D. GOTTLIEB & CO.

SYSTEM 80

BENCH TEST FIXTURE

The System 80 Bench Test Fixture provides complete test capabilities for the electronic sub-assemblies used in the System 80 games, including the Control Board, Master Driver Board, Power Supply, Display Boards and Sound Board.

The Bench Test Fixture is a compact unit which includes an internal Control Board and Power Supply and a 4 digit Display Board. Switches are provided on the base panel to select either the internal Control Board or a Control Board under test. The following provides detailed instructions for operation of the Bench Test Fixture.

I. Assembly

Note: The unit is shipped with the vertical section folded over the front cabinet.

1. Remove the banding strap and unfold the unit.

2. Secure the vertical section in the upright position using the three #10 machine screws provided.

II. Operation

Connect the fixture to the proper voltage source. An ON-OFF toggle switch on the right side of the front panel controls the line power to the unit. A pilot light indicates when the unit is "on". Five fuses protect circuits as indicated on the fuse holders.

III. Power Supply Test

1. Place the Power Supply under test into the vertical stand at the left rear corner of the front panel.

2. Connect the three connectors provided to the power supply.

3. Set the 12V select switch to "P.S. U.T."

4. Apply power.

Test points are provided on the power supply.

IV. Sound Board Test

1. Place sound board on the stand-off posts at the right rear of the front panel.

2. Connect the connector provided to the sound board.

3. Set the 12V select switch to "Other".

4. Apply power.

5. Switches S1, S2, S4, and S8 select, in binary format, which of the 16 sounds will be enabled. All switches down = 15, all switches up = 0.

6. The "SOUND ENABLE" switch is used to activate each selected sound.

7. Volume is controlled using the potentiometer to the left of the sound board.

V. Driver Board Test.

1. Place driver board on the stand-off posts at the lower right of the vertical front panel.

2. Connect the six connectors provided to the driver board.

3. Set the 12V select switch to "Other".

4. Apply power.

5. Indicators 48, 49, 50, and 51 on LED Board #1 should be on.

6. After a five second delay, indicators 14 through 18 should come on, and indicator 11 should begin flashing.

7. Press "REPLAY" switch.

8. Outhole solenoid should knock, indicators 0, 4 and 48 through 51 should come on. All other indicators should be off.

   Note: Game knocker solenoids are used to provide loading and an audible indication that each solenoid circuit is functional.

9. Press "OUTHOLE" switch once.

10. Outhole solenoid should knock. All solenoid drivers are now pulsed sequentially. S1, S2, S4, S8 and then the nine solenoid drivers will be energized repeatedly. Driver operation is noted by either a knock sound or a LED.

11. The solenoid which is being pulsed is indicated by a number which is displayed in the right half of the four digit display.

12. The test may be halted at any point by pressing the "TILT" switch.

13. When stopped, the test may be single stepped by pressing the " L. COIN" switch. Pressing the "TILT" switch will return the test to automatic advance.

14. Press the "OUTHOLE" switch to advance to lamp test.

15. Indicators 0 through 47 come on, and 48 through 51 go off for one second.

16. All indicators (except 48 through 51) then go off and come back on one at a time. The lamp drivers are thus pulsed sequentially and repeatedly.

17. Press " C. COIN" switch up to 6 times to increase the rate of the automatic test. (See note below.)

18. Press " R. COIN" switch up to 6 times to decrease the rate of the automatic test. (See note below.)

19. Press "TILT" switch to halt the automatic advance. Then press " L. COIN" to single step the test. Press "TILT" switch to return to automatic advance.

Note: If Steps 17 or 18 cause the test to become uncontrollably fast, press the "OUTHOLE" switch 3 times to return to a normal rate.

VI.   Six Digit Display Test

       1.   Place six-digit display on the stand-off posts at the
            bottom left of the vertical front panel.

       2.   Connect the connector provided to the display. Set 12v select to
            "Other".

       3.   Apply power.

       4.   Display should be blank for 5 seconds, then display all
            zeros.

       5.   Press "REPLAY" switch.

       6.   Display should show a single zero.

       7.   Press "OUTHOLE" switch.

       8.   Repeat #7.

       9.   Repeat #7.

       10. Display should add zeros until all six digits are zero,
            then increment 0-9 repeatedly.

       11. Press " C. COIN" switch up to 6 times to increase the rate
            of the automatic advance. (See note below.)

       12. Press " R. COIN" switch up to 6 times to decrease the rate
            of the automatic advance. (See note below.)

       13. Press "TILT" switch to halt the automatic advance. Then
            press " L. COIN" switch to single-step the digits. Press
            "TILT" switch to resume automatic advance.

