CyberPro50xx Demo Board User's Manual

Realease 1.1, 11/30/1998

CyberPro50xx Demo Board User's Manual, Realease 1.1

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ABOUT CYBERPRO 50XX

The CyberPro50xx Super TV Encoder and Graphics Accelerator

The CyberPro50xx merges the functions of a digital NTSC/PAL TV Direct™ encoder, high-resolution graphics accelerator and a flexible CPU Bus interface into a single IC. These three functions combine to make the CyberPro50xx the ideal solution for Internet Web Browser and other applications. The CyberPro50xx also features two ITU-BT656/601 digital video input ports, multi format Alpha Blending, AC97, I^2S Audio (505x) and Macrovision™ (50x5) Pay-per View copy protection system.[1]

1. This applies to The CyberPro50X5 devices only. The devices are protected by USA patent numbers 4631603, 4577217 and 4819098 and other intellectual property rights. Use of the Macrovision anti-copy process in the devices are licensed for noncommercial home use only. Reverse engineering or disassembly is prohibited. Please see the Macrovision web site at www,macrovision.com for more information.

Features

TV Encoder

- TVDirect output to TV without going through a frame buffer.
- Programmable 21 tap filter in Y, U and V paths
- 1K pixel line buffers for 16:9 TV.
- Macrovision
- One crystal for NTSC, PAL and VGA outputs
- NTSC (640x480@60Hz), PAL (800x600/720x540/ 640x480@50Hz)
- 6 on-chip DACS provide simultaneous S-video, composite (CVBS) and RGB/SCART outputs or simultaneous VGA and TV outputs (S-video and composite or RGB/SCART)
- Fully programmable field, line, and subcarrier frequencies to meet worldwide TV standards
- DuoVision™ - Display graphics on monitor while displaying graphics or video on a TV.
- Proprietary 3 line flicker filter
- 10 bit DAC's on TV outputs
- Programmable flicker filter bypass on interlaced video
- 11 bit high precision PLL for subcarrier and clock generation

Graphics

- Multi format Alpha blending
- 64-bit GUI
- 200 MHz RAMDAC
- Dual clock
- Supports EDO and SD/SGRAM up to 4MB
- Color expansion for all graphics modes
- Large data buffers for fast screen-to-screen BitBLTs
- Accelerated 8/16/24/32 BPP Packed modes
- 64-bit BitBLT engine
- Independent memory apertures for BitBLT and CPU/video
- Big Endian / Little Endian support

Flexibus™

- PCI v2.1-compliant
- Direct interface to 486 embedded processors via VL bus, including AMD Elan 400/410, Intel 486
- Direct interface to Pentium/RISC CPU via PCI bus/ bridge including Sparc/Java
- Direct interface to other RISC CPU including NEC, Hitachi SH, PowerPC, Mitsubishi, Toshiba
- High-throughput CPU bus interface
- Large write buffer allows sustained zero-wait-state bursts

Frame Buffer

- Multi format Frame Buffer:YUV-16 true color video with 8/16/24/32-bit graphics
- 64-bit DRAM interface optimized for EDO or SD/SGRAM
- 100 MHz MCLK up to 320 Mbytes/sec. peak bandwidth
- 256x16, 256x32, 128x16, 128x32, 1Mx16-bit DRAM options

Video Input

- VBI data pass through for Intercast, Teletext, closed caption support
- 2X ITU-BT656, ITU-BT601-8-bit video input interface or 1x16 bit video input interface
- High quality horizontal and vertical interpolation with jagged edge smoothing
- High quality multi-tap filtering
- X and/or Y mirror support for video conferencing
- Double buffering
- YUV 4:2:2, YUV 4:2:0 or RGB16

Video Window and Video Display

- 3 video windows plus PIP
- Color key
- Chroma key
- DirectDraw™ MPEG-1 playback
- X and Y linear interpolated scaling and zooming

Audio

- AC97 compliant
- I^2S input and output.
- Game port
- MIDI
- FM and 32 channel wave table synthesis.

Software Compatibility

- VGA/SVGA/VBE 2.0/DPMS BIOS
- Windows 98™, Windows 95™, Windows™3.X, Windows NT™3.X/4.0
- Direct Draw, DCI and Video Capture
- OS/2™ 2.X/3.X
- AutoCAD™, PCAD™, WordPerfect™ and Lotus 123™

CyberPro50xx Documentation

The *CyberPro50xx Demo Board User's Manual* provides information on the design and function of the demo board. The software shiped with the board is described in the README files

About this Manual

Chapter 1, "Quick Start" helps you to quickly set up and start using the CyberPro50xx demo board.

Chapter 2, "Board Functional Description" contain descriptions of the basic sections of the demo board: block diagram, layout, frame buffer, video in, video out, and audio.

Chapter 3, "Product Support" provides information on: reaching and using the IGST technical support services, product information and literature avaliable through IGST's World Wide Web and FTP sites, and support tools for the CyberPro50xx.

Appendix A, "Demo Board Default Settings" summerizes the jumper and configuartions on the CyberPro50xx demo board when it is shipped.

Appendix B, "Bill of Materials and Schematics" shows the bill of materials for the evaluation board, and the actual Orcad schematics used to build the board.

Suggested Reference Material

For information on ordering the below literature, see Chapter 3, "Product Support".

- *CyberPro^{TM} 50xx Data Sheet*
- *CyberPro^{TM} 5xxx Designer's Guide*
- *CyberPro^{TM} 5xxx Alpha Blending Registers*
- *CyberPro^{TM} 5xxx Coprocessor Registers*
- *CyberPro^{TM} 5xxx Extended Capture Registers*
- *CyberPro^{TM} 5xxx Extended Graphics Registers*
- *CyberPro^{TM} 5xxx Extended Misc Registers*
- *CyberPro^{TM} 5xxx Extended Playback Registers*
- *CyberPro^{TM} 5xxx Memory Counter Registers*
- *CyberPro^{TM} 5xxx Sync Lock Control Registers*
- *CyberPro^{TM} 5xxx TV Registers*
- For current application notes an technical bulletins, see our World Wide Web page at **http://www.igst.com**.

Documentation Conventions

The IGS Technologies *CyberPro50xx Demo Board User's Manual* uses the conventions shown in Table 1-1 (unless otherwise noted).

Table 0.1 Notational Convention

Symbol	Usage
Boldface	Indicates that characters must be entered exactly as shown, except that the alphabetic case is only significant when indicated.
Italic	Indicates a descriptive term to be replaced with a user-specified term.
`Typewriter face`	Indicates computer text input or output in an example or listing.
[ ]	Encloses an optional argument. To include the information described within the brackets, type only the arguments, not the brackets themselves.
{ }	Encloses a required argumnet. To include the information described within the brackets, type only the arguments, not the brackets themselves.
..	Indicates an inclusive range.
...	Indicates that a term can be repeated.
|	Seperates alternate choices in a list - only one of the choices can be entered.
:=	Indicates the the terms on either side of the sign are equivalent.

CHAPTER

1

QUICK START

This chapter provides information that helps you quickly setup and start using the CyberPro50xx demo board.

The CyberPro50xx demo board is shipped with a version of our BIOS configured especially for this board. The BIOS contains the code that would, not only let the demo board to boot up from CRT, allow it to recognize NTSC, PAL, and SCART TVs when you boot up the board on only a TV (Jumper JP1 setting determines NTSC or PAL TV boot up and Jumper JP2 determines SCART TV boot up). The CyberPro50xx demo board can boot from any AT-compatible PCI motherboard with AT-compatible diskette, and can use AT-compatible display or any TV.

For information on how to:

- Set up the CyberPro50xx and boot from a diskette, see page 1-2. In this mode, CyberPro50xx acts like a standard VGA board.
- Troubleshoot installation problem, see page 1-4.
- Connecting TV to the CyberPro50xx demo board to simulate a Set Top Box, see page 1-4.

Booting DOS from a Diskette

CAUTION: As with all computer equipments, the CyberPro50xx demo board may be damaged by electrostatic discharge (ESD). Please take proper ESD precautions when handling any board.

Warning: Read this before using this demo board

Before applying power, the following precautions should be taken to avoid damage or misuse of the board.

- Make sure power supply connectors (from a standard AT system power supply) are plugged on the motherboard correctly. The grounds (usually black wires) should meet at the center of the two power supply connectors on the motherboard.
- See “Board Block Diagram” on page 2-2 for important information.

Installation Requirements

First you need the CyberPro50xx demo board from our demo kit.

Then, you need to provide the following items:

- An AT-compatible, PCI Bus, motherboard with x86-compatible CPU and RAM
- An ATAcompatible Hard Disk Drive
- A standard 40-pin HDD cable
- An AT-compatible 3.5” disk driver
- A bootable DOS diskette
- A standard 34-wire AT floppy disk drive cable
- A VGA monitor
- A cable to connect to the VGA monitor to the CyberPro50xx demo board
- An AT-compatible keyboard
- A standard PC power supply
- A TV with either a composite or a S_Video video-in connector, or a SCART TV
- SCAT TV: a proprietary SCART cable from IGST (see “Product Support” for more information). Other TV: A composite or S-Video video cable to connect the TV to the CyberPro50xx demo board.

Board Installation

NOTE: See Figure 2-1 on page 2-2 for a block diagram of the board. See Figure 2-2 on page 2-3 for the layout diagram of the board, including connector locations referenced in this section.

DANGER: Make sure the power supply and the VGA monitor are not plugged in an electrical outlet during the following steps.

1. Remove the board from the shipping carton. Visually inspect the board to verify that it was not damaged during shipment. The board contains nine jumpers.
2. Connect the floppy disk drive to the motherboard with the 34-wire floppy cable. The red wire along one edge of the ribbon cable indicates wire 1.
3. Connect the hard disk drive to the motherboard with the HDD cable. The red wire along one edge of the ribbon cable indicates wire 1.
4. Connect the keyboard to the motherboard.
5. Connect the power supply to the motherboard. *Make sure the black ground wires from the power supply connectors meet in the middle.*

DANGER: Failure to verify and check the power supply connections may result in total destruction of the CyberPro50xx demo board.

6. Insert the CyberPro50xx demo board into one of the PCI slots on the motherboard.
7. Connect the VGA monitor cable form the monitor to the CyberPro50xx demo board.
8. Find one of the 4-wire power supply connector from the PC power supply and attach it the 4-pin power connector on the floppy disk drive.
9. Insert a bootable DOS diskette (not included) in the floppy disk drive.
10. Connect the power supply connector to the hard disk drive.
11. Plug the VGA monitor into an electrical outlet and turn it on.
12. Connect the power supply to an electrical outlet. Turn on the switch on the power supply. The power supply fan should be operating.
13. You should see the system BIOS message on the monitor display. You may need to enter the Set Up utility to configure the CMOS ROM.
14. The system should now boot from the DOS and the monitor displayed properly

.

