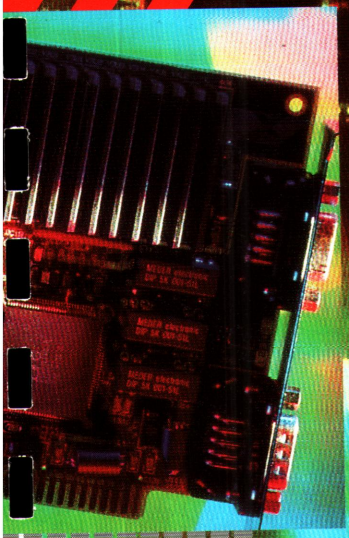
User Manual

Liberty II AT



RASTEREX

RASTEREX

User Manual

Liberty AT II Graphics Boards

Board Revision 7 and Higher

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1. INTRODUCTION

About Rasterex

Rasterex develops both hardware and software for working with graphics on a PC. The company originally distinguished itself with AutoIcon, the first on-screen digitizer for AutoCAD. Rasterex expertise in computer graphics technology led to the development of RxEDM, a solution for engineering document management. All Rasterex programs will offer high performance when running on most PC platforms, but naturally performance is significantly enhanced when run on Rasterex graphics boards.

About This Manual

This **User Manual** contains documentation for your Rasterex graphics board. It is set up in the following way:

Chapter 1 Introduction

This chapter explains how this manual is organized, and introduces conventions used in Rasterex screen messages and documentation.

Chapter 2 How to Install the Liberty AT

This chapter takes you step by step through the installation of the Rasterex graphics board in your PC.

Chapter 3 The Diagnostic Program

This chapter tells you how to run the diagnostic utility program to check that your board is functioning properly after it is installed.

Chapter 4 The TIGA Driver

This chapter tells you how to install the TIGA (Texas Instruments Graphics Architecture) Driver.

Chapter 5 Utility Programs

This section contains small "User Guides" for any utility programs that may be available for your board. The utilities diskette is included at the back of this manual.

Conventions

Messages displayed on the screen by the software system and commands to be executed by the user may appear in a special typeface.

The following conventions are used for instructions regarding the execution of commands:

When two or more keyboard commands are contained in a single set of brackets, they should be executed simultaneously. For example, when you see the command [ALT+F5], this means that the ALT and F5 keys should be pressed simultaneously.

When keyboard commands each appear in "their own" set of brackets, this means that they should be executed in sequence. For example, when you see the command [CTRL] [SHIFT], this means that you should first press the CTRL key and then the SHIFT key.

2. HOW TO INSTALL THE LIBERTY AT BOARD

2.1 Introduction

The Liberty AT graphics board has been designed for advanced use of graphics applications using IBM AT/Compaq 386 or compatible computers. This is achieved when you use application programs that take advantage of the high level graphic drivers available for your Liberty AT graphics board. In addition, all your standard PC application programs (CGA/ EGA/VGA-based programs) will run without any special modification using the built-in VGA graphics on PC/XT/AT compatible computers.

2.2 Installation

a. Turn off the power on the computer and all attached peripherals and remove the cover. (Please refer to your computer documentation.)

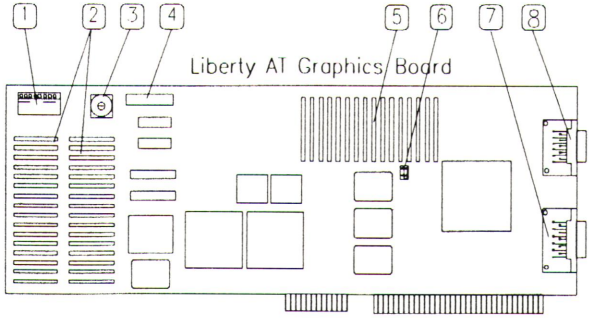


Fig. 1

1. *Block of eight DIP switches*
2. *DRAM banks D1 - D8*
3. *DRAM selector - Blue switch wheel*
4. *Memory decoder PAL*
5. *VRAM banks V1 - V4*
6. *Oscillator selector - ECL or TTL*
7. *9 pin DSUB male connector*
8. *9 pin DSUB female connector*

b. Set the DIP switches according to the table below.
NOTE: The default switch settings is all switches CLOSED.