VII.   Four Digit Display Test

       1.   Place the four digit display on the stand-off posts at
            the center left of the vertical front panel.

       2.   Connect A5-J1 to the display.

       3.   Set 12V select switch to "Other".

       4.   Apply power.

       5.   Display should be blank for 5 seconds, then show 25_ _.

       6.   Press "REPLAY" switch.

Note: If Steps 11 or 12 cause the test to become uncontrollably fast,
press the "OUTHOLE" switch 3 times to return to a normal rate.

7. Display should show 25_ _, 24_1, 25_1.

8. Press "OUTHOLE" switch.

9. Repeat #8.

10. Repeat #8.

11. Display should show a single zero, then add zeros until all four digits are zero, then increment 0-9 repeatedly.

12. Steps 11-13 of six digit display test now apply to this test.
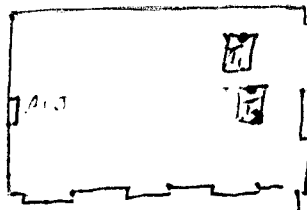
VIII. Control Board Test

1. Place the control board under test on the stand-off posts on the front panel.

2. Connect the six connectors provided to the control board.

3. Insert the Test Prom(s) into the proper socket(s) on the control board.

4. Set the 12V switch to "Other."

5. Apply power. Observe the following:

   - Digit LED's 1-15 come on
   - DS LED's 1-3 and 5-12 come on
   - LD LED's 1-4 come on
   - SOL LED's 1-9 come on
   - S1, S2, S4, S8 LED's come on
   - The left decimal point on all three 7 segment displays come on
   - After a 5 second delay, the three displays show zeros with left-hand decimal points and all remaining LED's come on.

6. Press switch STR7.

7. Display "A" shows a zero.

   Note: Disregard any LED indications at this time.

8. Turn all 32 DIP switches "ON." As the last switch is turned on, display "A" will increment to 7.

9. Turn all 32 DIP switches "OFF." As the last switch is turned off, display "A" will increment to 8.

10. Press the right outhole switch.

11. Press Test, L. Coin, R. Coin, C. Coin, Replay, and tilt switches in "Control Board Under Test" section. Press switch STR7 and switches RTN0 through RTN6. As the last switch is pressed, observe that:

- Display "A" counts 9, ⊏ , ⊐ .

- The three displays begin to increment in value.

Note: All three displays will count continuously
with "A" being two digits ahead of "C" and
"B" being one digit ahead of "C." The
displays will indicate 0-F in hex format.
The flashing decimal point indicates the
h-segment is functional.

If during Step 8, 9 or 11, display "A" stops at a
particular number and will not change, the following
chart may be used to determine the Failure mode:

"A" Stops At	Failure
0	DIP switches not all ON
1	U4 RAM
2	U5 RAM
3	U6 RAM
4	5101
5	U2 ROM
6	U3 ROM
7	DIP switches not all OFF
8	Switch strobe or return not read
9	U4 Timer
⊏	U5 Timer
⊐	U6 Timer

12. Press the right outhole switch once. Digit LED's
turn off one at a time sequentially from left to
right. Disregard the three displays at this time.

13. Press the right outhole switch once. Lamp strobe
and lamp data LED's turn off one at a time. Observe
all LED's to insure that each one turns off at some
time.

14. Press the right outhole switch once. Observe the
solenoid and sound board LED's.

- Solenoid LED's 1-8 turn off one at a time, then
turn off in pairs.

- Solenoid LED 9 turns off.

- Sound board LED's turn off one at a time sequentially from right to left.

The above sequence then repeats.

15. Press the right outhole switch. The test should jump back to step 11.

16. Press the slam switch. All LED and display activity should cease, verifying proper slam switch operation.

Pop Bumper Driver Board Test

1. Connect the pop bumper driver board to be tested
    to the connector marked 1A8-J1 located near the
    A1-J1 connector of the control board under test.

2. Turn power on.

3. Press the "SOUND ENABLE" switch to activate the
    pop bumper driver board. Knocker coil #1 serves
    as a load, and should energize each time the
    "SOUND ENABLE" switch is pressed.