

KONTRAST 7000CB

GRAPHICS CONTROLLER CARD
USER'S GUIDE

Rev. 1.1

May 1989

PREFACE

This user's guide describes the KONTRAST 7000CB Graphics Controller Card, its installation, and compatible graphics drivers. The card can be used with most AT- and XT-compatible computers that have a 16-bit bus. The 7000CB card can greatly improve both resolution and processing speed.

This is a user's guide; it contains all the information you need to use the 7000CB card. A system programmer's manual and utility programs are also available for advanced users.

Table of Contents

PREFACE	0-3
.....	0-3
CHAPTER 1	1-1
INTRODUCTION	1-1
THE USER'S GUIDE	1-2
COMPANY OVERVIEW	1-3
TECHNICAL OVERVIEW	1-4
GETTING STARTED	1-6
BASIC 7000CB PACKAGE	1-6
OPTIONS	1-6
MINIMUM CONFIGURATION	1-7
MONITORS	1-8
DRIVERS	1-9
CHAPTER 2	2-1
INSTALLATION	2-1
HANDLING THE CARD	2-3
SOFTWARE INSTALLATION	2-3
TOOLS	2-7
JUMPERS	2-8
SETTING THE DIP SWITCHES	2-12
PHYSICAL INSTALLATION	2-13
CONNECTING CABLE AND MONITOR ..	2-15
DRIVER INSTALLATION	2-17

CHAPTER 3	3-1
EGA-COMPATIBLE	
DRIVER	3-1
EGA-COMPATIBLE DRIVER	3-2
EGA-COMPATIBLE	
UTILITIES	3-3
CHAPTER 4	4-1
VIDEO PARAMETER AND SETUP	4-1
I/O PORT CONFLICT	4-1
CHANGING BASE ADDRESS AND MONITOR	
PARAMETERS	4-2
THE STANDARD 7K1S.DAT FILE:	4-3
CHANGING THE BASE ADDRESS	4-8
CHANGING THE MONITOR PARAMETERS	
10	
SELECTED MONITOR PARAMETERS	4-16
APPENDIX A	A-1
ERROR MESSAGES	A-1
SOFTWARE LIBRARY ERROR-MESSAGES	A-2
UTILITIES ERROR MESSAGES	A-3

Figures

2-1 The 7000CB Graphics Controller Card	2-2
2-2 Default Jumper Settings	2-7
2-3 External Sync Jumper Setting	2-8
2-4 Sync Polarity Jumper Settings	2-9
2-5 Interrupt Mode Jumpers	2-10
2-6 Default Dip Switch Setting	2-12
2-1 Monitor Cable Pin-Out	2-15
4-1 Horizontal Parameters	4-11
4-2 Vertical Parameters	4-12
4-3. Monitor Timings	4-13

Tables

2.1 Monitor Table Pin-Out	2-14
-------------------------------------	------

CHAPTER 1

INTRODUCTION

Thank you for purchasing the KONTRAST 7000CB Graphics Controller Card. We hope this User's Guide will help you enjoy working with your powerful new card.

The 7000CB Graphics Controller Card offers you all the power and control you expect from a complete CAD system, integrated with the friendliness of your personal computer. The 7000CB gives you extremely fast processing speed without sacrificing the high resolution you need for sharp, clear, screen displays.

The 7000CB also offers you many displayable colors to give you the exact touch you want for your graphics output. Sixteen or 256 colors out of a 4096-color palette come standard with the card. Optionally, you can get a color palette of up to 16.7 million different colors by changing only one chip. In addition, the KONTRAST-7000CB has a large on-board memory (you can get up to eight Megabytes of additional RAM), offers many popular graphics drivers to support a wide variety of graphics applications, and does it all on your 286 or 386® AT-style computer!

1.1. THE USER'S GUIDE

This user's guide contains the information you need to install and begin working with your 7000CB graphics card. The following paragraphs tell you what information you'll find in each chapter.

The rest of **Chapter 1** gives you a company overview, a technical overview of the controller card, what is included in the basic 7000CB package, options you can obtain, and information on monitors, drivers, and the minimum configuration you need to use the card.

Chapter 2 takes you through software installation, physical card installation, and the EGA-compatible software driver interface installation in an easy to follow, step by step manner, complete with helpful figures and diagrams.

Chapter 3 explains how to use the EGA compatible software interface driver.

Chapter 4 is for users who want to learn more about the 7000CB graphics card's advanced features. *You do not have to read this section to use the board.* Topics covered here include manual EGA-compatible driver installation.

Appendix A lists and explains error messages you may receive while operating the board.

1.2. COMPANY OVERVIEW

KONTRON ELECTRONICS manufactures and creates innovative microprocessor development instrumentation, as well as computer graphics and image processing systems. The DATASYSTEMS Division manufactures and distributes digitizers, high-resolution graphics terminals and subsystems, and AT-compatible 286- and 386®-based computers.

1.3. TECHNICAL OVERVIEW

The KONTRAST 7000CB is a high-performance, high-resolution AT-compatible graphics card, based on a single or dual AMD 95C60 Quad Pixel Dataflow Manager graphics processor. The 7000CB also has dual port video RAMs, and a triple 8-bit Video-DAC chip with 110 MHz video bandwidth, and an optional 2-bit overlay for future use.

The 7000CB graphics card avoids the performance and speed compromises of other cards. Most graphics cards can only modify each bit plane sequentially, meaning the higher the number of bits per pixel, the lower the performance (the number of bit planes determines the number of colors you can choose, and also the number of diagrams you can overlay over one another). On the KONTRAST 7000CB, each bit plane has its own private 16-bit data path and 16-bit ALU, so that any number of bit planes can be modified in parallel, without compromising performance.

KONTRON offers you four versions of the 7000CB card, which differ proportionately in cost and resolution. The four cards listed below are in order from the highest resolution (CB/1) to the lowest (CB/4).

	CB/1	CB/2	CB/3	CB/4
<i>Resolution</i>	1280x1024	1280x1024	1024x780	1024x780
<i>Bit Planes Per Pixel</i>	8	4	8	4
<i>Horizontal Scan Rate</i>	64kHz	64kHz	50kHz	50kHz
<i>Colors/Palette</i>	256/4096	16/4096	256/4096	16/4096
<i>VRAM</i>	2MB	1MB	2MB	1MB

1.4. GETTING STARTED

This sections contains information about the basic 7000CB package, options, monitors, drivers and the minimum configuration necessary to run the card.

