

## #897 - "EXPRESSWAY"

## 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.
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 plugs 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 one of the two balls into ball tilt assembly and adjust bracket so ball will roll over switch blade if front of cabinet is raised.

Plug in line cord:

Check adjustment of the (normally closed) kick-off switch on front cabinet mounting board that de-energizes the lock relay. Check adjustment of the (normally closed) anti-slam switch on front door that de-energizes the coin lock out relay.

#### GENERAL GAME OPERATION

Place ball into playfield by out hole.

Plug in line cord.

A. No lites lit.

Coin Game:

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

- 1A. If coin is inserted in 1st (nickel) coin chute and game is conditioned for 1 play-5¢, it will energize the "coin relay". If game is conditioned for 1 play-10¢, the first coin inserted will advance the "2 coin unit", then second coin inserted will energize the "coin relay" thru coin unit switch.

(See 1st coin chute adjustment plug on game adjustments sheet).

- 1B. If coin is inserted in 2nd (dime) coin chute and game is conditioned for 1 play-10¢, it will energize the "coin relay". If game is conditioned for 2 plays-10¢, it will energize the "2nd coin chute relay" and 2nd coin chute relay will advance "credit unit" (2 steps) thru coin credit circuit.

(See 2nd coin chute adjustment plug on game adjustment sheet)

- 1C. If coin is inserted in 3rd (quarter) coin chute and game is conditioned for 2-3-4-5 or 6 plays-25¢, it will energize the "3rd coin chute relay" and 3rd coin chute relay will advance "credit unit" (2-3-4-5-6 steps) thru coin credit circuit.

(See 3rd coin chute adjustment plug on game adjustment sheet).

- 1D. When "credit unit" has been advanced from 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 credit relay will energize "coin relay".

- 2A. 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. Coin relay will energize the "lock relay" which stays energized thru its own hold-in switch and cabinet kick-off switch.
- 2C. Coin relay will latch the "tilt interlock relay" (if tripped) and trip the "game over interlock relay" (if latched).
- 2D. Coin relay will energize the "reset relay", operate the "score motor" and then thru (normally open) #2 score motor switch, energize the "score reset relay". The reset relay will continue to operate score motor, and both the reset and score reset relays will stay energized until all "score counter units" are reset to "Zero Position".
- 2E. Coin relay, thru (normally open) #3 score motor switch will advance the "total play meter", reset the "ball count unit" and reset the "credit unit" (1 step) if credit button was used as score motor game start cycle ends.
- 3A. Ball on out hole switch will energize the "out hole relay" thru (normally closed) #1 score motor switch, and it will stay energized thru its own hold-in switch and (normally closed) #8 score motor switch.
- 3B. Out hole relay will operate the "score motor" and then energize the "out hole kicker" solenoid thru (normally open) #7 score motor switch. 1st ball is kicker thru ball trough to shooter alley and game is now conditioned for player to begin play.

# REGULAR BALL TO BALL SEQUENCE OF OPERATION

- 1A. When "1st ball" is played, the "ball index relay" will be energized by the "10 point", "100 point", or "1000 point" score relay and stay energized thru its own hold-in switch, outhole relay switch and (normally closed) #6 score motor switch.
- 1B. When 1st ball played returns to out hole, ball on out hole switch will energize the "out hole relay" thru (normally closed) #1 score motor switch. Out hole relay will stay energized thru its own hold-in switch and (normally closed) #8 score motor switch. Out hole relay will operate "score motor", advance the "ball count unit" thru (normally open) #4 score motor switch and ball index relay switch, then energize the "out hole kicker" solenoid thru (normally open) #7 score motor switch. 1st ball is returned to shooter alley and game is conditioned for "2nd ball play."
- 1C. Sequence 1A & 1B are then repeated on each ball played, until "last ball" is played. When last ball played returns to outhole, the "game over interlock relay" trip coil will be energized thru the "ball count unit disc" and game is completed.

## Note:

If game is "tilted" before last ball is played and returns to outhole, game over interlock relay trip coil will be energized by tilt interlock relay switch to end game.

## FEATURE OPERATION AND SCORING

### Name (Lites Out) Feature:

"Name Unit" lites the "E-X-P-R-E-S-S-W-A-Y" mushroom-bumpers and targets in sequence as it advances. Unit is advanced when the "name advance relay" is energized thru unit disc, by mushroom-bumper and target relays, or by spot letter target relay thru 00-90 unit\* disc. Name advance relay stays energized thru its own hold-in switch in series with name unit end of stroke switch. The name unit resets only when new game is started. The "mushroom-bumper relays" and "target relays" are energized when ball hits corresponding letter mushroom-bumper or target. The "spot letter target relay" is energized when ball hits spot letter target. Spot letter target lite is lit at random thru 00-90 unit\* during 5 ball operation, at all times during 3 ball operation. During 5 ball operation, when "E-X-P-R-E-S-S-W-A-Y" (lites out) sequence is completed, "special" lites at left or right alley thru "alternator relay", which is controlled by the 00-90 unit\*. A ball in lit special alleys will then score "credits" for duration of game. During 3 ball operation, only "E-X-P-R-E-S-S" part of (lites out) sequence is needed to lite "special" and score "credits".

