Allegro CE/DOS™

OWNER'S MANUAL

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Warranty and Repair Information

▲ Limited Warranties

Juniper Systems, Inc. (referred to as JS) warrants that all Allegro Field Computer hardware components (except for the items listed below) shall be free from defects in materials and workmanship for a period of 12 months from the date of shipment when properly installed, calibrated, and operated in accordance with instruction manuals accompanying said hardware and used for the purpose for which said hardware was designed. Battery packs, the media containing the Allegro Utility Programs, and accessories are warranted for 90 days from the date of shipment.

In the event a defect in materials or workmanship is discovered and reported to JS within the specified warranty period, JS will, at its option, repair the defect or replace the defective product. This warranty does not apply where the product has been operating outside the environmental specifications of the product. The obligation of JS hereunder will be limited to such repair or replacement.

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Removal of Serial Number

To view the serial number, open the battery compartment door. The serial number label is located in a recessed area directly above the battery compartment. Removal of the serial number label from an

Allegro voids any warranty. JS will not repair or update an Allegro and return it to an individual if it is without a serial number label.

Factory Sealed Unit

The Allegro is a factory sealed unit. There are no internal user serviceable parts. If the Allegro is opened or in any other way tampered with, all warranties are null and void.

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Extended Warranties

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▲ Repairs

If your Allegro is in need of repair or servicing, contact our Customer Service Department for an RMA (Return Materials Authorization) number. They can be reached by phone at 435-753-1881 or via e-mail at: techsupport@junipersys.com.

Please have this information ready when you contact us:

- Allegro serial number
- Your name
- Name and shipping address of company/university/agency
- Phone and fax number
- Clear description of the problem encountered
- Purchase order number and billing address (for equipment that is not under standard or extended warranty)

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Section 1

Introduction

Welcome
Allegro Overview
Quick Start Guide

Welcome

Juniper Systems, Inc. continues to provide cutting edge field computing solutions for agriculture, natural resources, and other rugged field applications. We are pleased to welcome you as a customer.

The Allegro CE/DOS Field PC™ is specifically designed for use in extreme field environments. It is rugged, waterproof, and can withstand temperature extremes. The ergonomic, lightweight, balanced design makes it easy to carry and use in the field for extended periods.

The Allegro features solid state disk storage so that your data are secure, even without power backup. Data are hand-keyed on the keyboard or entered directly via instruments such as GPS receivers, lasers, and bar code scanners. A user-accessible PC card slot provides additional storage and I/O capability.

Both Windows CE and DOS run on the Allegro, making it unique among field computers. You can use your existing DOS programs while developing new applications for Windows CE.

If you have any questions or comments about the Allegro after reviewing this manual, please feel free to contact our Sales Department.

Allegro Overview

▲ Allegro Features

The standard features of the Allegro Field PC are listed below. These features are described in detail throughout this manual. A complete list of specifications is in the *Technical Reference* section.

❏ Operating Systems: Windows CE 3.0 and MS-DOS 6.22

❏ Processor: 100 MHz 486 provides superior performance

❏ Memory: 16 M or 32 M RAM for program execution

❏ Data and Program Storage: 32 M non-volatile solid state disk

❏ PC Card Slot: User-accessible for flexibility and versatility

❏ Case: Rugged, waterproof, easy to hold, and lightweight

❏ Display: Large, anti-reflective, equipped with a backlight (brightness adjustable) and heater

❏ Touchscreen and Stylus: Used to operate Windows CE

❏ Keyboard: Includes all printable ASCII characters, 12 function keys, centrally located number keys, and special coatings to prevent the characters from rubbing off

❏ Keyboard Bezel: Protects keys from tearing; removable for cleaning keyboard

❏ Power: NiMH battery pack lasts an average of 10 to 16 hours, depending on the application

❏ Communication Ports: Two RS-232C serial ports and two IrDA communication ports

❏ Software: Windows CE Software Suite and DOS Utilities

❏ Sound: Plays WAV files

❏ LED Indicators: Monitor battery status, charging status, PC card activity, and hard disk activity

❏ File Synchronization: Between the Allegro and desktop PC

▲ Standard Accessories

The Allegro comes with the following accessories:

- Allegro Utilities CD-ROM with the Desktop PC Setup Programs, Windows CE Software Suite, DOS Utility Programs, and Device Drivers
- NiMH Battery Pack
- Universal AC Adapter
- Communication Cable
- Mini and Full Size Stylus
- Carrying Straps
- User's Manual

▲ Optional Accessories

The accessories listed below are optional. Contact our Sales Department if you are interested in any of these items.

- Alkaline Battery Holder
- Vehicle Cigarette Lighter Power Adapter
- External Battery Charger
- Bar Code Wands and Accessories
- Digital Calipers
- ATA Flash Cards and RAM PC Cards
- IrDA, USB and Printer Adapters
- Application Development Software
- LandMark GPS Package
- Replacement Accessories

Quick Start Guide

A Quick Start Guide is included with the Allegro CE/DOS. It offers ten basic and initial steps to get the Allegro charged and ready to take out into the field. The instructions on the guide should be done first, before you begin using the Allegro.

If the Quick Start Guide gets thrown away or misplaced after setting up the Allegro and you discover you need the guide again, you can access a copy of it from the Allegro CD.

To Access the Quick Start Guide from the Allegro CD complete the following steps:

1) Place the Allegro CD into the desktop PC's CD-ROM drive. The following splash page appears:

2) Click on the *Browse CD* option. The CD opens up in a Windows Explorer program displaying the contents of the CD.

3) Double-click on the *Quick Start Guide* file to open in Acrobat Reader.

4) Read and/or print the Quick Start Guide.

Section 2

Hardware Components

Introduction

The Allegro CE/DOS Field PC is designed to meet the needs of a user collecting data with a hand-held computer in a rugged field environment. This section of the manual describes the unique hardware components of the Allegro, including the case, keyboard, display, communication ports, batteries, PC card slot, and expansion pods.

Some hardware and software features are only functional within one operating system. For example, the touchscreen is used to operate Windows CE; it is not operational when you are in DOS. Conversely, the display panning features only apply to operation while in DOS.

Throughout the manual, one of the following symbols is shown next to the description of the features that are unique to one operating system:

> ➩ WIN CE
> ➩ DOS

If one of these symbols is not shown, the feature is functional for both operating systems.

Case Design

▲ Case Features

The case has the following features:

❏ The polycarbonate ABS material is rugged, shock resistant, and formulated to resist damage from chemicals.

❏ The ergonomic shape and smooth edges make it easy to hold, maximizing comfort and usability in the field.

❏ The weight distribution is balanced.

❏ There are three gaskets used to seal the case from water and dust:

- between the top and bottom case halves
- around the battery compartment
- around the PC card slot compartment

In most circumstances, these gaskets are not field replaceable. Contact our Service Department if a gasket needs to be replaced.

❏ There are two doors: one for the battery compartment and one for the PC card slot. These doors are user-replaceable. Contact our Sales Department for ordering information.

PC Card Slot

Battery Compartment

▲ Hand Strap and Shoulder Strap

There are four metal cleats, one on each corner of the Allegro case. Each cleat has two metal rings that are used to attach the hand strap and shoulder strap onto the Allegro.

The straps can be attached in numerous configurations, depending on your preference and whether you are right-handed or left-handed. The shoulder strap can be used as a neck strap for hands-free operation. The tension on the hand strap is adjustable.

Keyboard

▲ Keyboard Features

The keyboard on the Allegro is designed to maximize data entry efficiency and to withstand rugged, wet conditions.

❏ Careful planning went into the placement, size, and space between keys to increase efficiency and ease of use.

❏ The number keys are large and placed in the center of the Allegro for easy access from either side.

❏ Some keys have standard functions as well as special functions accessed with the GOLD and BLUE shift keys.

❏ Five function keys are located below the display. With the use of the GOLD and BLUE shift keys, twelve function keys are available.

❏ Two special coatings prevent the key labels from rubbing off after extended use.

❏ The keyboard bezel helps protect the keys from tearing. It is removable for cleaning purposes.

▲ Special Keys and Key Sequences

The standard keyboard letters, numbers, and functions are printed in dark brown on the off-white keys and in off-white on the dark brown keys. These standard options are operational unless a GOLD or BLUE shift key is pressed.

Blue Shift Key Usage

To access the keyboard characters printed in blue, press and release the BLUE shift key followed by the key with the desired blue-lettered character. To activate several blue-lettered keys before returning to standard mode, continue to hold the BLUE shift key down while you press the desired keys. Once the BLUE shift key is released, the keyboard reverts back to the standard mode.

Gold Shift Key Usage

To access the gold shift key options, press and release the GOLD shift key followed by the key with the desired gold symbol. To activate several gold-lettered options before returning to standard mode, continue to hold the GOLD shift key down while you press the desired keys. Once the GOLD shift key is released, the keyboard reverts back to the standard mode.

Circular Key Usage

The circular key located in the center of the keyboard has three functions:

1) Standard (no shift keys): Up, Down, Right, and Left arrow keys

2) BLUE shifted functions: Page Up, Page Down, Home, and End

3) GOLD shifted functions ë DOS: Pan the display Up, Down, Right, or Left

Shifted Options

The shifted options and the associated key sequences are listed below.

Option	Key Sequence
Function keys F6, F7, F8, F9 and F10	BLUE key + desired function key
Function keys F11 and F12	GOLD key + desired function key
Control Break ⇨ DOS	BLUE key + <Brk>
Enable/Disable touchscreen ⇨ WINCE	BLUE key + <TS>
View Windows CE Start Menu ⇨ WINCE	BLUE key + <Start>
Page up	BLUE key + <PgUp>
Page down	BLUE key + <PgDn>
End	BLUE key + <End>
Home	BLUE key + <Home>
Toggle caps lock on and off	BLUE key + <CapLk>
Toggle display backlight	GOLD key + <F3> (see gold on and off symbol above function key)
Lighten LCD	GOLD key + <F4> (see gold symbol above function key)
Darken LCD	GOLD key + <F5> (see gold symbol above function key)
View BIOS Setup Menu ⇨ DOS	GOLD key + <S>
Pan display window in the direction of the arrow ⇨ DOS	GOLD key + right, left, up, or down arrow (round key)
Toggle auto-panning on or off ⇨ DOS	GOLD key + <Ins>
Zoom font ⇨ DOS	GOLD key + <Z> or GOLD key + <Start>
Perform a hard reset (reboot)	<On/Off> (hold down for 8 seconds)
Enter Allegro Setup Program	<On/Off> + <Del>

Keyboard Options For Both Windows CE and DOS

The following keys and key sequences are functional in both Windows CE and DOS.

On/Off (Reset)
This key is used to turn the Allegro on and off. The ridge around the key helps prevent the Allegro from being accidentally turned on without your knowledge (while it is in a backpack, for example). Holding down the On/Off key for about eight seconds performs a hard reset. Release the key when the reboot process begins.

❖ *Note: When you turn the Allegro on or off, there is no "beep." Also, it is normal for a horizontal line to appear briefly on the screen. When the Allegro is booting to Windows CE, it takes a minute for the Windows CE Desktop to appear.*

Contrast Keys
To make the display darker, press the GOLD key and the <F5> key. To make the display lighter, press the GOLD key and the <F4> key.

Backlight On/Off
The backlight is toggled on and off by pressing the GOLD key and the <F3> key.

Tab, Forward and Backward
In a DOS program, the right arrow is a forward tab and the left arrow is a back tab. In Windows CE the tab keys are used primarily for cursor movement between fields.

➪ Win Ce **Keyboard Options**

The following keys and key sequences are functional in Windows CE only.

Touchscreen Disable/Enable   [Blue key] + [BkSp/TS]

The touchscreen key allows you to disable and enable the touchscreen. This feature allows you to wipe off the screen without inadvertently making selections on the screen. Press the BLUE shift key and the <TS> key to disable the screen. Once the screen has been cleaned, use the same key sequence to enable the touchscreen. (For instructions on how to clean the screen, refer to *Display, Touchscreen* later in this section.)

Task Manager (Switcher)   [Start]

Press the <Task Manager> key to view all of the programs that are currently running. Select which program you want to be in by using the up and down arrow keys to highlight the desired program and pressing <ENTER>.

Start Menu   [Blue key] + [Start]

Press the BLUE shift key and the <Start> key to view the Windows CE Start Menu. Use the arrow keys to move up and down the menu. Press the <ENTER> key to make your selection.

The Task Switcher and Start Menu functions have been provided to speed up operation while in Windows CE. You do not have to use the touchscreen and stylus to bring up the Start Menu or to change tasks. These keys are also handy when the Taskbar has been hidden.

Right Mouse Click

Press the <Alt> key and touch the screen with a stylus to achieve a right mouse click. In many Windows CE programs, when you right click on an item a menu is displayed listing functions and options that pertain to the item.

➪ DOS Keyboard Options

The following keys and key sequences are functional in DOS only.

Break (Brk)   **Blue key** + **Brk Esc**

The break function allows you to exit out of batch files and programs.
Press the BLUE shift key and the <Brk> key.

Panning   **Gold key** + [arrows PgUp, Home, End, PgDn]
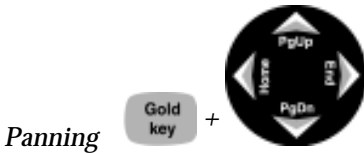
To pan the display in the direction of the arrow, press the GOLD key
plus the right, left, up, or down arrow key.

Auto-Panning   **Gold key** + **Ins ?**

Toggle auto-panning on or off by pressing the GOLD key then the <Ins>
key. (Auto Panning is described later in this section under *Display, Full
Screen, Auto Panning.*)

Zoom Fonts   **Gold key** + **Z '**

You can toggle between four font sizes by pressing the GOLD key then
the <Z> key.

Viewing the System Setup Program   **Gold key** + **S $**

The System Setup Program main menu screen can be invoked at any
time by pressing the GOLD key then the <S> key. Refer to *Section 5, MS
DOS, System Setup Program* for details on how to use this utility.

Typing Extended Characters
You can access characters that are not available on the keyboard by
pressing and holding the <ALT> key and typing the associated three
digit ASCII character code on the keyboard. The character is displayed
when the <ALT> key is released. For example, press <ALT> <2> <4>
<8> to access a degree symbol °. A list of extended characters is located
in *Section 6, Technical Reference.*

▲ Cleaning the Keyboard

Dirt and debris can get underneath the keyboard bezel. To clean it, use a coin to pull the bezel up at the recess located at the bottom of the keyboard and remove it. We recommend that you use warm water, mild detergent, and a toothbrush to clean the keyboard or simply brush it out. The Allegro remains sealed during this process. (Do not direct a high pressure stream of water at the keyboard to clean it. This action could break the seal, causing water to get inside the Allegro.)

Reattach the bezel by carefully inserting the top ridge under the function keys and lowering the bezel down flat onto the case. Press down along the sides while aligning the keys through the holes.

❖ *Important Note: After you reattach the bezel, check each key to make sure it is completely free from the bezel. If any part of a key is caught underneath the bezel, you may not be able to turn the Allegro on or you may hear a continuous string of beeps.*

Display

The Allegro CE has a high-contrast liquid crystal display. The active viewing area is 3.3" wide x 2.5" high. The display resolution is 320 x 240 pixels. The display is shock-mounted and sealed.

Display Features:

- Contrast: The display contrast can be lightened or darkened.
- Heater: The display heater allows you to use the Allegro in temperatures below freezing.
- Backlight: The backlight enhances visibility in low-light conditions. The brightness of the backlight is adjustable.
- Position: The display is slightly tilted up to reduce glare and enhance visibility.
- Touchscreen ⇨ Win Ce: The touchscreen is used to make selections and enter data in Windows CE.
- Auto-Panning ⇨ DOS: The display window can be set up to automatically pan with the cursor.
- Gray Scale ⇨ DOS: you can use up to 16 shades of gray in text mode and 4 shades in graphics mode.
- Shade Mapping ⇨ DOS: converts colors and gray shades into black and white to achieve the best contrast.

▲ Adjusting Display Features

The display features can be enabled, disabled, or adjusted through the Control Panel in Windows CE (see *Section 4*) and the System Setup Program in DOS (see *Section 5*). Some display features can be adjusted using the special key sequences shown below:

Display Feature	Key Sequence
Increase Contrast	GOLD + <F5>
Decrease Contrast	GOLD + <F4>
Backlight Toggle On and Off	GOLD + <F3>
Auto-Panning Toggle On and Off ⇨ DOS	GOLD + <INS>

Backlight
The display backlight is used to enhance visibility in low-light conditions in the field. The backlight can enhance visibility indoors as well when you are viewing the display under fluorescent lighting.

The brightness of the display backlight is adjustable from dim to bright (the default). This adjustment is made from the *Control Panel|Display Properties|Backlight* in Windows CE and *System Setup Program, Keyboard|Display Screen* in DOS.

Contrast and Automatic Temperature Compensation
Once you have set the contrast, you seldom need to readjust it. If you turn the Allegro on and the display contrast appears too light or too dark, it may be because the display contrast is automatically adjusting for changing temperatures. If you have moved the Allegro from a cold environment to a warmer one or visa versa, it can take up to seven seconds for the temperature compensation to take place and for the display to update. If you wait seven seconds and the display does not become visible, adjust it to the desired contrast setting using the key sequences outlined above.

▲ Touchscreen ⇨ WIN CE

The Allegro display has a touchscreen used to activate programs and functions in Windows CE. The touchscreen can be operated with a stylus, finger, or other pointed object (avoid using sharp objects that may scratch the screen). Two styli are provided: a mini stylus that snaps into a holding bay built into the top of the case and a pen-size stylus. For more details on how to use the touchscreen, refer to *Section 4, Windows CE Operating System, Display Touchscreen*.

Cleaning the Touchscreen

Disable the touchscreen before you wipe it off or clean it to avoid inadvertently making selections on the screen (see instructions below). Use a clean cotton cloth to gently wipe off the screen. Do not use anything abrasive that could scratch the screen (including tissues and paper towels). If you use a cleaning solution such as glass cleaner or a mild detergent, it is best to spray it onto the cloth instead of directly onto the screen. (Note: petroleum-based cleaners and solvents should not be used. They can damage polycarbonate.)

Touchscreen Disable/Enable Key

Blue key + TS BkSp

The touchscreen key disables and enables the touchscreen. Press the BLUE shift key and the <TS> key to disable the screen. Once the screen has been cleaned, use the same key sequence to enable the touchscreen.

▲ Adjusting Font Size ⇨ DOS

There are four font sizes available in DOS:

Font Size	Pixels (character width x height)
40 characters x 25 lines (used for FileScout DOS Utility Programs)	8 x 8
40 characters x 16 lines (default)	8 x 12
32 characters x 16 lines	10 x 12
20 characters x 12 lines	16 x 16

Gold key + Z '

To toggle between the font sizes, press the GOLD shift key and the <Z> key (for "Zoom").

If you are using a program that was written for another hand-held computer with a different screen size, select the font size that best fills the Allegro screen. You can usually avoid making modification to the original program this way.

When you develop a new DOS program to run on the Allegro, select a default font that will best display the data on the screen for your application. If you would like large characters to appear for ease of reading, use the largest font. If you need to show more data on the

screen at one time, use one of the smaller fonts. Refer to *Section 8, Software Developer's Guide for DOS, Extended BIOS Functions* for details about the extended BIOS functions.

▲ Full Screen ➪ DOS

When you are in DOS, the Allegro has a full screen stored in memory that is 80 characters wide by 25 lines deep. Because of the size of the display window, you can only view a portion of the full screen at a time. You can view any part of the full screen by panning vertically and horizontally. Panning can be done automatically using the auto-panning function or manually using GOLD key + arrow key combinations.
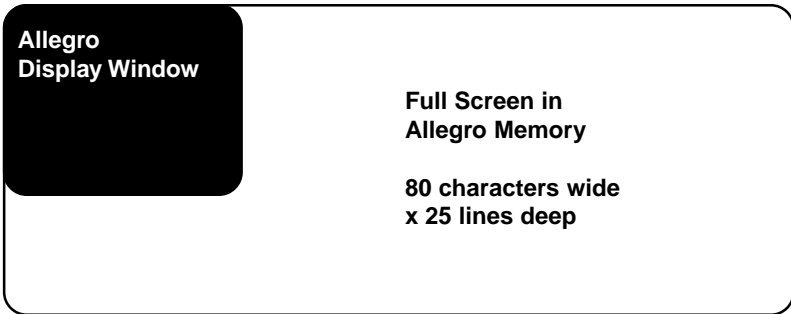
Auto-Panning

When auto-panning is enabled (the default), the screen automatically shifts (pans) as the cursor moves beyond the visible window.

When auto-panning is disabled, the screen does not shift as the cursor moves beyond the visible window. The display screen can be shifted by panning manually or through program control. Auto-panning can be turned off in the System Setup Program (see *Section 5, DOS Operating System, System Setup Program*). You can also toggle auto-panning on and off by pressing the GOLD key + <Ins>.

Panning Manually

You can manually move the display window around the full screen by pressing the GOLD key followed by the desired arrow key. The visible display pans in the direction of the arrow. The cursor remains in its original position; it does not follow the window.

A program can be written to control panning through the extended BIOS functions. Refer to *Section 8, Software Developer's Guide for DOS, Extended BIOS Functions* for details.

LED Indicators

The following LED indicators are located above the display:

These indicators are active while the Allegro is running, providing you with the following information:

LED	Description
Battery Charge Status: shows the percent of charge remaining in the batteries
External Power: indicates that you are connected to an external power source and not drawing power from the internal batteries
Charging Indicator: lights up while the rechargeable batteries are charging
Solid State Disk Access: flashes when data are being read from or written to the solid state disk
PC Card Access: indicates that your application program is accessing the PC card (do not remove it when this light is flashing)

A special circuit is implemented in the Allegro to reduce the amount of power required to light these indicators.

Brightness Adjustment

The brightness of the LED indicators can be set to dim, medium, or bright. This adjustment is made from the *Control Panel|Display Properties|Options* in Windows CE and the *System Setup Program, Keyboard/Display Screen* in DOS.

Batteries

The power consumption of the Allegro is very efficient. The Auto Suspend and Power Management features help to conserve power on the Allegro. This section discusses maintaining the battery pack and backup supply.

There are three types of batteries and a backup capacitor associated with the Allegro:

❏ NiMH battery pack
❏ Battery holder for three alkaline cells (optional accessory)
❏ Internal lithium backup battery (powers the real time clock and CMOS RAM)
❏ Super capacitor that serves as the RAM backup (maintains the RAM while you change the battery pack)

▲ Main Power Source

The Allegro is powered by a rechargeable nickel metal hydride (NiMH) battery pack. The battery compartment is accessed through a door on the back of the Allegro case. The NiMH battery pack is shipped along with the Allegro but is not installed at the factory.

Installing the Battery Pack for the First Time

Upon receiving the Allegro, you must install and then charge the battery pack. To do this, complete the following:

1) Push up the sliding latches on the sides of the Allegro to open the battery compartment door.