1.4.1 BASIC 7000CB PACKAGE

The 7000CB basic package includes

- Version 1, 2, 3 or 4 of the 7000CB High-Resolution Graphics Card
- The 7000CB User's Guide, which you are now reading.
- The disk "KONK7K.LIB" containing our driver, EGA emulation, test utilities and our C-library.
- The disk containing the device driver for your application package (e.g. AutoCAD, GEM, P-CAD. etc.)

1.4.2 OPTIONS

In addition to the basic package, you can get options to expand the card's capabilities to give you even greater flexibility and control over your graphic output. The currently available options are:

- Additional drivers. Please contact your local distributor or dealer, or call KONTRON Datasystems for details
- Memory expansion Dynamic RAM (DRAM) cards. You can get 1, 2, 4 or 8 Megabytes of extra DRAM. These cards snap onto the 7000CB card, so they don't take up another slot in your computer.
- System Programmer's Manual. This includes Kontron's KON7K.LIB utilities library and documentation; these allow you to interface your own applications-specific software with the graphics card.

1.4.3 MINIMUM CONFIGURATION

This section gives you the minimum requirements your computer must meet in order to use the KONTRON 7000CB Graphics Controller Card.

The host computer must be an AT-compatible or the equivalent, with one free 16-bit bus slot and a high density 5 1/4" diskette drive. You can also use a 80386 computer with a standard AT-compatible 16-bit bus. Your system needs a graphic card . The 7000CB runs on host computers with speeds of up to 25MHz, without wait states. However, we cannot guarantee that the card will function under all CPU speeds.

1.4.4 MONITORS

You cannot use the 7000CB with every monitor on the market. Some monitors do not have the ability to accept the high-frequency video signal needed to generate high-resolution graphics. Your monitor needs to have a 64KHz or 50KHz horizontal scan rate, depending on which version of the graphics card you have (see section 1.3 for details on which card takes which scan rate). The 7000CB's standard 75 OHM RGB output supports a wide range of high resolution graphics monitors. The following are recommended and their timing parameters are available and listed in chapter 4.

<u>Monitor</u>	<u>Order Nr.:</u>
SONY GDM 1601	212.S-GDM1601
SONY GDM 1602	212.S-GDM1602
SONY GDM 1950	212.S-GDM1950
SONY GDM 1952	212.S-GDM1952
Mitsubishi FC8652E	212.K-6116C-Monitor
Philips CCT 2048	212.P-CCT2048
Philips CCT 2064	212.P-CCT2064

For more information, contact your distributor or dealer, or call KONTRON Datasystems for details.

If your monitor is not listed above, but does have a 64KHz (1280 x 1024) or 50KHz (1024 x 780) scan rate, the

video timing parameter may have to be changed according to chapter 5.

1.4.5 DRIVERS

KONTRON Electronics also offers (or will soon offer) drivers for many other popular CAD and graphics programs, such as:

Ventura Publisher

Gem

AutoCAD

PC-Draft

X Windows

Microcadam

Caddy

Eltime

EICAD

PHIGS

P-Cad

Personal Designer/Drafter

GKS

GSS/CGI

TEK.4125 Emulator

Spirit

MS-Windows

For 80386-based computers running the UNIX operating system there are basic device drivers available (Interactive 386/IX and XENIX).

For more information, contact your distributor or dealer, or call KONTRON Datasystems for details.

CHAPTER 2

INSTALLATION

If you have ever installed a board in a computer, then you know how easy it is to do. This chapter shows you how to check your switch and jumper settings, install the graphics card and software, and run a test program.

The physical board installation is the same whether you are using one monitor or two monitors. The KONTRAST 7000CB is designed specifically so that you don't have to use two monitors (although you can).

WARNING: Do NOT physically install the 7000CB graphics card until you have first make software installation ; trying to run an application without running the installation first may cause damage to your monitor.

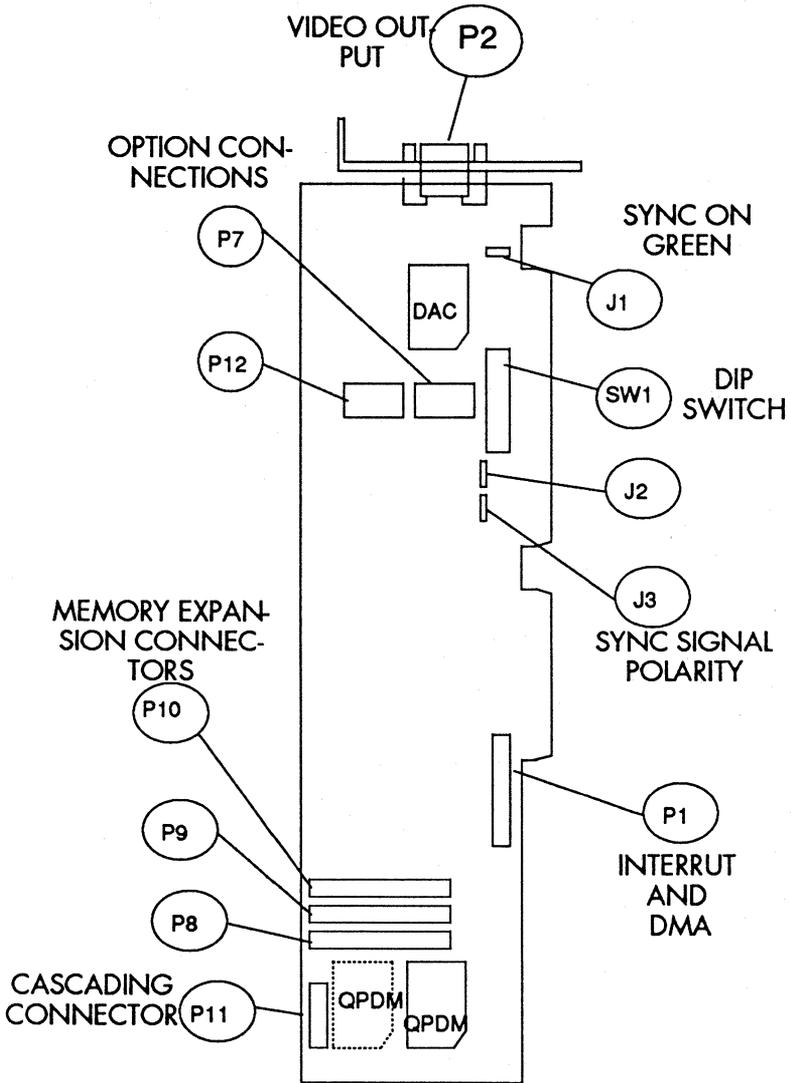


Figure 2-1 The 7000CB Graphics Controller Card

2.1. HANDLING THE CARD

The 7000CB graphics card (see figure 2-1) contains static sensitive chips. Make sure that you do not touch the chips when you handle the card, and that you are grounded. Hold the card by the edges and the metal post.