### Note:

During both 5 ball and 3 ball operation, a "credit" can be scored automatically upon completing "E-X-P-R-E-S-S-W-A-Y" sequence, thru "special feature adjustment plug". (see game adjustments sheet) Also during both 5 ball and 3 ball operation, both left and right alley "special" lites can be lit at same time, thru "name feature adjustment plug". (see game adjustment sheet)

### Bonus (mileage score) Feature:

"Bonus unit" lites the "Bonus Mileage Score Lites" (1000 to 10,000) as it advances. Unit is advanced by the W and Y mushroom-bumper relays or the advance bonus hole relay. The "W and Y mushroom-bumper relays" are energized when ball hits corresponding letter mushroom-bumper. The "advance bonus hole relay" is energized when ball goes into (top) advance bonus hole. "Lit bonus mileage score" is collected and bonus unit resets when "bonus score relay" is energized. Bonus score relay is energized by "bonus hole relay" when ball goes into (side) collect bonus hole, or when ball goes thru lit left or right outlane, which lite alternately thru the "alternator relay", controlled by the 00-90 unit\*. Bonus score relay stays energized thru its own hold in switch in series with bonus unit "zero" switch. Bonus unit is also reset by the "reset relay" when new game is started.

Note: When bonus unit resets to "0" position, it then is advanced (only) from "0" to "1st" position (1000) thru (normally open) #10 score motor switch.

\* 00-90 unit advances each time 10 point relay is energized.

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GAME ADJUSTMENTS

PLAYFIELD PANEL POST ADJUSTMENTS

Posts that control left and right outlane opening on panel (see panel sketch FO-322) can be moved to make access to outlanes easier or harder for ball to enter.

Easier entry will "decrease" playing time and scoring.

Harder entry will "increase" playing time and scoring.

BELL ADJUSTMENT PLUG:

Located on back box lite insert. This plug provides positions to ring bell for "100" point scores, "1000" point scores, or both "100 & 1000" point scores.

HI-SCORE ADJUSTMENT PLUG:

Located on back box lite insert. This plug provides a wide range of coverage at which hi-score "credits" can be scored. (See "Score adjustment card" in back box for plug positions).

MATCH FEATURE ADJUSTMENT PLUG:

Located on back box lite insert. This plug provides positions to turn 00-90 match feature "on" or "off".

BALLS PER GAME ADJUSTMENT PLUG:

Located on back box lite insert. This plug provides positions to operate game on "5 ball" or "3 ball" play.

NAME FEATURE ADJUSTMENT PLUG:

Located on front cabinet mounting board. This plug in "liberal" position lites both left and right alley "special" to score "credits" for name (lites out) feature.

2ND COIN CHUTE ADJUSTMENT PLUG:

Located on front 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:

Located on front cabinet mounting board. This plug provides positions to give "2 to 6 plays for 1 coin" thru the 3rd (quarter) coin chute. Use orange-white (male plug) wire.

SPECIAL FEATURE ADJUSTMENT PLUG:

Located on front cabinet mounting board. This plug in "liberal" position will score a "credit" automatically for complete name (lites out) feature.

1ST COIN CHUTE ADJUSTMENT PLUG:

Located on the 2 coin unit, on front 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.

#### Left (Kickback) Alley Feature:

Ball into left alley energizes the "left alley relay" to score "3000 points" thru (normally open) #9 score motor switch, and then energize the "left alley kicker solenoid" thru (normally open) #7 score motor switch, to return ball to playfield action. Left alley relay energized when "special" is lit, will score a "credit" thru (normally open) #4 score motor switch.

#### Right Alley Feature:

Ball into right alley scores "2000 points" thru "upper" and "lower" rollovers, and ball can also drop into "collect bonus mileage score hole". "Upper rollover" when "special" is lit, will score a "credit".

#### Playmore Post Feature:

"Post goes up and lites" when post relay is de-energized by ball into (top) "advance bonus hole", which energizes "advance bonus hole relay", or by ball hitting the "A" mushroom-bumper, which energizes "A" mushroom-bumper relay. Post relay de-energizes the "post solenoid", releasing post. Post goes down and lite goes off when post relay is energized by ball hitting "down post rollover buttons", (2) or when ball in play returns to outhole, game is tilted while ball in play, new game is started.

