

Bally[®]

LONDON

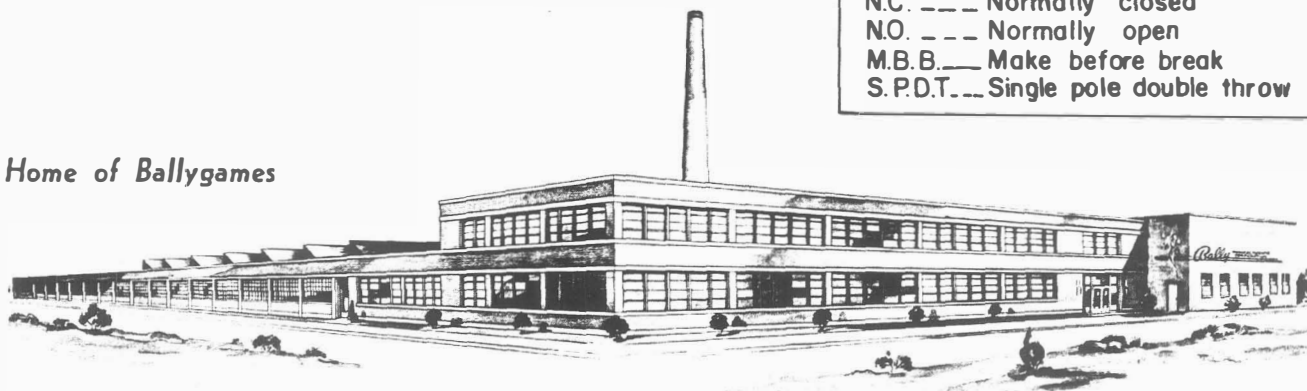
OPERATING INSTRUCTIONS AND PARTS CATALOG

Part Numbers are marked on illustrations
and a list of miscellaneous parts appears
on page 52.

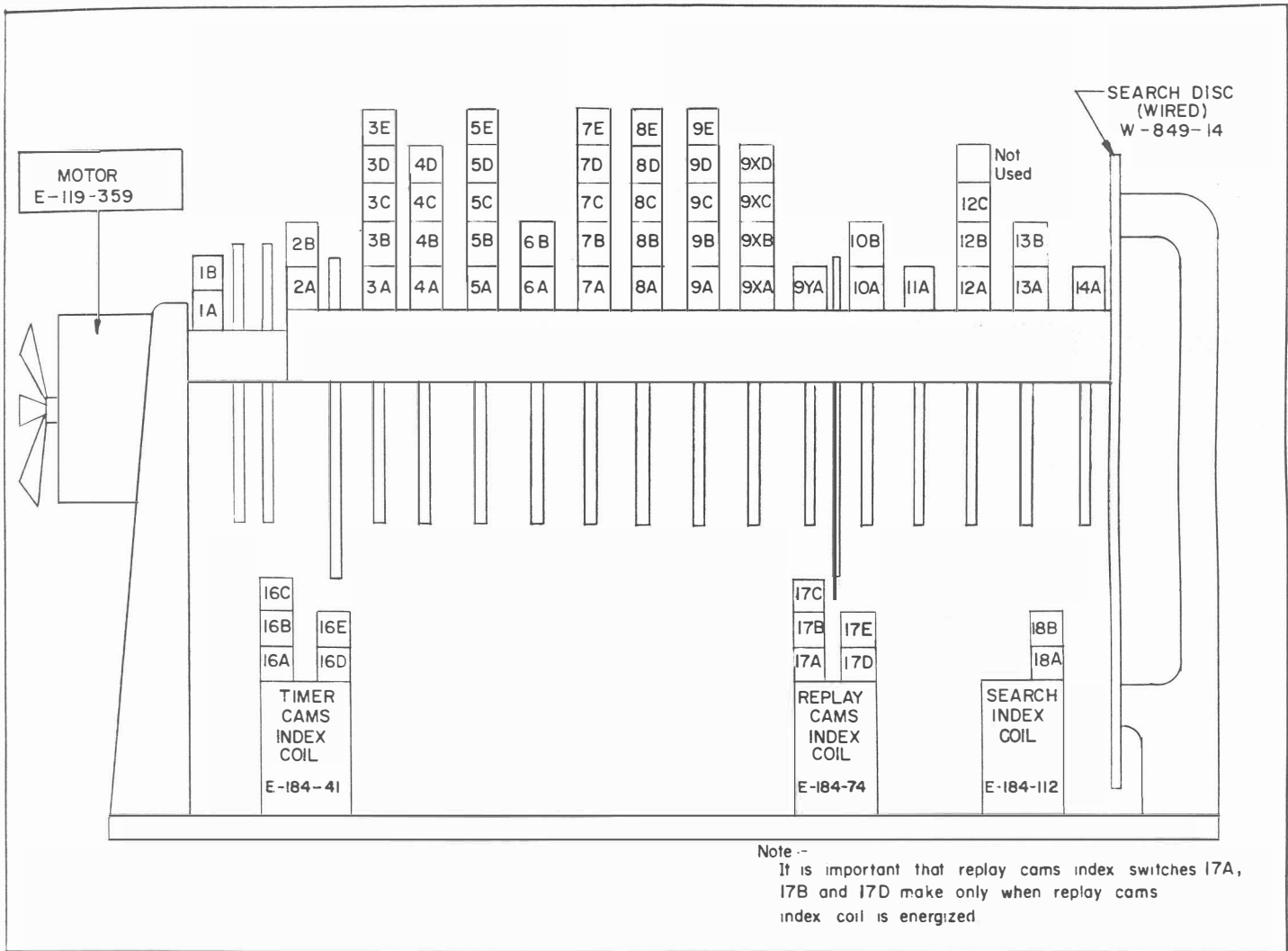
**FOR QUICKEST SERVICE
STATE CORRECT PART NUMBER
WHEN ORDERING PARTS**

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

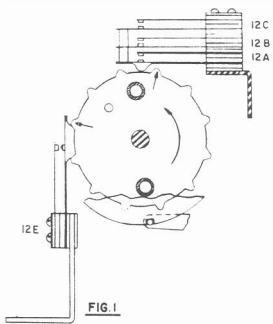
Home of Ballygames



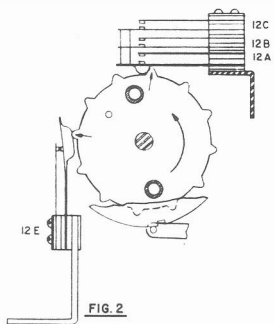
CONTROL UNIT PICTORIAL VIEW NUMBERS CORRESPOND TO SWITCH CHART ON PAGE 5



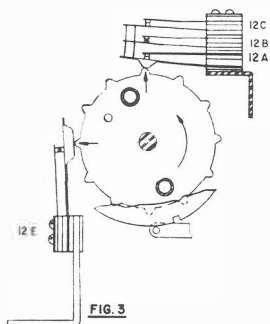
CORRECT ADJUSTMENT: CONTROL UNIT SWITCHES 12A, 12B, 12C & 12E NOTE: IMPORTANT PART OF ILLUSTRATION IS TO SHOW THAT SWITCH 12E CLOSSES FIRST AND OPENS LAST. IF AN ADJUSTMENT IS NECESSARY, SWITCH 12E CAN BE MOVED UP OR DOWN. LOOSEN SCREWS THAT HOLD SWITCH, THEN MOVE UP OR DOWN.



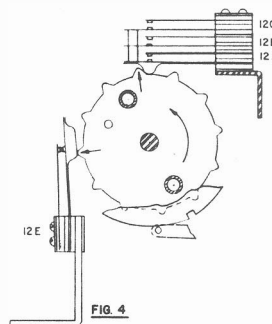
REPLAY CAMS SHOWN IN THEIR NORMAL INDEXED POSITION. SWITCHES 12A, 12B, 12C & 12E ARE OPEN AT THIS TIME.
NOTE: ARROWS POINT TO LOBES THAT WILL ACTUATE SWITCHES.



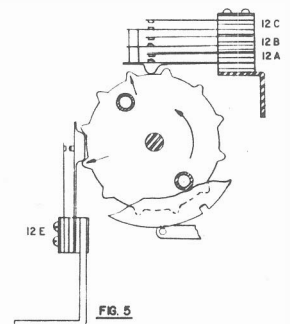
REPLAY CAMS SHOWN STARTING TO ROTATE. THEY ARE NOW OUT OF THEIR INDEX POSITION. SWITCHES 12A, 12B & 12C ARE STILL OPEN. SWITCH 12E IS NOW CLOSED.



SWITCHES 12A, 12B & 12C ARE NOW CLOSED. SWITCH 12E IS STILL CLOSED.



SWITCHES 12A, 12B & 12C ARE NOW OPEN AGAIN. SWITCH 12E IS STILL CLOSED.



ALL SWITCHES ARE NOW OPEN AGAIN, SAME AS IN FIG. 1. THIS SEQUENCE IS REPEATED THRUOUT REPLAY SCORING CYCLE.

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
1A	N.O.	E-8 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.	A-6 85-1 45-18	Black-White Green-White	Opens start relay circuits to mixer latch coils.
DRAG ARM SWITCH (Backside) N.O.	D-8	36-9 78-6	Yellow-Brown Orange-Black	(Not shown in pictorial view) Completes timer unit step up circuit from control unit 1A switch.
2A	N.O.	C-55 98-14 56-7	Gray-Black White-Brown	Thru features control circuit, energizes scores tripled feature trip relay.
2B	N.C.	G-7 30 25-9	Yellow Blue-White	Opens lock in circuit to 25¢ relay.
3A	N.C.	G-4 30 48-2	Yellow Green-Black	Opens entire game start circuit.
3B	S.P.D.T.	B-30 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.	D-39 60-13 57-13 21-3	Brown White-Orange Blue-Red	Directs pull in and lock in circuit to play scores relay.
3D	S.P.D.T.	C-38 74-16 81-13 21-3	Orange-Green Black-Red Blue-Red	Directs pull in and lock in circuit to play features relay.
3E	S.P.D.T.	C-39 61-16 43-18 21-3	Brown-Red Green-Yellow Blue-Red	Directs pull in and lock in circuit to triple play relay.
4A	N.O.	D-56 30 98-1	Yellow Gray-Black	Energizes spotting cams index coil.
4B	N.O.	C-5 27-9 80-2	Blue-Orange Black	Pulsing source for single coin meter, when meter is installed.
4C	N.O.	F-10 52-3 14-5	White-Blue Red-Green	Energizes tilt trip relay thru 25¢ arm switch circuit. (25¢ Anti-Cheat circuit)
4D	S.P.D.T.	E-4 10-5 13-9 14-5	Red Red-Yellow Red-Green	Directs 5¢ coin switch circuit from start relay to tilt relay. (5¢ Anti-Cheat Circuit).
5A	N.O.	A-20 27-20 23-7	Blue-Orange Blue-Yellow	Thru extra ball feature control circuit, pulses extra ball step up coil.
5B	N.O.	B-21 78-4 91-6	Orange-Black Gray-Red	Completes anti cheat relay pull in circuit.
5C	N.O.	C-21 85-4 10-7	Black-White Red	Thru guaranteed step circuit, pulses mystic lines feature and selection feature unit step up coils.
5D	N.O.	A-27 21-3 50-3	Blue-Red White	Energizes cam #5 relay.
5E	N.C.	C-38 21-3 40-15	Blue-Red Green	Opens lock in circuit to features lock and scores lock relay.
6A	N.C.	E-21 51-5 45-2	White-Red Green-White	Opens extra ball feature advance circuit during extra ball feature play cycles.
6B	N.C.	C-23 40-4 18-16	Green Red-Black	Opens all feature circuits during feature play cycles.

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
7A	N.O.	C-47 54-12 10-17	White-Green Red	Advances regular score units thru 0 to 4, 4 to 6, and 6 to 8 score advance circuits.
7B	N.O.	E-49 81-11 63-4	Black-Red Brown-Yellow	Thru regular scores control circuit, energizes multiple score feature trip relays and advances regular score units thru 12 to 16 and 16 to 24 score advance circuits.
7C	N.O.	C-41 45-15 31-21	Green-White Yellow-Red	Thru triple play score control circuit, advances triple play score unit thru 12 to 18, 18 to 24, 24 to 36 and 36 to 48 score advance circuits.
7D	N.O.	D-41 45-15 23-20	Green-White Blue-Yellow	Same function as switch 7C thru 0 to 2, 2 to 4, 4 to 6, 6 to 9, 9 to 12, 12 to 18, 18 to 24, 24 to 36, and 36 to 48 score advance circuits.
7E	N.O.	E-3 30 90-5	Yellow Gray	During play cycles, energizes regular reflex or triple play reflex unit play coil, replay register meter and color selector unit reset coil.
(BACKSIDE) 7YA	N.O.	E-46 25-16 51-6	Blue-White White-Red	(Not shown in pictorial view) Thru score control circuit, energizes multiple score feature trip relays and advances regular score units for extra steps.
(BACKSIDE) 7YB	N.O.	E-46 60-18 51-6	Brown White-Red	(Not shown in pictorial view) Same function as switch 7YA.
8A	N.O.	A-20 27-20 25-4	Blue-Orange Blue-White	Thru extra ball guaranteed step circuit, advances extra ball feature unit.
8B	N.O.	D-47 51-6 13-13	White-Red Red-Yellow	Thru regular scores control circuit during blue button, play energizes multiple score feature trip relays and advances regular score units for extra steps.
8C	N.O.	B-41 45-15 81-16	Green-White Black-Red	Thru triple play score control circuit, advances triple play score unit thru 2 to 4, 4 to 6, 6 to 9, 9 to 12, 12 to 18, 18 to 24 and 24 to 36 score advance circuits.
8D	N.O.	B-41 45-15 36-18	Green-White Yellow-Brown	Same function as switch 8C thru 2 to 4, 4 to 6, 6 to 9 and 9 to 12 score advance circuits.
8E	N.O.	C-47 54-12 20-6	White-Green Blue	Advances regular score units thru 0 to 4, 4 to 6 and 6 to 8 score advance circuits during blue button play.
8XA	N.O.	B-15 21-3 18-19	Blue-Red Red-Black	(Not shown in pictorial view) Energizes mixer cam #2 relay.
8ZA	N.O.	E-46 25-16	Blue-White	(Not shown in pictorial view) Same function as switch 7YA.
8ZB	N.O.	A-41 45-15 56-11	Green-White White-Brown	(Not shown in pictorial view) Same function as switch 8D, thru 4 to 6, 6 to 9, 9 to 12 and 12 to 18 score advance circuits.
(ALT.) 9A	N.O.	D-21 18-2 36-19	Red-Black Yellow-Brown	Thru extra ball feature control circuit, proportions extra ball feature unit advance.
(ALT.) 9B	N.O.	A-25 52-11 20-11	White-Blue Blue	Thru features control circuit, proportions all 4 stars 300 and all 4 stars 600 features.
(ALT.) 9C	N.O.	B-24 31-14 50-11	Yellow-Red White	Thru features control circuit, proportions any 2 stars red letter game feature.
(ALT.) 9D	N.O.	B-46 27-11 23-11	Blue-Orange Blue-Yellow	Thru regular scores control circuit, proportions multiple score features.
(ALT.) 9E	S.P.D.T.	B-16 63-9 71-10 58-2	Brown-Yellow Orange-Red White-Black	Directs blue score disc circuits to mixer #4 relay.
(ALT.) 9XA	N.O.	C-49 83-4 81-9	Black-Yellow Black-Red	Thru regular scores control circuit, proportions red score unit advance.
(ALT.) 9XB	N.O.			Not used.
(ALT.) 9XC	N.O.	C-23 85-12 40-4	Black-White Green	Thru features control circuit, proportions all regular game features.
(ALT.) 9XD	N.O.	A-55 15-16 45-16	Red-White Green-White	Thru regular scores control circuit, proportions circuit to 2nd extra step relay.
9YA	N.O.	D-28 21-3 36-13	Blue-Red Yellow-Brown	Thru 25¢ relay circuit, advances replay register unit.

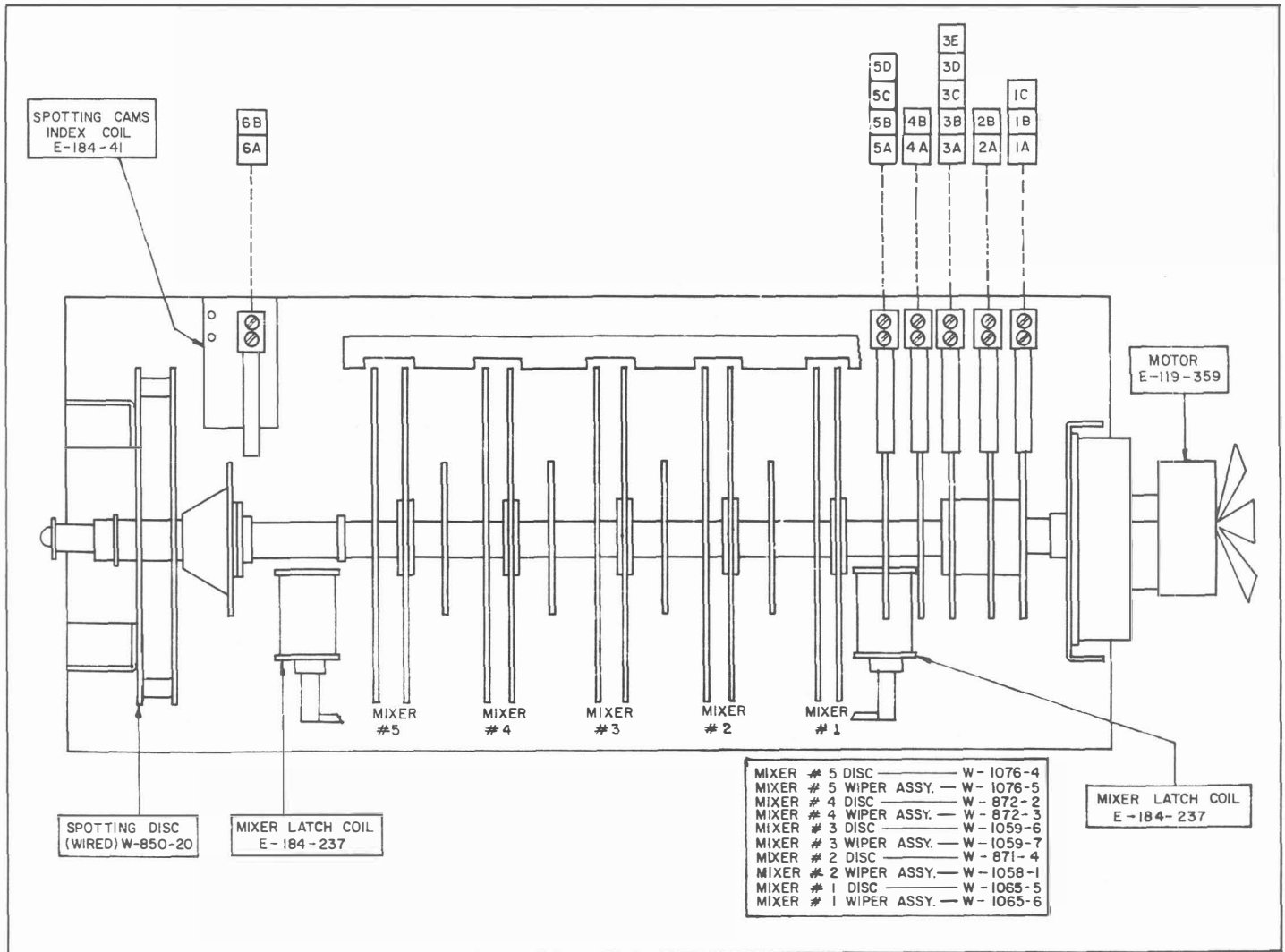
CONTROL UNIT SWITCH CHART FOR POSITION OF SWITCHES REFER TO PICTORIAL VIEW ON PAGE 4

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
12.1 MULTIPLIER 10A N.O.	B-32	63 90-1	Brown-Yellow Gray	When regular score units are at 10th step, advances corresponding replay counter unit during 3-4-5 in a zone winners also advances triple play replay counter unit when T.P. score unit at 9th step during T.O. winners.
12.1 MULTIPLIER 10B N.O.	B-30	23-17 27-17	Blue-Yellow Blue-Orange	Advances all 4 stars replay counter unit during all 4 stars – 600 winner.
6.1 MULTIPLIER 11A N.O.	B-32	57 90-1	White-Orange Gray	Same function as switch 10A when regular score units are at 4th, 7th, 9th step and triple play score unit is at 5th, 6th, 7th step.
1.1 MULTIPLIER 12A N.O.	B-32	45 90-1	Green-White Gray	Same function as switch 10A when regular score units are at 1st, 2nd, 3rd, 5th step and triple play score unit is at 1st, 2nd, 3rd, 4th step.
12B N.O.	C-29	41-14 81-10	Green-Red Black-Red	Advances replay register unit and replay meter during all replay winners. Also operates regular reflex unit replay magnet during 3-4-5 in a zone replay winner only.
12C N.O.	B-45	95-1 83-21	Gray-White Black-Yellow	Operates triple play reflex unit replay magnet during triple play winners only.
12D N.O.		27-17	Blue-Orange	Not used.
(BACKSIDE) 12E N.O.	E-29	21-3 23-13	Blue-Red Blue-Yellow	(Not shown in pictorial view) Completes search index winner lock in circuit while all replay winners are being registered.
4.1 MULTIPLIER 13A N.O.	B-32	52 90-1	White-Blue Gray	Same function as switch 10A when regular score units are at 6th, 8th step and triple play score unit is at 8th step.
4.1 MULTIPLIER 13B N.O.	C-31	10-16 27-17	Red Blue-Orange	Advances all 4 stars replay counter unit during all 4 stars – 300 winner.
14A N.C.	F-31	74 31-11	Orange-Green Yellow-Red	Opens initial 3-4-5 in zone and 4 stars winner search circuits, circuits then closed thru replay cams index switch 17B.
SEARCH WIPER LOCK MAGNET COIL (C-2794-303)	A-13	70 23-16	Orange Blue-Yellow	(Not shown in Pictorial view) Energized thru front rail "R" button thru triple play win relay circuit or before 4th ball lock out relay circuit and releases search wipers.
15A N.C.	D-13	14-4 57-12	Red-Green White-Orange	Opens circuit to move mystic lines.
15B N.C.	B-4	53-13 13-16	White-Yellow Red-Yellow	Opens regular circuit to start relay.
15C N.C.	A-13	52-9 23-16	White-Blue Blue-Yellow	Opens circuit to search wiper lock magnet coil.
15D N.O.	C-28	60 48-9	Brown Green-Black	Completes winner circuit to replay cams index coil.
15E N.O.	A-29	41-14 61-14	Green-Red Brown-Red	Open during triple play winner scoring, completes regular replay winner circuit to regular reflex replay magnet.
TIMER CAMS INDEX COIL	A-6	70 45-18	Orange Green-White	Energized thru start relay circuit and releases timing cams for play cycle.
16A N.O.	G-1	20(P) 60(P)	Blue(Plastic) Brown(Plastic)	Completes a circuit to control unit motor and mixer – spotting unit motor.
16B N.C.	G-5	27-9 71-2	Blue-Orange Orange-Red	Opens circuit to 25¢ coin lock out magnet.
16C N.C.	E-11	10-2 30	Red Yellow	Opens circuit to red button play relay and extra ball play relays.
16D N.O.	B-55	21-3 57-4	Blue-Red White-Orange	Completes lock in circuit to 1st and 2nd extra step relay.
16E N.C.	E-5	90-2 91-13	Gray Gray-Red	Opens circuit to 5¢ coin lock out magnet.

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
CAM #5 RELAY COIL	A-27	70 50-3	Orange White	(Not shown in pictorial view) Energized during play cycles by control unit cam switch 5D.
A N.O.	D-8	65-2 83-1	Brown-White Black-Yellow	Completes timer unit reset circuit during extra ball play.
B N.C.	B-15	21-3 18-7	Blue-Red Red-Black	Opens lock in circuit to mixer #4 relay.
C N.C.	D-18	13-3 21-3	Red-Yellow Blue-Red	Opens lock in circuit to mixer #2 relay.
D N.C.	E-40	85-4 43-10	Black-White Green-Yellow	Opens lock in circuit to triple play reflex relay.
E N.O.	B-25	85-4 10-9	Black-White Red	Completes guaranteed step circuit to advance twin feature unit.
F N.C.	B-55	57-4 36-16	White-Orange Yellow-Brown	Opens lock in circuit to 1st and 2nd extra step relays.
REPLAY CAMS INDEX COIL	A-28	70 41-13	Orange Green-Red	Energized thru winner search circuit when replay type winners are found and release replay cams to score winners.
17A N.O.	D-29	23-13 80	Blue-Yellow Black	Completes search index – winner lock in circuit while winners are scoring.
17B N.O.	E-31	31-11 74	Yellow-Red Orange-Green	Completes 3-4-5 zone and 4 star feature winner replay scoring circuits.
17C N.C.	B-28	71-3 15-2	Orange-Red Red-White	Opens initial 50 volt pull in circuit to search index coil.
17D N.O.	C-29	81-10 80	Black-Red Black	Completes circuit to register and record replay winners.
17E N.C.	B-7	27-2 58-5	Blue-Orange White-Black	Opens timer unit step up circuit while winners are scoring.
SEARCH INDEX COIL	A-28	15-2 70	Red-White Orange	Energized thru search disc winner circuits and stops search disc wipers to score and record winners.
18A N.O.	C-28	48-9 41-13	Green-Black Green-Red	Completes circuit to replay cams index coil.
18B N.C.	B-4	83-3 53-13	Black-Yellow White-Yellow	Opens regular circuit to start relay.

