red or blue button play. Also thru red letter game winner circuit.
L1 N.C.	B-66	43-11 43-11J	Green-Yellow Green-Yellow	Opens circuit to this relay coil.
L2 N.C.	E-74	90-4 31-7	Gray Yellow-Red	Opens a circuit for blue and green score steps.
L3 N.O.	C-25	23-4 58-2	Blue-Yellow White-Black	Completes a circuit to mixer #4 relay.
L4 N.O.	Q-31	74-10 30	Orange-Green Yellow	Completes circuit to blue scores multiple lite.
L5 N.O.	F-51	78-9 52-8	Orange-Black White-Blue	Completes circuit to multiple win relay #1 and multiple unit during blue scores doubled and tripled winners.
R1 N.C.	M-73	14-7 15-11	Red-Green Red-White	Opens a circuit for yellow, red, blue, green score steps and multiple score features.

TRIP RELAY BANK CHART FOR POSITION OF SWITCHES REFER TO PICTORIAL VIEW ON PAGE 28

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
REDScores MULTIPLE FEATURE RELAY COIL	A-65	41-11J 71-13	Green-Red Orange-Red	Energized thru score control circuit. Also thru red letter game winner circuit.
L1 N.C.	B-65	41-11 41-11J	Green-Red Green-Red	Opens circuit to this relay coil.
L2 N.C.	D-73	83-4 58-10	Black-Yellow White-Black	Opens a circuit for red score steps.
L3 N.O.	B-28	23-4 95-7	Blue-Yellow Gray-White	Completes a circuit to mixer #4 relay.
L4 N.O.	Q-27	75-10 30	Orange-White Yellow	Completes circuit to red scores multiple lite.
L5 N.O.	F-49	78-9 43-9	Orange-Black Green-Yellow	Completes circuit to multiple win relay #1 and multiple unit during red scores doubled and tripled winners.
R1 N.C.	N-73	10-15 14-7	Red Red-Green	Opens a circuit for yellow, red, blue, green score steps and multiple score features.
TILT RELAY COIL	A-16	14-5 70	Red-Green Orange	Energized by inertia tilt switches, plumb bob tilt, or thru anti-cheat coin switch tilt circuits.
L1 N.C.	M-20	40-8 93-3	Green Gray-Yellow	Opens circuit to search wiper lock magnet and mystic lines motors.
L2 N.C.	S-47	50-14 20-4	White Blue	Opens 17 volt circuit.
L3 S.P.D.T.	N-10	21-3 30 45-8	Blue-Red Yellow Green-White	Opens circuit to this relay coil. Also opens scores and features circuit, winner circuit, game playing circuit, and completes a circuit to close shutter when open.
L4 S.P.D.T.	T-46	36-17 54-2 91-2	Yellow-Brown White-Green Gray-Red	Opens 6 volt circuit to score and feature lites, and completes circuit to tilt lite.
R1 N.C.	M-2	60P 30P	Brown(Plastic) Yellow(Plastic)	Opens circuit to control unit and mixer-spotting unit motors.
R2 N.O.	H-18	57-6 85-7	White-Orange Black-White	Completes a circuit to red button relay.
R3 N.O.	D-6	83-3 13-16	Black-Yellow Red-Yellow	(Safety circuit) completes a circuit to start relay.

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
EXTRA BALL #1 FEATURE RELAY				
L1 N.C.	E-32	91-6 85-4	Gray-Red Black-White	Opens pull-in circuit to anti-cheat relay.
L2 N.O.	J-12	83-1 71-8	Black-Yellow Orange-Red	Completes a circuit to reset timer unit.
L3 S.P.D.T.	N-32	85-4 30 61-2	Black-White Yellow Brown-Red	Opens pull-in circuit to anti-cheat relay, yellow, red blue, green score step circuit, and completes circuit for extra ball steps.
L4 S.P.D.T.	G-33	90-11 56-6 18-2	Gray White-Brown Red-Black	Opens yellow, red, blue, green score step and multiple score feature circuit, and completes circuit for extra-ball steps.
R1 N.C.	L-24	25-5 41-17	Blue-White Green-Red	Opens a circuit to mixer #4 relay.
R2 S.P.D.T.	J-33	75-5 15-7 45-2	Orange-White Red-White Green-White	Opens yellow, red, blue, green score step and multiple score feature circuit, and completes circuit for extra-ball unit steps.
R3 N.O.	Q-46	50-9 23-6	White Blue-Yellow	Completes circuit to extra-balls feature lite.
EXTRABALL #2 FEATURE RELAY COIL	A-18	10-6J 70	Red Orange	Energized thru yellow button circuit after 5th ball is shot.
L1 N.C.	B-18	10-6 10-6J	Red Red	Opens circuit to this relay coil.
L2 N.O.	D-19	91-1 38-3	Gray-Red Yellow-Black	Completes extra-ball circuit to ball lifter motor.
L3 S.P.D.T.	H-10	14-3 61 98-2	Red-Green Brown-Red Gray-Black	Directs circuit from shutter motor to mixer latch and timer cams index coils.
L4 N.C.	E-17	20-2 85-7	Blue Black-White	Opens lock-in circuit to red button relay.
R1 N.C.	Q-12	31-16 81-6	Yellow-Red Black-Red	Opens spotting disc features flash lite circuits.
R2 N.O.	G-33	36-19 56-6	Yellow-Brown White-Brown	Completes circuit for extra-ball steps.
R3 S.P.D.T.	Q-35	15-17 13-4 74-9	Red-White Red-Yellow Orange-Green	Directs circuit from yellow, red, blue, green score and score multiple feature lites flash, to extra-ball lites flash.
R4 N.C.	J-35	83-9 50-5	Black-Yellow White	Opens features circuit.

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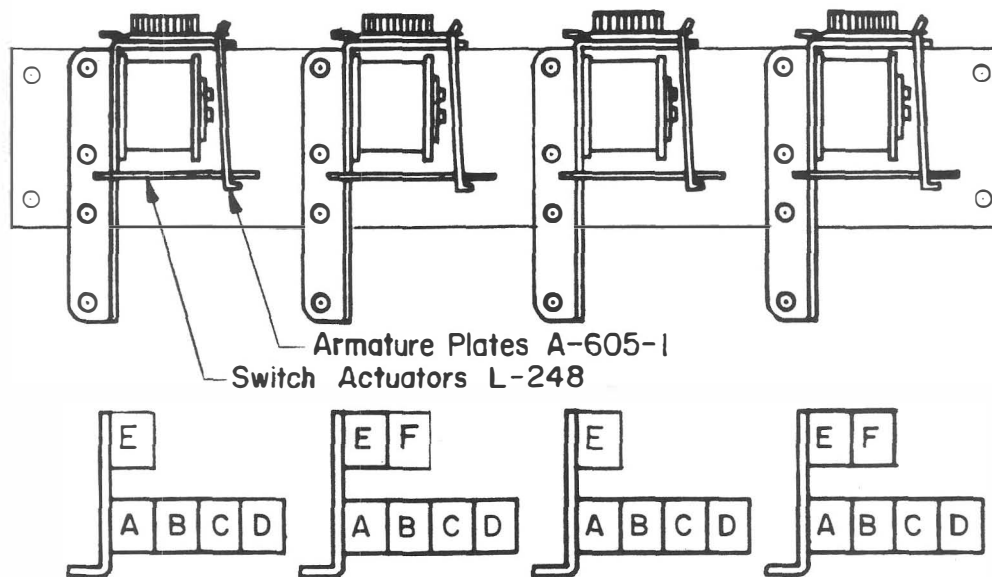
TRIP RELAY BANK CHART FOR POSITION OF SWITCHES REFER TO PICTORIAL VIEW ON PAGE 28

