

# Micro-Minutes

NEWSLETTER OF THE HEWLETT-PACKARD MICRO-COMPUTER INTEREST GROUP

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Building 28A

## INITIAL PURCHASE OF VIDEO BOARD

The hardware design committee of the HPNCIG has selected the CAT100 video board manufactured by Digital Graphics for the club microcomputer project. Hardware design committee members feel the purchase of the CAT100 board will reduce the time required to get our system up and running. The probability is very high that the CAT100 will be recommended for club use barring any unforeseen incompatibilities with our system. The purchase price for the bare board, control ROMs and documentation will be \$140 (this does not include the remainder of the required ICs, however). Any club member that desires to purchase the video board with the evaluation board order should send the completed information below along with a check for \$140 (made out to Mike Halsey) to Steve Hessel, building 29A by September 3. There will be another club purchase of CAT100 boards after the evaluation is complete. Persons not familiar with hardware debugging would be advised to purchase at this later date.

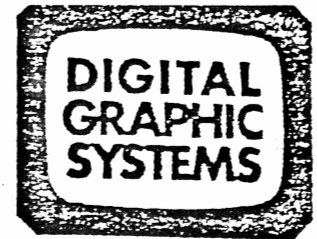
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Name \_\_\_\_\_

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Make check out to Mike Halsey and send this to Steve Hessel, 29A by Sept 3.

# HIGH RESOLUTION GRAPHICS FOR THE S-100 BUS



## GRAPHIC MEMORY BUFFER

- On-board 32K-byte capacity in basic CAT-100 system.
- Organized in 2 banks of 16K bytes of dynamic memory.
- Expandable up to 256K of capacity in 32K increments on extension boards for better gray scale or color resolution.
- 2-port design for a totally snow-free and clean display:
  - internal port for fast video access;
  - external port for S-100 bus. Access time: 1 microsecond average, 25 microseconds maximum during 0.2% of the time.
- Convenient addressing scheme:
  - Fixed access window in S-100 memory address space.
  - Window size (2K/8K) and location are switch-selectable.
  - The software-selectable page of the CAT-100 buffer appears to the CPU as regular memory located in the window.
  - Allows large buffers to be addressed without consuming a large fraction of the S-100 address space.

## VIDEO INPUT

- On-board 4-bit A/D converter yields 16 gray-scale levels.
- Full video-rate digitization: 1/60th of a second for a resolution of 240 x 256 x 4 or equivalent.
- Can be set to generate 1, 2 or 4 bits per pixel.
- Conversion speed: better than 76 nanoseconds for 4 bits.
- Accepts standard 1.4 volt composite B/W video; Z-75 ohms.
- Automatic composite sync extractor.
- Accepts EIA RS-170 or "random interlace" sync.
- No equalization requirements: will sync on a video tape or a video cassette recorder output
- Also accepts/generates external sync (selectable by software).
- On-board proprietary 2-threshold slicing/contouring circuit as an alternative to the A/D converter.
- Maximum output rate: 26 Mbits/sec. for both the A/D converter and the contouring circuit.
- Accepts external digital data from higher performance converters or real-time video processing equipment.
- Direct view of live contoured image before digitization.
- Large number of input formats matching the output formats.

## VIDEO OUTPUTS

- One main and 3 auxiliary standard composite video outputs.
- All 4 video outputs are 1.4 volt p-p; Z-75 ohms.
- Each output may display an independent digital image.
- The main output is driven by a 3-source video mixer which will show any combination of up to 3 simultaneous images: the live video input, the real-time contoured video input, and a digitized image or a text stored in the buffer.

## GRAPHIC MODE

- On-board 4-bit D/A converter; 4 individual bit switches.
- Can be set to generate 2, 4, 8 or 16 levels of gray scale.
- Dot mode available for 256, 288 and 320 pixels per line.
- When dot mode is selected, the main output display is composed of discrete square dots and shows a pleasant homogeneous texture horizontally and vertically.
- Variety of output mapping formats, fully compatible with all the input formats.
- 3 aspect ratios: square, standard rectangular, compressed.
- For each aspect ratio, an image can be mapped into 3 interlaced formats and 7 non-interlaced formats.
- 30 software-selectable GRAPHIC FORMATS, listed in the form:

Lines/frame x Pixels/line x Bits/pixel		
SQUARE	RECTANGLE	COMPRESSED*
480 x 512 x 1	454 x 576 x 1	408 x 640 x 1
480 x 256 x 1	454 x 288 x 1	408 x 320 x 1
480 x 256 x 2	454 x 288 x 2	408 x 320 x 2
240 x 1024 x 1	227 x 1152 x 1	204 x 1280 x 1
240 x 512 x 1	227 x 576 x 1	204 x 640 x 1
240 x 512 x 2	227 x 576 x 2	204 x 640 x 2
240 x 256 x 1	227 x 288 x 1	204 x 320 x 1
240 x 256 x 2	227 x 288 x 2	204 x 320 x 2
240 x 256 x 3	227 x 288 x 3	204 x 320 x 3
240 x 256 x 4	227 x 288 x 4	204 x 320 x 4

\* optional

## TEXT MODE

- A software-selectable alternative to the graphic mode.
- Makes efficient use of the buffer as a text file: 32,768 characters are stored, with up to 2,640 visible at one time.
- High quality full ASCII 7x9 character generator.
- Any character can be individually inverted by software.
- Instant scanning through the 32K-character text file by setting appropriate base address in control register.
- Smooth scrolling at raster line level permits variable scanning speed; text always remains perfectly legible.
- No wrap-around at end of buffer.
- 6 software-selectable TEXT FORMATS, listed in the form:

Text lines/frame x Characters/text line					
29 x 64	29 x 72	29 x 80	33 x 64	33 x 72	33 x 80

## LIGHTPEN INPUT

- Enabled by software; interaction flagged in status.
- 18 bits of X-Y coordinates available in status.
- CAT-100 timing must be restarted by software within one millisecond after interaction occurs.
- Input specs: active-high TTL pulse > 100 nanoseconds.

## PHOTOGRAPHIC TRIGGER INPUT

- Armed by software; screen blanks and waits for signal.
- Photo input designed to be grounded by closure of the "X" flash contacts of a photographic camera.
- A complete frame is then displayed and photographed. This technique avoids partial or multiple exposures and yields clean individual pictures or animated films.

**POWER** • DC voltages unregulated per S-100 specs.  
+8V, 2.5A typical; +16V, 0.8A typical; -16V, 0.3A typical.

**TEMPERATURE** +10°C to +40°C ambient, operating.