INTRODUCING GOTTLIEB'S Q*bert

Q*BERT QOLLECTS QUARTERS! The motto, as seen at the recent AMOA show in Chicago, depicts the new Gottlieb video sensation, "Q*BERT." Advance test reports confirm it. Q*BERT (an in-house design) combines all the skill of an action game. all the shrewdness of a strategy game, and its incredibly likeable and colorful characters all contribute to make it a tremendous earner.

WHO'S WHO AND WHAT'S WHAT Q*BERT is a snout-like character that hops from cube to cube on a 3-dimensional pyramid of illusionary colored cubes. The goal is to change the top color of all the cubes by hopping onto each one individually. Of course, no game is complete without villains. Coily, a wacky-looking snake, hops after Q*BERT, trying to 'squash' him by hopping onto a cube at the same time. Quick thinking and skillful timing hops Q*BERT onto a floating disk which ends Coily's pursuit (for now) and sends Q*BERT to the top of the pyramid. In later rounds, two intoxicatingly goofy characters, Ugg and Wrong Way, chase Q*BERT from the vertical sides of the cubes. Occasionally, Q*BERT is granted a visit by Slick and Sam, the bad guys of the game, whose ambition is only to make things more

difficult by changing the color of each cube they hop onto back to the original color. Add to all this action the red balls that randomly hop from top to bottom and you have "Q*BERT."



The software involved in Q*BERT has some very unique features, the first of which is the illusion of random movement of all falling objects from top to bottom. This avoids a maze-type pattern from being developed. Dependent upon the level and round, based on a time frame, the path of falling objects differs in each

play. Another handy software feature is the informational self-test (the hardware control panel is easily accessible through the front door). Included are several operator option screens, a monitor adjustment screen, and several diagnostic selftests. Among these is a distribution table that allows the operator to view total number of games ending in each level/round, time per game in 45 second increments, and total number of players to end a game within a table of scores that are incremented by 3K.

The options/parameter screen will allow the operator to view and change all game options on one screen. During this time, the screen will display seven operator-adjustable software options: A) reset high score table, B) factory preset (will reset all the following options to factory recommended levels), C) coin/ credit combinations, D) lives per game, E) difficulty-normal/hard (hard advances villain movement and speed in earlier rounds), F) 1st extra life and G) each additional life.

The diagnostic self-test will guarantee the integrity of each RAM, ROM, all switches, sound and hardware priority levels.

INTRODUCING GOTTLIEB'S Q*bert (CONT.)

Q*BERT's logic board has incorporated only minor changes from the Reactor logic board. HOWEVER, THESE TWO LOGIC BOARDS ARE NOT INTERCHANGEABLE! The GG-III logic board has a battery back-up system that allows the game to be turned off and still keep information in the bookkeeping tables intact. The operator does not need to reset the options screen due to a power loss. The board's memory capability has also been significantly increased. The GG-III allows 48K of program memory and up to 12K of scratch pad memory. board also has several operator adjustable switch options, which include a demonstration mode and a free play mode. The demonstration mode allows the operator to advance to any level/ round with infinite lives.



The GG-III is a character based graphics system using the Intel 8088 16-bit microprocessor for state of the art design. It is driven by a 5 MHZ clock derived by dividing

down a 20 MHZ crystal. The foreground generator can drive 62 individual, independent objects whose size is 16 pixels by 16 lines, selectable from 256 foreground objects at any frame time. All these objects have their own priority, which means there are 62 planes of depth. A double line buffer is used to drive the video information.

The background generator is character oriented. The characters are determined by an 8 pixel by 8 line matrix, which can be selected from a 128 character set, (when RAM is used for the background character generator) or from a 256 character set (when ROM is used instead). Both background and foreground objects can be displayed with 16 different colors out of a total of 4,096 possible colors during any given frame time.

The resolution of the GG-III system is 256 pixels by 240 lines for foreground and 32 x 30 for background.

The power supply used to supply all voltages is extremely tolerable to input line voltage variations. All output source voltages are guaranteed to be stable for line voltages varying from 95VAC 60 HZ to 135VAC 60 HZ.

The regulated logic +5VDC level is rated at 6 amps maximum and includes overvoltage crowbar protection. A quick visual voltage checking feature that can significantly minimize power supply troubleshooting time are 4 LED's which can quickly determine which of the voltages are not present. When lit, all input voltages are available. CAUTION: AFTER TURNING OFF POWER, DO NOT DISCON-NECT ANY BOARDS UNTIL THESE LED'S ARE COMPLETELY OFF.