CONCLUDED

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 CAM 1A N.O.	C-22	95-9 45-6	Gray-White Green-White	Thru control and spotting disc circuits, advances regular game feature units and energizes feature relays.
16 PULSE CAM 1B N.O.	G-4	90 10-11	Gray Red	Thru mystic lines feature disc, flashes "press buttons now lite" thru before 4th, 5th or 6th ball circuits.
16 PULSE CAM 1C N.O.	D-18	20-16 52-5	Blue White-Blue	Thru red letter game winner circuit, advances red letter scores, and feature units and energizes feature relays corresponding to guaranteed red letter feature game winner.
MIXER CAM 2A N.O.	A-15	18-19 93-11	Red-Black Gray-Yellow	Completes circuit to mixer cam #2 relay.
ROVING CAM CENTER 2B S.P.D.T.	D-40	85-4 71-16	Black-White Orange-Red	Thru triple play reflex disc, completes a circuit to triple play reflex relay.

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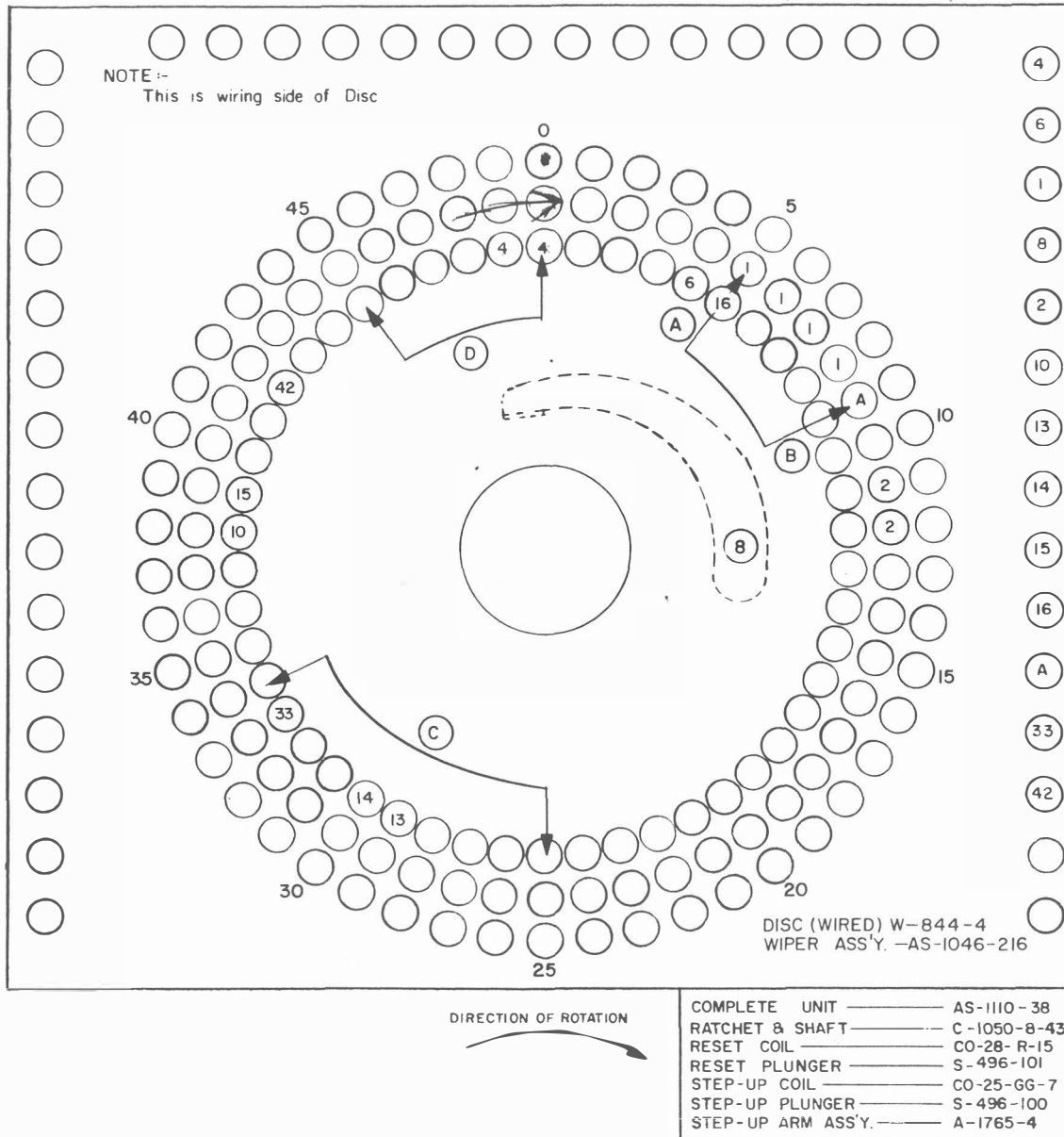
MIXER AND SPOTTING UNIT CAM SWITCH CHART

FOR POSITION OF SWITCHES REFER TO PICTORIAL VIEW ON PAGE 7

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
MIXER CAM 3A N.O.	E-48	63-4 50-12	Brown-Yellow White	Completes control circuit for regular game scores advance and multiple score feature relays.
MIXER PULSE 3B N.O.	F-46	60-16 90-11	Brown Gray	Same function as switch 3A.
ROVING CAM RIGHT 3C S.P.D.T.	D-40	85-4 38-9	Black-White Yellow-Black	Completes a circuit to triple play reflex relay.
MIXER CAM 3D N.C.				Not used.
MIXER CAM 3E N.O.	A-22	48-10 40-18	Green-Black Green	Completes control circuit for selection feature unit advance.
FLASH CAM (Backside) N.O.	G-30	20-14 50-13	Blue White	(Not shown in pictorial view) Flashes triple play feature color lites.
MIXER CAM 4A N.O.				Not used.
MIXER CAM 4B S.P.D.T.	E-40	85-4 36-20	Black Yellow-Brown	Thru triple play reflex disc, completes a circuit to triple play reflex relay.
MIXER CAM 4C N.C.				Not used.
16 PULSE CAM 5A N.O.	C-3	75-2 53-7	Orange-White White-Yellow	Thru replay reset relay circuit, reset replay register unit.
5B N.O.	A-19	78 27-20	Orange-Black Blue-Orange	Thru control and spotting disc circuits, advances extra ball feature unit.
5C N.O.	C-31	30 40-16	Yellow Green	Thru homing circuits, resets all 4 stars replay counter and multiple unit, also advances triple playcolor selector unit thru unit control circuit.
5D N.O.	B-46	83-21 98-15	Black-Yellow Gray-Black	Thru triple play winner circuit, advances delay unit.
BLUE BUTTON EXTRA STEP RELAY COIL	A-51	71-13 83-17	Orange-Red Black-Yellow	(Not shown in pictorial view) Energized thru regular game score step circuits.
A N.O.	A-52	36-16 83-17	Yellow-Brown Black-Yellow	Completes lock in circuit to this relay.
B N.O.	E-47	53-15 13-13	White-Yellow Red-Yellow	Completes control circuit for regular game scores advance and multiple score feature relays.
SPOTTING CAMS INDEX COIL	D-56	98-1 70	Gray-Black Orange	Energized by control unit cam switch 4A during each play cycle and releases spotting disc wipers.
6A N.O.	G-22	30 13-4	Yellow Red-Yellow	Completes spotting disc lite flash circuits for regular game scores and multiple score features, triple play scores or extra ball feature.
6B N.O.	G-6	81-6 30	Black-Red Yellow	Completes spotting disc lite flash circuits for mystic lines feature, selection feature, stars feature and twin number feature.
MIXER LATCH COILS (2)	A-6	85-1 70	Black-White Orange	Energized thru start relay circuit during each play cycle and releases mixer disc wipers.

TIMER UNIT DISC viewed from WIRING side

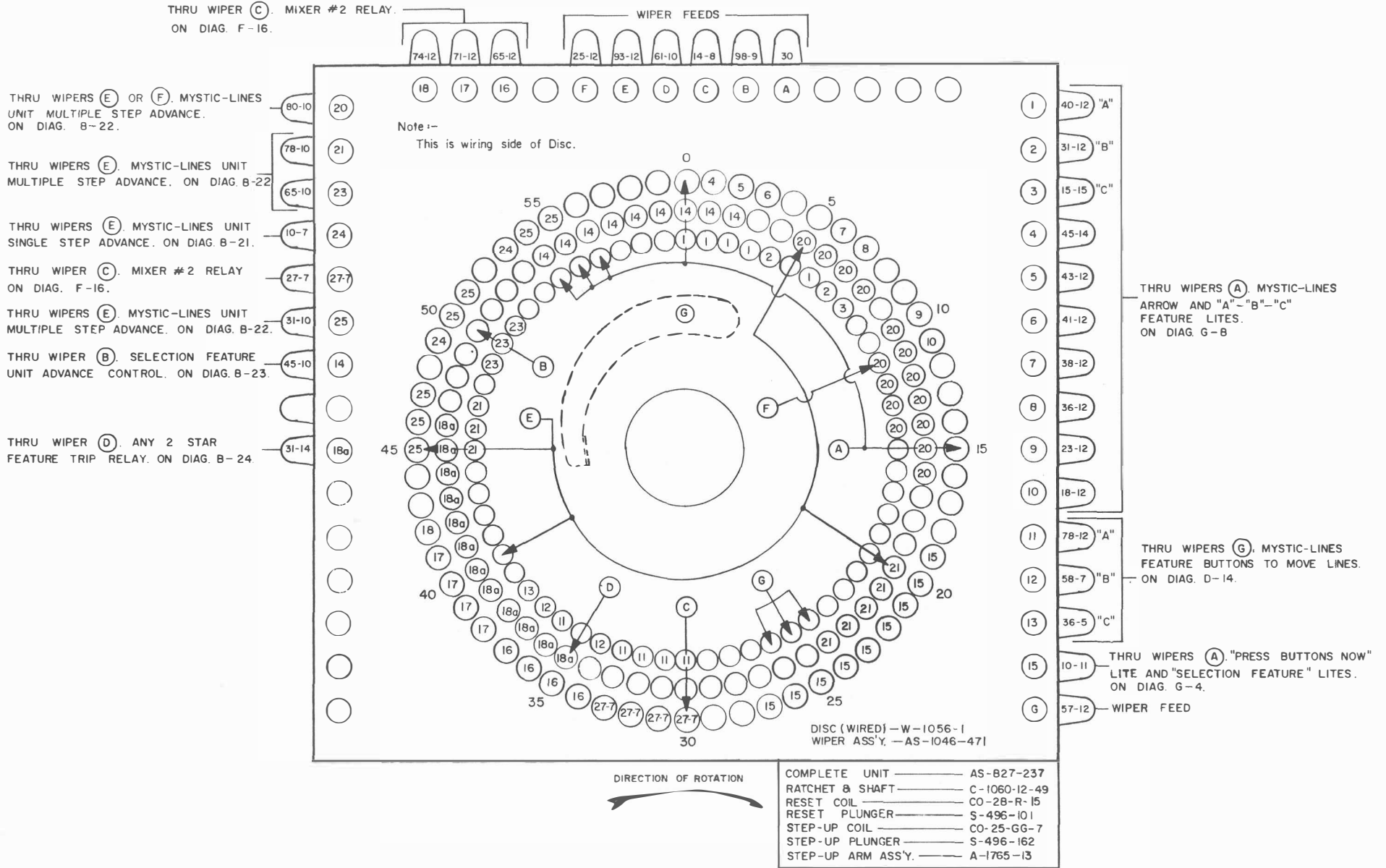
8 step unit. Wipers shown in zero or reset position



- 4 14-18 — WIPERS (D) FEED.
- 6 27-4 — THRU WIPERS (D). "PRESS BUTTONS NOW LITE" BEFORE 4th BALL. ON DIAG. H-4.
- 1 43-2 — THRU WIPER (A). TIMER UNIT ADVANCE — 0 THRU 4th STEPS. ON DIAG. F-7.
- 8 21-3 — WIPER (A) AND (B) FEED.
- 2 18-3 — THRU WIPER (B). SHUTTER MOTOR—CLOSE SHUTTER. ON DIAG. F-8.
- 10 83-6 — THRU WIPERS (C). BEFORE 4th BALL LOCKOUT TRIP RELAY. ON DIAG. B-10.
- 13 78-7 — THRU WIPERS (C). BEFORE 5th BALL LOCKOUT TRIP RELAY. ON DIAG. B-10.
- 14 54-5 — THRU WIPERS (C). BEFORE 5th BALL LOCKOUT TRIP RELAY. ON DIAG. B-10.
- 15 74-6 — THRU WIPERS (C). BEFORE 5th BALL LOCKOUT TRIP RELAY. ON DIAG. B-10.
- 16 23-5 — THRU WIPERS (D). "PRESS BUTTONS NOW LITE" BEFORE 5th BALL. ON DIAG. H-4.
- A 36-2 — THRU WIPER (A). TIMER UNIT ADVANCE — 4th TO 5th STEP. ON DIAG. F-8.
- 33 71-8 — THRU WIPERS (C). TIMER UNIT RESET—GOLD BUTTON. ON DIAG. D-9.
- 42 80-11 — THRU WIPERS (C). TIMER UNIT RESET—GOLD BUTTON. ON DIAG. D-9.

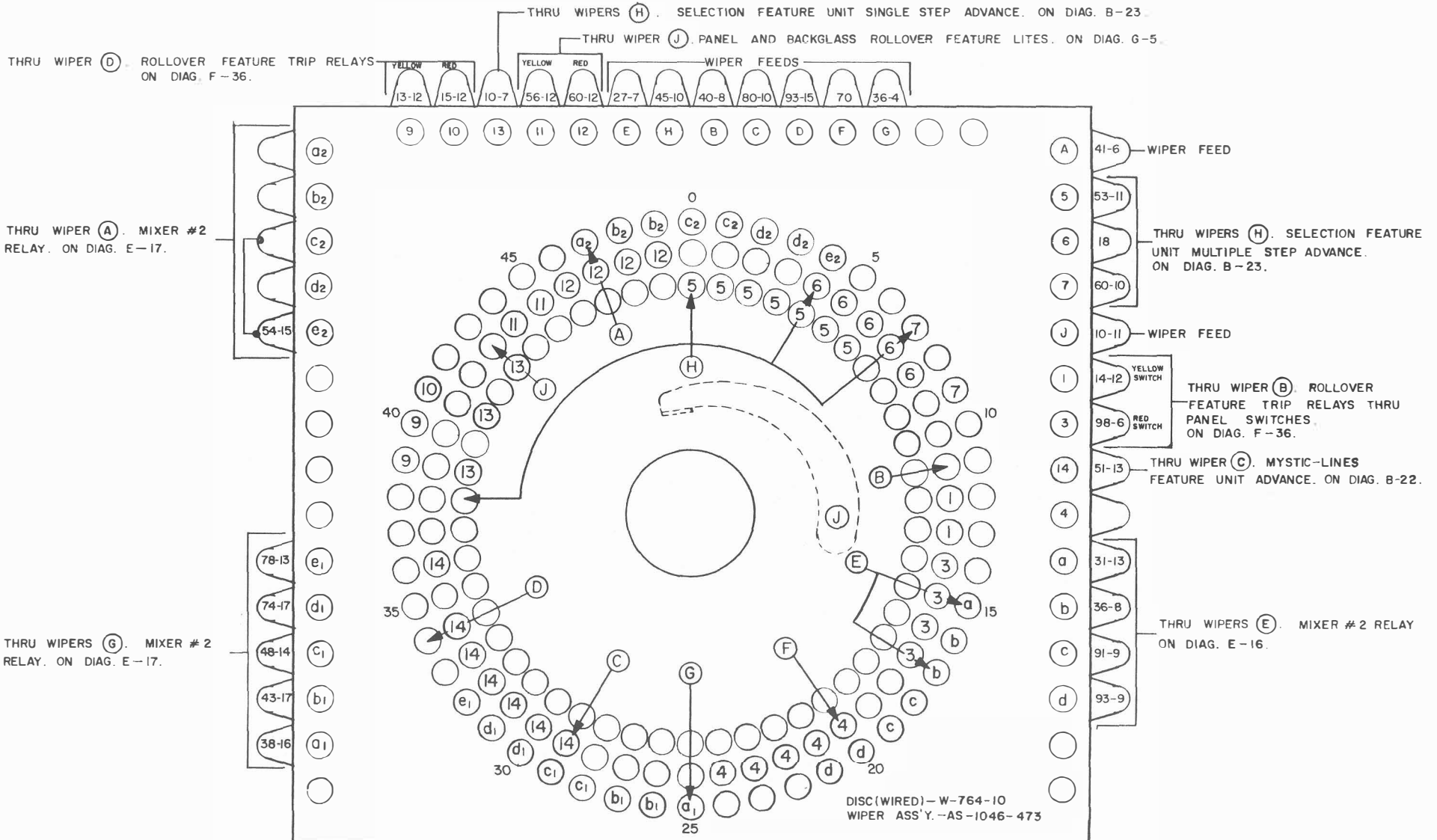
MYSTIC LINES FEATURE UNIT DISC viewed from WIRING side

12 step unit. Wipers shown in zero or reset position



SELECTION FEATURE UNIT DISC viewed from WIRING side

7 step unit. Wipers shown in zero or reset position



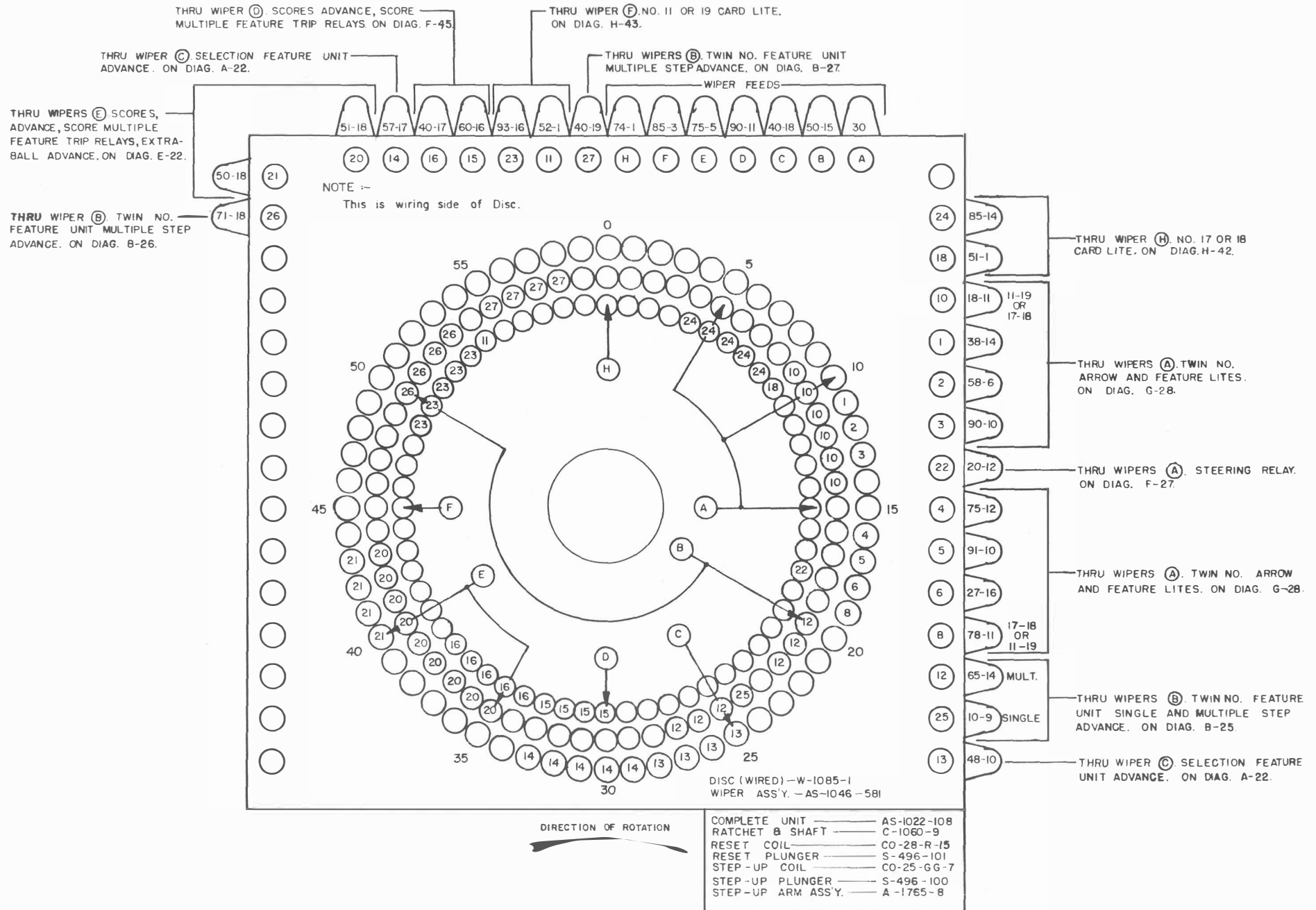
DIRECTION OF ROTATION



COMPLETE UNIT	AS-827-236
RATCHET & SHAFT	C-1050-7-40
RESET COIL	CO-28-R-15
RESET PLUNGER	S-496-101
STEP-UP COIL	CO-25-GG-7
STEP-UP PLUNGER	S-496-100
STEP-UP ARM ASS'Y.	A-1765-4

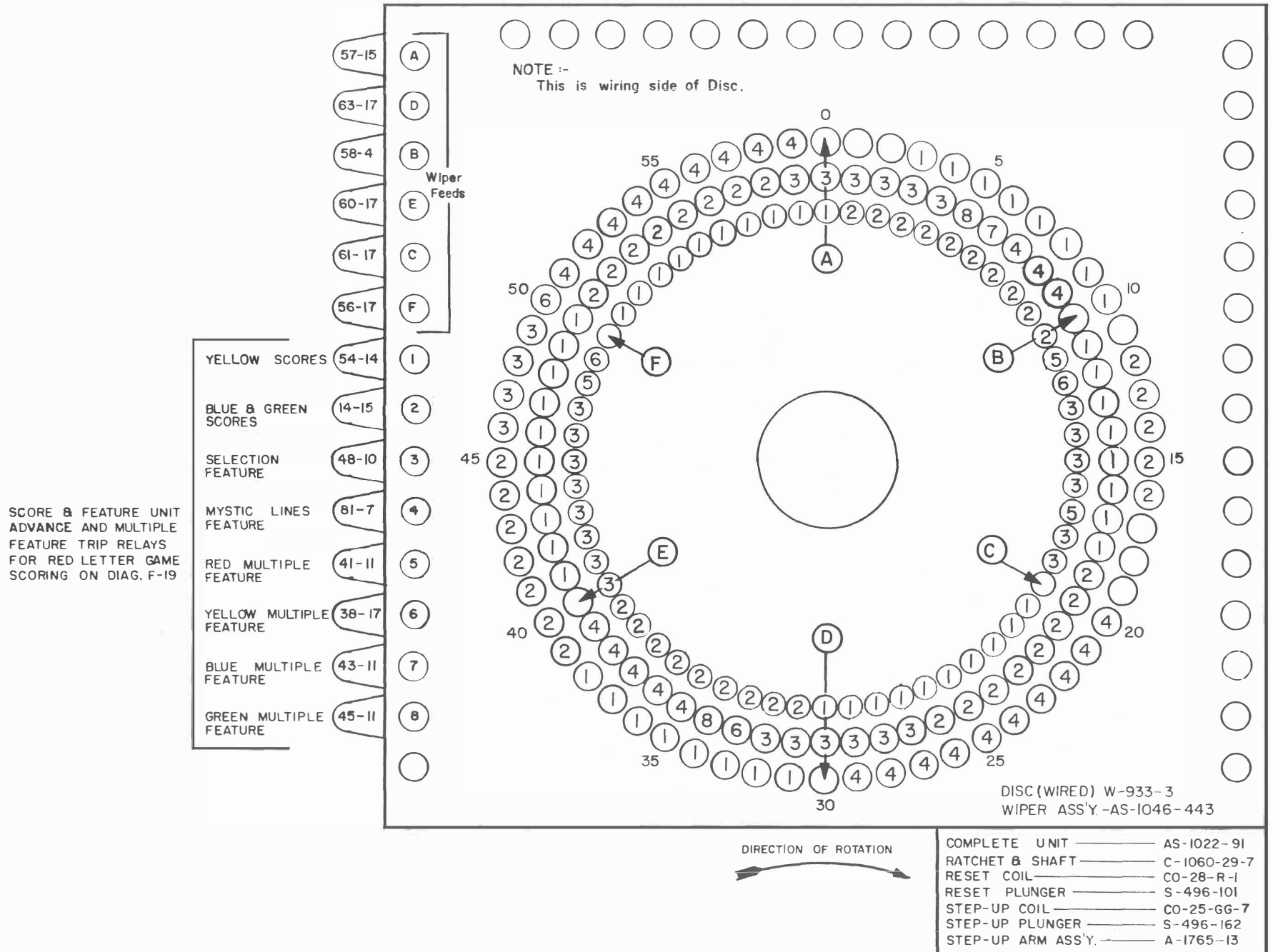
TWIN NUMBER FEATURE UNIT DISC viewed from WIRING side