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
RED ROLLOVER FEATURE RELAY COIL	A-57	25-13J 70	Blue-White Orange	Energized thru selection feature disc and red rollover button circuit. Also energized direct thru selection feature disc circuit.
L1 N.C.	A-57	25-13 25-13J	Blue-White Blue-White	Opens circuit to this relay coil.
L2 N.O.	K-21	93-3 21-12	Gray-Yellow Blue-Red	Completes circuit to move mystic-lines until 6th ball is shot.
L3 S.P.D.T.	R-8	51-12 90 52-13	White-Red Gray White-Blue	Directs circuit to flash press buttons now lite before 4th ball, before 5th ball or after 5th ball.
L4 S.P.D.T.	R-10	31-8 10-11 53-12	Yellow-Red Red White-Yellow	Directs circuit to press buttons before 4th ball, before 5th ball or after 5th ball feature lite.
YELLOW ROLLOVER FEATURE RELAY COIL	A-56	38-13J 70	Yellow-Black Orange	Energized thru selection feature disc and yellow rollover button circuit. Also energized direct thru selection feature disc circuit.
L1 N.C.	B-56	38-13 38-13J	Yellow-Black Yellow-Black	Opens circuit to this relay coil.
L2 N.O.	L-21	93-3 98-3	Gray-Yellow Gray-Black	Completes circuit to move mystic-lines until 5th ball is shot.
L3 S.P.D.T.	R-8	48-13 51-12 23-5	Green-Black White-Red Blue-Yellow	Directs circuit to flash press buttons now lite before 4th ball or before 5th ball.
L4 S.P.D.T.	R-10	57-5 31-8 74-8	White-Orange Yellow-Red Orange-Green	Directs circuit to press buttons before 4th ball or before 5th ball feature lite.
SELECT BEFORE 4th BALL LOCKOUT RELAY COIL	A-16	83-6J 70	Black-Yellow Orange	Energized thru timer disc ball count circuit when 4th ball is shot.
L1 N.C.	B-16	83-6 83-6J	Black-Yellow Black-Yellow	Opens circuit to this relay coil.
L2 N.O.	L-12	36-2 43-2	Yellow-Brown Green-Yellow	Completes timer unit step-up circuit, from 4th to 5th step.
L3 S.P.D.T.	L-20	98-3 93-3 53-18	Gray-Black Gray-Yellow White-Yellow	Opens before 4th ball circuit to move mystic-lines and completes circuit to "R" button to search for winners.
L4 N.C.	R-8	27-4 48-13	Blue-Orange Green-Black	Opens before 4th ball press buttons now lite flash circuit.
R1 N.O.	E-42	80 23-13	Black Blue-Yellow	Completes winner search circuit to search index coil.
R2 N.O.	K-54	60-1 50-16	Brown White	Completes winner search circuit to red letter win relays.

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
SELECT BEFORE 5th BALL LOCKOUT RELAY COIL	A-15	74-6J 70	Orange-Green Orange	Energized thru timer disc ball count circuit when 5th ball is shot.
L1 N.C.	S-11	52-12 56-12	White-Blue White-Brown	Opens circuit to yellow rollover button lite on panel.
L2 N.C.	G-56	13-12 38-13	Red-Yellow Yellow-Black	Opens circuit to yellow rollover trip relay.
L3 N.O.	K-14	54-11 71-8	White-Green Orange-Red	Completes timer unit reset circuit thru "R" button.
L4 N.O.	H-12	78-6 27-2	Orange-Black Blue-Orange	Completes timer unit step-up circuit, from 5th to 8th step.
L5 N.C.	K-20	98-3 21-12	Gray-Black Blue-Red	Opens before 5th ball circuit to move mystic-lines.
R1 N.C.	B-15	74-6 74-6J	Orange-Green Orange-Green	Opens circuit to this relay coil.
R2 N.O.	D-18	10-6 25-8	Red Blue-White	Completes circuit to extra-ball trip relays.
R3 N.O.	K-7	50-2 18-6	White Red-Black	Completes yellow button extra-ball play circuit to start relay when playing replays.
R4 S.P.D.T.	S-8	14-18 48-12 53-2	Red-Green Green-Black White-Yellow	Directs circuit to flash press buttons now lite before 4th ball, before 5th ball and after 5th ball.
SELECT AFTER 5th BALL LOCKOUT RELAY COIL	A-15	98-11J 70	Gray-Black Orange	Energized thru ball count circuit when 6th ball, 1st extra ball is shot.
L1 N.C.	J-20	21-12 14-4	Blue-Red Red-Green	Opens after 5th ball circuit to move mystic-lines.
L2 N.C.	F-57	15-12 25-13	Red-White Blue-White	Opens circuit to red rollover trip relay.
L3 N.C.	R-9	53-2 52-13	White-Yellow White-Blue	Opens after 5th ball flash circuit to press buttons now lite.
R1 N.C.	B-15	98-11 98-11J	Gray-Black Gray-Black	Opens circuit to this relay coil.
R2 N.C.	S-12	41-8 60-12	Green-Red Brown	Opens circuit to red rollover button panel lite.
#2 TRIP BANK RESET COIL	K-3	70P 50P	Orange(Plastic) White(Plastic)	Energized by shutter motor cam switch #3A.

4 RELAY BANK PICTORIAL VIEW

LETTERS CORRESPOND TO SWITCH CHART ON PAGE 33



Name	Replay Reset	Start	25¢	Anti-cheat
Coil turns & wire gauge	2300 #33	1800 #33	1800 #33	2300 #33
Coil resistance (nominal)	85 ohms	65 ohms	65 ohms	85 ohms
Operating voltage	50 volts	50 volts	50 volts	50 volts
Test voltage	37 volts	32 volts	32 volts	39 volts
Extension spring load	Clear	Red	Clear	Red
Sw actuator stroke	$\frac{3}{32}$	$\frac{3}{32}$	$\frac{3}{32}$	$\frac{3}{32}$
Additional information				Thermaleze wire or equivalent. No wrap on coil.
Coil No.	C-7800-331	C-7800-334	C-7800-334	C-7800-336

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

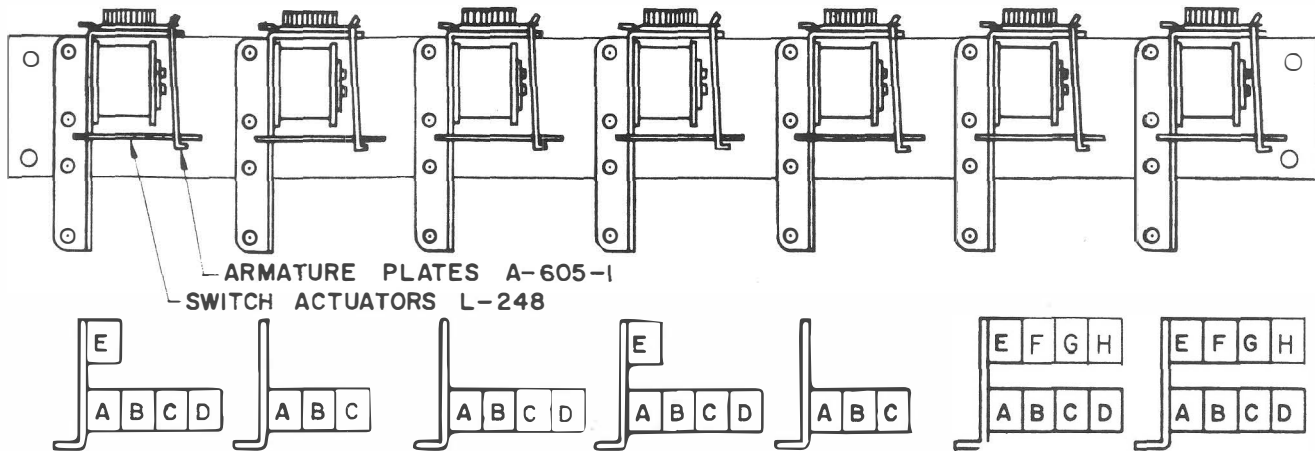
4 RELAY BANK SWITCH CHART FOR POSITION OF SWITCHES REFER TO PICTORIAL VIEW ON PAGE 32

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
REPLAY RESET RELAY COIL	A-5	75-2 70	Orange-White Orange	Energized by anti-cheat relay circuit thru replay register unit zero switch.
A S.P.D.T.	E-5	90-5 98-5 53-7	Gray Gray-Black White-Yellow	Directs single replay register unit reset circuit thru control unit cam switch 7E, or multiple reset circuit thru mixer-spotting cam switch 5A.
B N.O.	M-1	20P 60P	Blue (Plastic) Brown (Plastic)	Completes a circuit to control unit and mixer-spotting unit motors.
C N.O.	M-5	75-2 56-2	Orange-White White-Brown	Completes lock-in circuit for this relay. Also completes multiple replay register unit reset circuit.
D N.C.	F-7	10-5 83-3	Red Black-Yellow	Opens circuit to start relay.
E N.O.				Not Used.
START RELAY COIL	A-7	13-16 70	Red-Yellow Orange	Energized by coin switch circuit or by replay button (Red-Blue-Green-Yellow) switch circuit when replays are on register.
A N.C.	C-30	75-4 78	Orange-White Orange-Black	Opens multiple extra-ball unit step circuit.
B N.C.	G-35	18-16 95-9	Red-Black Gray-White	Opens features circuit.
C N.O.	K-9	48-2 13-16	Green-Black Red-Yellow	Completes lock-in circuit for this relay. Also in series with function of switch D.
D N.O.	J-9	13-16 10-10	Red-Yellow Red	Completes circuit to shutter motor to open shutter, then to mixer latch and timer cams index coils for play cycle.
E N.C.	G-55	56-4 38-15	White-Brown Yellow-Black	Opens lock-in circuit to red letter win relays.
F N.C.	C-24	21-3 14-9	Blue-Red Red-Green	Opens lock-in circuit to mixer cam #2 relay.