A block of eight DIP switches is located at the top of your Liberty AT board (see figure 1). The first four of these switches must be set according to the monitor(s) attached to your system. Three different system configurations are possible. (See table below.)

SW 1	SW 2	Function	Single/Dual screen
closed	closed	Rx VGA (built-in VGA)	Single
closed	open	VGA Loop-through*	Single
open	——	No VGA	Dual

* When the switches are set in this position an external VGA board has to be connected to the male connector on the Liberty AT board using the optional cable (order no. 400.008). The board must also be set to "separate sync" mode.
This is selected by switches 3 and 4, and connected to the monitor with a video cable (order no. 400.007) with 5 BNC connectors (red, green, blue, horizontal sync and vertical sync). Make sure that all 5 BNC connectors are connected to the monitor. If your monitor has only composite sync input, connect the Hsync BNC connector to the monitor. (See table below.)

The monitor sync output signals are controlled by switches 3 and 4 according to the table below.

SW 3	SW 4	Sync type/Cable connections
closed	closed	Composite sync on green/ Red, Green, Blue
closed	open	Composite sync on DSUB pin 4/ Red, Green, Blue & Hsync
open	closed	Neg. separate horizontal and vertical sync on DSUB pins 4 and 5/ Red, Green, Blue, Hsync & Vsync
open	open	Pos. separate horizontal and vertical sync on DSUB pins 4 and 5/ Red, Green, Blue, Hsync & Vsync

NOTE: Separate sync must be used if VGA loop-through is selected.

Switches 5 to 7 control the memory map (host interface) used by the graphics board. A 4 Kbyte area is used, and selected by the switches as follows:

Sw 7	Sw 6	Sw 5	Host Int. Addr.
closed	open	closed	C8000
closed	**closed**	**closed**	**CC000 (Default)**
closed	closed	open	CC000
closed	open	open	CC000
open	closed	closed	D0000
open	closed	open	D4000
open	open	closed	D8000
open	open	open	DC000

SW 8	
closed	16/8 - bit PC interface with automatic adjustment according to the slot where the board is installed.
open	Always 8 - bit PC interface, also when the board is installed in a 16 - bit slot.

This switch should normally be closed. It should be set to 8 - bit PC interface (open) if the Liberty board does not come up after it has been installed. If there are conflicts between the Liberty board and other 16 - bit adapters, setting the switch *open* may work around such a conflict. It may also work around timing problems on a 16 - bits bus, because Liberty only decodes an area of 4 Kbytes, and a 16 - bit bus requires 128 Kbytes.

d. Install your Liberty AT graphics board in a free expansion slot and fasten it to the back panel. This ensures proper grounding of the board. The Liberty AT graphics board may be installed in either a 16 or an 8 - bit slot in the PC. You will achieve the highest performance by installing the board in a 16 - bit slot, but the board will run in an 8 - bit slot. The board will detect whether it is installed in a 16 or an 8 - bit slot if switch 8 is closed.

e. If you have an IBM XT, set the system configuration switch SW1 on the system board so that positions 5 and 6 are both ON. (Please refer to your PC documentation.) Do not change any other switches. If you have an IBM AT/Compaq 386 or compatible, do not change any switches on the system board.

f. Replace the computer cover.

g. Connect the monitor cable (order no. 400.007) between the Liberty AT board and the monitor. If an external VGA board is used together with the Liberty board, the VGA loop-through cable (order no. 400.008) should, in addition, be connected between the Liberty board (to the male connector) and the VGA board.

2.3 DRAM Configuration

When delivered from Rasterex (International) a.s., your Liberty AT Graphics board is equipped with one of the following memory decoder PALs according to the amount of DRAM installed on your board.

1. PAL no. 507.511
   The board is equipped with 8 chips (256K*4) in the banks D1 and D2, a total of 1 Mbyte DRAM.
   The blue switch wheel (see fig. 1) is not used with this DRAM configuration and may be set to any position.

