

- Do Re Mi -

We suggest to the mechanic that he carefully study the below mentioned operations before making any attempt to adjust or repair the machine.

The mechanic must know that wherever a contact switch is mentioned to be checked, this switch should be cleaned with a point (contact) file, and unless otherwise specified, the contact gap should be about $3/64$ " when open, and when closed, should make with as much rub or follow thru as possible to insure a good contact.

Before checking for any difficulties, check the following:

1. Lead-in cord to wall outlet.
2. Jack Plugs to match with female plugs and fit tightly.
3. Fuses for proper amperes and burn-outs.
4. Contacts on tilt coil and lock coil relays.
5. Clock contact located under playfield.

Solenoid armatures should be lubricated with genuine "Gulf" Graphite Penetrating Oil occasionally.

I. Numbered Bumpers (#1 - #5)

These bumpers when hit, score 1000's and trip their respective relay in Trip Relay bank.

The sequence of operation works as follows:-

1. The "Bumper Intermediate Relay" and respective Trip Relay, being wired in series, energize together.
2. The Bumper Intermediate Relay when energized, completes circuit to the 1000 Gravity Delayed Relay, which when energized closes circuit to the 1000 Step-Up Drive Coil, and scores the 1000's.
3. The respective Trip Relay when tripped opens the lite circuit to bumper and completes the circuit to back panel thru the three-leaf switch. The two-leaf switch forms a part of continuity to 1-5 (2) Trip Relays.

If any of the above fail to operate when bumper is hit, Check:-

1. Solder connections on bumpers.
2. Fine braided wire soldered to pin of bumper.
3. Soldered connections on Bumper Intermediate Relays.
4. Open in coils of either relay.

II. D, O, R, E, M and I Bumpers.

These bumpers score only 1000's when not lit.

When all the numbered bumpers are hit then the D, O, R, E, M and I lite up and when hit operate in same sequence as outlined under paragraph I, with one exception that the two-leaf switches now form a continuity to the "Do Re Mi 5 Replay Relay" and award player five replays.

If these bumpers fail to function properly, check:-

1. Same as Paragraph I check.
2. When relay bank is reset, respective coil armatures should have about $1/32$ " to $1/16$ " gap between armature tip and side of tripper arm.
3. The two-leaf switches when closed energize the 1-5 (2) Trip Relays thru the switches on 1-5 Trip Relays.
4. Lites to the bumpers and back panel are controlled by a switch on 1-5 Trip Relay.

III. When all the bumpers are hit, the player is awarded 5 replays which are attained in the following order:-

1. The continuity of the two-leaf switches on "D" Trip Replay to "I" Trip Relay inclusive, energize the "DO RE MI 5 Replay Relay".
2. The inner two-leaf switch energizes the "5 Replay Relay" which in turn records 5 Replays. See Section XI in regard to this.
3. The outer two-leaf switch on the "DO RE MI 5 Replay Relay" energizes the "DO RE MI Trip Relay" which in turn breaks the circuit to the "DO RE MI 5 Replay Relay". This breaking of the circuit is accomplished by means of the two-leaf break switch on the "DO RE MI Trip Relay".
4. If any difficulty is encountered in the above operation, check:-
 - a. All the two-leaf switches from #1 to I inclusive on the Relay Bank.
 - b. The two switches on the "DO RE MI 5 Replay Relay".
 - c. The three-leaf break switch on the "DO RE MI Trip Relay" which should break near the end of the stroke.
 - d. The holding switch on the "5 Replay Relay". This switch, which is the innermost one, should make before any other switch on this relay. See Section XI.

IV. The "5000 When Lit" bumper.

This bumper registers 1000's when not lit and will not lite until the #1 to #5 bumpers have been hit; it will now register 5000.

1. If any difficulty is encountered in the above operation, check:-
 - a. The three-leaf switch on one of the "1-5 Trip Relays".
 - b. The top three-leaf switch on "5 Replay Relay".
 - c. See Section XI.

V. When the Solo bumper is hit, it scores 1000 and if a ball goes thru bottom middle roll-over, the player is awarded 5 Replays, which are attained in the following order.

1. Hitting the Solo Bumper energizes the "Solo Relay" which by means of the bottom two contacts of the three-leaf switch located on this relay, completes the circuit to 5 Replay Relay when a ball goes thru the bottom middle roll-over.
2. If any difficulty is encountered in the above operation, check:-
 - a. The bottom middle roll-over switch. There should be sufficient follow-thru with a ball.
 - b. The three-leaf switch located on the "Solo Relay". The bottom two contacts should make with plenty of rub and still break the top two contacts.
 - c. The two-leaf holding circuit on Solo Relay.
 - d. The bottom side roll-overs. The bottom switch should make until a ball goes over it.
 - e. The reset break switches. In normal position they should all be making with plenty of rub.
 - f. The 15 Volt Coil fuse.

