

# ON TARGET

TECHNICAL NEWSLETTER VOLUME 3, ISSUE 6 JUNE 1982

## INTRODUCING GOTTLIEB'S *Reactor*

Gottlieb's new video, Reactor, should now be available at your distributor. The video system that we call the Graphics Generator 2, or GG-2, has been totally developed and designed at our video engineering facility in Bensenville, Illinois. The GG-2 system is an expandable system that is a self-contained, self-supporting board without the need for external ROM boards or I/O boards. The exception is a small track ball interface board, which handles the conversion of four X-Y coordinates into digital form for the CPU.

Our engineers have also designed a new, simplified, more reliable power supply board. The new A2 power supply for video combines the logic supply, a 6 Amp +5 regulated DC crowbar-protected output and all the voltages for the Sound/Speech board.

The Reactor game has the added dimension of speech because of our A6 Sound/Speech board. We have used two speakers for a richer sound and more reliable operation. Some notes for technicians familiar with our Sound/Speech board: In the binary input coding from the CPU board, S32 input is now used as the MSB of input codes. If servicing the Sound/Speech or Power Supply Assembly, do not remove any connectors until the LED indicator, D25, for the

+30V DC Audio Amp reference is completely off.

The cable and connector layouts have been designed to correspond to our pin-game coding systems. Those familiar with the cable, connector and wire codes in pinball games should find



our video system familiar: Wires are triple color coded, male connectors are coded AxPx, female connectors are AxJx, ground is always white or green/yellow and +5V DC is blue/grey/grey.

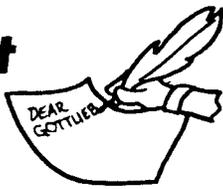
The CPU Video Generator board is divided into two

semi-independent control sections. The CPU uses the 8088 Intel Micro-processor to control the reading and execution of the program, selection of I/O ports, and selection of certain timing and RW signals. The 8088 has capabilities for 64K of memory. We are using 32K x 8 ROM and 8K scratch RAM, operating on a 5 Mhz. clock and controlling 5 input and 5 output ports.

The Video generator section of the board is called the Video State machine. A separate clock machine generates and controls the video signal output. The vertical sync is used to reset the Watchdog Timer and also to synchronize the CPU to the Video State machine. With the Video State machine controlling many of its own functions, the CPU has more programming room, more reliable stabilization of the buses, and more reliable set-up of program execution. The extra programming room gives the GG-2 system up to 4096 possible color variations and a 128 character set for foreground out of a possible 512 characters and objects.

You will find all of our technicians at the pinball hotline are familiar with the video system. If you have any questions or if technical help is needed for video repair, feel free to call us anytime.

## comment corner



Believe it! Gottlieb listens to you! D. Gottlieb is aware that operator experience and expertise can only help our efforts to produce a more reliable and serviceable product. ON TARGET will publish any letters of opinion if it will be beneficial to our readers. At times, letters sent to us may not appear in the upcoming issue. However, they may be included in future issues.

## 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 February 1950 Gottlieb joined the shuffle-alley craze and made BOWLETTE, a puck bowling game put into a cabinet not much larger than that of a pinball game. A special small puck was used, and the pins (about 2" high) didn't move but were fixed to a shelf. The puck passed under this shelf and lights in the pins would go out to show which pins had been "hit." The puck did not rebound back but was returned to the front of the machine by a long conveyor belt within the cabinet.

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

© 1982 D. Gottlieb & Co.  
All Rights Reserved  
Printed in U.S.A.

# ON TARGET

Gottlieb Amusement Games  
165 W. Lake Street  
Northlake IL 60164

MR FRED ABEL  
HOME DESIGN INC  
9609 BERRICKHIRE CT S E  
OLYMPIA, WA 98503