9 step unit. Wiphrs shown in zero or reset position



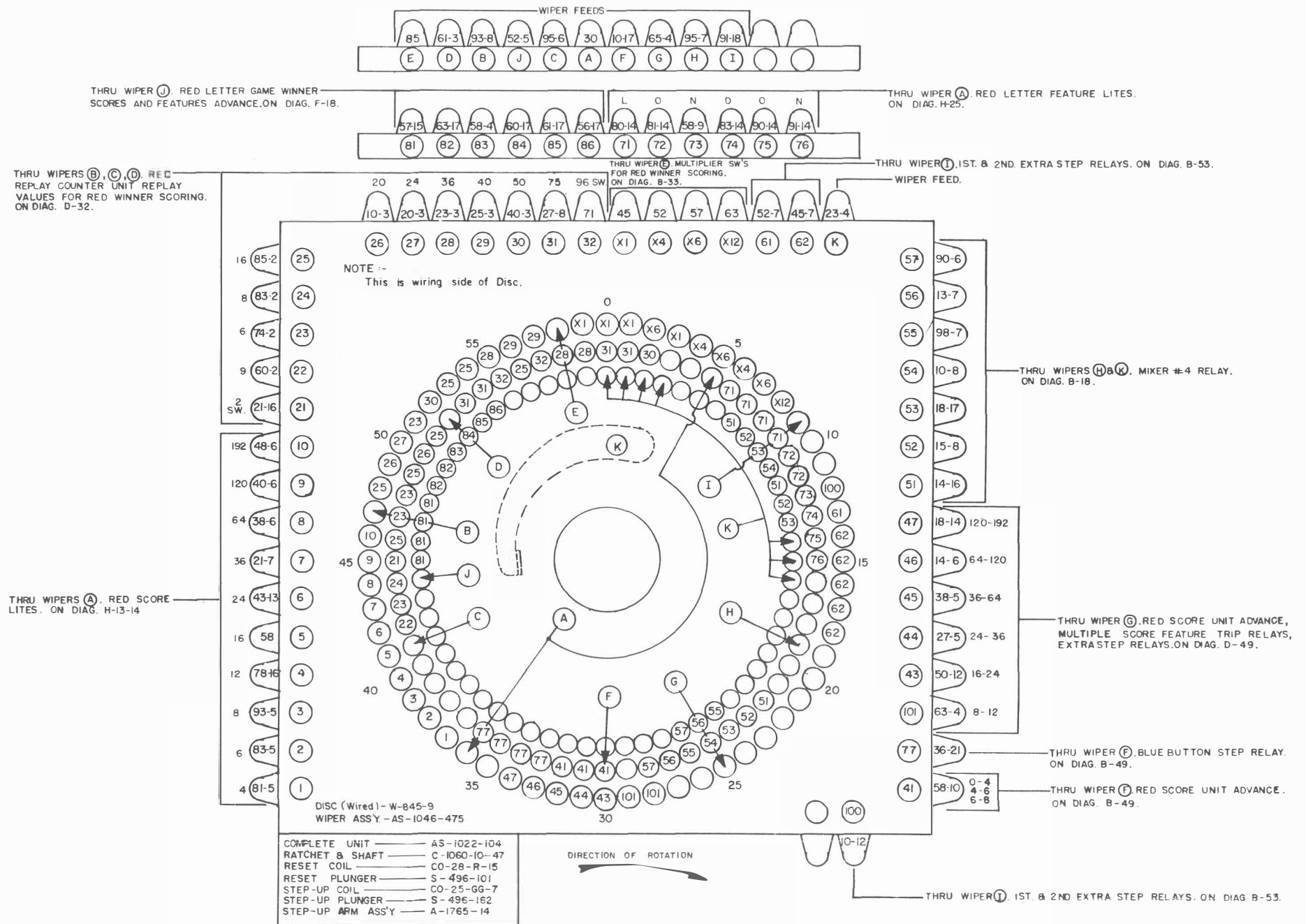
RED LETTER UNIT DISC viewed from WIRING side

29 step unit. Wipers shown in zero or reset position



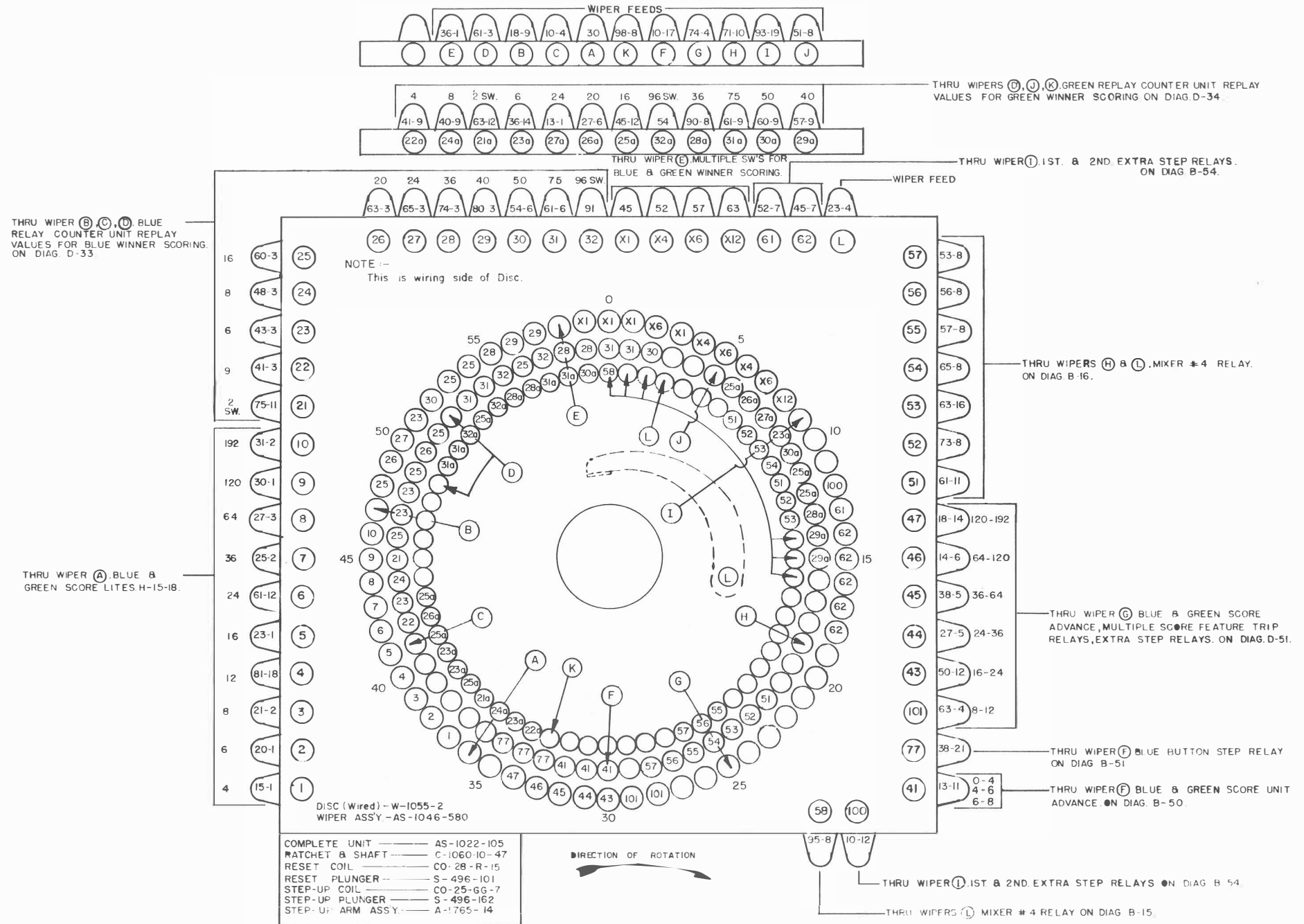
RED SCORE UNIT DISC viewed from WIRING side

10 step unit. Wipers shown in zero or reset position



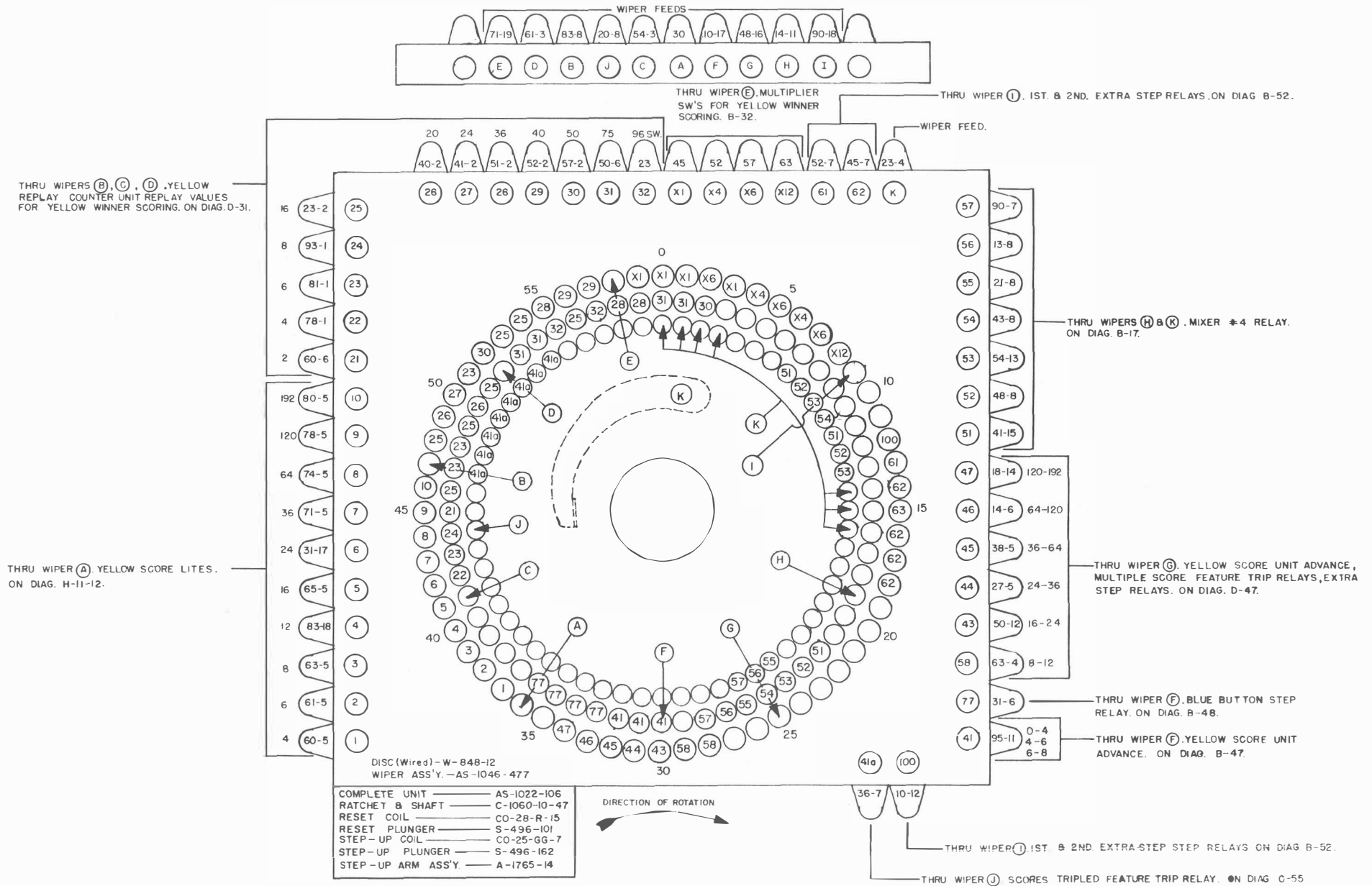
BLUE & GREEN SCORE UNIT DISC viewed from WIRING side

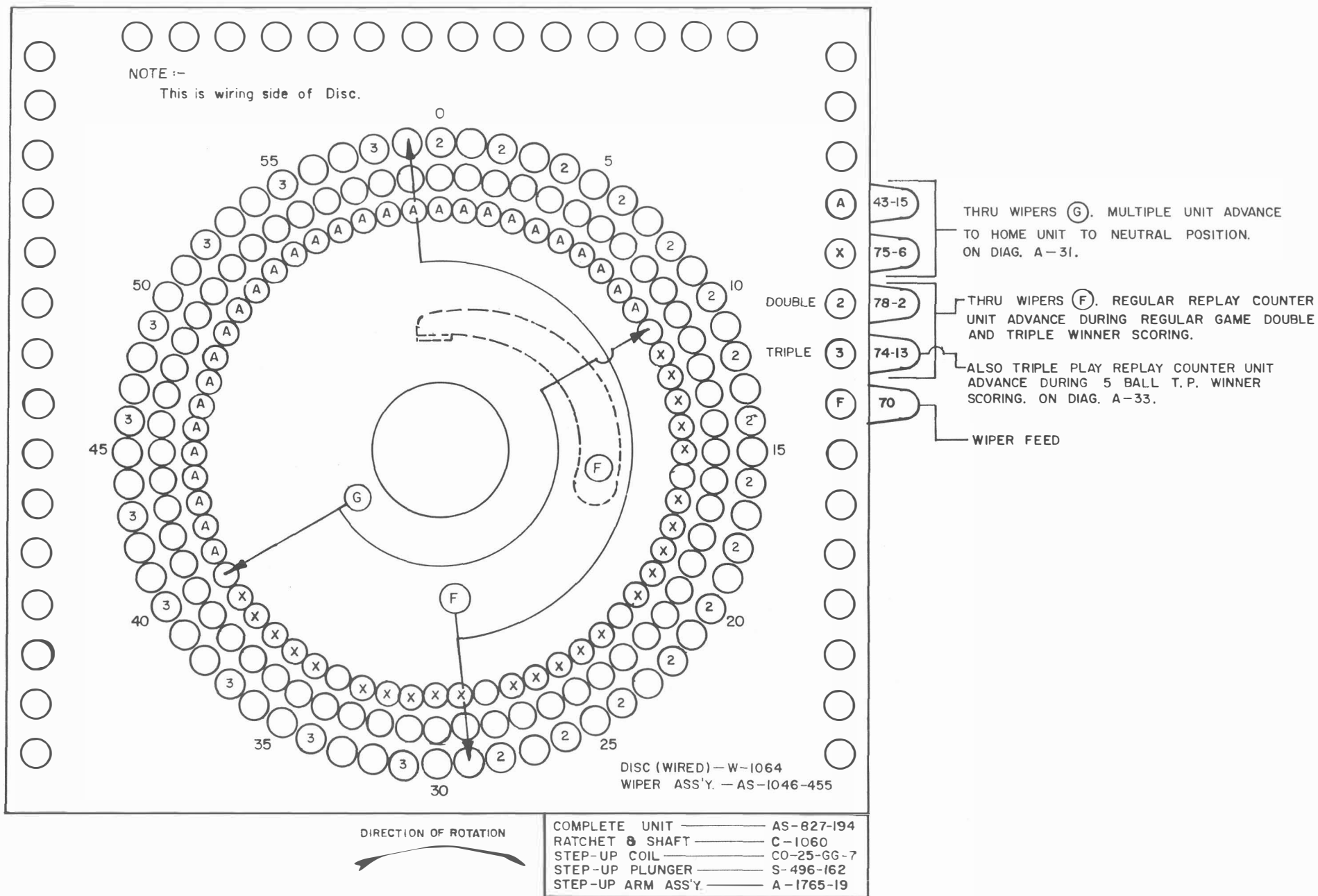
10 step unit. Wipers shown in zero or reset position



YELLOW SCORE UNIT DISC viewed from WIRING side

10 step unit. Wipers shown in zero or reset position

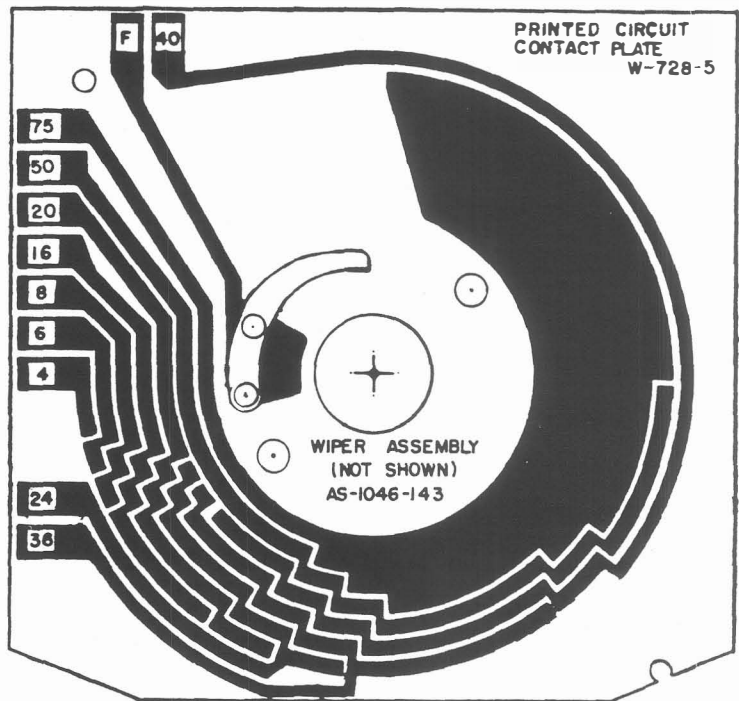




REPLAY COUNTER UNIT DISC viewed from WIPER side

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	27-8	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	CO-28-R-15
STEP-UP COIL	CO-25-GG-7
STEP-UP PLUNGER	S-496-116
STEP-UP ARM ASSY.	A-1765-8
RATCHET & SHAFT	C-100
RESET PLUNGER	S-496-101

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)

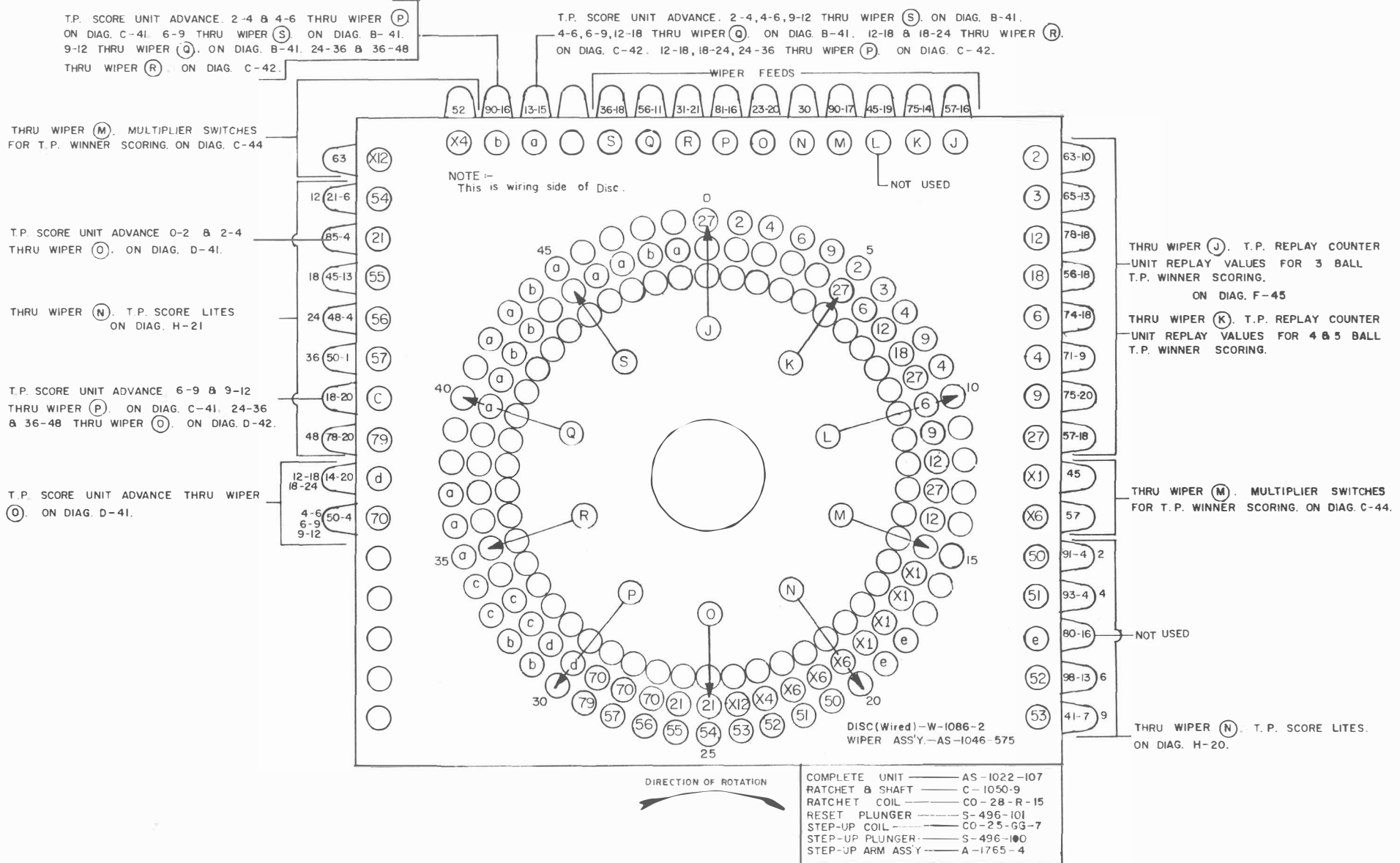
Large numbers are Green, Red, Yellow and Blue Replay Scores shown on backglass. Numbers in circles indicate the replay counter disc value each score is effective thru during winners.

