

ABBREVIATIONS

RE	RELAY
SCM	SCORE MOTOR
SOL	SOLENOID
T-B	THOMPSON BUMPER

CABINET TO INSERT PLUGS

10	20	24	28
18-6	52-3	28-1	80-2
21-1	80	27-7	85-1
21-2	80	36-5	85-4
21-3	80	38-5	85-4
40-7	81-1	40-8	81-4
41-3	85-2	41-6	81-4
43-3	83-2	43-3	83-4
48-2	89-4	58-2	89-5
48-2	89-4	58-7	89-5

PANEL TO CABINET PLUGS

14	22	26
14	81-8	93-8
21-1	80	27-7
21-2	80	36-5
21-3	80	38-5
40-7	81-1	40-8
41-3	85-2	41-6
43-3	83-2	43-3
48-2	89-4	58-2
48-2	89-4	58-7

FLIPPER PLUG

18-10	52-7
38-8	78-4
38-2	81-8
58-4	81-8

DOOR PLUG

15-6	75-3
25-1	80

CHIME PLUG

15-6	75-3
25-1	80

1/2 WATT 8200 OHM

WIRES ENCLOSED IN INDICATES #16 GAUGE WIRE USED AT POSITION ON PLUGS.

COIL LOCATIONS CHART

NAME OF COIL	LOCATION
ALTERNATOR RE	F-24
BALL COUNT UNIT RESET	F-24
BALL COUNT UNIT STEP UP SOL	F-31
BALL INDEX RE	F-8
COIN LOCKOUT COIL	F-8
COIN RE	F-12
COLLECT RE	F-11
CREDIT UNIT RESET SOL	F-9
CREDIT UNIT STEP UP SOL	F-14
DOWN POST SOL	F-4
DOWN POST SOL	F-29
EXTRA BALL RE	F-20
EXTRA BALL TARGET RE	F-20
TUNNEL RE	F-11
TUNNEL RE	F-11
GAME OVER RE (LATCH)	F-3
GAME OVER RE (TRIP)	F-8
KNOCKER SOL	F-22
LEFT ALLEY KICKER SOL	F-28
LEFT BLUE T-B RE	F-25
LEFT BLUE T-B SOL	F-25
LEFT FLIPPER SOL	F-25
LEFT HOLE EJECT SOL	F-27
LEFT HOLE RE	F-26
LEFT RED T-B RE	F-26
LEFT RED T-B SOL	F-26
LEFT SLING SHOT SOL	F-27
LOCK RE	F-12
LOWER GATE RE	F-8
OUTHOLE KICKER SOL	F-28
OUTHOLE RE	F-8
POST LATCH COIL	F-29
RESET RE	F-3
RIGHT BLUE T-B RE	F-25
RIGHT BLUE T-B SOL	F-25
RIGHT FLIPPER SOL	F-25
RIGHT HOLE EJECT SOL	F-27
RIGHT HOLE RE	F-26
RIGHT RED T-B RE	F-26
RIGHT RED T-B SOL	F-26
RIGHT SLING SHOT SOL	F-27
SCORE RESET RE	F-20
START TUNNEL TARGETS RE	F-10
TILT RE	F-10
TOTAL PLAY METER	F-19
UPPER GATE RE	F-13
00-90 UNIT STEP UP SOL	F-2
#1 PLAYER RE	F-3
#2 PLAYER RE	F-7
(8) STEP UP UNIT SOL	F-17
1st PLAYER 10-90	F-18
1st PLAYER 100-900	F-18
2nd PLAYER 10-90	F-18
1st PLAYER 1000-9000	F-18
2nd PLAYER 1000-9000	F-18
1st PLAYER 1000-9000	F-21
2nd PLAYER 1000-9000	F-21
2 COIN UNIT STEP UP SOL	F-2
2nd COIN CHUTE RE	F-4
3rd COIN CHUTE RE	F-4
2nd COIN RE (LATCH)	F-10
2nd COIN RE (TRIP)	F-10
10 POINT CHIME SOL	F-22
100 POINT CHIME SOL	F-23
100 POINT RE	F-17
100 POINT RE	F-17

**939**  
**TIME ZONE**  
**(2 PLAYER)**  
**W-1042-111**  
**4-11-73**

INSTALLATION AND GENERAL GAME OPERATION INSTRUCTIONS

INSTALLATION

On all games there are certain items that should be checked after shipment. These are visual inspections which may avoid time consuming service work later. Minor troubles caused by abusive handling in shipment are unavoidable. Cable plugs and sockets may be loosened, switches (especially tilt switches) may go out of adjustment. Plumb bob tilt switch should always be adjusted after game is set on location and leg levelers are adjusted.