Table 1.1 Installation Troubleshooting

Problem	Solution
I hear a beep on the speaker but see nothing on the VGA monitor.	Check that the monitor has AC power. Check that the monitor is turned on. Check that the monitor is correctly connected to the CyberPro50xx demo board.
I hear three beeps on the speaker but see nothing on the VGA monitor.	Check that the CyberPro50xx demo board is seated correctly in the PCI slot.
I've configured the CMOS ROM but don't hear any sound from the disk drives and the system does not boot from the diskette.	Check that the 34-wire cable is properly connected on both ends. Check the CMOS set up indicates that drive A is a 3.5" 1.44MB driver, hard disk drive is correctly identified, and that the boot sequence starts from drive A.
I hear the diskette being accessed but get an error message "Non System Disk".	Check that the disk in the disk drive is indeed bootable.
I get a "Missing Keyboard" error message on the monitor during boot up.	Check that the keyboard is properly connected.
There s a problem you cannot resolve.	Check that the CyberPro50xx demo board is set to its default settings (See Appendix A, "Demo Board Default Settings"). Contact the IGST Technical Support (see Chapter 3, "Product Support")

Connecting to a TV

This section describes how to connect a TV to the CyberPro50xx demo board. You can then boot the demo board from TV. You need to provide the following additional items:

- A TV (NTSC or PAL) equipped with either a composite video-in connector or a S-Video video-in connector or both, or a SCART TV.
- Video cable to connect TV to the CyberPro50xx demo board. If you want to connect to the composite connector on the TV, you need a composite video cable. If you want to connect via S-Video connectors, you'll need a S-Video video cable. If you want to connect to a SCART TV, you'll need to obtain a SCART cable from IGST (see Chapter 3, "Product Support").

Assuming you have successfully booted to DOS from a diskette as described on "Booting DOS From a Diskette" on page 1-2, do the following:

1. Disconnect power by turning off the power supply and unplugging the power supply from the AC outlet.
2. Disconnect the monitor cable from the CyberPro50xx demo board.
3. Connect the video cable from TV to the CyberPro50xx demo board (composite, S-Video, or SCART).
4. If you have a PAL TV, you'll need to close JP1. If you have a SCART TV, you'll need to close JP1, and JP2.
5. Plug in power supply to an AC outlet and turn it on. The system should boot directly to TV correctly.

CHAPTER

2

BOARD FUNCTIONAL DESCRIPTION

The CyberPr50xx demo board provides a test and development platform for CyberPro50xx-based designs. Read the flowing sections to learn more about the board:

- "Board Block Diagram" on page 2-2
- "Board Layout" on page 2-3
- "Board Restrictions" on page 2-6
- "Board Features" on page 2-6
  - "Frame Buffer" on page 2-6
  - "Video In" on page 2-7
  - "Video Out" on page 2-7
  - "Audio" on page 2-8
  - "Misc." on page 2-8

See "Demo Board Default Settings" on page A-1 for a summary of the board settings when shipped.