2. PAL no. 507.512
   The board can be equipped in the following two ways depending on the setting of the blue switch wheel (see fig. 1).

   a.)The blue switch wheel is set to even numbers (switch in position 0,2,4,6 or 8).
   The banks D1 to D4 can be equipped with up to 16 chips (256K*4) DRAMs, giving a total of 2 Mbytes DRAM on the board.

   b.) The blue switch wheel is set to odd numbers (switch in position 1,3,5,7 or 9)
   The board can be equipped with 4 chips (1M*4) in bank D1 only, giving a total of 2 Mbytes DRAM.

3. PAL no. 507.510
This PAL is used when the Liberty AT graphics board is equipped with more than 2 Mbytes DRAM. The blue switch wheel must be set according to the amount of DRAM installed (see table under DRAM Memory Upgrade).

The PAL is also delivered with the DRAM memory upgrade kits that can be ordered separately through your local dealer.

2.4 DRAM Memory Upgrade

The Liberty AT graphics board can be equipped with a maximum of 16 Mbytes DRAM. DRAM Memory Upgrade Kits are available through your local dealer. The blue switch wheel (see fig. 1) must be set according to the amount of DRAM used. (See table below.)

SW2	0	1	2	3	4	5	6	7	8	9
Bank D1	1M	4M	4M	4M	4M	4M	4M	4M	4M	1M
D2	1M	1M	4M	4M	4M	4M	4M	4M	4M	1M
D3	1M	1M	1M	4M	4M	4M	4M	4M	4M	1M
D4	1M	1M	1M	1M	4M	4M	4M	4M	4M	1M
D5	1M	1M	1M	1M	1M	4M	4M	4M	4M	4M
D6	1M	1M	1M	1M	1M	1M	4M	4M	4M	4M
D7	1M	1M	1M	1M	1M	1M	1M	4M	4M	4M
D8	1M	1M	1M	1M	1M	1M	1M	1M	4M	4M
Max.RAM size in Mb	4	5.5	7	8.5	10	11.5	13	14.5	16	10

Please note that the Liberty AT graphics board has 16 bits word access. The table of DRAMs (can be 256k*4 or 1M*4 chips) is interpreted this way:

1M = 256K*4 chips: 4 of these are needed to give 512 Kbytes and 16 bits word.
4M = 1M*4 chips:4 of these give 2 Mbytes and 16 bits word.

When you upgrade the Liberty AT board, note that banks D1 to D8 must be filled in order beginning with D1, then D2 and so on. No empty sockets are allowed in between. (I.e. you must fill the four sockets in bank D1 before filling bank D2.)

WARNING : The warranty for the Liberty board is no longer valid if the board is upgraded with DRAM other than the DRAM upgrade kits available from Rasterex (International) a.s.

2.5 VRAM Memory Upgrade

The Liberty AT graphics board can be equipped with a maximum of 2 Mbytes VRAM (VideoRAM). VRAM Memory Upgrade kits are available through your local dealer. Note that the VRAM memory banks are numbered V1 - V3 - V2 - V4 from left to right.

WARNING : The warranty for the Liberty board is no longer valid if the board is upgraded with VRAM other than the VRAM upgrade kits available from Rasterex (International) a.s.

2.6 VGA

The Liberty AT Graphics board is equipped with Rx VGA when sent from us. If you want to use another VGA adapter in your PC with the Liberty AT graphics board from Rasterex, you must use the VGA loop-through connector (9 - pin DSUB male connector located at the back of the board. (See fig. 1). The cable needed for this is available through your local dealer (order no. 400.008). Also read part b of the Installation instructions to set the switches for correct setup of the board.

2.7 Technical Information

Liberty AT (all boards):

System memory:	1 Mb standard, upgradable in steps of 1Mb or 4 Mb
Max. system memory:	16 Mb
Graphics processor:	Texas Instruments TMS34010 @60 MHz
Bus interface:	16 bit PC bus, with automatic adjustment to 8 bits
Size:	PC/XT Board size
Video connector:	9 - pin female DSUB for video output and 9 - pin DSUB male for VGA loop-through
VGA:	Built-in Rx VGA (standard), VGA loop-through
Host Interface Address:	Selectable through dip-switches

Liberty 410 AT:

Resolution:	1024 *768
Frame buffer:	512 Kb - 16 colours
Video clock frequency:	64 MHz (optional 80 MHz)
Line frequency:	48 KHz (optional 60 KHz)
Vertical refresh:	60 Hz (optional 75 Hz)

Liberty 810 AT:

Resolution:	1024*768
Frame buffer:	1 Mb - 256 colours
Video clock frequency:	64 MHz (optional 80 MHz)
Line frequency:	48 KHz (optional 60 KHz)
Vertical refresh:	60 Hz (optional 75 Hz)

Liberty 412 AT:

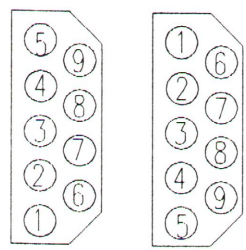
Resolution:	1280*1024
Frame buffer:	1 Mb - 16 colours
Video clock frequency:	110 MHz (optional 130 MHz)
Line frequency:	64 KHz (optional 78 KHz)
Vertical refresh:	60 Hz (optional 72 Hz)

Liberty 812 AT:

Resolution:	1280*1024
Frame buffer:	2 Mb - 256 colours
Video clock frequency:	110 MHz (optional 130 MHz)
Line frequency:	64 KHz (optional 78 KHz)
Vertical refresh:	60 Hz (optional 72 Hz)

DSUB pin connections

1 - Red video
2 - Green video
3 - Blue video
4 - Horizontal sync (External composite sync, DIP switch dependant)
5 - Vertical sync
6 - Red ground
7 - Green ground
8 - Blue ground
9 - Sync ground



DSUB male (6 in fig. 1) DSUB female (7 in fig. 1)

Appendix A

Preventing Radio & TV Interference

This equipment generates, uses, and can radiate radio frequency energy. If not installed and used in accordance with the instructions in this Guide, it may cause interference to radio communications. The equipment has been designed to comply with the limits for a Class A Computing Device pursuant to FCC rules, which are designed to provide reasonable protection against such interference when operating in a commercial environment. Operation of this equipment in a residential area may cause interference, in which case the user will be required to take the necessary measures to correct the interference at his own expense.

This equipment may cause interference to radio or television reception. This can be determined by turning the equipment off and on, and the user is encouraged to try to correct the interference by one or more of the following measures:

1. Reorient the receiving antenna.
2. Relocate the computer with respect to the receiver.
3. Move the computer away from the receiver.
4. Plug the computer in a different outlet so that computer and receiver are on different branch circuits.
5. Ensure that the mounting screws, attatchment connector screws and ground wires are tightly secured.
6. Ensure that shielded and grounded cables of good quality are used for data communications.

If necessary, please consult your dealer or an experienced radio/ television technician for additional suggestions.

3. DIAGNOSTIC TEST FOR 34010-BASED BOARDS

3.1 Introduction

The RxDiag10 program is used to check that your Rasterex board is functioning properly. If you encounter any irregularities, please call your dealer.

RxDiag10 program can be run from the diskette by placing it in drive A, typing A, then pressing *Enter* to change the drive to A. Then type RX*DIAG* and press *Enter.* All files on the floppy disk can also be copied to a directory on the hard disk, and the program started from this directory with the command RXDIAG.

The program starts by displaying a menu containing function keys. Each key has a label on the top of it indicating which test is being performed when that key is pressed. The tests may be performed in random order, and you can exit from the RXDIAG program after any of the tests.

3.2 The Function Keys

[F1] System RAM Test

The system RAM on the graphics board is tested. During this test the number of bytes being tested is displayed in a red square. When the test is completed, the number of bytes that are OK is displayed in a blue square for Liberty, Lazer, and Light boards, and in a gray square for MB2000 boards.

If the test reveals that some of the RAM is "not OK", the number of bytes that are OK is displayed in red for Liberty, Lazer, and Light boards, and in black for MB2000 boards.

[F2] Video RAM Test

Display RAM is tested. During this test the number of bytes being tested is displayed in a red square, and a vertical bar tracking the progress of the test is scrolled down the screen. When the test is completed, the number of bytes that are OK is displayed in a blue square for Liberty, Lazer, and Light boards, and in a gray square for MB2000 boards.