2.2. SOFTWARE INSTALLATION

This chapter describes how to install the EGA emulation. This software EGA-driver copies the contents of the standard display adapter (MDA, CGA, Hercules, EGA or VGA) to the 7000CB-board and the high resolution screen. This is important for users wanting single screen solution. All other installations for special applications (for example AutoCAD, GEM etc.) are described in the appendix.

Use the "kon7k.lib" disk to install the EGA driver at your system:

Step 1:

Copy the following files to your **boot** directory:

-7K.SYS or 7KS.SYS* (* this driver is smaller and without EGA emulation)

-7K*.DAT (* = number of board and type of monitor
you are using)

-.*.FNT

by typing

copy a:7k.sys c: or copy a:7ks.sys c:

copy a:7k*.dat c:

copy a:default.lut

copy a:*.fnt c:

and the following files in your **system** directory or an equivalent:

-EGAON.EXE

-EGAOFF.EXE

-EGASET.EXE

-SETUP7K.EXE

-CTEST.EXE

by typing

copy a:egaon.exe c:

copy a:egaoff.exe c:

copy a:egaset.exe c:

copy a:setup7k.exe c:

copy a:ctest.exe c:

Step 2:

Add the following line with any editor to your config.sys:

device = 7k.sys or device=7ks.sys

Step 3:

Run the program:

SETUP7K 7K*.DAT 7K.CFG (* = version number of board and type of monitor you are using).

This is a software configuration for your board version (CB/1, CB/2, CB/3 or CB/4), and the manufacturer of your monitor (S -> Sony, M -> Mitsubishi, P -> Philips).

Step 4:

Now install your KONTRAST board according to chapter 2.6

Step 5:

To test the screen you can run the program

ctest.exe

A test image should appear on the screen.

If the test image is not in the middle of the screen, please look to chapter 5 video parameter and setup.

2.3. TOOLS

To install the card, you need a screwdriver, and possibly an adjustable wrench, depending on the way the cover panel is fastened to your computer. The cover panel is usually either on the back or top of the computer. Before you install the card, follow the instructions in sections 2.4 and 2.5.

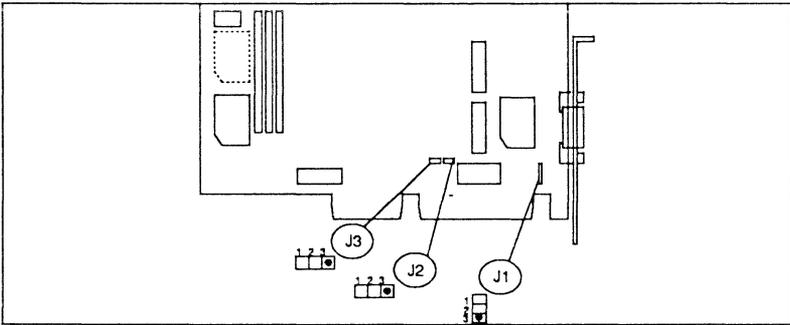


Figure 2-2 Default Jumper Settings

2.4. JUMPERS

The jumpers are pre-set for you by KONTRON to **sync on green**. Sync means synchronize, so that the picture on your screen appears cleanly, without distortion of any kind. You may need to change the settings of jumpers one, two, and/or three, depending on the way your monitor syncs.

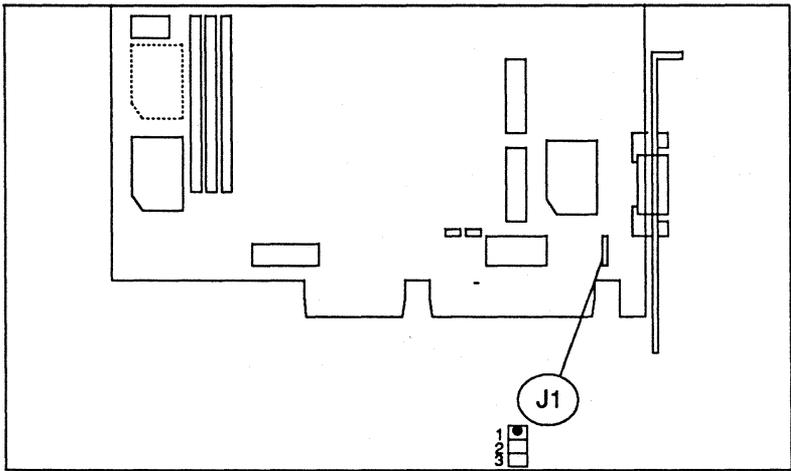


Figure 2-3 External Sync Jumper Setting

Jumper one (1) controls the two ways in which the monitor can sync. The setting you need (sync on green or external sync) depends entirely on your monitor. Most monitors can sync on green. Compare the jumper settings on your graphics card with the default settings shown in figure 2-2.

If your monitor does **sync on green**, make sure that the settings of jumpers one (1), two (2) and three (3) match the figure exactly; if they do not, change the jumper settings to those shown in the diagram. Please skip the rest of this section and proceed to section 2.5.

If your monitor must use **external sync**, you need to change jumper one (1) as shown in figure 2-3 from its position on pins one (1) and two (2) to pins two (2) and three (3). Gently pull the jumper off the first two pins, then carefully insert it on pins 2 and 3, making sure that you do not bend the pins with undue force.

