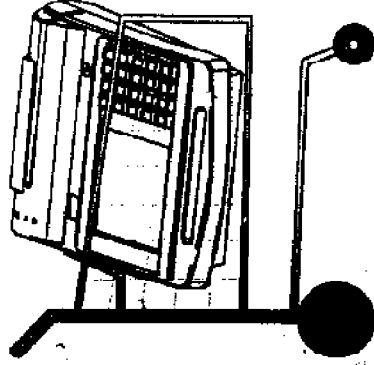


Quantum



USER'S GUIDE

P101A

AUGUST 1988
CHRYSLER PUMP & OIL LTD

Who should use this manual...

Congratulations on your purchase of Quantum! If you have just started to use this advanced miniPOS system but you do not know how to set it up. With little technical knowledge, this manual can guide and assist you to set up the system and connect to the proper devices correctly.

GES Part No. 54300111

GES Singapore Pte Ltd
28 Marsiling Lane
Singapore 739152
Tel: 7329898
Fax: 3687671

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This equipment has been tested and found to comply with limits for a Class B digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is located.
- Consult the dealer or an experienced radio/TV technician for help.

Operation of this equipment in a residential area may cause harmful interference in which case the user will be required to correct the interference at his own expense. Any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

FCC ID: JUK089GES101

CE Certification

This device complies with the requirements of the EEC directive 89/336/EEC with regard to "Electromagnetic compatibility."

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CHAPTER 1 INTRODUCTION

Quantum is a small scale and yet fully functional point of sales system. It combines serial/parallel interface, RS485/422 networking, customer display, and magnetic stripe reader in a small design to maximize the flexibility and saves counter space. It is a low cost, high performance machine with an advanced design for the retail environment.

Quantum includes a 33MHz Enhanced Am386 SXLV CPU Core. It is capable of supporting a system memory of 2M to 4M Bytes DRAM. Its compact and all-in-one design includes a ROM disk that can be replaced with a HDD which would save space and cost. It also enables you to expand your disk space with the option of including a 2.5" hard disk drive. It has both flash BIOS and a flash ROM disk in an optional range of 128K to 256K bytes for BIOS and 512K to 4M bytes for ROM disk. There is also a printer port as well as 5 COM ports for flexible upgrading and custom purposes.

Quantum has an icon supportable display module with a touch panel, which decreases the need for a large number of buttons for different applications. Being flexible, Quantum allows these software programmable icons to be increased according to your needs. It also has a 5x4 keypad matrix for the numeric keys and keys which are frequently used. There is also 9x1 Vacuum Fluorescence Display module for customer's display.

In addition, a 3-track Magnetic Stripe Reader (MSR) is built in the system. A bar code scanner and a printer can also be easily attached through the serial or parallel port. In view of the involvement of money with this system, there is an emphasis for high security. There is a 5 position keylock in which separate keys are given to staff of different position levels to access various parts of the Quantum's software. A dual slot unbuffered PCMCIA socket can also be included as an optional item.

Quantum uses a power supply 24V/1.5A or 18V/2A from an external AC/DC adapter. Whether used in a network or as a stand-alone, Quantum provides ease of operation with advanced programming versatility.

Features

- ⇒ **CPU**
 - 33MHz Enhanced Am386 SXLV CPU Core
- ⇒ **System Memory**
 - 2M or 4M Bytes DRAM
- ⇒ **Flash BIOS**
 - Phoenix PICO BIOS supporting ROM DOS, Non Standard CGA compatible LCD display Modules; 128K or 256K Bytes in-system upgradeable Flash memory
- ⇒ **Flash ROM Disk**
 - 256K Bytes, 512K Bytes, 1M Bytes, 2M Bytes or 4M Bytes (optional)
- ⇒ **NVRAM**
 - 32K bytes default; can be built up to 512K Bytes (optional)
- ⇒ **2.5" HDD**
 - An Optional 2.5" Hard Disk Drive. The system can be configured with either Flash ROM Disk or 2.5" HDD existing individually or with both Flash ROM Disk and 2.5" HDD existing simultaneously.
- ⇒ **Printer Port**
 - Bi-directional Parallel Port with EPP Mode.
- ⇒ **COM Ports**
 - There are five COM ports (16550 or 16450 UART Compatible):
 - I. COM 1 with IRQ 4, for the touch screen
 - II. COM2 for RS485/422 or RS232 communications
 - III. COM3 for RS-232 communications
 - IV. COM 5 & COM6 for RS-232 communications with +5V and +12V power supply respectively.

