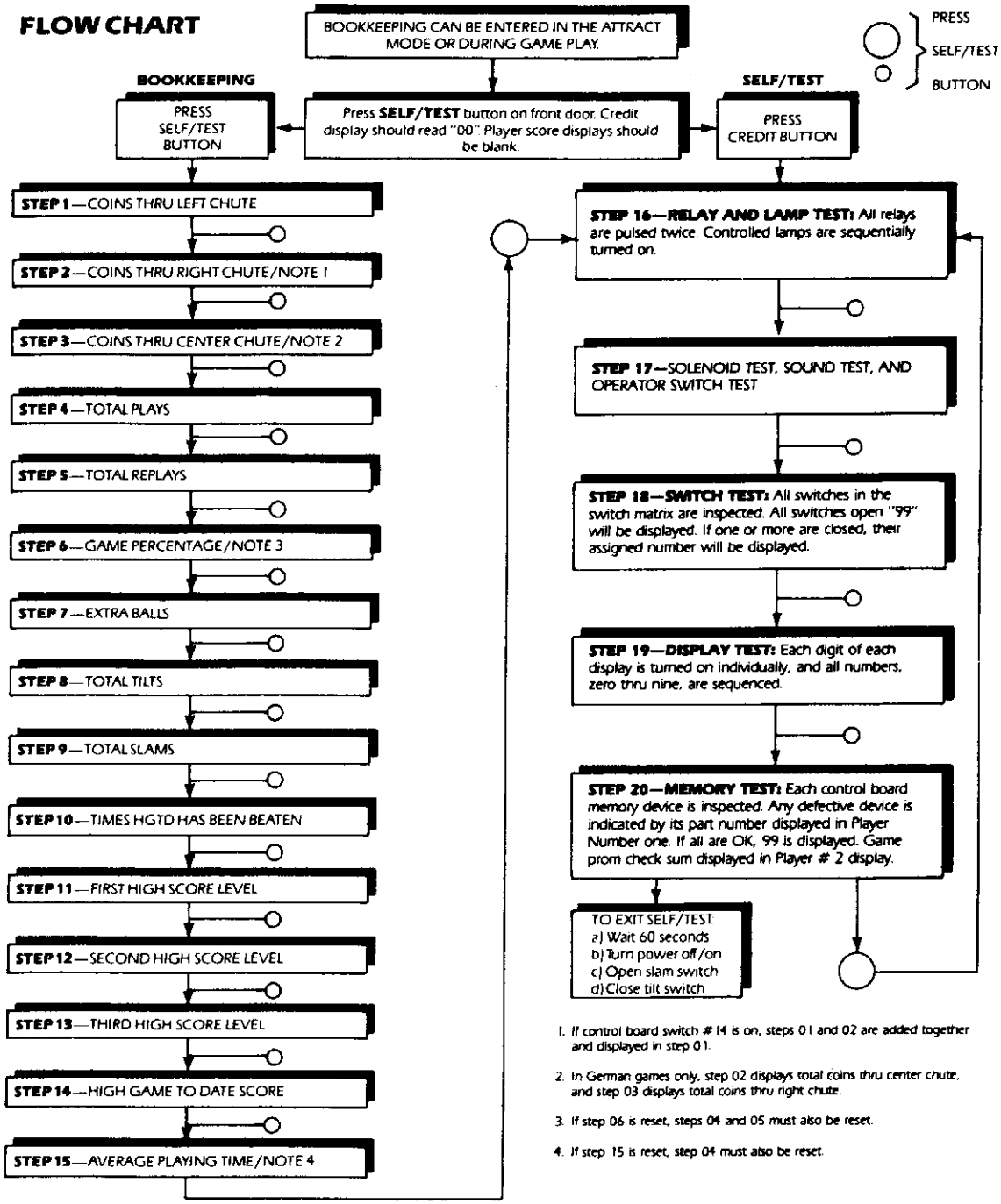
Gottlieb
ON TARGET
TECHNICAL NEWSLETTER VOLUME 3, ISSUE 4 APRIL 1982

SYSTEM 80A ENHANCEMENTS (PART TWO)

As previously mentioned in our March issue of ON TARGET, Gottlieb has replaced System 80 with System 80A commencing with Devils Dare and Caveman. Besides the major change of seven digit display capability, Gottlieb has also enhanced the bookkeeping and self-test. The following flow chart/sequence steps, will take you through these enhancements.

FLOW CHART



1. If control board switch # 14 is on, steps 01 and 02 are added together and displayed in step 01.
2. In German games only, step 02 displays total coins thru center chute, and step 03 displays total coins thru right chute.
3. If step 06 is reset, steps 04 and 05 must also be reset.
4. If step 15 is reset, step 04 must also be reset.