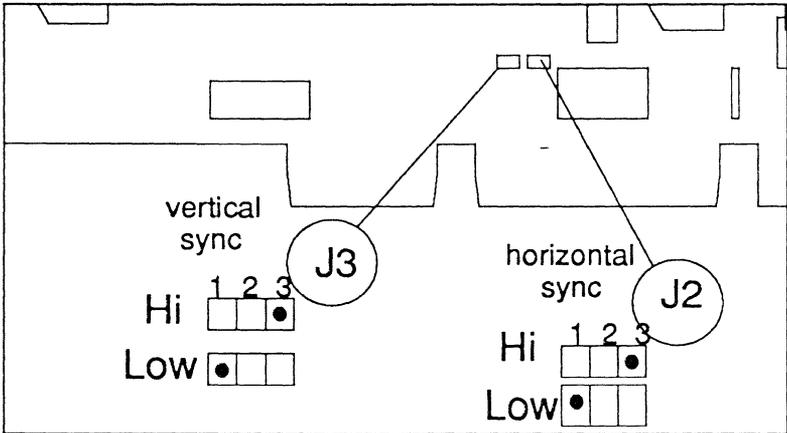


Figure 2-4 Sync Polarity Jumper Settings

Jumpers 2 and 3 control the horizontal and vertical synchronization polarity (+ or -), respectively. Check your monitor's manual to find out at what polarity to set jum-

pers 2 and 3. For jumper 2, horizontal sync is high active on pins 1 and 2, and low active on pins 2 and 3. For jumper 3, vertical sync is high active on pins 1 and 2, and low active on pins 2 and 3.

Figure 2-4 shows these jumper positions. Handle the jumper setting the same way you did for jumper 1, according to the polarity required by your monitor.

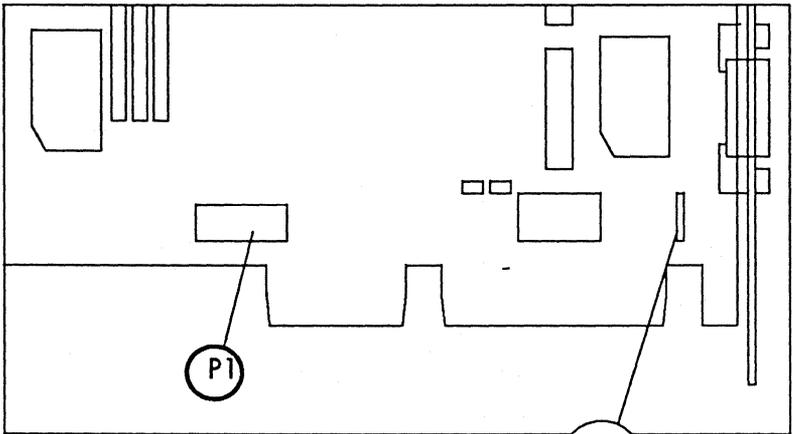


Figure 2-5 Interrupt Mode Jumpers

QPDM Interrupt Mode

The QPDM - interrupt request can be attached to various Interrupt Request signals on the AT - bus

P1 jumper on position	13-14 : QPDM INT on IRQ10
	15-16 : QPDM INT on IRQ11
	17-18 : QPDM INT on IRQ12
	19-20 : QPDM INT on IRQ7
	default

QPDM DMA Mode

For DATA - DMA - operation (Transfer of raster image data or macro programs to/from video-RAM, the following DRQ/DACK - bus signals of the AT - bus can be selected:

P1 jumper on position	1-2 : DRQ7	}	no default setting
	2-4 : DRQ6		
	5-6 : DRQ5		
P1 jumper on position	11-12 : DACK7		
	8-10 : DACK6		
	7-8 : DACK5		

For COMMAND - DMA - operation (Transfer of commands to the command - FIFO), the following DRQ/DACK - bus signals of the AT - bus can be selected:

P1 jumper on position	3-5 : DRQ7	}	no default setting
	3-4 : DRQ6		
	3-1 : DRQ5		
P1 jumper on position	9-11 : DACK7		
	9-10 : DACK6		
	9-7 : DACK5		

2.5. SETTING THE DIP SWITCHES

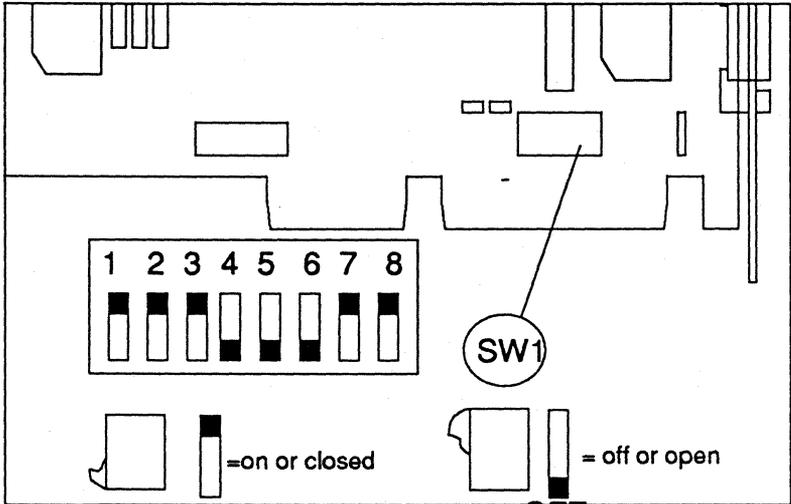


Figure 2-6 Default Dip Switch Setting

The dip switches are also pre-set in the factory. Please check your graphics card to make sure the dip switches are set as shown in figure 2-6. If the dip switches are not positioned exactly as shown, please correct them by gently flipping the switches. There is only one case in which you may need to change the default dip switch settings, if you have an I/O (Input/Output) port conflict with another board. If you are in this situation, please see chapter 4 (I/O Port Conflict).

2.6. PHYSICAL INSTALLATION

Physically installing the graphics card is a quick and easy procedure (see section 2.1 for how to handle the card). Follow the step-by-step instructions below, noting the safety cautions.

- 1** Make sure that you have turned off the power to your computer! Unplug the computer and any peripherals.
- 2** Locate the cover panel on your computer. Remove the screws that hold on the cover, put them in a safe place, then remove the cover panel.
- 3** Find a free 16-bit expansion slot on the mother board. The 16-bit slots have connectors on the mother board that match the gold fingers which stick out from the graphics card.
- 4** Remove the expansion slot cover. This is a metal post that prevents you from immediately sliding in the card. Take out the screw that holds the metal slot cover in place and remove the cover. Save the screw, because you will need it to hold the 7000CB card in place.
- 5** Slide the graphics card into the free 16-bit slot, applying even, gentle, but firm pressure.

Make sure that the gold fingers are firmly seated in the connector on the mother board.