- ⇒ **Internal Keyboard**
 - A 4 x 5 key array for the miniPC's frequent data input
 - Internal connection
- ⇒ **External Keyboard**
 - A cascaded PC standard keyboard (optional)
 - Plugged into the PS/2 Port
- ⇒ **Operator's Display**
 - 5.7" 320x240 Dots STN LCD display module for operating use, non standard CGA mode, with 10-bit analog resistive touch screen
- ⇒ **Customer's Display**
 - 9x1 Vacuum Fluorescence Display module for customer's display
- ⇒ **LAN**
 - RS-485/422 interface are available for network purposes
- ⇒ **Cash Drawer Interface**
 - A 6-pin modular jack Cash Drawer Interface is able to support one or two Cash Drawers operating with a +12V power supply
- ⇒ **Magnetic Stripe Reader**
 - A Magnetic Stripe Reader (MSR) can support up to 3-track magnetic card readings
- ⇒ **Keylock**
 - There is a built-in 5-position keylock
- ⇒ **PCMCIA Interface**
 - Dual Slot unbuffered PCMCIA socket is an optional item
- ⇒ **Power Supply**
 - Uses a 24V/1.5A or 18V/2A external AC/DC adapter

CHAPTER 2 GETTING TO KNOW YOUR SYSTEM

This chapter illustrates several components incorporated within Quantum's system.

LCD Display with Touch Panel - Icon support

To enhance the operation of this POS system, it supports software programming for new icons, thus increasing the keypad options. The software programmable icons displayed on the LCD display can be increased if needs rise. This allows you to be flexible with your product sales.

This also decreases the need for the large number of buttons for different applications that are found in many conventional point of sales equipment.

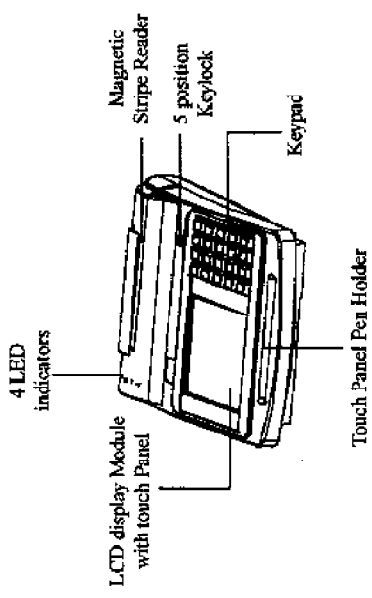


Figure 2-1 Quantum's features (front view)

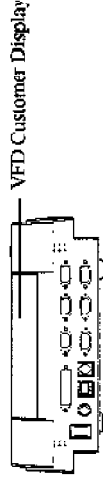


Figure 2-2 Quantum's features (back view)



Figure 2-2 Quantum's features (side view)

A 3 track Magnetic Stripe Reader (MSR)

Quantum has a built-in MSR port which supports the use of VISA, MasterCard and other Nets services. With this 3-track Magnetic Stripe reader, you will be able to reduce the cumbersome extra equipment that is normally used for this interface function.

Cash drawer interface

The cash drawer is connected through the RJ11 connector at the rear panel of the system.

LAN

A RS-485/422 standard port is available to interface several Quantum systems to provide LAN communication. This RS-485/422 communication port can be configured for a sales network with a back-office personal computer.

LEDs

There are four LEDs for status indication.

- Power LED
- Touch Panel Status
- As long as you touch the touch panel, the LED will be lighted
- HDD LED
- When accessing the hard disk drive, the LED will indicate the read or write cycle
- COM port status LED

5 position keylock

In view of the involvement of money with this system, there is an emphasis for high security. This 5-position electronic keylock has separate keys to allow for various access levels. Thus, only authorised personnel is allowed to operate Quantum. You will also be able to lock the system while it is idle.

Keypad

Quantum has only 20 keys of with sound response in a 4x5 numeric keypad matrix. 10 of which are the 0-9 numeric keys and the other 10 can be programmed for frequently used function keys.

ROM disk

Quantum has a ROM disk that saves necessary space and cost. You can even expand your disk space with the option of including a hard disk drive, ROM Disk from 256k bytes to 4M bytes configurable with DOS boot up.

NVRAM

The NVRAM is 32k Bytes to 512k Bytes configurable (default 32K bytes)

A bar code scanner

This accessory can be easily attached through the serial port.

Printers

A parallel port as well as the serial ports are provided for use to support the printer system. Therefore an external stand alone printer can be conveniently connected to Quantum.

Additional PCMCIA slot

To provide flexibility for a future system, this slot can be used to expand your system's functions. You can expand your memory using the memory card, have another option to connect to the network by using a LAN card, and also to have a modem card.