If the test reveals that some of the RAM is "not OK", the number of bytes that are OK is displayed in red for color boards, and in a black square for MB2000 boards.

[ALT+F3] EEROM Test

The EEROM is tested. When this test is completed, the number of bytes that are OK is displayed in a blue square on Liberty, Lazer, and Light boards, and in a gray square for MB2000 boards.

If the test reveals that some of the EEROM is "not OK", the number of bytes that are OK is displayed in red for Liberty, Lazer, and Light boards, and in a black square for MB2000 boards. You can terminate the test at any time by pressing the ESC key.

Important! Do NOT turn off the power during this test! Doing so will erase the contents of the EEROM, resulting in a blank screen when you restart the PC. (The EEROM must then be reprogrammed).

[F4] Geometry Test

If you press [F4], the lines will be displayed in white on a black background. If you press [ALT-F4], the lines will be displayed in black on a white background.

The picture contains 10 horizontal and 9 vertical lines. These lines are used to check the linearity of the screen. If some of the lines are missing, or some of them are not straight, there may be an error in your system.

Press any key to return to the main menu, select a new test, or exit.

[F5] Color Test
(Liberty, Lazer, and Light Boards Only)

This test will display a set of color pictures that can be used to check the system's color saturation and intensity. Use any key to progress through the series of "pictures". You can either go through all the pictures until you return to the main menu, or return to it directly by pressing the escape (ESC) key. A description of the pictures follows:

Picture 1	An intense blue ellipse
Picture 2	A pale blue ellipse
Picture 3	An intense green ellipse
Picture 4	A pale green ellipse
Picture 5	An intense red ellipse
Picture 6	A pale red ellipse
Picture 7	An intense white ellipse
Picture 8	A medium white ellipse
Picture 9	An pale white ellipse
Picture 10	A gray scale, blue scale, green scale, and red scale for the Liberty 810/812 boards, Lazer 256-color, Light 256-color, Lazer 16-color and Light 16-color boards. A gray shaded scale for the Liberty 410/412 boards.

[F6] VGA Resolution Test
(Liberty AT and Light AT Boards Only)

This tests the monitor's sync capabilities using the different resolutions available at the DOS BIOS level. You can either go through all the pictures until you return to the main menu, or return to it directly by pressing the escape (ESC) key.

Picture 1	320 X 200, used in CGA/EGA/VGA modes
Picture 2	640 X 200, used in CGA/EGA/VGA modes
Picture 3	640 X 350, used in EGA mode

Picture 4	640 X 400, used in VGA mode
Picture 5	640 X 480, used in VGA mode
Picture 6	360 X 400, used in 40 X 25 characters text mode
Picture 7	720 X 400, used in 80 X 25 characters text mode
Picture 8	720 X 480, used in VGA text mode

[F7] Hardware Configuration

This test provides an overview of the system, showing which monitor and which board are in use. In addition, it provides information about the Host Interface Address and the contents of the EEROM, which may be of interest to support personnel.

The table below shows a configuration display for the MB2000 board set up for a Hitachi monitor. The data displayed will be different for Liberty/Lazer/Light boards, and a MB2000 board set up for another monitor.

Hardware Configuration Display

MB2000 Diagnostics V 10.1

Test	Result	Explanation
Board Addr.	CC00	Host Interface Address
BIOS Switch	on	RxBIOS n/off (not applicable to MCA-bus cards.)
Dual Switch	off	Single/Dual Screen Solution
DRAM Start	FF80 0000	Start of DRAM
VRAM End	0030 0000	End of Video RAM
Palbits	0	No. of bits in the palette device

Contents of the EEROM

Version	1	EEROM contents version
Revision	0	EEROM contents revision
CONFIG1	0	Internal configuration register 1
CONFIG2	0	Internal configuration register 2
DSP Width	1152	Horizontal screen resolution
DSP Heigth	870	Vertical screen resolution
HESYNC	7	Monitor sync parameters