Board Block Diagram

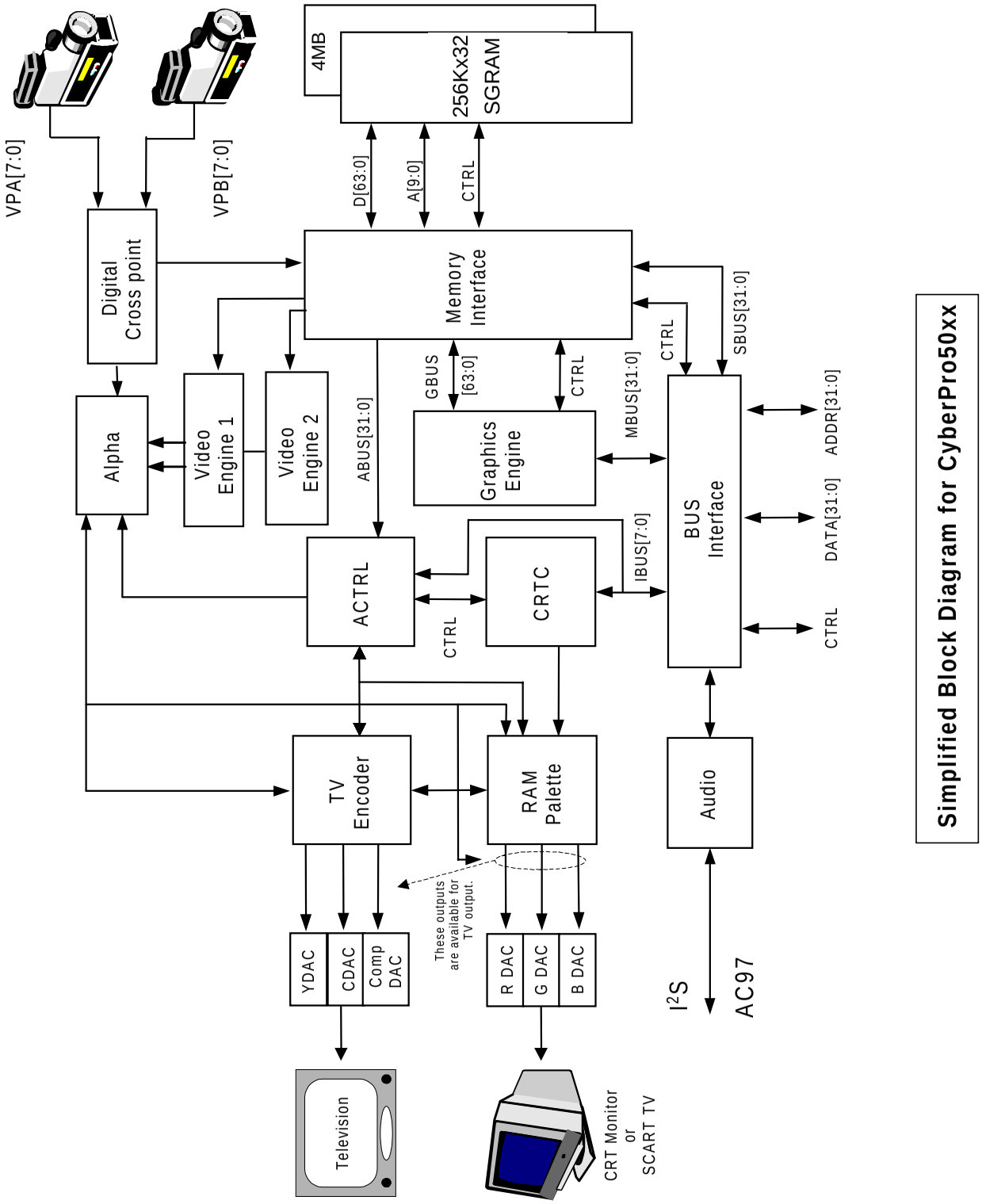

Figure 2-1

Board Layout

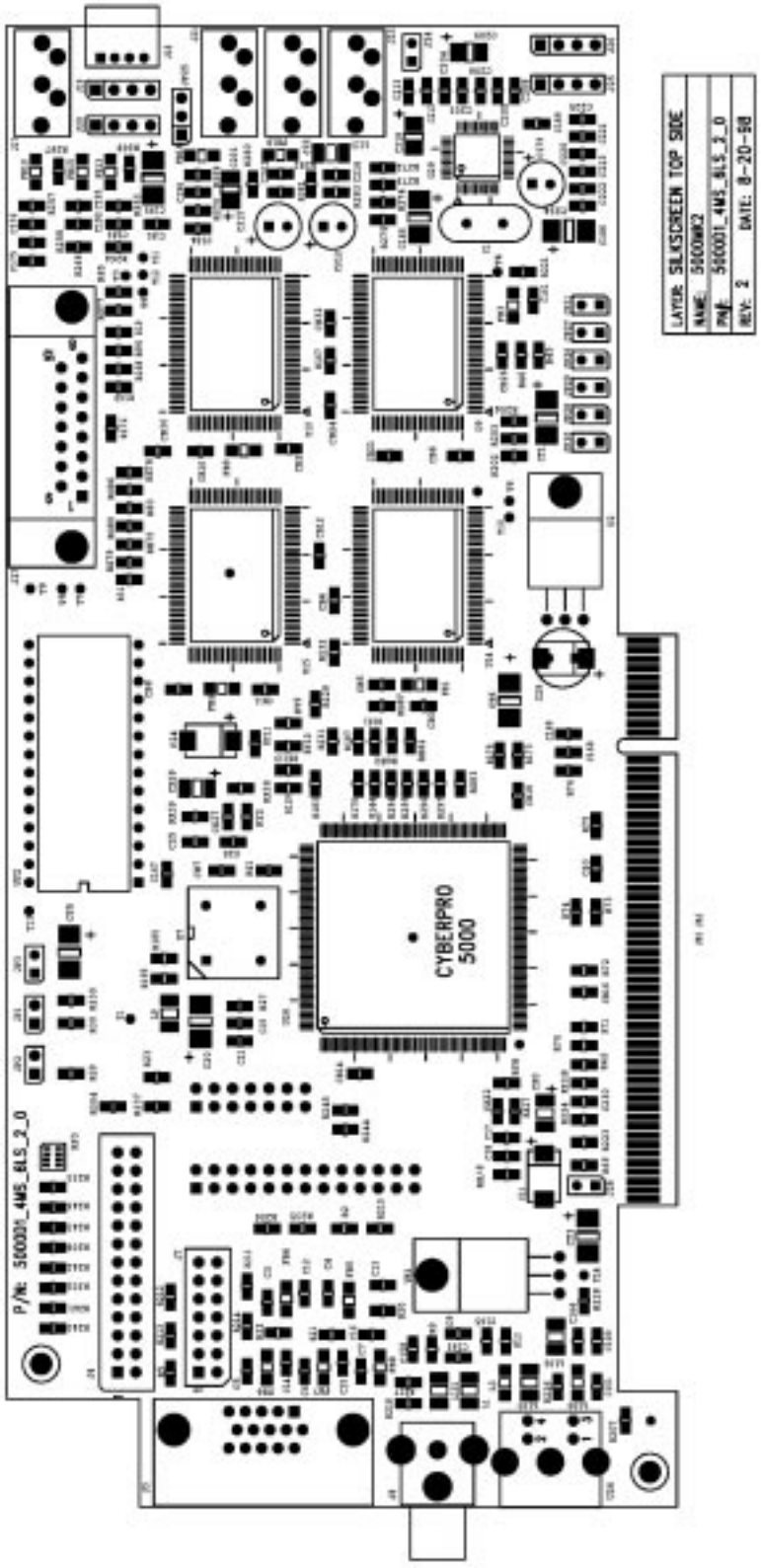

Figure 2-2

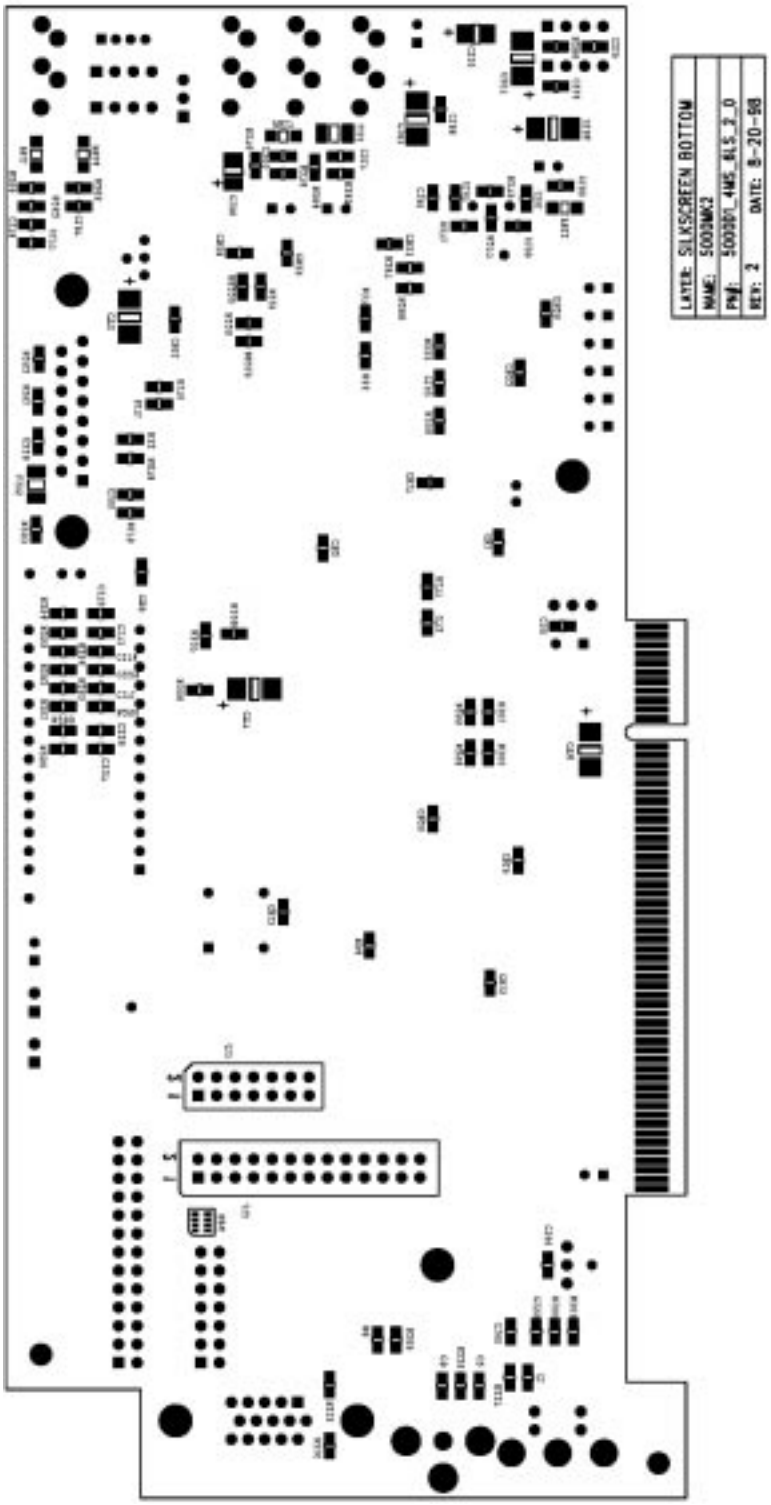
LAYER: SILKSCREEN BOTTOM
NAME: 5000MK2
PN#: 500001_4MS_BLS_2_0
REV: 2
DATE: 8-20-98

Figure 2-3

Table 1.2 Board Jumpers, Connectors, and Chips

Part	Name	Description	See schematic on	For more info., see
JP1	PAL/NTSC Selector	TV signal selection; Closed - PAL, Open - NTSC.	page B-8	page 1-4
JP2	SCART Enable	Jumper for SCART TV; Closed - Enable, Open - Disable	page B-8	page 1-4
JP3	Reserved		page B-8	
JP25	Test Pins	Audio Test Pins	page B-6	
JP26	Test Pins		page B-7	
JP27	Test Pins		page B-7	
JP28	Test Pins		page B-7	
JP29	Test Pins		page B-7	
JP30	Test Pins		page B-7	
JP31	Test Pins		page B-7	
J3	VGA Connector	VGA DB-15 or SCART RGB output	page B-14	
J8	CVBS TV Out	Composite connector for TV output	page B-14	
J4/J7	Video Input Port A		page B-14	
J12/J13	Video Input Port B		page B-14	
J17	Audio Line In	Connector for Audio Line In	page B-6	
J18	CD Audio In		page B-6	
J19	CD Audio In		page B-6	
J20	Modem Speaker In		page B-6	
J21	Microphone In	Connector for audio in from microphone	page B-6	
J22	Line Out	Connector for audio out	page B-6	
J23	Headphone out	Connector for audio out to Headphone	page B-7	
J24	Mono Out Measurement		page B-7	
J25	Speaker In		page B-7	
J26	Speaker Out		page B-7	
J27	MIDI/Game Port		page B-12	
U2	Regulator	12v ~ 5v Regulator	page B-13	
U7	24,576MHz Osc for CyberPro50xx		page B-9	
U9, U10 U14, U15	Memory Modules	4MB of SGRAM	page B-10,11	
U24	S-Video TV Out		page B-14	
U26	Video Controller		page B-9	
U29	AC97 Codec		page B-6	
UY2	BIOS EPROM		page B-10	
VR1	Regulator	5v ~ 3.3v Regulator	page B-8	
Y1	24,576MHz Crystal for Audio		page B-6	

Board Restriction

- Headphone and Microphone Audio Inputs are not implemented on this version of the demo board.
- Second Video Input can be enabled only if the Game port is disabled, and vise versa.

Board Feature

CyberPro50xx

The CyberPro50xx product family is an advanced and highly integrated Multimedia accelerator chip that provides all the hardware and software components to design the next generation TV/ graphic products, such as a set top boxes, for use in Satellite, Cable, Terrestrial, Internet, Video Phone, DVD and TV applications.

The CyberPro™ 50xx products feature:

- FlexiBus™ CPU interface built inside the chip that enables direct interface to the leading RISC and embedded CPUs used in set top boxes
- FlexVideo™ (simultaneous video inputs including DVD, MPEG-2, MPEG-1, live video)
- VideoDirect™ (pass through of DVD/MPEG-2 video to TV)
- FlexAlpha™ (a powerful and programmable alpha blending of multiple video and graphics)
- 21-tap filter with 10 bit TV DACs
- EDO/SD/SGRAM support (EDO up to 4MB, SGRAM up to 8MB)
- TVDirect (on-chip TV encoder)
- 64-bit GUI accelerator
- Chip options: AC-97 audio and Macrovision ™

The chip is a 206-pin PQFP in socket U26.

Frame Buffer

The CyberPro50xx demo board supports multi format frame buffer for video inputs such as YUV-16 true color video with 8/16/24/32-bit graphics. The frame buffer utilize 64-bit DRAM interface optimized the use of the 4MB on board SGRAM.

Video In

The CyberPro50xx demo board supports two video in sources through the Video Input Port A and the Video Input Port B (see board layout on pages 2-3, 2-4), i.e., two video capturing devices can be used at the same time. ITU-BT656, ITU-BT601-8-bit video input interface or 1x16 bit video input interface are supported by the board. It also allows VBI data pass through for Intercast, Teletext, closed caption support.

The demo board utilize double buffering for faster video transfer rate and captures video source in three formats; YUV 4:2:2, YUV 4:2:0 or RGB16. It also features multi-tap filtering, and horizontal and vertical interpolation with jagged edge smoothing, as to improve the video qualities and clarity. X and/or Y mirroring is also supported for video conferencing applications.

Video Out

The CyberPro50xx demo boards offers two type of video output; VGA, for monitor display, and TV output.

VGA

The demo board is a VGA, VESA 3.0, VBE2.0, DPMS, and PC97 compliant board. It has a high resolution of 1600x1200, and can display in 24-bit true-color to up to 1024x680 (see Table 2-2). The demo board also has MPEG-1 playback subset built-in, i.e., it can play any video files in the MPEG-1 format. X and Y linear interpolated scaling and zooming are employed by the demo board. Both color key and chroma key are utilized by the demo boards for hardware video outputs on the monitor or TV.

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Table 1.2 Supported Display mode

Resolution	Color Depth		
	256 Color (8 bpp)	High Color (16 bpp)	True Color (24 bpp)
640 x 480	✓	✓	✓
720 x 540	✓	✓	✓
1024 x 768	✓	✓	✓
1280 x 1024	✓	✓	
1600 x 1400	✓		

TV

The CyberPro50xx demo board has a on-chip TV encoder which has fully programmable field, line, and subcarrier frequencies to meet worldwide TV standards. It uses 6 on-chip 10-bit DACs to provide simultaneous S-video, composite (CVBS) and RGB/SCART outputs or simultaneous VGA and TV outputs (S-video and composite or RGB/SCART). It also has a programmable 21 tap filter in Y, U and V paths and a 1K pixel line buffers for 16:9 TV. 3-line flicker filter is also utilized by the demo board for better TV quality.

The demo board supports both standard NTSC (640x480@60Hz), and PAL (800x600/720x540/640x480@50Hz) TV signals. The board can be set to NTSC or PAL TV boot up by setting the JP1 jumper (see board layout, page 2-3,2-4), where OPEN for NTSC and CLOSE for PAL. For SCART TV, set JP2 jumper (see board layout, page 2-3), where OPEN disables SCART and CLOSE enables it. A proprietary cable can be ordered from IGST for the connection of SCART TV to the demo board. The board should also be set to PAL mode, because SCART is an European standard.

Audio

The Audio portion of the demo board is built to be AC97 compliant. The AC97 controller (which built within the CyberPro50xx chip) would communicate with a on board AC97 codec to process standard I^2S input and output. Two inputs and two outputs are provided on the board: Line in, Microphone in, Line out, and Headphone out (see board layout on pages 2-3, 2-4). A MIDI/Game port is also provide on the board for MIDI instruments or Joystick connections. However, some functionalities of the audio portion have restrictions, please refer to Board Restriction for details (page 2-6).

Miscellaneous

CHAPTER

3

PRODUCT SUPPORT

The Chapter Provides information on:

- Reaching and using the IGST technical suport services
- Product information and literature avaliable through IGST's World Wide Web site
- Support tools for CyberPro50xx family.

IGST Technical Support Services

Technical support for the CyberPro50xx family of Multimedia Graphic chip and corresponding support products is available via email, online (WWW), or through telephone or fax. For non-technical support, see "Product Support" on page 4-4.

Email Support

Please include your name, company, telephone number, IGST product requiring technical support, and question or problem in all e-mail correspondence.

In the USA and Canada, send mail to:

`support@igst.com`

In Europe and the UK, send mail to:

[to be annuounced]

In Asia and Pacific Region, sent mail to:

[to be announced]

Online Support

IGST offers technical support on our WWW site. See :Product Support" on page 4-4 for more on what our WWW site has to offer.