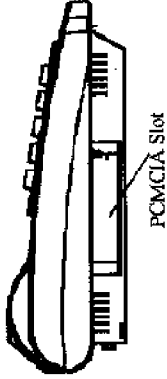


Figure 2-3 PCMCIA Slot

Display Modes

The unique icon supportable touch screen LCD display offers the cashier a clear and easily viewable screen. The 320 x 240 LCD display module with a resistive analog touch panel offers better viewing and customised settings are available by adjusting the contrast levels.

A 9x1 VFD customer display module. It is able to display alphanumeric figures up to 9 places.



Optional

The LCD display can be replaced with a 9" VGA monitor (when the system is configured as VGA display mode instead of LCD display mode). The VGA monitor is an optional accessory that increases the flexibility and improves the effectiveness of Quantum.

CHAPTER 3 GETTING STARTED

This chapter is divided into two main sections, hardware installation and software application. It should contain useful information on how to begin using your minipos.

Quantum

The illustration below shows Quantum with its LCD Display Module and Touch Panel. The 320 x 240 LCD Display Module is icon supportable. It has a resistive analog touch screen which creates a user friendly interface. The software programmable icons displayed on the LCD display can be increased if your needs rises.

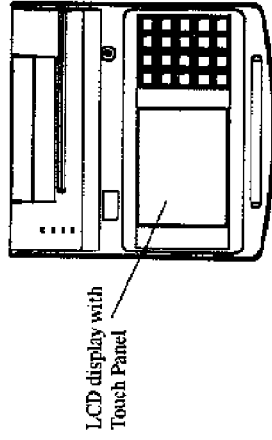


Figure 3-1 Front View

Hardware Installation

This section concentrates on the external connections and explains the functions of each.

Labeling of Quantum

Shown below is the rear panel of Quantum. Indicated are the cable connections to the various output and input ports.

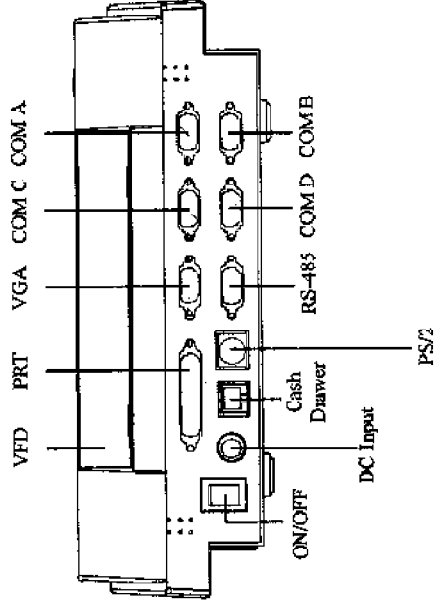


Figure 3-2 Back View

Cable connection

This section consists of two parts namely: the connection and disconnection of the cables.

Connecting the cable

Install the devices in the following order

1. Before connecting any cables, make sure that the power switch is off.
2. Plug the male connector on the DC output end of the AC/DC adaptor into the power receptacle on the rear panel of the system.
3. Plug the female connector AC power cord into the AC/DC adaptor.
4. Plug the male connector on the other end of the power cable into a socket.
5. Plug in and secure the other cables.
6. Plug all power cables from the peripherals into the main power sockets.
7. After all the connections are ready, turn on the power switch.



Caution

If you intend to unplug the cable from the system, never unplug the cable by pulling the cable itself. Always take hold of the actual plug body. Never plug in or unplug data cables during thunderstorms. Avoid plug in or unplugging data cables when the power is ON.

Disconnecting the cable

To disconnect the cables, simply follow procedures:

1. There is a power switch at the rear of the system. Turn off all power and equipment switches.
2. Unplug all cable plugs from the main power sockets.
3. Disconnect all cables from the devices.
4. Unplug all data communication cables from the sockets of the data networks.

To begin using your minipos system:

Switch it on using the power switch located towards the left of the rear panel of the system.

The system is set by default in the manufacturing process. However, if the CMOS battery is weak, it might be necessary for you enter the BIOS setup screen to adjust several things.

To reconfigure the CMOS, upon boot up, enter the CMOS Setup menu by pressing F2.

- 1. At the first page of the menu, go to the floppy disk configuration bar and using the "+" and "-" keys, make sure there are no floppy drives installed.
- 2. Go to the IDE Adapter and press the "Enter" key twice. This will auto detect your hard disk and the information of your hard disk will then be displayed.
- 3. Do not touch any other configuration and exit by pressing the "ESC" key and Save changes and exit.

F2

Note:
The CMOS BIOS Setup screen is actually larger than the Minipos screen. Therefore some information may be not be fully displayed.