Visual inspections before plugging in line cord: -

1. Check that all cable plugs are firmly seated in proper sockets.
2. Check that cables are clear of all moving parts and relays.
3. Check for any wires that may have become disconnected.
4. Check switches for loose solder or other foreign material that may have come loose in shipment and could cause shorting of contacts.
5. Check wires on relay coils for proper soldering, especially the bare (common) wire connecting a row of relay coils. Cold solder connections may not show up in factory inspection, but vibration in shipment may break contact.
6. Check that fuses are firmly seated and making good contact.
7. Check (manually) the stepping and resetting of all step-up units. The wiper action should not be sluggish.
8. Check transformer for any foreign material shorting across wiring lugs.
9. Check wiring of transformer to correspond to location voltage.  
(Transformer wiring card in front cabinet)

Before line cord is plugged in: -

Check all plug and sockets and dress cables:

- (A) Plugs in correct sockets.
- (B) Plugs securely seated in sockets.
- (C) Dress cables away from relays.

Check adjustment of the three (normally open) tilt switches:

- (A) Panel tilt on bottom of playfield panel.
- (B) Plumb-bob tilt on left side of cabinet near front door.
- (C) Ball tilt above plumb-bob tilt.

Insert the ball (15/16" dia.) into ball tilt assembly and adjust bracket so ball will roll freely if front of cabinet is raised.

Check adjustment of the kick-off and slam switches:  
 Check adjustment of the (normally open) kick-off switch at rear of cabinet mounting board, near cable plugs. Check adjustment of the (normally open) anti-slam switch, on the front door. These switches should close when front door is slammed or the bottom of the cabinet is kicked. Either switch when closed will energize the delay relay.

#### GENERAL GAME OPERATION

Place ball onto playfield by out hole.  
 Plug in the line cord.

#### Coin Game:

If the coin should be rejected, move on-off master switch at the bottom right front corner of cabinet to "on" position, then coin game. The coin lock-out device rejects all coins when power (master switch) is off.

- 1A. If the coin is inserted in the 1st (nickel) coin chute and the game is set for 1 play-5¢, it will energize the "coin relay". If game is set for 1 play-10¢, the first coin inserted will advance the "2 coin unit", then the second coin inserted will energize the "coin relay" thru the 2 coin unit switch. (See 1st coin chute adjustment plug positions on game adjustments sheet).
- 1B. If the coin is inserted in the 2nd (dime) coin chute and the game is set for 1 play-10¢, it will energize the "coin relay". If game is set for 2 plays-10¢, it will energize the "2nd coin chute relay" and the 2nd coin chute relay will advance the "credit unit" (2 steps) thru the coin credit circuit. (See 2nd coin chute adjustment plug positions on game adjustments).
- 1C. If the coin is inserted in the 3rd (quarter) coin chute and the game is set for 2-3-4-5-**or** 6 plays-25¢, it will energize the "3rd coin chute relay" and the 3rd coin chute relay will advance the "credit unit" (2-3-4-5-6 steps) thru the coin credit circuit. (See 3rd coin chute adjustment plug positions on game adjustments).
- 1D. When the "credit unit" has been advanced from the 2nd or 3rd coin chute, (as described in section 1B and 1C) the front door "credit button" switch will energize the "credit relay" and then the credit relay will energize "coin relay".

- 2A. The coin relay, when energized by any of the ways described, (in sections 1A thru 1D) will stay energized thru its own hold-in switch and (normally closed) #8 score motor switch.
- 2B. The coin relay will energize the lock relay which stays energized thru its own hold-in switch and cabinet kick-off switch.
- 2C. The coin relay will energize the reset relay thru a game over relay switch; operate the score motor and thru the (normally open) #2 score motor switch, energize the score reset relay. The reset relay will stay energized thru a normally closed #8 score motor switch, and until all score counter units are reset to zero position. The coin relay will latch the game over relay thru the (normally open) #4 score motor switch.
- 2D. The coin relay, thru the normally open #3 score motor switch will advance the total play meter, and thru the reset relay will reset ball count unit, and latch the 2nd coin relay. The coin relay will also reset the credit unit (1 step) when started by the credit relay. The coin relay will trip the 2nd coin relay when the reset relay is not energized.
- 3A. A ball in the out hole will energize the out hole relay thru a normally closed #1 score motor switch, and it will stay energized thru its own hold-in switch and normally closed #10 score motor switch.
- 3B. The out hole relay will operate the score motor and then energize the out hole kicker solenoid thru a normally open #7 score motor switch. The 1st ball is kicked thru the ball trough to the shooter alley and the game is now ready for the "1st player" to begin play.
- 3C. To condition the game for "2nd player" , inserting coin (s) or use of the credit button (before 1st ball is played) will energize the coin relay again. This time, the coin relay will not energize the reset relay. It will operate the score motor and advance the total play meter, subtract a credit from the credit unit, (if credit button was used) and trip the 2nd coin relay thru a normally open #3 score motor switch. The game is now set for "2 players".