HEBLNK	16	Monitor sync parameters
HSBLNK	88	Monitor sync parameters
HTOTAL	90	Monitor sync parameters
VESYNC	2	Monitor sync parameters
VEBLNK	41	Monitor sync parameters
VSBLNK	911	Monitor sync parameters
VTOTAL	914	Monitor sync parameters
H dot size	330 µm	Hor. distance between 2 pixels
V dot size	330 µm	Vert. distance between 2 pixels
Dot Frequency	100.00 MHz	Monitor requirements
Line Frequency	68.68 KHz	Monitor requirements
Refresh Rate	75.06	Monitor requirements
Cable number	400.004	Rasterex cable order no.
Switches	87654321	Factory switch settings
open->		
closed->	xxxxxxxx	

[F8] Exit

When this key is pressed you will return to the system. Anything loaded to the Rasterex board at power-up will now be lost. To ensure that everything is reloaded, please reboot your system.

4. THE TIGA DRIVER

4.1 Introduction

The TIGA (Texas Instruments Graphics Architecture) is a software interface that standardizes communication between application software and all TMS340 family based hardware for IBM-compatible personal computers. The TIGA drivers are independent of colors and resolution. The same driver can therefore be used for all Rasterex graphics boards.

Before You Begin

Please read these directions before attempting to install the driver.

Please make sure that the Rasterex graphics board is correctly installed before trying to install the driver.

Make sure that your PC operating system is MS-DOS or PC-DOS Version 3.0 or later, and check that the DOS version will support the application software you wish to install.

Make a backup of the TIGA diskette. Store the original in a separate place, and use the backup diskette for installation.

Last-Minute Information

Any information and updates to the driver made after the publication of this manual will be contained in a README file on the diskette. Please check the README file before you begin the installation.

There is also a file called ERRATA.nnn which describes errors in the Windows 3.0 TIGA driver.

4.2 TIGA Installation

4.2.1 Overview

TIGA is easy to install. It consists of a *Terminate and Stay Resident* (TSR) driver invoked by using the TIGACD.EXE program. The program allows configuration of the board by reading the board ID number, the DIP-switches and/or EEROM values, without having to modify the driver.

4.2.2 Required Hardware Configuration

TIGA requires a Rasterex graphics board and an IBM AT or compatible, or a PS/2 computer.

4.2.3 Using TIGA With Other Rasterex Drivers

TIGA will automatically disable all other drivers that have been previously loaded to the Rasterex graphics board. Any application using the RxGTI or a direct driver must be reloaded after using TIGA.

4.2.4 Installing TIGA

The TIGA diskette contains the following files:

TIGACD.EXE	TIGA communication driver
TIGAGM.OUT	TMS340 Graphics Manager
EXTPRIMS.RLM	TIGA graphics library extension
TIGAMODE.EXE	TIGA mode utility
TIGALNK.EXE	TIGA linking loader
README	contains last minute information
ERRATA.100	contains errata sheet of known bugs in the Windows 3.0 TIGA driver.
SETUP.EXE	installation program
RXGTI.OUT	used by SETUP.EXE
CLG.EXE	program for generating .CL files
TSETUP.EXE	program for making .CFG file
TIGADEMO.EXE	demonstration program
MAKEPATN.RLM	RLM file for TIGADEMO.EXE
OEMSETUP.INF	information file Windows 3.0
TIGAWIN30.RLM	Windows driver GSP part
TIGA1.DRV	driver for 1 bit per pixel modes
TIGA48.DRV	driver for 4/8 bit per pixel modes
TIGA48LO.DRV	driver for 4/8 bit per pixel modes
TIGA.GR3	386 grabber
VDDTIGA.386	386 virtual device driver

To install all the necessary files onto your hard disk, simply do the following: Insert the TIGA diskette into drive A: and type:

A:SETUP A:

or drive B: and type

B:SETUP B:

Note that it may take some time before the installation screen is displayed.

Follow the on-screen instructions to complete the installation.

The SETUP program will add the following line to the AUTOEXEC.BAT file:

SET TIGA=-m<path1> -l<path2> -ino

Where:

<path1>	specifies the path for TIGA system files as entered in the SETUP program.
<path2>	specifies the path for TIGA dynamic load user modules as entered in the SETUP program.
-ino	specifies the host interrupt level used by the TIGA communication driver. If you want to run TIGA in a protected mode environment (such as under the *Pharlap Extender*), this number must be below 0x70. TI recommends using 0x60.