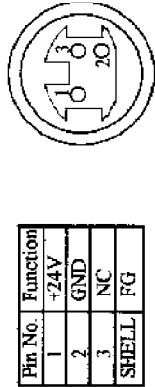
CHAPTER 4
TECHNICAL INFORMATION

This chapter should offer a more in depth explanation of Quantum's features.

Cabling of Quantum

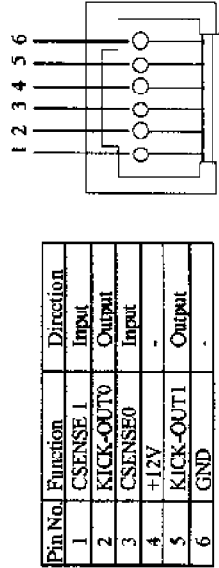
Power Supply

This is a 3-pin connector, to connect with an AC/DC adapter with 24V/15A or 18V/2A DC output, the pin assignment is as follows:



Cash Drawer Interface

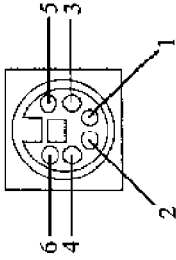
This is a 6-pin Modular Jack (RJ-11) connector, support two cash drawers with the +12V power supply, pin assignments as follows:



External Keyboard Interface

This is a 6-pin mini din P/S2 mouse connector. Pin assignments are as follows:

Pin No.	Function
1	DATA
2	NC
3	GND
4	+5V
5	CLK
6	GND



VGA Port

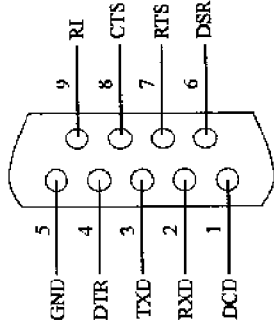
The VGA port is currently not available in this version.

COM 1

This is an internal connector from which the LCD Touch Panel is interfaced to the CPU. There is no external connector for the COM port.

COM A

This is a standard RS-232 port. The pin assignment is as shown below.



COM B

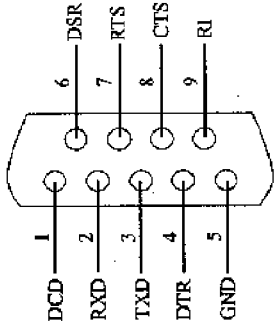
If RS-485 is used, this port cannot be used. You can either use the RS-485 or COM Port 2.

COM C and D

There are two alternative functions for these ports.

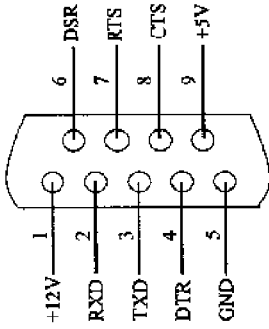
General function

When the ports are in this function, they have the traditional configuration for RS-232 standard connections. They are full function pins where 1 pin is to the ground and the rest are signal pins. The DSUB/9 pin female connector pin assignment is shown below.



Special function (default)

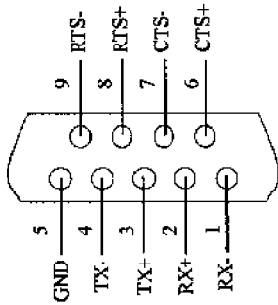
When in this function, some signal pins are not used. Moreover, there is connections of power supply with +5V and +12V. The DSUB/9 pin female connector pin assignment is shown below.



RS-485 COM Port

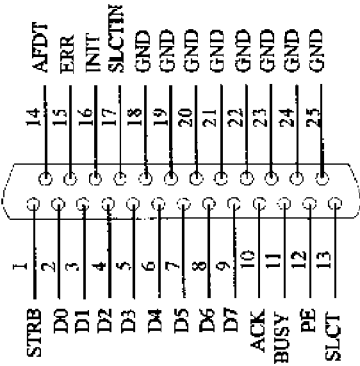
This port is used to connect the minipos to a back office personal computer system to build up a low cost point of sales network. In general, one back office personal computer can connect up to 32 sets of minipos terminals through a RS-485 communication port.

The illustration below shows the RS485/422 LAN Connector's pin assignment.



Parallel Port

This is a bi-directional parallel (PRT) port with EPP mode. The pin assignment is as follows.



CHAPTER 5
SOFTWARE DRIVERS

This Chapter provides Quantum's Software Driver Specifications.

