

MON TARGET

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MYLSTAR ELECTRONICS, INC.

M.A.C.H. 3 SYSTEM OVERVIEW

Mylstar Electronics, Inc. Video Disc Graphics System is a character based system controlled by the Intel 8088 16-bit microprocessor for state of the art design. The graphics state machine is driven by a 10 MHz clock derived by dividing down a 20 MHz crystal or from the VCO (Voltage Controlled Oscillator) on the Color/Sync Board. The foreground generator can drive 63 individual, independent objects whose size is 16 pixels by 16 lines, selectable from 256 foreground objects, at any frame time. All of these objects have their own level of priority, which means that there are 63 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 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 selected from a total of 4096 possible colors during any given frame time. The dot resolution of the

system is 256 pixels by 240 lines.

All horizon and target information is encoded for each video frame and stored on audio channel 2 of the video disc. During game play, the video frame decoder reads the frame number from the video on the video disc so that the computer system knows exactly what frame is being displayed. Knowing the frame number, the computer system accesses the target data buffer describing object position and/or nature of that particular frame target.

Mylstar Electronics, Inc. utilizes a Pioneer LaserDisc(TM) brand video disc player and reflective disc. The video disc has encoded composite video information including picture, synchronized pulse and audio data. The pulse data identifies a unique frame number pre-assigned to each video frame.

The video disc player also produces two completely discreet audio channels from the audio data on the reflective disc. Audio is stored on channel 1/L while target data is stored on the channel 2/R.

The audio channel 1/L is routed to an audio summer on the Sound Board while the audio channel 2/R is routed to the audio decoder on the Interface Board. The composite video signal is sent to the sync separator (U10) and to the color decoder (U1) on the Color/Sync Board. The color decoder decodes the chrominance and luminance from the composite video signal and produces an RGB signal via the Chroma-Luma Processor (U1 on the Color/Sync Board).

The RGB output from the computer system and the RGB signal from the Chroma-Luma Processor are multiplexed (U2) and sent to the monitor.

The composite video signal from the video disc is asynchronous with the rest of the system, especially the video produced by the computer system. The composite sync is separated from composite video by the sync separator to produce the horizontal and vertical synchronization signals. The sync separator produces an external vertical sync pulse, DVSINCR, which resets the vertical counters causing vertical synchronization between the computer graphics image and the video disc image. The sync separator also produces

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an external horizontal sync signal, DHSYNC, which is coupled to a phase comparator (U6) of a phase locked loop (PLL) circuit also on the Color/Sync Board. The PLL also includes a voltage controlled oscillator (VCO) (U5).

ciated voltages at the outputs are present.

The Power Supply Board also houses the Sound Boards output amplifier, a TDA 2002.

LOGIC BOARD ASSY.

The Logic Board consists of three major areas: the game machine, the graphics machine and I/O (input/output).

formation can be displayed for the correct frame time.

COLOR/SYNC BOARD ASSY.

BOTTOM PANEL

The Bottom Panels main functions are to filter, fuse and transform the 115V AC input voltage to supply power to the Power Supply Board for rectification and distribution. It also supplies the video disc player with 115V AC via the VIDEO DISC OUTLET.

POWER SUPPLY ASSY.

The Power Supply Board is extremely tolerable to input line voltage variations. All output source voltages are guaranteed to be stable for line voltage variations from 95V AC to 135V AC 60 Hz. The regulated logic +5V DC level is rated at 6 amps maximum and includes over-voltage crowbar protection. Four LED's on the Power Supply Board indicate that the asso-