All changes can be done interactively with the SETUP program. The TIGA driver should now be ready to run.

4.2.5 Installing Windows 3.0 TIGA Driver

The following procedure should be followed to install the TIGA driver with Windows 3.0.

- Make sure that TIGACD is installed.
- Run the Windows *SETUP* program.

When prompted for display type, select *Other* and then insert the diskette containing the files supplied with this release. Select the appropriate driver when you are prompted to do so. Complete the setup as described by Microsoft.

4.2.6 Installing TIGA for Windows 3.1

To install TIGA for use with Windows 3.1, you must first install TIGA, and then follow the instructions in the Microsoft documentation for the Windows SETUP program.

A TIGA DEMO program is included on the diskette. You can run this program to see how the various functions perform under the TIGA interface.

4.2.7 TIGA Error Messages

When running TIGACD, or an application program using the TIGA interface, you may get an error message. This section describes some potential errors, and how to correct them.

-2 TIGA communication driver (CD) error.
Invalid command line arguments have been specified for TIGACD.EXE. Make sure the command line specified when running TIGACD.EXE is valid. Check the TIGA User Guide for valid options.

-3 TIGA memory error.
Not enough memory to run TIGALNK.EXE or not enough memory on the TMS340 board. To correct this:

1) Free up memory on the host by eliminating unused TSR's.
2) Make sure your TMS340 board has enough memory to run the application. If not, add additional memory to the TMS340 board, if possible.

-4 TIGA communication driver (CD) error.
The TIGA Communication Driver (TIGACD.EXE) is not running. Run TIGACD.EXE to install the TIGA communication driver before running a TIGA application or driver.

-5 TIGA graphics manager (GM) error.
There has been a TIGA graphics manager (TIGAGM.OUT) load error or TMS340 board failure. Make sure that the file TIGAGM.OUT exists in the directory specified by the *-m* option of the TIGA environment variable. Make sure your TMS340 board is operating properly by running the RxDIAG program.

-6 RLM load error.
The RLM file does not exist in the directory specified in the application or RLM file does not exist in the directory specified by the *-l* option of the TIGA environment variable. Make sure the RLM file exists in either directory specified by the application, or in the directory specified by the -l option of the TIGA environment variable. Obtain a new copy of the RLM file, if necessary.

-8 ALM load error.
The ALM file does not exist in the directory specified in the application, or ALM file does not exist in the directory specified by the -l option of the of the TIGA environment variable. Make sure the ALM file exists in either directory specified by the application, or in the directory specified by the -l option of the TIGA environment variable. Obtain a new copy of the ALM file if necessary.

-13 Handshake error.
There is a TIGA graphics manager (TIGAGM.OUT) load error, or the wrong TIGAGM.OUT file is being used, or there is a TMS340 board failure. Make sure that TIGAGM.OUT exists in the directory specified by the *-m* option of the TIGA environment variable. Run RxDIAG to ensure that the board operates properly.

-25 TMS340 board error.
There is a communication error with the target TMS340 board. Make sure you installed the TMS340 board properly, and run RxDIAG to verify the operation of the board.

5. UTILITY PROGRAMS

5.1 The RXLIBFNT and STDFNT Font Programs

The RXLIBFNT and STDFNT programs can only be used with the Liberty AT, Lazer AT, and Light AT graphics boards.

The RXLIBFNT program enables large fonts, (12 x 28) in text mode. When you use the Liberty, Lazer, or Light graphics boards together with a single sync monitor, the RXLIBFNT should be loaded. This will enable fonts utilizing the entire screen on a 1024X768 monitor. On a 1280X1024 monitor, the text will be displayed in a larger window than the VGA window, but will not cover the entire screen.

To load this font, type *RXLIBFNT* and press *Enter*. To remove this font and the load the default fonts (9X12), run the *STDFNT* program.

Please note that when using *RXLIBFNT* with the Rx Accelerator /AutoCAD, the *RXLIBFNT* must be loaded *before* starting AutoCAD, and *after* loading the Rx Accelerator.

This is easily done by inserting a line in the AUTOEXEC.bat file or the RXACAD.bat file -- assuming that a path has already been made to the directory where the RXLIBFNT file is located.