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

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

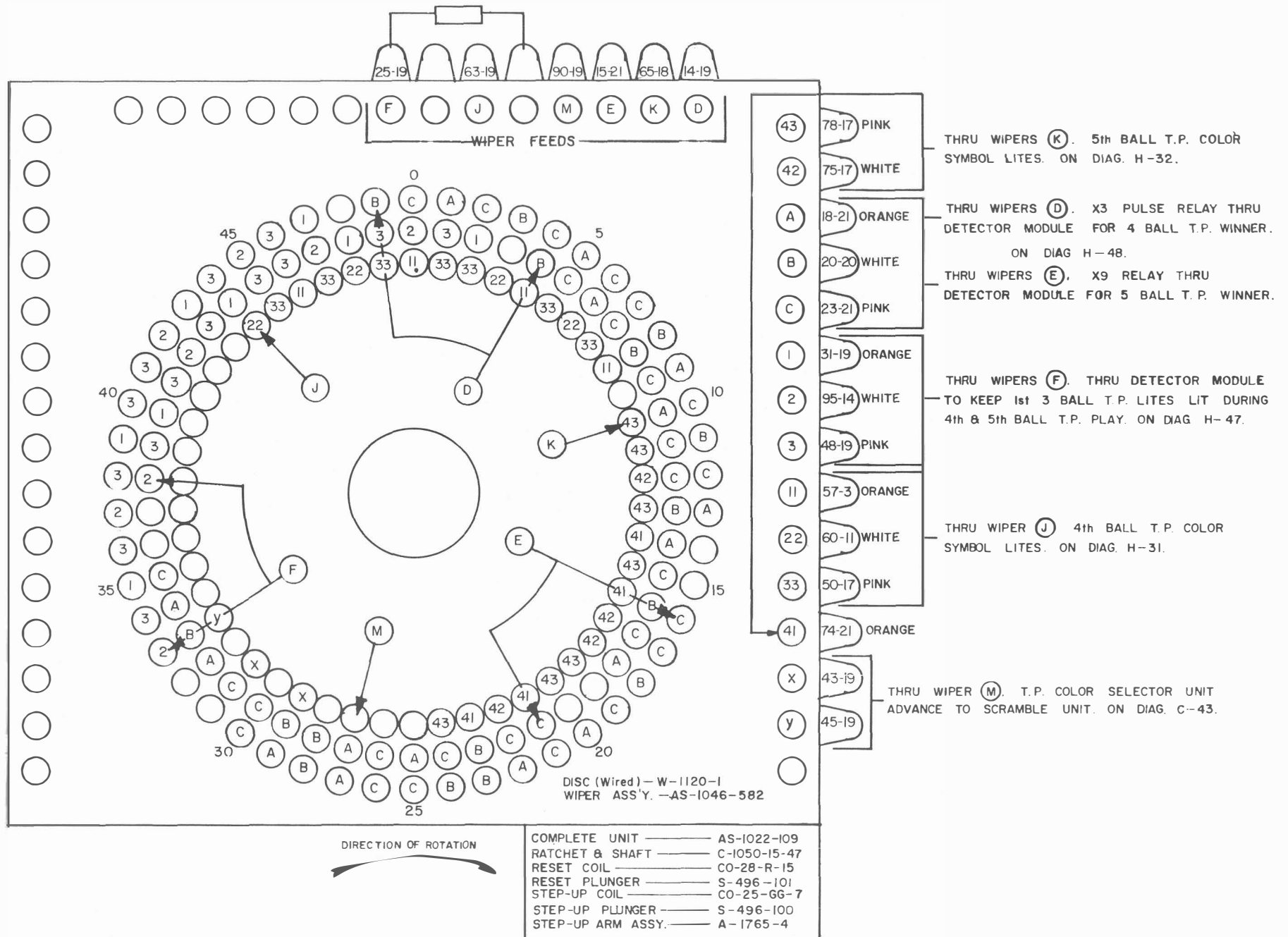
TRIPLE PLAY SCORE UNIT DISC viewed from WIRING side

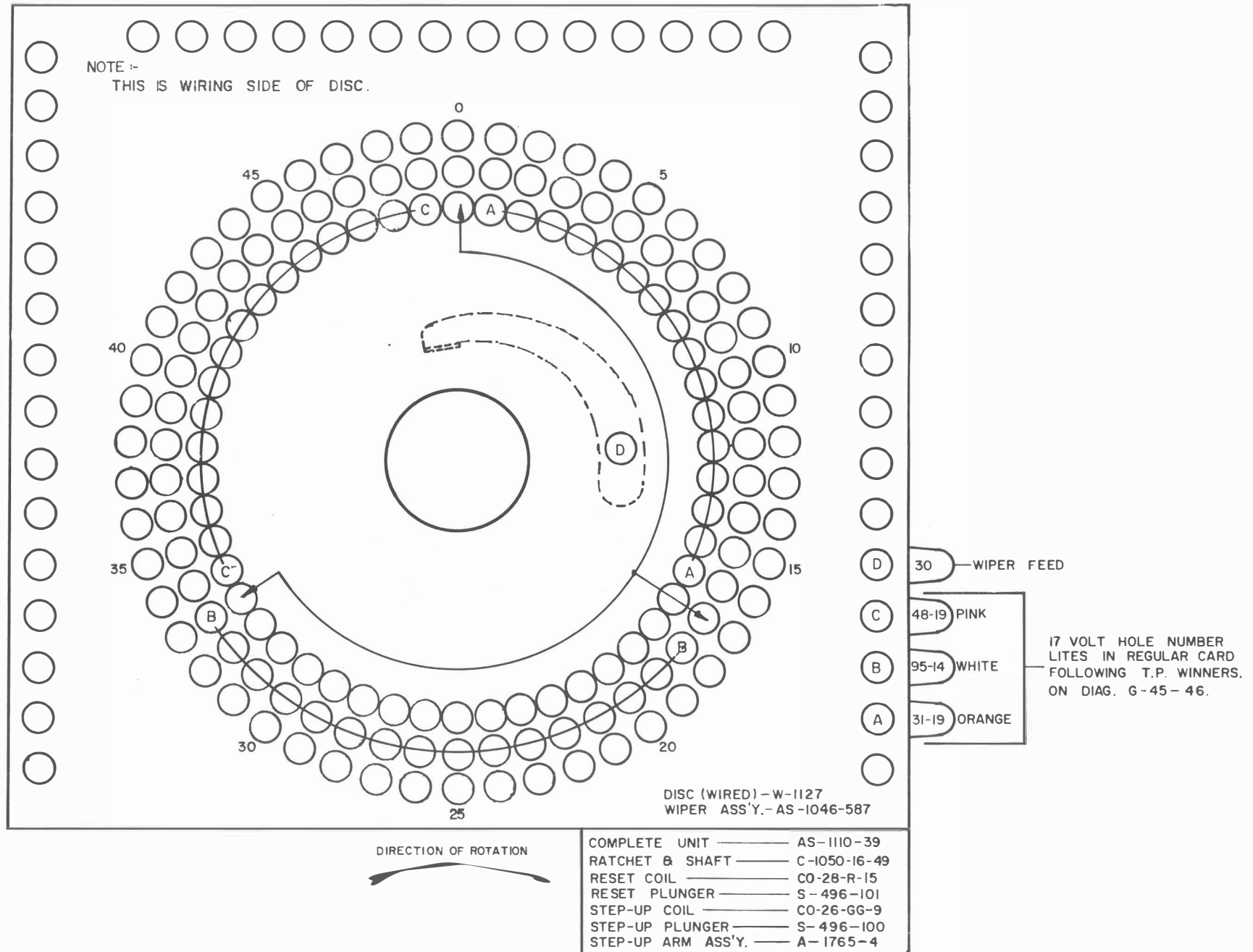
9 step unit. Wipers shown in zero or reset position



TRIPLE PLAY COLOR SELECTOR UNIT DISC viewed from WIRING side

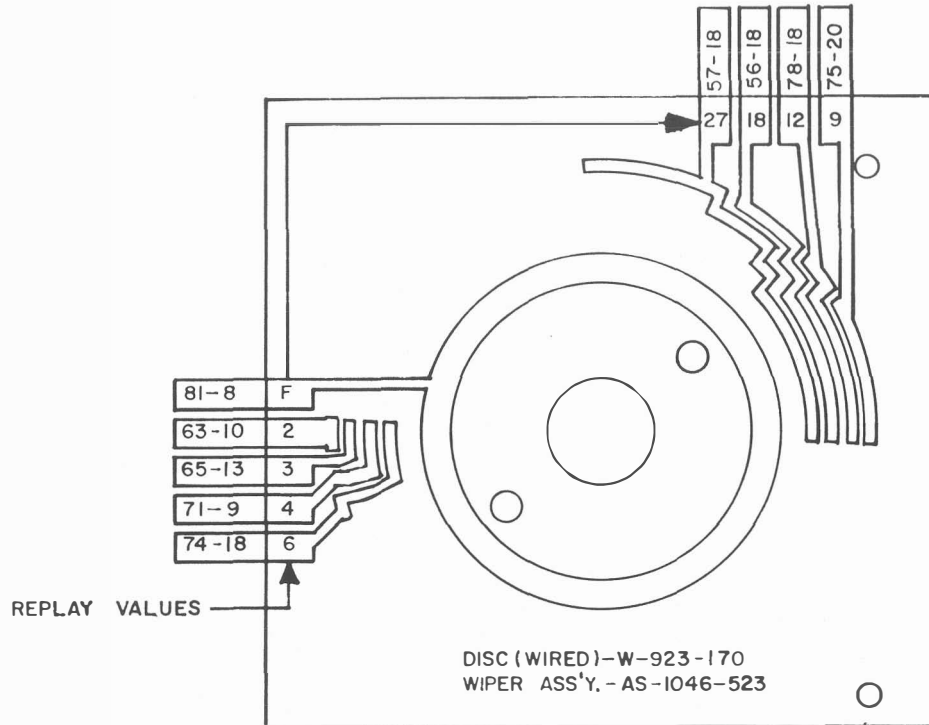
15 step unit. Wipers shown in zero or reset position





TRIPLE PLAY REPLAY COUNTER UNIT DISC viewed from WIRING side

15 step unit. Wipers shown in zero or reset position



REPLAY VALUES

- COMPLETE UNIT — AS-797-166
- RATCHET & SHAFT — C-100
- RESET COIL — CO-28-R-15
- RESET PLUNGER — S-496-101
- STEP-UP COIL — CO-25-GG-7
- STEP-UP PLUNGER — S-496-116
- STEP-UP ARM ASS'Y. — A-1765-8

CONTROL UNIT MULTIPLIER CAM SWITCHES THAT PULSE TRIPLE PLAY REPLAY COUNTER UNIT STEP-UP COIL DURING 3-4-5 BALL TRIPLE PLAY WINNERS. DURING 5 BALL WINNERS, MULTIPLIER SWITCHES TRIPLE THEIR RATIO THRU MULTIPLE UNIT DISC.

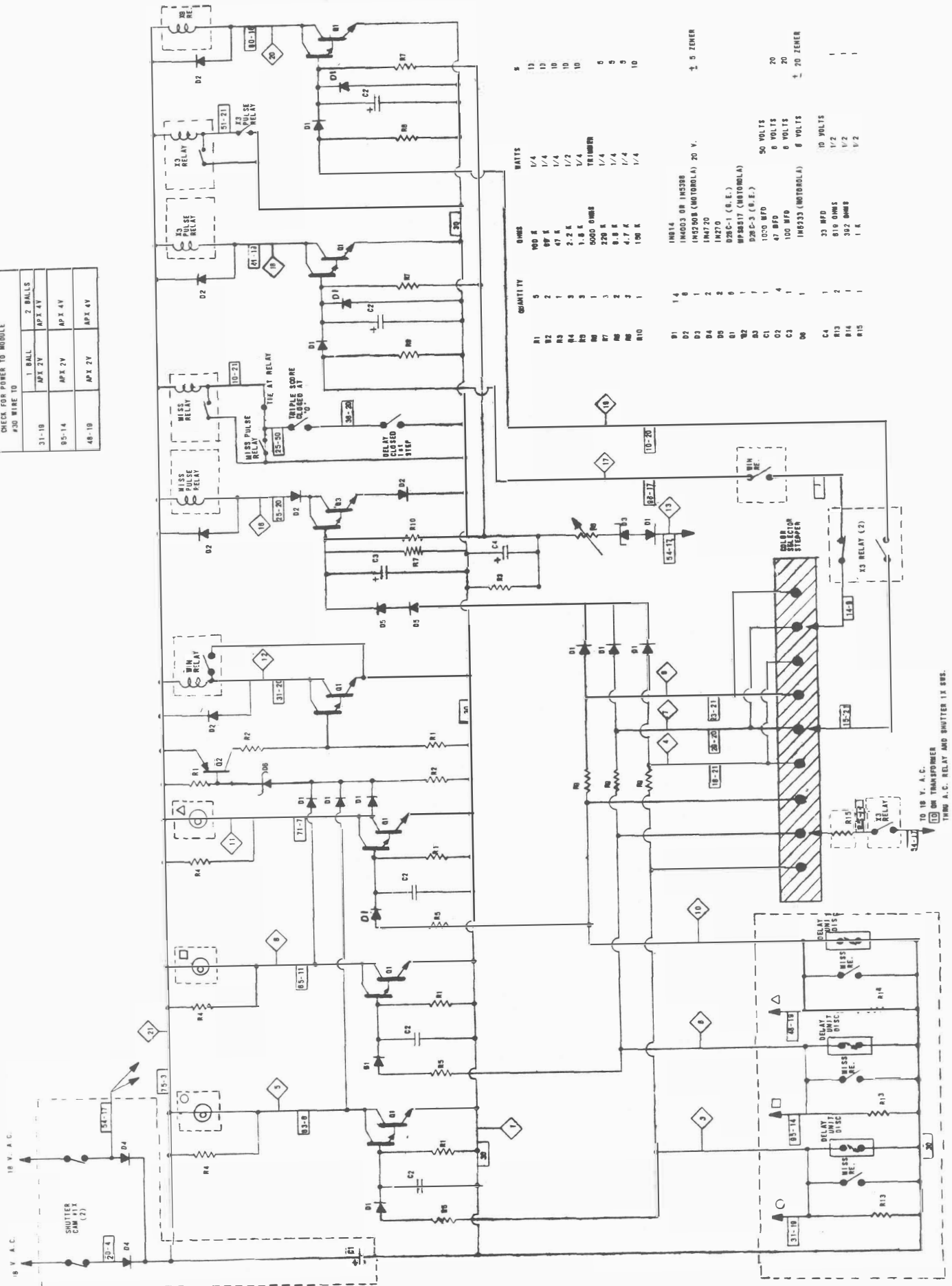
C.U. 10 A 12.1	48 (4)	144 (12)	432 (12)
C.U. 13 A 4.1	36 (9)	108 (27)	324 (27)
C.U. 11 A 6.1	24 (4)	72 (12)	216 (12)
C.U. 11 A 6.1	18 (3)	54 (9)	162 (9)
C.U. 11 A 6.1	12 (2)	36 (6)	108 (6)
C.U. 12 A 1.1	9 (9)	27 (27)	81 (27)
C.U. 12 A 1.1	6 (6)	18 (18)	54 (18)
C.U. 12 A 1.1	4 (4)	12 (12)	36 (12)
C.U. 12 A 1.1	2 (2)	6 (6)	18 (6)
	3 BALL WINNER	4 BALL WINNER	5 BALL WINNER

LARGE NUMBERS ARE TRIPLE PLAY REPLAY SCORES SHOWN ON BACK GLASS. NUMBERS IN CIRCLES INDICATE THE REPLAY COUNTER DISC VALUE, EACH REPLAY SCORE IS EFFECTIVE THRU DURING WINNERS.

TRIPLE PLAY CIRCUIT

CHECK FOR POWER TO MODULE
#30 WIRE TO

31-10	1 BALL	2 BALLS
	APX 2V	APX 4V
95-14	APX 2V	APX 4V
48-19	APX 2V	APX 4V

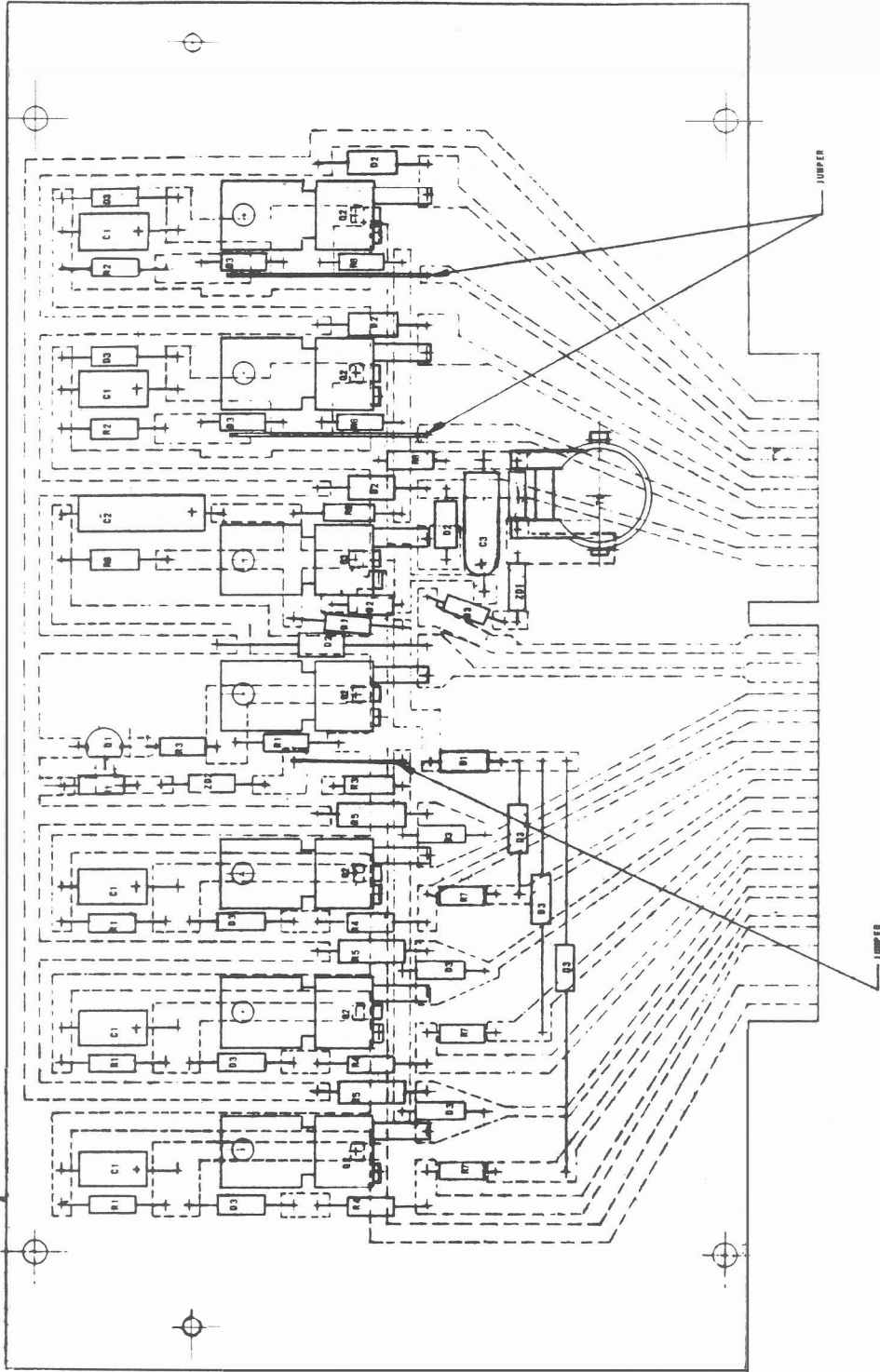


QUANTITY	OHMS	WATTS
R1	100 K	1/4
R2	67 K	1/4
R3	47 K	1/4
R4	2.2 K	1/4
R5	1.8 K	1/4
R6	5000 OHMS	0
R7	220 K	1/4
R8	9.8 K	1/4
R9	4.7 K	1/4
R10	100 K	1/4
R11	100 K	1/4
R12	100 K	1/4
R13	100 K	1/4
R14	100 K	1/4
R15	100 K	1/4

QUANTITY	OHMS	WATTS
D1	1N314	± 5 ZENER
D2	1N4003 OR 1N5398	
D3	1N4298 (MOTOROLA) 20 V.	
D4	1N4720	
D5	1N770	
D6	50C-1 (G. E.)	
D7	50C-3 (G. E.)	
D8	50B8317 (MOTOROLA)	
D9	50C-3 (G. E.)	
D10	1000 MFD	50 VOLTS
D11	47 MFD	6 VOLTS
D12	100 MFD	6 VOLTS
D13	100 MFD	6 VOLTS
D14	100 MFD	6 VOLTS
D15	100 MFD	6 VOLTS
D16	100 MFD	6 VOLTS
D17	100 MFD	6 VOLTS
D18	100 MFD	6 VOLTS
D19	100 MFD	6 VOLTS
D20	100 MFD	6 VOLTS
D21	100 MFD	6 VOLTS
D22	100 MFD	6 VOLTS
D23	100 MFD	6 VOLTS
D24	100 MFD	6 VOLTS
D25	100 MFD	6 VOLTS
D26	100 MFD	6 VOLTS
D27	100 MFD	6 VOLTS
D28	100 MFD	6 VOLTS
D29	100 MFD	6 VOLTS
D30	100 MFD	6 VOLTS
D31	100 MFD	6 VOLTS
D32	100 MFD	6 VOLTS
D33	100 MFD	6 VOLTS
D34	100 MFD	6 VOLTS
D35	100 MFD	6 VOLTS
D36	100 MFD	6 VOLTS
D37	100 MFD	6 VOLTS
D38	100 MFD	6 VOLTS
D39	100 MFD	6 VOLTS
D40	100 MFD	6 VOLTS
D41	100 MFD	6 VOLTS
D42	100 MFD	6 VOLTS
D43	100 MFD	6 VOLTS
D44	100 MFD	6 VOLTS
D45	100 MFD	6 VOLTS
D46	100 MFD	6 VOLTS
D47	100 MFD	6 VOLTS
D48	100 MFD	6 VOLTS
D49	100 MFD	6 VOLTS
D50	100 MFD	6 VOLTS
D51	100 MFD	6 VOLTS
D52	100 MFD	6 VOLTS
D53	100 MFD	6 VOLTS
D54	100 MFD	6 VOLTS
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D60	100 MFD	6 VOLTS
D61	100 MFD	6 VOLTS
D62	100 MFD	6 VOLTS
D63	100 MFD	6 VOLTS
D64	100 MFD	6 VOLTS
D65	100 MFD	6 VOLTS
D66	100 MFD	6 VOLTS
D67	100 MFD	6 VOLTS
D68	100 MFD	6 VOLTS
D69	100 MFD	6 VOLTS
D70	100 MFD	6 VOLTS
D71	100 MFD	6 VOLTS
D72	100 MFD	6 VOLTS
D73	100 MFD	6 VOLTS
D74	100 MFD	6 VOLTS
D75	100 MFD	6 VOLTS
D76	100 MFD	6 VOLTS
D77	100 MFD	6 VOLTS
D78	100 MFD	6 VOLTS
D79	100 MFD	6 VOLTS
D80	100 MFD	6 VOLTS
D81	100 MFD	6 VOLTS
D82	100 MFD	6 VOLTS
D83	100 MFD	6 VOLTS
D84	100 MFD	6 VOLTS
D85	100 MFD	6 VOLTS
D86	100 MFD	6 VOLTS
D87	100 MFD	6 VOLTS
D88	100 MFD	6 VOLTS
D89	100 MFD	6 VOLTS
D90	100 MFD	6 VOLTS
D91	100 MFD	6 VOLTS
D92	100 MFD	6 VOLTS
D93	100 MFD	6 VOLTS
D94	100 MFD	6 VOLTS
D95	100 MFD	6 VOLTS
D96	100 MFD	6 VOLTS
D97	100 MFD	6 VOLTS
D98	100 MFD	6 VOLTS
D99	100 MFD	6 VOLTS
D100	100 MFD	6 VOLTS

TRIPLE PLAY MODULE BOARD

P-7412-1C



IDENT. PART NO.	NAME	SPECS	REQ.
R-1	E-105-153b	RESISTOR 10% 100 K. 1/4 W.	5
R-2	E-105-100b	RESISTOR 5% 6.8 K. 1/4 W.	2
R-3	E-105-100b	RESISTOR 10% 100 K. 1/4 W.	2
R-4	E-105-155b	RESISTOR 10% 1.5 K. 1/4 W.	3
R-5	E-105-100b	RESISTOR 10% 2.2 K. 1/2 W.	3
R-6	E-105-101b	RESISTOR 5% 220 K. 1/4 W.	3
R-7	E-105-100b	RESISTOR 5% 4.7 K. 1/4 W.	1
R-8	E-105-102b	RESISTOR 10% 150 K. 1/4 W.	1
C-1	E-500-3	CAPACITOR 47 MFD.	5
C-2	E-500-6	CAPACITOR 100 MFD.	1
C-3	E-500-5	CAPACITOR 33 MFD.	1
D-1	E-507	DIODE 1N970	2
D-2	E-507-2	DIODE 1N2000	0
D-3	E-507-3	DIODE 1N914	14
ZD-1	E-508	ZENER DIODE 1N6250 10	1
Q-1	E-505-4	TRANSISTOR MP5-0517	1
Q-2	E-505-5	TRANSISTOR 2N201	0
Q-3	E-505-7	TRANSISTOR 2N203	1
T-1	E-500-1	TRIMMER 750 1/4 W.	1
ZD-2	E-500-1	ZENER DIODE 1N6223	1

SPOTTING DISC

viewed from WIRING side

Wipers shown in zero position

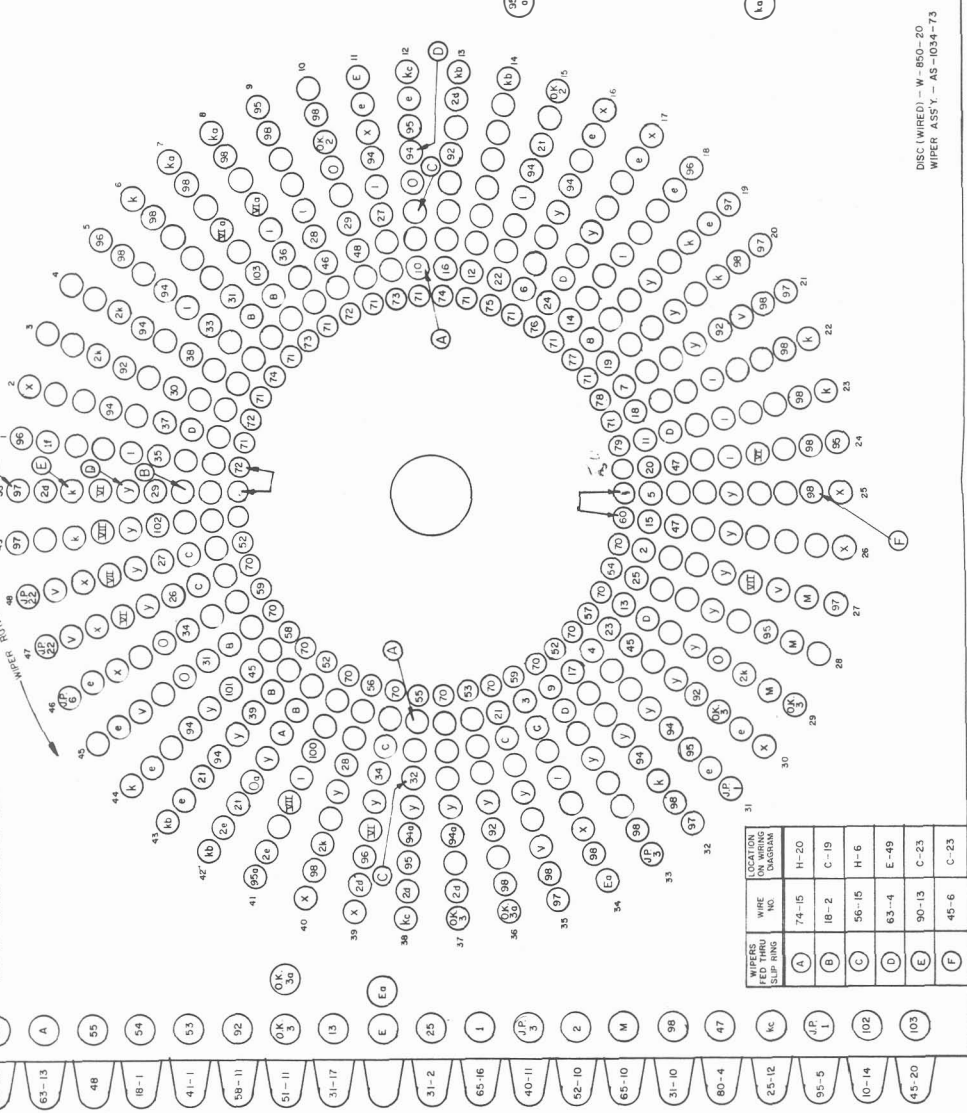
- 63-18
101
- 98-10
11
- 71-18
21
- 65-14
2e
- 40-14
2f
- 50-11
3a
- 48-4
3b
- 41-7
3c
- 35-4
3d
- 21-6
3e
- 95-13
3f
- 78-20
3g
- 85-15
22
- 18-14
23
- 31-18
24
- 43-5
25
- 81-2
26
- 57-5
27
- 43-7
28
- 25-2
29
- 71-5
30
- 30-1
31