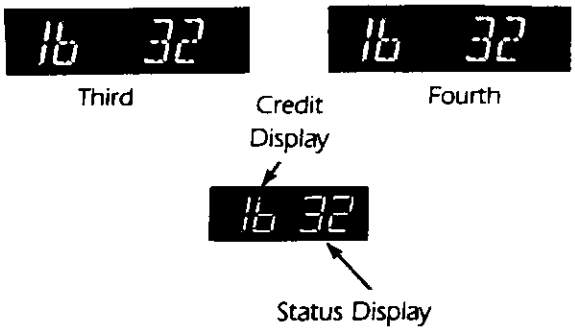
BOOKKEEPING AND SELF TEST

SELF/TEST

- Steps 16 through 20 are SELF/TEST or game tests the operator can use for quick troubleshooting.
- All the tests are explained in the flow chart.
- Each test can be repeated by pressing the replay button on the front door. This starts the test for another 60 seconds.
- If the SELF/TEST button or the replay button is not pressed within 60 seconds, the game will return to the attract mode.

Test information is displayed in the third and fourth player score displays and the status display.

EXAMPLE:

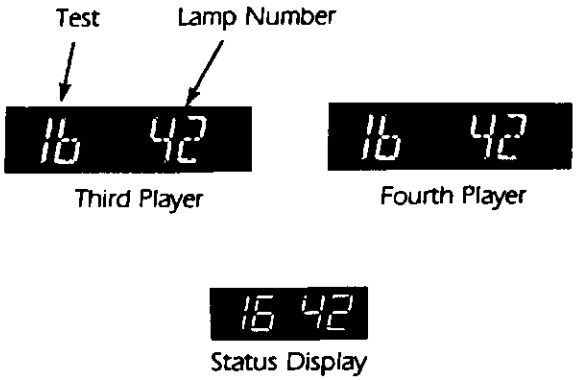


STEP 16—RELAY AND LAMP TEST

a. Relay Test-All relays are pulsed twice in the following order:

		A3 Driver Board Transistor Assignment (See Schematic)
Q (Game Over) Relay	-	A3J3 PIN #$\overline{A}$ Q1
T (Tilt) Relay	-	A3J3 PIN #$\overline{B}$ Q2
Coin Lockout Relay	-	A3J5 PIN #2 Q3
B (Ball Save) Relay	-	A3J6 PIN #3 Q54

b. Lamp Test-Lamps are sequentially strobed. Lamp assignment numbers appear in the third and fourth player's score display and the status display:



Lamp number (L9, L16, etc.) can be referenced to the Driver Board Schematic where the specific transistor for each lamp can be identified.

To repeat test, push the credit button. To advance to test # 17, push the Self/Test Button.

STEP 17—SOLENOID TEST, SOUND TEST, OPERATOR SWITCH TEST.

a. Solenoid Test-Each solenoid on the playfield is sequentially pulsed. The solenoid number displayed identifies which solenoid is being tested. The following chart lists solenoid assignments.

NUMBER DISPLAYED	ASSIGNMENT	A3 DRIVER BOARD TRANSISTOR ASSIGN. SEE SCHEMATIC
SOL. 1	Top Drop Target Bank	Q60
SOL. 2	Top Ball Kicker	Q57/58
SOL. 3	Hole	Q54
SOL. 4	Ball Save Relay	Q55
SOL. 5	Left Drop Target Bank	Q61/62
SOL. 6	Right Drop Target Bank	Q63/64
SOL. 7	Not Used	
SOL. 8	Knocker	Q53
SOL. 9	Outhole	Q59

b. Sound Test-Immediately after the solenoid test, the sound enable signals (inputted to the A6 Sound Board) will be tested in the following order:

SOUND ENABLE	NUMBER DISPLAYED	A3 DRIVER BOARD TRANSISTOR ASSIGN. SEE SCHEMATIC	
S16	17 (combination S1&S16)	A3J2	PIN 9
S8	8	A3J5	PIN 7
S2	2	A3J5	PIN 5
S4	4	A3J5	PIN 1
S1	1	A3J5	PIN 6

c. The first and second player's score displays show hexadecimal representative of the operator switch positions. Converting hexidecimal to binary will give the switch positions in binary form.