## Sequence of operation

- 1A. When the 1st ball is played, the ball index relay will be energized by the 10 point relay, 100 point relay or 1000 point relay, and it will stay energized thru its own hold-in switch, outhole relay switch and a normally closed #6 score motor switch.
- 1B. When the 1st ball played returns to the outhole, it will energize the outhole relay thru a normally closed #1 score motor switch and it stays energized thru its own hold-in switch and a normally closed #10 score motor switch.
- 1C. The outhole relay operates the score motor and thru a ball index relay switch will advance the ball count unit either two steps thru normally open #3 and #4 score motor switches during a one player game or one step thru a normally open #4 score motor switch during a two player game. The outhole relay then completes the circuit to the outhole kicker solenoid thru a normally open #7 score motor switch. The 1st ball is returned to the shooter and the game is now set for either 1st player; 2nd ball or 2nd player, 1st ball.
- 1D. Sequence 1A, 1B, and 1C are then repeated for each ball played until the last ball is played. When the last ball played returns to the outhole, the game over relay trip coil will be energized thru the ball count unit disc. The game over relay when tripped will turn off the ball in play lite, turn on 00-90 match lite and open the game play and scoring circuits.

NOTE: Regular ball to ball operation (sequence 1C) is interrupted whenever a player scores an extra ball with the exception that the outhole kicker solenoid will operate as indicated.

## FEATURE OPERATION AND SCORING

Tunnel Feature:

The "Tunnel motor unit" controls the tunnel flashing lites and tunnel scoring. The motor starts operating when ball is kicked out of outhole, when ball goes into either top eject holes and when ball hits either "start tunnel" target. The motor stops when ball goes over shooter alley roll-over, thru "collect tunnel" target. The motor also stops on game over. "Collect tunnel" roll-overs and target stop tunnel motor unit and scores lit tunnel score.

Skill Shots: To register a high score when ball is in shooter alley, the ball shooter should be released so ball will go over shooter alley roll-over when "5000" score lite is lit, and the ball should shot with just the right force to go into "collect tunnel" lane at top of playfield.

Right alley feature:

The alley has two gates. The upper gate is opened when ball goes into right eject hole. The lower gate is opened when ball goes into left eject hole. The gates remain open until ball goes into right alley, into outhole or when game is tilted. The top three roll-overs score 1000 each and the bottom roll-over stops "tunnel motor unit" and scores "tunnel score" lit.

Left alley feature:

There is no entrance gate into left alley, so ball can go into the alley at any time.

When ball goes into the alley, it stops "tunnel motor unit", scores lit tunnel score, and kicks ball to top of playfield.

Extra ball feature:

When the ball hits "extra ball target" when lit, the game awards an extra ball and the "same player shoots again" lites are lit (lites on playfield and score glass). When same player shoots again is lit and the ball goes into the outhole, the ball is kicked into shooter alley and the same player shoots again. There is no advance of ball in play lite.

The "extra ball target" lite is controlled by 00-90 unit. Only one "extra ball" is awarded per ball in play.

Playmore Post (Up post) feature:

When a ball hits the center target, it will raise the post located between the flippers. This prevents the ball from going into the outhole. When the ball goes over either down post roll-over button, the post will be lowered. The post is also lowered at the start of a game, when the ball goes into the outhole or when the game is tilted.

Thumper-bumper lites feature:

Thumper-bumpers when hit score 10 points when not lit or 100 points when lit. The thumper-bumper lites are controlled by #12 score motor cam switch.

GAME ADJUSTMENTS**PLAYFIELD PANEL POST ADJUSTMENTS:**

The game has (2) posts that can be moved to make game playing time and scoring more conservative. Spotting holes are provided for the movement of the posts, and liberal and conservative positions are shown on panel sketch FO-

**HI-SCORE ADJUSTMENT PLUG:**

The plug is located on the back box lite insert. This plug provides a full range of coverage at which hi-score credits or extra balls can be scored. (See score adjustment card in back box for plug positions).