6 Use the screw from the expansion slot cover to screw down the graphics card.

7 Replace the computer's cover panel and screw it on tightly. **MAKE CERTAIN THAT YOUR COMPUTER IS SEALED BEFORE POWERING UP!**

8 Plug in your computer and any peripherals you disconnected earlier, then turn on the power. Your new KONTRAST 7000CB graphics card is installed in your computer!

2.7. CONNECTING CABLE AND MONITOR

Table 2-1 Monitor Cable Pin-Out

<u>PIN NUMBER</u>	<u>FUNCTION</u>
1	red
2	green
3	blue
4	hsync
5	vsync
6	shield
7	ground
8	ground
9	ground

You can construct the monitor cable yourself by following the pin-out wiring shown in table 2.1. The pin-outs are for a female SUB-D connector, and are labeled on the 7000CB card connector. Make sure that each line is an individually shielded 75 Ohm coaxial cable if you construct your own, because using inferior cable can lead to problems such as excessive radio interference or poor graphics quality on screen. You can order a separate, optional monitor cable from KONTRON. KONTRON Datasystems is not responsible for damage resulting from using a cable not supplied by KONTRON.

The KONTRON cable has a 9-pin D connector on one end; this splits into three colored wires with BNC connectors at the other end. The 9-pin cable connector plugs into the 9-pin connector on the 7000CB card. The three wires are colored red, green and blue. These wires connect to your monitor. Respectively, they control the primary color cannons red, green (including horizontal and vertical synchronization) and blue. The red, green and blue wires plug into the connectors labeled R, G, and B (or Red, Green, and Blue) on your monitor. When you connect these, your monitor is completely connected to the graphics card. The KONTRAST 7000CB graphics card is compatible only with high-quality, high-resolution monitors, including the following:

<u>Monitor</u>	<u>Order Nr.:</u>
SONY GDM 1601	212.S-GDM1601
SONY GDM 1602	212.S-GDM1602
SONY GDM 1950	212.S-GDM1950
SONY GDM 1952	212.S-GDM1952
Mitsubishi FC8652E	212.K-6116C-Monitor
Philips CCT 2048	212.P-CCT2048
Philips CCT 2064	212.P-CCT2064

For more information on monitors, see chapter 4.5 (Changing the monitor parameters).

2.8. DRIVER INSTALLATION

This section assumes that you have set the jumpers and dip switches, run the install procedure, installed your board, connected it to your monitor, and run the test program. The final step before you use your graphics station is to install your graphics application driver.

Each driver has a different method of installation. The specific information you need to install the drivers is on the driver disks e.g. in a read.me or install.doc file.



CHAPTER 3

EGA-COMPATIBLE

DRIVER

This chapter explains the EGA-compatible software driver and its utility programs.

3.1. EGA-COMPATIBLE DRIVER

KONTRON provides you with an EGA-compatible software interface driver and EGA utility programs.

Note that presently, EGA controlled output is for text (ASCII) mode only.

Connecting the EGA emulator to your system does several things:

- Initializes the KONTRAST 7000CB card
- Loads the default fonts into the 7000CB card
- Identifies the system's standard display adapter (Monochrome, Hercules, CGA, EGA or VGA)
- Refreshes the standard display adapter's temporary display content.

3.2. EGA-COMPATIBLE UTILITIES

You can redefine or set various EGA driver parameters by invoking the following utility programs as necessary:

EGAON.EXE

Switches EGA mode on

EGAOFF.EXE

Switches EGA mode off

EGASET.EXE

There are several variations of this command, which sets different modes of operation. Simply enter the options you want with a backslash (/) or a dash (-), followed by a code letter and optional parameters. You can invoke more than one option, if you wish. The following examples explain the various *EGASET* options in detail.

EGASET /P x y

The option */P* tells the system to change the window to a new position. The parameters *x* and *y* are coordinates corresponding to the upper left corner of the window, which is (0, 0) by default. The *x* number is the horizontal coordinate, in pixels, and the *y* number is the vertical coordinate, in pixels. When you enter numbers for *x* and *y*, you change the position of the window's upper left corner, thus moving the window on the screen.

EGASET /C Nx Ny

The */C* option tells the system to set the space between characters. The parameter *Nx* controls horizontal space; *Ny* controls vertical line spacing between characters. Note that the horizontal space between characters must be identical to the *x* character size of the current font. The parameter *Ny*, however, may be larger than the current font size, which creates larger line spacing.

EGASET /N SKIPLINE NLINE

The */N* option sets how many lines of EGA text to display, within an *NLINE* parameter range of 1 to 25 text lines. From the top of the screen, the parameter *SKIPLINE* denotes which lines of text will be skipped in the display. For example, the command *EGASET /N 0 25* displays the full text screen. The command *EGASET /N 20 5* displays lines 20 through 24 on the screen (the last five lines).

EGASET /D

This option enables the EGA driver to support color on multiple planes.

EGASET /M

This option sets the driver to support monochrome text output (in predefined planes).

EGASET /A FF

This option sets bit planes 0 to 7 active to the EGA-driver in monochrome mode (normally, just one plane is used); for example, *EGASET /A 1* or *EGASET /A 80*. Note that you enter this parameter in **HEXADECIMAL** code, not decimal. That means that bit plane 0 = 01, bit plane 1 = 02, plane 2 = 04, plane 3 = 08, plane 4 = 10, plane 5 = 20, plane 6 = 40 and bit plane 7 = 80 (all hexadecimal numbers).

EGASET /I

This option initializes the EGA driver, and loads default fonts and the Look-Up Table (LUT) for monochrome mode.

EGASET /R

This enables you to refresh the EGA screen.

EGASET /T

Set EGA time clicks (activity delay, 16 msec steps).

EGASET /Y

Switches the cursor ON.

EGASET /Z

Switches the cursor OFF.

KONTRON also provides an EGA-compatible software interface driver support in the optional 7000CB utilities library (KON7K.LIB) to enable you to change EGA parameters within an application. To order this optional library as part of the *System Programmer's Manual*, call KONTRON Datasystems.

CHAPTER 4

VIDEO PARAMETER AND SETUP

4.1. I/O PORT CONFLICT

In the unlikely event of an I/O (Input/Output) port conflict with another board in your system, you have two choices. First, you can simply remove the conflicting board. Second, if you want to keep the conflicting board in your system, you need to change the dip switch settings, reconfigure the software, and change the 7k*.dat file.

For more information see chapter 4.4.