Autoexec.bat

```
@ECHO OFF
PROMPT $pg
@PATH C:\DOS;C:\MINIPOS
@SET TEMP=C:\DOS
GOTO %CONFIG%

:MINIPOS
COTO END

:INTERLINK
COTO END

:NVFORMAT
@CALL C:\MINIPOS\NVFM32D.EXE
COTO END

:CALIBRAT
@CALL C:\MINIPOS\CALIBRATE.EXE
COTO END

:VIDEODOS
:BYPASS
:END
@ECHO ON

:END
```

Config.sys

```
INSTALL C:\MINIPOS\UNT10\TXT\COM
[INFORMAT]
INSTALL C:\MINIPOS\UNT10\TXT\COM
[CALIBRAT]
INSTALL C:\MINIPOS\UNT10\TXT\COM
DEVICE=C:\MINIPOS\NVRAM.SYS
[BYPASS]
[Common]
FILES=60
BUFFERS=30
DOS=HIGH
DEVICE=C:\DOS\HIMEM.SYS
```

Calibration

Calibrat ver 1.00++

Before the Touch Panel responds properly to your taps, you may need to calibrate your touch screen. The Calibrat program involves tapping the left top and right bottom of a touch screen, then the coordinates of left top and right bottom points will be saved in the CMOS.DAT file. The CMOS.DAT file on NVRAM drive or C drive will be used as a reference to adjust any subsequent taps.

Usage

At DOS prompt, type

C>Calibrat



Note:

The TSR80H program takes over the soft interrupt 0x86 to provide the x and y coordinates of the touch screen. Make sure to run the calibration first and then try the TSH80H program in the first install.

Do not delete the CMOS.DAT file on the NVRAM drive or C drive.

Once the touch Panel has been calibrated, you do not need to re-calibrate it at the next MiniPOS restart.

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CashMini

File: cashmini.txt

Description: How to use DOS device driver cashmini.sys

Purpose:

Kicking out Cashdrawer on MiniPOS i/o Board Version II. Note that the detecting of cashdrawer's status is NOT implemented here. Standard DOS device driver. To be installed in CONFIG.SYS.

- 1). In config.sys, include device=cashmini.sys
- 2). In your C program:

```
#define DRVNAME_CASHDR "CASH$$"
#define DRVOPEN_CASHDR "r+b"
```

```
FILE *fpcashdr;
```

```
fpcashdr = fopen(DRVNAME_CASHDR, DRVOPEN_CASHDR);
if(fpcashdr == NULL) return;
else
{
    fprintf(fpcashdr, "%c%c%c", 0x1B, 0x4F, 0x01);
    fclose(fpcashdr);
}
```

>ls

Cls.txt - Readme file of Cls.com

Usage

- 1) Copy it into your DOS directory.
- 2) Replace command.com with our new command.com (MSDOS6.22) at root;
- 3) Include your DOS path in %PATH%;

Why we use cls.com?

"Cls" is a DOS command to clear screen, but our Video resolution on MiniPOS is 40x30 (text mode). It is NOT compatible with DOS command "CLS" (supports only 40x25, or 80x25). So we use "cls.com" instead of "CLS";

For more information, see "command.txt".

>om2key

COM2KEYM - COM to Keyboard for MiniPOS Version 1.01

COM2KEYM is a Terminate and Stay Resident program that will redirect the input from one serial line to the keyboard buffer using the BIOS keyboard write call

Usage

At DOS prompt, type

C>COM2KEYM [port]

where port is the serial comm port 2,3,5 or 6 to read.

Default Setting

All serial ports are configured for 9600 baud, 8 data bits, 1 stop bit, with no parity.

Comm Port	IRQ	INT
2	3	b
3	6	c
5	3	b
6	6	e



Note:

After installing COM2KEYM, please note the communication port shall not be accessed via DOS as a device. The operating system is no longer in control of the port.

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Command.com

Command.txt - Readme file of Command.com

Usage

- 1) Copy it into your DOS directory;
- 2) Replace command.com with our new command.com (MSDOS6.22) at root;
- 3) Include your DOS path in %PATH%;

Why we modify command.com?

"Cls" is a DOS command to clear screen, but our Video resolution on MiniPOS is 40x30 (text mode). It's NOT compatible with the DOS command "CLS" (supports only 40x25, or 80x25). So we use "cls.com" instead of "CLS". But if you use an unmodified command.com, "CLS" will have the higher priority to be executed then "cls.com" does.

What has been modified in "command.com"?

You can simply replace "CLS" string in command.com with space by any binary editing tool you're familiar with. We modify the MSDOS 6.22 command.com the same way

If I don't want to use a modified command.com, how do I clear the screen correctly?

Use "cls.com", it should be copied to your DOS dir. It does exactly the same thing except for different name. (You can also rename cls.com).

int10.txt

FILE: INT10TXT.TXT - ReadMe File of INT10TXT.COM

FILE: INT10TXT.COM - Bios Video Interface for MiniPOS project.