#### Thumper-Bumpers W/lit Feature:

When lit, thumper-bumpers score "100 points" instead of 10 points. "Thumper-bumpers are lit" thru the "alternator relay", which is controlled by the 00-90 unit\*. When alternator relay is de-energized, left and right thumper-bumpers are lit. When alternator relay is energized, only lower thumper-bumper is lit.

\* 00-90 unit advances each time 10 point relay is energized.

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## Parts List

## MISCELLANEOUS

Transformer  
Score Motor (Domestic)  
Score Motor (Export)  
Meter (Total Play)

## RELAY COILS

Alternator  
Bonus Score  
Ball Index  
Out Hole  
Bonus Hole  
Left Alley  
Reset  
Credit  
3rd Coin Chute  
2nd Coin Chute  
Coin  
Lock  
Game Over (Trip)  
Game Over (Latch)  
Tilt (Trip)  
Tilt (Latch)  
Spot Letter Target  
"Y" M.B.  
"A" M.B.  
"W" M.B.  
2nd "S" target  
1st "S" target  
2nd "E" target  
"R" target  
"P" M.B.  
"X" M.B.  
1st "E" M.B.  
Left T.B.  
Right T.B.  
Post  
Score reset  
1000 Point  
100 Point  
10 Point  
Advance Bonus Hole  
Name Advance

## PART NO.

E-122-95  
E-119-354  
E-119-411  
E-130-10

## ASSEMBLY COILS

|                      |                  |
|----------------------|------------------|
| Outhole kicker       | A-26-1100        |
| Advance bonus hole   | A-26-1100        |
| Collect bonus hole   | A-26-1100        |
| Thumper bumper (3)   | A-25-1000        |
| Slingshot kicker (2) | AP-26-1200       |
| Post (playmore)      | AP-31-3000       |
| Flipper (2)          | AF-26-750/31-900 |
| Knocker              | C-27-1000        |
| Bell                 | CB-31-2000       |
| Coin lockout         | FC-33-2600       |
| Left alley kicker    | A-26-1200        |

## UNIT COILS

|                      |            |
|----------------------|------------|
| Name (Step-up)       | B-26-1100  |
| Name (Reset)         | C-28-1100  |
| Bonus (Step-up)      | B-26-1100  |
| Bonus (Reset)        | C-28-1100  |
| Credit (Step-up)     | B-26-1100  |
| Credit (Reset)       | C-28-1100  |
| Ball count (Step-up) | B-26-1100  |
| Ball count (Reset)   | C-28-1100  |
| 00-90 (Step-up)      | B-26-1100  |
| Score (Step-up)      | CD-29-1600 |
| 2 coin (Step-up)     | CD-29-1600 |