4.2. CHANGING BASE ADDRESS AND MONITOR PARAMETERS

This chapter describes how you can change the Base Address and the Video Parameters of the monitor by changing the 7k*.dat file (* = number of the board 'Kontrast 7000CB/*' you are using).

4.3. THE STANDARD 7K1S.DAT FILE:

```
; initialization tables for KONTRAST 7000 CB version /1
; for SONY GDM 1601 or GDM 1950
; 8.8.88 wb
; =====
;
;
01      software version #
;
0x300   base address of board (=DIP - switch)
6       DMA - channel FIFO - cmd - output
7       DMA - channel I/O block
7       interrupt channel for QPDM - interrupts
2048    video-memory size in X
1024    video-memory size in Y
8       number of bits per pixel
3       number of video-DAC channels (r,g,b)
4       number of bits output of video-DAC (451: 4; 458: 8)
0       reserved
0       reserved
0       reserved
0       reserved
;
00      screen horizontal start
00      screen vertical start
1279    screen horizontal terminate
1023    screen vertical terminate
00      reserved
0x3e8   reserved
00      reserved
0x3e8   reserved
00      reserved
0x3e8   reserved
```

```

21      horiz sync width
51      horiz scan delay
160     horiz active (160*8=1280 dots)
214     horiz total
6       vert sync width
58      vert scan delay    odd
58      vert scan delay    even
1024    vert active
2152    vert total
0x8     NONINTERLACED
0x10    CONFIGURATION_B
0x2c8   200+RAMREFRESH_ENABLE memory refresh rate
1       masked write memory enable
0
0
0
;
%\12x20.fntfont-name # 1    from root directory
;
%\7x12.fntfont-name # 2    from root directory
;
;           data tables for structure QVM: organization of VRAM
;
12      nqvm = # of qvm - structures. # 41
;
0       SVM_DSP: X0      qvm[0]: display
0       y0
1279   x1
1023   y1
0xff   planes ls 16 bits
0x0    planes ms
0x0    attr
;
2032   SVM_STK: x0      qvm[1]: stack
0       y0

```

```

2047    x1
1023    y1
0x8888 planes ls
0x8888 planes ms
0x0     attr
;
2       SVM_EGA: X0    qvm[2]: EGA - emulation (dialog)
2       y0
960    x1
500    y1
0x01   planes ls
0x0    planes ms
0x0    attr
;
1296   SVM_FNT1      qvm[3]: font1
0       y0
2015   x1
256    y1 - 100 char
0x8888 planes ls
0x8888 planes ms
0x0    attr
;
1296   SVM_FNT2      qvm[4]: font2
257    y0
2015   x1
514    y1 - 100 char
0x8888 planes ls
0x8888 planes ms
0x0    attr
;
1296   SVM_QSLqvm[5]: local segment list
0       y0behind fonts
2015   x1
514    y1
0x77   planes 0-2, 4-6

```

```

0x0
0x0      attr
;
1296    SVM_SCR1      qvm[6]: scratch buffer # 1
515     y0
1655    x1
614     y1
0xff    planes 0-7
0x0
0x0      attr
;
1656    SVM_SCR2      qvm[7]: scratch buffer # 2
515     y0
2015    x1
614     y1
0xff    planes 0-7
0x0
0x0      attr
;
1296    SVM_MC qvm[8]: local macro list
516     y0
2015    x1
1023    y1
0xff    planes 0-7
0x0
0x0      attr
;
;
0       free
0
0
0
0
0
0

```

```

;
;
1280   SVM_DSP1      qvm[10]: local display area 1
0      y0
0      z0
46     nxnumber of columns
768    nynumber of lines
1      nzplane
0
;
;
1280   SVM_DSP2      qvm[11]: local display area 2
0      y0
1      z0
46     nx
1008   ny
3      nz
0
;
0
0
0

```

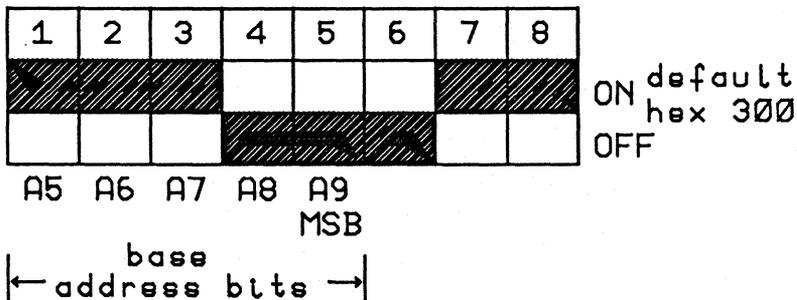
4.4. CHANGING THE BASE ADDRESS

The base address of the board is determined by the dip-switches on the board and by line 8 in the 7k*.dat file.

SW1:

line 8:

0x300 base address of board (=DIP - switch)



The default value is hex 300. If you have another board in your system which already uses I/O address hex 300 (for example most network cards do this) you need to change this address.

You can only change the address lines A5..A9. The lower address bits A0..A4 are used to select various I/O ports on the board internally. Two 10h - address pages are allocated by the graphic boards.

4.5. CHANGING THE MONITOR PARAMETERS

If you use a different monitor you may find that the image is not in the center of the screen. Please use the test image by calling the program 'ctest' (on our disk delivered along with the card).

Now you can either adjust the image by turning at the monitor potentiometers or, more conveniently, by changing the video timing parameters in the 7k*.dat file.

The monitor parameters are between line 32 and 41 in your 7k*.dat file. Here are the explanations on what the values do:

Horizontal parameters:

You do not write the timing values in seconds in the 7k*.dat file, you write them in a unit which depends on the clock of the graphics board. The unit for the horizontal timing is 8 pixels and have the following values:

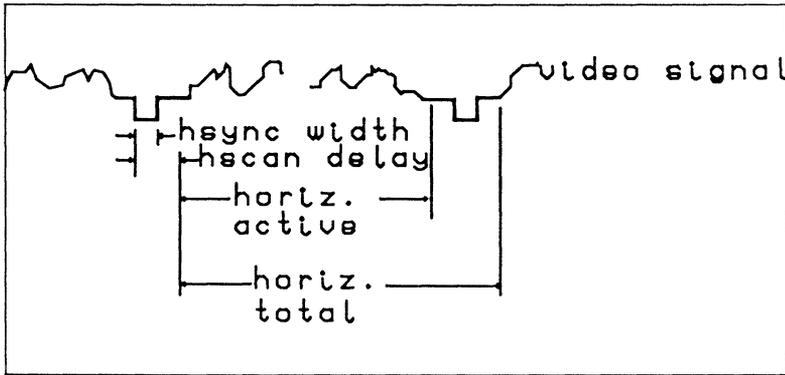


Figure 4-1 Horizontal Parameters

- 72.8ns on CB/1 and /2 boards and
- 125ns on CB/3 and /4 boards.

horiz sync width: the duration of the horizontal sync pulse.

horiz scan delay: the duration of the horizontal sync pulse plus the back porch.

horiz active: the number of pixels per line divided by 8.

horiz total: the time of one line plus the horizontal blank.