WWW Technical Support

Go to IGST's home page at **http://www.igst.com** and click on "Support" for the latest IGST technical phone number, software, and Frequently Asked Questions.

Telephone and Fax Support

Telephone assistance is avalable in the U.S. from 9:30am to 6:30pm Pacific time, Monday through Friday (except major holidays). In Europe, assistance is available during U.K. business hours. In Asia, assitance is available during Taiwan business hours. Contact the hotlines at one of the following telephone or fax numbers.

Direct Dial Numbers

Country	Number
USA and Canada	Tel: (408) 982-8588 x159 Fax: (408) 982-8591
Far East Asia	Tel: Fax:
UK and Europe	Tel: Fax:
Japan	Tel: Fax:

Product Support

IGST's WWW site is described below. Question, requests, and input concerning these sites can be sent via E-mail to **webmaster@igst.com**.

In addition, IGST's literature support and third-party development support products are described.

WWW Site ...under construction (ready in Dec. 1998)

A subset of the IGST WWW pages, the CyberPro5xxx section is frequently updated and includes general product information, as well as technical documents such as data sheets, application notes, and technical bulletins (to be established). To access these files, go to IGST home page at **http://www.igst.com** and click on ...

Literature & Accessories Support

Documentation and accessories, such as the video capturing daughter card, or the IGST proprietary SCART cable, can be ordered by phone, or e-mail.

Telephone

Country	Number
USA and Canada	Tel: (408) 982-8588
Far East Asia	
UK and Europe	
Japan	

E-Mail

Please include your name, company, telephone number, and complete mailing address with your literature request.

In the USA and Canada, send mail to:

`support@igst.com`

In Europe and the UK, send mail to:

[to be announced]

In Far East Asia and Pacific region, sent mail to:

[to be announced]

APPENDIX

A

DEMO BOARD DEFAULT SETTINGS

This chapter lists the default settings of the CyberPro50xx demo board when it is shipped.

Table A.1 CyberPro50xx Jumper Defaults

Location	Name	Pin Setting	Description
JP1	PAL/NTSC Selector	Open	NTSC TV signal
JP2	SCART Enable	Open	SCART TV disabled
JP25	Audio Test Pins	Open	Normal mode
JP26	Test Pins	Open	Normal mode
JP27	Test Pns	Open	Normal mode
JP28	Test Pins	Open	Normal mode
JP29	Test Pins	Open	Normal mode
JP30	Test Pins	Open	Normal mode
JP31	Test Pins	Open	Normal mode

APPENDIX

B

BILL OF MATERIALS AND SCHEMETICS

The bill of materials for the CyberPro50xx demo board begins on page B-2.

The actual Orcad schemetics used to build the CyberPro50xx demo board begin on page B-5.

Board Bill of Materials (BOM)

Table B.1 CyberPro50xx Demo Board BOM

Qty	Reference	Part	Pakage	Description
46	CB1, CB2, CB3, CB4, CB5, CB6, CB7, CB9, CB10, CB11, CB12, CB13, CB14, CD15, CB16, CB17, CB18, CB19, CB20, CB21, CB22, CB23, CB24, CB25, CB26, CB27, CB28, CB29, CB30, C30, CB31, CB32, C166, C167, C168, C169, C180, C188, C189, C190, C191, C204, C208, C214, C217	0.1UF, 16V	SMD-0805	
13	CT1, CT2, CT3, CT4, CT5, CT6, CT7, C20, C183, C184, C185, C186, C207	10UF, 16V	TAN. SMD. Size-C	
3	CX0, CX28, C195	2.2UF,16V	TAN. SMD. Size-B	
2	CX22, CX27	100PF, 16V	SMD-0805	
3	C1, C2, C101	68PF, 16V	SMD-0805	
4	C3, C4, C12, C13	47PF, 16V	SMD-0805	
6	C5, C6, C7, C14, C15, C16	10PF, 16V	SMD-0805	
3	C8, C9, C100	560PF, 16V	SMD-0805	
2	C11, C24	22UF, 16V	TAN. SMD. Size-C	
3	C17, C21, C26	0.01UF, 16V	SMD-0805	
3	C18, C19, C25	0.1UF, 16V	SMD-0805	
1	C29	22UF, 16V	Through-hole	
1	C63	10PF - NO LOAD		
4	C72, C150, C161, C162	10PF - NO LOAD		
3	C158, C159, C160	180PF		
3	C163, C164, C165	120PF		
8	C171, C172, C173, C174, C226, C227, C228, C229	0.01UF - NO LOAD		
16	C175, C177, C181, C187, C193, C194, C213, C216, C219, C220, C221, C222, C223, C224, C225, C230	0.33UF, 16V	SMD-0805	
7	C176, C178, C182, C192, C196, C200, C202	1NF, 16V	SMD-0805	
3	C179, C212, C215	100UF		
2	C197, C199	22PF, 16V	SMD-0805	
5	C198, C201, C209, C210, C218	1UF, 16V	TAN. SMD. Size-B	
1	C203	0.022UF, 16	SMD-0805	
2	C205, C206	270PF, 16V	SMD-0805	
1	C211	47NF NPO, 16V	SMD-0805	
12	FB4, FB5, L9, FB10, FB11, FB12, FB13, FB14, FB15, FB16, FB17, FB18	Ferrite Bead		
3	FB6, FB7, FB8	High Frequency Ferrite Bead		200MHz
4	FB1, FB2, FB3, FB9			SHORT

Table B.1 CyberPro50xx Demo Board BOM

Qty	Reference	Part	Pakage	Description
1	JA1	PCIBUS_A		
1	JB1	PCIBUS_B		
8	JP1, JP2, JP26, JP27, JP28, JP29, JP30, JP31	HEADER 2X1		
1	JP3	HEADER 2X1 - NO LOAD		
1	JP25	HEADER 3X1		
1	J3	3 Row VGA 15 Pin D_SUB	HDR, Female, Connector	
2	J4, J12	HEADER 13X2		
2	J7, J13	HEADER 7X2		
1	J8	RCA PHONO_JACK		
4	J17, J21, J22, J23	3.5 mm AUDIO_JACK		
1	J18	MISUMI HEADER		
4	J19, J20, J25, J26	HEADER 4X1		
2	J24, J28	HEADER 2X1		
1	J27	2 Row DB15 - NO LOAD		
6	L1, L3, L100, L101, L102, L103	2,7 uH, 10%	SMD-1210	
3	L105, L115, L116	Ferrite Bead		
3	RE78, RE79, RE82	33R - NO LOAD		
8	R41, R71, R72, R73, R75, R76, R223, R224	33R, 5%, 1/8W	SMD-0805	
44	R69, R71, R74, R80, R85, R94, R144, R173, R175, R179, R181, R183, R185, R187, R195, R199, R207, , R215, R217, R228, R272, R273, R274, R279, R293, R295, R296, R297, R298, R299, R300, R301, R302, R303, R304, RG77, RG78, RG79, RG80, RG82, RG83, RG86, RG87,	0R - 5%, 1/8W	SMD-0805	
8	R219, R220, R240, R241, R242, R243, R246, R271	0R - NO LOAD		
2	RP3, RP4	33R - NO LOAD		
1	R5	1K, 5%, I/8W	SMD-0805	
2	RX/8, RX38	330R, 5%, 1/8W	SMD-0805	
4	R253, R254, R255, R256	2.2K, 5%, 1/8W	SMD-0805	
2	RX17, RX39	7.5K, 5%, 1/8W	SMD-0805	
8	RY2, RY8, RZ118, RZ119, R216, R218	0R - NO LOAD		
2	RZ219, RZ220	0R, 5%, 1/8W	SMD-0805	
11	RY9, RY11, R29, R30, R31, R32, R45, R229, R230, R231, R232	22K, 5%, 1/8W	SMD-0805	
1	R46	22K - NO LOAD		
18	RY10, R19, R36, R37, R95, R167, R168, R169, R170, R171, R172, R202, R203, R204, R305, R306, R307, R308	22K - NO LOAD		
6	R2, R8, R211, R212, R250, R286	10K, 5%, 1/8W	SMD-0805	