- 65-15
J P
- 18-14
VI
- 31-18
VII
- 43-5
VIII
- 81-2
IX
- 57-5
X
- 43-7
XI
- 25-2
XII
- 71-5
XIII
- 30-1
XIV

- 15
- 27-3
- 75-10
- 48-6
- 61-5
- 23-1
- 51-13
- 93-12
- 43-12
- 60-10
- 4-6
- 27-5
- 18-12
- 80-12
- 31-12
- 15-15
- 40-6
- 93-5

- 32
- 23
- 4
- 17
- 9
- 3
- 21
- 4b
- 39
- 97
- 0
- y
- 26
- 36
- 28
- 29
- 27
- 16
- 12

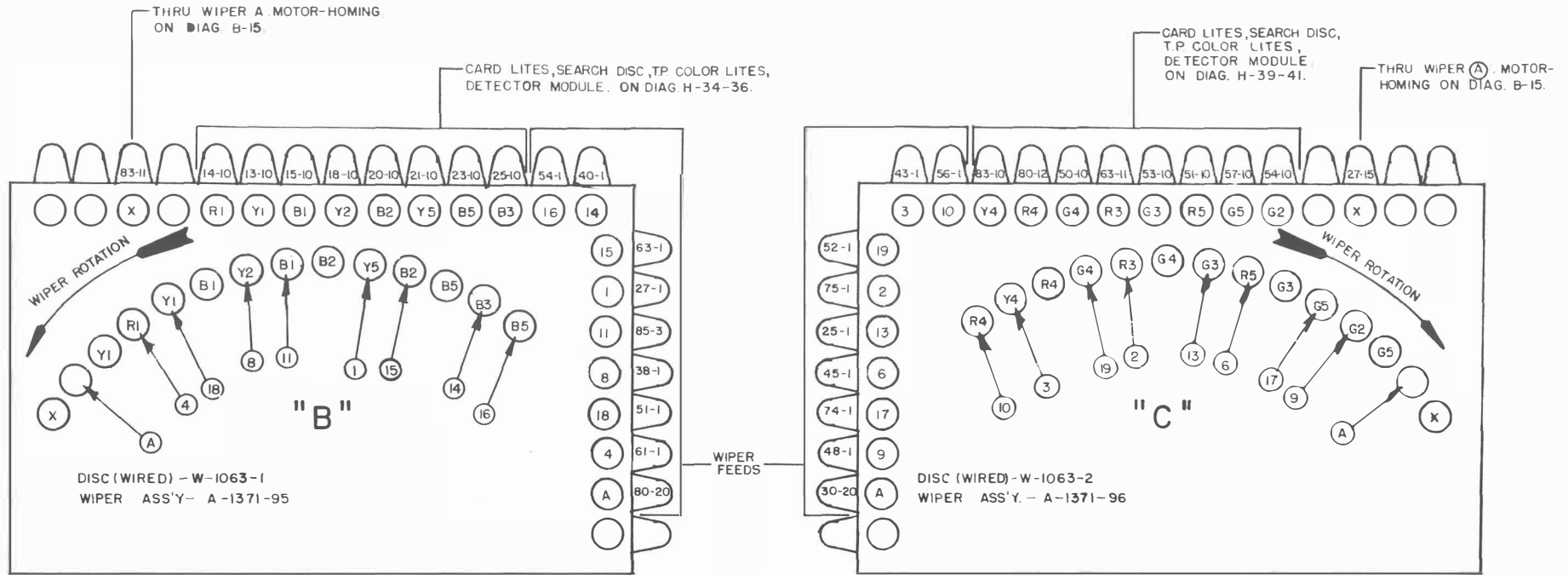
NOTE: THIS IS WIRING SIDE OF DISC.



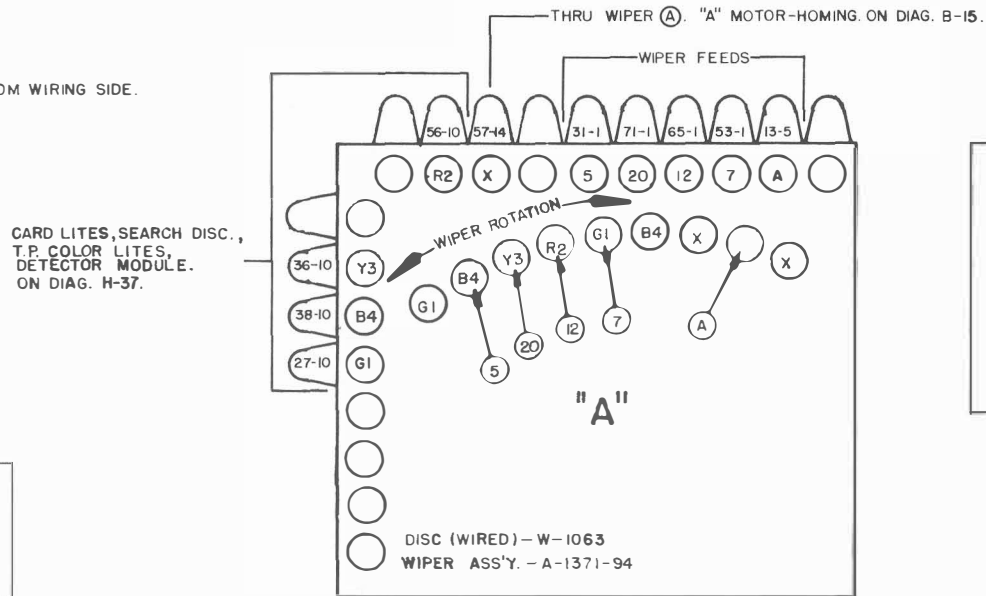
WIRES FED THRU SLIP RING	LOCATION ON WIRING DIAGRAM
A	H-20
B	C-19
C	H-6
D	E-49
E	C-23
F	C-23

DISC (WIRED) - W-850-20
WIPER ASSY. - AS-1034-73

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



NOTE:
DISC'S SHOWN FROM WIRING SIDE.



COMPLETE UNIT.....	AS-1809-7
MOTOR-"A" LINE.....	E-119-352
MOTOR-"B" & "C" LINES.....	E-119-353
RELAY "B" & "C" CAMS.....	E-146-618
CAM & HUB ASS'Y-"A" LINE.....	A-800-130
CAM & HUB ASS'Y-"B" & "C" LINES.....	A-800-131
SWITCH & BRACKET ASS'Y-"A" CAM.....	AS-982-535
SWITCH & BRACKET ASS'Y-"B" & "C" CAM.....	AS-982-579
PLASTIC SLAT ASS'Y - ROW # 1.....	A-2988
PLASTIC SLAT ASS'Y - ROW # 2.....	A-2989
PLASTIC SLAT ASS'Y - ROW # 3.....	A-2990
PLASTIC SLAT ASS'Y - ROW # 4.....	A-2991
PLASTIC SLAT ASS'Y - ROW # 5.....	A-2992
PLASTIC OVERLAY.....	M-1423

SPOTTING DISC
on other side
of this sheet

SEARCH DISC viewed from WIPER side

Wipers shown in zero position

1000 SE. 901 HELAY WIPER STAFF RELAYS MOTOR UNIT DISCS ON DIAG. H-42

ICE FAQM MYSTIC-LINES

THRU WIPER (1) BLUE 3-IN-ZONE WINNERS SCORING FEED ON DIAG. E-33

THRU WIPERS (2) RED 4-IN-ZONE WINNERS SOURCE ON DIAG. I-32

THRU WIPERS (3) GREEN 5-IN-ZONE WINNERS SOURCE ON DIAG. E-34

THRU WIPERS (4) YELLOW 3-IN-ZONE WINNERS DOUBLE TRIPLE SCORING FEED ON DIAG. C-32

THRU WIPERS (5) 11 4 STARS REPLAY COUNTER UNIT ADVANCE DURING 4 STAR WINNERS ON DIAG. C-30

THRU WIPERS (6) RED ZONE WINNERS DOUBLE TRIPLE SCORING FEED ON DIAG. C-33

THRU WIPERS (7) RED REPLAY COUNTER UNIT ADVANCE DURING RED ZONE WINNER SCORING ON DIAG. C-33

THRU WIPERS (8) RED LETTER GAME SCORING ON DIAG. C-35

THRU WIPERS (9) BLUE ZONE WINNERS SCORING FEED ON DIAG. C-34

THRU WIPERS (10) DELAY UNIT ADVANCE, Z REPLAY, T.P. REFLX UNIT REPLAY ADVANCE AND T.P. REPLAY COUNTER UNIT ADVANCE DURING T.P. WINNER SCORING ON DIAG. O-45

THRU WIPERS (11) YELLOW 4-IN-ZONE WINNER SOURCE ON DIAG. E-31

WIPERS (12) FEED

THRU WIPERS (13) GREEN REPLAY COUNTER UNIT ADVANCE DURING GREEN ZONE WINNER SCORING ON DIAG. C-35

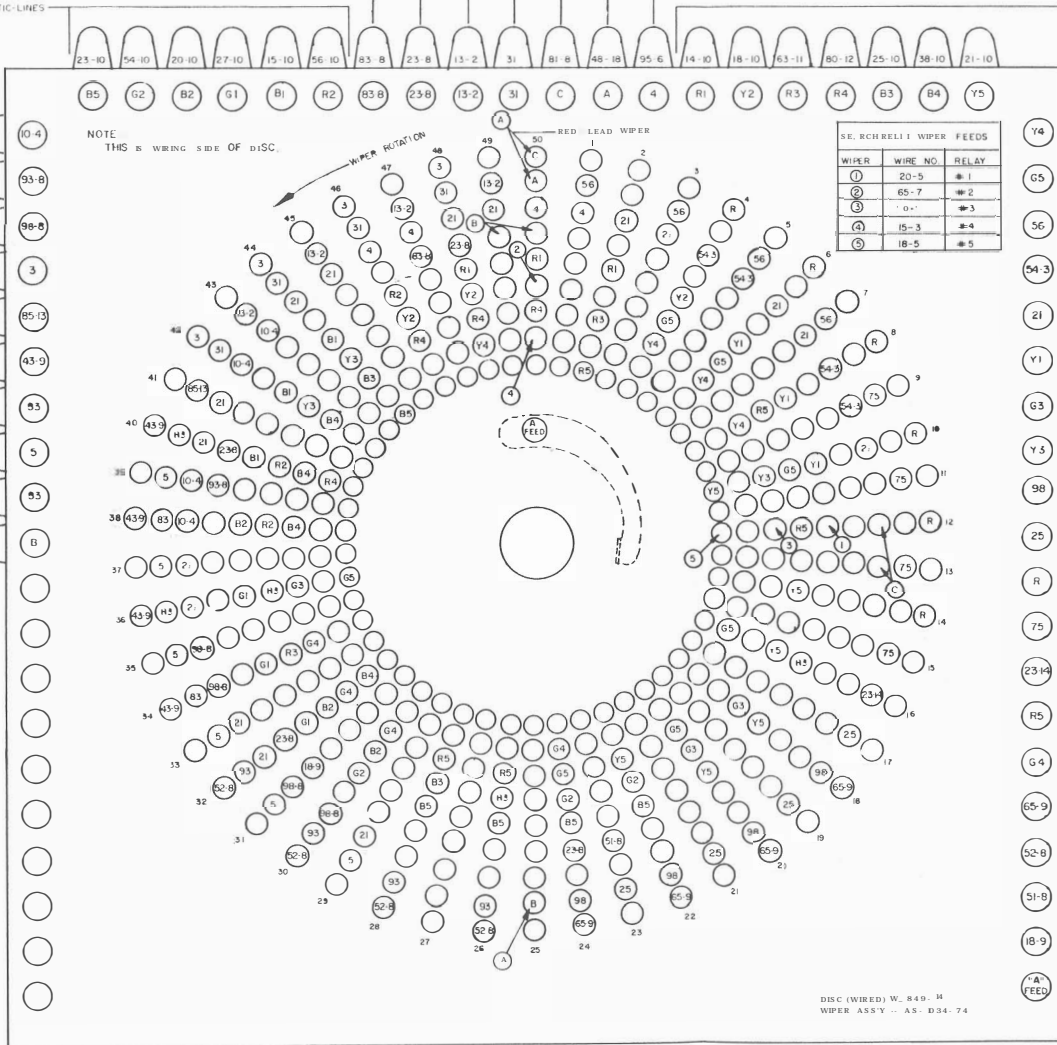
THRU WIPERS (14) YELLOW REPLAY COUNTER UNIT ADVANCE DURING YELLOW ZONE WINNER SCORING ON DIAG. C-32

THRU WIPERS (15) T.P. WINNERS SCORING FEED ON DIAG. D-45

THRU WIPERS (16) MULTIPLE WIN RELAY #1 DURING 5 BALL T.P. WINNER ON DIAG. D-45

THRU WIPERS (17) RED 3-IN-ZONE WINNERS SOURCE ON DIAG. E-32

THRU SEARCH RELAY WIPERS SEARCH RELAYS SOURCE FROM MYSTIC-LINES MOTOR UNIT DISCS ON DIAG. H-42



DISC (WIRED) W. 849. H
WIPER ASSY. AS. D34. 74

THRU WIPERS (18) BLUE REPLAY COUNTER UNIT ADVANCE DURING BLUE ZONE WINNER SCORING ON DIAG. C-34

THRU WIPERS (19) YELLOW 3-IN-ZONE WINNER SOURCE ON DIAG. E-30

WIPERS (20) FEED

THRU SEARCH RELAY WIPERS SEARCH RELAYS SOURCE FROM MYSTIC-LINES MOTOR UNIT DISCS ON DIAG. H-42

THRU WIPERS (21) GREEN ZONE WINNERS SCORING FEED ON DIAG. C-31

THRU WIPER (22) YELLOW ZONE WINNERS SCORING FEED ON DIAG. C-31

THRU WIPERS (23) RED LETTER GAME WINNERS SCORING FEED ON DIAG. C-35

THRU WIPERS (24) RED ZONE WINNERS SCORING FEED ON DIAG. C-33

THRU WIPER (25) ALL 4 STAR WINNERS SCORING FEED ON DIAG. C-30

THRU SEARCH RELAY WIPERS SEARCH RELAYS SOURCE FROM MYSTIC-LINES MOTOR UNIT DISCS ON DIAG. H-42

THRU WIPER (26) GREEN ZONE WINNERS DOUBLE TRIPLE SCORING FEED ON DIAG. C-35

THRU WIPERS (27) BLUE ZONE WINNERS DOUBLE TRIPLE SCORING FEED ON DIAG. C-34

THRU WIPERS (28) GREEN 4-IN-ZONE WINNERS SOURCE ON DIAG. I-34

THRU WIPERS (29) BLUE 4-IN-ZONE WINNERS SOURCE ON DIAG. E-33

ALL WINNER SCORING FEED TO SEARCH INDEX COIL ON DIAG. C-30

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

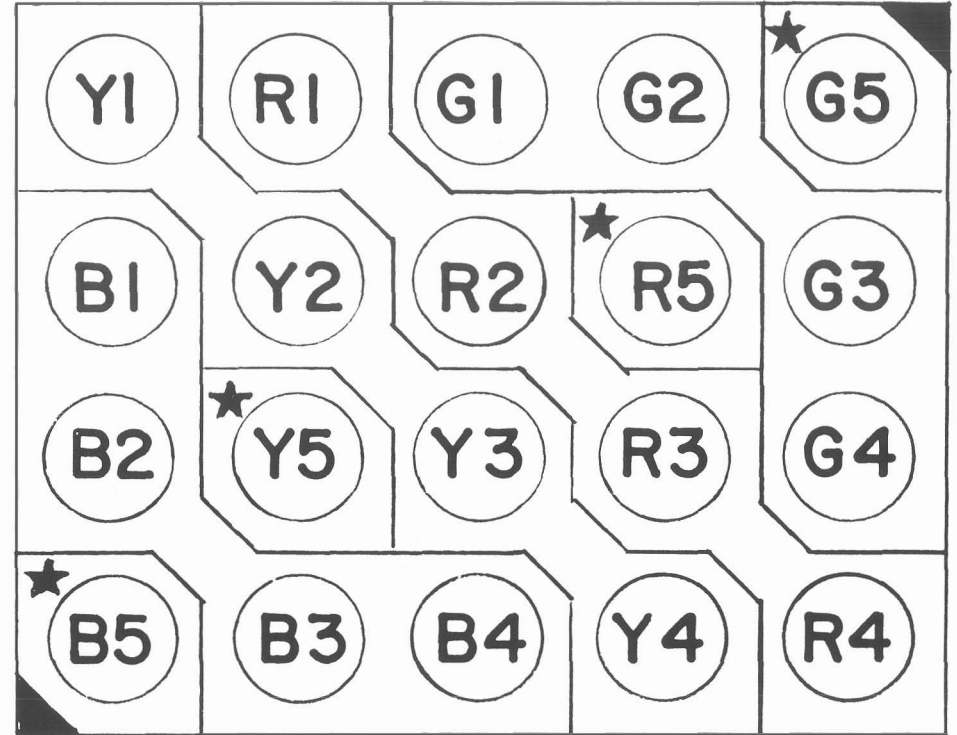
Green Zone Winners

Blue Zone Winners

Red Zone Winners

Yellow Zone Winners

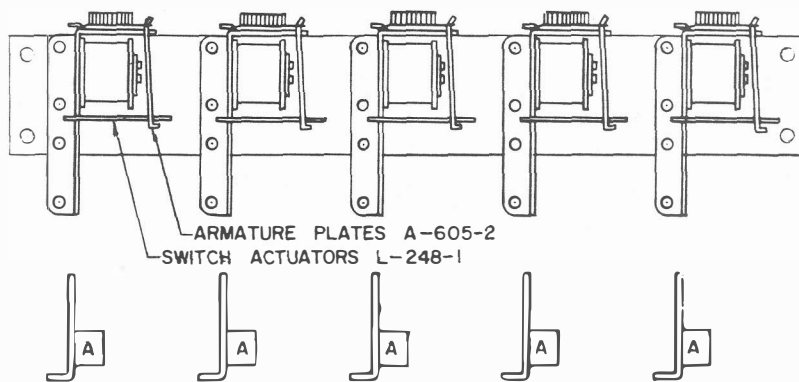
MYSTIC LINES LAYOUT



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

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					
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 PICTORIAL VIEW ABOVE

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
#5 SEARCH RELAY COIL	J-44	50-14 18-5	White Red-Black	Energized thru search disc circuit, from panel hole switches and mystic lines motor unit discs.
A N.O.	E-31	61-3 23-8	Brown-Red Blue-Yellow	Completes yellow, red, blue green 5 in zone winner scoring circuits.
#4 SEARCH RELAY COIL	J-43	50-14 15-3	White Red-White	Energized thru search disc circuits from panel hole switches and mystic lines motor unit discs.
A N.O.	E-31	74 23-8	Orange-Green Blue-Yellow	Completes all 4 star zone 300-600 and yellow, red, blue green 4 in zone - 5 in zone winner scoring circuits.
#3 SEARCH RELAY COIL	J-42	50-14 60-4	White Brown	Energized thru search disc circuits from panel hole switches and mystic lines motor unit discs.
A N.O.	F-31	31-11 36-11	Yellow-Red Yellow-Brown	Completes all 4 star zone 300-600, any 3 star zone red letter game, and yellow, red, blue, green 3 in zone - 4 in zone - 5 in zone winner scoring circuits.
#2 SEARCH RELAY COIL	J-42	50-14 65-7	White Brown-White	Energized thru search disc circuits from panel hole switches and mystic lines motor unit discs.
A N.O.	F-31	38-11 36-11	Yellow-Black Yellow-Brown	Completes all 4 star zone 300-600, any 3 star zone, any 2 star zone red letter game, and yellow, red, blue, green 3 in zone - 4 in zone - 5 in zone winner scoring circuits.
#1 SEARCH RELAY COIL	J-42	50-14 20-5	White- Blue	Energized thru search disc circuits from panel hole switches and mystic lines motor unit discs.
A N.O.	F-31	40-5 38-11	Green Yellow-Black	Same function as switch A on #2 search relay.

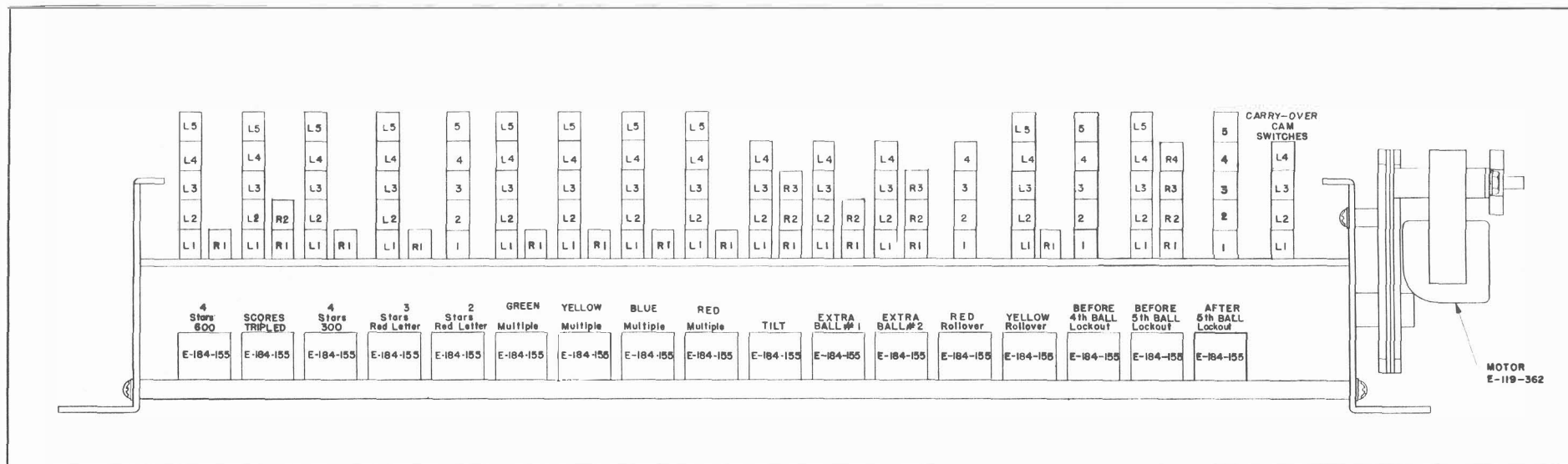
MISCELLANEOUS RELAYS SWITCH CHART

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
BALL DETECTOR RELAY COIL	A-13	70 41-4	Orange Green-Red	Energized thru ball count circuit, de-energized after each ball lifter cycle.
A N.O.	E-12	41-4 58-13	Green-Red White-Black	Completes regular and extra ball circuits to ball lifter motor.
B N.O.	F-13	51-3 41-4	White-Red Green-Red	Completes lock in circuit to this relay.
C N.C.	F-11	21-3 93-17	Blue-Red Gray-Yellow	Completes a circuit to tilt relay thru ball lifter cam switch 2B, if lifter motor cycles when relay de-energized.
"R" BUTTON RELAY COIL	A-13	70 52-9	Orange White-Blue	Energized by "R" button switch thru 3 and 4 triple play winner circuit, direct thru 5 ball T.P. winner circuit or by "R" button switch regular game winner search circuit, after shooting 4th ball.
A N.O.	F-9	21-3 54-11	Blue-Red White-Green	Completes a timer unit reset circuit.
B N.O.	D-35	60-1 57-1	Brown White-Orange	Completes any 3 - any 2 star zones red letter game winner search circuit to red letter win relays.
LIFTER START RELAY COIL	A-37	38-8 70	Yellow-Black Orange	Energized thru ball runway switch circuit. De-energized when each ball is shot.
A N.O.	C-37	36 38-8	Yellow-Brown Yellow-Black	Completes lock in circuit to this relay.
B N.C.	E-10	10-13 15-6	Red Red-White	Completes ball count circuits to select before 5th and select after 5th ball lockout relays, when relay de-energized.
C N.C.	D-12	58-13 31-3	White-Black Yellow-Red	Completes ball count circuits to ball lifter motor, when relay de-energized.
D N.C.	C-44	51-17 75-15	White-Red Orange-White	Completes 3 and 4 ball triple play winner circuit to gold button relay if gold button not pressed when shooting for 4 and 5 ball T.P. winner
CAM #7 RELAY COIL	A-29	70 90-5	Orange Gray	Energized thru C.U. cam switch 7E during each play cycle.
A N.O.	F-16	21-3 25-5	Blue-Red Blue-White	Thru regular score control circuits, energizes mixer #4 relay.
B N.O.	D-37	21-3 43-14	Blue-Red Green-Yellow	Thru play features relay circuit, energizes feature lock relay. Thru play scores relay circuit, energizes scores lock relay.
C N.O.	G-16	21-3 14-8	Blue-Red Red-Green	Thru feature control circuits, energizes mixer #2 relay.
D N.O.	B-40	38-9 41-10	Yellow-Black Green-Red	Thru triple play control circuit, energizes triple play reflex relay.
E N.O.	B-54	13-11 65-17	Red-Yellow Brown-White	Thru blue and green score control circuits, energizes 1st and 2nd extra step relays.
F N.O.	B-53	58-10 48-17	White-Black Green-Black	Thru red score control circuits, energizes 1st and 2nd extra step relay.
G N.O.	B-51	95-11 20-18	Gray-White Blue	Thru yellow score control circuit, energizes 1st and 2nd extra step relays.