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
25¢ RELAY COIL	A-11	15-13 70	Red-White Orange	Energized by 25¢ coin switch circuit.
A S.P.D.T.	D-43	41-14 75-9 36-13	Green-Red Orange-White Yellow-Brown	Opens winner replay register unit step-up circuit and completes 25¢ credit replay register unit step-up circuit.
B N.O.	K-11	25-9 15-13	Blue-White Red-White	Completes lock-in circuit for this relay.
C N.O.	L-9	10-5 90-2	Red Gray	Completes 25¢ coin circuit to start relay.
D N.C.	C-5	45-9 98-5	Green-White Gray-Black	Opens replay register unit reset circuit.
E N.C.	C-8	83-16 80-2	Black-Yellow Black	Opens circuit to single coin meter.
ANTI-CHEAT RELAY COIL	A-32	78-4 70	Orange-Black Orange	Energized by circuit thru control unit cam switch 5B. Stays energized unless power is interrupted.
A S.P.D.T.	M-7	75-2 56-2 50-2	Orange-White White-Brown White	Opens circuit to start relay and completes circuit to replay reset relay, when relay drops out.
B N.O.	R-47	20-4 80-1	Blue Black	Opens 17 volt circuit, when relay drops out.
C N.O.	F-32	30 78-4	Yellow Orange-Black	Completes lock-in circuit to this relay.
D N.C.	P-10	30 14-14	Yellow Red-Green	Completes circuit to shutter motor to close shutter, when relay drops out while shutter is open.
E S.P.D.T.	T-45	91-2 36-17 40	Gray-Red Yellow-Brown Green	Opens 6 volt scores and feature lite circuit and completes circuit to tilt lite, when relay drops out.
F N.C.	J-18	57-6 85-7	White-Orange Black-White	Completes a circuit to red button relay, when this relay drops out.

(TOP) 7 RELAY BANK PICTORIAL VIEW

LETTERS CORRESPOND TO SWITCH CHART ON PAGE 35



Name	MIXER CAM #2	MIXER # 2	MIXER # 4	PLAY FEATURES	FEATURES LOCK	PLAY SCORES	SCORES LOCK
Coil turns & wire gauge	2300 # 33	2800 # 33	2800 # 33	2300 # 33	2300 # 33	2300 # 33	2300 # 33
Coil resistance (nominal)	85 OHMS	116 OHMS	116 OHMS	85 OHMS	85 OHMS	85 OHMS	85 OHMS
Operating voltage	50 VOLTS	50 VOLTS	50 VOLTS	50 VOLTS	50 VOLTS	50 VOLTS	50 VOLTS
Test voltage	37 VOLTS	37 VOLTS	37 VOLTS	37 VOLTS	37 VOLTS	37 VOLTS	37 VOLTS
Extension spring load	RED	RED	RED	RED	CLEAR	RED	RED
Sw actuator stroke	$\frac{3}{32}$	$\frac{3}{32}$	$\frac{3}{32}$	$\frac{3}{32}$	$\frac{3}{32}$	$\frac{3}{32}$	$\frac{3}{32}$
Additional information		Note: Thermaleze wire or equivalent. No wrap on coil.	See note				
Coil No.	C-7800-331	C-7800-3312	C-7800-3312	C-7800-331	C-7800-331	C-7800-331	C-7800-331

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

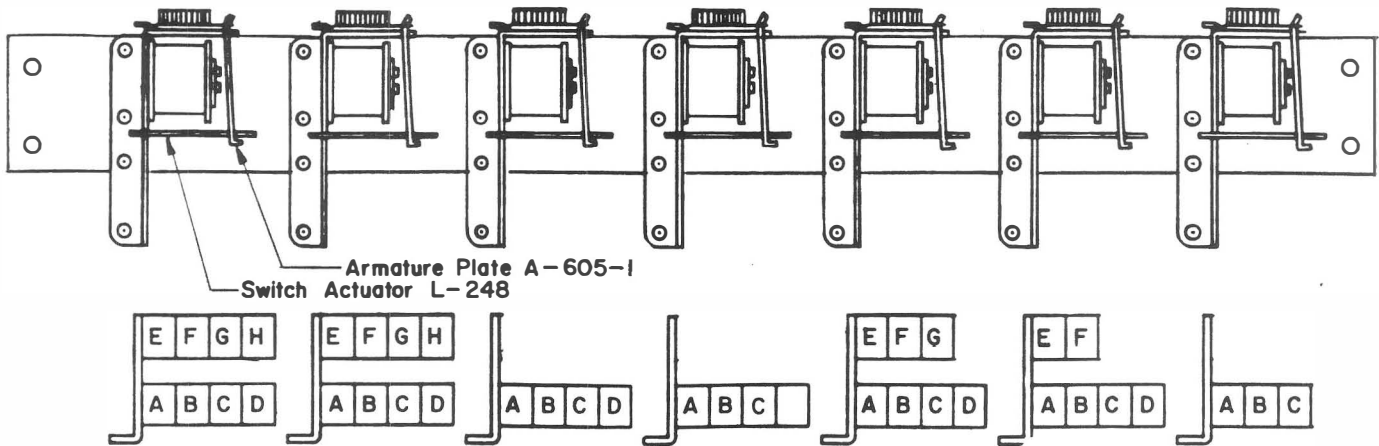
(TOP) 7 RELAY BANK SWITCH CHART FOR POSITION OF SWITCHES REFER TO PICTORIAL VIEW ON PAGE 34

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
MIXER CAM #2 RELAY COIL	A-24	93-11 70	Gray-Yellow Orange	Energized during play cycle by control unit cam 8XA thru mixer cam #2A circuit.
A N.O.	B-24	14-9 93-11	Red-Green Gray-Yellow	Completes lock-in circuit for this relay.
B N.O.	E-71	23-9 21-11	Blue-Yellow Blue-Red	Completes alternator 9XB circuit for yellow score steps.
C N.O.	E-74	81-9 58-10	Black-Red White-Black	Completes alternator 9XC circuit for red score steps.
D N.O.	E-75	31-9 13-11	Yellow-Red Red-Yellow	Completes alternator 9XA circuit for blue and green score steps.
E S.P.D.T.	E-65	25-11 18-8 27-11	Blue-White Red-Black Blue-Orange	Directs mixer #4 disc circuit for yellow, red, blue, green score steps or score multiple features.
MIXER #2 RELAY COIL	A-29	27-7 70	Blue-Orange Orange	Energized thru mixer #2 disc control circuit.
A N.O.	H-27	27-7 13-3	Blue-Orange Red-Yellow	Completes lock-in circuit for this relay.
B N.O.	L-70	85-4 54-12	Black-White White-Green	Completes circuits for yellow, red, blue, green score steps and score multiple features.
C N.O.	H-33	56-6 15-7	White-Brown Red-White	Completes circuits for yellow, red, blue, green score steps and score multiple features during regular play, extra-ball feature steps during extra-ball play.
MIXER #4 RELAY COIL	A-27	23-4 70	Blue-Yellow Orange	Energized thru mixer #4 disc control circuit.
A N.O.	B-24	23-4 18-7	Blue-Yellow Red-Black	Completes lock-in circuit for this relay.
B N.C.	J-33	45-2 51-5	Green-White White-Red	Opens score advance and score multiple features circuit, or extra-ball feature advance circuit.
C N.C.	F-77	50-7 56-7	White White-Brown	Opens triple scores feature circuit.
D N.C.	K-35	52-15 43-16	White-Blue Green-Yellow	Opens mystic-lines, selection, any 3, any 2 star red letter, all 4 star 300, all 4 star 600 feature circuits.
PLAY FEATURES RELAY COIL	B-59	61-13 31-15	Brown-Red Yellow-Red	Energized thru green play features button circuit.
A N.O.	D-58	43-14 53-14	Green-Yellow White-Yellow	Completes circuit to features lock relay.
B N.O.	D-59	81-13 61-13	Black-Red Brown-Red	Completes lock-in circuit for this relay.
C N.C.	Q-35	74-15 15-17	Orange-Green Red-White	Opens yellow, red, blue, green score lites and multiple score feature lites flash circuit.
D N.C.	A-62	71-13 70	Orange-Red Orange	Opens yellow, red, blue, green score step-up and multiple score feature circuits.
E S.P.D.T.	Q-44	95-2 36-15 23-15	Gray-White Yellow-Brown Blue-Yellow	Directs circuit to red button (scores & features) lite, blue button (scores only) lite, or green button (features only) lite.