Table B.1 CyberPro50xx Demo Board BOM

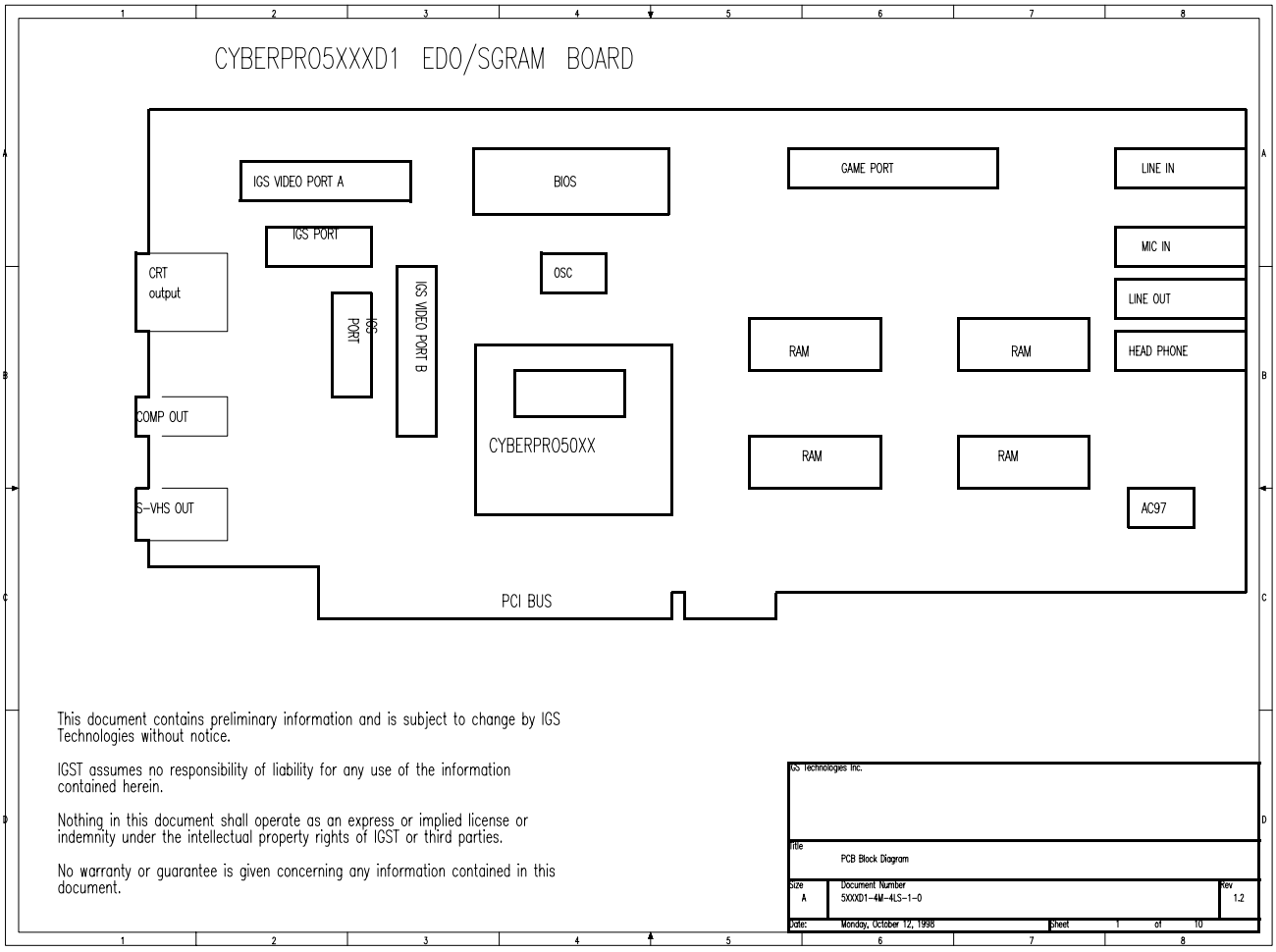
Qty	Reference	Part	Pakage	Description
4	R289, R290, R291, R292	10K - NO LOAD		
6	R9, R13, R20, R21, R22, R100	75R, 5%, 1/8W	SMD-0805	
1	R23	6.8K - NO LOAD		
1	R27	127R, 5%, 1/8W	SMD-0805	
11	R42, R257, R259, R263, R265, R267, R269, R276, R280, R282, R284	1K, 5%, 1/8W	SMD-0805	
2	R251, R252	47R, 5%, 1/8W	SMD-0805	
4	R177, R178, R221, R222	330R - NO LOAD		
1	R206	1K - NO LOAD	SMD-0805	
1	R235	4.7K - NO LOADS	SMD-0805	
1	R237	0R - NO LOAD		
2	R208, R233	22R - NO LOAD		
5	R209, R213, R214, R244, R245	100R, 5%, 1/8W	SMD-0805	
1	R210	100R - NO LOAD		
3	R225, R226, R227	75R - NO LOAD		
9	R258, R262, R264, R266, R270, R278, R281, R283, R285	47K, 5%, 1/8W	SMD-0805	
1	R268	7.5K		
2	R277, R275	1M, 5%, 1/8W	SMD-0805	
2	R287, R288	100R 5%, 1/8 W	SMD-0805	
1	T1	NO LOAD		GND
1	T3	NO LOAD		CS1#
1	T4	NO LOAD		CAS#
1	T5	NO LOAD		WE_0#
1	T6	NO LOAD		RAS#
1	T7	NO LOAD		WE_1#
1	T8	NO LOAD		OE0
1	T9	NO LOAD		CS0#
1	T10	NO LOAD		BA
1	T11	NO LOAD		OE1
1	T12	NO LOAD		SGCK
1	T13	NO LOAD		VCC
1	T14	NO LOAD		PVDD
1	UY2	EPROM 27256	28 PIN DIL	
1	U2	LM7805		
1	U7	OSC 24.576		
4	U9, U10, U14, U15	256KX32 100 PIN EDO or SGRAM	TQFP/LQFP	
1	U24	MINI DIN 4 FEMALE	S-VIDEO	
1	U26	CYBERPRO50xx 208 PIN	PQFP	
1	U29	LM4545, AC97 CODEC (or AD1819 or CS4297)		

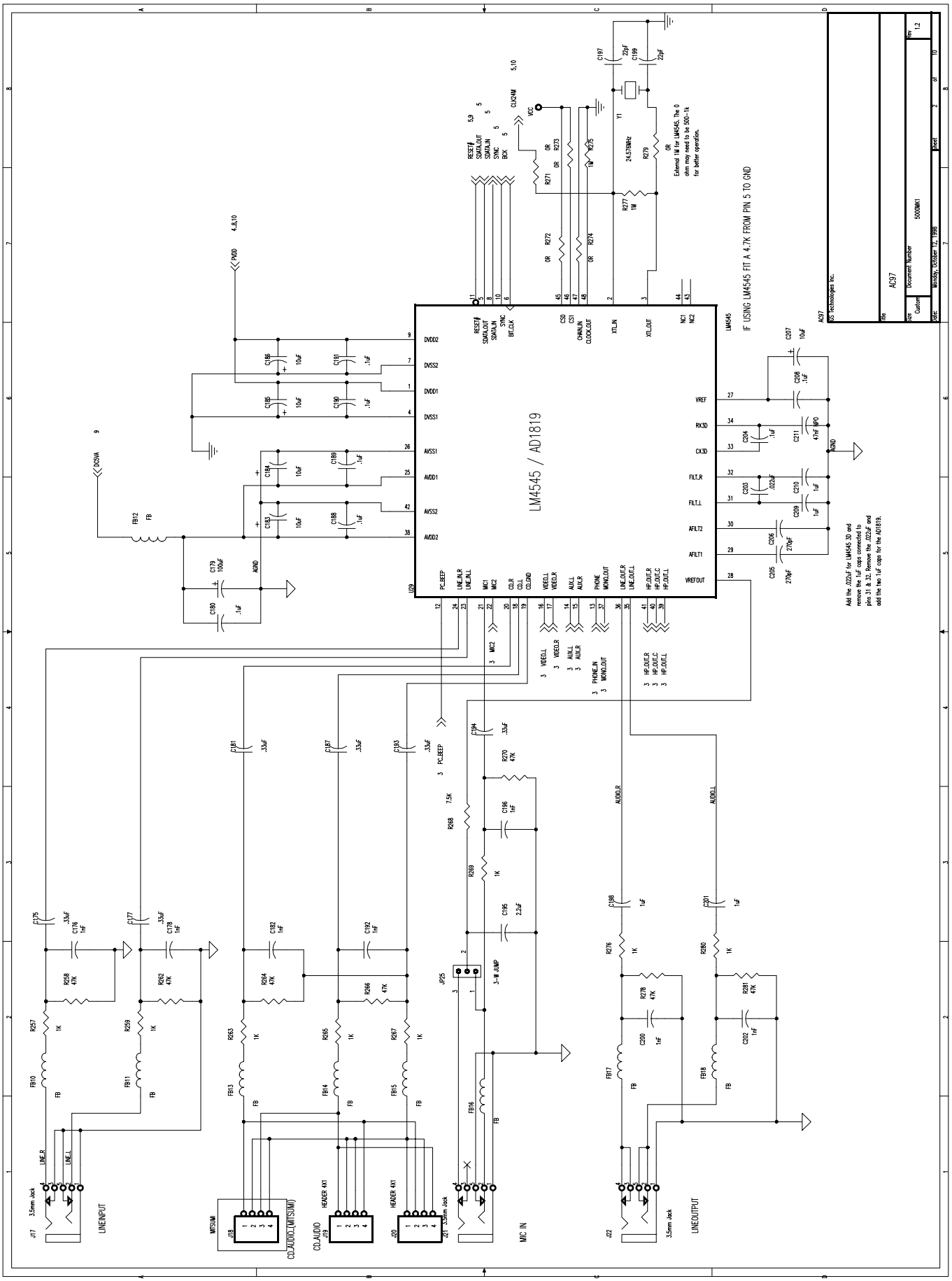
Table B.1 CyberPro50xx Demo Board BOM

Qty	Reference	Part	Pakage	Description
1	VR1	LT1086CT - 3.3		
1	Y1	24.576MHz XTAL		

Schematics

The chematics taht follow are the actual Orcad schematics used to build the CyberPro50xx demo board. These schematics are useful for understanding and modifying the demo board. Since the demo board incorporates many different possible configurations for the CyberPro50xx multimedia graphic chip, these schematics are not a good place to start for actual CyberPro50xx-based designs.