**BALLS PER GAME ADJUSTMENT PLUG:**

The plug is located on the back box lite insert. This plug provides setting to operate game on 5 ball or 3 ball play.

**MATCH FEATURE ADJUSTMENT PLUG:**

The plug is located on the back box lite insert. This plug provides positions to turn the match feature on or off.

**1ST COIN CHUTE ADJUSTMENT PLUG:**

The plug is located on the 2 coin unit, on the front part of the cabinet mounting board. This plug provides positions to give 1 play for 1 coin or 1 play for 2 coins, thru the 1st (nickel) coin chute.

**2ND COIN CHUTE ADJUSTMENT PLUG:**

The plug is located on the front of the cabinet mounting board. This plug provides positions to give 1 play for 1 coin or 2 plays for 1 coin thru the 2nd (dime) coin chute. Note: When this plug is set for 2 plays - 1 coin, brown-white (male plug) wire on 3rd coin chute adjustment must be in position 2.

**3RD COIN CHUTE ADJUSTMENT PLUG:**

The plug is located on the front of the cabinet mounting board. This plug provides positions to give 2 to 6 plays for 1 coin, thru the 3rd (quarter) coin chute, orange-white (male plug) wire. See 2nd coin chute not above for use of brown-white (male plug) wire.

**HI-SCORE FEATURE ADJUSTMENT PLUG:**

The plug is located on the front of the cabinet mounting board. This plug provides positions to award credits or extra balls for preset hi scores.



#939 TIME ZONE  
Parts List

MISCELLANEOUS	PART NO.	ASSEMBLY COILS	PART NO.
Transformer	E-122-95	Coin Lockout	FC-33-2600
Score Motor (Domestic)	E-119-354	Knocker	C-27-1000
Score Motor (Export)	E-119-411	Chimes (3)	CC-29-2000
Tunnel Motor	E-119-410	Thumper-bumpers (4)	A-25-1000
Meter (Total Play)	E-130-10	Left hole eject	A-27-1100
Resistor	E-105-147	Right hole eject	A-27-1100
		Left alley kicker	A-25-1050
		Outhole kicker	A-25-950
RELAY COILS		Down post	A-26-1200
Coin	G-31-1800	Tunnel unit index	F-32-2100
2nd coin chute	G-31-1800	Post latch	G-31-1800
3rd coin chute	G-31-1800	Sling-shot (2)	AP-26-1200
Credit	G-31-1800	Flippers (2)	AF-26-650/28-800
Lock	G-33-2800		
2nd coin (latch)	G-31-1800	UNIT COILS	
2nd coin (trip)	G-31-1800	2 coin (step-up)	CD-29-1600
Left hole	G-31-1800	credit (step-up)	B-26-1100
Right hole	G-31-1800	credit (reset)	C-28-1100
Left alley	G-31-1800	Ball count (step-up)	B-26-1100
Game over (latch)	G-31-1800	Ball count (reset)	C-28-1100
Game over (trip)	G-31-1800	Score drum (step-up) (8)	CD-29-1600
Down post	G-30-1500	00-90 (step-up)	<del>B-27-1300</del>
Reset	G-31-1800		
Score reset	G-30-1500	UNIT CONTACT DISC	
#1 player	G-32-2500	Ball Count	W-1043-13b
#2 player	G-32-2500	00-90	W-1123-16b
Outhole	G-31-1800	Tunnel Motor	W-1072-19b
Ball index	G-32-2500		
Tilt	G-32-2500	UNITS WIPER ASS'YS	
Extra ball	G-32-2500	Ball Count	AS-1046-618a
Tunnel	G-32-2500	00-90	AS-1046-627a
Collect	G-31-1800	Tunnel Motor	AS-1046-642b
Lower gate	G-32-2500		
Upper gate	G-32-2500		
1000 point	G-30-1500		
100 point	G-30-1500		
10 point	G-30-1500		
Extra ball target	G-30-1500		
Start targets	G-30-1500		
Alternator	G-32-2500		
Thumper-bumper (4)	G-31-1800		

## TIME DELAY CIRCUIT

Purpose of the time delay circuit is to prevent unnecessary abuse of the machine it is installed in.