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
FEATURES LOCK RELAY COIL	B-58	53-14 31-15	White-Yellow Yellow-Red	Energized by control unit cam #7 relay switch thru play features relay circuit.
A N.O.	C-58	40-15 53-14	Green White-Yellow	Completes lock-in circuit for this relay.
B N.O.	F-37	45-6 90-13	Green-White Gray	Completes added spotting disc circuits for mystic lines feature steps, selection feature steps, any 3, any 2 red letter feature, all 4 300, all 4 600 feature.
C N.C.	K-24	52-17 41-17	White-Blue Green-Red	Opens a mixer #4 relay circuit.
PLAY SCORES RELAY COIL	B-60	85-15 31-15	Black-White Yellow-Red	Energized thru blue play scores button circuit.
A N.O.	D-70	10-17 20-6	Red Blue	Completes added yellow, red, blue, green score steps circuit.
B S.P.D.T.	R-44	25-15 95-2 21-15	Blue-White Gray-White Blue-Red	Directs circuit to red button (scores & features) lite or blue button (scores only) lite.
C S.P.D.T.	J-26	36-4 27-7 41-6	Yellow-Brown Blue-Orange Green-Red	Directs selection feature disc circuits to mixer #2 relay.
D N.C.	R-12	56-15 31-16	White-Brown Yellow-Red	Opens feature lites flash circuit.
E N.O.	E-60	57-13 85-15	White-Orange Black-White	Completes lock-in circuit for this relay.
F N.O.	E-58	43-14 93-14	Green-Yellow Gray-Yellow	Completes circuit to scores lock relay.
G N.O.	G-70	98-12 51-6	Gray-Black White-Red	Completes added yellow, red, blue, green score step and multiple score features circuit.
H S.P.D.T.	G-65	52-7 51-6 45-7	White-Blue White-Red Green-White	Directs mixer #5 disc circuits for yellow, red, blue, green score steps and multiple score features.
SCORES LOCK RELAY COIL	B-58	93-14 31-15	Gray-Yellow Yellow-Red	Energized by control unit cam #7 relay switch thru play scores relay circuit.
A N.O.	C-59	40-15 93-14	Green Gray-Yellow	Completes lock-in circuit for this relay.
B N.O.	J-73	38-5 65-16	Yellow-Black Brown-White	Completes added spotting disc circuits for yellow, red, blue, green score step and multiple score features.
C N.O.	J-72	63-4 27-5	Brown-Yellow Blue-Orange	Completes added circuits for yellow, red, blue, green score steps and multiple score features.
D N.O.	K-72	23-12 63-4	Blue-Yellow Brown-Yellow	Completes added circuits for yellow, red, blue, green score steps and multiple score features.
E N.O.	J-76	18-14 31-18	Red-Black Yellow-Red	Completes added spotting disc circuits for yellow, red, blue, green score steps and multiple score feature.
F N.C.	K-35	83-9 52-15	Black-Yellow White-Blue	Opens features circuit.
G N.O.	J-75	58-11 14-6	White-Black Red-Green	Completes added spotting disc circuits for yellow, red, blue, green score steps and multiple scores feature.
H N.O.	H-62	51-6 78-17	White-Red Orange-Black	Completes added circuits for yellow, red, blue, green score steps and multiple score feature.

(BOTTOM) 7 RELAY BANK PICTORIAL VIEW

LETTERS CORRESPOND TO SWITCH CHART ON PAGE 37



Name	8 SCORE	12 SCORE	16 SCORE	24 SCORE	RED LETTER WIN # 1	RED LETTER WIN # 2	RED BUTTON
Coil turns & wire gauge	1800 # 33	1800 # 33	1800 # 33	1800 # 33	1800 # 33	1800 # 33	2000 # 33
Coil resistance (nominal)	65 OHMS	65 OHMS	65 OHMS	65 OHMS	65 OHMS	65 OHMS	75 OHMS
Operating voltage	50 VOLTS	50 VOLTS	50 VOLTS	50 VOLTS	50 VOLTS	50 VOLTS	50 VOLTS
Test voltage	37 VOLTS	37 VOLTS	37 VOLTS	37 VOLTS	37 VOLTS	37 VOLTS	37 VOLTS
Extension spring load	RED	RED	RED	RED	RED	RED	RED
Sw actuator stroke	$\frac{3}{32}$	$\frac{3}{32}$	$\frac{3}{32}$	$\frac{3}{32}$	$\frac{3}{32}$	$\frac{3}{32}$	$\frac{3}{32}$
Additional information	NOTE 1- THERMALEZE WIRE OR EQUIVALENT. NO WRAP ON COIL.	SEE NOTE	SEE NOTE	SEE NOTE			SEE NOTE
Coil No.	C-7800-339	C-7800-339	C-7800-339	C-7800-339	C-7800-334	C-7800-334	C-7800-3310

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

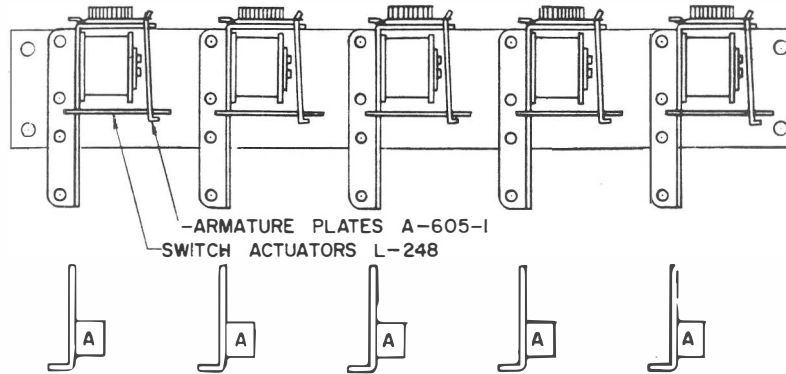
(BOTTOM) 7 RELAY BANK SWITCH CHART FOR POSITION OF SWITCHES REFER TO PICTORIAL VIEW ON PAGE 36