LM4545 / AD1819
LM4545
AC97
IF USING LM4545 FIT A 4.7K FROM PIN 5 TO GND
External 1M for LM4545. The 0 ohm may need to be 500~1k for better operation.
Add the .022uF for LM4545 3D and remove the 1uF caps connected to pins 31 & 32. Remove the .022uF and add the two 1uF caps for the AD1819.
LINEINPUT
CD-AUDIO(MITSUMI)
CD-AUDIO
MIC IN
LINEOUTPUT
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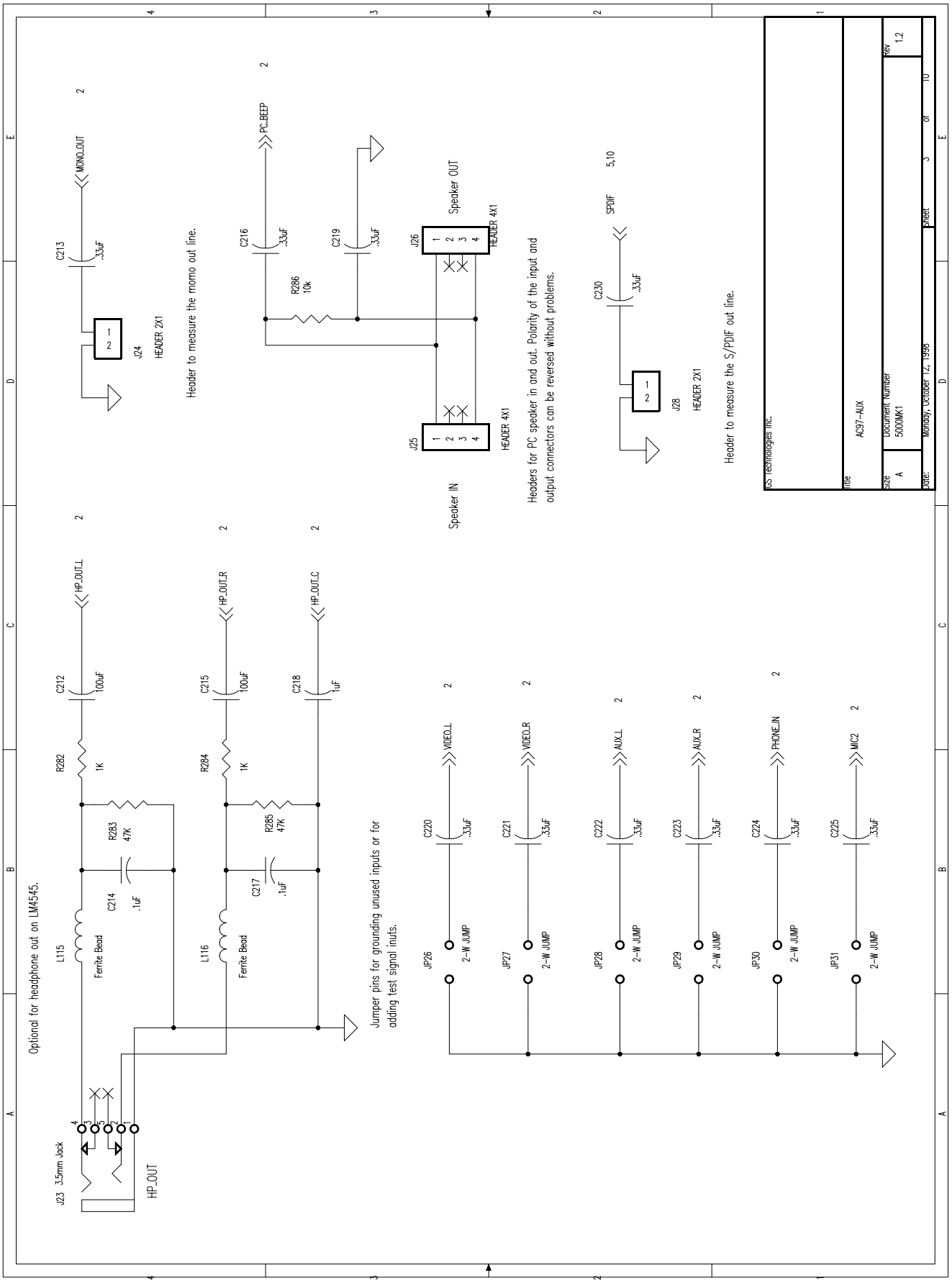
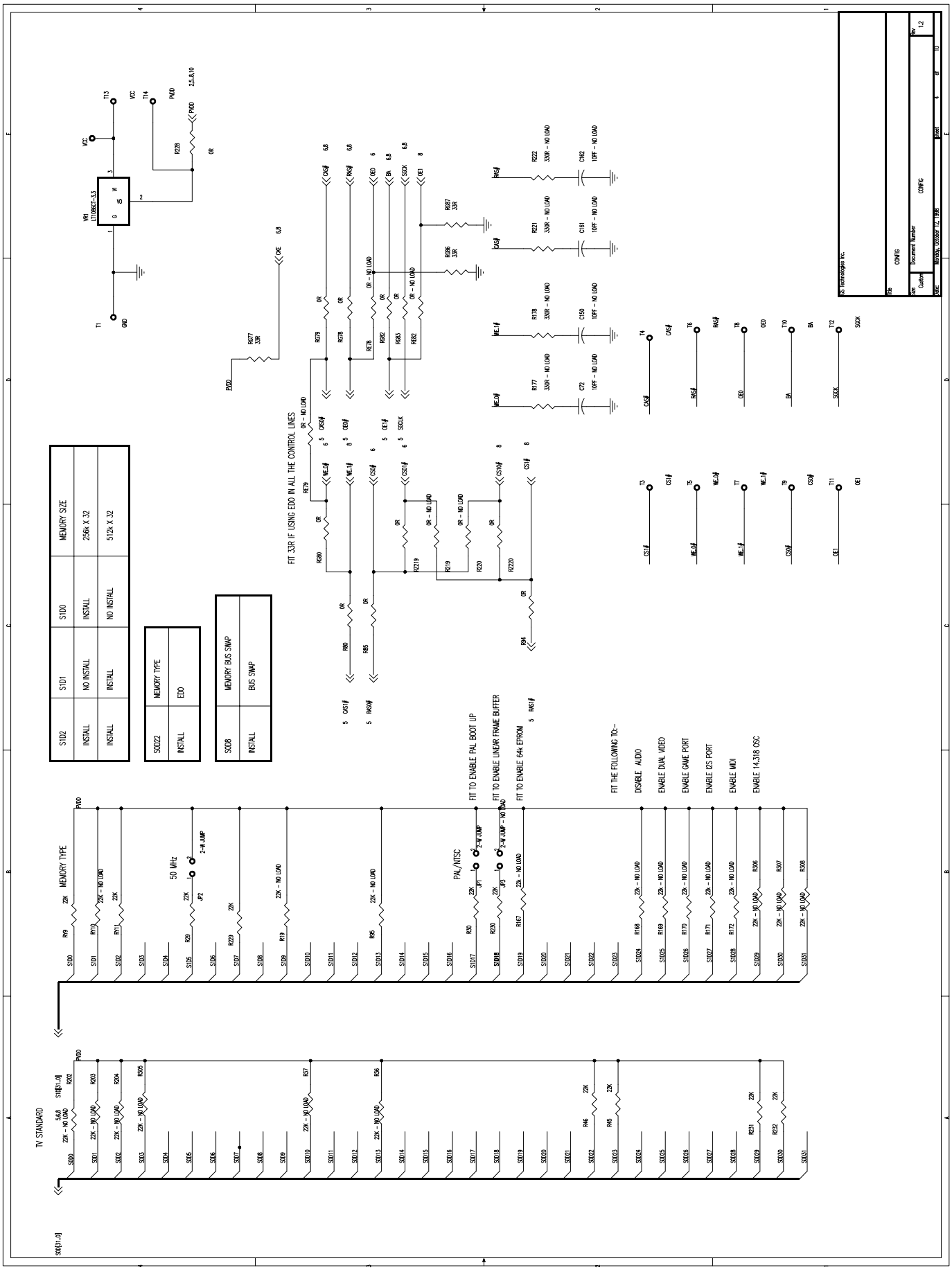
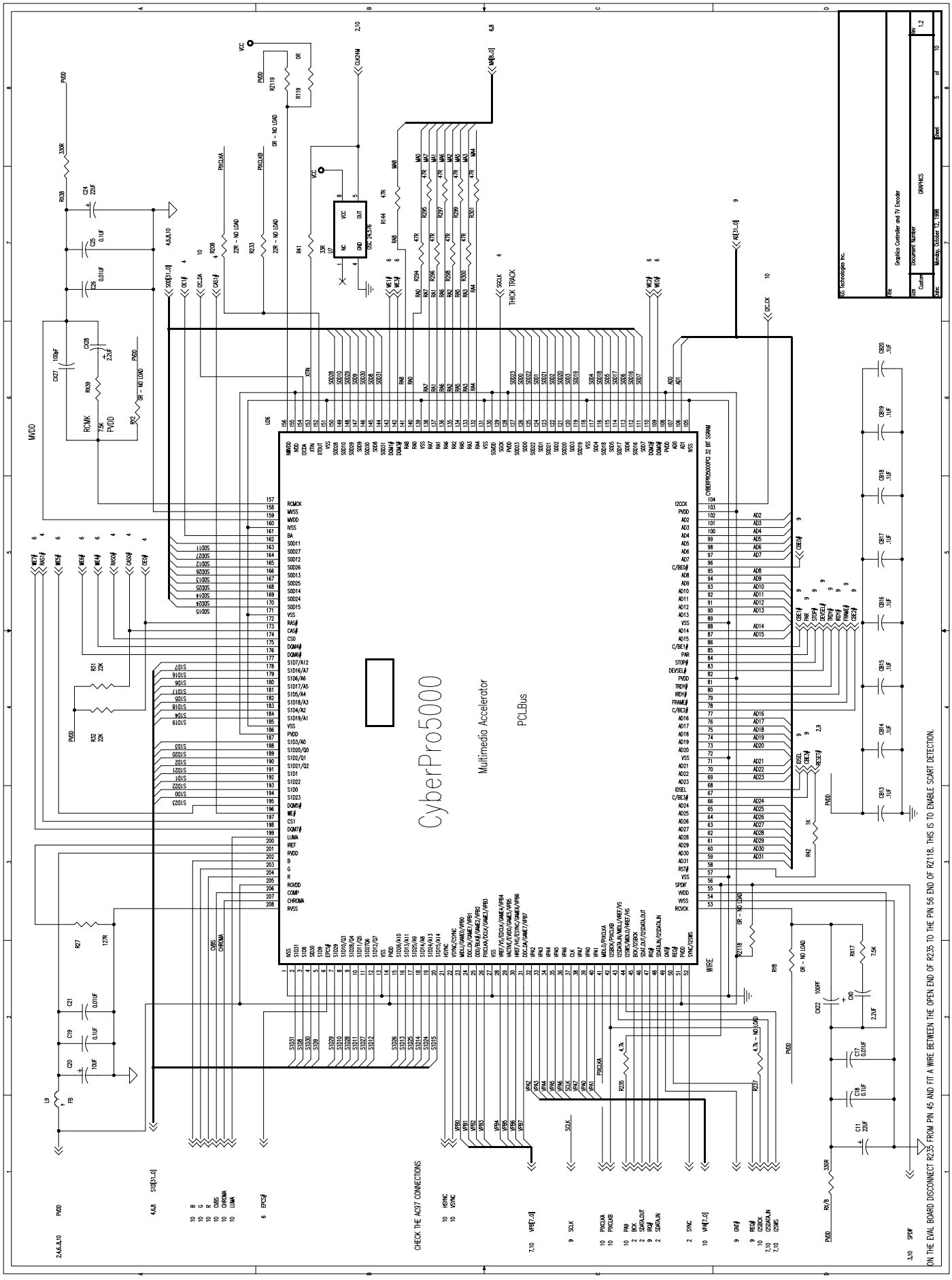
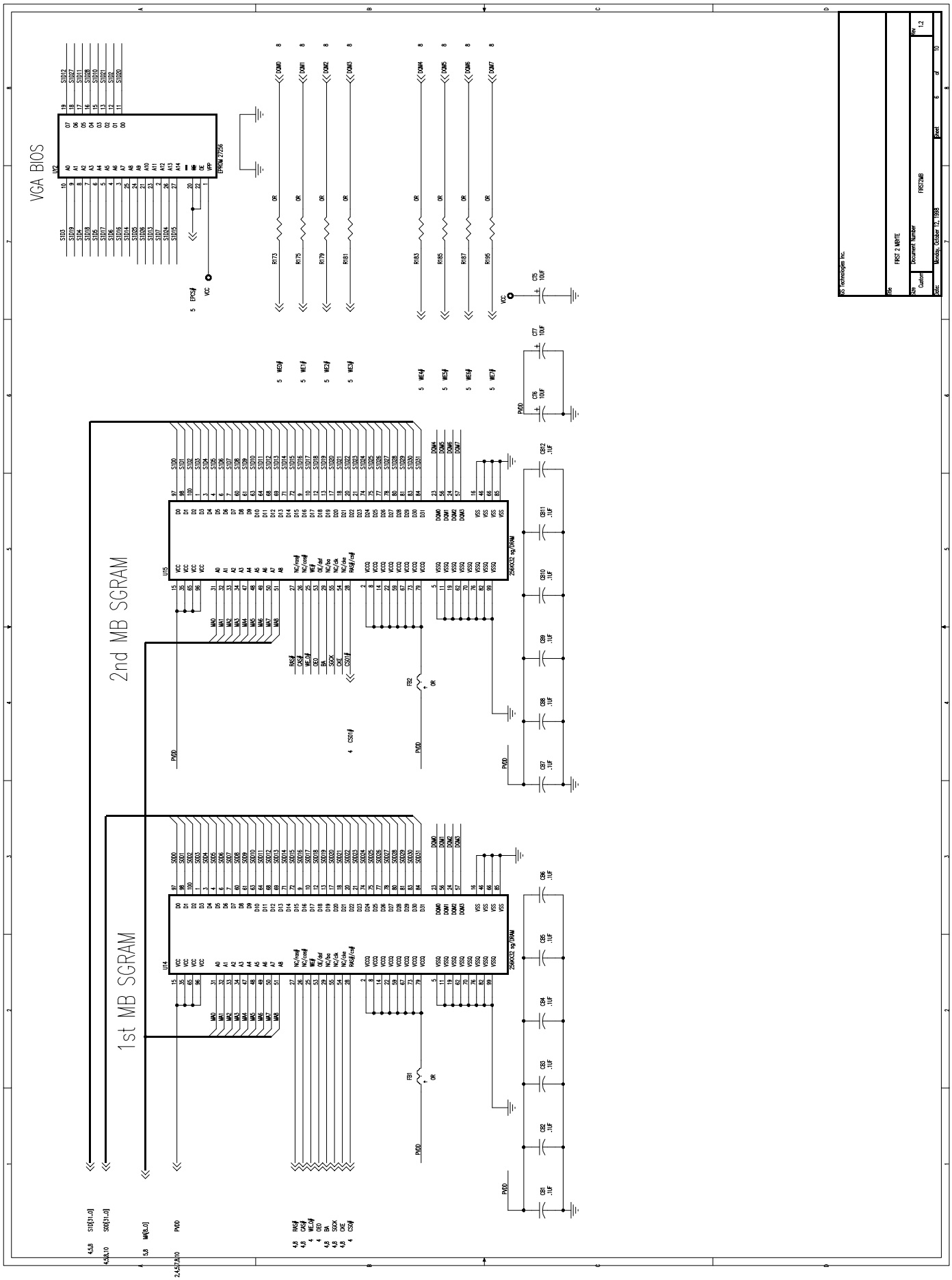
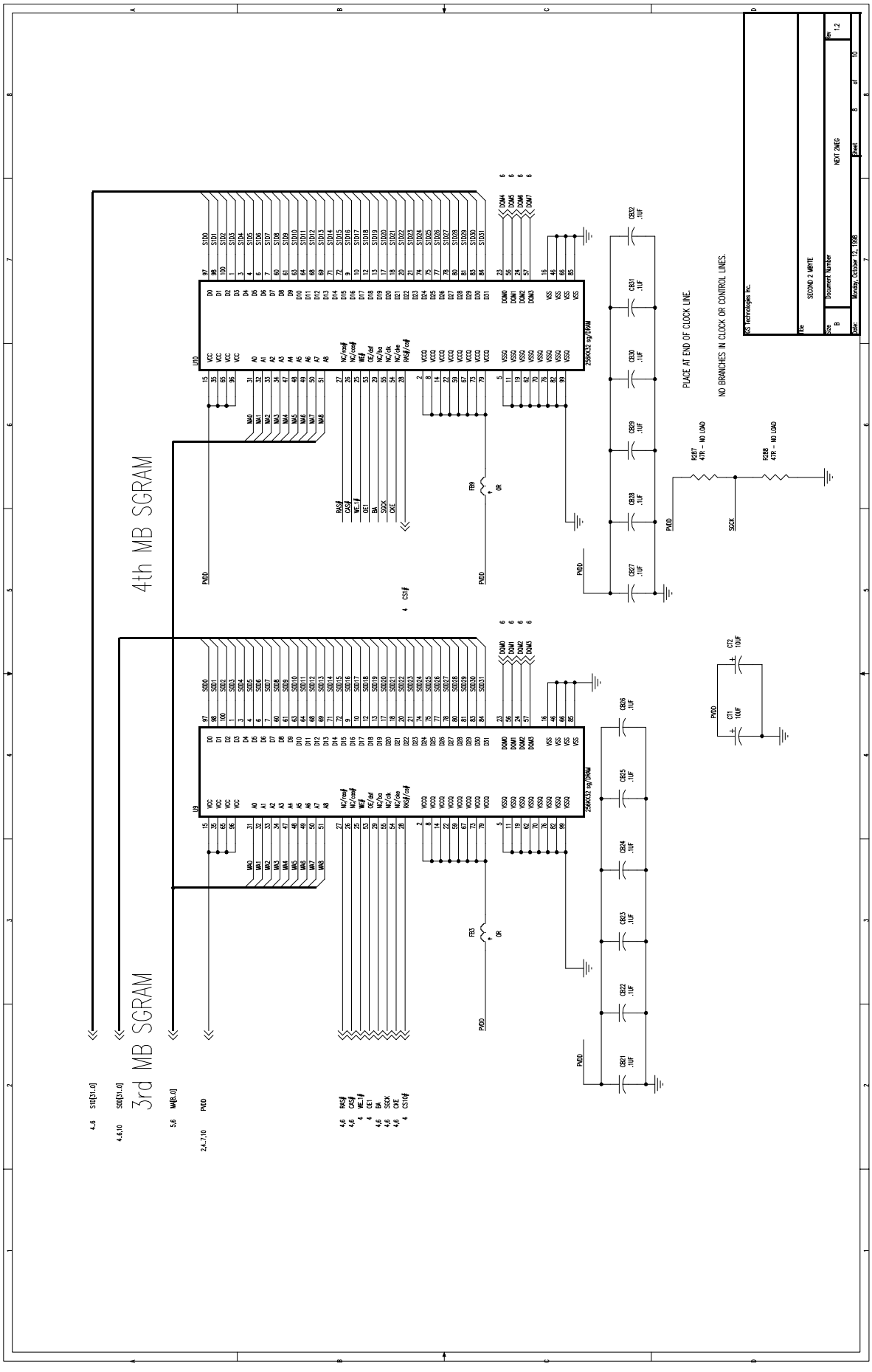
Monday, October 12, 1998

