Problem: Kickout saucer (actually 2 of them and they behave the same) right above the flippers. They are lit to award 50,000 at game start. Hit the saucers and ball kicks out as it should but no points are awarded. Hitting the left or right rollover switches (above the saucers) increases the lit award for the saucers to 200,000. Once again hit the saucer and ball kicks out but no points awarded. Now hit the rollover switch you haven't hit yet (left or right) and the saucer award goes up to 500,000. Now hitting the saucer will award the 500,000 points correctly.

I just can't figure out why the 50,000 and 200,000 point awards aren't working for those saucers (the big 500,000 award does work).

Analysis:
First, let's look at what IS working. The lights are working correctly, so the left and right rollover switches are registering as they should. Also, the 500,000 point score is working correctly.

The blue line in figure 1 below shows the circuit that scores 500,000 points when both the left and right lane rollovers have been completed.

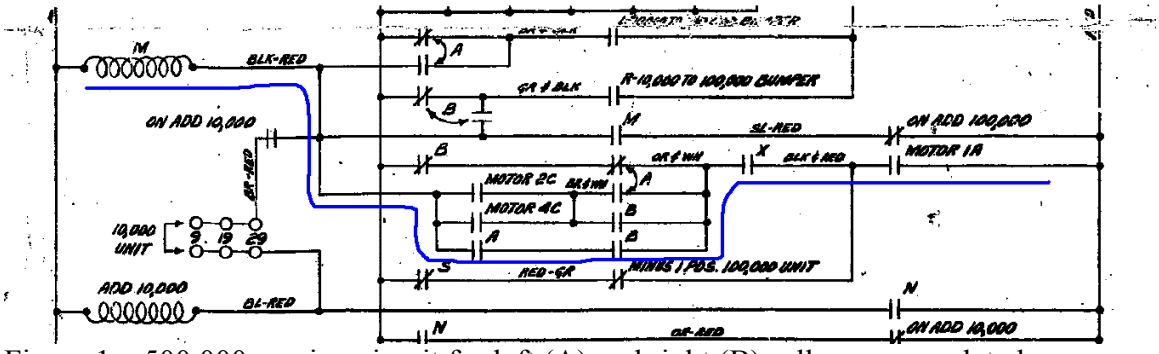


Figure 1 – 500,000 scoring circuit for left (A) and right (B) rollovers completed

Looking at the circuit from left to right:

- M is the coil for scoring 100,000 points. It will be pulsed five times to achieve a 500,000 score. Whenever something is done 5x in a Gottlieb machine it will involve score motor switch 1A.

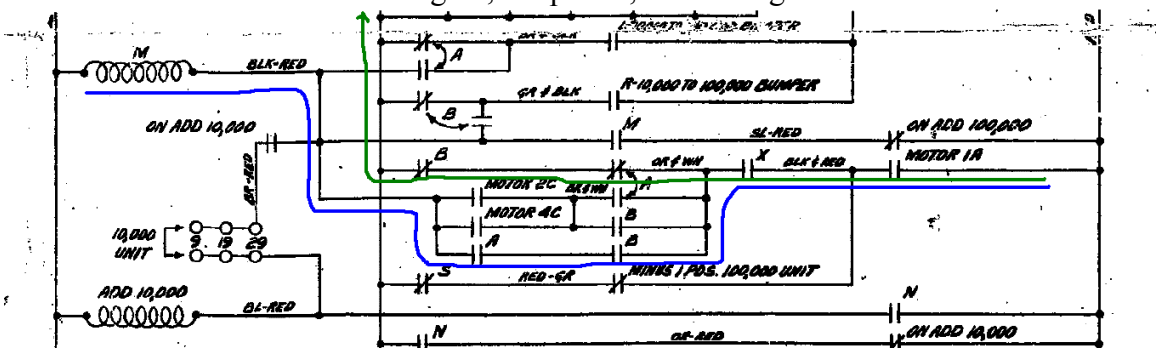
- Switch A is the switch on bank relay A that closes when the left rollover has been completed.

- Switch B is the switch on bank relay B that closes when the left rollover has been completed. Since switches A & B are in series, BOTH must be closed to activate this branch of the circuit. Notice how this aligns with the rules of the game.