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
1ST EXTRA STEP RELAY COIL	A-52	71-13 31-5	Orange-Red Yellow-Red	Energized thru regular game score control circuits.
A N.O.	A-52	36-16 31-5	Yellow-Brown Yellow-Red	Completes lock in circuit to this relay.
B N.O.	E-46	81-11 60-18	Black-Red Brown	Thru C.U. cam switch 7YB, completes control circuits for regular game scores advance and multiple score feature relays.
2ND EXTRA STEP RELAY COIL	A-55	71-13 45-16	Orange-Red Green-White	Energized thru regular game score control circuits.
A N.O.	A-55	36-16 45-16	Yellow-Brown Green-White	Completes lock in circuit to this relay.
B N.O.	E-46	81-11 25-16	Black-Red Blue-White	Thru C.U. cam switches 7YB and 8ZA, completes control circuits for regular game scores advance and multiple scores feature relays.
MULTIPLE WIN #1 RELAY COIL	A-31	70 78-9	Orange Orange-Black	Energized thru regular game scores winner circuit to score double and triple winners. Also thru triple play winner circuit to score 5 ball T.P. winner.
A N.C.	A-31	80-16 43-15	Black Green-Yellow	Opens multiplier unit homing circuit.
B N.C.	A-34	70- 90-1	Orange Gray	Opens regular and triple play replay winner scoring circuits thru C.U. multiplier cam switches, scoring circuits then function thru multiple disc.
C N.C.	A-34	90-1 70	Gray Orange	Same function as switch B.
MULTIPLE WIN #2 RELAY COIL	A-34	70 90-1	Orange Gray	Energized by C.U. multiplier cam switches thru regular game double and triple replay winner scoring circuits, and 5 ball triple play winner scoring circuit.
A N.O.	C-31	75-6 78-9	Orange-White Orange-Black	Completes a circuit to advance multiple unit.
"B" CAM RELAY COIL	A-14	80-20 70	Black Orange	Energized thru mystic lines feature disc circuit by "B" button switch.
A N.C.	C-15	25-6 30-20	Blue-White Yellow	Opens mystic lines feature disc "C" button circuit.
B N.C.	C-14	40-13 45-5	Green Green-White	Opens mystic lines feature disc "A" button circuit.
C N.C.	J-38	18-4 54-7	Red-Black White-Green	Opens search relays circuit.
"C" CAM RELAY COIL	A-14	30-20 70	Yellow Orange	Energized thru mystic lines feature disc circuit by "C" button switch.
A N.C.	B-14	13-5 40-13	Red-Yellow Green	Opens mystic lines feature disc "A" button circuit.
B N.C.	J-39	54-7 50-14	White-Green White	Opens search relays circuit.
C N.C.	C-14	80-20 48-5	Black Green-Black	Opens mystic lines feature disc "B" button circuit.

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
4 STARS - 600 RELAY COIL	B-24	48-11J 52-11	Green-Black White-Blue	Energized thru control and spotting disc circuit during red or green button play.
L1 N.C.	B-24	48-11 48-11J	Green-Black Green-Black	Opens circuit to this relay coil
L2 S.P.D.T.	G-7	71-15 30 63-13	Orange-Red Yellow Brown-Yellow	Directs circuit to all 4 stars 300 to 600 feature lite.
L3 S.P.D.T.	C-30	10-16 85-13 23-17	Red Black-White Blue-Yellow	Directs all 4 stars replay counter step up circuit during 300 or 600 winner scoring.
L4 N.O.	C-25	80-9 40-11	Black Green	Completes a circuit to all 4 stars 300 feature trip relay.
L5 N.O.	A-25	52-11 70	White-Blue Orange	Same function as switch L4.
R1 S.P.D.T.	E-30	98-18 81-20 83-13	Gray-Black Black-Red Black-Yellow	Directs all 4 stars 300 or 600 winner search and scoring circuit.

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
SCORES TRIPLED RELAY COIL	A-55	36-7J 71-13	Yellow-Brown Orange-Red	Energized thru control circuit during red or blue button play.
L1 N.C.	A-55	36-7 36-7J	Yellow-Brown Yellow-Brown	Opens circuit to this relay coil.
L2 N.C.	C-46	27-11 23-11	Blue-Orange Blue-Yellow	Opens a circuit to yellow, red, blue, green multiple feature relays.
L3 S.P.D.T.	A-33	78-2 50-16 74-13	Orange-Black White Orange-Green	Directs regular game scores replay counter unit step up circuit for double and triple scoring.
L4 S.P.D.T.	G-9	57-11 30 80-7	White-Orange Yellow Black	Directs circuit to lit color scores doubled or lit color scores tripled feature lite.
L5 S.P.D.T.	C-48	95-11 25-17 75-8	Gray-White Blue-White Orange-White	Directs yellow score and extra step relay circuits.
R1 N.C.	C-49	81-9 58-10	Black-Red Black-Black	Opens red score and extra step relay circuits.
R2 S.P.D.T.	C-51	13-11 15-19 0-4	Red-Yellow Red-White Gray	Opens blue and green score and extra step relay circuits.

CONTINUED ON NEXT PAGE

TRIP RELAY BANK CHART FOR POSITION OF SWITCHES REFER TO PICTORIAL VIEW ON PAGE 34

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
4 STARS- 300 RELAY COIL	B-25	40-11J 52-11	Green White-Blue	Energized thru control and spotting disc circuit during red or green button play. Also energized thru all 4 stars 600 relay circuit.
L1 N.C.	B-25	40-11 40-11J	Green Green	Opens circuit to this relay coil.
L2 N.C.	D-21	18-2 36-19	Red-Black Yellow-Brown	Opens a circuit for extra ball steps.
L3 N.C.	D-25	80-9 30	Black Yellow	Opens all 4 stars 600 relay circuit to this relay.
L4 N.O.	H-7	61-19 71-15	Brown-Red Orange-Red	Completes circuit to all 4 stars 300 feature lite.
L5 N.O.	E-30	81-20 23-8	Black-Red Blue-Yellow	Completes all 4 stars 300 to 600 winner search and scoring circuit.
R1 N.C.	B-19	74-7 51-4	Orange-Green White-Red	Opens a circuit for extra ball unit steps.
ANY 3 STARS RED LETTER RELAY COIL	A-24	51-11J 70	White-Red Orange	Energized thru control and spotting disc circuit. During red or green button play. Also energized thru 2 stars red letter feature relay circuit.
L1 N.C.	A-24	51-11 51-11J	White-Red White-Red	Opens circuit to this relay coil.
L2 N.C.	C-50	85-10 91-17	Black-White Gray-Red	Opens red score and extra step relay circuits.
L3 N.C.	D-24	38-2 30	Yellow-Black Yellow	Opens any 2 stars red letter feature relay circuit to this relay.
L4 N.O.	G-7	50-8 58-3	White White-Black	Completes circuit to any 3 stars red letter game feature lite.
L5 N.O.	E-35	74-11 98-16	Orange-Green Gray-Black	Completes winner search circuit to search index coil and red letter win relays for any 2 - any 3 star scoring.
R1 N.C.	D-27	10-18 95-15	Red Gray-White	Opens circuit to steering relay.
ANY 2 STARS RED LETTER RELAY COIL	A-24	61-10J 70	Brown-Red Orange	Energized thru control and spotting disc circuit during red or green button play.
1 N.C.	A-24	61-10 61-10J	Brown-Red Brown-Red	Opens circuit to this relay coil.
2 N.C.	C-49	83-4 85-10	Black-Yellow Black-White	Opens a red score and extra step relay circuits.
3 S.P.D.T.	H-7	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.
4 S.P.D.T.	F-35	31-11 74-11 36-11	Yellow-Red Orange-Green Yellow-Brown	Directs winner search circuit to search index coil and red letter win relays for any 3 - any 2 star scoring.
5 N.O.	C-24	38-2 51-11	Yellow-Black White-Red	Completes a circuit to any 3 star feature trip relay.

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
GREEN MULTIPLE RELAY COIL	A-47	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.	A-47	45-11 45-11J	Green-White Green-White	Opens circuit to this relay coil.
L2 N.C.	C-51	31-7 13-11	Yellow-Red Red-Yellow	Opens a blue & green score and extra step relay circuits.
L3 N.O.	A-16	23-4 63-9	Blue-Yellow Brown-Yellow	Completes a control circuit to mixer #4 relay.
L4 N.O.	G-20	27-14 30	Blue-Orange Yellow	Completes circuit to green multiple lite.
L5 N.O.	D-35	78-9 65-9	Orange-Black Brown-White	Completes circuit to multiple win relay #1 and multiple unit during green double - triple scoring.
R1 N.C.	F-49	15-11 81-11	Red-White Black-Red	Opens a regular game score advance, score multiple features and extra step relay circuit.
YELLOW MULTIPLE RELAY COIL	A-46	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.	A-46	38-17 38-17J	Yellow-Black Yellow-Black	Opens circuit to this relay coil.
L2 N.C.	C-48	95-11 75-8	Gray-White Orange-White	Opens a yellow score and extra step relay circuit.
L3 N.O.	B-17	23-4 14-11	Blue-Yellow Red-Green	Completes a control circuit to mixer #4 relay.
L4 N.O.	G-13	52-10 30	White-Blue Yellow	Completes circuit to yellow multiple lite.
L5 N.O.	C-31	78-9 80-6	Orange-Black Black	Completes circuit to multiple win relay #1 and multiple unit during yellow double - triple scoring.
R1 N.C.	F-47	60-16 10-15	Brown Red	Opens a regular game score advance, score multiple features and extra step relay circuit.
BLUE MULTIPLE RELAY COIL	A-47	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.	A-47	43-11 43-11J	Green-Yellow Green-Yellow	Opens circuit to this relay coil.
L2 N.C.	C-51	90-4 31-7	Gray Yellow-Red	Opens a blue and green score and extra step relay circuit.
L3 N.O.	B-16	23-4 58-2	Blue-Yellow White-Black	Completes a control circuit to mixer #4 relay.
L4 N.O.	G-19	74-10 30	Orange-Green Yellow	Completes circuit to blue multiple lite.
L5 N.O.	D-34	78-9 52-8	Orange-Black White-Blue	Completes circuit to multiple win relay #1 and multiple unit during blue double - triple scoring.
R1 N.C.	F-48	14-7 15-11	Red-Green Red-White	Opens a regular game score advance, score multiple features and extra step relay circuit.

CONTINUED ON NEXT PAGE

TRIP RELAY BANK CHART FOR POSITION OF SWITCHES REFER TO PICTORIAL VIEW ON PAGE 34

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
RED ROLLOVER RELAY COIL	A-37	25-13] A-37	Blue-White Orange	Energized thru selection feature disc circuit by red rollover button, or direct thru selection feature disc circuit.
1 N.C.	A-37	25-13 25-13]	Blue-White Blue-White	Opens circuit to this relay coil.
2 S.P.D.T.	H-4	51-12 90 52-13	White-Red Gray White-Blue	Directs circuit to flash mystic lines press buttons now lite before shooting 4th, 5th or 6th ball.
3 S.P.D.T.	G-5	31-8 10-11 53-12	Yellow-Red Red White-Yellow	Directs circuit to press buttons before shooting 4th, 5th or after 5th ball feature lite.
4 N.O.	E-13	93-3 21-12	Gray-Yellow Blue-Red	Completes circuit to move mystic lines until 6th ball is shot.
YELLOW ROLLOVER RELAY COIL	A-36	38-13] 70	Yellow-Black Orange	Energized thru selection feature disc circuit by yellow rollover button, or direct thru selection feature disc circuits.
L1 N.C.	A-36	38-13 38-13]	Yellow-Black Yellow-Black	Opens circuit to this relay coil.
L2 N.C.	F-47	60-16 90-11	Brown Gray	Opens a control circuit for regular game scores advance, multiple score feature and scores tripled feature.
L3 S.P.D.T.	H-4	75-18 51-12 23-5	Orange-White White-Red Blue-Yellow	Directs circuit to flash mystic lines press buttons now lite before shooting 4th or 5th ball.
L4 S.P.D.T.	H-5	57-5 31-8 74-8	White-Orange Yellow-Red Orange-Green	Directs circuit to press buttons before shooting 4th or 5th ball feature lites.
L5 N.O.	F-13	93-3 98-3	Gray-Yellow Gray-Black	Completes circuit to move mystic lines until 5th ball is shot.
R1 N.C.	A-22	40-18 48-10	Green Green-Black	Opens a control circuit for selection feature unit advance.
BEFORE 4TH BALL LOCKOUT RELAY COIL	A-10	83-6] 70	Black-Yellow Orange	Energized thru timer disc ball count circuit when 4th ball is shot.
1 N.C.	A-10	83-6 83-6]	Black-Yellow Black-Yellow	Opens circuit to this relay coil.
2 N.C.	H-4	27-4 75-18	Blue-Orange Orange-White	Opens before shooting 4th ball mystic lines press button now lite flash circuit.
3 S.P.D.T.	E-13	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 relay and search wiper lock magnet.
4 N.O.	F-8	36-2 43-2	Yellow-Brown Green-Yellow	Completes circuit to advance timer unit from 4th to 5th step.
5 N.O.	F-30	15-5 40-5	Red-White Green	Completes winner search and scoring circuit for regular game color zone and star zone winners.

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
BEFORE 5TH BALL LOCKOUT RELAY COIL	A-10	74-6] 70	Orange-Green Orange	Energized thru timer disc ball count circuit when 5th ball is shot.
L1 N.C.	H-6	52-12 56-12	White-Blue White-Brown	Opens yellow rollover panel lite circuit.
L2 N.C.	D-36	13-12 38-13	Red-Yellow Yellow-Black	Opens selection feature disc circuits to yellow rollover trip relay.
L3 N.C.	E-13	98-3 21-12	Gray-Black Blue-Red	Opens before 5th ball circuit to move mystic lines.
L4 N.O.	E-9	54-11 71-8	White-Green Orange-Red	Completes "R" button relay circuit to reset timer unit.
L5 N.O.	C-8	78-6 27-2	Orange-Black Blue-Orange	Completes circuit to advance time unit from 5th thru 8th step.
R1 N.C.	A-10	74-6 74-6]	Orange-Green Orange-Green	Opens circuit to this relay coil.
R2 S.P.D.T.	J-4	14-18 48-12 53-2	Red-Green Green-Black White-Yellow	Directs circuit to flash mystic lines press buttons now lite before shooting 4th, 5th or 6th ball.
R3 N.O.	B-11	10-6 25-8	Red Blue-White	Completes yellow button play circuit to extra ball trip relays #1 & #2.
R4 N.O.	F-4	50-2 18-6	White Red-Black	Completes yellow button play circuit to start relay when playing replays.
RED MULTIPLE RELAY COIL	A-46	41-11] 71-13	Green-Red Orange-Red	Energized thru score control circuit during red or blue button play. Also thru red letter game winner circuit.
L1 N.C.	A-46	41-11 41-11]	Green-Red Green-Red	Opens circuit to this relay coil.
L2 N.C.	C-48	83-4 58-10	Black-Yellow White-Black	Opens a red score and extra step relay circuit.
L3 N.O.	B-18	23-4 95-7	Blue-Yellow Gray-White	Completes a control circuit to mixer #4 relay.
L4 N.O.	G-15	75-10 30	Orange-White Yellow	Completes circuit to red multiple lite.
L5 N.O.	D-33	78-9 43-9	Orange-Black Green-Yellow	Completes circuit to multiple win relay #1 and multiple unit during red double - triple scoring.
R1 N.C.	F-48	10-15 14-7	Red Red-Green	Opens a regular game score advance, score multiple features and extra step relay circuit.
TILT RELAY COIL	A-10	14-5 70	Red-Green Orange	Energized thru inertia tilt and plumb bob tilt circuits. Also thru coin anti cheat, ball lift anti cheat or key switch circuits.
L1 N.C.	F-13	40-8 93-3	Green Gray-Yellow	Opens circuit to search wiper lock magnet, "R" - button relay, mystic lines unit motors, and gold button relay.
L2 N.C.	J-34	10-1 51-19	Red White-Red	Opens 17 volt circuit.
L3 S.P.D.T.	G-7	21-3 30 45-8	Blue-Red Yellow Green-White	Opens circuit to this relay, 50 volt game feature, winner, playing circuits, and completes a shutter motor circuit to close shutter.
L4 S.P.D.T.	J-33	36-17 54-2 91-2	Yellow-Brown White-Green Gray-Red	Opens 6 volt circuit, and completes circuit to tilt lite.
R1 N.C.	F-1	60(P) 30(P)	Brown(Plastics) Yellow (Plastics)	Opens circuit to control unit and mixer spotting unit motors.
R2 N.O.	D-11	57-6 85-7	White-Orange Black-White	Completes a circuit to red button relay.
R3 N.O.	B-4	83-3 13-16	Black-Yellow Red-Yellow	Completes safety circuit to start relay.

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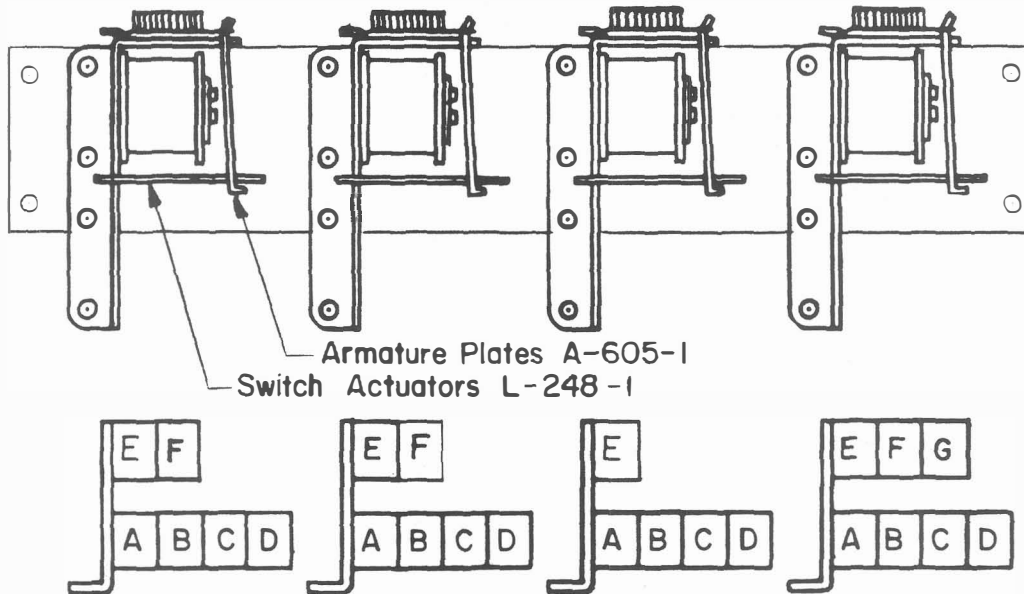
TRIP RELAY BANK CHART FOR POSITION OF SWITCHES REFER TO PICTORIAL VIEW ON PAGE 34

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
EXTRA BALL #1 RELAY COIL	A-11	10-6J 70	Red Orange	Energized thru yellow button circuit after 5th ball is shot.
L1	N.C.	C-21 91-6 85-4	Gray-Red Black-White	Opens pull in circuit to anti-cheat relay.
L2	S.P.D.T.	G-21 85-4 30 95-20	Black-White Yellow Gray-White	In series with switch L1 circuit. Also opens mystic lines, selection, twin no. features and T.P. score advance circuit, and completes extra ball feature unit advance circuit.
L3	S.P.D.T.	F-21 90-11 56-6 45-2	Gray White-Brown Green-White	Opens regular game score unit advance and multiple score features circuit, and completes extra ball feature unit advance circuit.
L4	N.O.	C-8 83-1 71-8	Black-Yellow Orange-Red	Completes a circuit to reset time unit.
R1	N.C.	E-15 25-5 41-17	Blue-White Green-Red	Opens a control circuit to mixer #4 relay.
R2	N.O.	G-32 50-9 23-6	White Blue-Yellow	Completes circuit to extra balls feature lite.
EXTRA BALL #2 RELAY COIL	A-11	10-6J 70	Red Orange	Energized thru yellow button circuit after 5th ball is shot.
L1	N.C.	A-11 10-6 10-6J	Red Red	Opens circuit to this relay coil and extra ball #1 relay coil.
L2	N.C.	C-11 20-2 85-7	Blue Black-White	Opens safety lock in circuit to red button relay.
L3	S.P.D.T.	B-6 14-3 61 98-2	Red-Green Brown-Red Gray-Black	Directs circuit from shutter motor to mixer latch and timer cams index coils during E.B. play.
L4	N.O.	B-12 91-1 38-3	Gray-Red Yellow-Black	Completes extra balls feature circuit to ball lifter motor.
R1	N.C.	G-6 31-16 81-6	Yellow-Red Black-Red	Opens spotting disc circuits to flash other game feature lites.
R2	N.C.	D-22 83-9 50-5	Black-Yellow White	Opens spotting disc control circuits for other game features.
R3	S.P.D.T.	G-22 15-17 13-4 78-19	Red-White Red-Yellow Orange-Black	Opens spotting disc circuits to flash regular game score and triple play score lites, and completes circuits to flash extra ball lites.

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
AFTER 5TH BALL LOCKOUT RELAY COIL	A-10	98-11J 70	Gray-Black Orange	Energized thru ball count circuit when 6th ball, 1st extra ball is shot.
1	N.C.	A-10 98-11 98-11J	Gray-Black Gray-Black	Opens circuit to this relay coil.
2	N.C.	E-13 21-12 14-4	Blue-Red Red-Green	Opens after 5th ball circuit to move mystic lines.
3	N.C.	C-36 15-12 25-13	Red-White Blue-White	Opens selection feature disc circuits to red rollover trip relay.
4	N.C.	H-4 53-2 52-13	White-Yellow White-Blue	Opens after 5th ball circuit to flash mystic lines press buttons now lite.
5	N.C.	H-6 41-8 60-12	Green-Red Brown	Opens red rollover panel lite circuit.
CARRY OVER CAM 1	N.O.	B-9 30 90-20	Yellow Gray	Completes trip bank reset motor carry over circuit.
CARRY OVER CAM 2	N.C.	E-35 98-16 60-1	Gray-Black Brown	Opens red letter game winner circuit during bank reset cycle.
CARRY OVER CAM 3	N.C.	H-22 74-9 78-19	Orange-Green Orange-Black	Opens spotting disc extra ball lite flash circuit during bank reset cycle.
CARRY OVER CAM 4	N.C.	E-20 95-20 61-2	Gray-White Brown-Red	Opens extra ball guaranteed advance circuit during bank reset cycle.