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
8 SCORE RELAY COIL	B-62	54-9 71-13	White-Green Orange-Red	Energized thru yellow, red or blue score disc circuit when scores are at 3rd step (8).
A N.O.	H-70	27-8 98-12	Blue-Orange Gray-Black	Completes a mixer #2 relay circuit for yellow, red, blue, green, multiple score features and score step during blue button play.
B N.O.	L-62	75-7 31-5	Orange-White Yellow-Red	Completes a mixer #5 circuit for yellow, red, blue, green multiple score features and score step during red button play.
C N.O.	K-69	75-7 63-7	Orange-White Brown-Yellow	Completes a mixer #5 circuit for yellow, red, blue, green multiple score features and score step during blue button play.
D N.O.	L-69	75-7 21-13	Orange-White Blue-Red	Same function as switch C.
E N.O.	C-62	36-16 54-9	Yellow-Brown White-Green	Completes lock-in circuit for this relay.
F N.O.	K-64	95-3 61-8	Gray-White Brown-Red	Same function as switch B.
G N.O.	L-65	95-3 81-17	Gray-White Black-Red	Same function as switch B.
H N.O.	L-65	95-3 78-14	Gray-White Orange-Black	Same function as switch C.
12 SCORE RELAY COIL	A-63	56-14 71-13	White-Brown Orange-Red	Energized thru yellow, red or blue score disc circuit when scores are at 4th step (12).
A N.O.	L-64	95-3 61-8	Gray-White Brown-Red	Completes a mixer #5 circuit for yellow, red, blue, green multiple score features and score step during red button play.
B N.O.	K-65	95-3 81-17	Gray-White Black-Red	Same function as switch A.
C N.O.	K-66	95-3 14-1	Gray-White Red-Green	Completes a mixer #5 circuit for yellow, red, blue, green multiple score features and score step during blue button play.
D N.O.	L-72	21-14 23-12	Blue-Red Blue-Yellow	Completes mixer #1 circuit for yellow, red, blue, green multiple score features and score steps during blue button play.
E N.O.	C-62	36-16 56-14	Yellow-Brown White-Brown	Completes lock-in circuit for this relay.
F N.O.	K-62	75-7 52-14	Orange-White White-Blue	Same function as switch A.
G N.O.	L-69	75-7 15-16	Orange-White Red-White	Same function as switch C.
16 SCORE RELAY COIL	A-63	57-7 71-13	White-Orange Orange-Red	Energized thru yellow, red or blue score disc circuit when scores are at 5th step (16).
A N.O.	C-63	36-16 57-7	Yellow-Brown White-Orange	Completes lock-in circuit for this relay.
B N.O.	L-63	75-7 43-6	Orange-White Green-Yellow	Completes a mixer #5 circuit for yellow, red, blue, green multiple score features and score step during red button play.
C N.O.	H-62	54-16 15-14	White-Green Red-White	Completes a 1st step relay circuit for yellow, red, blue, green multiple score features and score step during blue button play.
D N.C.	L-67	95-3 18-15	Gray-White Red-Black	Completes a mixer #5 circuit for yellow, red, blue, green multiple score features and score step during blue button play.

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
24 SCORE RELAY COIL	A-64	58-12 71-13	White-Black Orange-Red	Energized thru yellow, red or blue score disc circuit when scores are at 6th step (24).
A N.O.	C-64	36-16 58-12	Yellow-Brown White-Black	Completes lock-in circuit for this relay.
B N.O.	K-68	75-7 14-13	Orange-White Red-Green	Completes a mixer #5 circuit for yellow, red, blue, green multiple score features and score step during blue button play.
C N.O.	H-61	15-14 78-17	Red-White Orange-Black	Completes a 1st step relay circuit for yellow, red, blue, green multiple score features and score step during blue button play.
RED LETTERWIN #1 RELAY COIL	A-55	56-4 70	White-Brown Orange	Energized thru winner search circuit to score any 3 stars and any 2 stars red letter game winners.
A N.O.	P-10	10-11 30	Red Yellow	Completes circuit to selection feature lites.
B N.O.	K-28	25-18 20-16	Blue-White Blue	Completes circuit to step red letter unit and advance scores and features to guaranteed level.
C N.C.	C-71	54-14 21-11	White-Green Blue-Red	Opens regular yellow score unit step-up circuit.
D N.C.	C-75	14-15 13-11	Red-Green Red-Yellow	Opens regular blue and green score unit step-up circuit.
E N.C.	L-35	43-16 61-15	Green-Yellow Brown-Red	Opens features circuit.
F N.C.	B-35	93-12 81-7	Gray-Yellow Black-Red	Opens regular mystic lines feature unit step-up circuit.
G N.C.	C-42	71-3 23-13	Orange-Red Blue-Yellow	Opens circuit to search index coil.
RED LETTERWIN #2 RELAY COIL	A-55	56-4 70	White-Brown Orange	Energized thru winner search circuit to score any 3 stars and any 2 stars red letter game winners.
A N.O.	F-11	21-3 91-11	Blue-Red Gray-Red	Completes a circuit to shutter motor to open shutter.
B N.O.	M-55	38-15 63-8	Yellow-Black Brown-Yellow	Completes lock-in circuit for this relay and red letter win #1 relay.
C N.C.	B-78	85-5 15-4	Black-White Red-White	Opens red score unit reset circuit.
D N.C.	C-73	58-10 52-19	White-Black White-Blue	Opens regular red score unit step-up circuit.
E N.C.	F-42	80 60	Black Brown	Opens circuit to replay cams index coil.
F N.C.	B-37	48-10 98-9	Green-Black Gray-Black	Opens regular selection feature unit step-up circuit.
RED BUTTON RELAY COIL	B-17	85-7 91-15	Black-White Gray-Red	Energized by circuit from anti-cheat relay switch, tilt relay switch, green score unit zero switch or red button switch.
A S.P.D.T.	D-10	93-2 98-2 14-3	Gray-Yellow Gray-Black Red-Green	Directs circuit to mixer latch and timer cams index coils during extra-ball play, or to shutter motor when starting new game after extra-ball play.
B S.P.D.T.	Q-44	23-6 30 36-15	Blue-Yellow Yellow Yellow-Brown	Directs circuit to extra-ball feature lite during yellow button play, or to red, blue or green button feature lites during red, blue or green button play.
C N.O.	J-17	57-6 20-2	White-Orange Blue	Completes lock-in circuit for this relay.

5 (SEARCH) RELAY BANK PICTORIAL VIEW

LETTERS CORRESPOND TO SWITCH CHART BELOW



Name	Search # 5	Search # 4	Search # 3	Search # 2	Search # 1
Coil turns & wire gauge	850 # 29	850 # 29	850 # 29	850 # 29	850 # 29
Coil resistance (nominal)	12 Ohms	12 Ohms	12 Ohms	12 Ohms	12 Ohms
Operating voltage	18 Volts	18 Volts	18 Volts	18 Volts	18 Volts
Test voltage	Under 12 Over 9 volts	Under 12 volts Over 9 volts	Under 12 volts Over 9 volts	Under 12 volts Over 9 volts	Under 12 volts Over 9 volts
Extension spring load	Clear	Clear	Clear	Clear	Clear
Sw actuator stroke	$\frac{3}{32}$	$\frac{3}{32}$	$\frac{3}{32}$	$\frac{3}{32}$	$\frac{3}{32}$
Additional information	Note: -.0005 durochrome on armature	See note	See note	See note	See note
Coil No.	C-7800-291	C-7800-291	C-7800-291	C-7800-291	C-7800-291
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		

5 (SEARCH) RELAY BANK SWITCH CHART

LETTERS CORRESPOND TO SWITCH CHART ABOVE

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
#5 SEARCH RELAY COIL	S-56	10-1 18-5	Red Red-Black	Energized thru search disc by circuit from (A-B-C) mystic lines motor discs.
A N.O.	K-47	61-3 23-8	Brown-Red Blue-Yellow	Completes yellow, red, blue, green 5-in-a zone winner circuits.
#4 SEARCH RELAY COIL	S-55	10-1 15-3	Red Red-White	Energized thru search disc by circuit from (A-B-C) mystic lines motor discs.
A N.O.	L-47	74 23-8	Orange-Green Blue-Yellow	Completes Big 4, yellow, red, blue, green 4-5 in a zone winner circuits.
#3 SEARCH RELAY COIL	S-55	10-1 60-4	Red Brown	Energized thru search disc by circuit from (A-B-C) mystic lines motor discs.
A N.O.	M-47	31-1 36-1	Yellow-Red Yellow-Brown	Completes Big 4, yellow, red, blue, green 3-4-5 in a zone, and any 3 winner circuits.
#2 SEARCH RELAY COIL	S-54	10-1 65-7	Red Brown-White	Energized thru search disc by circuit from (A-B-C) mystic lines motor discs.
A N.O.	M-47	38-11 36-11	Yellow-Black Yellow-Brown	Completes Big 4, yellow, red, blue, green 3-4-5 in a zone, and any 2, any 3 winner circuits.
#1 SEARCH RELAY COIL	S-54	10-1 20-5	Red Blue	Energized thru search disc by circuit from (A-B-C) mystic lines motor discs.
A N.O.	N-47	15-5 38-11	Red-White Yellow-Black	Completes Big 4, yellow, red, blue, green 3-4-5 in a zone, and any 2, any 3 winner circuits.