- X is the hole relay, it actuates when a ball is captured in either kickout hole.

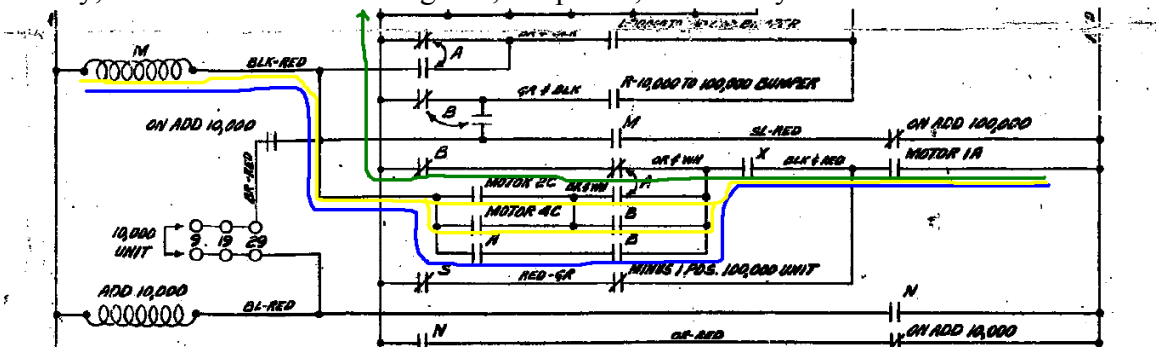
- 1A is the SCORE MOTOR switch that provides the five pulses needed to score 100,000 points five times.

Now look at the circuit for scoring 50,000 points, shown in green.



The 10,000 relay (N) is not shown here, but the green arrow indicates where it is. There is a lot in common with the circuit described above, but the A and B normally closed switches show that when neither left (A) or right (B) rollovers have been completed, the green circuit is active and the kickout hole will score 50,000 points.

Finally, look at circuit for scoring 200,000 points, shown in yellow.



Again there is a lot in common with the above scoring circuits, but this is more complicated than the first two. Note that the 2C and 4C score motors are wired in parallel. There's an assumption that must be made here since the schematics did not provide a switch timing diagram for the score motor. 2C will gate one of the 1A pulses through and 4C will gate a different 1A pulse through. This will give the two pulses needed to score 200,000 points. This will happen whenever the left (A) rollover OR the right (B) rollover has been completed.

Solution:
The solution here is not a straight-forward as I had hoped it would turn out. The key to the problem is the center of the schematic where the blue, green, and yellow lines diverge. The circuit in blue works correctly, so it's safe to assume that X and 1A are working correctly. The 100,000 coil (M) is working since 500,000 is scoring as it should. Problems with other 10,000 scores were not mentioned, so I'm assuming the 10,000 (N) coil is working correctly.

For 50,000 score to not work, the normally closed switch on either A or B (green line) must not be conducting.

For 200,000 score to not work, BOTH the normally open switches on A and B (yellow line) must not be conducting. There is one caveat here as this will depend on whether the left or right rollover is completed first. I don't know if this has been tested in both sequences.

If a game has been working it is not common for more than one switch to suddenly stop working. Since this game may have been sitting for some time and/or had significant restoration, it is possible that there are multiple problems. Cleaning and adjusting those switches on A and B would certainly be a good first step.

With multiple problems like this, it's also possible to have a broken wire that would stop multiple circuit branches from working. Unfortunately, the schematics don't show how the wires are physically connected so you can't tell where a single break might disconnect multiple things. If the A & B switches are good, I would check continuity of the ORANGE & WHITE wire from the switch on X to the switches on A and B. Having a broken wire, in my experience, is quite rare.

Summary:

1. Check normally closed (N.C.) switch on B with orange&blue wire and a jumper wire over to a make-break switch on A.

2. Check make-break switch on A with the jumper from N.C. switch in step 1 and orange&white wire on the N.C. side

3. Check normally open (N.O.) side of make-break switch on A with brown&white and orange&white wires

4. Check N.O. switch on B with with brown&white and orange&white wires.