2) Place the NiMH battery pack in the left side of the battery compartment, push down, and slide it all the way to the right.

3) Push the battery door closed until each latch clicks into place.

4) Slide the latches downward until they cannot slide any further to securely latch the battery door closed.

Do not turn on the Allegro yet.

5) Plug the AC wall charger that came with the Allegro into the wall socket.

The small green light on the wall adapter turns on when it is plugged into the wall.

6) Remove the rubber protector from the Allegro's external power input jack.

7) Plug the power connector end of the wall charger into the Allegro.

8) Charge the battery pack at room temperate until the LED charge light on the Allegro turns off. This can take three to five hours the first time you charge the battery.

By initially charging the batteries this way, you will become familiar with the Allegro's battery gauging feature and how the battery status LEDs work. This recommendation is made even if you eventually plan to use an external battery charger to charge the battery pack or if you are going to use the optional alkaline battery holder.

Setting the Battery Charge
After installing the battery pack into the Allegro, the battery charge percent must be set. This allows the Allegro to know the pack's charge status. When you insert the battery pack into the Allegro for the first time, the charge status is unknown to the Allegro.

To set the charge status of the battery pack after you install the battery pack for the first time, complete the following:

1) Turn on the Allegro by pushing the On/Off button.

As Windows CE loads, various screens appear that do not require any action until it gets to the *New Battery Detected* screen.

2) Tap on the circle next to the *Specify charge (%)* option to set charge status.
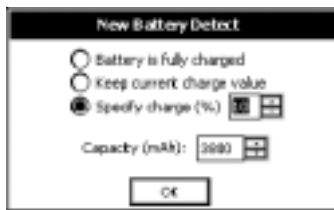
3) Set the charge percent to 10 by taping on the small up or down arrows to move the percent.

The capacity of the NiMH battery we have provided with the Allegro is dependant on what brand of NiMH battery pack you are using.

The capacity default is set at 3800. If you are unsure of your batteries capacity check the label on the battery to discover the charge capacity. If it is not 3800 mAh you will need to set the capacity as well.

4) Tap on *OK* to save the set charge percent.

The *New Battery Detected* screen closes and the charge status is set. Once the battery pack is fully charged, the gauging is automatically set to 100%. The battery task bar icon indicator now accurately reflects the battery charge.

Resume Versus Reboot

The first time you turn the Allegro on after you receive it, the Allegro boots to Windows CE, the system default. Each time you replace the batteries, the Allegro *resumes* to the operating system it was in and the screen that was last displayed before the batteries were removed.

Example: You are editing a PTab document in Windows CE. To change the battery pack, you save the document but do not close it, turn the Allegro off, change the battery pack (within five minutes), and turn the Allegro back on. The Allegro automatically resumes to the PTab document you were editing.

If the batteries are removed from the Allegro for longer than five minutes, the Allegro *reboots* to the last operating system it was in, but it does not resume to the screen that was last displayed before the batteries were removed. The Windows CE Desktop or the DOS prompt appears.

New Battery Detected Screen

There are other situations when you turn on your Allegro and the *New Battery Detected* screen pops up, directing you to set the values for battery charge percent and battery charge capacity. The following are reasons for this:

- Restore function is used
- Set Factory Defaults function is used
- Power is removed from the Allegro because the battery is fully discharged
- Removal and replacement of the battery pack

These values must be set correctly for the battery charge function to work properly, as previously outlined in this section.

If you are working in DOS and turn off your Allegro and replace your battery pack your Allegro is reboot to the DOS operating system. After the DOS operating system is loaded, the following window appears:

```
┌─────────────────────────────────────┐
│        Battery Change Detected       │
│                                      │
│  Please set desired values for       │
│  percent charge and bettery capacity.│
│                                      │
│  Battery Charge Percent: >100  %     │
│                                      │
│  Battery Charge Capacity: 3800 mAh   │
│                                      │
│                                      │
├─────────────────────────────────────┤
│     ←↑↓→=Move        F1=Prev         │
│     ESC =Exit        F2=Next         │
└─────────────────────────────────────┘
```
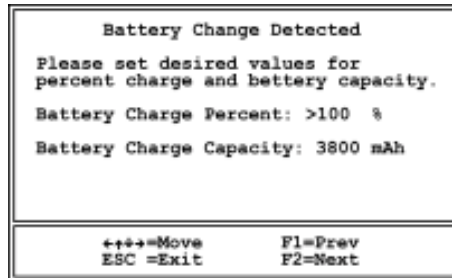
The Arrows key will move your selection between the *Battery Charge Percent* and the *Battery Charge Capacity*.

F1 moves the selection up.

F2 moves the selection down.

ESC exists the *Battery Change Detected* screen and saves your settings.

Setting the Battery Charge Percent
Based on the status of the battery pack, the following recommendations will help you set the battery charge percent.

Battery Status	Windows CE	DOS
Fully charged	Battery is fully charged	100% (default)
Removed and replaced without charging	Keep current charge value	Last
Uncertain, can estimate	Select charge from 10 to 100%	Select charge from 10 to 100%
Uncertain, can't estimate	See suggestions that follow	See suggestions that follow

If you insert a battery pack and do not have a good idea what the status of it is, we recommend that you do the following:

Plug the Allegro into the AC wall charger and set the battery charge to 10% as previously instructed. Fully charge the pack for three to five hours.

Once the battery pack is fully charged, the gauging is automatically set to 100% and the battery LED indicators accurately reflect the battery charge.

Setting the Battery Capacity

The charge capacity field should be set to the charge capacity of the newly installed battery pack in milliamp-hours (mAh). The charge capacity of the NiMH batteries we have provided for the Allegro are as follows:

Gold Peak™ (GP) VR151	3800 mAh
Empire™	3500 mAh
Duracell™ DR9	3000 mAh

If you purchase a battery pack from another vendor, note what the capacity is. For optimum performance, it is best to use battery packs with a 3000 to 4000 mAh capacity. The higher the capacity of the battery pack, the longer it holds a charge. However, battery packs with a capacity over 4000 mAh may not charge fully.

As a battery pack ages, it does not operate as long on a charge as it did when it was new. The capacity could be reduced by as much as 50% at the end of its useful life. Over time, the capacity setting for an individual battery pack may be adjusted downward to account for age.

Details about battery life, recharging the battery pack, the battery status LED indicators, power management features, and removing and inserting battery packs are located in this section of the manual.

Battery Life

Depending on your application, the batteries can last from five to 30 hours between charges (NiMH) or replacement (alkaline cells) as shown below:

Battery Pack	Capacity	Typical Operating Time
NiMH	3,800 mA hours	12 to 20 hours
Alkaline	1,600 mA hours	5 to 8 hours

The operating times previously stated are based on a typical application where the Allegro performance level is set to medium, the Power Manager is on, data are being entered manually on the keyboard, no external devices are powered by the Allegro, the backlight is used 10% of the time, and processing time is 20%. The actual operating time could vary from as little as five hours to as much as 30 hours, depending on your program and how the system is set up.

Recharging the NiMH Battery Pack

For applications where the Allegro is used for several hours each day, the NiMH batteries can be charged daily. The Allegro's built-in intelligent charging circuit manages the charging of the batteries and prevents them from being overcharged.

You should always be aware of the status of the main batteries before you go out into the field to collect data. The batteries may need to be recharged before you go. You need to take into account the amount of battery life that is left and how much time is required for charging the pack.

Temperature Ranges for Charging the NiMH Battery Pack
The Allegro's NiMH batteries are charged most efficiently at temperatures ranging between 10° to 20° C (50° to 68° F) when the AC power adapter is used.

The Allegro batteries <u>must</u> be charged when the battery temperature is between 0° to 40° C (32° to 104° degrees F) due to the nature of NiMH batteries.

The chart below describes the Allegro battery charging behavior at different temperatures.

	Temp. Range Degrees C	Temp. Range Degrees F	Charging Behavior
Recommended Charge Range	10° to 20°	50° to 68°	Most efficient; batteries charge within three hours.
Acceptable Charge Range	0° to 30°	32° to 86°	Batteries are charged within four hours.
Too Cold Range	< 0°	< 32°	The batteries must reach 0° C (14° F) before they begin to charge.
Too Hot Range	> 30°	> 86°	Battery charge cycle is complete in four to five hours. If the batteries become too warm, they may only reach a 90 to 95% charge capacity.

Try to charge the batteries within the recommended temperature range. If you need to charge the batteries in temperatures exceeding this range, you should purchase an extra battery and keep it charged for the most efficient operation of the Allegro.

Power Connector
A dedicated standard external DC power input connector is located on the top of the Allegro. The connector is 5.5 x 2.1 mm, 10 to 20 V DC. The AC power adapter and optional cigarette lighter power adapter are inserted into this connector.

 < Power Connector

Charging Accessories for NiMH Battery Packs
❏ AC Power Adapter

Using the AC power adapter, the battery packis recharged without removing it from the Allegro.

Please note that you must use the adapter included with the Allegro or one that is capable of supplying adequate current (12 V at 1 Amp). Otherwise, the battery pack could be damaged.

You can run the Allegro from the adapter while the batteries are being charged. To charge the battery complete the following steps:

1) Plug the AC charging adapter into an AC outlet.

2) Insert the connector into the external power input jack located on the top of the Allegro case. It can take up to five hours to fully charge a battery pack.

3) When the batteries are fully charged, the charging circuit switches into trickle charge mode. You can leave the Allegro connected to the adapter continuously without overcharging or damaging the batteries.

❏ Vehicle Power Adapter

With this adapter, you can charge battery packs via an automobile cigarette lighter. To charge the battery, complete the following steps:

1) Plug the adapter into the cigarette lighter.

2) Insert the connector into the external power input jack located on the top of the Allegro case. It can take up to five hours to fully charge a pack. You can operate the Allegro with this adapter as well as charge the batteries.

❏ External Battery Charger

The battery pack is removed from the Allegro to be charged using the external battery charger. To charge the battery complete the following steps:

1) Place the NiMH battery adapter on the charger.

2) Slide the battery onto the charger and leave until fully charged, which can take up to five hours. Refer to the instructions that came with the charger for more details. (Details on how to remove the battery pack are located later in this chapter.)

Using Vehicle Power

It is important to have the Allegro in Vehicle Mode when it is left connected to vehicle power for periods of an hour or more, either directly or via the vehicle power adapter. Vehicle Mode prevents excessive charging of the NiMH battery pack.

Using Vehicle Mode is necessary because every time the power is cycled (the key to the vehicle is turned on) the Allegro begins a new battery charge cycle. The Allegro circuitry detects when a battery pack is fully charged, however, it takes approximately 20 minutes for this to occur.

Repeatedly attempting to charge a fully charged battery pack causes premature degradation in battery performance. In Vehicle Mode, charging is inhibited if the gauging circuitry indicates that battery pack is above 90% charged.

To put the Allegro in Vehicle Mode, complete the following steps (the default is for Vehicle Mode to be off):

1) Tap on the *Start* menu and select the *Settings|Control Panel* options, double-tap on *Power* icon. The *Power Properties* screen appears.

2) Tap on the box next to the *Select the In-Vehicle Charge Mode* option so a check mark appears. (Refer to *Chapter 4, Windows CE, Control Panel* for details).

3) Tap on *OK*.

Your Allegro is now set up fur use in vehicle power mode.

Battery Gauging Explained

The Allegro's intelligent battery gauging circuit helps you efficiently maintain the batteries for applications. The percentage of remaining charge in the batteries is indicated through the battery status LED indicators. The gauging works for both NiMH rechargeable batteries and alkaline batteries, although the mechanism is different, as outlined in this section.

❖ *Important Note: Battery gauging is provided as a tool to help you manage your batteries. It does not affect the performance of the Allegro or the batteries in any way. If the gauging circuitry is not properly synchronized with a NiMH battery, it may show erroneous readings. Please read this section on battery gauging so you understand the proper setup, functionality, and limitations of battery gauging.*

How Battery Gauging Works for the NiMH Rechargeable Battery
The Allegro employs a circuit that watches how much charge is added to or removed from the rechargeable battery.

To illustrate how this circuit works, imagine the battery as a tank of water. The battery capacity is like the size of the tank in gallons. Watching charge is like watching how many gallons of water flow into or out of the tank.

Gauging the battery is like gauging how full the tank is, without being able to see into it. You must know the size of the tank and how full it was to start with to determine the amount of water in the tank.

As water flows out of the tank, the percent full can be calculated by subtracting how much water has flowed out of the tank from the starting point and then dividing by the capacity of the tank. This is exactly what the Allegro does, except it monitors milliamp-hours of electric charge instead of gallons of water.

For the battery gauging to work correctly on the Allegro, the following values must be known about the NiMH battery pack:
- Charge percent
- Capacity

Setting the battery charge percent and capacity are both described earlier in this chapter in the *Setting Battery Charge* section.

How Battery Gauging Works When Using Alkaline Batteries
Alkaline batteries have a better slope to the voltage discharge curve than NiMH batteries. Because of this, the voltage can be read directly to gauge the battery charge percent.

The gauging may vary depending on the grade and brand of the batteries being used. For best results, we recommend that you use the new types of alkaline batteries such as the Duracell Ultra™ and Energizer Titanium™.

Temperature and loading affect alkaline battery voltage and may cause the gauging to behave differently in different environmental conditions. When moving from a cold environment to a warm one the battery charge LED indicators may actually move up instead of down.

This happens because in cold temperatures the alkaline batteries actually have less charge capacity than in warm temperatures and this is reflected in the voltage output.

Battery Status LED Indicators

There are five LEDs. Depending on which LED is lit, starting left and moving right, the battery charge remaining is as follows:

LED	Status	Indicator	Battery Charge Remaining
1	Blinking	Low Voltage	0 to 10%
1	Steady Light	Charge Flow	10% to 20%
2	"	"	20 to 40%
3	"	"	40 to 60%
4	"	"	60% to 80%
5	"	"	80% to 100%

❖ *Important Note: The LED indicators are meant to give only an approximate indication of battery charge remaining, not an exact reading.*

When the battery charge drops to 10%, the voltage begins to drop off rapidly. When the Allegro detects this low battery condition, the battery status LED indicator farthest to the left begins to blink to let you know it is time to recharge or replace the batteries.

You have from ten minutes to one hour (depending upon power consumption rate) to save your data and exit your program.

When the battery pack voltage drops sufficiently, the Allegro automatically goes into suspend mode. Charge or replace the batteries as soon as possible.

The battery pack has enough charge left to retain the system RAM for a short period of time, at which point the Allegro completely powers down to prevent damage to the batteries. If this happens, the Allegro reboots after you charge or replace the batteries. All data not saved to the disk is lost.

Charging Indicator

When the rechargeable batteries are being charged via the AC power adapter or the vehicle cigarette lighter power adapter, the LED underneath the charging indicator is lit. When the batteries are fully charged, the LED turns off. Note that when the LED turns off, the batteries continue to receive a trickle charge.

If the charging indicator LED does not light up when you plug the Allegro into a charger, the battery has a 90% or higher charge and does not need to be charged. Batteries should be discharged below 80% before they are recharged for maximum battery life.

Windows CE Battery Status Icons ➪ WᴵɴCᴇ

In addition to the LED indicators, when you are in Windows CE icons appear on the Taskbar in the system tray that indicate the battery status of the main battery and the CMOS battery.

Batteries are charging while the Allegro is being operated

Powered by the battery pack, charge is low

Powered by the battery pack, charge is very low

CMOS backup battery is low

Power Management Features

To conserve power, the Allegro has the following built-in power management features: Auto Suspend and Power Manager. These features are controlled through the *Control Panel|Power Properties* program in Windows CE and the *System Setup Program|Power Management* screen in DOS.

Auto Suspend
When the Auto Suspend feature is on, the Allegro turns itself off if there is no activity after a specified period of time. The time ranges are from five to 75 minutes in five minute increments. Auto Suspend monitors both keystrokes and processor activity.

Power Manager
The BIOS Power Manager is a sophisticated mechanism which automatically speeds up and slows down the system CPU based on the level of activity. Activities monitored include keypresses, serial port activity, changes to video memory, file system activity, and PC card activity.

When there is a high degree of activity, the system runs at a faster rate. When there is a lesser degree of activity, the system runs at a slower rate, consuming less power. If the Power Manager is enabled, the CPU Performance setting affects the range of speeds at which the CPU runs. When the Power Manager is turned off, the CPU Performance setting causes the CPU to run at a fixed clock speed.

In Windows CE, the Power Manager is built-in. In DOS, you can leave it on (default) or turn it off. Because the Power Manager can greatly extend the life of the batteries, we recommend that you run the Allegro with the Power Manager on and the CPU speed set to medium.

You can gain even more power management efficiency within your application program by following the recommended power management techniques discussed in *Section 7 and Section 8.*

Changing the NiMH Battery Pack
The battery compartment is accessed through a door in the back of the case. Before you remove an existing battery pack from the Allegro, complete the following:

1) Exit from all open programs.

2) Turn the Allegro off.

3) Push up on the sliding latches on the sides of the Allegro to open the battery compartment door.

4) Slide the battery pack towards the left side of the battery compartment and pull it out.

5) Place the new battery pack in the left side of the battery compartment, push down, and slide it all the way to the right.

6) Push the battery door closed until each release latch clicks into place.

7) Slide the release latches downward, until they cannot slide any further, to securely latch the battery door closed.

Alkaline Battery Holder: Inserting Batteries and Usage Information

The alkaline battery holder enables alkaline batteries to power the Allegro Field PC. For proper usage, complete the following steps:

1) Exit from any open programs and turn the Allegro off before changing the batteries.

2) Push up on the release latches on the sides of the Allegro to open the battery compartment door.

3) Remove the NiMH pack or alkaline holder by sliding it to the left and pulling it out.

4) Open the door to the alkaline battery holder by pressing in on both tabs with your index finger and thumb as shown below.

5) Insert three fresh AA alkaline batteries, taking care to orient them correctly (only use alkaline batteries). Always replace all three batteries at once. (Note: For best results, we recommend that you use the new types of alkaline batteries such as the Duracell Ultra™ and Energizer Titanium™.)

6) Slide the door to the alkaline holder back into place, making sure it snaps securely shut.

7) Place the alkaline battery holder in the left side of the Allegro battery compartment and slide it all the way to the right.

8) Press the battery door closed until each release latch clicks into place.

9) Slide the release latches downward until they cannot slide any further to securely latch the battery door closed.

Check the battery LED indicators from time to time. They are located above the Allegro display. When the battery power gets low, replace the alkaline batteries or insert a NiMH pack.

Important Information Regarding the Use of Alkaline Batteries
The Allegro Field PC is designed to use the rechargeable NiMH battery pack that came with the unit. The alkaline battery option should be considered as a backup to the NiMH battery pack, not as the main source of power for an extended period of time.

Alkaline batteries have a lower capacity and a higher resistance than NiMH batteries. Thus the battery life and performance of the Allegro are reduced when alkaline batteries are used. The Allegro runs as follows:

❏ The clock speed automatically switches down to a maximum speed of 33 MHz
❏ The display heater cannot be used
❏ As the batteries are drained, the Allegro automatically switches to a slower clock speed and limits the backlight intensity to further reduce power consumption and prevent the unit from turning itself off because of power demands
❏ Battery life ranges between two and eight hours (this is highly dependent on the temperature)

If you have been using alkaline batteries in the Allegro and switch to a NiMH battery pack, the clock speed and backlight brightness settings automatically return to the levels they were previous set at.

Storing the Allegro During Inactive Periods

To protect the Allegro and your files during long or short-term storage periods, please take the following precautions:

❏ Close all application programs.

❏ Run the *SaveRegistry* utility found at *Start|Programs|Utilities.*

❏ Store the Allegro in a cool location (<20°C, 68°F).

The data and programs are secure as long as they have been saved to the non-volatile solid state storage, even if the batteries become discharged. The Allegro does not depend on the battery to store the data for extended periods.

Storing the Allegro for Less Than Two Months
If you store the Allegro for less than two months, we recommend that you leave the NiMH battery pack in the Allegro and attach the AC power adapter to keep the batteries charged.

Once the battery pack is fully charged, the Allegro switches to trickle charge mode. You can leave the Allegro in trickle charge mode continuously without damaging the batteries. The battery pack will be fully charged when you are ready to use the Allegro.

❖ *Note: Do not leave the Allegro plugged into a wall outlet where the power to that outlet cycles on and off frequently. The battery can become damaged from overcharging.*

Storing the Allegro for More Than Two Months
If you store the Allegro for more than two months, perform a *SaveRegistry* command to save all data on the Allegro's internal data storage, remove the battery pack from the Allegro and attach the AC power adapter to prevent the internal lithium backup battery from draining.

When you are ready to use the Allegro, insert a battery pack and fully charge it as outlined in the beginning of the *Batteries* section. The Allegro will automatically restore the saved system and reset the time on the Allegro. You are now ready to begin using the Allegro again.

NiMH Battery Pack's Useful Life

Battery packs can be recharged approximately 600 times before they need to be replaced. This is dependent on the temperatures they have been exposed to, operating conditions, and charging and discharging practices.

Recycling the NiMH Batteries

The NiMH batteries inside the Allegro battery packs are recyclable. We are voluntarily participating in an industry program to collect and recycle these batteries when they are taken out of service in the United States or Canada.

The recycling program provides a convenient alternative to placing used NiMH batteries into the trash or the municipal waste stream. Our involvement in this program is part of our commitment to preserving our environment and conserving our natural resources.

Because most battery recycling bins available for public use do not accept NiMH batteries, you are welcome to return the spent battery packs used in the Allegro to our office and we will recycle the batteries for you. If you plan to do this, please contact us for information on how to properly package and ship the batteries.

Spare NiMH Battery Packs

Spare battery packs should be stored in a cool location. Avoid placing battery packs "contact side" down on a metal surface. Also, do not stack packs so that their contacts touch one another.

These practices will cause the batteries to drain. The shelf life of a battery pack is about two months. Before using a spare pack, you should charge it.

▲ Short-Term Backup Supply

The Allegro has a super capacitor that behaves like a backup battery. When the main batteries are removed, the capacitor maintains the RAM for up to five minutes, allowing you plenty of time to change the batteries.

The capacitor cannot operate the Allegro. The batteries charge the capacitor. It holds a charge as long as the batteries or external power are supplied. When a battery pack is replaced, the capacitor charges up to full capacity in about two minutes.

If power is not supplied to the Allegro for more than five minutes, the Allegro reboots when the battery pack is replaced or charged. All the programs, data, and applications saved to the disk are safe. Information that was not saved to the disk is lost.

The super capacitor should not need replacement through the life of the Allegro.

▲ Backup Battery, Real Time Clock

A 3.6 V lithium backup battery supplies current to the Allegro to maintain the real time clock when power is not supplied to the Allegro. This battery should last for at least five years.