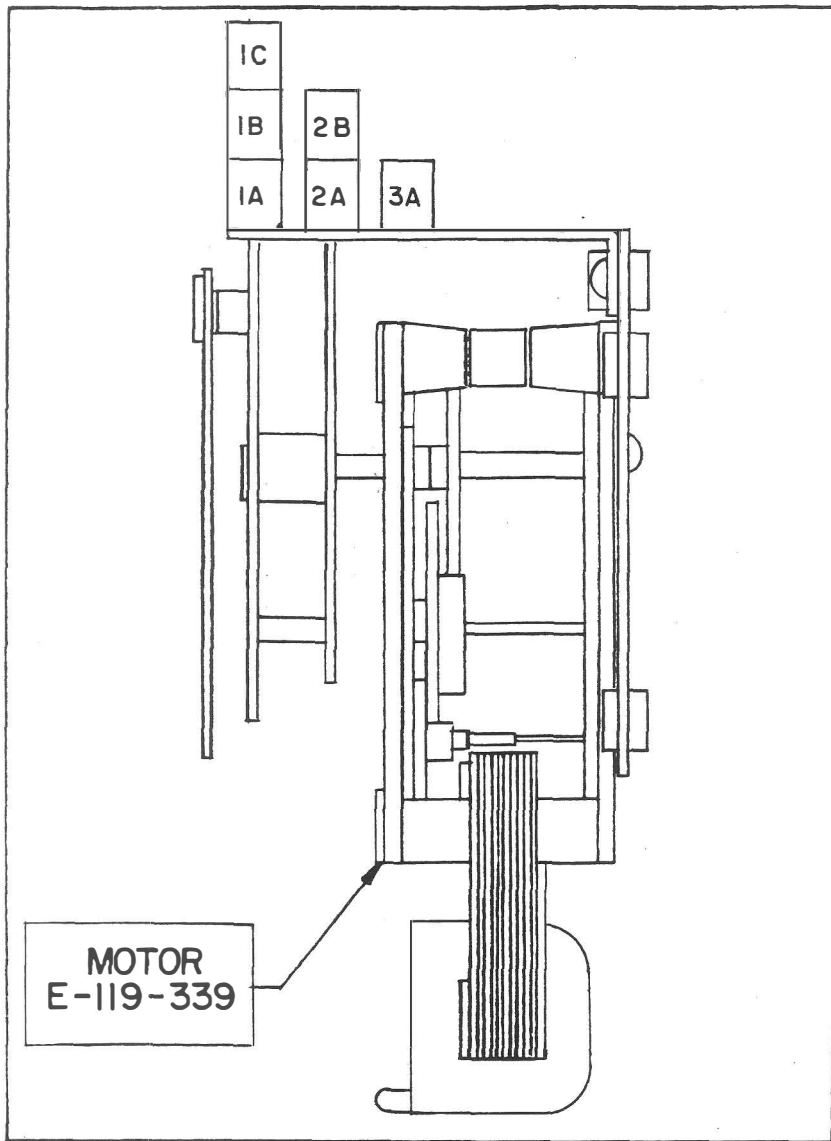
MISCELLANEOUS RELAYS

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
MULTIPLE WIN #1 RELAY COIL	A-46	78-9 70	Orange-Black Orange	Energized thru winner search circuit to score yellow, red, blue and green double and triple feature winners.
A N.C.	C-46	80-16 43-15	Black Green-Yellow	Opens multiple unit homing circuit.
B N.C.	B-51	90-1 70	Gray Orange	Opens regular winner multiplier cam switch pulsing source, multiplier cams then function thru multiple unit disc.
C N.C.	B-51	90-1 70	Gray Orange	(Safety) Same function as switch B.
MULTIPLE WIN #2 RELAY COIL	A-51	90-1 70	Gray Orange	Energized by multiplier cam switches during yellow, red, green, blue double and triple feature winners.
A N.O.	F-47	75-6 78-9	Orange-White Orange-Black	Completes multiple unit step-up circuit.
CAM #7 RELAY COIL	A-43	90-5 70	Gray Orange	Energized by control unit cam 7E during play cycles.
A N.O.	L-24	21-3 25-5	Blue-Red Blue-White	Completes circuits thru mixer #1 disc or mixer #4 disc to mixer #4 relay.
B N.O.	F-62	21-3 56-9	Blue-Red White-Brown	Completes circuits thru yellow, red, blue score discs to 8, 12, 16, 24 score relays.
C N.O.	J-58	21-3 43-14	Blue-Red Green-Yellow	Completes play features relay circuit to features lock relay or play scores feature relay circuit to scores lock relay.
"B" CAM RELAY COIL	A-22	80-20 70	Black Orange	Energized thru mystic lines feature disc "B" button circuit.
A N.C.	F-23	25-6 30-20	Blue-White Yellow	Opens mystic lines feature disc "C" button circuit.
B N.C.	E-21	40-13 45-5	Green Green-White	Opens mystic lines feature disc "A" button circuit.
C N.C.	T-49	18-4 54-7	Red-Black White-Green	Opens mystic lines lines and search relay circuit.
"C" CAM RELAY COIL	A-22	30-20 70	Yellow Orange	Energized thru mystic lines feature disc "C" button circuit.

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
A N.C.	D-21	13-5 40-13	Red-Yellow Green	Opens mystic lines feature disc "A" button circuit.
B N.C.	T-49	54-7 10-1	White-Green Red	Opens mystic lines lines and search relay circuit.
C N.C.	F-22	80-20 48-5	Black Green-Black	Opens mystic lines feature disc "B" button circuit.
LIFTERSTART RELAY COIL	A-57	38-8 70	Yellow-Black Orange	Energized by ball runway switch circuit. Drops out thru ball gate switch circuit.
A N.C.	L-15	10-13 15-6	Red Red-White	Completes ball count circuit to before 5th and after 5th ball lock-out relays, when relay drops out.
B N.C.	J-19	58-13 31-3	White-Black Yellow-Red	Completes ball count circuit to ball lifter motor, when relay drops out.
C N.O.	H-57	36 38-8	Yellow-Brown Yellow-Black	Completes lock-in circuit for this relay when energized.
BALL DETECTOR RELAY COIL	A-20	41-4 70	Green-Red Orange	Energized thru ball count circuit.
A N.O.	K-19	41-4 58-13	Green-Red White-Black	Completes regular and extra ball circuits to ball lifter motor.
B N.C.	K-18	21-3 95-4	Blue-Red Gray-White	Completes a circuit to tilt relay if ball lifter motor cycles when relay is out.
C N.O.	L-19	51-3 41-4	White-Blue Green-Red	Completes lock-in circuit for this relay.