The time delay relay is energized anytime one of the slam switches are made to contact. There are two factory installed slam switches, one on the front door and one on the mechanism mounting board. (Any number of slam switches could be installed by the operator, to meet his individual requirement). The switches should be adjusted to have approximately 1/16" gap between the contacts. The weighted blade should be adjusted to attain the desired sensitivity. Decreasing the gap between contacts will make switch more sensitive. Opening the gap will reduce sensitivity. The total time the delay relay is energized can be varied by changing the #455 lite bulb mounted on the delay relay frame. If unable to get a short enough time of delay, get a Westinghouse #455 bulb; these units are considerably faster. If still unable to bring the time down, check the location voltage. It should not be under 49.5 V.A.C. on the transformer secondary.

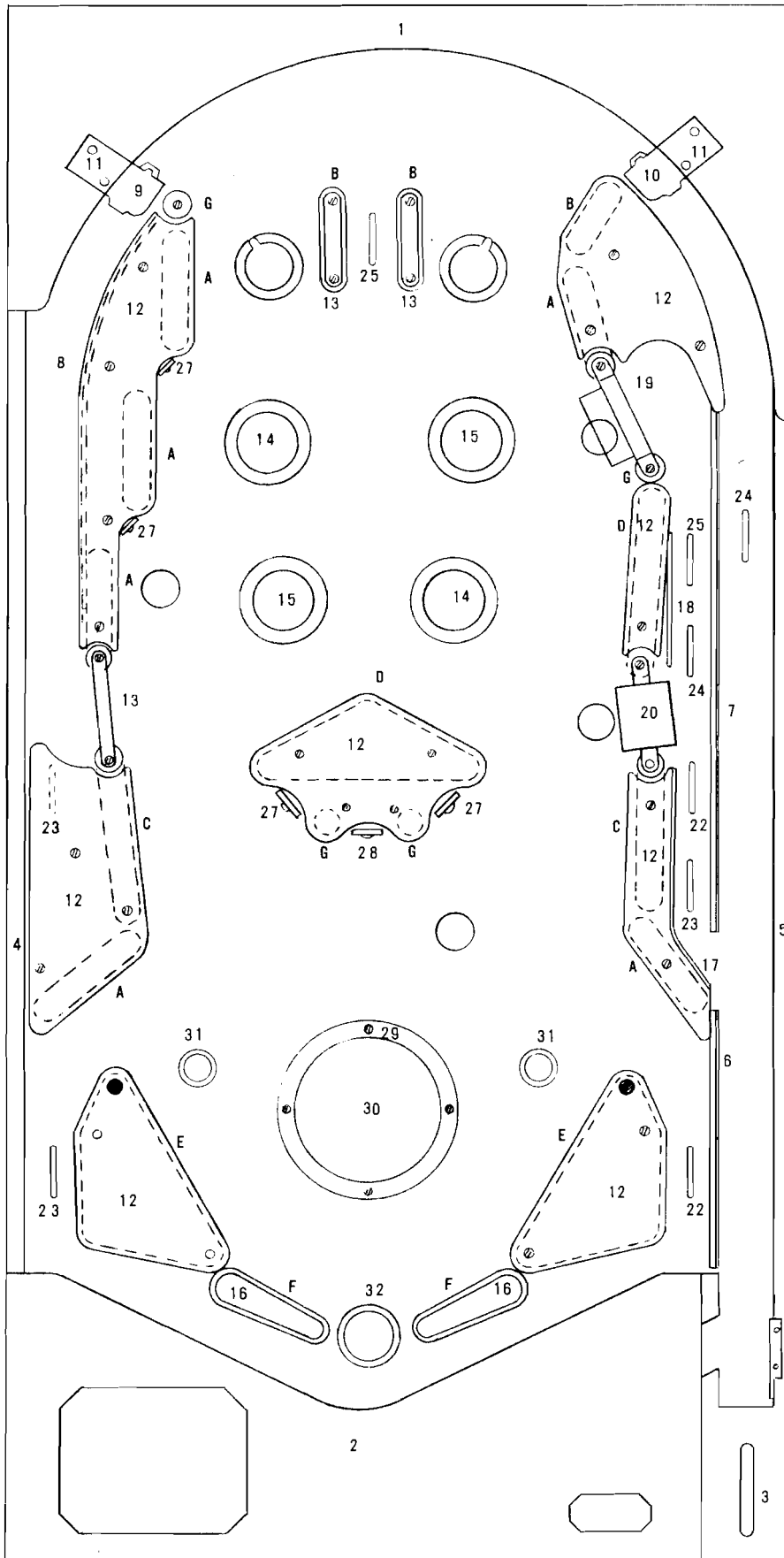
RUBBER PARTS

A	R-521-2	1-1/2"	(6)
B	R-521-1	1"	(3)
C	R-521-3	2"	(2)
D	R-521-4	2-1/2"	(2)
E	R-521-5	3"	(2)
F	R-406-3	YELLOW	(2)
G	R-243	5/16	(4)