4 RELAY BANK PICTORIAL VIEW

LETTERS CORRESPOND TO SWITCH CHART ON PAGE 39



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				
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

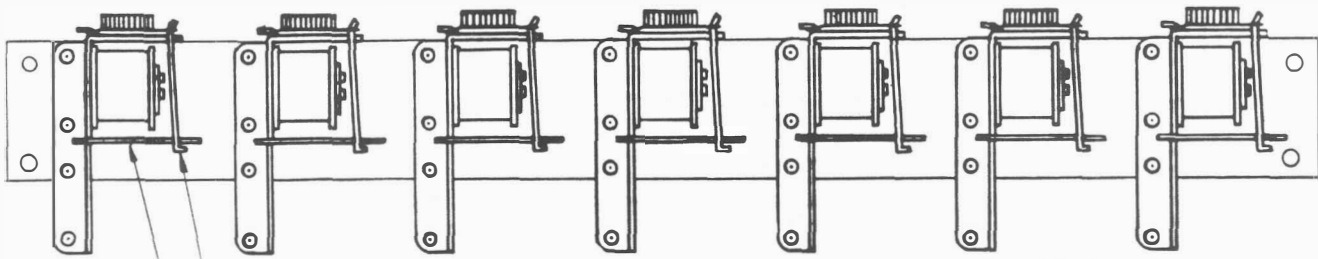
4 RELAY BANK SWITCH CHART FOR POSITION OF SWITCHES REFER TO PICTORIAL VIEW ON PAGE 38

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
REPLAY RESET RELAY COIL	A-3	75-2 70	Orange-White Orange	Energized by anti cheat relay circuit thru replay register unit zero switch.
A N.O.				Not used
B N.C.	B-29	30 93-20	Yellow Gray-Yellow	Opens key circuit to advance replay register unit and key plays meter.
C S.P.D.T.	B-3	90-5 98-5 53-7	Gray Gray-Black White-Yellow	Directs single replay register unit reset circuit thru C.U. cam switch 7E, or multiple reset circuit thru M & S 16 pulse cam switch 5A.
D N.O.	F-3	75-2 56-2	Orange-White White-Brown	Completes lock in circuit to this relay. Also in series with replay register multiple reset circuit.
E N.O.	F-1	20(P) 60(P)	Blue(Plastic) Brown(Plastic)	Completes a circuit to control unit and mixer spotting unit motor.
F N.C.	D-4	10-5 95-3	Red Gray-White	Opens start relay circuit.
START RELAY COIL	A-4	98-20 70	Gray-Black Orange	Energized thru 5¢ and 25¢ coin circuits, or thru red, green, blue, white, yellow replay button circuits, when replays are on register.
A N.C.	A-19	75-4 78	Orange-White Orange-Black	Opens extra ball unit multiple advance circuit.
B N.C.	C-23	18-16 95-9	Red-Black Gray-White	Opens control circuit to all regular game features advance and feature trip relays.
C N.O.	E-6	13-16 48-2	Red-Yellow Green-Black	Completes lock in circuit to this relay. Also in series with switch D circuit.
D N.O.	D-6	10-10 13-16	Red Red-Yellow	Completes circuits thru shutter motor cam switch 5A to open shutter and energize timer cams and mixer latch coils.
E N.C.	D-36	56-4 38-15	White-Brown Yellow-Black	Opens lock in circuit to red letter win relays #1 and #2.
F N.C.	B-15	21-3 14-9	Blue-Red Red-Green	Opens lock in circuit to mixer cam #2 relay.

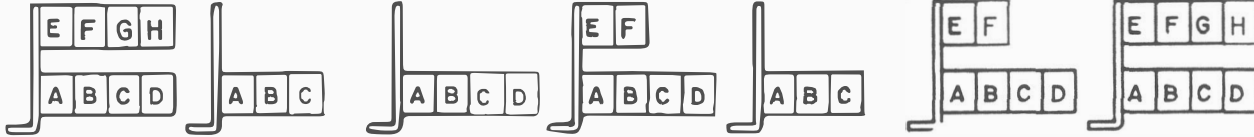
SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
25¢ RELAY COIL	A-7	15-13 70	Red-White Orange	Energized thru 25¢ coin circuit.
A S.P.D.T.	B-28	41-14 75-9 36-13	Green-Red Orange-White Yellow-Brown	Directs winner or 25¢ credit replay register unit advance circuit.
B N.O.	F-7	15-13 25-9	Red-White Blue-White	Completes lock in circuit to this relay.
C N.O.	E-6	10-5 90-2	Red Gray	Completes a circuit to start relay.
D N.C.	B-3	45-9 98-5	Green-White Gray-Black	Opens relay register unit reset circuit.
E N.C.	A-5	83-16 80-2	Black-Yellow Black	(When single coin meter is used) opens circuit to meter.
ANTI-CHEAT RELAY COIL	A-21	78-4 70	Orange-Black Orange	Energized thru C.U. cam switch 5B circuit or thru key switch circuit. Stays energized unless power interrupted.
A S.P.D.T.	F-4	75-2 56-2 50-2	Orange-White White-Brown White	Opens replay buttons circuit to start relay and completes circuit to replay reset relay, when relay drops out.
B N.O.	H-34	51-19 80-1	White-Red Black	Opens 17 volt circuit, when relay drops out.
C N.O.	B-20	30 78-4	Yellow Orange-Black	Completes lock in circuit to this relay, when energized.
D N.C.	G-6	14-4 30	Red-Green Yellow	Completes a shutter motor circuit to close shutter when relay drops out while shutter is open.
E N.O.	J-44	45-21 58-8	Green-White White-Black	Opens 18 volt triple play module circuits, when relay drops out.
F N.C.	E-11	57-6 85-7	White-Orange Black-White	Completes a circuit to red button relay, when relay drops out.
G S.P.D.T.	J-32	91-2 36-17 40	Gray-Red Yellow-Brown Green	Opens 6 volt lite circuits and completes a circuit to tilt lite, when relay drops out.

(TOP) 7 RELAY BANK PICTORIAL VIEW

LETTERS CORRESPOND TO SWITCH CHART ON PAGE 41



ARMATURE PLATES A-605-1 (EXCEPT MIXER #2 & MIXER #4 RELAYS A-605-2)
SWITCH ACTUATORS L-248-1



Name	MIXER CAM SW.#2	MIXER # 2	MIXER # 4	PLAY FEATURES	FEATURES LOCK	PLAY SCORES	SCORES LOCK
Coil turns & wire gauge	2300 # 33	2500 # 33	2500 # 33	2300 #33	2300 # 33	2300 # 33	2300 # 33
Coil resistance (nominal)	85 OHMS	100 OHMS	100 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							
Coil No.	C-7800-331	C-7800-332	C-7800-332	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

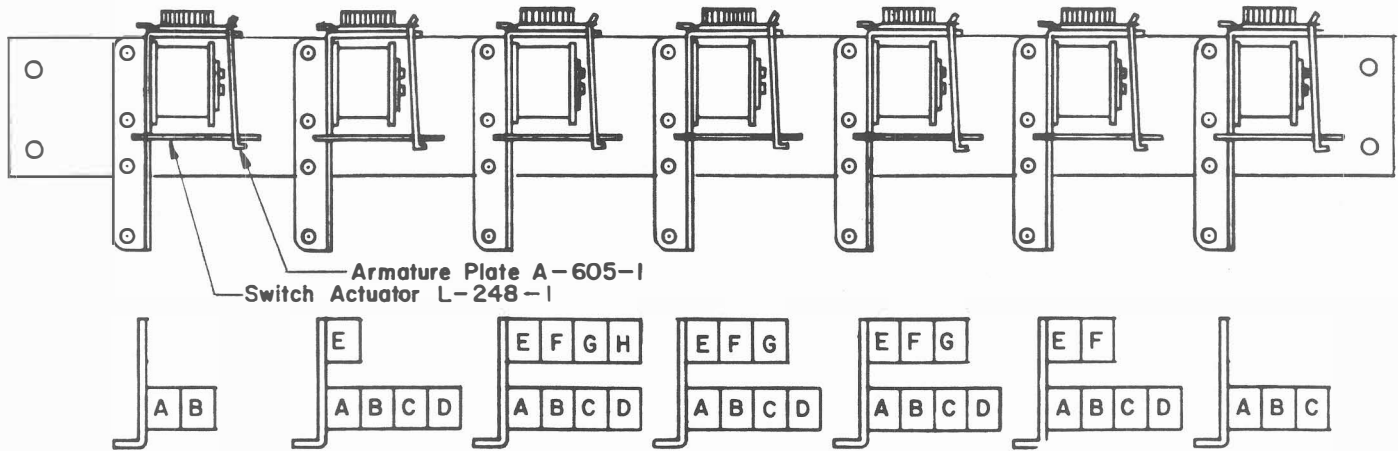
(TOP) 7 RELAY BANK SWITCH CHART FOR POSITION OF SWITCHES REFER TO PICTORIAL VIEW ON PAGE 40

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
MIXER CAM#2 RELAY COIL	A-15	70 93-11	Orange Gray-Yellow	Energized during play cycles by control unit cam switch 8XA, when circuit complete thru mixer cam 2A switch.
A N.O.	A-15	14-9 93-11	Red-Green Gray-Yellow	Completes lock in circuit to this relay.
B N.O.	B-49	81-9 58-10	Black-Red White-Black	Completes control circuit thru C.U. alternator cam switch 9XA for red score advance.
C N.O.	E-27	21-17 10-18	Blue-Red Red	Completes twin no. feature disc control circuit to steering relay.
D N.O.	D-55	83-12 98-14	Black-Yellow Gray-Black	Completes control circuit thru C.U. cam switch 2A to scores tripled feature trip relay.
E N.C.	A-25	20-11 70	Blue Orange	Opens a control circuit to all 4 stars 300 and 600 feature trip relays.
F N.C.	B-27	71-18 40-19	Orange-Red Green	Opens a control circuit for twin no. feature advance.
G S.P.D.T.	C-46	25-11 18-8 27-11	Blue-White Red-Black Blue-Orange	Directs control circuits for regular game scores advance and score multiple feature trip relays.
H N.O.	A-51	31-5 15-9	Yellow-Red Red-White	Completes a control circuit to extra step relays.
MIXER #2 RELAY COIL	A-19	70 27-7	Orange Blue-Orange	Energized by cam #7 relay switch thru control circuit during play cycles.
A N.O.	D-18	13-3 27-7	Red-Yellow Blue-Orange	Completes lock in circuit to this relay.
B N.O.	C-47	85-4 54-12	Black-White White-Green	Completes regular game scores advance circuits thru C.U. cam switches 7A and 8E.
C N.O.	E-21	56-6 75-5	White-Brown Orange-White	Completes control circuits for regular game scores advance scores multiple feature and scores tripled feature during regular play cycles extra ball feature advance during E.B. play cycles.
MIXER #4 RELAY COIL	A-17	70 23-4	Orange Blue-Yellow	Energized by cam #7 relay switch thru control circuit during play cycles.
A N.O.	A-15	18-7 23-4	Red-Black Blue-Yellow	Completes lock in circuit to this relay.
B N.C.	D-21	36-19 51-5	Yellow-Brown White-Red	Opens control circuit for extra ball feature advance.
C N.C.	C-55	20-8 56-7	Blue White-Brown	Opens control circuit to scores tripled feature trip relay.
D N.C.	E-22	48-20 43-16	Green-Black Green-Yellow	Opens control circuit to all regular game features advance and feature trip relays.
PLAY FEATURES RELAY COIL	A-38	31-15 61-13	Yellow-Red Brown-Red	Energized thru green play features button circuit also thru triple play relay circuit.
A N.O.	C-37	43-14 53-14	Green-Yellow White-Yellow	Completes features lock relay circuit thru cam #7 relay switch.
B N.O.	B-38	61-13 81-13	Brown-Red Black-Red	Completes lock in circuit to this relay.
C N.O.				Not used.
D N.C.	G-21	74-15 15-17	Orange-Green Red-White	Opens spotting disc regular game scores and scores multiple feature lites flash circuit.
E S.P.D.T.	H-26	95-2 14-21 23-15	Gray-White Red-Green Blue-Yellow	Directs circuit to red button, blue button or green button play lite.
F N.C.	A-46	70 71-13	Orange Orange-Red	Opens circuit for all regular game scores advance, scores multiple and score tripled features.

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
FEATURE LOCK RELAY COIL	A-37	31-15 53-14	Yellow-Red White-Yellow	Energized by cam #7 relay switch thru play features relay circuit.
A N.O.	B-37	40-15 53-14	Green White-Yellow	Completes lock in circuit to this relay.
B N.O.	C-23	45-6 90-13	Green-White Gray	Completes added spotting disc circuits for all regular game feature advance and feature trip relays.
C N.C.	F-15	52-17 41-17	White-Blue Green-Red	Opens a control circuit to mixer #4 relay.
PLAY SCORES RELAY COIL	A-39	31-15 85-15	Yellow-Red Black-White	Energized thru blue play scores button circuit. Also thru triple play relay circuit.
A N.O.	B-38	57-13 85-15	White-Orange Black-White	Completes lock in circuit to this relay.
B N.O.	C-46	10-17 20-6	Red Blue	Completes regular game scores advance circuit thru C.U. cam switch 8F.
C N.O.	C-37	43-14 93-14	Green-Yellow Gray-Yellow	Completes scores lock relay circuit thru cam #7 relay switch.
D N.C.	H-6	56-15 31-16	White-Brown Yellow-Red	Opens spotting disc regular game features lite flash circuit.
E S.P.D.T.	H-26	25-15 95-2 21-15	Blue-White Gray-White Blue-Red	Directs circuit to red button or blue button play lite.
F S.P.D.T.	D-17	36-4 27-7 41-6	Yellow-Brown Blue-Orange Green-Red	Directs selection feature disc control circuits to mixer #2 relay.
SCORES LOCK RELAY COIL	A-37	31-15 93-14	Yellow-Red Gray-Yellow	Energized by cam #7 relay switch thru play scores relay circuit.
A N.O.	B-38	40-15 93-14	Green Gray-Yellow	Completes lock in circuit to this relay.
B N.O.	E-49	38-5 65-16	Yellow-Black Brown-White	Completes added spotting disc circuits for regular game scores advance and scores multiple feature trip relays.
C N.O.				Not used.
D N.O.	E-49	18-14 31-18	Red-Black Yellow-Red	Same function as switch B.
E N.O.	E-49	58-11 14-6	White-Black Red-Green	Same function as switch B.
F N.O.	F-46	81-11 53-15	Black-Red White-Yellow	Completes a control circuit thru C.U. cam switch 8B for regular game scores advance and score multiple feature trip relay.
G N.C.	E-23	83-9 48-20	Black-Yellow Green-Black	Opens control circuit for all regular game features advance and feature trip relays.
H S.P.D.T.	A-51	52-7 10-12 15-9	White-Blue Red Red-White	Directs regular game score disc control circuits to 1st and 2nd extra step relays.

(BOTTOM) 7 RELAY BANK PICTORIAL VIEW

LETTERS CORRESPOND TO SWITCH CHART ON PAGE 43



Name	Z	GOLD	STEERING	TRIPLE PLAY	RED LETTER WIN # 1	RED LETTER WIN # 2	RED BUTTON
Coil turns & wire gauge	1800 # 33	1800 # 33	2300 # 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							
Coil No.	C-7800-334	C-7800-334	C-7800-331	C-7800-334	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

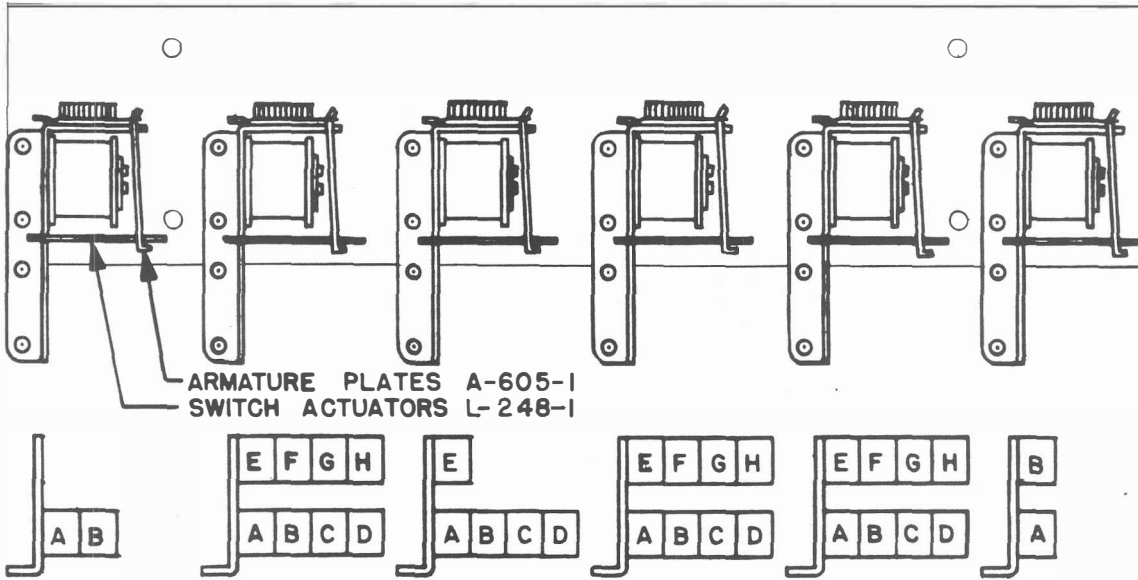
(BOTTOM) 7 RELAY BANK SWITCH CHART FOR POSITION OF SWITCHES REFER TO PICTORIAL VIEW ON PAGE 42

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
Z RELAY COIL	A-45	70 83-21	Orange Black-Yellow	Energized thru triple play winner search circuit when any T.P. winner is scored.
A S.P.D.T.	A-32	50-16 90-1 74-13	White Gray Orange-Green	Opens regular game scores replay counter step up circuits for double & triple winners, and completes triple play replay counter step up circuit for 5 ball T.P. winners only.
B N.O.	D-45	83-21 53-16	Black-Yellow White-Yellow	Completes triple play replay counter step up circuit for all T.P. winner scoring.
GOLD RELAY COIL	A-44	70 75-15	Orange Orange-White	Energized thru triple play winner circuit by gold button switch or lifter start relay switch.
A N.O.	C-44	51-17 75-15	White-Red Orange-White	Completes lock in circuit to this relay.
B N.O.	H-32	60-19 57-19	Brown White-Orange	Completes triple play win relay circuit to flash colored symbol lite for 4th and 5th ball T.P. scoring.
C N.O.	G-9	21-3 80-11	Blue-Red Black	Thru timer disc, completes a timer unit reset circuit.
D N.C.	H-30	52-16 91-12	White-Blue Gray-Red	Opens triple play win relay circuit to collect or shoot next ball (4th-5th) for triple or nothing lite.
E N.C.	D-13	53-18 85-16	White-Yellow Black-White	Opens 3 and 4 ball triple play "R" button winner collect circuit.
STEERING RELAY COIL	A-28	70 95-15	Orange Gray-White	Energized thru twin no. selector feature disc control circuit.
A N.O.	E-28	41-20 95-15	Green-Red Gray-White	Completes lock in circuit to this relay.
B N.O.	A-22	57-17 48-10	White-Orange Green-Black	Completes a control circuit for selection feature advance.
C N.O.	G-46	40-17 60-16	Green Brown	Completes a control circuit for regular game scores advance scores multiple and scores tripled features.
D N.O.	H-43	85-14 51-1	Black-White White-Red	Completes a circuit thru twin no. selector disc to lites and scoring components for #17 - #18 twin no. feature.
E S.P.D.T.	H-28	98-10 18-11 10-14	Gray-Black Red-Black Red	Directs circuit thru twin no. selector disc to 11-19 or 17-18 twin no. feature lite.
F S.P.D.T.	H-29	63-18 78-11 45-20	Brown-Yellow Orange-Black Green-White	Directs circuit thru twin no. selector disc to 17-18 or 11-19 twin no. feature lite.
G N.C.	H-44	93-16 52-1	Gray-Yellow White-Blue	Opens a circuit thru twin no. selector disc to lites and scoring components for #11 - #19 twin no. feature.
H N.C.	A-25	20-11 70	Blue Orange	Opens a control circuit for all 4 star 300-600 features.
TRIPLE PLAY RELAY COIL	A-39	31-15 60-14	Yellow-Red Brown	Energized thru white play triple button circuit.
A N.O.	B-39	43-18 60-14	Green-Yellow Brown	Completes lock in circuit to this relay.
B N.O.	A-41	45-15 56-16	Green-White White-Brown	Completes all circuits to advance triple play scores.
C N.O.	H-22	40-14 15-17	Green Red-White	Completes spotting disc triple play score lites flash circuit.
D N.O.	A-38	61-13 75-13	Brown-Red Orange-White	Completes a circuit to play features relay.
E S.P.D.T.	A-2	13-14 90-5 81-15	Red-Yellow Gray Black-Red	Directs regular or triple play reflex unit play magnet circuit.
F S.P.D.T.	H-26	14-21 36-15 38-19	Red-Green Yellow-Brown Yellow-Black	Directs red, blue, green or white button play lite circuits.
G N.O.	A-38	75-13 85-15	Orange-White Black-White	Completes a circuit to play scores relay.

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
RED LETTER WIN #1 RELAY COIL	A-36	70 56-4	Orange White-Brown	Energized thru winner search circuit for any 3 stars and any 2 stars feature winner.
A N.O.	G-5	30 10-11	Yellow Red	Completes selection feature lite circuits.
B N.O.	E-18	25-18 20-16	Blue-White Blue	Completes circuit to advance red letter unit to advance scores and features to guaranteed level.
C N.C.	A-47	54-14 94-11	White-Green Gray-White	Opens play control circuit for yellow score advance.
D N.C.	A-50	14-15 13-11	Red-Green Red-Yellow	Opens play control circuit for blue & green score advance.
E N.C.	E-22	43-16 61-15	Green-Yellow Brown-Red	Opens play control circuit for all regular game features.
F N.C.	B-21	93-12 81-7	Gray-Yellow Black-Red	Opens play circuit for guaranteed mystic lines feature advance.
G N.C.	B-28	71-3 80	Orange-Red Black	Opens search index coil circuit.
RED LETTER WIN #2 RELAY COIL	A-36	70 56-4	Orange White-Brown	Energized thru winner search circuit for any 3 stars and any 2 stars feature winners.
A N.O.	C-7	21-3 91-11	Blue-Red Gray-Red	Completes a shutter motor circuit to open shutter.
B N.O.	F-35	38-15 63-8	Yellow-Black Brown-Yellow	Completes lock in circuit to this relay and red letter #1 relay.
C N.C.	A-56	85-5 15-4	Black-White Red-White	Opens red score unit reset circuit.
D N.C.	A-49	58-10 52-19	White-Black White-Blue	Opens play control circuit for red score advance.
E N.C.	D-28	80 60	Black Brown	Opens replay cams index coil circuit.
F N.C.	A-23	40-18 98-9	Green Gray-Black	Opens play circuit for guaranteed selection feature advance.
RED BUTTON RELAY COIL	A-11	85-7 91-15	Black-White Gray-Red	Energized thru red button play circuit, anti-cheat relay circuit, tilt trip relay circuit or blue & green score unit zero circuit.
A S.P.D.T.	B-6	45-18 98-2 14-3	Green-White Gray-Black Red-Green	Directs mixer latch and timer cams index coil circuit during extra ball play or shutter motor circuit, to open shutter following extra ball play.
B S.P.D.T.	G-26	23-6 30 36-15	Blue-Yellow Yellow Yellow-Brown	Directs red, blue, green, white or yellow button play lite circuit.
C N.O.	E-11	57-6 20-2	White-Orange Blue	Completes lock in circuit to this relay.

6 RELAY BANK PICTORIAL VIEW

LETTERS CORRESPOND TO SWITCH CHART ON PAGE 45



Name	TRIPLE PLAY REFLEX	X 3	X 9	MISSED	WIN	PULSE
Coil turns @ wire gauge	2500 #33	2150 #32	2150 #32	2150 #32	2150 #32	2500 #33
Coil resistance (nominal)	100 OHMS	69 OHMS	69 OHMS	69 OHMS	69 OHMS	116 OHMS
Operating voltage	50 VOLTS	18 VOLTS D.C.	18 VOLTS D.C.	18 VOLTS D.C.	18 VOLTS D.C.	18 VOLTS D.C.
Test voltage	37 VOLTS	10 VOLTS D.C.	10 VOLTS D.C.	10 VOLTS D.C.	10 VOLTS D.C.	10 VOLTS D.C.
Extension spring load	CLEAR	RED	RED	RED	RED	RED
Sw actuator stroke	$\frac{3}{32}$	$\frac{3}{32}$	$\frac{3}{32}$	$\frac{3}{32}$	$\frac{3}{32}$	$\frac{3}{32}$
Additional information						
COIL NUMBER	C-7800-331	C-7800-323 D.C.	C-7800-323 D.C.	C-7800-323 D.C.	C-7800-323 D.C.	C-7800-3312 D.C.