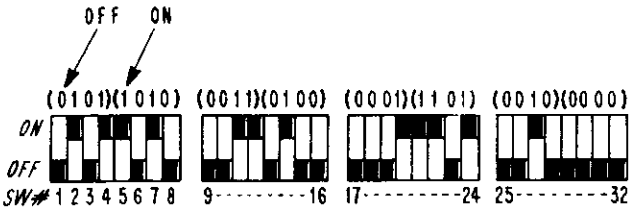
CONVERSION TABLE

0 = OFF 1 = ON

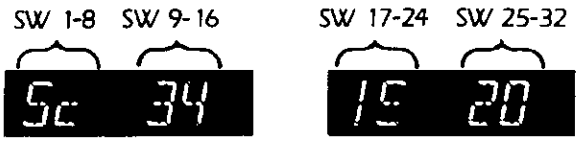
DISPLAYED HEXIDECIMAL		DECIMAL	BINARY
0	0	0	0000
1	1	1	0001
2	2	2	0010
3	3	3	0011
4	4	4	0100
5	5	5	0101
6	6	6	0110
7	7	7	0111
8	8	8	1000
9	9	9	1001
A	⊏	10	1010
B	⊐	11	1011
C	⊔	12	1100
D	⊆	13	1101
E	⊑	14	1110
F	BLANK	15	1111

BOOKKEEPING AND SELF TEST

EXAMPLE:



DISPLAYED



Checking Switches

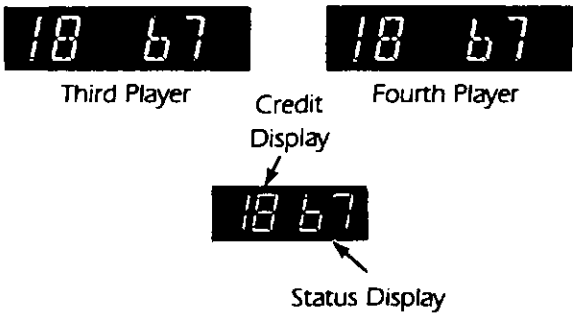
1) Switch all odd number switches to the ON position, and all even switches to the OFF position. Display should show:

2) Switch all even numbered switches to the ON position and all odd switches to the OFF position. Display should show:

To repeat test # 17, push the credit button.

To advance to test # 18, push the Self/Test switch.

STEP 18—SWITCH TEST



1) All switches open. 99 will be displayed. (Note: The slam switch is not part of the switch test (normally closed).

2) Switch(es) closed. Designated number(s) will be sequentially displayed. The last switch number will remain displayed, unless test is repeated.

STEP 19—DISPLAY TEST: Each digit of each display is individually turned on, and numbers zero through nine are sequenced.

- Test number is not displayed.

NOTE: On the second and fourth player displays only, the least significant digits are strobed first. Then the most significant digits and the remaining digits are sequentially strobed. This is normal operation.

STEP 20—MEMORY TEST - Each control based memory device is checked. If all are good, a 99 will be displayed.

If a memory chip is defective, a corresponding number in the following chart will be displayed:

NUMBER DISPLAYED	CHIP ASSIGNMENT/ DESCRIPTION
99	All Memory Good
5101	Z5 Bookkeeping Ram
2332-1	U2 Background Rom
2332-2	U3 Background Rom
6532-1	U4 Ram
6532-2	U5 Ram
6532-3	U6 Ram
2716*	Prom 1 Game E Prom

Player #2 displays the check sum for the game prom in hexidecimal. Refer to the conversion Table for interpretation.

To repeat test #20, push the credit button. To advance to Step # 16, push the Self/Test button.

* James Bond (658) and later System 80 games up to and including Haunted House will display 7641-1 for a bad 2716 game prom.

Technical Tip

When replacing a prematurely burnt flipper coil, don't forget to adjust the end-of-stroke switch. When a flipper is energized and the end-of-stroke switch does not open up, the coil will heat up and eventually burn. The end-of-stroke switch contacts should open approximately 1/16" before full plunger stroke.

Seminar Advance Notice

A mini seminar on trouble-shooting Gottlieb Pinball Games, will be held at the Ohio Music and Amusement Operators annual convention on Saturday May 8th, 1982. The convention will be held at the University Hilton Inn, in Colombus, Ohio. For more information contact the OMAA at (614) 221-8600.

DEVIL'S DARE™

MAILING LIST: Get ON TARGET every month by sending your name and mailing address to:

ON TARGET
GOTTLIEB AMUSEMENT GAMES
165 W. LAKE STREET
NORTHLAKE, IL 60164

Next Month:

Caveman! Introduction to Gottlieb's new Pin/Video game.

Notice

The Pinball/Video Service Hotlines are now the same. Call 800-323-9121, in Illinois 800-942-1620 from 8:00 a.m. to 4:30 p.m. CST for any Gottlieb pinball or video game assistance.

FLASHBACK

In December of 1955 Gottlieb broke new ground with the building of the game SPOT POOL. This was an automatic bumper pool table of regulation size. Bumper pool was the rage at that time, with many game companies making coin-op versions which scored automatically and in some cases had actual scoring bumpers.

ON TARGET

Gottlieb Amusement Games
165 W. Lake Street
Northlake IL 60164

BULK RT

DONALD H SOKOLIS
2015 N KOLMAR AVE
CHICAGO, IL 60639