BALL LIFTER MOTOR PICTORIAL VIEW

LETTERS CORRESPOND TO SWITCH CHART BELOW



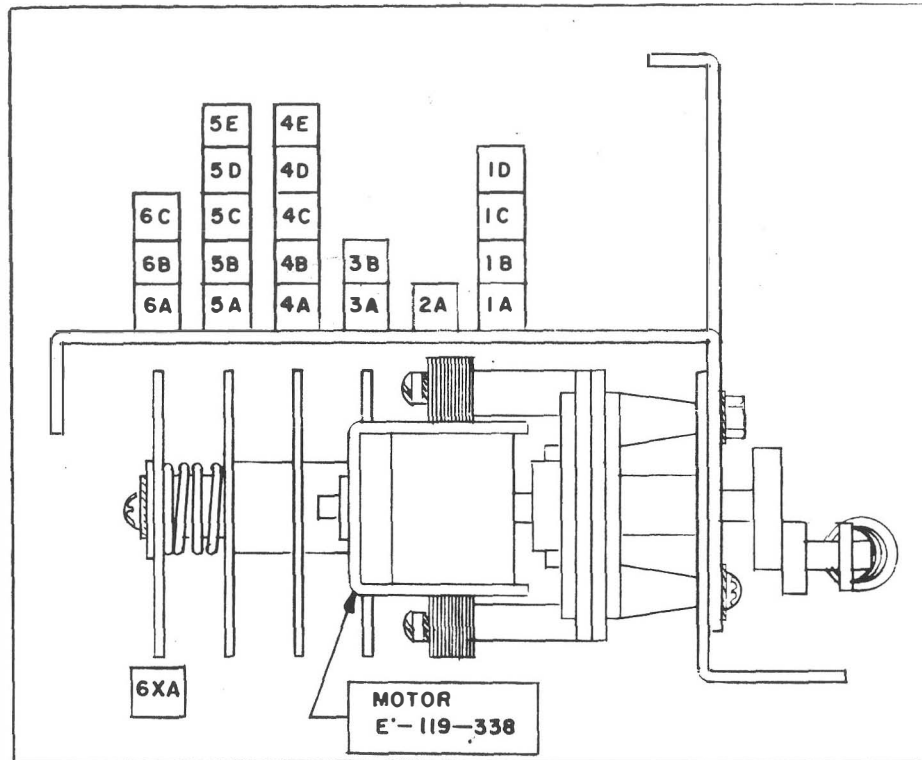
BALL LIFTER MOTOR SWITCH CHART

FOR POSITION OF SWITCHES SEE PICTORIAL VIEW ABOVE

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES	
1A	N.C.	K-15	15-6 85-6	Red-White Black-White	(Safety circuit) opens circuit to select before 5th ball and after 5th ball lockout relays.
1B	N.O.	F-19	91-1 30	Gray-Red Yellow	Completes ball lifter motor carry-over circuit.
1C	N.O.	M-19	21-3 51-3	Blue-Red White-Blue	Completes lock in circuit to ball detector relay.
2A	N.O.	J-11	43-2 27-2	Green-Yellow Blue-Orange	Completes timer unit step-up circuit (0 to 5th step)
2B	N.O.	K-16	95-4 14-5	Gray-White Red-Green	(Safety circuit) completes ball detector relay circuit to tilt relay.
3A	N.O.	M-16	21-3 83-7	Blue-Red Black-Yellow	Completes circuit to select before 4th ball lockout relay when 4th ball is shot.

SHUTTER MOTOR PICTORIAL VIEW

LETTERS CORRESPOND TO SWITCH CHART AT RIGHT

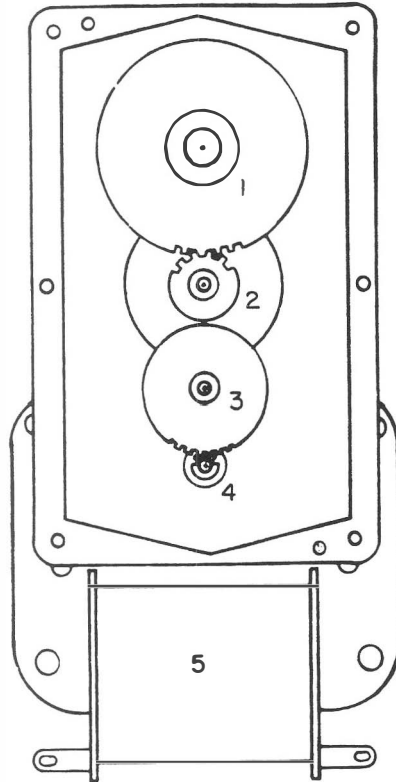


SHUTTER MOTOR SWITCH CHART

FOR POSITION OF SWITCHES SEE PICTORIAL VIEW AT LEFT

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES	
1A	N.C.	N-13	98-8 21-3	Gray-Black Blue-Red	When shutter is closed, completes timer unit step-up circuit when 5th ball is shot. Also completes timer unit reset circuit during extra ball play.
1B	N.O.	N-9	14-3 30	Red-Green Yellow	During shutter cycle, completes shutter motor carry-over circuit.
1C	N.C.	M-28	90-3 21-3	Gray Blue-Red	When shutter is open, completes red letter unit step-up circuit and guaranteed scores and feature circuit for red letter game winners.
1D	M.B.B.	N-47	21-3 15-5 63-8	Blue-Red Red-White Brown-Yellow	When shutter opens, starts red letter win relays lock-in circuit before breaking winner search circuit.
2A	N.C.	H-19	31-3 36-3	Yellow-Red Yellow-Brown	When shutter is closed, completes circuit to ball lifter motor.
3A	N.O.	L-3	70P 20P	Orange(Plastic) Blue(Plastic)	When shutter opens, completes circuit to trip bank reset coil #2.
3B	N.O.	D-61	85-5 30	Black-White Yellow	When shutter opens, completes reset circuit to red score unit, yellow, blue, green and red replay counter units and selection feature unit.
4A	N.O.	K-10	18-3 14-3	Red-Black Red-Green	When shutter is open, completes tilt circuit to run shutter motor to close shutter.
4B	N.C.	N-20	21-3 40-8	Blue-Red Green	When shutter is closed, completes circuit to move mystic lines, search for winners, energize yellow and red rollover relays thru rollover buttons and energize selection lock-out relays.
4C	N.O.	M-10	18-3 45-8	Red-Black Green-White	When shutter is open, completes tilt circuit to run shutter motor to close shutter.
4D	N.C.	N-15	10-13 40-8	Red Green	When shutter is closed, completes circuit to before 5th and after 5th selection lock-out relays.
4E	N.O.	N-54	63-8 21-3	Brown-Yellow Blue-Red	When shutter opens, completes lock-in circuit to red letter win relays.
5A	N.C.	M-13	98-8 65-2	Gray-Black Brown-White	When shutter is closed, completes timer unit step-up circuit when 5th ball is shot. Also completes timer unit reset circuit during extra-ball play.
5B	N.O.	L-57	31-4 90-9	Yellow-Red Gray	When shutter is open, completes lock-in circuit to lifter start relay.
5C	N.O.	M-38	85-12 50-5	Black-White White	When shutter is open, completes circuit for features during red or green button play.
5D	N.O.	C-45	40-16 80-16	Green Black	When shutter is open, completes Big 4 replay counter unit and multiplier unit homing circuit.
5E	S.P.D.T.	J-9	61 10-10 93-2	Brown-Red Red Gray-Yellow	Directs start relay circuit to shutter motor when shutter closed, and to mixer latch and timer cams index when shutter opens.
6XA	N.C.	B-17	91-15 70	Gray-Red Orange	Open only during shutter cycle, completes circuit to red button relay when shutter open or closed.
6A	N.O.	M-14	71-8 30	Orange-Red Yellow	When shutter opens, completes timer unit reset circuit.
6B	N.O.	G-61	78-3 30	Orange-Black Yellow	When shutter opens, completes reset circuit to extra ball unit, yellow, blue and green score units, mystic lines feature unit and red letter unit.
6C	N.O.	L-2	52P 20P	White-Blue(Plastic) Blue(Plastic)	When shutter opens, completes circuit to trip bank reset coil #1.

MOTOR PARTS GUIDE



SHUTTER MOTOR
(E-119-338)

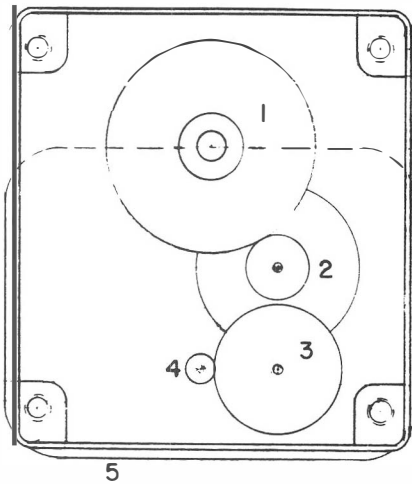
- 1 ZGS-1725-15
- 2 G-5818-1
- 3 G-4109-1
- 4 ZRST-1715-30-1
- 5 ZS-1708-2519

BALL LIFTER MOTOR
(E-119-339)

- 1 ZGS-1745-12
- 2 G-5318-1
- 3 G-4114-1
- 4 ZRST-1715-30-1
- 5 ZS-1708-2519

CODE

- 1 GEAR & SHAFT ASSEMBLY.
- 2 GEAR.
- 3 GEAR.
- 4 GEAR ROTOR & SHAFT ASSEMBLY.
- 5 STATOR & COIL ASSEMBLY.