Replacing the Lithium Backup Battery
If the Allegro does not hold the date and time or you get a CMOS error message, the lithium battery needs to be replaced. You can check and see whether or not the lithium battery is good or bad.

In Windows CE, go to *Control Panel|Power Properties |Battery.* Additionally, when it is low, the following icon appears in the system tray on the Windows CE Desktop .

In DOS, go to *System Setup Program|System Information Screen* to view the status of the lithium battery.

You must return your Allegro to the factory for lithium backup battery replacement.

Communication Ports

The Allegro has four communication ports:

❏ Two 9 pin serial ports (located on the top of the case)

❏ Two infrared ports ë WINCE (one on top of the case, one on the bottom)

These ports are recessed to protect them in case of a drop. They are also completely sealed.

▲ 9 Pin Serial Communication Ports

The standard 9 pin serial communication ports (COM1 and COM2) allow for the simultaneous operation of two serial devices such as printers, modems, and bar code wands. Additional power is provided on COM1 to power bar code wands and other sensors.

The data transfer rate on these ports ranges from 300 baud to 115 Kbaud. Rubber connector protectors keep dirt and moisture out of the ports. The ports are sealed without the protectors.

Be sure to use the serial communication cable (9 pin to 9 pin) included with the Allegro to connect the Allegro to a desktop PC. A wiring diagram of the cable is shown in *Section 6, Technical Reference*. Note that a standard 'straight through' serial cable will not work.

9 Pin D Connector Pinouts

Pin #

1	Data Carrier Detect (DCD) Input
2	Receive Data (RCD) Input
3	Transmit Data (TXD) Output
4	Data Terminal Ready (DTR) Output
5	Ground (GND)
6	Data Set Ready (DSR) Input
7	Request To Send (RTS) Output
8	Clear To Send (CTS) Input
9	Ring Indicator (RI) Input

Connecting Sensors to COM1

Pin 4 (DTR) on COM1 supplies up to 200 mA at +5 volts to power bar code scanners and other sensors. This signal (DTR) must be set high by the application to take advantage of this feature. When the DTR signal goes low, the output is -5 volts. Insure that the device connected to the DTR line can accept negative voltages or is protected against them (standard RS-232 signal levels).

▲ Infrared Communication Port ⇨ WIN CE

The infrared wireless communication port (IrDA) located on the top of the Allegro case allows you to send data to a printer or another computer with an IrDA port without the need for a cable. The IrDA port adheres to the Infrared Data Association Standards. The communication speed is 115 kbps.

< IrDA Port

The IrDA port is used to connect the Allegro and a desktop or laptop computer together to run ActiveSync, which allows you to transfer and copy files between the computers and manage the Allegro files remotely.

Files can be sent from the Allegro directly to a printer with an IrDA port from programs that have printing capabilities built-in, such as Pocket Word.

The IrDA port on the bottom of the case is for use with an optional docking cradle.

Setting up Communication

In Windows CE, the communication port is set up from the *Control Panel/Communication Properties.* In DOS, use the FileScout <F5> Transfer function. For details about setting up communication between the Allegro and another computer or device, refer to *Section 4, Windows CE Operating System, Windows CE File Transfer Programs* or *Section 5, DOS Operating System, Setting up Communication.*

The Allegro and the other device communicating with it via an IrDA port need to be placed less than one meter apart with their infrared ports aimed right at each other (within 15 degrees in any direction).

PC Card Slot

The Allegro has a user-accessible PC Card Slot (PCMCIA 2.0 Type II) that allows you to add mass data storage and I/O capabilities to your Allegro. The PC card drivers and utilities are factory-installed on the Allegro. These programs provide the card and socket services necessary to operate the card. In Windows CE, an installed PC card is designated as a folder called *PC Card* in *My Computer*. In DOS, the PC card is the D: drive.

▲ Types of PC Cards Accepted

The PC card slot accepts Type I or Type II cards. These cards include ATA Flash cards, SRAM (Static Random Access Memory), Compact Flash cards, or Input/Output cards. All types have a **68 pin** connector for attachment to the Allegro. The cards must be 5 V or 5 V/3 V (PC cards that are 3 V only are not supported). The PC card slot is a 16 bit card slot. It is not a "card bus" slot.

Memory Cards

A memory card is a solid state, self-contained memory board housed in a credit card-sized package. There are several types and brands of cards on the market. These cards behave like hard disks. Refer to *Section 3, Program and Data Storage Options*, for more details.

Input/Output Device Cards

Input/Output Device cards can provide additional communication capabilities to your Allegro. Common I/O cards include fax/modem and network cards. Refer to the manufacturer's instructions for information on how to use these cards and for information about hardware or software accessories that may be required. Contact our sales department for information on compatible cards and technical information about the installation and operation of the cards.

▲ Inserting and Changing Cards

1) ATA cards should be ready to use. If you are using an SRAM card, make sure the battery is installed (if required) and that the card has been formatted.

2) Turn the Allegro off and place it facedown on a clean surface.

3) The card slot is located in the top part of the Allegro behind the display. It is accessed from behind through the PC card slot door.

There are two screws holding the door in place. Turn each screw counter-clockwise l/4 of a turn to release the door.

4) PC cards have a 68 pin socket on one end. Insert the card socket-first. The front of the card should be facing the door.

❖ *Important Note: Be careful when inserting and removing cards. Excess force could damage the card and the card drive. If the LED indicator for the PC card slot (farthest right) is blinking, the computer is writing to the card. Do not turn off the Allegro and remove the card until the LED stops blinking. Incomplete files can corrupt the data already stored on the card.*

5) To remove a card, push the eject button, grasp the card firmly, and pull it out.

6) Close the door to the PC card slot. Turn both screws clockwise l/4 of a turn to seal the compartment.

▲ Displaying Information About the PC Card

You can display information about the installed PC card such as the card type and the name of the manufacturer. In Windows CE go to *Control Panel|System Properties|General* to view this information. In DOS, use the CARDINFO utility. From the DOS prompt type: CARDINFO and press <ENTER>.

The following information is displayed:
       Slot 1:
       [Card Information]
   Card Type = "ATA Disk" (Drive D:)
       Manufacturer = <Vendor Name>
       Product Name = <Vendor Product Name>

Sound Generator

The Allegro has the ability to produce basic computer sounds such as beeps and clicks. A secondary processor generates the key press and screen tap sounds to reduce power consumption.

The sound properties for key presses and screen taps can be adjusted in the *Control Panel | Volume and Sounds* in Windows CE (as shown below) or the *System Setup Program | Keyboard | Display Screen* in DOS. Note that the tone of key presses and screen taps can be adjusted, but the volume cannot.
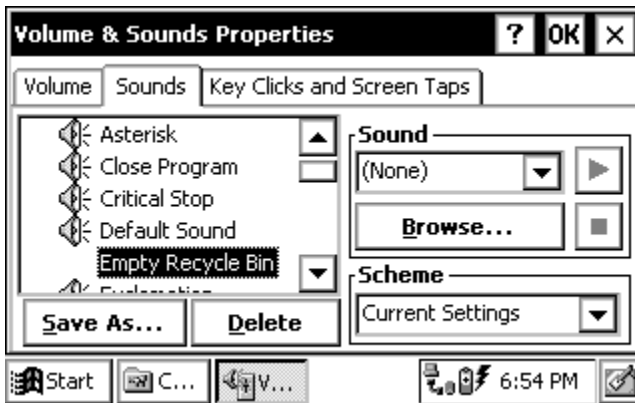
WAV files can be played to produce any audio sound ⇨ WIN CE. The volume of WAV files can be controlled.

Expansion Pods

Custom expansion pods allow you to integrate additional components as they become available. Options include an RF network, animal ID reader, bar code scanner, GPS receiver (shown below), parallel port, and analog sensor input. Call our Sales Department for information about the availability of these expansion pods.

Expansion pods replace the PC card door. The Allegro remains sealed when an expansion pod is installed.

Section 3

Memory Configuration and Data Storage Options

Internal Memory

Program and Data Storage Options

Internal Memory

The Allegro's internal memory is configured much like the memory in laptop computers. It consists of ROM (Read Only Memory) and RAM (Random Access Memory).

▲ Read Only Memory (ROM)

ROM is used to store the Operating Systems, BIOS, and Utility programs. The files on the A: drive of the Allegro are located in the ROM. Information in the ROM is electronically "burned" into a chip before the chip is installed at the factory. Information stored in ROM can be read or copied. It can only be altered with a special utility program provided by the factory. The information stored in ROM remains intact whether the system power is on or off.

▲ Random Access Memory (RAM)

The Allegro has 16 or 32 M (megabytes) of internal RAM. Often referred to as the computer's workspace, RAM is where programs are executed or run. RAM can be written to, read from, erased, etc. Its storage ability is temporary in nature, only holding information while the system has power (although the Allegro does not have to be turned on). If the battery pack is drained or power is interrupted for any reason, everything stored in RAM is lost. The backup capacitor saves the contents of RAM for a limited time while you change the battery pack (see *Section 2, Batteries*, for details). You can use the Save Registry utility to save the RAM file system and registry. Refer to *Section 4, Windows CE, Save Registry Utility.*

When you boot to Windows CE, part of the RAM is used to store the Operating System. To see how much RAM is available for your use, tap on *Start* and select *Settings | Control Panel | System Properties | Memory.* Subtract the *In Use* figures from the *Allocated* figures. From this screen you can adjust the amount of RAM that is allocated for storage memory versus program memory. The majority of RAM should be allocated to program memory to provide adequate program execution space.

If you try to save a file that is too large for the amount of RAM that has been allocated to storage memory or run a program that requires more execution space than you have allocated to program memory, an error message is displayed.

In DOS, all but a small portion of the 16M or 32M of RAM is available.

Program and Data Storage Options

The Allegro has two options for storing programs and data: a solid state hard disk and a PC card slot for memory cards.

▲ Storage Designations

➪ WIN CE

In Windows CE, double-tap on *My Computer*. The data storage options are designated as follows.

Folder	Type of Storage
C_Drive	Solid State Hard Disk
PC Card (shown only if a card is installed)	PC Card
My Document	RAM
Program Files	RAM

We recommend you use the solid state hard disk as your primary storage area because it is non-volatile and information is retained without power. (ATA Flash cards are also non-volatile.)

➪ DOS

The solid state disk and PC memory cards are accessed by typing in their drive assignment letters at the DOS prompt as follows:

Drive	Type of Storage
C:	Solid State Hard Disk
D:	PC Card

▲ Solid State Hard Disk

The Allegro has a 24 M solid state hard disk used to store programs and data. It can be read from and written to just like the hard disk on a PC. The hard disk is non-volatile so information stored on it is retained even when no power is supplied to the Allegro.

Some utility files and drivers are factory installed on the C: drive including: AUTOEXEC.BAT, CONFIG.SYS, Text Editor, PC Card Drivers, and MS-DOS Commands. To see a complete list of these files, refer to *Section 7, Technical Reference.*

▲ PC Cards

The Allegro has a user-accessible PC card slot (PCMCIA 2.0 Type II) that allows you to add mass data storage to your Allegro with PC cards.

PCMCIA stands for the "Personal Computer Memory Card International Association." This association has developed standards for PC cards. PC cards are about the size of a credit card and come in three thicknesses or types.
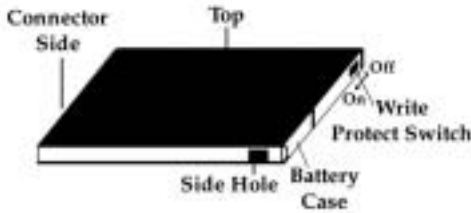
The PC card slot accepts Type I or Type II cards. These cards include ATA Flash cards, SRAM (Static Random Access Memory), and Compact Flash cards. All types of cards have a 68 pin connector for attachment to the Allegro. The cards must be 5 V or 5 V/3 V (PC cards that are 3 V only are not supported). This is a 16 bit card slot. It is not a "card bus" slot.

A PC memory card is a solid state, self-contained memory board housed in a credit card-sized package. These cards behave like hard disks. You can read from them, write to them, and erase single files from them. There are several types and brands of cards available.

ATA Flash Cards

ATA Flash cards provide solid state data storage. Power is not required to maintain the data. Because of this feature, we recommend them over other types of memory cards. The Allegro accepts cards ranging in size from 1 M to 100 M.

Formatting ATA Flash Cards
ATA Flash cards come pre-formatted. If you need to format a card, enter the following command into the Allegro from the DOS prompt: Format D: /u

❖ *Warning: Formatting the ATA Flash card deletes everything previously stored on the card. For more information on using FORMAT, refer to the MS-DOS Help.*

SRAM Cards

Power
SRAM cards are powered by the Allegro while installed in the PC card slot. An on-board battery retains data when the card is not being powered by the Allegro. Some brands have a replaceable lithium battery (coin type). If you have this type, make sure that the battery is installed before attempting to use the card. Other brands have a rechargeable battery that is automatically recharged while it is inside the Allegro. The rechargeable batteries are not replaceable.

The life of these batteries varies greatly depending on usage and the memory size of the card. If the lithium battery is drained, the information stored on the card is lost. When a new battery is installed, the card needs to be formatted. The manufacturer's instructions that came with the card should include information on battery life and recommended changing intervals.

Replacing SRAM Card Batteries
SRAM card batteries are readily available at most stores. Unless the manufacturer's instructions state otherwise, we recommend that you change the battery every six months.

Formatting SRAM Cards
SRAM cards come pre-formatted. Files and directories can be copied onto it just like a standard disk drive. If you need to format a card, enter the following command into the Allegro from the DOS prompt:

> Format D:

❖ *Warning: Formatting the SRAM card will delete everything previously stored on the card. For more information on using FORMAT, refer to the MS-DOS Help.*

Inserting and Removing Cards

For details on how to access the PC card slot and insert and remove cards, refer to *Section 2, Hardware Components, PC Card Slot.*

Section 4

Windows CE Operating System

Windows CE Overview

This section describes the operation of the Allegro using Microsoft™ Windows™ CE, a new operating system that has a similar look and feel to Windows 98/NT. Windows CE is designed for small, portable hand-held computers like the Allegro. Windows CE gives the Allegro the ability to communicate and share information with Windows-based computers and the internet using ActiveSync. (Note: The Allegro communicates with Windows-based computers in DOS also.)

❏ Windows CE offers the following advantages:
❏ Compact operating system and application file sizes
❏ Advanced power management
❏ Communication flexibility
❏ Graphic user interface similar to Windows 98/NT
❏ Packaged programs, including PTab Spreadsheet, Pocket Word, and Internet Explorer
❏ Multiple applications can run simultaneously

Windows CE has the same Windows interface you are familiar with if you have used Windows 95/98/NT. You will find that you already have much of the knowledge you need to use Windows CE 3.0 effectively. This section of the manual was written with the assumption that you have a working knowledge of Windows.

▲ Starting Windows CE

When you first turn the Allegro on, it boots to Windows CE. It takes a minute for the Desktop to appear and remain on the display. Various screens appear during the boot process that do not require any action. If you have installed a PC card, you are asked whether or not you want to run the card on battery power. Tap on *Yes* or *No*.

PC card detected

Answer YES to use this card now.

Answering NO will disable the PC card. Battery life can be extended if the PC card is disabled.

To enable the PC card remove and re-insert it.

Yes   No

In Windows CE version 3.0 you receive an error message if the registry was not restored.

The Windows CE Desktop appears on the screen:

———————————————————————————————

Recycle Bin   Microsoft   PCLink   PTab
Pocket Word

My Computer   My Documents   C_MyDocs

Start   11:29 AM
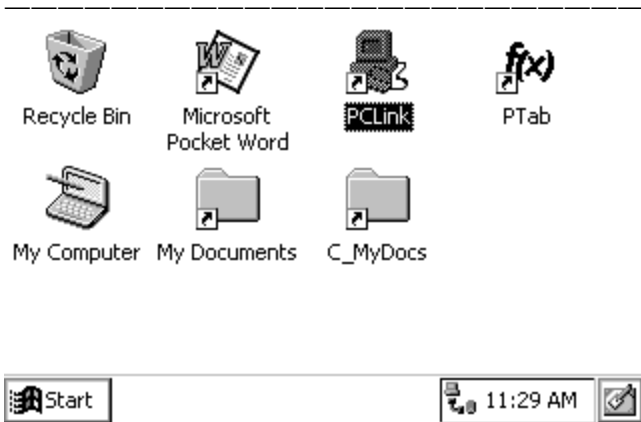
Suspend/Resume Mode

If you press the On∕Off key when you are in Windows CE, the Allegro goes into suspend mode. When you turn it back on, it resumes in the same place it left off before you turned it off. For example, if a PTab spreadsheet file was on the screen when you turned the Allegro off, the same spreadsheet screen appears when you turn the Allegro back on. (If the batteries are drained or left off of the Allegro for more than 5 minutes, the Allegro reboots instead of resuming. Refer to *Section 2, Hardware Features, Batteries* for details.)

Moving Between Windows CE and DOS

If you want to boot to DOS from Windows CE, tap the Start button and select *Programs∕Boot to DOS*. To return to Windows CE, type WCE from the DOS command prompt and press <ENTER>.

▲ Display Touchscreen

The display has a touchscreen used to activate programs in Windows CE and to make selections. The touchscreen works similar to a mouse.

Two styli are provided: a small onboard stylus that snaps into a holding bay built into the top of the case and a full size pen-type stylus. Other pointed objects can be used, including a finger. Take care not to use a device that will scratch the screen.

Calibration

To calibrate the touchscreen and set up the screen-tap sensitivity, refer to *Windows CE, Control Panel, Stylus* later in this section. If you have trouble selecting an item when you tap on it, the touchscreen may need to be calibrated.

Touchscreen Operation

Use the following techniques to operate the touchscreen:
- Touch the screen at the desired location, much as you would point and click with a mouse.
- Tap on the screen once to achieve a single click or twice to achieve a double click.
- Hold down the <Alt> key and tap on the screen to accomplish a right mouse click.
- Drag and drop items by touching and holding the item on the screen, dragging the stylus to the desired location, and removing the pointing device from the screen.

Wiping Off the Touchscreen

When the touchscreen gets wet or dirty or you want to wipe fingerprints off of it, your natural inclination may be to wipe across the display with the sleeve of your shirt or your hand. If you do this while the Allegro is running in Windows CE, you will inadvertently press items on the

screen as you move across it. To avoid this problem, the Allegro is equipped with a special *Touchscreen Disable/Enable key* described below.

The unique *Touchscreen Disable/Enable key* allows you to temporarily disable the touchscreen and wipe it off without inadvertently making selections on the screen. Press the BLUE shift key and the <TS> key to disable the screen. The contents of the display are still shown, but nothing happens if you press on the touchscreen.

Ideally, you should use a clean cotton cloth to gently wipe off the screen. Do not use anything abrasive that could scratch the screen, including tissues and paper towels. (In the field, the tail of your shirt will do, as long as it is made of a non-abrasive fabric!) Once the screen has been cleaned, use the same key sequence to enable the touchscreen. Refer to *Section 2, Hardware, Display* for more details.

▲ Windows CE Programs

Desktop PC Programs

The CD-ROM's include the following programs for your PC:

❏ Windows ActiveSync® (on the Microsoft ActiveSync CD-ROM)

❏ PTab® File Converter (on the Allegro Utilities CD-ROM)

❏ Software Development Kits for Visual Basic® and Visual C++[a] (on the Allegro Utilities CD-ROM)

Software Suite

A set of Windows CE programs are factory installed on the Allegro. The following programs are included:

❏ PTab™ Spreadsheet Program

❏ Explorer™ File Manager

❏ Inbox™ Email Utility

❏ Pocket Internet Explorer ™

❏ Pocket Word™

❏ Calculator

❏ Terminal Program

Copies of the Windows CE programs are included on the Allegro Utilities CD-ROM. Each program is described in detail in this section of the manual.

▲ **Desktop**

When you turn the Allegro on, a Desktop similar to the example shown below appears on the screen. The Desktop looks and operates much like the Windows 95/98/NT Desktop. Program icons and shortcuts are displayed. Tap on an icon twice to execute it.
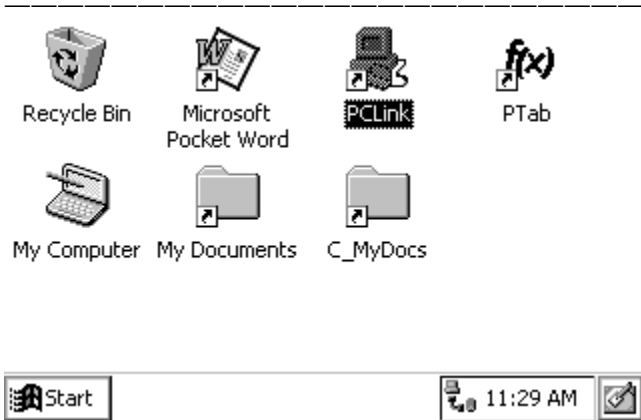
Desktop

At the bottom of the screen is the Taskbar, which includes: the Start button, buttons for all the active applications, the system tray, and the Desktop icon.

Start button   Active Application Buttons   System Tray   Desktop Icon

Start Menu
Tap the *Start* button to view the menu as shown below:

From the menu, tap on the category you want to select. You can also use the up and down arrow keys to make a selection and press <ENTER>. A secondary menu or dialog box appears.

Application Buttons
The Taskbar shows which applications are currently running and can be used to select an active application. Tap an application's button on the Taskbar to maximize it. Tap it a second time to minimize it.

System Tray
Using icons, the system tray gives you the following information:

1) Communication status (if the Allegro is communicating with another PC)
2) Power source (battery pack or external power)
3) Battery pack charge status
4) CMOS backup battery status
5) Current time

Double-tap an item in the status area to bring up the associated Control Panel setup screen. For example, if you double-tap on the time, the Control Panel "Date/Time Properties" screen is shown.

The standard system tray icons are described below (other icons may be put in the system tray by specific applications):

Communication set up with desktop PC via direct connection

Communication set up with desktop PC via telephone modem

Running on AC power, batteries are fully charged or removed

Batteries are charging while the Allegro is being operated

Powered by the battery pack, charge is low

Powered by the battery pack, charge is very low

CMOS backup battery is low

Desktop Icon
Tap the Desktop icon to minimize all running applications and display the Desktop. Tap it again to return to the screen you were previously viewing.

▲ Special Functions

Keyboard functions have been provided that allow you to bring up the Start menu and change applications without using the touchscreen. These functions can speed up operation in some situations and come in handy when the taskbar has been minimized.

Start Menu

Press the BLUE shift key and the <Start> key to view the Windows CE Start Menu. Use the arrow keys to move up and down the menu. Press the <Enter> key to make your selection.

Task Manager (Switcher)

Press the <Start> key to view the Task Manager. All of the programs that are currently running are shown. Select the program you want to run by using the up and down arrow keys to highlight the desired program and pressing <Enter>. You can also close applications from the Task Manager.