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

6 RELAY BANK SWITCH CHART

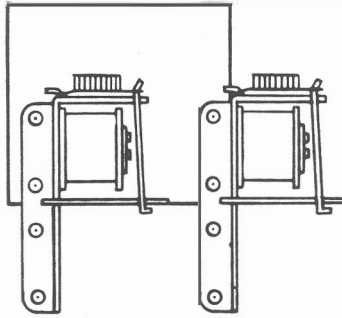
FOR POSITION OF SWITCHES REFER TO PICTORIAL VIEW ON PAGE 44

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
TRIPLE PLAY REFLEX RELAY COIL		70 41-10	Orange Green-Red	Energized thru mixer cams and triple play reflex disc control circuit.
A N.O.	B-40	43-10 41-10	Green-Yellow Green-Red	Completes lock in circuit to this relay.
B N.O.	F-42	85-4 50-4	Black-White White	Completes control circuit for triple play score advance.
X3 RELAY COIL	J-49	75-3 51-21	Orange-White White-Red	Energized by X3 pulse relay circuit.
A N.O.	G-50	85-11 30	Black-White Yellow	Completes circuit to pulse relay.
B S.P.D.T.	H-31	60-19 63-19 30	Brown Brown-Yellow Yellow	Directs color selector disc circuit to flash or lite 4th ball triple play color symbol lite.
C S.P.D.T.	F-45	57-16 51-16 75-14	White-Orange White-Red Orange-White	Directs winner search and scoring circuit for triple play 3 and 4 ball winners.
D N.O.	H-32	61-18 60-19	Brown-Red Brown	Completes color selector disc circuit to flash 5th ball triple play color symbol lite.
E N.O.	G-49	30 51-21	Yellow White-Red	Completes lock in circuit to this relay.
F N.O.	G-48	15-21 10-20	Red-White Red	Completes color selector disc circuit thru detector module for X9 relay circuit.
G N.O.	G-47	25-19 54-17	Blue-White White-Green	Completes color selector disc circuit to detector module from panel hole switches for 5th ball T.P. hit or miss circuits.
H N.C.	G-48	14-19 58-15	Red-Green White-Black	Thru color selector disc circuit to detector module opens win relay circuit to X3 pulse relay.
X9 RELAY COIL	J-50	75-3 80-18	Orange-White Black	Energized thru triple play detector module circuit from panel - hole switches, when 5th ball T.P. color symbol is made.
A N.O.	D-45	78-9 48-18	Orange-Black Green-Black	Completes a multiple win #1 relay and multiple unit advance circuit.
B N.O.	G-50	80-18 30	Black Yellow	Completes lock in circuit to this relay.
C S.P.D.T.	H-32	61-18 65-18 30	Brown-Red Brown-White Yellow	Directs color selector disc circuit to flash or lite 5th ball triple play color symbol lite.
D S.P.D.T.	H-30	13-19 50-19 23-19	Red-Yellow White Blue-Yellow	Directs "collect score or shoot next ball" and "collect score" lite circuits.
E S.P.D.T.	D-44	51-17 41-18 52-9	White-Red Green-Red White-Blue	Directs gold button relay and R button relay search wiper lock magnet circuits.

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
MISSED RELAY COIL	J-49	75-3 10-21	Orange-White Red	Energized by miss pulse relay circuit.
A S.P.D.T.	G-30	50-19 83-20 80-8	White Black-Yellow Black	Directs "missed", "collect score or shoot next ball" and "collect score" lite circuits.
B N.C.	E-44	65-19 41-18	Brown-White Green-Red	Opens win relay circuit to gold button relay, R button relay and search wiper lock magnet.
C N.C.	G-45	85-19 15-5	Black-White Red-White	Opens triple play winner scoring circuit.
D N.C.	G-31	56-19 20-14	White-Brown Blue	Opens triple play color symbol lite flash circuits.
E N.O.	G-49	30 10-21	Yellow Red	Completes lock in circuit to this relay.
F N.O.	G-45	30 31-19	Yellow Yellow-Red	Completes 17 volt circuit for orange hole number lites.
G N.O.	G-46	30 95-14	Yellow Gray-White	Completes 17 volt circuit for white hole number lites.
H N.O.	G-46	30 48-19	Yellow Green-Black	Completes 17 volt circuit for pink hole number lites.
WIN RELAY COIL	J-49	75-3 31-20	Orange-White Yellow-Red	Energized thru triple play detector module circuit from panel - hole switches, when 3 ball T.P. winner is made.
A N.O.	G-49	98-17 58-15	Gray-Black White-Black	Completes detector module circuit to X3 pulse relay.
B N.O.	F-45	85-19 51-16	Black-White White-Red	Completes triple play winner search and scoring circuits.
C N.O.	E-44	20-13 14	Blue Red-Green	Completes 3 and 4 ball triple play winner circuit to gold button relay. Completes 5 ball T.P. winner circuit to R button relay and search wiper lock magnet.
D N.O.	F-13	93-3 80-17	Gray-Yellow Black	Completes 3 and 4 ball triple play winner circuit to R button relay and search wiper lock magnet.
E N.O.	G-49	30 31-20	Yellow Yellow-Red	Completes lock in circuit to this relay.
F N.O.	H-30	13-19 91-12	Red-Yellow Gray-Red	Completes 3 and 4 ball triple play winner circuit to "collect score or shoot next ball lite".
G N.O.	H-31	95-13 56-19	Gray-White White-Brown	Completes triple play color selector disc circuits to flash 4th and 5th ball T.P. color symbol.
H S.P.D.T.	H-31	56-19 74-20 30	White-Brown Orange-Green Yellow	Directs circuit to flash or lite first three balls triple play color symbol lites.
PULSE RELAY COIL	J-50	75-3 85-11	Orange-White Black-White	Energized by X3 relay circuit, only when 4th ball triple play winner is made. Stays energized only few seconds.
A N.C.	G-32	57-19 95-13	White-Orange Gray-White	Opens circuit to flash 5th ball triple play color symbol lite.
B N.C.	F-44	93-3 20-13	Gray-Yellow Blue	Opens circuit to gold button relay.

2 RELAY BANK PICTORIAL VIEW

LETTERS CORRESPOND TO SWITCH CHART BELOW



NAME	X3 PULSE	MISS PULSE
Coil turns & wire gauge	2150 # 32	2150 #32
Coil resistance (nominal)	69 OHMS	69 OHMS
Operating voltage	18 VOLTS D.C.	18 VOLTS D.C.
Test voltage	10 VOLTS D.C.	10 VOLTS D.C.
Extension spring load	CLEAR	CLEAR
Switch actuator stroke	$\frac{3}{32}$	$\frac{3}{32}$
Additional information		

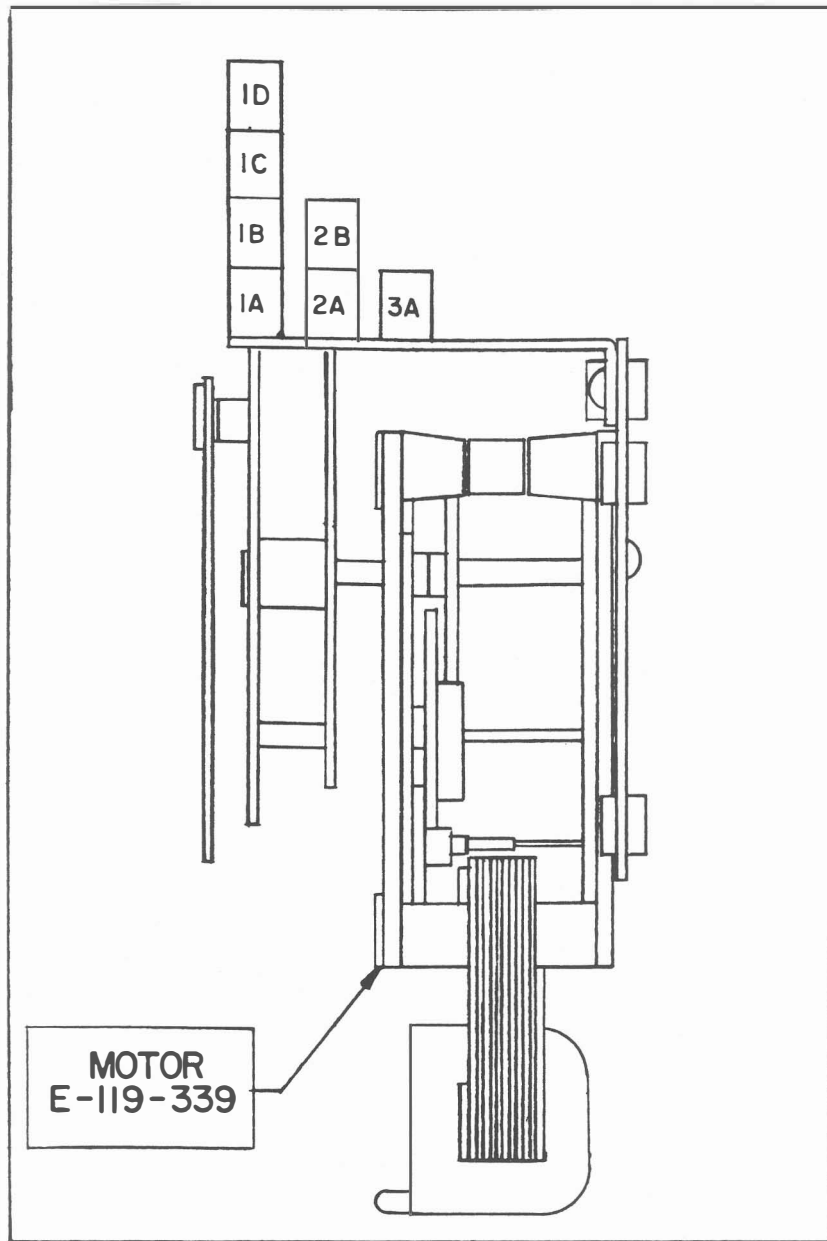
2 RELAY BANK SWITCH CHART

LETTERS CORRESPOND TO PICTORIAL VIEW ABOVE

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
X3 PULSE RELAY COIL	J-48	75-3 41-19	Orange-White Green-Red	Energized thru triple play detector module circuit from panel – hole switches when 4th ball T.P. color symbol is made.
A N.O.	H-49	51-21 30	White-Red Yellow	Completes circuit to X3 relay.
MISSED PULSE RELAY COIL	J-48	75-3 25-20	Orange-White Blue-White	Energized thru triple play detector module circuit from panel – hole switches when 3rd, 4th or 5th ball T.P. color symbol not made.
A N.O.	H-49	10-21 30	Red Yellow	Completes circuit to missed relay.

BALL LIFTER MOTOR PICTORIAL VIEW

LETTERS CORRESPOND TO SWITCH CHART BELOW



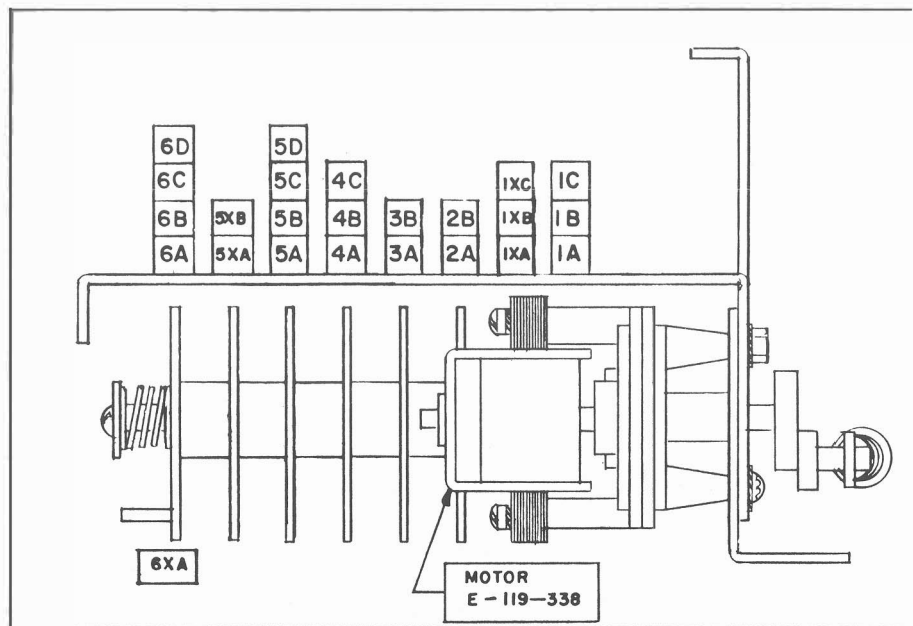
BALL LIFTER MOTOR SWITCH CHART

FOR POSITION OF SWITCHES SEE PICTORIAL VIEW ABOVE

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES	
1A	N.C.	D-10	15-6 85-6	Red-White Black-White	Opens ball count circuit to select before 5th and after 5th ball lockout relays.
1B	N.O.	C-12	91-1 30	Gray-Red Yellow	Completes carry over circuit to ball lifter motor.
1C	N.C.	C-4	95-3 85-3	Gray-White Black-Yellow	Opens start relay circuit.
1D	N.O.	G-12	21-3 51-3	Blue-Red White-Red	Completes lock in circuit to ball detector relay.
2A	N.O.	E-7	43-2 27-2	Green-Yellow Blue-Orange	Completes timer disc circuits to advance timer unit 0 thru 5th step.
2B	N.O.	E-11	93-17 14-5	Gray-Yellow Red-Green	Completes ball detector relay circuit to tilt relay.
3A	N.O.	F-10	21-3 20-7	Blue-Red Blue	Completes timer disc circuit to select before 4th ball lockout relay.

SHUTTER MOTOR PICTORIAL VIEW

LETTERS CORRESPOND TO SWITCH CHART



SHUTTER MOTOR SWITCH CHART

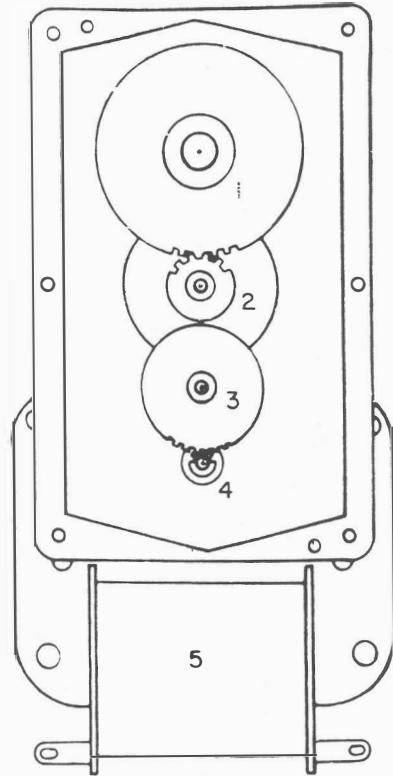
FOR POSITION OF SWITCHES SEE PICTORIAL VIEW ABOVE

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
1A	N.C.	G-18 90-3 21-3	Gray Blue-Red	When shutter opens, starts red letter unit advance circuit and guaranteed score and feature circuits for red letter game winners.
1B	N.O.	E-6 14-3 30	Red-Green Yellow	Completes carry over circuit to shutter motor.
1C	M.B.B.	G-30 21-3 93-15 63-8	Blue-Red Gray-Yellow Brown-Yellow	When shutter opens, starts red letter win relays lock in circuit before opening winner search and scoring circuit.
1XA	N.C.	J-44 51-19 20-4	White-Red Blue	During shutter cycles, opens 17 volt circuit.
1XB	N.C.	F-8 21-3 65-2	Blue-Red Brown-White	When shutter is closed, completes after 5th ball circuit to advance timer unit. Also completes extra ball circuit to reset timer unit.
1XC	N.C.	J-45 58-8 54-17	White-Black White-Green	During shutter cycles, opens 18 volt circuit.

SHUTTER MOTOR UNIT SWITCH CHART - continued

SWITCH	LOCATION ON DIAGRAM	WIRE No.	WIRE COLORS	FUNCTION OF SWITCHES
2A	N.C.	D-12 31-3 36-3	Yellow-Red Yellow-Brown	When shutter is closed, completes ball lifter motor circuits.
2B	N.C.	F-28 41-20 30	Green-Red Yellow	When shutter opens, opens steering relay lock in circuit.
3A	N.O.	B-56 85-5 30	Black-White Yellow	When shutter opens, completes reset circuit to T.P. relay counter unit, delay unit, selection feature unit, red, green, blue, yellow replay counter units & red score unit.
3B	N.O.	A-8 90-20 30	Gray- Yellow	When shutter opens, completes a circuit to trip bank reset motor.
4A	N.O.	D-7 14-3	Red-Green	When shutter is open, completes tilt and anti cheat relay circuits to run shutter motor to close shutter.
4B	N.O.	F-7 45-8 18-3	Red-Black Green-White Red-Black	Same function as switch 4A.
4C	N.O.	G-36 63-8 21-3	Brown-Yellow Blue-Red	When shutter opens, completes lock in circuit to red letter win relays #1 and #2.
5A	S.P.D.T.	C-6 61 10-10 51-15	Brown-Red Red White-Red	Directs start relay circuit to shutter motor when shutter is closed, mixer latch and timer cams index coil when shutter opens.
5B	N.O.	E-37 31-4 90-9	Yellow-Red Gray	When shutter opens, completes lock in circuit to ball lifter start relay.
5C	N.O.	D-23 85-12 50-5	Black-White White	When shutter is open, completes play circuits for regular game feature advance and feature trip relays.
5D	N.O.	B-31 40-16 80-16	Green Black	When shutter opens, completes all 4 star replay counter unit and multiple unit homing circuits. Also completes T.P. color selector unit (scramble) step up circuit.
5XA	N.C.	G-13 40-8 21-3	Green Blue-Red	When shutter is closed, completes mystic lines feature buttons circuit, selection feature rollover buttons circuit, regular game winner search circuit, T.P. win circuit to gold button relay, T.P. winner search circuit, and ball count circuit, and ball count circuit to selection lock out relays.
5XB	N.C.	F-10 40-8 10-13	Green Red	When shutter is closed, completes ball count circuit to selection lock out relays.
6A	N.O.	D-9 71-8 30	Orange-Red Yellow	When shutter opens, completes time unit reset circuit.
6B	N.O.	D-56 78-3 30	Orange-Black Yellow	When shutter opens, completes reset circuit to twin no. unit, triple play score unit, extra ball unit, red letter unit, mystic lines unit, blue & green score unit, yellow score unit.
6C	N.O.	B-8 90-20 30	Gray Yellow	Same function as switch 3B.
6D	N.O.	A-43 30 98-12	Yellow Gray-Black	When shutter opens, completes a circuit to advance triple play color selector unit.
6XA	N.C.	A-11 91-15 70	Gray-Red Orange	When shutter is open or closed, completes red button relay circuits.
PANEL SHUTTER SWITCHES				Shutter switch below not shown in pictorial view. Switches are operated when shutter board opens and closes.
1A & 1B	D-15	21-3 27-15 83-11 57-14	Blue-Red Blue-Orange Black-Yellow White-Orange	(Closed when shutter open) completes mystic lines motor unit homing circuits.
1C	B-7	91-11 14-3	Gray-Red Red-Green	(Open when shutter open) opens red letter game winner circuit to shutter motor.
1D	C-36	56-4 71-14	White-Brown Orange-Red	(Open when shutter open) opens red letter game winner search circuit to red letter win relays #1 & #2.
1E	E-38	21-3 75-13	Blue-Red Orange-White	(Closed when shutter open) completes blue, green, white button circuits to play scores, play features, play triple relays.
1F	F-18	90-3 25-18	Gray Blue-White	(Closed when shutter open) opens red letter game winner circuit to advance red letter unit, score units, feature units and energize feature relays.
1G	B-6	45-18 51-15	Green-White White-Red	(Closed when shutter open) completes start relay circuit to mixer latch and timer cams index coils.
2A	F-30	93-15 15-5	Gray-Yellow Red-White	(Open when shutter open) opens all winner search and scoring circuits.

MOTOR PARTS GUIDE



SHUTTER MOTOR (E-119-338)

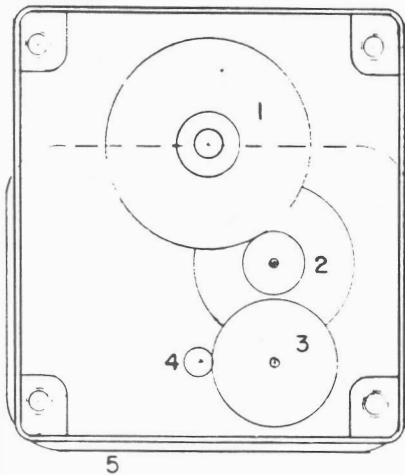
- 1 ZGS-1725-15
- 2 G-5818-1
- 3 C-4109-1
- 4 ZRST-1715-30-1
- 5 ZS-1708-2519

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

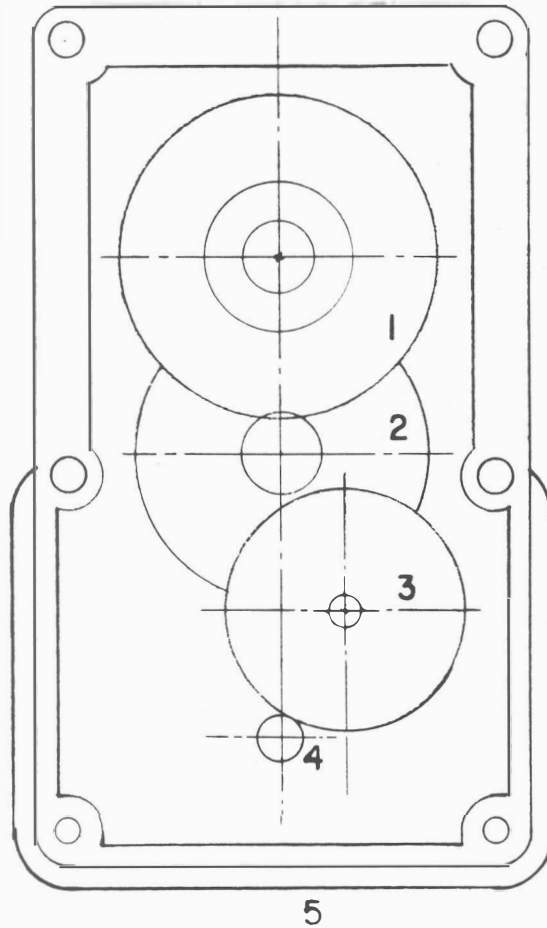
MYSTIC LINES "B" & "C" MOTOR (E-119-353)

- 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



Motor
(E -119-359)

Bearing & Bracket Assembly	-----	ZBB-7553-20
Gear Case Ass'y. (Minus Stator & Coil)	-----	ZEGB-4020-1
1. Output Gear & Shaft Ass'y.	-----	ZEGS-4020-1
2 Gear	-----	G-6712-32
3. Gear	-----	GL-6312-21
4. Gear-Rotor & Shaft Ass'y.	-----	ZRS-4038-52-1 R.H.
5 Stator & Coil Ass'y.	-----	ZS-4018-26109

Misc Parts

Fan	-----	P-1036-1
Oil Pad Retaining Plate	-----	A-1417
Oil Pad	-----	P-4010
Washer, Bottom (for ZEGS-4020-1)	-----	W-2060-2
Spacer (for ZEGS-4020-1)	-----	B-1887
Washer, Top (for ZEGS-4020-1)	-----	W-2044
Spacer (for G-6712-32)	-----	V-1309-3
Washers, Two (for G-6712-32)	-----	W-2078
Spacer (for GL-6312-21)	-----	V-1309-1
Washers, Two (for GL-6312-21)	-----	W-2077

MISCELLANEOUS PARTS

Back Cabinet Assembly:

Part No.	Name of Part
G-292-32	Backglass
M-1424-10	Backglass (Plexiglass)
M-281-31	Lock & Keys (2 Keyed alike)
E-122-109	Transformer

Back Door Assembly:

M-281-25	Lock & Keys (3 keyed alike)
SW-100-106	Lock Switch
E-105-6	Resistor (8200 ohm ½ watt)
E-105-64	Resistor (100 ohm 2 watt)

Front Cabinet Assembly:

K-241	Ball Kit (8 Balls)
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-2790-19	Coin Box
P-3089-30	Coin Box Cover
E-130-10	Counter (total play-replay-key play)
A-2618	Legs
M-106-1	Leg Bolt
M-163-4	Leg Adjuster
M-281-22	Lock & Keys (key play)
AS-2183-11	Push Button (Blue)
AS-2183-10	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
E-108-02	Coin Switch
	Coin Guide Assembly*
	Coin Slide Assembly*
AS-2041-47	Front Door Assembly (Single Coin)
AS-2041-48	Front Door Assembly (Double Coin)
CA-567-165	Front Door Only (Single Coin)
A-254-84	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)
A-1729-18	Push Button (White)
	Slug Rejector*

* 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.

Front Moulding Assembly:

Part No.	Name of Part
AS-1305-52	Front Moulding Assembly
CA-1119-29	Front Moulding Only
A-1272-17	Button (A)
A-1272-18	Button (B)
A-1272-19	Button (C)
A-1272-29	Button (R)
A-1272-50	Button (Gold)
	Coin Entry Plate*

Panel Assembly:

AS-1315	Ball Gate & Switch Assembly
AS-493-2	Ball Rebound Assembly
R-115-4	Ball Rebound Rubber (Only)
C-119-23	Bumper Post (Yellow)
C-119-21	Bumper Post (Red)
R-243	Rubber Ring (White Post)
R-243-2	Rubber Ring (Red Post)
M-170	Rebound Spring
C-326-9	Light Shield Post
C-387-1	Rollover Button (Red)
C-387-2	Rollover Button (Yellow)

Miscellaneous Relays:

E-146-576	Blue Button Extra-Step
C-7800-332	Coil Only Above
E-146-618	Multiple Win #1
C-7800-331	Coil Only Above
E-146-618(2)	Mystic-Line "B" & "C" Cam
C-7800-331	Coil Only Above
E-146-619	Multiple Win #2
C-7800-334	Coil Only Above
E-146-622	Ball Detector
C-7800-3312	Coil Only Above
E-146-640	"R" - Button
C-7800-3312	Coil Only Above
E-146-720(2)	1st & 2nd Extra-Step
C-7800-331	Coil Only Above
E-146-721	Cam #7
C-7800-331	Coil Only Above
E-146-722	Cam #5
C-7800-331	Coil Only Above
E-146-723	Ball Lifter Start
C-7800-332	Coil Only Above