PANEL TOP PARTS

1	TOP ARCH	-----	P-5839-54
2	BOTTOM ARCH	-----	P-5871-38
3	SHOOTER GAUGE	-----	P-6359-10
4	SIDE RAIL (L)	-----	CA-1208-15
5	SIDE RAIL (R)	-----	CA-1208-1
6	BALL GUIDE (BOT. R)	----	P-6495-66
7	BALL GUIDE (TOP R)	----	P-6495-64
8	BALL GUIDE (TOP L)	----	P-6495-65
9	BALL GATE (L)	-----	A-1475-4
10	BALL GATE (R)	-----	A-1475-1
11	BALL GATE COVER	-----	P-2996-5 (2)
12	LITE SHIELDS	-----	A-2890-87
13	PLATE	-----	P-5899-29
14	BUMPER CAP	-----	A-3713-11a
15	BUMPER CAP	-----	A-3713-7a
16	FLIPPER (WHITE)	-----	C-611-5
17	GUIDE WIRE	-----	M-121-28
18	GUIDE WIRE	-----	M-121-18
19	GATE & WIRE ASSY.	-----	AS-2250-28
20	GATE & WIRE ASSY.	-----	AS-2250-4
21	GATE BRACKET	-----	P-5867-2
22	ROLLOVER WIRE	-----	M-1336-2 (2)
23	ROLLOVER WIRE	-----	M-1336-3 (3)
24	ROLLOVER WIRE	-----	M-1336-9 (2)
25	ROLLOVER WIRE	-----	M-1336-10 (2)
27	TARGET ASSY.	-----	AS-982-699 (4)
28	TARGET ASSY.	-----	AS-982-723 (1)
29	WINDOW GASKET	-----	M-1398
30	PLAYFIELD WINDOW	-----	M-1499
31	ROLLOVER BUTTON	-----	C-387-5a
32	BUMPER	-----	C-810

● INDICATES MOVABLE POSTS FOR SCORING ADJUSTMENTS



Jan. 6, 1971

NEW COIL NUMBERS

FO-319a

<u>OLD COIL NUMBER</u>	<u>NEW BALLY COIL NUMBER</u>
CO-25A-7	A-25-1050
CO-25GG-7	B-25-925
CO-25H-7	BC-25-925
CO-26A-9	A-26-1100
CO-26GG-9	B-26-1100
CO-27R-11	C-27-1000
CO-28R-15	C-28-1100
E-184-41	BF-27-1250
E-184-46	EA-30-1150
E-184-47	EA-32-1550
E-184-55	B-29-1200
E-184-56	A-27-1100
E-184-74	CF-28-1025
E-184-75	E-32-1700
E-184-112	EA-29-950
E-184-135	BA-25-925
E-184-155	D-27-425
E-184-156	D-28-500
E-184-160	B-25-750
E-184-175	AP-27-1300
E-184-180	CE-33-4800
E-184-190	AF-25-600/31-1000
E-184-204	AF-27-1000/32-1300
E-184-205	B-27-1300
E-184-206	CD-29-1600
E-184-207	A-27-1400
E-184-213	A-27-1300
E-184-218	F-31-1500
E-184-224	F-31-2100
E-184-231	CA-29-800/31-900
E-184-235	AK-25-1050
E-184-236	J-28-1100
E-184-237	BA-26-1040
E-184-241	AF-25-600/31-1000
E-184-243	A-26-1200
E-184-248	FC-30-1300
E-184-249	BF-28-1500
E-184-250	D-30-700
E-184-252	BB-26-655/32-1245
E-184-254	FC-30-1400
E-184-257	AP-25-1050
E-184-260	B-28-1600
E-184-261	AP-31-3000
E-184-262	A-26-1200
E-184-263	AF-27-775/31-861
E-184-264	A-28-1900
E-184-265	AF-25-600/31-1000
E-184-266	D-29-675
E-184-268	AF-26-750/31-900
E-184-269	FC-33-2600
E-184-270	AB-31-3000
E-184-271	AK-24-750
E-184-272	A-25-1000
E-184-274	FC-32-2100

NOTE:

THESE COILS MAY BE ORDERED BY THE OLD COIL NUMBER OR BY THE NEW COIL NUMBER OR BY BOTH.