Performing a Warm Reboot into Windows CE

A warm reboot saves the registry and data stored in RAM before restarting the Allegro. This is useful when you are asked to reboot the Allegro after installing or a program. To perform a warm reboot in Windows CE, tap on the Start button, select *Programs | Utilities | Reboot CE*.

Performing a Hard Reboot

The hard boot restarts the Allegro. The registry and any data that were not saved to disk are lost. To perform a hard reboot press the <On/Off> button and hold it for 8 seconds. The Allegro restarts in the operating system it was running in before the reboot. You should only perform a hard reboot when your operating system locks up.

▲ Online Help

For online help with Windows CE basics or with a specific application, tap the Start button and select *Help*. Select a topic from the Help Contents list. You can also tap the [?] button from within an application to obtain program specific or Windows CE help.

▲ Control Panel

The Control Panel consists of a group of programs that control different aspects of Windows CE. Each program has settings that you can change, allowing you to customize your Allegro. To open the Control Panel, tap the Start button and select *Settings/Control Panel*. A Control Panel screen similar to the one shown below appears. Double-tap on the application you want to view.
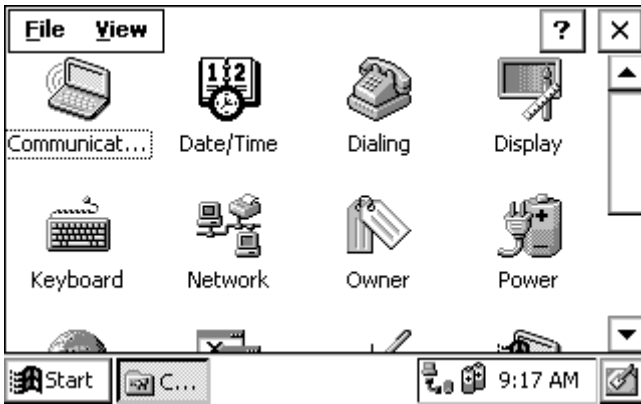
❖ *Important Note: You must press the "OK" button when you change settings in a Control Panel for the settings to be saved. Once the Control Panel programs are set up the way you want them, run the Save Registry utility (described later in this section of the manual).*

Communications

The Communications Properties program allows you to set options for establishing a connection between the Allegro and a desktop PC.
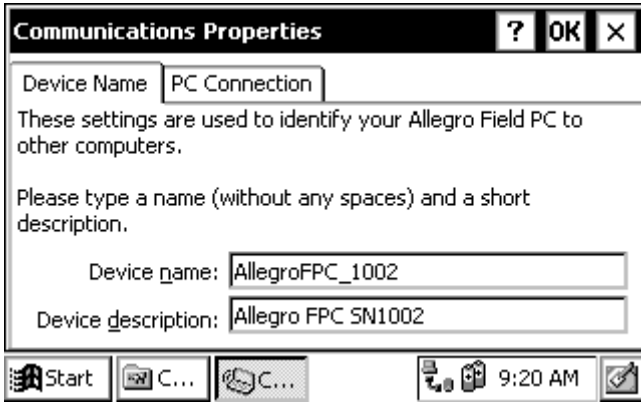
Specify a name and description for the Allegro on the *Device Name* tab. Others computers can identify a particular unit with this information.

On the *PC Connection* tab, select "Connect to desktop computer when attached" if you want to communicate with a desktop computer. You have the option to change the port and baud rate you are using to communicate with another computer on this tab (the default is COM1 at 115K baud). Tap on the *Change* button for a pull-down list of options.
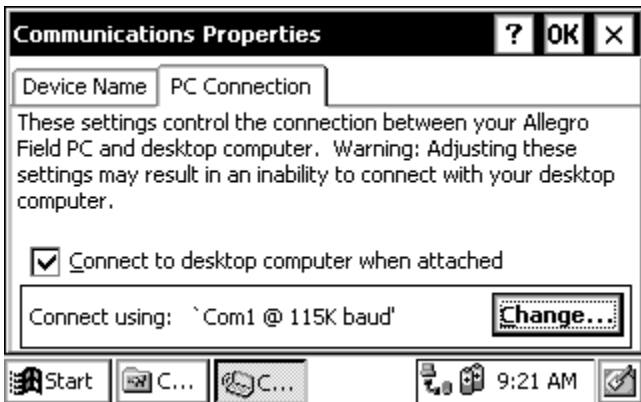
Date/Time

The Date/Time program is used to set the current date, time and time zone.
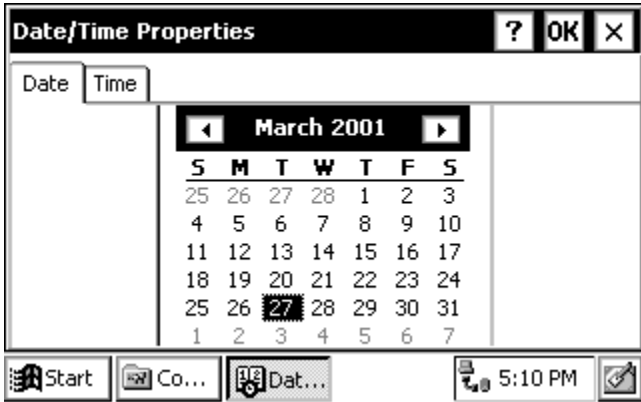
Dialing

The Dialing program is used to create dialing locations and set dialing options for connecting to a service provider or remote computer.
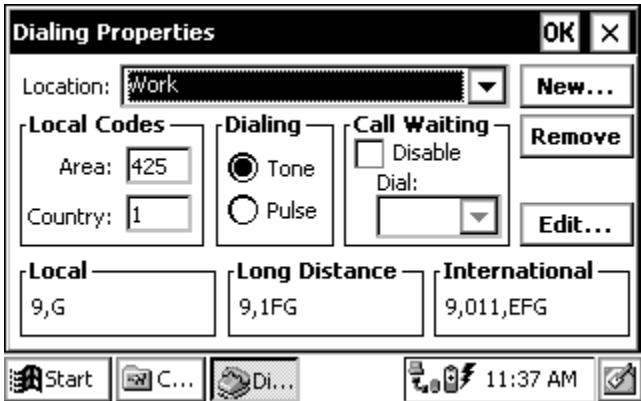
Display

The Display program allows you to change the appearance of your
Windows CE desktop. The *Background* tab gives you desktop
background image options (the default is "None").
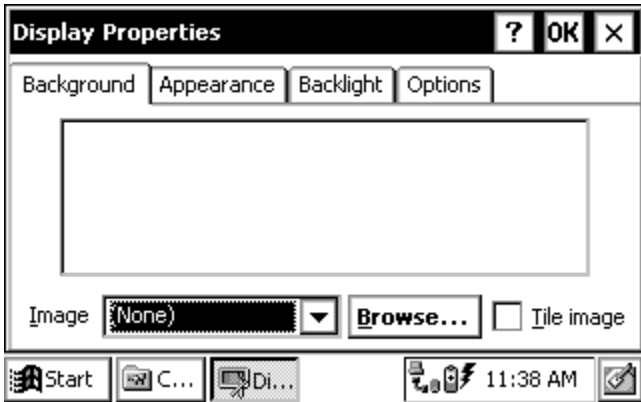
The *Appearance* tab allows you to change the color scheme of the display
contents (the default is "High Contrast White"). Windows Standard and
High Contrast Black and are also recommended. Options such as
Eggplant appear as various shades of gray. As you make an appearance
selection, the change is shown on the left side of the screen, allowing
you to view it before you apply your selection. You can customize the
display by clicking on an element shown on the left, Window Text for
example, or selecting it from the pull down list shown on the lower
right. Above the pull down list the default color for your selection is
shown in a box labeled "Item." Tap in the box and a palette with the
available shades of gray appears.
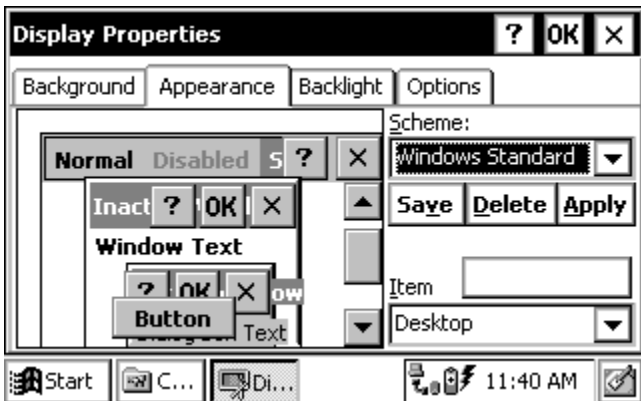
The *Backlight* tab allows you to select the length of time you want the backlight to remain on while the Allegro is in an idle state and to set the brightness of the backlight.

Display Properties ? OK ×

| Background | Appearance | Backlight | Options |

☑ Automatically turn off while on battery power.
Turn off after [1 minute ▼] of continuous idle time.
☑ Automatically turn off while on external power.
Turn off after [10 minutes ▼] of continuous idle time.

Dim   Brightness Adjustment   Bright

🏁Start | Co... | Dis... | 5:13 PM
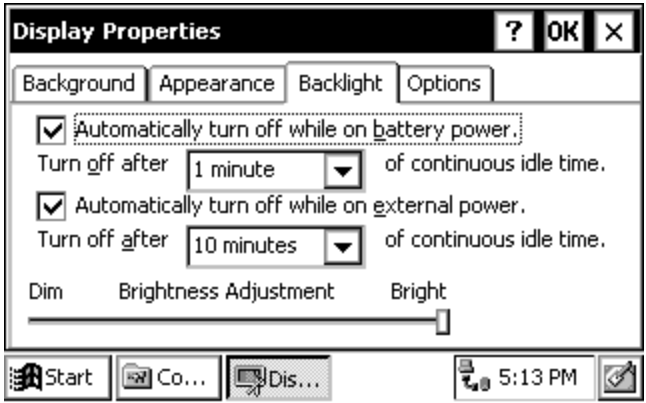
The *Options* tab is used to: 1) select the brightness of the LED indicators; 2) turn the display heater *Off* (*Auto*, the default, turns the heater on automatically when the temperature is -3° C or less); and 3) adjust the display contrast.

❖ *Note: If you are using alkaline batteries, the display heater cannot be used. The Auto option is not available.*

Display Properties ? OK ×

| Background | Appearance | Backlight | Options |

LED Indicators
○ Bright
○ Medium
● Dim

Display Heater
● Auto
○ Off

Light   Contrast Adjustment   Dark

🏁Start | C... | Di... | 11:41 AM
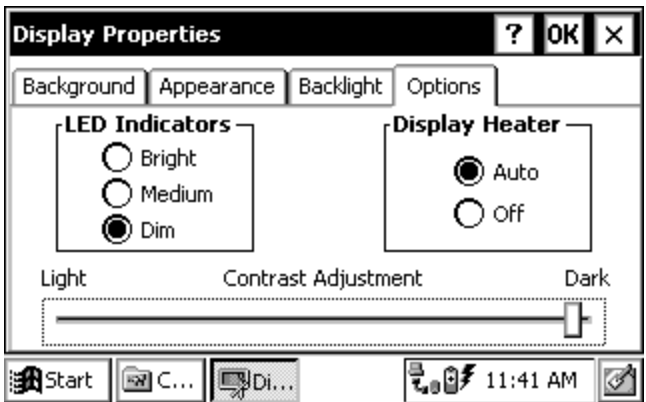
Keyboard

The Keyboard Properties *Repeat* tab is used to enable or disable character repeat and set the repeat delay and repeat rate when you hold down a key on your Allegro Field PC keyboard.
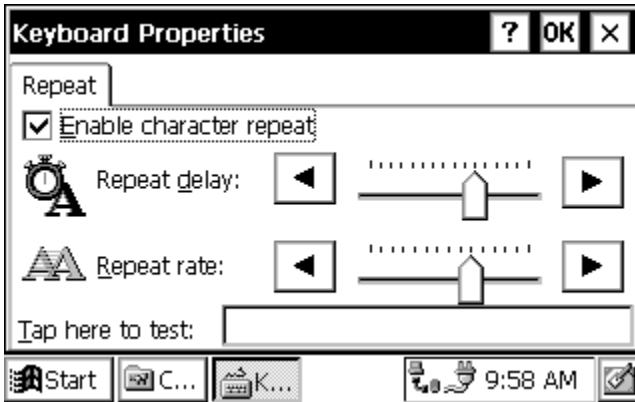
Network

The Network Configuration program lists the network drivers that are installed on your device and allows you to change driver settings on the *Adapters* tab. The *Identification* tab allows you to type in your user name and password for connecting to a network.
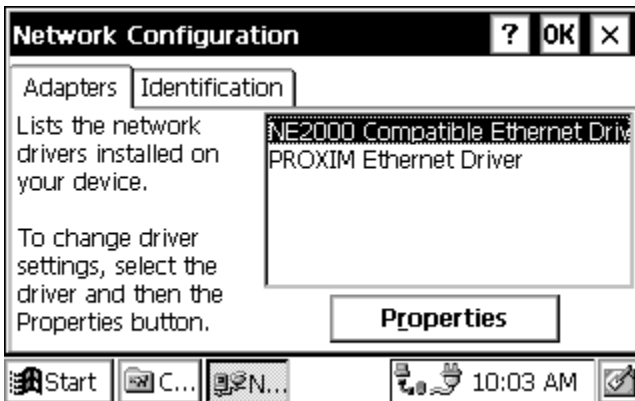
Owner

The Owner Properties program *Identification* tab allows you to specify personal information, such as your name, address, and phone number.
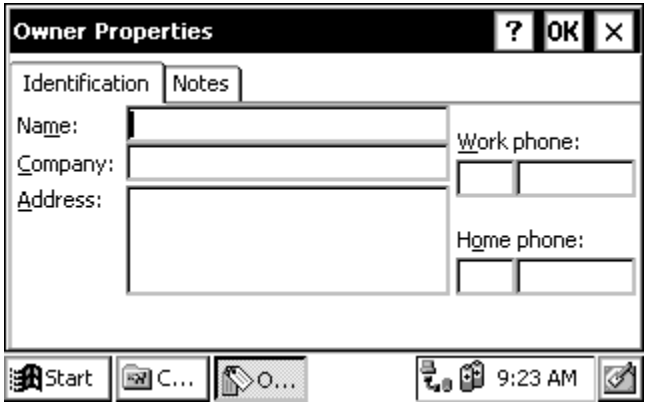
The *Notes* tab provides a place to add any additional information that is not included in the *Identification* tab.

Power

The Power program shows information about the condition of your batteries. The *Battery* tab shows the status of your main battery and the CMOS lithium battery that maintains the real time clock when power is not supplied to the Allegro.
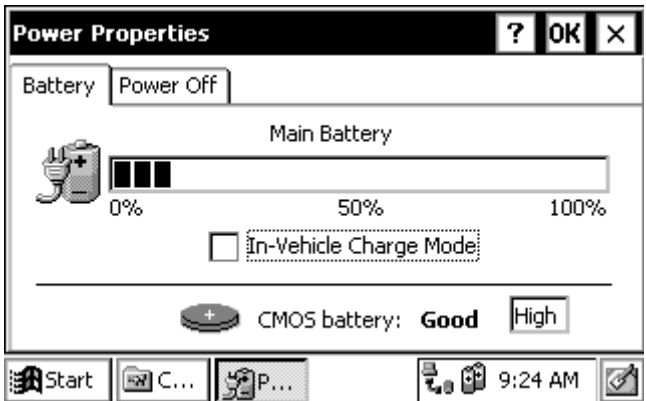
The *Power Off* tab allows you to specify how much time will pass before the Allegro goes into suspend mode. You can also have it suspend while it is running on external power.
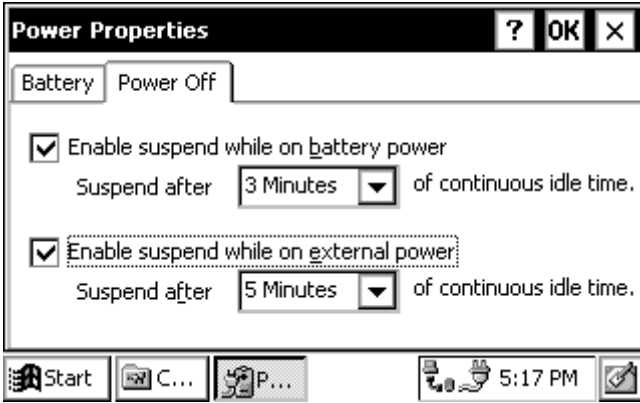
Regional Settings

Changes made in the Regional Settings program mainly affect programs that support international settings. In this program, you can change the way these programs display and sort dates, times, currency, and numbers.
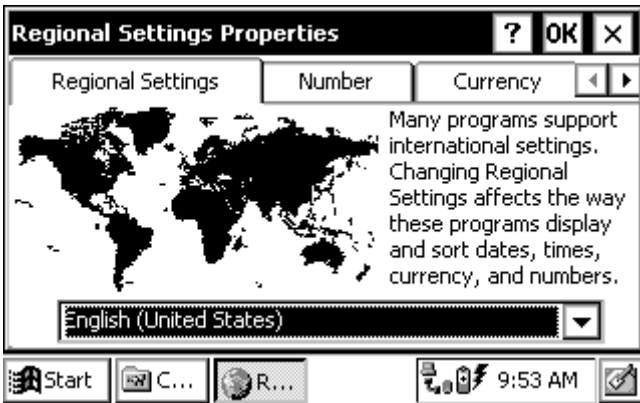
Remove Programs

This program allows you to remove programs that you have installed on the Allegro. You cannot remove programs that were factory installed, such as Pocket Word, using *Remove Programs*.
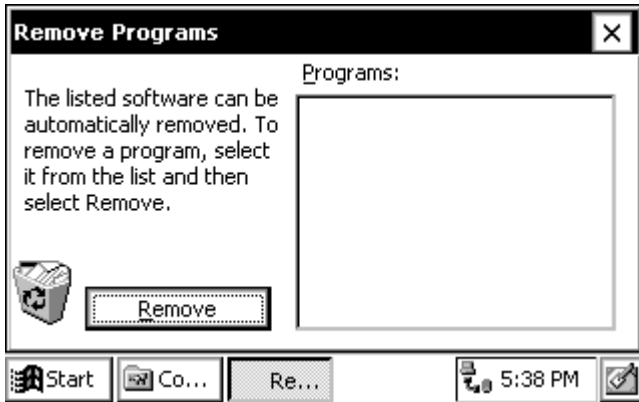
Stylus

The Stylus Properties program, *Double-Tap* tab, is used to set and test the double-tap sensitivity for both speed and physical distance between taps.
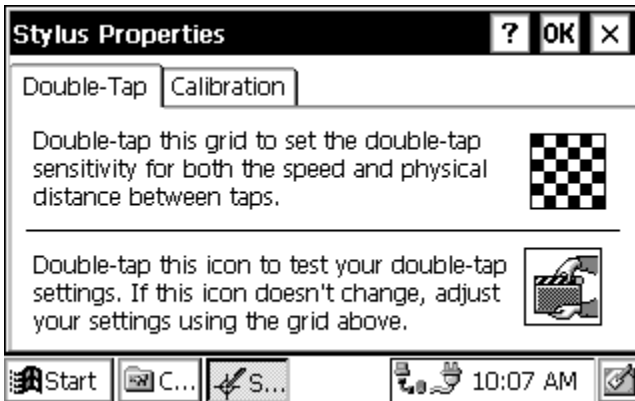
From the *Calibration* tab, the touchscreen is recalibrated. If you have trouble selecting an item when you tap on it, the touchscreen may need to be recalibrated.

System

The System Properties program displays general information about the hardware and software configurations for your Field PC. The *General* tab gives you system information including the processor type, etc. (The sample screen shown below is for an Allegro with 16 M of RAM).
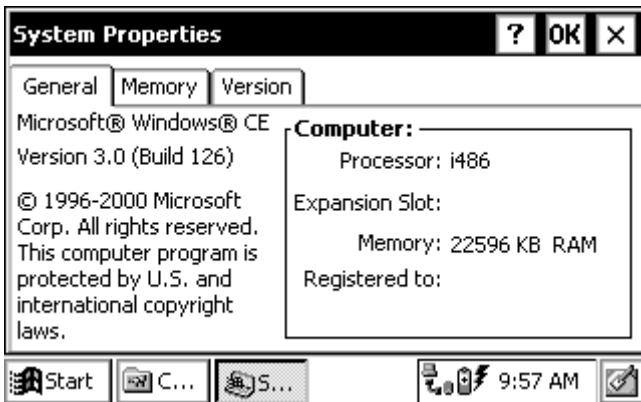
The *Memory* tab allows you to adjust the allocation of RAM between program memory and storage memory. The majority of RAM should be allocated to program memory so that your applications have

plenty of execution space. You can figure out how much RAM is available to use by subtracting the *In Use* figure from the *Allocated* figure. (The sample screen shown below is for an Allegro with 16 M of RAM).
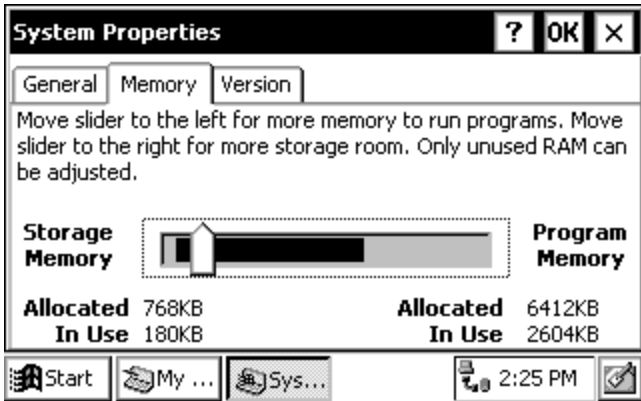
The *Version* tab displays the Allegro system version numbers and the release date.