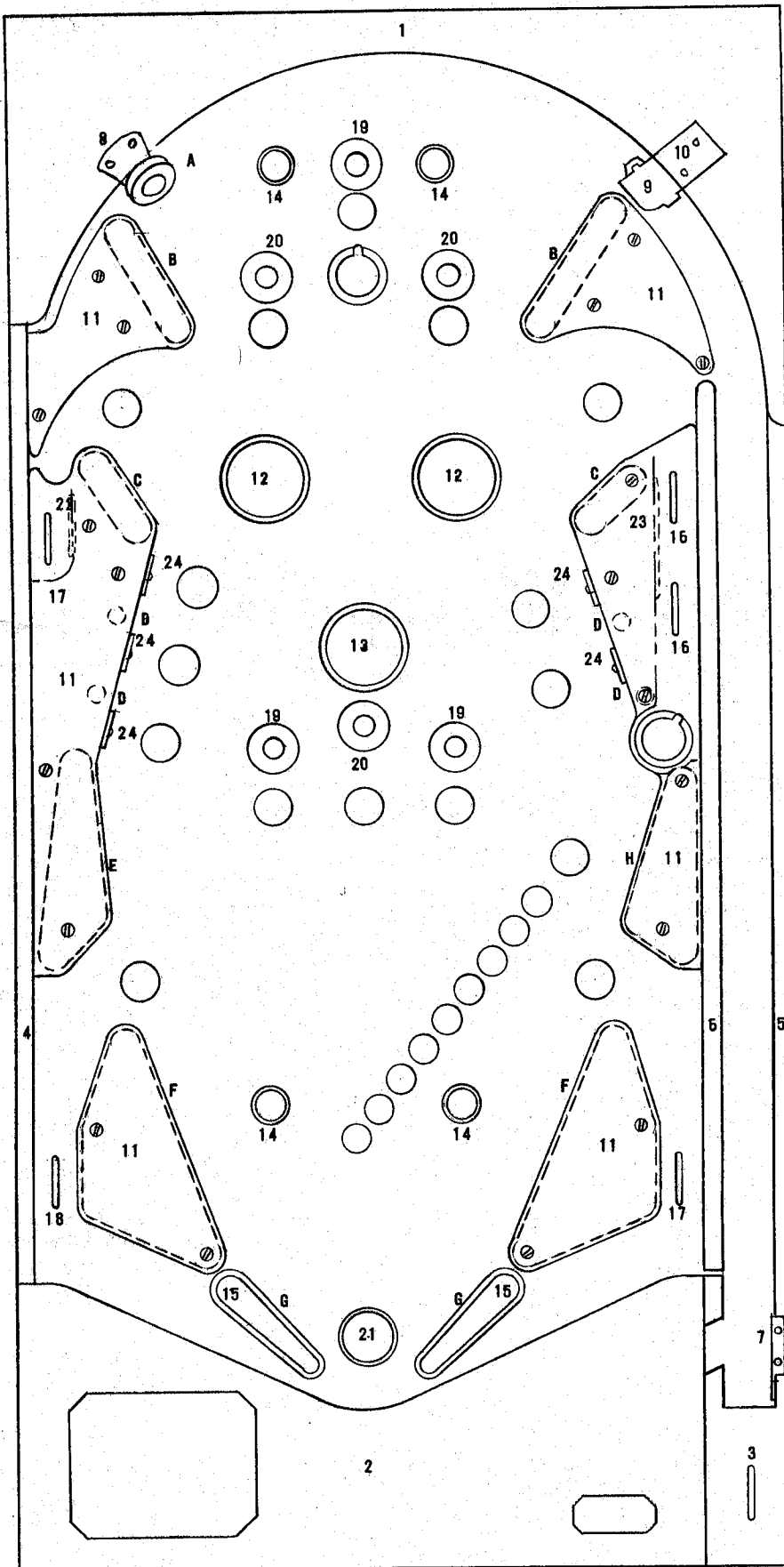
## UNIT CONTACT DISC'S

|            |           |
|------------|-----------|
| Name       | W-1077-7  |
| Bonus      | W-1072-20 |
| Ball count | W-1043-15 |
| 00-90      | W-1123-10 |
| Score      | A-2212-7  |

## UNIT WIPER ASSY'S

|            |             |
|------------|-------------|
| Name       | AS-1046-650 |
| Bonus      | AS-1046-629 |
| Ball count | AS-1046-626 |
| 00-90      | AS-1046-627 |
| Score      | A-1618-3    |

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## RUBBER PARTS

- A - R-115-4 REBOUND (1)
- B - R-521-3 2" (2)
- C - R-521-1 1" (2)
- D - R-243 5/16" (4)
- E - R-521-5 3" (1)
- F - R-521-6 3-1/2" (2)
- G - R-406-3 FLIPPER (2)
- H - R-521-4 2-1/2" (1)

## PANEL TOP PARTS

- 1 - TOP ARCH P-5839-59
- 2 - BOTTOM ARCH P-5871-38
- 3 - SHOOTER GAUGE P-6359-10
- 4 - SIDE RAIL (L) CA-1208-13
- 5 - SIDE RAIL (R) CA-1208-1
- 6 - INNER RAIL CA-1208-14
- 7 - PROTECTIVE ANGLE P-7639
- 8 - BALL REBOUND AS-493-3
- 9 - BALL GATE A-1475-1
- 10 - BALL GATE COVER P-2996-5
- 11 - LITE SHIELD (SET) A-2890-71
- 12 - BUMPER CAP (GREEN) C-719-13
- 13 - BUMPER CAP (YELLOW) C-719-17
- 14 - ROLL OVER BUTTONS C-387-5
- 15 - FLIPPERS (WHITE) C-611-5
- 16 - ROLL OVER WIRE M-1336-10
- 17 - ROLL OVER WIRE M-1336-2
- 18 - ROLL OVER WIRE M-1336-3
- 19 - MUSHROOM BUMPER (YELLOW) AS-2219
- 20 - MUSHROOM BUMPER (ORANGE) AS-2219-5
- 21 - BUMPER C-810
- 22 - BALL GUIDE WIRE M-121-30
- 23 - BALL GUIDE WIRE M-121-33
- 24 - TARGET ASSEMBLY (RED) AS-882-723

Jan. 6, 1971

NEW COIL NUMBERS

FO-319a

OLD COIL NUMBERNEW BALLY COIL NUMBER

|                 |                    |
|-----------------|--------------------|
| 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:

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