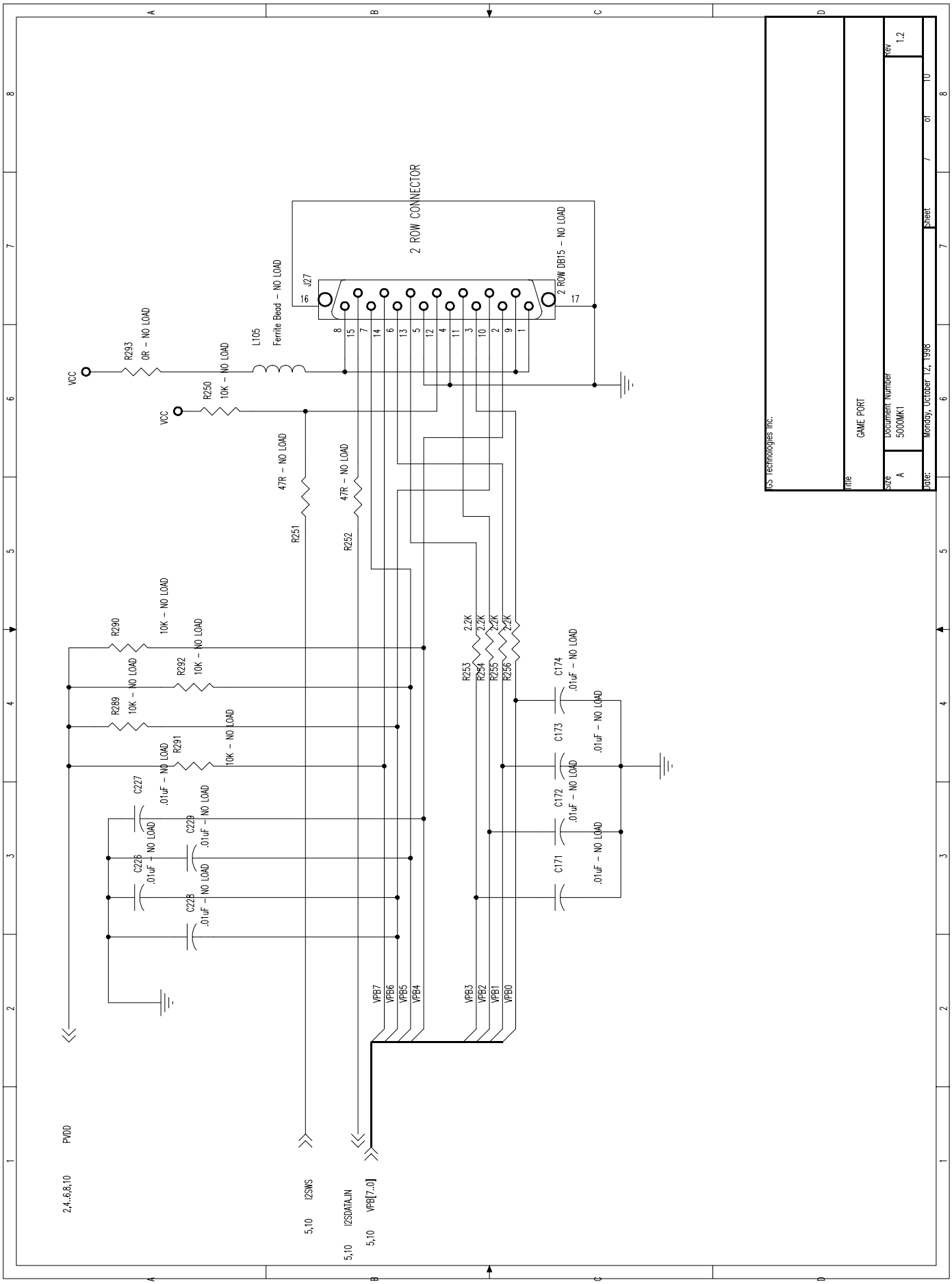

MONO_OUT
C213
.33uF
J24
HEADER 2X1
Header to measure the momo out line.
PC_BEEP
C216
.33uF
C219
.33uF
R286
10k
J26
HEADER 4X1
Speaker OUT
J25
HEADER 4X1
Speaker IN
Headers for PC speaker in and out. Polarity of the input and output connectors can be reversed without problems.
SPDIF
5,10
C230
.33uF
J28
HEADER 2X1
Header to measure the S/PDIF out line.
HP_OUT_L
HP_OUT_R
HP_OUT_C
C212
100uF
C215
100uF
C218
1uF
R282
1K
R284
1K
R283
47K
R285
47K
C214
.1uF
C217
.1uF
L115
Ferrite Bead
L116
Ferrite Bead
Optional for headphone out on LM4545.
J23 3.5mm Jack
HP_OUT
Jumper pins for grounding unused inputs or for adding test signal inuts.
VIDEO_L
VIDEO_R
AUX_L
AUX_R
PHONE_IN
MIC2
C220
C221
C222
C223
C224
C225
.33uF
JP26
JP27
JP28
JP29
JP30
JP31
2-W JUMP
IGS Technologies Inc.
Title
AC97-AUX
Size
A
Document Number
5000MK1
Rev
1.2
Date:
Monday, October 12, 1998
Sheet
3
of
10