Vertical parameters:

The unit for the vertical timing is 'half lines' and have the following values:

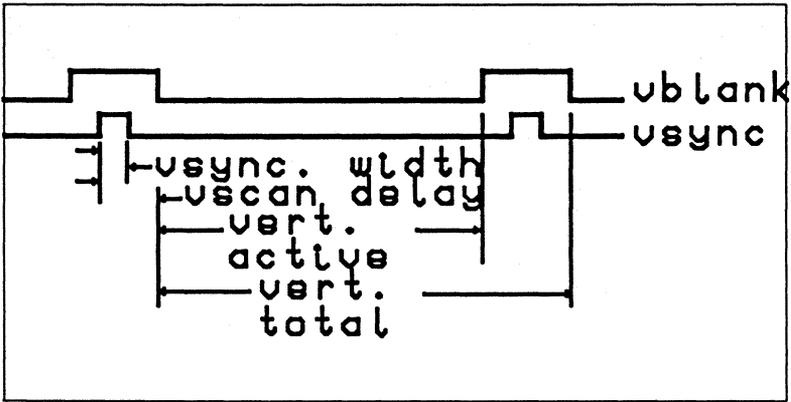


Figure 4-2 Vertical Parameters

- 30.8us on CB/1 and /2 boards and
- 40.1us on CB/3 and /4 boards.

vert sync width: duration of vertical sync pulse.

vert scan delay: duration of vertical sync pulse and vertical back porch. When your system is running in noninterlaced mode the value for odd and even is the same.

vert active: the number of lines you have on the screen.

vert total: the time for an entire image in half lines.

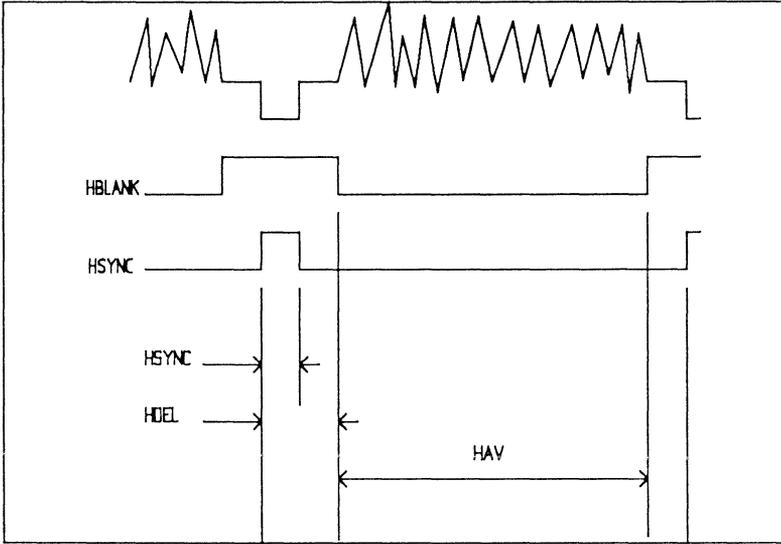
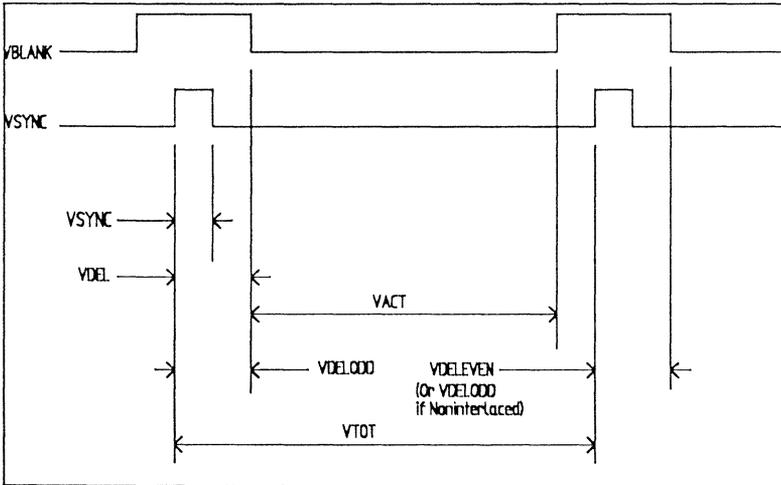


Figure 4-3: Monitor Timings



Example for monitor data:

Values given (from monitor data sheet):

Kontrast 7000 CB1 => 110 MHz Pix. Clk.
Sony GDM 1601 => ...

hor. sync width:	1,701 μ s
hor. backporch:	1,849 μ s
hor. total time:	15,788 μ s
vert. sync width:	47,360 μ s
ver. backporch:	410,500 μ s
vert. total time:	16,672 ms

Find:

horiz. sync width	HSYNC
horiz. scan delay	HDEL
horiz. active	HAV
horiz. total	HTOT
vert. sync width	VSYNC
vert. scan delay odd	VDELODD
vert. scan delay even	VDELEVEN
vert. active	VACT
vert. total	VTOT