HW: LCD - 320x240, 1bpp. Hitachi LMG6911RPBC-XOT

HOST CPU - And Elan SC300 25/33, it has a built-in LCD controller.

OS: DOS 3.0 and above

Function: The Bios interrupt 10 will perform video input/output in all Bios video modes. Both monochrome Text and mono-colour graphic are supported.

Note:

The LCD Panel is NOT a standard CGA device. So all the function descriptions here are for further application development in DOS.

LPT port: On ElanSC300, a video index 20h, ipt port is set to 378h.

MiniPOS Video Driver(BIOS) Ver 1.0

INTERRUPT 10h

AH = 00h - Set Video Mode

Entry: AL - 0 = 40x30 TEXT, Monochrome only

1 = 40x30 TEXT, Monochrome only

2 = 40x30 TEXT, Monochrome only

3 = 40x30 TEXT, Monochrome only

4 = 40x30 TEXT, Monochrome only

5 = 40x30 TEXT, Monochrome only

6 = 40x30 TEXT, Monochrome only

7 = 320x240, Graphic, 1 Bit Per Pixel(1bpp)

Modifies: These Modes are NOT standard CGA compatible.

AH = 01h - Set Cursor Size

Entry: CH - Bits 0-4 are start scan line

CL - Bits 0-4 are end scan line

AH = 02h - Set Cursor Position

Entry: DH - Row for cursor, 0-29

DL - Column for cursor, 0-39

BH - Page to set (zero for graphics mode), 0-5

AH = 03h - Get Cursor Position

Entry: BH - Page of cursor

Exit: DH - Row of cursor

DL - Column of cursor

CH - Start cursor scan line

CL - End cursor scan line

AH = 04h - Get Light Pen Position

Exit: AH = 0, Not triggered

BX = 1056h (My Emplay # is '1056')

Modifies: Can not be triggered here.

Processing: Elan300 does not support light pen on LCD panel!
So BX is used to identify if int10.txt is in MEM

AH = 05h - Change Active Display Page
 Entry: AL - Video page to make active, 0 to 5
 Modifies:

AH = 06h - Scroll Active Page Up
 Entry: AL - Number of lines to scroll
 0 = Blank entire screen
 BH - Attribute for blanked area
 CH - Upper left row to scroll
 CL - Upper left column to scroll
 DH - Lower right row to scroll
 DL - Lower right column to scroll
 Modifies: This version supports only in Mode 0(text)

AH = 07h - Scroll Active Page Down
 Entry: AL - Number of lines to scroll
 0 = Blank entire screen
 BH - Attribute for blanked area
 CH - Upper left row to scroll
 CL - Upper left column to scroll
 DH - Lower right row to scroll
 DL - Lower right column to scroll
 Modifies: This version supports only in Mode 0(text)

AH = 08h - Read Character and Attribute at Cursor
 Entry: BH - Video Page to read character
 Exit: AL - Character
 AH - Character attribute

AH = 09h - Write Character and Attribute at Cursor
 Entry: AL - Character to write
 BL - character attribute for alpha modes
 Character color for graphics modes

BH - Page to write character

CX - Count of characters to write
 It supports graphic mode. In graphic mode, if bit 7 of BL is set, the char will be XORed to screen.

AH = 0Ah - Write Character at Cursor
 Entry: BH - Page to write character
 AL - Character to write
 CX - Count of characters to write
 It supports graphic mode. In graphic mode, if bit 7 of BL is set, the char will be XORed to screen.

AH = 0Bh - Write Color Palette
 Entry: BL - Color value for palette
 BH - Palette color ID (0-127)
 Exit:

Modifies: For our MiniPOS LCD, it's a 1bpp panel. So this is a dummy function that does nothing.
 Processing: Does nothing

AH = 0Ch - Write Graphics Pixel
 Entry: AL - Color value for pixel
 If bit 7=1 then color is XORed
 CX - Column to write pixel
 DX - Row to write pixel

AH = 0Dh - Read Graphics Pixel
 Entry: CX - Column to read pixel
 DX - Row to read pixel
 Exit: AL - Value of pixel read

AH = 0Eh - Teletype Write Character
 Entry: AL - Character to write
 BL - Foreground color (graphics only)
 Modifies: This version supports Text Mode. In graphic mode, only. BEEP(AL=07h) will be done.

AH = 0Fh - Return Current Video Parameters
 Exit: AL - Current video mode (00h or 07h)
 AH - Number of character columns
 BH - Active page

AH = 13h - Write a string to the screen.