C:\RX\RXEL . . . . . .
RXLIBFNT
ACAD

If you start AutoCAD by typing the necessary commands at the DOS prompt, simply type *RXLIBFNT*, then press *Enter* before starting AutoCAD.

5.2 The RXVGA and RXMDA Programs

The RXVGA and RXMDA programs can only be used with MB 2000 boards and Windows/386.

If you wish to run Windows/386 on the MB 2000 board, the RXVGA program must be run *before* you start Windows/386. The RXVGA program changes the RxBIOS settings to tell Windows that the graphics board is a VGA board. This must be done in order to get Windows/386 up and running.

After closing Windows/386, you should run the RXMDA program to reset the RxBIOS so that other text applications will run properly. This is easily done by making a WIN386.bat file (assuming that a path has already been made to the directory where the RXVGAFNT and STDFNT files are located).

```
RXVGAFNT
WIN
STDFNT
```

About the @8052.ADF File

This is an Adapter Setup File for Liberty MC graphics boards only. It provides information regarding the available address response range and configuration options necessary for the PS/2 configuration utility. Detailed information on how to set up the Liberty board in a PS/2 is included with the Liberty MC graphics boards.

About the @8053.ADF File

This is an Adapter Setup File for Lazer MC and Light MC graphics boards only. It provides information regarding available address response range and configuration options necessary for the PS/2 configuration utility. Detailed information on how to set up the Light board is included with the Lazer MC and Light MC graphics boards.

Rasterex hardware products support all Rasterex software and all software running under Windows® and TIGA.

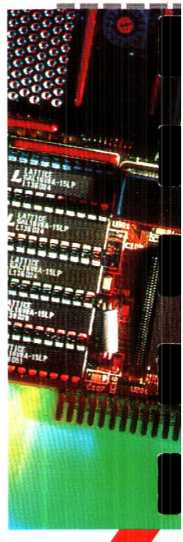
Liberty
- Available for both AT and Micro Channel Bus.
- Equipped with Octopus, the Rasterex vector processor.
- Based on the TMS34010 at 60 MHz.
- Up to 16 MB DRAM on AT boards, and up to 8 MB DRAM on Micro Channel boards.
- 1280x1024 resolution at 72 Hz.

Lazer
- Available for both AT and Micro Channel Bus.
- Equipped with Octopus the Rasterex vector processor.
- Based on the TMS34010 at 60 MHz.
- Up to 4 MB DRAM.
- 1024x768 resolution.

Tracer
- Available for AT Bus.
- Based on the TMS34020.
- Up to 16 MB DRAM.
- 1280x1024 resolution at 72 Hz.
- Springboard to your own graphics application.
- Hardware cursor and overlay.

Diamond
- Available for AT Bus.
- Based on the TMS34020 at 40 MHz.
- Supports the TMS34082 64-bit floating point coprocessor.
- 4 MB DRAM.
- Resolutions range from 640x480 to 1600x1200, depending on your monitor.
- True color at resolutions up to 800x600, and "High" color at resolutions up to 1152x900.

Star
- Available for AT Bus.
- Based on the TMS34020 at 40MHz.
- Available with 1 MB or 4 MB DRAM.
- Resolutions range from 512x512 to 1600x1200, depending on your monitor.
- True color at resolutions up to 512x512, and "High" color at resolutions up to 800x600.



Rasterex (International) Total Solutions

Rasterex (International) a.s, develops both hardware and software for working with graphics on a PC. Rasterex products are internationally acclaimed for their high quality and innovation. The company originally distinguished itself with AutoIcon, the first on-screen digitizer for AutoCAD. It is also known for its powerful graphics boards – Liberty, Lazer, Tracer, Diamond and Star. Rasterex expertise in graphics technology led to the development of RxEDM, a solution for engineering document management. RxEDM offers stand-alone modules for viewing, redlining, cleaning-up scanned drawings, raster-to-vector conversion of scanned drawings, and file management through an easy-to-use graphical index. RxEDM and RxAutoIcon are available for DOS and Windows, and can run on all Rasterex graphics boards; VGA, SVGA, S3 and all TMS 340XX-based boards.

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