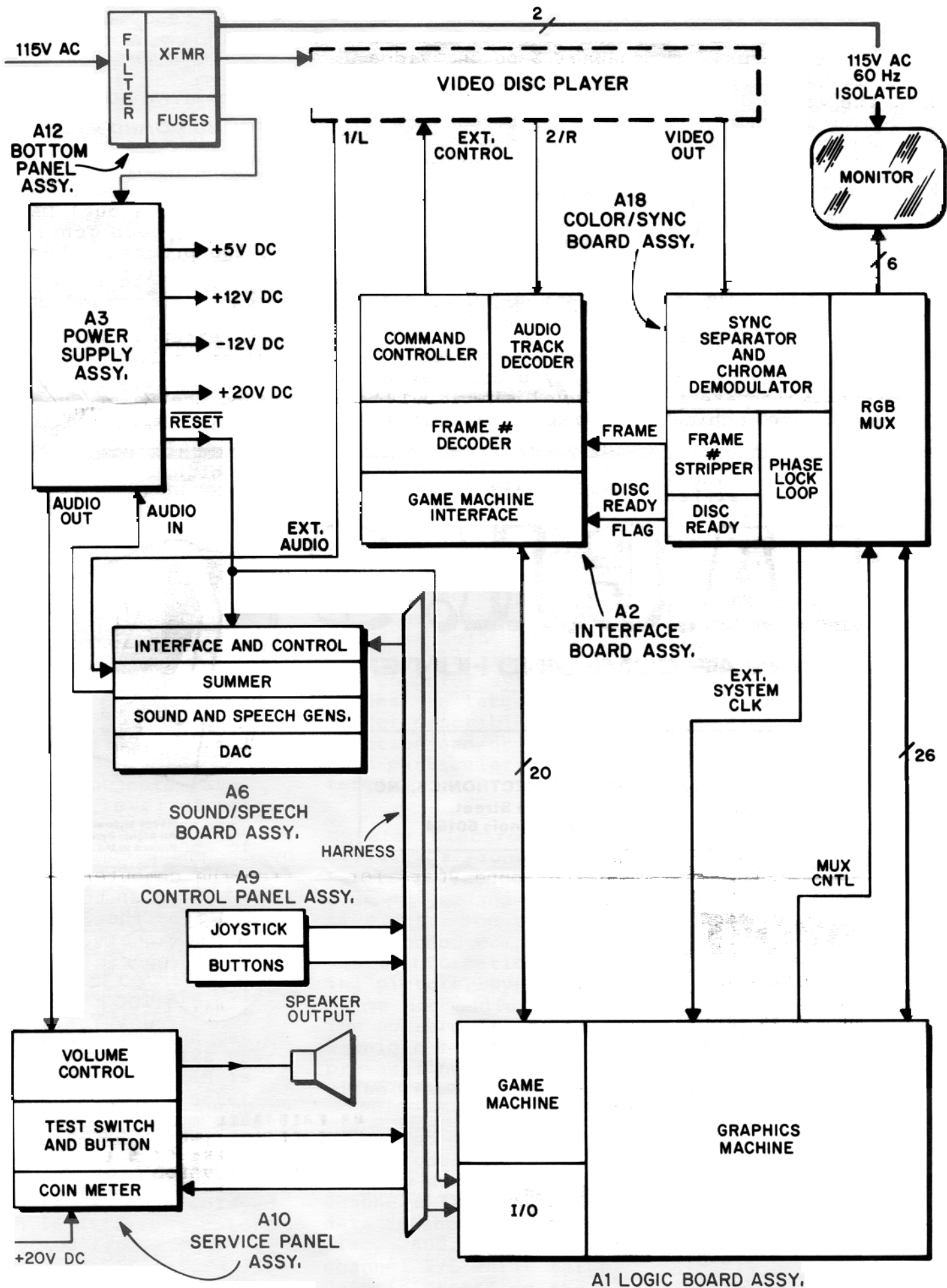
The graphics machine consists of the components that generate the display graphics. This would include the 5 MHz Dot Clock, the 9-bit Horizontal Dot Counter, the 8-bit Vertical Line Counter, the foreground and background registers, the vertical and horizontal registers, the buffers and the color registers.

The I/O components allow the Logic Board to communicate with the Service Panel, the Control Panel and the Sound Board for sound commands.

The Logic Board must also communicate with the Color/Sync Board for multiplexing the Chroma-Luma Processor RGB output with the graphics machine RGB as well as an external system clock to synchronize the state machine clock and the video disc synchronization signals.

Communication with the Interface Board is necessary so that the game machine knows what the current frame number of the video disc is, so that the correct graphics in-

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SYSTEM BLOCK DIAGRAM

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INTERFACE BOARD ASSY.

The Interface Board is the game machines interface to the video disc player. The board has four functions:

1) Frame number decoder. The frame number code is stripped from the video signal and is received at TTL levels from the Color/Sync Board. The detector detects a valid frame number and produces the clocking signal that latches the frame number into latches which are read into the game machine.

2) The Audio Track Decoder receives data from audio channel 2 on the video disc. It decodes the signal to extract digital data and stores data in RAM until the computer system is ready to read it.

3) Command Controller. The Command Controller is the means by which the game machine sends instructions to the video disc player, i.e., play, reject, still/step, etc.

4) Disc Ready Flag. The Color/Sync Board sends a TTL level signal to the Interface Board called

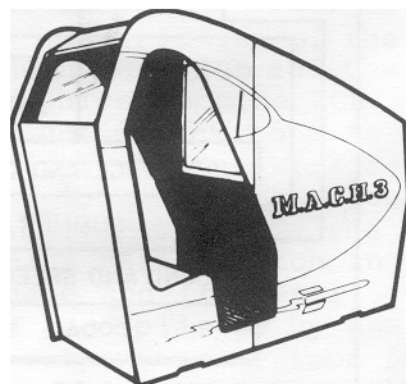
the Disc Ready Flag. This signal is high when the video disc player is producing valid video.

SOUND BOARD ASSY.

The Sound Board consists of two 6502 microprocessor systems, a dual DAC, an L.P.C. speech generator, two programmable sound generators, input ports to receive commands from the game Logic Board, external audio input and a low level audio output, which is sent to the Power Supply Board for amplification.

M.A.C.H. 3

MILITARY AIR COMMAND HUNTER



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