Volume and Sounds

The Volume & Sounds Properties program, *Volume* tab, is used to adjust the speaker volume and turn on and off the sounds associated with different system events.
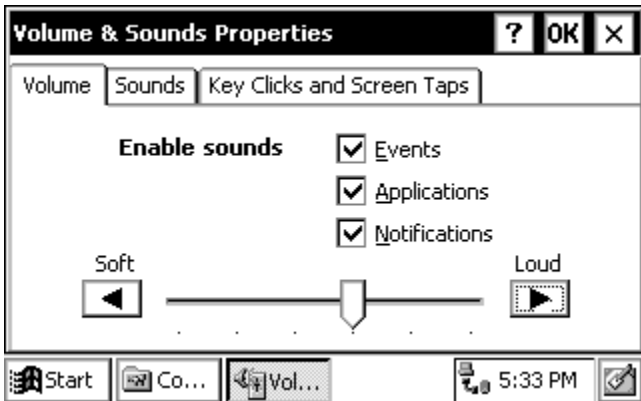
From the *Sounds* tab, you can associate a sound with an action. The actions are listed on the left. Those that have sounds associated with them have a speaker icon next to them (like Asterisk in the screen shown below). To edit, add, or listen to a sound, make a selection from the list on the left. The name of your selection is shown in the *Sound* box if a sound is already associated with it. Otherwise, it says (None). Select *Browse* to find and select the desired sound WAV file that you want to associate with the selected action. To listen to the new sound (or an existing sound), press the left arrow button next to the *Sound* box. Changes you make can be saved as a new sound *Scheme* or you can choose an existing sound scheme from the drop down list.
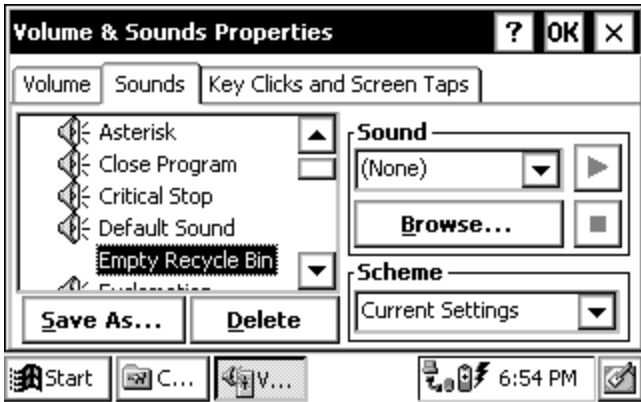
The *Key Clicks and Screen Taps* tab allows you to turn these sounds off or adjust the frequency of the tones. Note: adjusting the tone frequency does not change the volume.
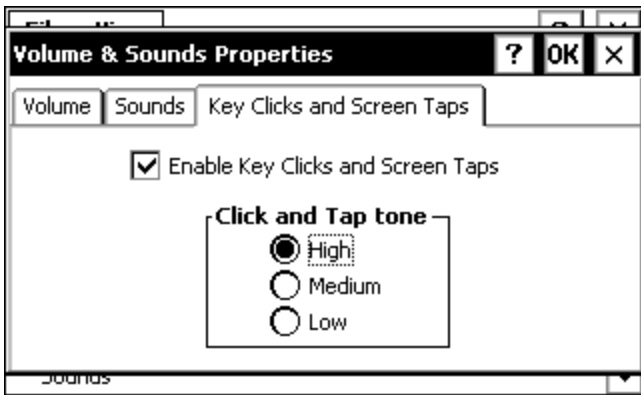
ActiveSync Transfer Program

Instructions on establishing communication between the Allegro and a desktop PC using ActiveSync, and synchronizing files are described in this section.

Microsoft ActiveSync® program runs on your desktop PC, allowing you to:

- Transfer and copy files between your desktop PC and the Allegro
- Manage the files on the Allegro remotely from your desktop PC
- Synchronize saved files between your desktop PC and Allegro

Obtain ActiveSync in one of the following ways:
1) Download the program from Microsoft's web site free of charge.

2) Purchase a CD-ROM of ActiveSync from Juniper Systems.

We recommend downloading ActiveSync from the Internet, to ensure you have the most recent version. Typing in ActiveSync in the search engine at the Microsoft web site will help you fine the most recent version of ActiveSync available. This is a large file and a minimum of a DSL or cable modem Internet connection is highly suggested. If you only have a 56K dial-up modem connection, the downloading process takes a couple of hours.

Install ActiveSync on your desktop PC first, before installing any of the programs on the Allegro CE Utilities CD-ROM. The installation process is the same regardless of whether you download it from the Internet or install it from the CD-ROM.

❖ *Note: Depending on which Microsoft applications you have installed on your desktop PC and whether or not you have previously downloaded ActiveSync, the screens you see during installation could vary from those described in this section. Carefully read and follow the directions given to you from the ActiveSync installation program.*

▲ Downloading ActiveSync from the Internet

To download ActiveSync from Microsoft's Internet site, start with the web address below and complete the following steps:

http://www.microsoft.com/mobile/pocketpc/downloads

1) Select *ActiveSync* from the *Microsoft Downloads* list.

2) The first screen asks you to select a language to view the download instructions.

3) Once you select a language, the Microsoft End-User's License Agreement is shown. If you agree to the terms of the agreement, click on the *I Accept >>* button located at the end of the agreement.

4) The *Download ActiveSync* screen is shown. You must have Internet Explorer 4.01 or later to install. Read the instructions and press the *Download Now* button.

5) Follow the instructions given to you by the ActiveSync Setup program.

❖ *Note: Periodically check with Microsoft's web site for updates to ActiveSync.*

▲ Installing ActiveSync

To install ActiveSync on your PC, complete the following steps:

1) Open the downloaded copy of ActiveSync or insert your Microsoft ActiveSync CD into your PC's CD-ROM drive and select the *Install ActiveSync* option. The following screen is shown:

2) Click on the *Next* button and follow the instructions given to you by the ActiveSync Setup program. When ActiveSync is installed the following screen appears:

3) Click on the *Cancel* button on the "Get Connected" screen so you can continue to set up the communication settings. The following screen appears:
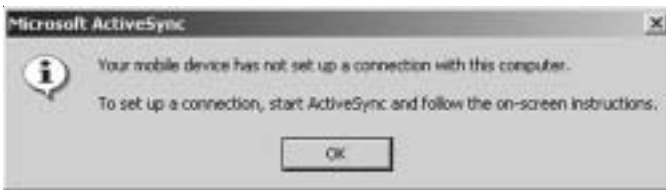
4) Click on the *OK* button.

❖ *Note: If you have problems connecting, restart your desktop PC before completing the connection process.*

▲ Establishing ActiveSync Connection the First Time

There are two procedures for establishing a connection between the Allegro and your desktop PC. The first is the initial ActiveSync connection and the second is for all connections after the first one.

If you have just downloaded and installed ActiveSync then complete the following steps. If you already have ActiveSync installed proceed to *Establishing Additional ActiveSync Connections* section found later in this chapter.

The Allegro CE has three communication ports available for establishing an ActiveSync connection between the Allegro and desktop PC. The communication ports available are:

COM 1 and 2

Infrared

ActiveSync COM 1 or 2 Connection
When establishing a COM 1 or 2 connection between the Allegro and your desktop PC for the first time, complete the following steps, all additional connections can be made by following the steps in the *ActiveSync Connection Process* section found later in this chapter.

1) Using COM 1 or 2, attach one end of the serial communication cable to the COM port on your desktop PC and plug the other end of the communication cable into COM 1 or 2 on the Allegro. You must use the communication cable included with the Allegro CE, part number 12446.

2) Turn on the Allegro. Tap the *Start* button and select *Settings|Control Panel|Communications Properties*. Tap the *PC Connection* tab. At the bottom of the dialog box under *Connect using:*, the COM port the Allegro is set on for the connection process is shown. If the communication port you are using is not listed in the bottom dialog box under *Connect using*, tap the *Change* button.
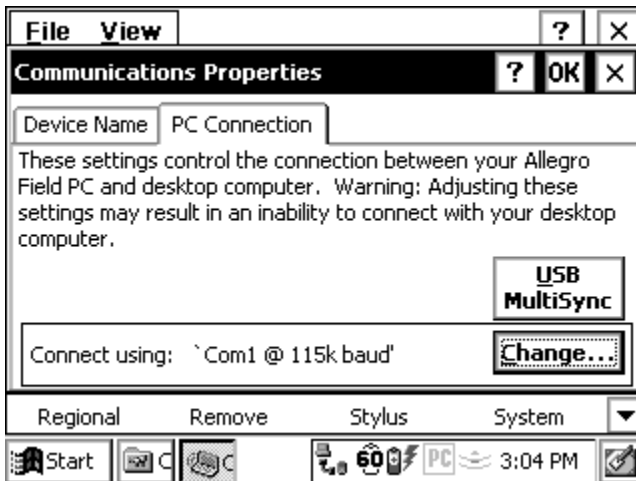
Select the correct port and baud rate from the drop-down list. Tap on the *OK* button.

3) Double-click on the ActiveSync icon on the desktop PC.

Microsoft
ActiveSync
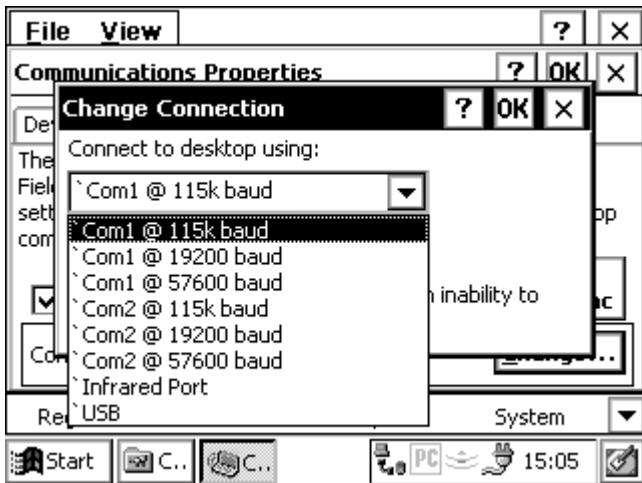
The following screen is shown:

4) Click on the *Next* button on the *Get Connected: Checking COM Ports* screen. The following screen is shown:

5) If the cable is connected to COM 1 on the PC, the *Progress* box of the *Checking COM Ports* screen says *Looking for a Mobile device… Checking on COM Port 1*, double-tap on the PC Link icon on your Allegro desktop.

After tapping the *PC Link* icon on the Allegro desktop, a screen that says *Connecting to Host* is shown. After a connection is made, the following screen briefly shows on the Allegro:

If you are unsuccessful in your connection go to the *An Unsuccessful Connection* section found later in this chapter.

If using COM 2 on the Allegro, wait for the *Progress* box of the *Checking COM Ports* screen indicating *Looking for a Mobile device… Checking on COM Port 1* to advance to *Checking on COM Port 2.*

Now double-tap on the PC Link icon on your Allegro desktop.

Once connected, this screen is automatically minimized and placed in the status box on the Taskbar.
↓
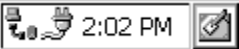
If the Allegro becomes disconnected from the desktop PC by choice or inadvertently, this symbol disappears, letting you know the Allegro is not connected to the computer.

A screen on the desktop PC that says *Connecting* is shown. The "New Partnership: Set Up a New Partnership" screen appears. Proceed to the "Setting Up a Partnership" heading of this section.

*ActiveSync IrDA Infrared Connection*
When establishing an infrared connection between the Allegro and your
desktop PC for the first time, complete the following steps, all additional
connections can be made through the *ActiveSync Connection Process*
section and follow the steps there.

Complete the installation instructions that came with your IrDA
infrared adapter. Depending on your desktop's Windows operating
system you may need to access your desktop PC's wireless
communications setup by selecting *Settings|Control Panel* and the
wireless option (the name varies between operating systems). After the
infrared settings are set, you will then follow the same connection
process as COM 1 or COM 2.

To select the infrared COM port as the COM port you will be using, tap
the *Start* button and select *Settings|Control Panel|Communications
Properties*. Tap the *PC Connection* tab. At the bottom of the dialog box
under *Connect using* you see which COM port the Allegro is set on for
the connecting process. If the communication port you are using is not
listed in the bottom dialog box under *Connect using*, tap the *Change*
button.

Select the IrDA port from the drop-down list. Tap the *OK* button.
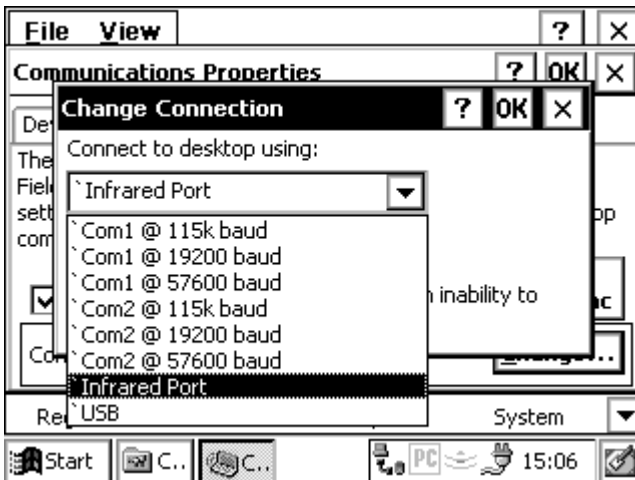
An Unsuccessful Connection
If the connection was not successful, the following screen appears on the
PC:
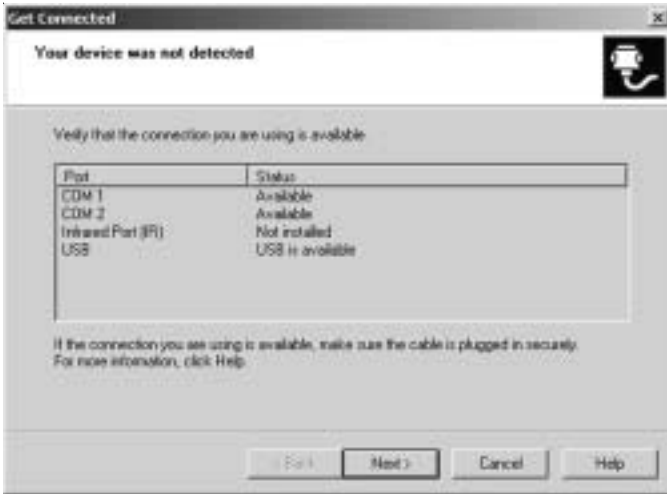
From here, click on the *Next* button on the *Your device was not detected*
screen and the *Getting Connected* screen appears again. Repeat the
connection instructions for the COM port you are using until a
successful connection is made.

▲ Establishing Additional ActiveSync Connections

If you already have ActiveSync installed on your desktop PC, complete the following steps for connecting the Allegro to the desktop PC. These instructions are also designed for all additional connections to between the Allegro and desktop PC using ActiveSync. You do not need to set up the communication settings each time, as described in *Establishing a First Time Connection Using ActiveSync.*

1) Turn on the Allegro and the desktop PC.

2) Connect the communication cable to the ports you set up on each computer during the file transfer program installation process.

3) Press the *PC Link* icon on the Allegros desktop. The following type of screen is briefly shown on the Allegro display:

If you set up a partnership between the Allegro and desktop PC, the connection is made automatically. When the connection is complete the following screen is shown:

5) Press the *Explore* button to view the contents of the Allegro from the desktop PC.

If you did not initially set up a partnership you are shown the *Set Up a Partnership* screen. Select *Yes* to set up a partnership now or *No* to connect as a guest, refer to the instructions earlier in this chapter.

Troubleshooting

If you have any problems establishing communication between the Allegro and the desktop PC, check the communication settings on both computers and make sure the communication cable is firmly connected to the correct ports. Refer to the installation instructions for ideas on settings to review.

New Partnership Set Up

After you have successfully connected the Allegro to the desktop PC the following screen will appear:

You can select *Yes* to set up a partnership or *No* to connect as a guest. The advantage to setting up a partnership is that each time you connect the Allegro to the desktop PC you are not asked which type of connection you want. The Allegro automatically connects as a partner. If you select *Yes* continue on to the *Setting Up a Partnership* section. If you select *No,* and want to connect to the Allegro and desktop PC as a guest, read steps for *Connecting as a Guest* later in this chapter.

Setting Up a Partnership
To set up a partnership between the Allegro and desktop PC, complete
the following steps:

1) Select the *Yes* option and press the *Next* button on the *Setting up a
Partnership Screen*. The following screen appears:

2) Select *Yes* if you want the Allegro to share a partnership with the
desktop you are connected to, or *No* if you want to connect to more
than one computer. Press the *Next* button. The following screen
appears:

The *Synchronized Files* option is the only synchronization function currently operational with the Allegro. Additional options are not available.

3) Select the *Files Synchronized Files* option. The following screen appears:

4) Press *OK* to return to the *Select Synchronization Settings* screen. The *Files | Synchronized Files* option is now selected.

5) Press the *Next* button. The *Setup Complete* screen appears:

6) Press the *Finish* button to complete the new partnership setup and begin the synchronization process.

A shortcut to a new folder created in the *AllegroCE_#### My Documents* (#### = serial number) folder appears on the PC's desktop. This is the file synchronization folder that holds all of the files which are automatically transferred from the Allegro to PC or vice versa.

After a Partnership is set up perform the Save System utility on the Allegro before you take the Allegro out into the field.

This is necessary in case a restart is required where RAM is lost on the Allegro, you will be able to restore the system and still connect to the desktop PC through ActiveSync.

If the system is not saved and RAM is lost, the Synchronize function will not be set up and will stop the connection between the Allegro and desktop PC. If you are using MultiSync it can block all other Allegros from connection to the desktop.

ActiveSync begins connecting the Allegro to the desktop PC. The following screen appears:

The Allegro and the desktop PC are connected to each other through ActiveSync. The following screen appears:

The synchronization program looks for changes between the folder on the Allegro and desktop PC. The following screen appears:
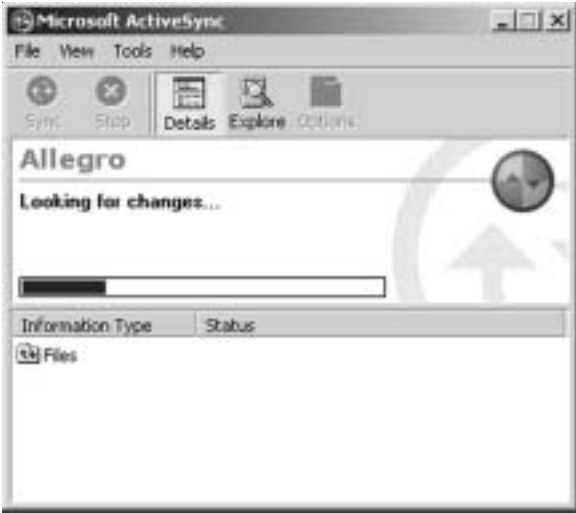
ActiveSync informs you if there are files that are not synchronized with the Allegro and desktop PC. The following screen appears:

ActiveSync automatically synchronizes files between the Allegro and the desktop PC. The following screen appears:

The Allegro and desktop PC are now connected and the files synchronized.

❖ *Note: If the connection message on the Allegro does not disappear, press Cancel and double-tap on PCLink again.*

Unresolved Files through File Synchronization

It is very important to note that the synchronize files option always replaces all old files with the most recent file. If you have saved a document on the Allegro in the *My Documents* folder, it automatically transfers to the *Allegro My Documents* synchronization folder on the desktop PC with the same name.

After disconnecting communication between the Allegro and desktop PC, the synchronized file can be altered. When reconnecting the Allegro to the desktop PC after, ActiveSync's file synchronization will replace the unaltered document with the master updated file.

The synchronization process stops when both documents, the one on the Allegro and the one on the desktop PC, are altered and ActiveSync is unsure which one is the master document. The following screen appears:

To specify which file is the master file, complete the following steps:

1) Click on the *Resolve items...* option to continue the file synchronization process. The following screen appears:

2) Click on the drop-down box next to Skip in the *Action* section of the "Resolve Conflict" screen. The following options appear:
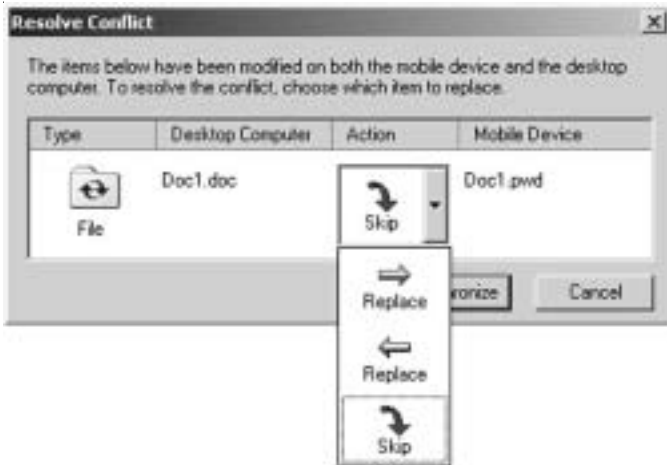
3) Select which computer you want to synchronize with the master file. The right arrow synchronizes the file on the desktop PC to the Allegro. The left arrow synchronizes the file on the Allegro to the desktop PC. The selection appears in the action box, shown in the following example:
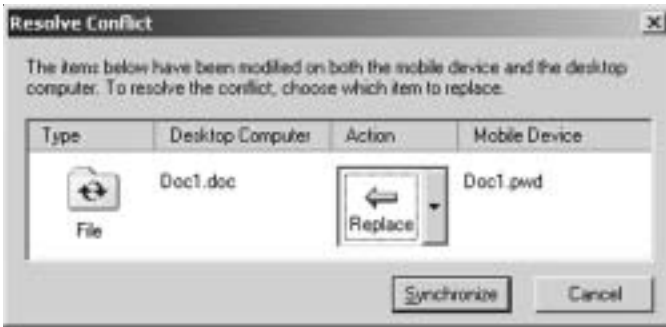
4) Click on the *Synchronize* button. The following appears:

The file you select to be synchronized now replaces the existing file with the file chosen as the master file. In this example, the left arrow is selected and the file on the Allegro is transferred to the desktop PC, replacing the file on the desktop PC with the master file on the Allegro.

The files are now synchronized. The following screen appears:

Renaming Files
Renaming the files helps to avoid the unresolved notification. Renaming is also an option available for keeping both altered files when the unresolved file notice appears, to do this complete the following steps:

1) Disconnect the Allegro from the desktop PC.

2) Rename one of the altered files.

3) Reconnect the Allegro to the desktop PC.

Both files can now synchronize.

ActiveSync Connection Process

Because the Allegro's communication ports are used for a variety of peripherals, the ports are not dedicated to ActiveSync only, as with other handheld devices. Therefore the 'PCLink' icon on the Allegro CE desktop is used to activate this feature. After making your first successful connection, the following process makes the reconnection of the Allegro to the desktop PC a more efficient process.

For all remaining connections for the Allegro to the desktop PC, complete the following steps:

1) Turn on the Allegro.

2) Plug in the connection cable from the desktop PC to the Allegro, or place the Allegro into the USB/Power Dock.

3) Double-click on the ActiveSync icon on the desktop PC.

Microsoft
ActiveSync

The ActiveSync program starts up. The following screen appears:

4) Open the *Files Menu* and select the *Connection Settings...* option:
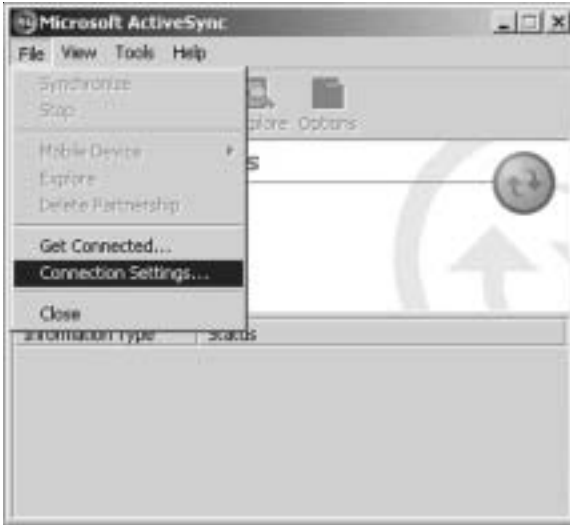
The following screen appears:

5) While using COM 1, COM 2, or the infrared port, check the *Allow serial cable or infrared connection to this COM port:* box and confirm the correct PC port is selected in the drop down box.