VI. If a ball goes thru the bottom middle roll-over when the Solo bumper hasn't been hit, 5000 is registered.

1. This operation is controlled by the three-leaf switch on the "Solo Relay" and feeds thru to the "5000 Relay".

See Section XI on this relay.

VII. R E and M I Roll-over switches.

These roll-overs score 1000's when the "Special" cap in play field is not lit.

Roll-overs score 5 Replays when "Special" is lit, the Sequence works as follows:-

When the bumpers R and E are hit when lit, they trip their respective Trip Relays, which thru a two-leaf switch on "R" relay and three-leaf switch on "E" relay complete circuit to lite to "Special" cap. The outer three-leaf switches on these relays control value of R E Roll-over. When R E roll-over switch is made when "Special" is out it registers 2000 thru the 2000 Delayed relay. When "Special" is lit, it scores 5 Replays thru the 5 Replay Relay. See section XI.

If bumpers M and I are hit, check same as above with the exception of the switches which in this case are located on the M and I Trip Relays.

VIII. To achieve a ~~J. P.~~ ~~P.~~, one must hit out all the bumpers; that is, the 1-5, D, O, R, E, M, I and the Solo and then go thru the bottom middle roll-over when lit. The sequence of operation works as follows:-

1. The circuit starts on the "DO RE MI Trip Relay" thru bottom two contacts of the three-leaf switch, goes thru a two-leaf switch on the "Solo Relay" and finishes to the "J. P. Start Relay". This completes half the circuit and going thru the bottom middle roll-over, trips the "J. P. Start Relay".
2. The "~~J. P.~~ ~~P.~~ Start Relay" when tripped, keeps the "5 Replay Relay" energized until the "J. P. Stop Relay" is tripped. This relay is energized at either 25, 45 or 90 Replays depending on the operator's discretion.

See Special Award. Plug in back cabinet.

3. If failure arises from the above operation, check:-
 - a. The three-leaf switch on the "DO RE MI Trip Relay".
 - b. The middle two-leaf switch on the "Solo Relay".
 - c. The two-leaf make switch on the "J.P. Start Relay."
 - d. The two-leaf break switch on the "J. P. Stop Relay".

IX. 1000 Step-Up Unit

This unit controls the following:-

1. 1000 lites (^{CENTER}~~outside~~ row of buttons).
2. 10,000 and up lites (brass segments).
3. Replays thru ^{OUTSIDE}~~center~~ row of buttons, plug adjustment and the switch on the side of the unit.

X. Replay Step-Up Unit.

Completes circuits to replay lites thru brush arm against outside row of buttons and segments.

The Special Award is controlled by the inner buttons and the 25 - 45 plug. The open-at-zero switch is opened by the pin on the ratchet when the unit is reset completely; when it is closed with replays up, it completes the circuit to the replay coin chute coil thru the Replay Regular jack, the three-leaf switch on the "Replay Reset Relay", and the three-leaf switch on the door.

Note:- The open-at-zero switch is of no consequence if the game is operated on Regular.

XI. 5000 - 5 Replay - Replay Reset Relays --

These relays, when energized, complete the circuits to the following

1. To hold their own circuit.
2. To the 1000 Gravity Delayed Relay if 5000 relay is energized, to the Replay Gravity delayed relay when 5 replay is in, or to the Replay reset coil when Replay reset is energized. The 1000, 5000 gravity delayed relays and Replay reset coil are operated by the "Motor Cam Switch" on "Motor Scoring Unit".
3. Complete circuit to "Brake Coil" which energizes and makes with a single leaf and completes circuit to the motor coil, Unit then operates the "Motor Cam Switch" by notched cam. Circuits to 5000 and 5 replays are opened by Relay control switch.

Read instructions on Motor Unit for useful information.

XII. Meter.

When Replays are reset or counted off by means of a button located under cabinet, the meter will record as many replays as were shown in back cabinet. This operation works only when game is used as Replay.

If Meter fails to operate, check:-

1. Reset switches.
2. Plug in Replay position (located in back cabinet).
3. Two-leaf switch on "Replay Reset Relay".

If game is used as Regular, meter registers with every Replay and must be plugged into Regular. See instructions on side of back cabinet for complete information.

Henry Dabek, Chief Inspector
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