Calculation:

$$\begin{aligned} H_{\text{sync}} &= \text{horiz. sync. width} / 8 * \text{time per pixel} \\ 8 * \text{time per pixel} &= 8 / \text{pix. clk. Freq.} = 8 / 110 \text{ MHz} \\ &= 72,73 \text{ ns} \end{aligned}$$

$$\underline{HSYNC} = 1,701 \mu\text{s} / 72,73 \text{ ns} = 23,39 \Rightarrow \underline{23}$$

$$\begin{aligned} \underline{HDEL} &= \text{hor. sync width} + \text{hor. backporch} / 8 \text{ time per} \\ \text{pixel} &= (1,701 \mu\text{s} + 1,849 \mu\text{s}) / 72,73 \text{ ns} = 48,82 \\ &=> \underline{49} \end{aligned}$$

$$\begin{aligned} \underline{HAV} &= \text{number of Dots per line} / 8 = 1280 / 8 = \\ &= \underline{160} \end{aligned}$$

$$\begin{aligned} \underline{HTOT} &= \text{hor. total line} / 8 \text{ time per pixel} = \\ &= 15,788 \mu\text{s} / 72,73 \text{ ns} = 217,1 => \underline{217} \end{aligned}$$

$$\begin{aligned} \underline{VSYNC} &= 2 \text{ vert. sync width} / \text{hor. total time} = \\ &= 2 \cdot 47,36 \mu\text{s} / 15,788 \mu\text{s} = 5,99 => \underline{6} \end{aligned}$$

$$\begin{aligned} \underline{VDELODD} &= \underline{VDELEVEN} = \\ &= 2 (\text{vert. sync width} + \text{vert. backporch}) / \text{hor. total time} \\ &= 2 (47,36 \mu\text{s} + 410,5 \mu\text{s}) / 15,788 \mu\text{s} = 58,00 \\ &= \underline{58} \end{aligned}$$

$$\underline{VACT} = \text{number of Pix. vert.} = \underline{1024}$$

$$\begin{aligned} \underline{VTOT} &= 2 \text{ vert. total time} / \text{hor. tot. time} = \\ &= 2 * 16,672 \text{ ms} / 15,788 \mu\text{s} = \underline{2112} \end{aligned}$$

4.6. SELECTED MONITOR PARAMETERS

	Sony GDM 1601 and GDM 1950	PhilipsPhilips CCT 2064 and	CCT 1648 CCT 2048
horiz sync width	23	16	12
horiz scan delay	48	48	32
horiz active	160	160	128
hoiz total	214	212	163
vert sync width	6	6	12
vert scan delay odd	58	104	78
vert scan delay even	58	104	78
vert active	1024	1024	780
vert total	2152	2154	1650

APPENDIX A

ERROR MESSAGES

Two types of error messages can appear when you work with the 7000CB graphics card. The first type of error message has to do with the graphics card software. The second type of error message comes from the graphics card utilities and can occur only if you have loaded the EGA driver.

For problems or errors you cannot solve, please call the KONTRON ELECTRONICS service department.

A.1. SOFTWARE LIBRARY ERROR-MESSAGES

The software library generates the following error messages under the conditions described:

Incomplete or invalid font file xxxx\n

The font file that should have been loaded contains some incorrect information or is not a font file. Recopy the font file from the master diskette; if the problem persists, call Kontron Electronics.

KONTRAST 7000 board not found

The application you tried to implement could not find a hardware device at the address specified in the configuration file. Make sure the graphics card is firmly seated in the 16-bit bus, the computer chips on the card are firmly seated, and check the jumper and dip switch settings.

No space for font xxxx in VRAM

When you use the built-in functions to load the user default fonts, the fonts are loaded at a location specified in the configuration file. If that location is too small to hold the font files, this error message appears. Contact Kontron Electronics.

xxxx does not exist

One of the two font files specified in the configuration file upon loading cannot be found. Make sure that the font files are located in the directory from which you initialized the action.

A.2. UTILITIES ERROR MESSAGES

The 7000CB graphics card utilities can produce the following error messages, which only occur when you have loaded the EGA driver:

Can't find 7k.cfg or font(s)

The utility could not find a configuration file and/or a font file. Make sure that the font files are located in the directory from which you initialized the action.

Can't reset QPDM

An attempted QPDM (Quad Pixel Dataflow Manager) reset failed. Either the configuration file was faulty or the QPDM did not respond. Make sure the chips are firmly seated on the card, then reboot the machine. If the problem persists, contact Kontron.

Ega - driver not installed

The EGA driver was not installed. The utility cannot perform its function if the EGA driver is not installed. Install the EGA-compatible software interface driver.

Error: mode not implemented

The utility cannot perform the specified command. Retype the command and check it for correct syntax.

Unknown parameter

The utility was given a parameter it could not recognize. Retype the command and check it for correct syntax.

Index

7k.dat-file	4-3
7K.SYS	2-3

B

Base address	
changing	4-8

C

Changing addresses	4-2
Configuration	1-7
Connecting	2-15

D

Dip switches	2-12
Driver	
EGA-compatible	3-2
Drivers	1-9

E

EGA	
Driver	3-1
Utilities	3-3
EGA bit planes	3-5
EGA character spacing	3-4
EGA color planes	3-4
EGA corsor on/off	3-5
EGA fonts	3-5

EGA line spacing	3-4
EGA mode on/off	3-3
EGA modes of operation	3-3
EGA monochrome text	3-4
EGA screen refresh	3-5
EGA window position change	3-3
Error messages	A-1
External sync	2-9
External sync jumper setting	2-9

G

General description	1-1
Getting started	1-6
Graphics card versions	1-5

H

Horizontal parameters	4-10
---------------------------------	------

I

I/O PORT	4-1
Installation	2-1
Board	2-13
Drivers	2-17
Software	2-3

J

Jumper setting	2-8
Jumpers	2-8 / 2-9

M

Memory expansion	1-7
Monitor parameters	4-2
changing	4-10
selected	4-16
Monitors	1-8

O

Options	1-6
Overview	1-2

P

Parameters	
changing	4-10
Monitor	4-1

Q

QPDM	A-3
----------------	-----

S

Software installation	2-3
Sync polarity jumper setting	
SieheJumper setting	

T

Technical data	1-4
Test program	2-6
Tools	2-7

U

Utilities3-3

V

Vertical parameters4-11

In West Germany:
KONTRON Datensysteme
Freisingerstr. 21
8057 Eching bei München
(08165)707-0

In Great Britain:
KONTRON Electronics Ltd
Blackmore Lane, Croxley Center
Watford Herts GB-WD1-8XG
(923)-245991

In USA:
KONTRON Electronics
630 Clyde Ave
Mountain View, CA 94039
(800)227-8834

In France:
KONTRON Electronique S.A.R.L.
6, Rue des Freres Caudron
78140 Velizy-Villaconblay
39469722

In Switzerland
KONTRON Elektronik AG
Bernerstraße-Süd 169
8010 Zürich
(1)4354111

For your local distributor
or dealer, check for label
on the box