6) Press *OK.*

❖ *Note: This setting gives ActiveSync complete control over the selected PC port. To disable this control setting, follow the previous three steps, only uncheck the Allow serial cable or infrared connection to this COM port box.*

7) Double-tap on the PC Link icon on the Allegro to connect to ActiveSync on your PC. If you have not set up a partnership the New Partnership screen appears. If a partnership is set up, ActiveSync begins the synchronization process. The following screen appears:

After ActiveSync is connected it goes through synchronization process as described earlier in this section.

Connecting as a Guest

ActiveSync also allows you to connect as a guest and interact between both computers without setting up a partnership. To connect as a guest complete the following steps:

1) Select the *No* option on the *Set Up a Partnership* screen, and click on the *Next* button. ActiveSync goes through the connection process. When connected, the following screen appears:

2) Click on the *Explore* option on the *Microsoft ActiveSync* screen.

3) Begin viewing the contents of the Allegro.
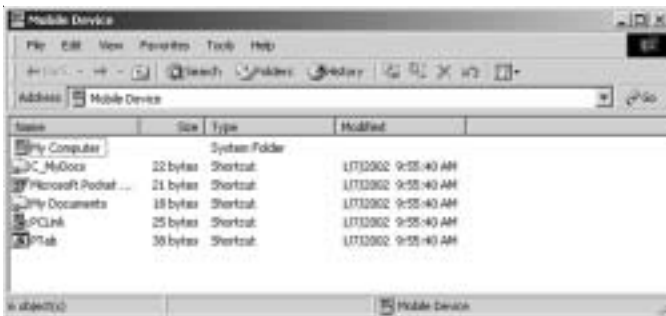
▲ Transferring Files Between the Allegro CE and the Desktop PC

Once the Allegro and the desktop PC are communicating, files can be transferred between the two computers. On the desktop PC, use *My Computer*, *Windows Explorer*, or another file management program to view and navigate through the contents of the desktop PC. On the Allegro double-tap on the *My Computer* icon to view and navigate through the folders and stored files. Use the drag and drop, cut, copy, and paste functions to move files between the Allegro and the desktop PC. On the Allegro, we recommend that you use the internal non-volatile storage, C_Drive, as the primary storage area. Refer to the *Storing Files and Programs* section later in this chapter for details.

File Conversion

When transferring files between the Allegro and the desktop PC, file conversion may be necessary. From the ActiveSync program on the desktop PC you can set up the file conversion options up as desired. Complete the following steps:

1) Select *Tools | Options*.

2) Click on the *Rules* tab on the *Options* screen.

3) Click on the *Conversion Settings...* button in the *File Conversion* box.

4) Select the *Convert files when synchronized, copied or moved* to enable that all file conversions are handled automatically, and click on the *OK* button.

PTab File Converter

On the Allegro CE Utilities CD-ROM is a program called *PTab File Converter*. You must install this converter on the desktop PC to facilitate the conversion of PTab files on the Allegro to Excel files when they are transferred to the desktop PC, and Excel files on the desktop PC to PTab files when they are transferred to the Allegro. Insert the Allegro CE/DOS Utilities CD-ROM into the computer, select *PTab File Converter*, and follow the installation instructions.

❖ *Note: ActiveSync must be installed on the desktop PC before you installed the PTab File Converter. ActiveSync deletes the Converter during installation.*

Remote Allegro File Maintenance

You can perform many convenient Allegro file maintenance operations remotely from the desktop PC using ActiveSync. Move, copy, and delete files from the Allegro window simply by dragging and dropping them or by using the cut and paste functions. You cannot start programs remotely. If you double-click on an executable file, the properties of that file are shown.

Disconnecting

When you are finished transferring files between the Allegro and the desktop PC, disconnect the Allegro by double tapping on the *Connected* symbol located in the status box on the Taskbar.

↓
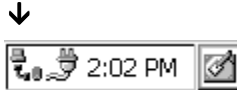
The following type of screen is shown:

Tap on the *Disconnect* button. If you are using a serial port, you can now disconnect the communication cable.

❖ *Note: In addition to the steps outlined previously, the following actions cause the Allegro to disconnect from the desktop PC:*

  - *Turning the Allegro or the desktop PC off*
  - *Disconnecting the communication cable*
  - *Misaligning the IrDA ports while using infrared communication*

Windows Explorer

Windows Explorer® allows you to browse the files and folders on the Allegro Field PC. To launch Windows Explorer double-tap the My Computer icon on your desktop, or tap on the Start button and select *Programs|Windows Explorer*. When Windows Explorer opens the contents of the My Computer folder are displayed:
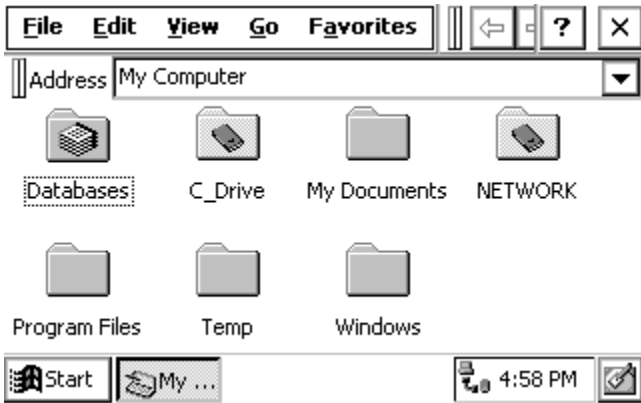
The menu options and buttons available on your Field PC are similar to the options in Windows Explorer on your desktop PC. The buttons on the toolbar are only partially visible when Explorer is first opened. To see the extended toolbar, tap on the double bar that appears to the right of the menu options. To hide the buttons, tap the double bar that appears at the far left of the toolbar. Many of the options that can be accessed using the buttons can also be accessed through one of the menus.

▲ Moving and Copying Files

Using the Edit Menu Options

You can use the cut, copy, and paste commands to move and copy files. Select the file you want to act on and tap on *Edit|Cut* or *Edit|Copy*. Go to the location you want to move or copy the file to and tap on *Edit|Paste*.

Opening Two Explorer Screens

You can open two Windows Explorer screens, one open to the source folder or file and one open to the destination folder.
Both Explorer screens are shown as active application buttons in the Taskbar as shown below:
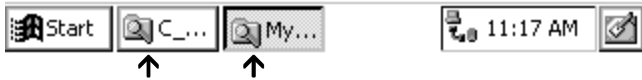
Both of these active application buttons represent Explorer screens

Open the Explorer screen with the source file or folder in it. Select the file you wish to move or copy and drag it to the destination folder's button on the taskbar. Continue to hold down the stylus on the button until the destination window opens, then drag the file or folder to the desired location in the window. Note: When you are dragging a file or folder, it may not appear to be moving, even though it is. You may need to experiment with this procedure.

Help

Use the on-line Help [?] for more details about the Windows Explorer program.

Storing Files and Programs

It is important that you understand the difference between storing data on the hard disk versus RAM. In the Desktop, double tap on the *My Computer* icon. The following folders have been created:
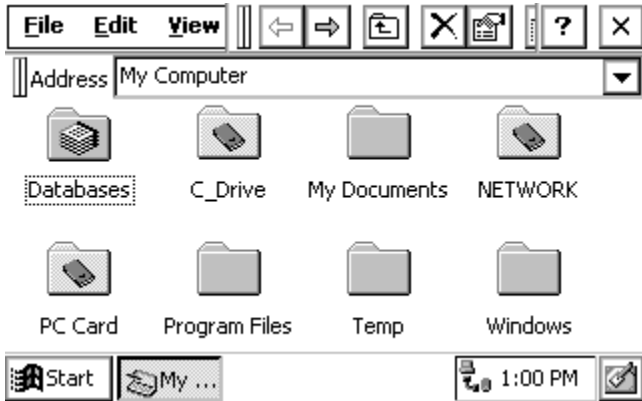
C_Drive, Solid State Disk
The solid state hard disk is non-volatile. Information is retained even when no power is supplied to the Allegro. We recommend that you use the hard drive as your primary storage area. In the *My Computer* folder double tap on *C_Drive*. The following folders are shown:
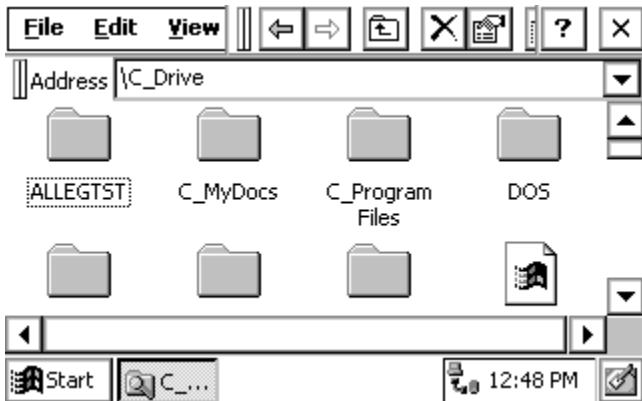
The *C_MyDocs* and *C_Program Files* folders were created for you to use in place of the *My Documents* and *Program Files* folders that are in the RAM file system. The C reminds you that these files are on the C_Drive, a safe area to store data.

RAM File System

The storage ability of RAM is temporary in nature. If the batteries are drained or removed or a hard reset is performed on the Allegro, information stored in RAM can be lost. (The super capacitor behaves like a backup battery and can maintain the RAM for up to 5 minutes while you change the batteries.) From the Desktop, double-tap on the *My Computer* icon. The following folders have been provided:
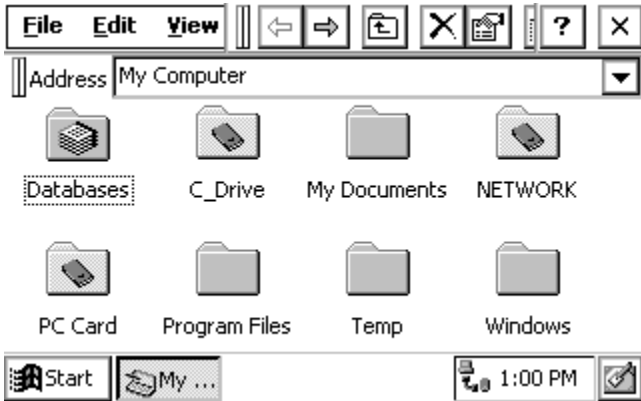
All of the folders are stored in RAM except for C_Drive and PC Card.

Some applications automatically bring up the *My Documents* folder when you save a file as shown in the example below. My *Documents* is stored in RAM, not on the hard disk.

```
Save As  [↥] [📁] [▥] [▦]        [?] [OK] [✕]
🔍 \My Documents\
┌──────────────────────────────────────────┐
│ 🗀 Shortcut to Office Templates.lnk        │
│                                          │
│                                          │
│                                          │
│                                          │
└──────────────────────────────────────────┘
Name:  [Doc1]
Type:  [Pocket Word Document (*.pwd)]      [▼]
[🏁 Start] [📝 Doc1]              [📶 1:15 PM] [📝]
```
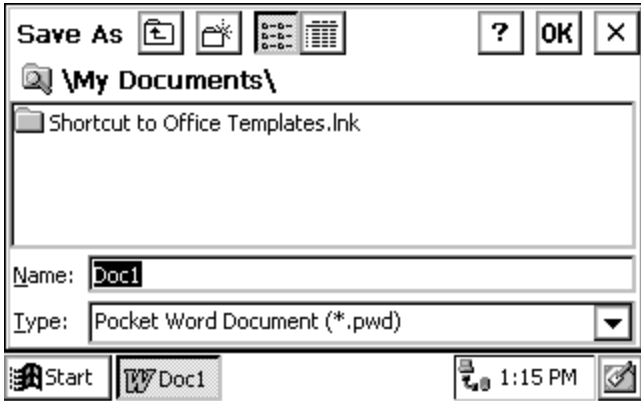
To save your file to the hard disk, switch the drive to the C_Drive before you save the file:

```
Save As  [↥] [📁] [▥] [▦]        [?] [OK] [✕]
🔍 \C_Drive\
┌──────────────────────────────────────────┐
│ 🗀 ALLEGTST      🗀 DOS        🗀 WINCESYS │
│ 🗀 C_MyDocs      🗀 NETWARE    📄 AA.BAT   │
│ 🗀 C_Program Files 🗀 UTIL     📄 AUTOEXEC.BA│
│ [◀] [   ]                            [▶]  │
└──────────────────────────────────────────┘
Name:  [Doc1]
Type:  [Pocket Word Document (*.pwd)]      [▼]
[🏁 Start] [📝 Doc1]              [📶 1:14 PM] [📝]
```
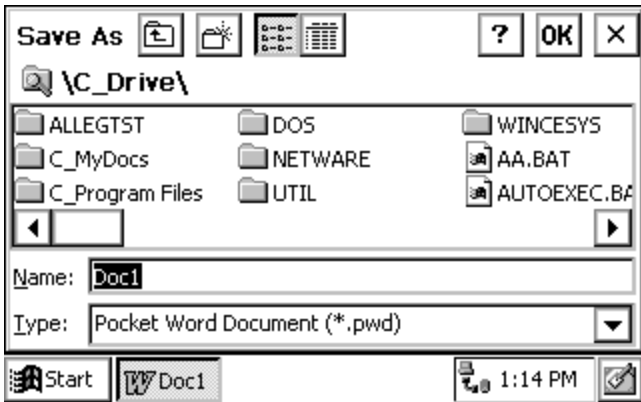
For more information about data storage options, refer to *Section 3, Memory Configuration and Data Storage Options.*

Save Registry Utility

The Save Registry utility saves everything in the RAM file system and the system registry to the hard disk. If the batteries become completely discharged or you have to reset the system, everything stored in RAM at the time you ran the Save Registry utility is restored when you return to Windows CE. Normally, information stored in RAM is lost if the system is rebooted.

Once you get the Control Panel applications set up the way you want them, for example, the display appearance, you should run the Save Registry utility. You should also run it if you set up a new application.

To run the utility, tap on *Start* then select *Programs|Utilities|Save Registry*. The following message is shown:

System Backup

Saving Registry...
Saving Object Store...

Start   ...   9:59 AM

Application Command Bars

Active applications display a command bar across the top of the screen. The command bar for Pocket Word is shown below:
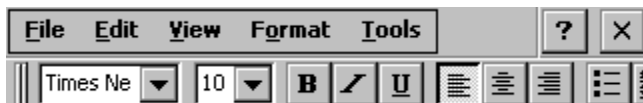
This command bar contains drop-down menus, a help button [?] and an exit button [X] on the first line and a slider [⫼] and a toolbar on the second line.

Use the menus and toolbar buttons as you would on your desktop or notebook PC. Refer to the information about a particular program later in this section of the manual for more specific details.

Gaining More Viewing Area on the Screen
You can gain additional viewing area on the screen by hiding the menu bar, toolbar, and taskbar.

Moving the Menu Bar and Toolbar
The slider [⫼] is used to adjust how much of the menu bar or toolbar is displayed. Touch the slider with the stylus and drag it directly into the upper left-hand corner to combine the menu bar and the toolbar into one line. Part of the toolbar is shown:

Once you have combined them, tap once on the slider to move the toolbar completely to the right and display the menu bar:
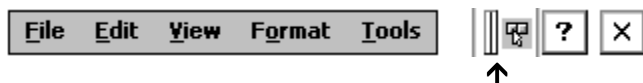
Tap the slider again to move it back to the left, displaying the toolbar again. You can also manually slide it to the right or left to view all of the menu bar, all of the toolbar, or part of each:

To view both bars on separate lines again, move the slider down where
the toolbar was originally:

File	Edit	View	Format	Tools		?	×

Times Ne ▼ 10 ▼ **B** *I* U ≡ ≡ ≡ ☰

↑

Hiding the Taskbar
You can hide the Taskbar, freeing up room on the display for
applications. To do this, tap the Start button and select *Settings/
Taskbar.* Under Taskbar options tap the box next to *Auto hide.*

File	Edit	View	Format	Tools		?	×

Times Ne ▼ 10 ▼ **B** *I* U ≡ ≡ ≡ ☰

↑   *Press the stylus along the edge to view the Taskbar*

When the Taskbar is hidden, you can get it to appear if you press a
stylus along the very bottom of the Allegro screen.

When the Taskbar is hidden you can press the <Start> button on the
keyboard to bring up the Start menu. Press the Task Manager button to
bring up the Task Manager and move between active applications and
tasks.

Press Blue key + [Start] *for Start menu,* [Start] *for Task Manager*

PTab Spreadsheet Program

PTab™ is a fully functional spreadsheet program designed to run on
Microsoft CE Field PCs. It has the key features of common desktop
spreadsheet programs.
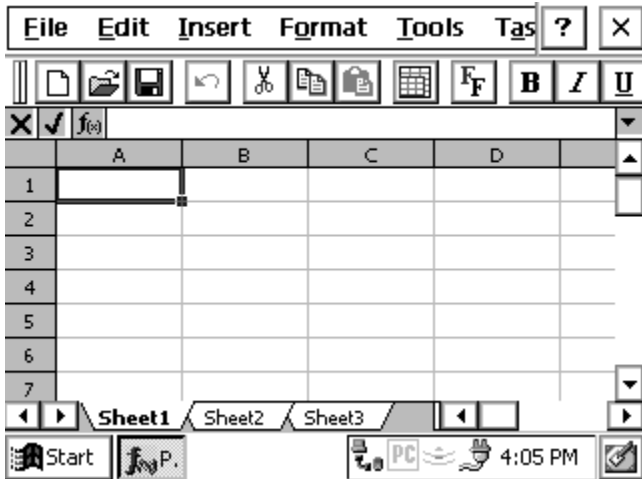
You can easily create spreadsheets on the field computer or download
an existing Excel® spreadsheet from the desktop PC. Using ActiveSync,
files created in PTab are automatically converted to Excel files on the
desktop PC and Excel files are converted back to PTab files on the
Allegro.

▲ Excel Considerations

Follow these guidelines when you set up and save an Excel file that is
going to be converted to PTab on the Allegro:

- If the Excel file has graphics incorporated into it, the spreadsheet
  cannot be converted to a PTab file. We recommend that you make a
  copy of the Excel spreadsheet, remove the graphics, then convert the
  modified copy.
- Do not use macros in the file.
- Save the file as an Excel 97 or version 5.0 file for best results.

▲ PTab File Converter

On the Allegro CE CD-ROM is a program called "PTab File Converter." You must install this on the desktop PC to facilitate the conversion of PTab and Excel files to and from the Allegro and the desktop PC. Refer to the *Windows CE File Transfer Programs, Transferring Files Between the Allegro CE and the Desktop PC* section found earlier in this chapter for important details.

▲ Saving PTab Files

When you select *File|Save* or *File|Save As,* PTab automatically sets the path to \C_Drive\C_MyDocs\. Your file is saved to the non-volatile solid state storage. We recommend that you use the C_Drive as the primary storage area.

▲ Summary of PTab Features

The main PTab version 2.1 features are listed below.

❏ Charts (Bar, Line, Pie, XY)

❏ Definable Automating Tasks (Macros)

❏ Auto Filter

❏ Protection of Sheet or Workbook

❏ Locked and Hidden Cells

❏ Export/Import Microsoft Excel (.xls) Files (Using Desktop Filters) and Microsoft Pocket Excel (.pxl) files directly

❏ Import CSV (Comma Separated Values)

❏ 256 Sheets x 16384 Rows x 256 Columns

❏ Numeric, Text, Date/Time, Boolean Values

❏ 127 Built-in Scientific, Statistical, Financial, Date/Time, Logical, Database and Text Functions and 32 Task Functions

❏ Multiple Undo/Redo

❏ Cut, Copy, Paste, Paste Special, Clear, Fill Cells, Insert/Delete Rows and Columns

❏ Set Row Height and Column Width, Hide/Unhide Rows and Columns, Autofit Row Heights and Column Widths

❏ Insert Function, Pointing

❏ Format: Numbers, Alignment, Font Size, Font Color, Font Style, Background Color, Borders, Protection

❏ Zoom (25% to 200%) and Full Screen Mode

❏ Freeze Titles (Row and Column Freezing)

❏ Use the Formula Bar or Edit Cells on the Spot

❏ Show/Hide: Column and row titles, Gridlines, Zero values

❏ Sheets: New, Rename, Delete

❏ Sort (Ascending, Descending, up to three keys), Go to Cell, Find/
  Replace

❏ Names (Define and Insert)

❏ Custom lists (e.g. Monday, Tuesday, Wednesday...)

❏ On-line help

❏ Password Protection

▲ Opening a PTab file

When you double-tap the PTab icon on the desktop, PTab opens and automatically brings up a new workbook, as shown below. If you would like to open an existing workbook choose *File|Open* and then specify the location of the file you wish to open.
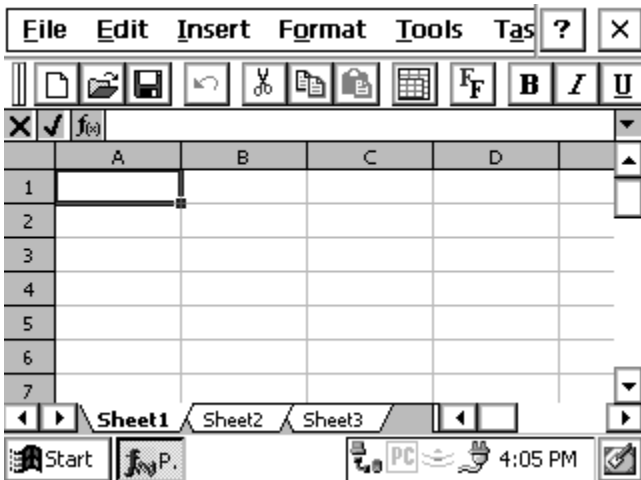
Adjusting the Viewing Area on the Display

A standard PTab screen is shown above with the menu bar, toolbar, formula bar, and taskbar showing. You can view seven lines of the spreadsheet on the screen.