MYSTIC LINE "A" MOTOR
(E-119-352)

- 1 HGS-1726-1
- 2 G-5818-1
- 3 G-4109-1
- 4 ZRST-1415-32-8
- 5 ZS-1704-2521

MYSTIC LINES "B" & "C" MOTOR
(E-119-353)

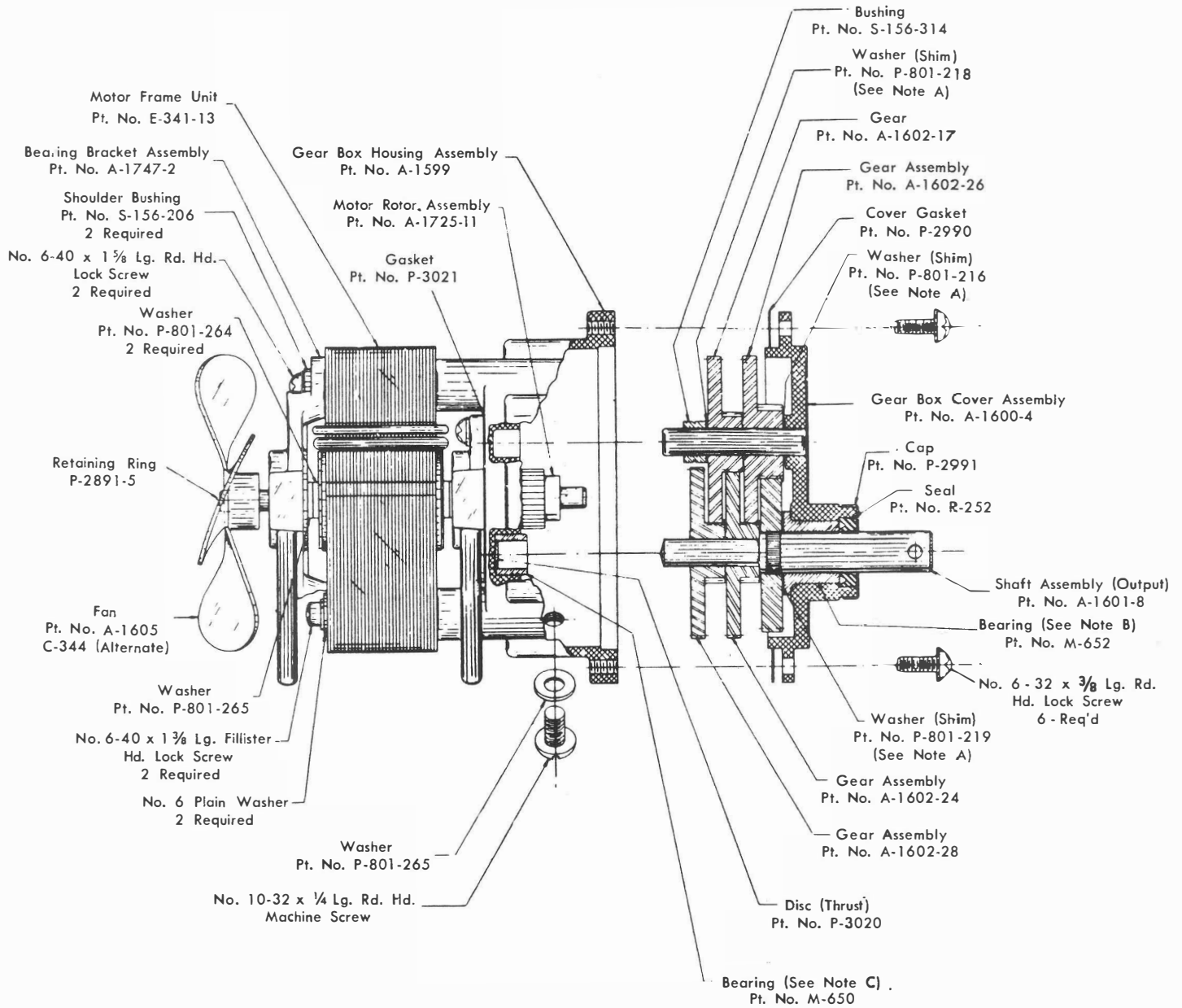
- 1 HGS-1744-1
- 2 G-5318-1
- 3 G-4114-1
- 4 ZRST-1415-32-9
- 5 ZS-1703-2522

CODE

- 1 GEAR & SHAFT ASSEMBLY.
- 2 GEAR.
- 3 GEAR.
- 4 GEAR ROTOR & SHAFT ASSEMBLY
- 5 STATOR & COIL ASSEMBLY.

MOTOR FOR CONTROL UNIT AND MIXER & SPOTTING UNIT

E-119-341



NOTE A: In order to maintain proper clearances between gears it is most important that when re-assembling gear train that the same number of shims be replaced in each of their respective locations.

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

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

ADJUSTMENT PLUGS

REFLEX ADJUSTMENT:

This adjustment functions in series with mixer #1 disc and reflex unit disc to proportion scores and features. Plug positions are numbered 1 to 7 from post, denoting most liberal position (1), most conservative position (7).

EXTRA BALLS ADJUSTMENT:

This adjustment functions in series with spotting disc, mixer #4 disc and extra ball unit disc to proportion extra balls. Plug positions are numbered 1 to 5 from post, denoting most liberal position (1), most conservative position (5).

BIG 4 300 ADJUSTMENT:

This adjustment functions in series with control circuit and spotting disc to proportion Big 4 300 feature. Plug positions are numbered 1 to 4 from post, denoting most liberal position (1), most conservative position (4).

MISCELLANEOUS PARTS

Back Cabinet Assembly:

Part No.	Name of Part
G-292-25	Backglass
M-1424-3	Backglass (Plexiglass)
M-281-31	Lock & Keys (2 Keyed alike)
E-122-103	Transformer

Back Door Assembly:

M-281-24	Lock & Keys (2 keyed alike)
SW-100-106	Lock Switch
E-105-6	Resistor (8200 ohm 1/2 watt)
E-105-64	Resistor (100 ohm 2 watt)

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
A-2790-17	Coin Box
P-3089-30	Coin Box Cover
E-130-10	Counter (Total play-replay)
A-2618	Legs
M-106-1	Leg Bolt
M-163-4	Leg Adjuster
A-1729-13	Push Button (Blue)
A-1729-14	Push Button (Green)
E-138-3	Plumb Bob Tilt
G-213	Top Glass
E-108-57	Toggle Switch

Front Door Assembly:

	Coin Switch & Rejector Mount Assembly*
E-101-58	Coin Lockout Magnet Coil

Front Door Assembly (Continued):

Part No.	Name of Part
E-108-92	Coin Switch
	Coin Guide Assembly*
	Coin Slide Assembly*
AS-2041-43	Front Door Assembly (Single Coin)
AS-2041-44	Front Door Assembly (Double Coin)
CA-567-153	Front Door Only (Single Coin)
CA-567-154	Front Door Only (Double Coin)
A-254-63	Hinge & Bracket Assembly
M-281-6	Lock & Keys
S-490-18	Push Button (Reject)
A-1729-15	Push Button (Yellow)
A-1729-16	Push Button (Red)
	Slug Rejector*

Front Moulding Assembly:

A-1272-17	Button (A)
A-1272-18	Button (B)
A-1272-19	Button (C)
A-1272-29	Button (R)
A-2359-6	Coin Plate Assembly
	Coin Entry Plate*
AS-1305-40	Front Moulding Assembly
CA-1119-11	Front Moulding Only

Panel Assembly:

AS-1315	Ball Gate & Switch Assembly
AS-493-2	Ball Rebound Assembly
R-115-4	Ball Rebound Rubber (Only)
C-119-4	Bumper Post (Yellow)
C-119-5	Bumper Post (Red)
R-243	Rubber Ring (White Post)
R-243-2	Rubber Ring (Red Post)
M-170	Rebound Spring
E-146-439	Relay (Lifter start)
C-7800-335	Relay (Coil Only)
C-387-1	Rollover Button (Red)
C-387-2	Rollover Button (Yellow)

*When ordering part, specify full name of game, part name and type of coin(s) used.

Bally Pin Game Lubricant Available in 8 oz. containers with plastic spout and screw cap.