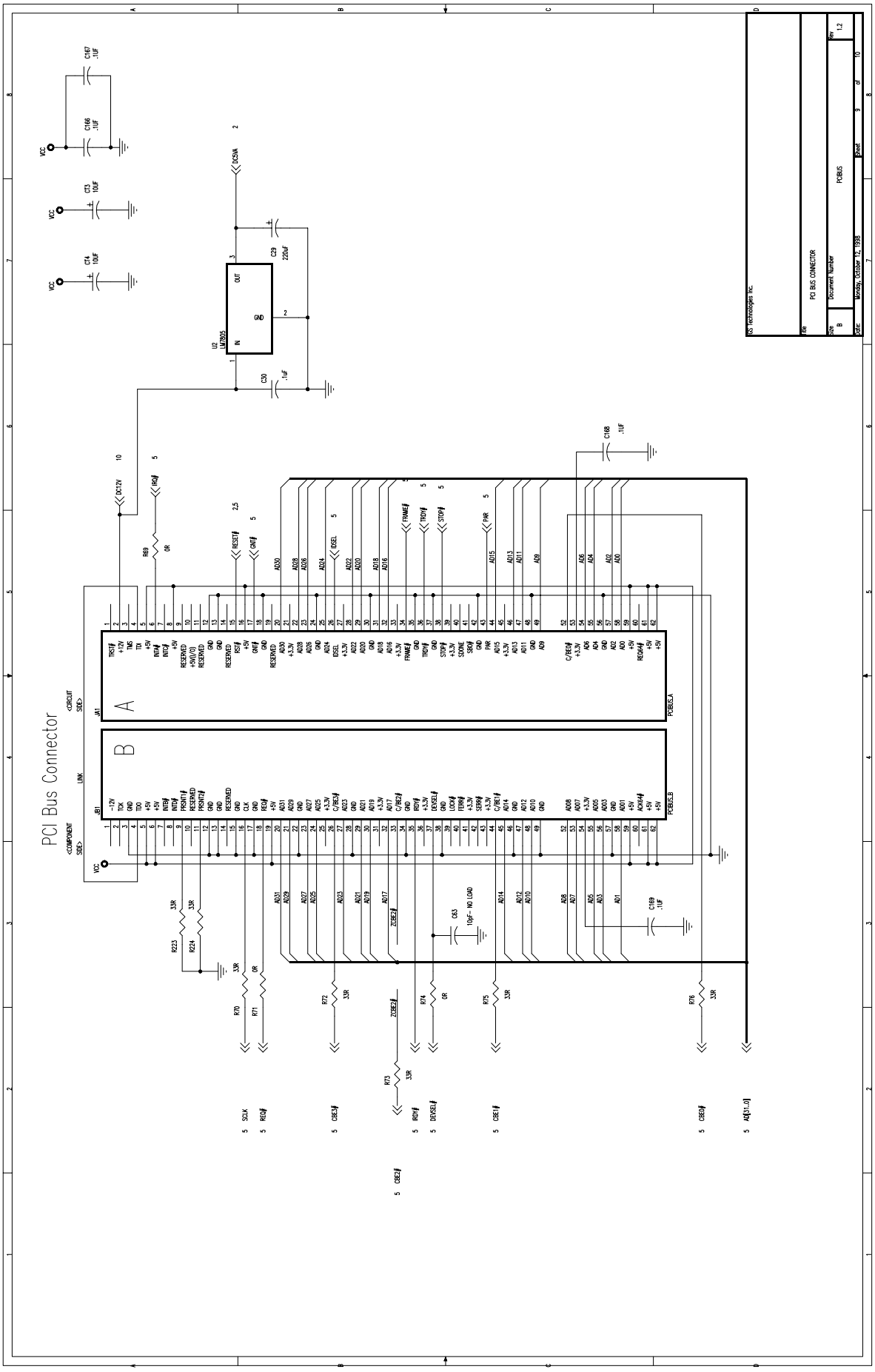

S1D2 | S1D1 | S1D0 | MEMORY SIZE
INSTALL | NO INSTALL | INSTALL | 256k X 32
INSTALL | INSTALL | NO INSTALL | 512k X 32
S3D22 | MEMORY TYPE
INSTALL | EDO
S3D28 | MEMORY BUS SWAP
INSTALL | BUS SWAP
TV STANDARD
MEMORY TYPE
50 MHz
PAL/NTSC
FIT TO ENABLE PAL BOOT UP
FIT TO ENABLE LINEAR FRAME BUFFER
FIT TO ENABLE 64k EPROM
FIT 33R IF USING EDO IN ALL THE CONTROL LINES
FIT THE FOLLOWING TO--
DISABLE AUDIO
ENABLE DUAL VIDEO
ENABLE GAME PORT
ENABLE I2S PORT
ENABLE MIDI
ENABLE 14.318 OSC
IGS Technologies Inc.
CONFIG
Document Number
CONFIG
Rev 1.2
Monday, October 14, 1996

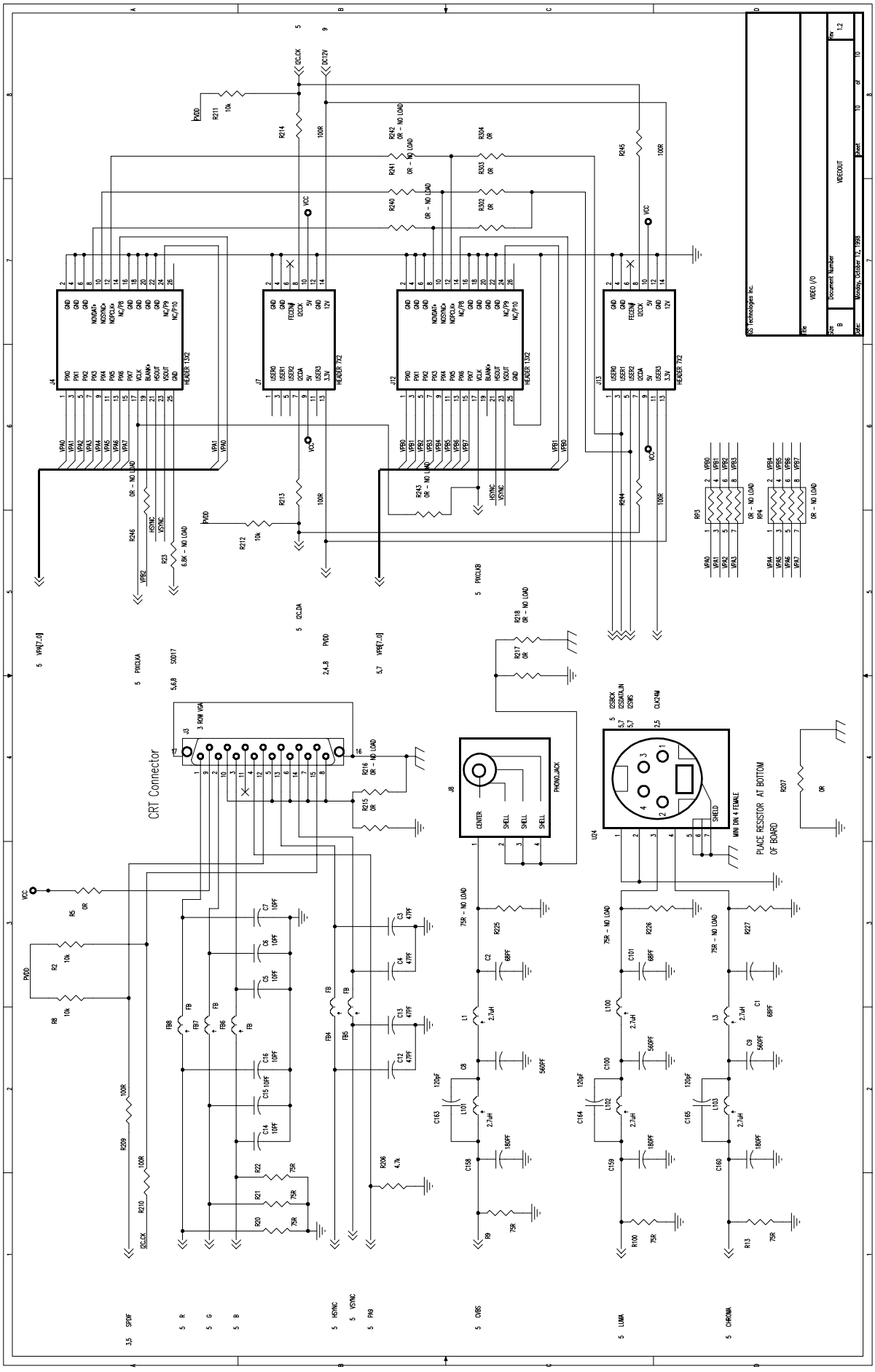

CyberPro5000
Multimedia Accelerator
PCI Bus
CHECK THE AC97 CONNECTIONS
ON THE EVAL BOARD DISCONNECT R235 FROM PIN 45 AND FIT A WIRE BETWEEN THE OPEN END OF R235 TO THE PIN 56 END OF RZ118. THIS IS TO ENABLE SCART DETECTION.
IGS Technologies Inc.
Graphics Controller and TV Encoder
GRAPHICS
Monday, October 12, 1998


VGA BIOS
2nd MB SGRAM
1st MB SGRAM
IGS Technologies Inc.
FIRST 2 MBYTE
FIRST2MB
Monday, October 12, 1998


4th MB SGRAM
3rd MB SGRAM
PLACE AT END OF CLOCK LINE.
NO BRANCHES IN CLOCK OR CONTROL LINES.
R237 47R - NO LOAD
R238 47R - NO LOAD
IGS Technologies Inc.
SECOND 2 MBYTE
NEXT 2MEG
Monday, October 12, 1998


IGS Technologies Inc.
Title
GAME PORT
Size
A
Document Number
5000MK1
Rev
1.2
Date:
Monday, October 12, 1998
Sheet
1
of
10
J27
2 ROW CONNECTOR
2 ROW DB15 - NO LOAD
L105
Ferrite Bead - NO LOAD
R293
0R - NO LOAD
R250
10K - NO LOAD
R251
47R - NO LOAD
R252
47R - NO LOAD
R253
2.2K
R254
2.2K
R255
2.2K
R256
2.2K
R289
10K - NO LOAD
R290
10K - NO LOAD
R291
10K - NO LOAD
R292
10K - NO LOAD
C171
.01uF - NO LOAD
C172
.01uF - NO LOAD
C173
.01uF - NO LOAD
C174
.01uF - NO LOAD
C226
.01uF - NO LOAD
C227
.01uF - NO LOAD
C228
.01uF - NO LOAD
C229
.01uF - NO LOAD
VCC
VCC
PVDD
2,4..6,8,10
I2SWS
5,10
I2SDATAIN
5,10
VPB[7..0]
5,10
VPB7
VPB6
VPB5
VPB4
VPB3
VPB2
VPB1
VPB0


PCI Bus Connector
PCI BUS CONNECTOR
Document Number
PCIBUS
Monday, October 12, 1998


CRT Connector
PLACE RESISTOR AT BOTTOM OF BOARD
IGS Technologies Inc.
VIDEO I/O
VIDEOOUT
Monday, October 12, 1998