When the menu bar, toolbar, formula bar, and taskbar are hidden, as shown below, you can view eight lines of the spreadsheet. Refer to the *Application Command Bars* section found earlier in this chapter for details on how to adjust the viewing area.
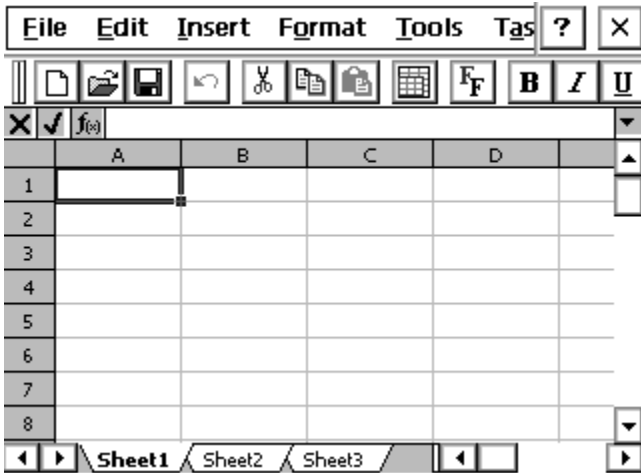
▲ Entering Data/Editing Cells

A cell can contain: a number, text, date/time, Boolean value or formula. Tap on the formula bar (or double-tap the cell if the formula bar is off) to edit the cell's value/formula. If the number or date begins with a single quote ('), it is treated as text.
- Number (examples: 123.45, -1.2e55)
- Text
- Date/Time: The format is taken from the FPC regional settings. Go to *Start|Settings|Regional Settings*, then choose the *Number* tab and the *List separators* combo box. You must specify a year in the date. (Examples: 8/22/99 in the U.S.A. vs. 22.8.99 in Germany, 10:44, 12/30/1999 14:25:30.)

- Boolean: True or false
- Formula: Formulas begin with an equal sign (=). PTab evaluates the value. (Example: =A5+2, =Sum(B2:C7)). Formulas can contain:
  Number, text, date/time, Boolean values
     Cell references (examples: A4, $B7, $C$3,
         Sheet1!A3,'2ndSheet'!$C$7)
  Cell ranges (examples: A1:B4, 'Year 1999'!C5:D7)
  Arithmetic operations: +, -, /, *, %, ^ (examples: A1*B5%, C7*100-5)
  Comparative operators: =, <, <>, >, <=, >= (example: if(A1>B1, A1, B1))
  Text joining operators: & (example: A1 & "years")
  Functions

▲ PTab Menu Options

The PTab pull-down menu options include: File, Edit, Insert, Format, Tools, and Task. Each menu option is described in detail on the following pages. On-line help is accessed by pressing the [?] in the upper right- hand corner of the screen.

File Menu Options

The following functions are available from the File Menu option:
- *File|New*: Creates a new workbook.
- *File|Open*: Opens an existing workbook. You can open a PTab file (.pt), a Microsoft Pocket Excel file (.pxl) or a CSV file (.csv). Microsoft Excel files (.xls) are converted to PTab files during the desktop PC to Allegro file transfer. CSV files are ASCII text files containing values separated by a separator taken from the Allegro's regional settings. Select *Start|Settings|Control Panel|Regional Settings*, then choose the *Number* tab and the *List separators* combo box. To open a CSV file select *Text Files (*.csv)* from the *Type* combo box.
- *File|Save*: Saves the current workbook. If you have not previously saved the workbook, *Save* works the same as *Save As*.
- *File|Save As*: Saves the current workbook with a specified name.
- *File|Delete*: Deletes the specified file.
- *File|Recent Files*: Displays a list of recently opened files.
- *File|Password*: Sets or changes the password.
- *File|Close*: Closes the current workbook.

Edit Menu Options

The following functions are available from the Edit Menu option:
- *Edit/Undo*: Undoes the last action.
- *Edit/Redo*: Redoes the last action.
- *Edit/Cut*: Cuts the selected cells to the clipboard.
- *Edit/Copy*: Copies the selected cells to the clipboard. If you paste the copied contents of the clipboard into another application, cell texts separated by tabs are pasted.
- *Edit/Paste*: Pastes the clipboard contents to the sheet. You can paste texts separated by tabs from another application.
- *Edit/Paste Special*: Pastes the clipboard contents to the sheet using special options (paste contents, paste formats, paste only the results of formulas, skip empty cells).
- *Edit/Clear All/Contents/Format*: clears contents+format/contents/format of selected cells.
- *Edit/Fill Right/Down/Series*: Fills the selected cells by the leftmost/topmost cell contents or fill series: linear, growth, date (date unit: day, weekday, month, year) or autofill (e.g. January, February, March).
- *Edit/Delete Cells*: Removes the selected rows/columns.

Insert Menu Options

The following functions are available from the Insert Menu option:
- *Insert/Cells*: Inserts the same number of rows/columns as selected.
- *Insert/Function*: Inserts a function to the current cell.
- *Insert/Chart*: Creates a simple chart (bar, line, pie, Y) from selected cells that contain that data and labels the chart.
- *Insert/Name*: Inserts a name in a formula.
- *Insert/Define Name*: Defines a name.

Format Menu Options

The following functions are available from the Format Menu option:
- *Format/Cells*: The *Format* tab lets you select the numeric format or date & time format for a cell(s). Set the horizontal and vertical cell alignment with the *Alignment* tab. Use the *Font* tab to select the font and the font size, color, and style. Format the borders from the *Border* tab. Protect locked or hidden cells from the *Protect* tab.
- *Format/Row*: Sets row height and hides or unhides rows.
- *Format/Column*: Sets column width and hides or unhides columns.
- *Format/Sheets*: Adds, renames, or deletes sheets.
- *Format/Zoom*: Changes the magnification of the sheet. You can specify 25 - 200 percent.

- *Format|Full Screen*: Toggles the full screen mode on and off.
- *Format|Freeze Titles*: Allows row and/or column titles to stay visible as you scroll the sheet. To freeze the vertical titles, select the column to the right of where you want the split to appear. To freeze the horizontal titles, select the row below where you want the split to appear. To freeze both titles, select the cell below and to the right of where you want the split to appear.

Tools Menu Options

The following functions are available from the Tools Menu option:
- *Tools|Go to*: Selects specified cell or range.
- *Tools|Find*: Finds a cell in the current sheet containing the specified text. You can search by rows or columns, look in values or formulas, search case sensitive/insensitive, and search entire cells.
- *Tools|Replace*: Finds a cell as outlined above and replaces the text as specified.
- *Tools|Sort*: Sorts a selected range of cells: ascending or descending, case sensitive/insensitive, sorts rows or columns, exclude header row from sort.
- *Tools|Filter*: Toggles the auto filter on and off.
- *Tools|Name|Insert/Define*: Defines and inserts a name in a formula.
- *Tools|Protection*: Toggles the Protect Sheet and Protect Workbook features on and off. Go to *Format|Cells|Protection* to lock/unlock and hide/unhide cells. Use Protect Sheet or Protect Workbook to activate these settings.
- *Tools|Options*: View options: enables/disables formula bar, showing of column and row titles, gridlines and zero values. General options: move after enter (none/right/down), full screen zoom. Custom lists: import from selection, delete list.

Task Menu Options

- *Task|Tasks*: Lets you create and run automating tasks (see *Automating Tasks* later in the section). User defined tasks can be added to this menu.
- *Tools|About*: Gives information about Z4Soft PTab spreadsheet: copyright, version and contact info.

▲ Converting Microsoft Excel Files (.xls)

To convert PTab files to Microsoft Excel files or Microsoft Excel files to PTab files, follow these steps:

1) Check conversion properties:
   - If you are using ActiveSync: Open ActiveSync. From the menu Tools/Options open the Options dialog box. Select the Rules tab and press the Conversion Settings... button.

- Select (or confirm you have selected) Conversion from Excel(*.xls) to PTab(*.pt) in the Desktop-Device tab. Select "Microsoft Excel Worksheet in the list box, press the Edit button, and select "PTab filter (*.pt)" in the combo box.
- Select Conversion from PTab(*.pt) to Excel(*.xls) in the Device-Desktop tab. Select "PTab file" in the list box, press the Edit button, and select "PTab filter (*.xls)" in the combo box.

2) Convert your files: Conversion is done by dragging the files from/to the desktop computer to/from the document folder on the Allegro.

▲ Spreadsheet Functions

The following sections are the available spreadsheet functions available in PTab.

Math & Trig Functions

Abs(number) Returns the absolute value of a number. Example: Abs (-3) equals 3.

Acos(number) Returns the arccosine of a number. The number must be from -1 to 1.
Example: Acos(-0.5) equals 2.094395.

Acosh(number) Returns the inverse hyperbolic cosine of a number. The number must be greater or equal to 1.
Example: Acosh(1) equals 0.04613.

Asin(number) Returns the arcsine of a number. The number must be from -1 to 1.
Example: Asin(-0.5) equals -0.5236.

Asinh(number) Returns the inverse hyperbolic sine of a number.
Example: Asinh(8) equals 2.77647.

Atan(number) Returns the arctangent of a number.
Example: Atan(0.5) equals 0.46365.

Atan2(x,y) Returns the arctangent of the specified x and y coordinates.
Example: Atan2(1, 1) equals 0.785398.

Atanh(number) Returns the inverse hyperbolic tangent of a number. The number must be between -1 and 1 (excluding -1 and 1).
Example: Atanh(-0.1) equals -0.10034.

Ceiling(number, significance) Returns the number rounded up to the nearest multiple of the significance.
Example: Ceiling(10.43, 0.1) equals 10.5.

Combin(number, numberChosen) Returns the number of combinations. Number is the number of items, numberChosen is the number of items in each combination.
Example: Combin(10, 2) equals 45.

Cos(number) Returns the cosine of the given angle.
Example: Cos(0.5) equals 0.87758.

Cosh(number) Returns the hyperbolic cosine of a number.
Example: Cosh(5) equals 74.20995.

Degrees(number) Converts radians into degrees.
Example: Degrees(Pi()/2) equals 90.

Even(number) Returns the number rounded up to the nearest even integer.
Example: Even(1.3) equals 2.

Exp(number) Returns e raised to the power of the number.
Example: Exp(Ln(2)) equals 2.

Fact(number) Returns the factorial of a number. The number must be nonnegative number.
Example: Fact(5) equals 120.

Floor(number, significance) Rounds the number down, toward zero, to the nearest multiple of the significance.
Example: Floor(3.5, 1) equals 3.

Int(number) Rounds a number down to the nearest integer. Example: Int(1.7) equals 1.

Ln(number) Returns the natural logarithm of a number.
Example: Ln(Exp(2)) equals 2.

Log(number, base) Returns the logarithm of a number to the base you specify. If the base is omitted, it is assumed to be 10.
Example: Log(100, 10) equals 2.

Log10(number) Returns the logarithm (base 10) of a number.
Example: Log10(100) equals 2.

Mod(number, divisor) Returns the remainder after the number is divided by the divisor.
Example: Mod(5, 2) equals 1.

Odd(number) Returns the number rounded up to the nearest odd integer.
Example: Odd(2) equals 3.

Pi() Returns the number 3.14159265358979, the mathematical constant PI.

Power(number, power) It raises the number to the power. You can also use the "^" operator (e.g. 4^2).
Example: Power(4,2) equals 16.

Product(number, number, ...) Multiplies all the numbers given as arguments and returns the product.
Example: A1 contains 2, Product(A1, 5) equals 10.

Radians(number) Converts degrees to radians.
Example: Radians(180) equals 3.14159.

Rand() Returns a random number greater than or equal to 0 and less than 1. A new number is returned every time the workbook is recalculated.

Round(number, number) Rounds a number to the specified number of digits. Example: Round(5.46, 1) equals 5.5.

RoundDown(number, numDigits) Rounds the number down, toward zero, to the specified number of digits.
Example: RoundDown(40.8, 0) equals 40.

RoundUp(number, numDigits) Rounds the number up, away from zero, to the specified number of digits.
Example: RoundUp(39.1, 0) equals 40.

Sign(number) Returns 1 if the number is positive, 0 if the number is 0, and -1 if the number is negative.
Example: Sign(-5) equals -1.

Sin(number) Returns the sine of the given angle.
Example: Sin(Pi()/2) equals 1.

Sinh(number) Returns the hyperbolic sine of the number.
Example: Sinh(3) equals 10.01787.

Sqrt(number) Returns the square root.
Example: Sqrt(4) equals 2.

Sum(number, number, ...) Return the sum of all the numbers in the list of arguments.
Example: Sum(10, 20) equals 30.

SumIf(range, criteria, sumRange) It sums up the values of only those cells from the sumRange for which the corresponding cells in the range satisfy the criteria.
Example: Sumif(A1:A5,">100000",B1:B5).

Tan(number) Returns the tangent of the given angle.
Example: Tan(5) equals -3.38051.

Tanh(number) Returns the hyperbolic tangent of the number.
Example: Tanh(1) equals 0.76159.

Trunc(number, numDigits) Truncates the number to an integer. The argument numDigits is the precision of the truncation. The default value for the numDigits is 0.
Example: Trunc(-7.8) equals -7.

Statistical Functions

Average(number, number, ...) Returns the average of the arguments.
Example: Average(1, 2, 3) equals 2.

Count(number, number, ...) Counts how many numbers are in the list of arguments.
Example: B1 contains 5, B2 contains 3, Count(B1:B2) equals 2.

CountA(number, number, ...) Counts the number of nonblank values in the list of arguments.
Example: A1 contains 2, A2 is blank, CountA(A1:A2) equals 1.

CountBlank(range) Counts empty cells in the specified range of cells.

CountIf(range, criteria) Counts the number of cells within the range that meets the given criteria.
Example: A1 contains 6, A2 contains3, CountIf(A1:A2,">5") equals 1.

Max(number, number, ...) Returns the maximum value in the list of arguments.
Example: Max(1, 2, 3) equals 3.

Min(number, number, ...) Returns the minimum value in the list of arguments.
Example: Min(1, 2, 3) equals 1.

Permut(number, numberChosen) Returns the number of permutations. Number is the number of objects, numberChosen is the number of objects in each permutation.
Example: Permut(10, 2) equals 90.

Stdev(number, number, ...) Estimates the standard deviation based on a sample.

StdevP(number, number, ...) Calculates the standard deviation of the entire population.

Var(number, number, ...) Estimates the variance based on a sample.

VarP(number, number, ...) Calculates the variance of the entire population.

Financial Functions

Ddb(cost, salvage, life, period, factor) Returns the depreciation of an asset for a specified period using the double-declining balance method (you can specify another method). Cost is the initial cost of the asset. Salvage is the value at the end of the depreciation. Life is the number of periods over which the asset is being depreciated. Period is the period for which you want to calculate the depreciation. Period must use the same units as life. Factor is the rate at which the balance declines. If factor is omitted, it is assumed to be 2. All the arguments must be positive numbers.
Example: Ddb(30000, 500, 3650, 10) equals 16.357.

Fv(rate, nper, pmt, pv, type) Returns the future value of an investment. Rate is the interest rate per period. Nper is the total number of payment periods in an annuity. Pmt is the payment made each period. Pv is the present value. Type can be 0 or 1 (0 - payments at the end of the period, 1 - at the beginning). If type is omitted, it is assumed to be 0.
Example: Fv(0.01, 12, -500) equals 6341.25.

IPmt(rate, per, nper, pv, fv, type) Returns the interest payment for an investment. Per is the period for which you want to find the interest (must be 1 <= per <= nper). For more information see Pmt.
Example: Ipmt(0.01, 1, 24, 5000) equals -50.

Irr(values, guess) Returns the internal rate of return. Values is a reference to cells that contain the numbers for which you want to calculate the internal rate of return. Guess is your guess of the result. If guess is omitted, it is assumed to be 0.1.
Example: A1:A6 contain the following values: $-100,000, $10,000, $16,000, $20,000, $22,000 and $24,000 Irr(A1:A6) equals -2.43%.

Nper(rate, pmt, pv, fv, type) Returns the number of periods for an investment. For more information see Pmt.
Example: Nper(0.01, -100, -1000, 20000) equals 101.

Npv(rate, value1, value2...) Returns the net present value of an investment. Rate is the rate of discount over the length of one period. Value1, value2, are arguments representing the payments (negative values) and income (positive values).
Example: Npv(10%, -10000, 4000, 5000, 6000) equals 2069.53.

Pmt(rate, nper, pv, fv, type) Returns the periodical payment for an annuity. Rate is the interest rate per period, nper is the number of payment periods in an annuity, pv is the present value, fv is the future value, type see Fv.
Example: Pmt(0.01, 10, 10000) equals -1055.82.

PPmt(rate, per, nper, pv, fv, type) Returns the payment on the principal for a given period of an investment. For more information see Pmt.
Example: Ppmt(0.01, 1, 36, 1000) equals -23.21.

Pv(rate, nper, pmt, fv, type) Returns the present value of an investment. For more information see Pmt.
Example: Pv(0.01, 5*12, 1000, 0) equals -44955.04.

Rate(nper, pmt, pv, fv, type, guess) Returns the interest rate per period of an annuity. For more information see Pmt. Guess is your guess for what the rate will be.
Example: Rate(36, -300, 10000, 0) equals 0.42%.

Sln(cost, salvage, life) Returns the straight-line depreciation of an asset for one period. Cost is the initial cost of the asset. Salvage is the value at the end of the depreciation. Life is the number of periods.
Example: Sln(40000, 5000, 8) equals 4375.

Syd(cost, salvage, life, period) Returns the sum-of-years' digits depreciation of an asset for a specified period. Cost is the initial cost of the asset. Salvage is the value at the end of the depreciation. Life is the number of periods. Period is the period.
Example: Syd(40000, 5000, 8, 8) equals 972.22.

Date & Time Functions

Date(year, month, day) Returns a particular date.
Example: Year(Date(1999, 1, 1)) equals 1999.

DateValue(dateText) Converts a date in the form of text to a serial number.
Example: DateValue("1/1/99") equals 36161.

Day(date) Returns the day of a date.
Example: Day(1/1/99) equals 1.

Hour(time) Returns the hour of a time.
Example: Hour(2:45) equals 2.

Minute(time) Returns the minutes of a time.
Example: Minute(2:45) equals 45.

Month(date) Returns the month of a date.
Example: Month(1/1/99) equals 1.

Now() Returns the current date and time.

Second(time) Returns the seconds of a time.
Example: Second(Time(1, 45, 20)) equals 20.

Time(hour, min, sec) Returns a particular time. Time(1,45,0) equals 1:45.

TimeValue(timeText) Converts a time in the form of text to a serial number. TimeValue("1:45") equals 0.072917.

Today() Returns the current date.

Weekday(date, type) Returns the day of the week corresponding to a date. If type = 1 or omitted returns: 1 (Sunday) through 7 (Saturday). Example: Weekday(Date(1999,8,15)) equals 1.

Year(date) Returns the year of a date. Example: Year(Date(1999, 1, 1)) equals 1999.

Logical Functions

And(logical1, logical2, ...) Returns TRUE if all its arguments are TRUE, otherwise returns FALSE. Example: And(FALSE, TRUE) equals FALSE.

If(condition, trueValue, falseValue) Returns trueValue if condition evaluates to TRUE or falseValue if condition evaluates to FALSE. Example: If(A1>A2, "OK", "Cancel").

Not(logical) Reverses logical value. Example: Not(TRUE) equals FALSE.

Or(logical1, logical2, ...) Returns TRUE if any argument is TRUE, otherwise return FALSE. Example: Or(FALSE, TRUE) equals TRUE.

Text Functions

Char(number) Returns the character specified by a number. Example: Char(66) equals B.

Code(text) Returns a numeric code for the first character in a text string. Example: Code("ABC") equals 65.

Exact(text1, text2) Returns TRUE if two text strings are identical (case sensitive). Example: Exact("palm", "PALM") equals FALSE.

Find(findText, withinText, start) Finds string (findText) within another text string (withinText), and returns its starting position. Example: Find("A", "CBA", 1) equals 3.

Left(text, num_chars) Returns the leftmost characters from a text string. Example: Left("Allegro", 2) equals "Al".

Len(text) Returns the number of characters in a text string. Example: Len("Allegro") equals 7.

Lower(text) Converts text to lowercase. Example: Lower("Allegro FPC") equals "allegro fpc".

Mid(text, start, count) Returns a specific number of characters from a text string, starting at the position start.
Example: Mid("Allegro", 3, 2) equals "le".

Proper(text) Capitalizes the first letter of all words. Converts all the other letters to lowercase.
Example: Proper("this CHAPTER") equals "This Chapter".

Replace(oldText, start, count, newText) Replaces part of a text string oldText, based on the number of characters you specify (start, count), with a newText.
Example: Replace("Allegro", 5, 1, "-Size") equals "Alle-sizero".

Rept(text, nTimes) Repeats text the given number of times.
Example: Rept("-", 5) equals "——".

Right(text, num_chars) Returns the rightmost characters from a text string.
Example: Right("Allegro", 2) equals "ro".

Substitute(text, oldText, newText, n) Substitutes newText for oldText in a text string. N specifies which occurrence of the oldText you want to replace.
Example: Substitute("1/1/1999", "1", "2", 2) equals "1/2/1999".

T(value) Returns the text referred to by value.
Example: A1 contains "AAA" then T(A1) equals "AAA".

Upper(text) Converts text to uppercase.
Example: Upper("Allegro FPC") equals ALLEGRO FPC.

Value(text) Converts a text that represents a number to the number.
Example: Value("1000") equals 1000.

Information & Lookup Functions

Column(reference) Returns the column number of the given reference.

Columns(range) Returns the number of columns in an array or reference.
Example: Columns(A1:D1) equals 4.

HLookup(lookupValue, data, row) Searches for a value in the top row of a data table and then returns a value in the same column from a row you specify. LookupValue is the value to be found in the first row of the data table. Data is the table of data. Row is the row number in the data table from which the matching value is returned.

Index(range, rowNum, colNum) Returns a reference to a specified cell within range.

IsBlank(value) Returns TRUE if the value is blank.

IsErr(value) Returns TRUE if the value is any error value except !!NA.

IsError(value) Returns TRUE if the value is any error value.

IsLogical(value) Returns TRUE if the value is a logical value.

IsNA(value) Returns TRUE if the value is error value !!NA.

IsNonText(value) Returns TRUE if value is any value that is not text.

IsNumber(value) Returns TRUE if the value is a number.

IsRef(value) Returns TRUE if the value refers to a reference.

IsText(value) Returns TRUE if the value is text.

Match(lookupValue, lookupRange, matchType) Returns the position of an item in a range that matches a specified value in a specified order. LookupValue is the value you want to match in the range.

N(value) Returns a value converted to a number.

NA() Returns the error value !!NA (no value is available).

Row(reference) Returns the row number of the given reference.

Rows(range) Returns the number of rows in a reference or array. Example: Rows(A1:A5) equals 5.

VLookup(lookupValue, data, column) Searches for a value in the leftmost column of a data table, and then returns a value in the same row from a column you specify. LookupValue is the value to be found in the first column of the data table. Data is the table of data. Column is the column number in the data table from which the matching value is returned.

Database Functions

Daverage(database, field, criteria) Averages the values in the specified database column matching the conditions.

Dcount(database, field, criteria) Counts the cells containing numbers in the specified database column matching the conditions.

Dcounta(database, field, criteria) Counts nonblank cells in the specified database column matching the conditions.

Dget(database, field, criteria) Extracts a single value from the specified database column matching the conditions.

Dmax(database, field, criteria) Returns the largest number in the specified database column matching the conditions.