Entry:

AH 13h Write string

cs:

- BP - Pointer to string
- CX - Length of string to display
- DH - Character row for display
- DL - Character column for display
- BH - Page#(zero if in graphic mode), Wang Aimin
- BL - Display attribute
- AL - Write string mode
- 0 - Characters only, no cursor update
- 1 - Characters only; update cursor
- 2 - Char. Attrib, no cursor update
- 3 - Char. Attrib, update cursor

LockMini

File: Lockmini.txt

Descr: How to use DOS device driver Lockmini.sys

Project: MiniPOS

Purpose: Handle Keylock position reading on MiniPOS i/o Board

Version: 1.1. Note that the keylock is changed from a

keyboard device to a standalone device.

Standard DOS device driver.

To be installed in CONFIG.SYS.

Prepared by: Wang Aimin, 10-Sep-1997

- 1). In config.sys, include device=lockmini.sys
- 2). In your C program:

```
FILE *fplock;
unsigned char keypos;
```

```
/Valid='1','2','3','4','5'; Invalid=?
if((fp=fopen("KEYSYS", "rb"))!=NULL)
{ keypos = (unsigned char) (0x00ff & fgetc(fplock));
  fclose(fp);
}
```

NVFM32d

Formatting Tool for NV-RAM Drive on MiniPOS.

How to use: nvfm32d [Enter]

See NVRAM.TXT for more information.

NVRAM

NVRAM.TXT - Read Me file of NVRAM.SYS

NVRAM.SYS - Standard DOS Device Driver for NV-RAM

1. Make sure on MiniPOS, 32K NVRAM has been mounted and NVFM32D.EXE(utility) has been used to format NVRAM;
2. In Config.sys, put a line "Device=%\POSDRV\PATH%\nvr.am.sys. Here %\POSDRV\PATH% refers to the path of where you copy NVRAM.SYS to on the HDD;
3. Reboot MiniPOS, if there is no error message after loading NVRAM.SYS, it is now ready to use H: as a normal HDD, you can process normal read/write execution on it except for formatting it by a normal DOS format command. The only tool to format your NVRAM Driver is NVFM32D.EXE.
4. The DOS drive ID is stored at 40h; 0dh as ASCII.

TSR80H

TSR80H ver 1.00++

TSR80H is a Terminate and Stay Resident program that takes over the soft interrupt 0x80h to provide the x and y coordinates. Before installing the TSR80H, make sure that the touch screen has been calibrated.

Usage

At DOS prompt, type

C>TSH80h



Note:

The TSR80H program will detect if the CMOS.DAT (CMOS.DAT contains the calibration data) exists on NVRAM driver or C drive. If CMOS.DAT can not be found on NVRAM drive and C drive, the TSR80H program will ask you to run the Calibrat.exe first, then try the TSR80H program again.

How to call the soft interrupt 80h

```
int get_input_touchpanel( unsigned *x, unsigned *y )
{
    union REGS in/out;
    int ret;

    int86(0x80,&in,&out);

    ret=out.x.cx;
    *x=(unsigned)out.x.ax;
    *y=(unsigned)out.x.bx;

    return ret;
} //get_input_touchpanel

// Entry : &x,&y
// Exit : 0-Got it
```

```
// 1-Untouched
// 2-Time out
// 3-Miss data package HEAD (0xff)
```

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VFDMini

VFDMini.TXT - Device driver for VFD Display

Device Driver name : VFDMINI.SYS

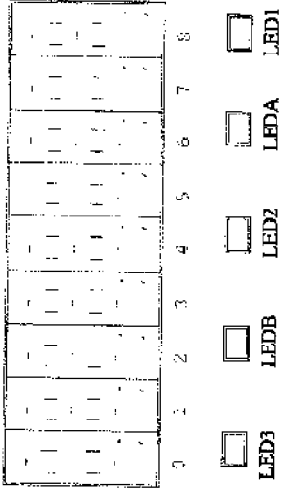
Version: 1.0

Module PCB #: D602

INTRODUCTION

The module driven by this Device Driver is a Vacuum Fluorescent Display (VFD), which is composed of a Vacuum Fluorescent Tube and a Printed Circuit Board. It interfaces to a host system through a 8-bit parallel port. The module displays 9 digits, which can be 0-9, A-F, decimal points, comma, minus, and <. It also drives five LED indicators (A Brief Outlook, please see below)

VFD Display



ABOUT LEDs

The module can control five LEDs. They are LED1, LED2, LED3 and LEDA, LEDB. In most cases, LEDA and LEDB are not mounted on PCB.

Please check your module before developing your Application. This Device Driver supports the control to all these five LEDs.