RAM SUBSTITUTION

Q*BERT utilizes the OKI-MSM 2128-20RS NMOS RAM (XO-195). The following are suitable replacements for this RAM:

> MOSTEK MK 4802-4 TI TMS 4016-20 SYNERTEK SY2128 HITACHI HM6116P-4

The CMOS RAM being used is the HITACHI HM6116 LP-4 (XO-191). The following are suitable replacements for this RAM:

OKI-MSM5128-2ORS NEC UPD 446-2 FUJITSU MB 8416

Note: The GG-III system has been tested and found to comply with the limits for a class A computing device pursuant to subpart J of part 15 of FCC rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment.

CONDITION OF ARRIVAL REPORT

Just a reminder: As mentioned in the last issue of "On-Target," a self-adhesive condition of arrival tag will be affixed on all pinball and video games. Your assis-

tance in filling out and sending us this conditon of arrival report will be greatly appreciated. Please be sure to add your name, address, name of game and its serial num-

ber. This will help to insure the quality of all Gottlieb games. Thanks to all that have begun to participate in this program and have mailed us your reports.

MA-400 FILTER BOARD

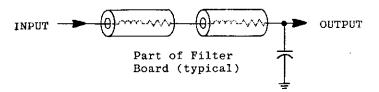
Commencing with Q*bert, the higher the impedance GV-103A, a Filter Board (typically 100 ohms above 30 MHZ). The larger suppress spurious radio beads are utilized on frequency emission which can cause electromagnetic currents, such as power interference.

The method utilized by Gottlieb, (ferrite beads coupled with bypass capacitors), form low pass filters. The ferrite beads surrounding the transmission lines are electrically nonconductive and 'absorb' magnetic flux. The higher the frequency,

the higher the impedance (typically 100 ohms above 30 MHZ). The larger beads are utilized on lines carrying larger supply lines and ground; the smaller beads suppress all other transmission lines. The output side of the beads, related to the logic board, are coupled to ceramic high frequency capacitors that suppress high frequency spikes to ground. Ceramic substrate capacitors were found to have the most desireable effect.

Only the wires (signals/voltages) that penetrate the metallic shield surrounding the master electronic board utilize the Filter Board. The large foil area on the Filter Board is a ground plane which allows as small an impedance as possible.

Illustrated is a schematic representation of the resistive/inductive properties of the beads. Note: Input to the Filter Board is any wire coming from the master electronic board.



TROUBLESHOOTING TIPS

The GG-III logic board employs several jumpers that give the operator some troubleshooting leeway. The two jumper posts are shorted together by a blue plastic-coated jumper terminal. These can be removed by pulling upwards on the terminal.

Jumpers JP21 and JP22 are jumper options for the video summer. The video summer is the arbitrator to set priority for either background or foreground. This determines whether the foreground character will appear in front of or behind the background character. JP21 has the blue terminal on it, JP22 is bare. If there is question as to whether a problem

exists in the foreground or the background, remove JP21. This will eliminate all foreground characters from the screen. By placing the terminal onto JP22, all of the background characters disappear from the CRT. This will aid the operator in determining what area of the logic board to concentrate his efforts on, either the background logic or the foreground logic.

There are several groups of LSI on the GG-III logic board that deserve some mention. J1 through J6 are the Line Object Select RAM's. These should be suspected if either the wrong characters appear on the screen or if extra characters

appear (i.e., a floating disk above Coily or all of the foreground objects being identical characters). H1 through H4 are the Vertical Position RAM's. If defective, these can attribute to erratic movement of the characters and cause them to be positioned incorrectly on the CRT. E1-2, the Foreground Horizontal Position Register, will produce all characters at the bottom of the CRT when faulty while E4, the Foreground Vertical Position Register will move all the characters to one side of the screen. E2-3, the Foreground Object Select Register can give rise to the absence of several or all of the foreground characters.

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.

(FLASHBACK)

Games like CHARLIE'S ANGELS and INCREDIBLE HULK are not the first games Gottlieb has named after popular television shows. The first time was in July 1951 with WATCH MY LINE. Then came DRAGONETTE (May 54), Video game assistance. EASY ACES (Dec. 55), and finally BONANZA (June 64). Except for EASY ACES, each model was introduced shortly after its namesake appeared on television.

FIXIN' IT BY PHONE

The Pinball/Video Service Hotlines are now the same. Call Toll Free: 1-800-323-9121 (ILLINOIS) 1-800-942-1620 Call from 8:00AM to 4:30PM Central Standard Time, for any Gottlieb Pinball or

SEASON'S GREETINGS and a PROSPEROUS EW YEAL

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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

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