COMPATIBILITY

100% compatible with applications developed on the VFDDR.SYS (A VFD Device Driver which drives another VFD Module on SPECTRUM's POS3000/3000Plus - D425B).

Usage

The devices can be opened as a file handle in any program languages that supports this feature. Following is a piece of sample program in C:

```
FILE *fp;

if((fp = fopen("VFDD$$", "wb"))==NULL)
{printf("a VFDD(MINI).SYS not loaded!\n");
  /*Pis check your config.sys'm'n*/; /* Open VFD Device */
  exit(1);
}

fprintf(fp, "%c", 0); /* Initialize the VFD */
fprintf(fp, "%cABCDEF123%c", 0x02, 0x03, 0x04);
/*
1. Set Blank Display. See more in BLANK DISPLAY;
2. Send 'ABCDEF123' to Screen (Can not be seen);
3. Disable Blank Display. ('ABCDEF123' now pop to screen);
4. Toggle LED1 on/off.
*/
```

```
llush(fp); /* Force Physically sending to Module */
```

```
fclose(fp);
```

For simple usage, declare a 1x9 matrix that contains the characters to be displayed, and write to VFD. Hence, scrolling, and some other effects can be achieved by manipulating the matrix.

WORKING MODE

DC1 - Digits are left aligned and wrapped if exceeding the screen;
DC2 - Digits are right aligned. If exceeding the screen, the left most digit is truncated

BLANK DISPLAY

When command 02h is sent and received, the screen is blanked. Although nothing displayed, data buffer in VFD still remains.

When command 03h is sent and received, VFD restores the previous screen. During blanking, VFD can still receive incoming data.

COMMAND

00a - To reset the VFD

01h - To clear screen

02h - Set Blank Display*

03a - Disable Blank Display*

04h - DC1 Mode*

05h - DC2 Mode*

1xh - Set cursor to position x, where x is in the range 0 to 8.

\r - Carriage Return, set cursor =0 (0x0D)

\n - Line feed, set cursor =0, clear screen (0x0A)

\f - Form feed, cursor position unchanged, clear screen (0x09)

\b - Backspace (0x08)

'.' - Display dot
 ',' - Display comma
 ':' - Display semicolon
 '%' - Display 1/2 sign (0xAB)

'!' - Toggle LED1 on/off
 '*' - Toggle LEDA on/off*
 '@' - Toggle LED2 on/off
 ')' - Toggle LEDB on/off*
 '#' - Toggle LED3 on/off

The rest will be treated as characters to be displayed on the VFD. Note that the character to be displayed will be equal to its ASCII code value. For example to display 'A', just send 41h(65) to VFD, which is the ASCII value of 'A'.

Please limit your alphabet to ('A' - 'F') and numeric to ('0' - '9') for normal usage.

Ⓔ

Note:

New commands relative to VFDDR.SYS

APPENDIX SYSTEM MAINTENANCE

When a problem occurs....

Problems can be caused by either software or hardware problems, sometimes both. This chapter contains troubleshooting tables to help you identify the types of problems and methods to resolve them accordingly.

Preliminary Check

When a problem occurs, use the following checklist to identify the type of problem.

1. All I/O devices are connected firmly and correctly.
 There might be a possibility that one of the interface cards is loosely connected or is not installed in the right slot. Therefore, check the connection of the cards and cables.
2. Adjust the contrast and brightness on the VGA monitor if any.
3. Any reconfiguration must be initialised through the CMOS setup program.

Handling the System with Care

This section provides guidelines for handling the system. We recommend the following guidelines to keep your terminal in an optimum operating condition. In addition, a list of a number of ways to prevent accidents like malfunctions and other related issues are shown below.

Guidelines

Set up the system in a clean and dry environment. The system should be placed on a flat, sturdy surface.

Do not cover any of the holes at the sides of the system. These holes allow air flow to keep the terminal from overheating.

A good practice is to provide at least 2-inches of clearance on both sides of the terminal for cooling.

Avoid placing food or drinks in top of the system. Food particles and spills will make the keyboard sticky and unusable.

Do not get the power switches or other controls wet. Moisture can damage these parts and cause equipment damages.

Always disconnect the power plugs by grasping the plug, not the cord.

General Troubleshooting Guide

The table below provides some solutions to common problems which might occur to your system. If there are other problems which are not shown in the following table, please contact your supplier.

No response from the system

- Check whether the power cord is connected firmly at the wall outlet and also at the back of the system
- Confirm whether the power switch is on
- Check if there is a broken wire
- Check for blown fuses, tripped circuit breakers or a power failure. (First check at the fuse box then inside the terminal)

System shows abnormal result from the self test

Run POST BIOS Setup or PC BIOS Setup to verify the setting of devices.