Dmin(database, field, criteria) Returns the smallest number in the specified database column matching the conditions.

Dproduct(database, field, criteria) Multiplies the values in the specified database column matching the conditions.

Dstdev(database, field, criteria) Estimates the standard deviation based on a sample, using the numbers in the specified database column matching the conditions.

Dstdevp(database, field, criteria) Calculates the standard deviation of a population based on the entire population, using the numbers in the specified database column matching the conditions.

Dsum(database, field, criteria) Adds the numbers in the specified database column matching the conditions.

Dvar(database, field, criteria) Estimates variance based on a sample, using the numbers in the specified database column matching the conditions.

Dvarp(database, field, criteria) Calculates the variance of a population based on the entire population, using the numbers in the specified database column matching the conditions.

Help

Use the on-line Help [?] located in the upper right-hand corner of the display for more details about the PTab spreadsheet program.

▲ Automating Tasks

The Tasks function allows you to create simple spreadsheet applications (macros) to automate tasks.

Task Dialog Box

Use the Tasks function to define, modify, and run automating tasks. To open the Task dialog box, go to *Task | Workbook Task*.

The Task options are described below:

Run: Runs the selected task

New: Creates a new task

Edit: Edits or renames the selected task

Delete: Permanently deletes the selected task

Run on

To start a task, select one of the following events:

(no event): Selecting this option runs the task only from this dialog using the Run button.

Menu Item: Selecting this option adds a new item to the menu task. In the following edit line enter the label of the menu item you are using.

Tap On Cell: Selecting this option executes a task by tapping on a cell or cell range. In the following edit line enter the cell or cell range reference. Example: Task body: Zoom(80), select Tap on Cell: A1. Now by tapping on A1 your workbook zooms to 80%.

New Value In: Selecting this option to execute this task when a cell value is entered. In the following edit line enter a cell or cell range reference.

Tutorial

To create a simple task, follow these steps:

1) Select *Task | Task Workbook* to open the Task Workbook dialog box.

2) Tap the *New...* button to open Define Task dialog box.

3) Type in the word *Hello* to name your task (*Task Name* is highlighted and is overwritten with your word)

4) Tap on the *fn()* button to open the Insert Function dialog box.

5) Select the function *MsgBox* (message box) from the list and click *OK*.

6) Type "Hello World" between the parenthesis (the cursor should already be between the parenthesis):
   MsgBox("Hello World")

❖ *Note: you must include the quotation marks.*

7) Tap *OK* to close the Define Task dialog box and return to the Task dialog box.

8) Select Run on *Menu Item* and tap the close button.

9) When you open the Task menu, Hello is now listed. Select Hello to run your new task. A message box saying Hello World is displayed.

Cell Automating Tasks

Use Cell Task menu item (Task>Cell Task) to define or modify automating tasks stored in a cell.

Cell Text: Text to display in a cell.

Task Icon: Choose an icon you want to display in a cell. You can run the task by tapping on this icon. Choose (no icon) if you want to execute this task by tapping on the cell.

Task Definition: Task source. Example: ShowPicture("myBMW.jpg").

fn(): Tap on this button to open Insert function dialog box.
PTab uses cell tasks to insert pictures, sounds or hyperlinks into cells (see Insert in Cell>Picture.../Sound.../ Hyperlink...) or to save charts (see Chart/Options). You can use cell tasks for short "macros" that you can execute by tapping on a cell or cell icon.

Variables

You can use variables in tasks.
Example:
ok = YesNoBox("Finish task?")
if ok then
  Return()
end
There are no global variables. Use a workbook to store global data.

How to Set and Get Cell Values

Use Set(reference, value) function to set cell value.
Example:
Set(A1,1000)

If you need to create a cell reference using row and column numbers (column A has number 1) use function CellRef(col, row [, sheetIndex]). Parameter sheetIndex is optional.
Example:
```
i = 1
while i < 100
 Set(CellRef(1,i), i)
 i = i+1
end
```

If Command

```
if condition then
 commandsTrue
end
if condition then
 commandsTrue
else
 commandsFalse
end
```

Executes commandsTrue if a condition is True or commandsFalse if a condition is False.
Examples:
```
if a1<>0 then Set(c1, b1/a1) end
if a1=0 then
 Set(c1, "Sorry...")
else
 Set(c1, b1/a1)
end
```

While Command

```
while condition
 commands
end
```
Executes commands as long as a condition is True.
Example:
```
while a1>0
 Set(CellRef(2, a1), a1*100)
 Set(a1, a1-1)
end
```

You can structure your code into more simple tasks and then you can *call previously defined task from within a task* using its name.
Example:
Set(a1,100)
while a1>0
 Hello
Set(a1,a1-1)
end

Automating Tasks Functions Reference

Parameters in [ ] are optional.

ActiveCell()
Returns the active (highlighted) cell.
Example: Set(ActiveCell(), "Hello World!")

ActiveSheet([index])
Returns the number of the active sheet (1-based) and selects the new one if index is specified. Returns "!!Val" if index is less than 1 or greater than number of sheets.
Example: ActiveSheet(2)

CellRef(col, row [, sheetIndex])
Returns the cell reference.
Example: Set(CellRef(a1,2), 123);

CellTask(text, task [, icon])
Creates cell task in the current cell. Text is cell label visible in sheet, task is task source and icon is number of icon (see Cell Task dialog for more info). If icon=0 (or if this parameter is omitted) cell task is executed by tapping on cell. If icon>0 then cell task is executed by tapping on icon.
Example: CellTask("Picture","ShowPicture(""pic.jpg"")",3)

Chart(["Type:Bar/Line/LineMarkers/Pie/XY/XYLines/XYLinesMarkers",
"Title:ChartTitle",
"XTitle:XaxisTitle",
"YTitle:YaxisTitle",
"Series:Rows" or "Series:Columns",
"Legend" or "Legend:No",
"Xaxis" or "Xaxis:No",
"Yaxis" or "Yaxis:No",
"Xgrid" or "Xgrid:No",
"Ygrid" or "Ygrid:No",
"AutoScale" or "AutoScale:No"])
Shows the chart of the selection. All parameters are optional and their order is not important.

Default values of parameters: Chart("Type:Bar", ""Series:Rows",
"Legend", "Xaxis", "Yaxis", "Xgrid:No", "Ygrid:Yes", "AutoScale").
Example: Sel(a1:c20)
       Chart("Type:XY", "Title:Sin(x)", "Xgrid", "Ygrid")
       Sel(b2:f5)
       Chart("Series:Columns", "AutoScale:No")

Clear()
Clears contents in the current selection.
Example: Clear()

ClearFormat()
Clears format in the current selection.
Example: ClearFormat()

ColHide([hideUnhide])
Returns whether the first column of current selection is hidden and
hides (true) or unhides (false) selected columns if hideUnhide is
specified.
Example: Sel(B1:B1)
       ColHide(true)

ColWidth([width])
Returns column width of the first column of current selection and sets
width of selected columns if width is specified.
Example: Sel(B1:C1)
       ColWidth(100)

Copy()
Copies the current selection to the clipboard.
Example: Sel(A1:A5)
       Copy()
       Sel(B1)
       Paste()

DeleteCells(colsRows)
Deletes cells (true - columns, false - rows).
      Example: DeleteCells(true)

FileBox(title [,filter])
Opens a file dialog box with the title and the file type filter.
Example: picture=FileBox("Pictures",
       "*.jpg,*.gif,*.bmp,*.2bp,*.xbm")
       ShowPicture(picture)

Filter(onOff)
Sets auto filter (true = autofilter on, false = autofilter off). Auto filter
range is the current selection.
Example: Filter(true)

FindDialog()
Shows Find dialog box.
Example: FindDialog()

FormatPainter(cellRef)
Formats the current selection using the format from the specified cell (cellRef).
Example: FormatPainter(f2)

FreezeTitles(onOff)
Freeze/unfreeze titles.
Example: Sel(a2)
        FreezeTitles(true)

FullScreen(onOff)
Returns the current screen mode and sets it if onOff is specified (true = full screen, false = normal).
Example: FullScreen(true)

IBrowser([webpage])
Runs Internet browser.
Example: IBrowser("www.z4soft.com")

InputBox(title)
Shows input dialog box with the title.
Example: age = InputBox("Enter your age")

InsertCells(colsRows)
Inserts cells (true - columns, false - rows).
Example: InsertCells(false)

LastCol([rowNumber])
Returns the last nonblank cell in the whole sheet (if rowNumber is not specified) or in the specified row.
Example: last = LastCol()
        last = LastCol(15)

LastRow([columnNumber])
Returns the last nonblank cell in the whole sheet (if columnNumber is not specified) or in the specified column.
Example: last = LastRow()
        last = LastRow(15)

ListBox(title, range)
Shows list box dialog with items from range and with the title and returns the index of the selected item.
Example: med = ListBox("Choose medicine",
        Medicines!a1:a50)

ListBox2(title, item, item2, item3... item29)
Shows list box dialog with items: item1, item2, item3... and with the title and returns the text of the selected item.
Example: car = ListBox("Choose car",
        "BMW", "Jaguar", "Ferrari")

Modified([onOff])
Returns true if the Modified flag is true (workbook was modified) and sets the Modified flag to onOff (true or false).
Example: Modified(false)

MsgBox(text)
Shows the Message Box with the text.
Example: MsgBox("Hello")

Paste([contents, format, skipBlanks, onlyResults])
Pastes the clipboard to the current selection.
Example: Sel(A1:A5)
        Copy()
        Sel(B1)
        Paste()
All arguments are optional. Paste() function without arguments works as Edit/Paste menu command. The Paste() function with arguments works as Edit/Paste Special menu comment. The Default values for arguments are Paste(true, true, false, false).
Example for paste contents, preserve previous format:
        Paste(true, false)

PlaySound([filename])
Plays a sound (file of type *.wav). If you use this function without parameter, any currently playing sound is stopped.
Example: PlaySound("Song1.wav")

RangeRef(col1, row1, col2, row2 [, sheetIndex])
Returns the range reference.
Example: MsgBox(Sum(RangeRef(a1,2,20,2)))

Return()
Stops task execution.
Example: if a1=0
        MsgBox("A1 must not be 0")
        Return()
        end

RowHeight([height])
Returns row height of the first row of current selection and sets height of selected rows if height is specified.
Example: Sel(A2:A7)
        RowHeight(10)

RowHide([hideUnhide])
Returns whether the first row of current selection is hidden and hides (true) or unhides (false) selected rows if hideUnhide is specified.
Example: Sel(A2:A5)
          RowHide(true)

RunApp(application [,parameters])
Runs and application (program) with optional parameters.
Example: RunApp("iexplore.exe", "http://z4soft.com")

Sel([range])
Returns the current selection and select the new one if range is specified.
Example: Sel(a2:c12)

Set(reference, value)
Sets cell specified by reference to the value.
Example: Set(a1, 12.34)

SheetName(sheetNum)
Returns name of the specified sheet.
Example: name = SheetName(1)

SheetsCount()
Returns a number of sheets in workbook.
Example: MsgBox("Sheets count is "&SheetsCount())

ShowPicture(pictureFile [,Time])
Shows a picture (file of types: *.jpg, *.gif, *.bmp, *.2bp, *.xbm). Use the second (optional) parameter to close a picture window after time seconds. Without specifying the time parameter a picture can be closed by tapping on it.
Example: ShowPicture("car.bmp")

Sort(firstBy[, ascending, secondBy, ascending, thirdBy, ascending, headerRow, caseSensitive, sortRows])
Sorts the current selection. FirstBy, secondBy, thirdBy - column numbers (or row numbers if sortRows is true). Sorts ascending (ascending = true) or descending (ascending = false).
For more info see Sort dialog in Tools menu.
Example: Sel(a1:c20)
          Sort(1)

TopLeftCell(reference)
Returns the top left cell on the screen and sets it if reference is specified.
Example: TopLeftCell(A1)

YesNoBox(text)
Shows the box giving the choice yes or no and returns true if user selects Yes.
Example: if YesNoBox("Stop") then
         Return()
         end

Zoom([magnification])
Returns current value of zoom magnification and sets it to magnification if specified.
Example: Zoom(65)
         Zoom(Zoom()-10)

Automating Task Examples

Selecting cells from a2 to the last cell
        Sel(RangeRef(1, 2, LastCol(), LastRow()))

Selecting column by tapping the cell in the first row (onTap: $A$1:$A$255)
        curCol = Column(ActiveCell())
        Sel(RangeRef(curCol, 1, curCol, LastRow()))

Entering a product name to the tapped cell in column B from product table in Sheet2 (onTap:$B$1:$B$16384)
        choice = ListBox("Select a product", Sheet2!a1:a16384)
        Set(ActiveCell(), CellRef(1, choice, 2))

Get current selection coordinates:
col = Col(Sel())
row = Row(Sel())
numCols = Cols(Sel())
numRows = Rows(Sel())

Keyboard Shortcuts

Format Cells	Ctrl+1	Fill Right	Ctrl+R
Select All	Ctrl+A	File Save	Ctrl+S
Copy	Ctrl+C	Paste	Ctrl+V
Fill Down	Ctrl+D	Close	Ctrl+W
Find	Ctrl+F	Cut	Ctrl+X
Goto	Ctrl+G	Redo	Ctrl+Y
Replace	Ctrl+H	Undo	Ctrl+Z
File New	Ctrl+N	Clear Contents	Del
File Open	Ctrl+O		

Pocket Word

Microsoft Pocket Word® allows you to create and edit documents much the same way as you do using Microsoft Word on your desktop PC. To open Pocket Word, double-tap the icon on the desktop or go to *Start|Programs* and tap Pocket Word. A new document is automatically opened. To open an existing document, choose *File|Open* and specify the location of the file.
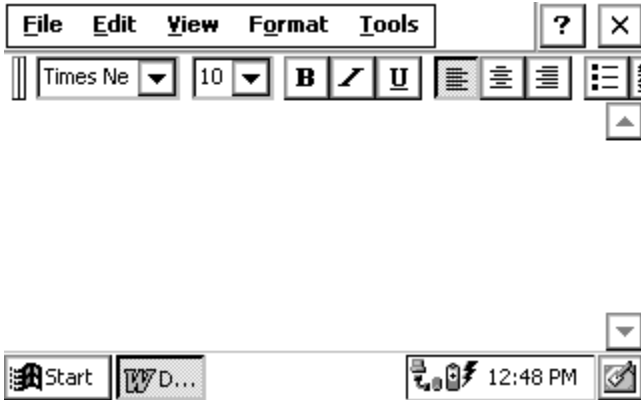
Pocket Word allows you to open Pocket Word documents (.pwd) and ASCII text files (.txt). If you have more than one document opened, cycle through them by pressing CTRL+< or CTRL+>.

▲ Command Bar

The buttons on the command bar give you quick access to many of the same options that are available in the Format menu such as font attributes and alignment. You can choose whether you would like the command bar to be below the menu bar or to the right of the menus to allow for more viewing space. Refer to *Application Command Bars* earlier in this section for details.

Help

Use the on-line Help [?] for more details about Pocket Word.

▲ Saving Pocket Word Files

When you select *File|Save* or *File|Save As*, the path is automatically set to: \My Documents\, which stores the file in RAM. We recommend that you change the path to: \C_Drive\C_MyDocs\ so that the file is saved

Internet Explorer and Inbox

Allegro includes Microsoft Pocket Internet Explorer® for accessing the World Wide Web and Microsoft Inbox® for sending and receiving e-mail.

▲ Setting up an Internet Connection

The procedure for accessing the Internet depends on your specific requirements and network environment. For example, you may wish to use a phone line to dial into an Internet Service Provider (ISP). In this case you will need a PC card modem and an established ISP account. Or you may wish to connect Allegro directly to your office internet, in which case you need an ethernet PC card and assistance from your network administrator.   These are just a few of the possibilities. Regardless of how you decide to make the connection, the following information will assist you in getting Allegro configured properly.

If you plan to use a dialup connection for Internet access, you need to configure a new connection as follows:

1) Install and configure a PC card modem according to the manufacturer's instructions.

2) Turn on the Allegro and go to *Start | Programs | Communication | Remote Networking*.

3) Double-tap the *Make New Connection* icon. Enter a name for the connection and select *Dial-Up Connection.* Tap the *Next* button. Select the modem you are using in the drop-down box. In most cases, you do not need to make changes under the *Configure* or *TCP/IP Settings* dialogs. Consult with your network administrator if you need to change these settings. Tap the *Next* button and enter your dialing information. Tap the *Finish* button.

4) Double-tap the connection icon, enter your user name and password, and tap the *Connect* button. Once the connection is established, you have complete access to the Internet. Start Pocket Internet Explorer to browse the Web, or follow the instructions below to set up Inbox for sending and receiving e-mail.

▲ Using Inbox

Inbox allows you to send and receive e-mail as well as compose outgoing messages and view incoming messages.

First, set up a service so that Inbox knows how you are accessing the internet by following these steps:

1) Start Inbox from the desktop icon or from the *Start* menu.

2) Go to *Services/Options* on the main menu. On the Services tab, tap *Add.* Choose IMAP4 Mail or POP3 Mail and enter a service name. Tap the *OK* button.

3) The Mail Service Definition dialog is displayed. If you are using a dialup connection, select the connection that you created previously (see above) from the drop-down list. If you are using a network connection, select Network Connection. Enter your ISP or network information in the remaining edit boxes.

4) Tap the *Next* button to access the Mail General Preferences and Mail Inbox Preferences dialog boxes. Configure the settings in these dialogs according to your needs. For additional information on these settings consult the online help. When you are finished, tap the *Finish* button.

5) You can establish a connection using Inbox by tapping *Sevices/Connect* from the main menu.

To send an e-mail, tap *Compose/New Message*. Enter the address, subject, and message and tap the *Send* button on the toolbar. To read your incoming e-mail, tap *Inbox* in the tree view at the left of the screen. This displays a list of your messages in the list view on the right. Double-tap a message in this list to view its content.

Help
Use the on-line Help [?] for more details about the Internet Explorer and Inbox programs.

Calculator Program

The six-function Calculator program functions like a desktop calculator. To open Calculator, go to *Start|Programs* and select *Calculator* from the list.

Tap on the numbers and mathematical functions required to perform the desired calculation. The numbers appear in the horizontal box at the top of the screen as you type them in. The answer to the calculation also appears in this box. You can enter the numbers from the keyboard if you wish.

The box in the upper-left corner displays an *M* if there is information stored in the memory of the calculator.
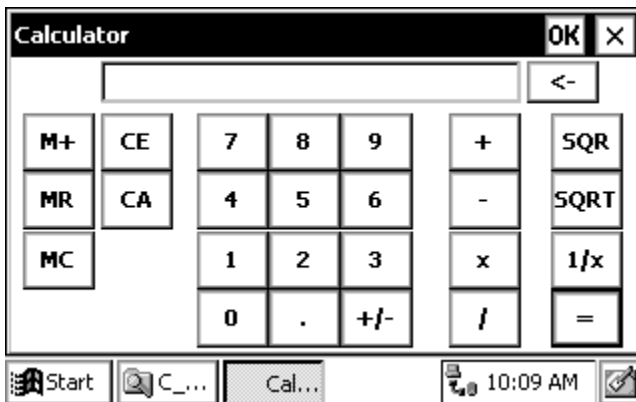
Terminal Program

The Terminal® Emulation program is used to connect the Allegro to an online service.

Creating a New Session

1) Double-tap on the "Make a New Session" icon shown above. A screen called *Session Properties* is shown.
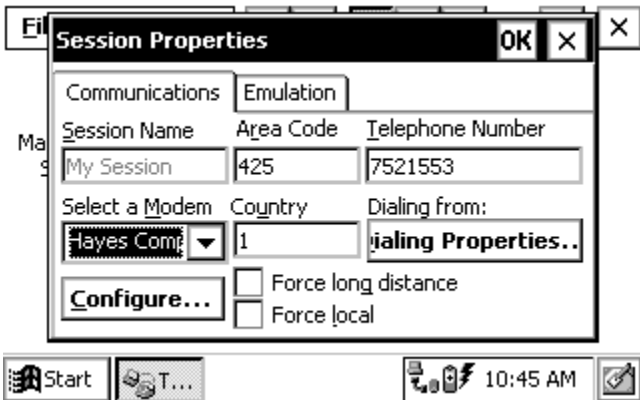
2) Enter a name in the *Session Name* box.

3) Select the name of your modem from the pull-down list.

4) Enter the telephone number for the remote computer.

5) Select *OK* to connect.

6) An icon for the new session appears in the Terminal folder.

7) To disconnect, select *File | Close.*

Adjusting the Properties

To adjust the properties, follow these steps:
1) Select the icon for the session you want to adjust.

2) Tap on *File | Properties* to bring up the *Session Properties* screen.
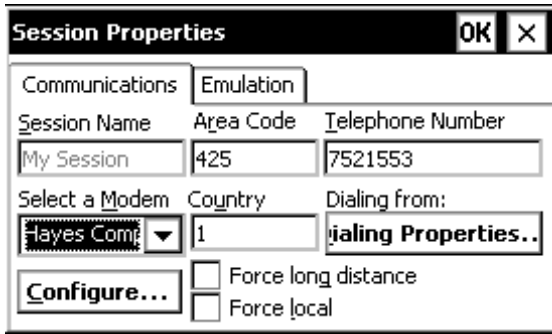
3) Make any necessary adjustments on the *Communications* tab. Call
   options and port settings are adjusted by pressing the *Configure...*
   button.

Device Properties		OK	×

Port Settings | Call Options

Baud Rate | 19200 ▼ | ☐ Use terminal window before dialing
Data Bits | 8 ▼
Parity | None ▼ | ☐ Use terminal window after dialing
Stop Bits | 1 ▼
Flow Control | Hardware ▼ | ☐ Manual Dial (user supplies dial strings)
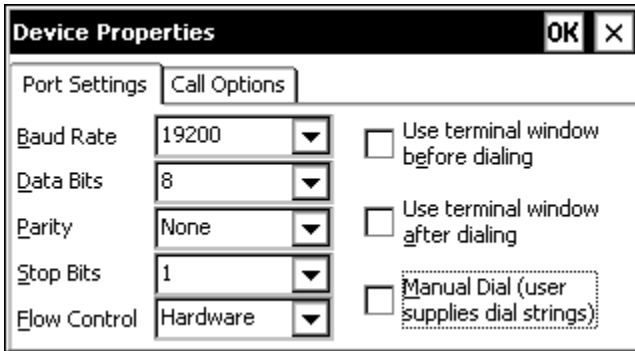
Press the *Dialing Properties* button to make dialing property adjustments.
Press OK when you are finished.

Dialing Properties		OK	×

Location: Work ▼ | New...

Local Codes
Area: 425
Country: 1

Dialing
◉ Tone
○ Pulse

Call Waiting
☐ Disable
Dial:
▼

Remove

Edit...

Local
9,G

Long Distance
9,1FG

International
9,011,EFG
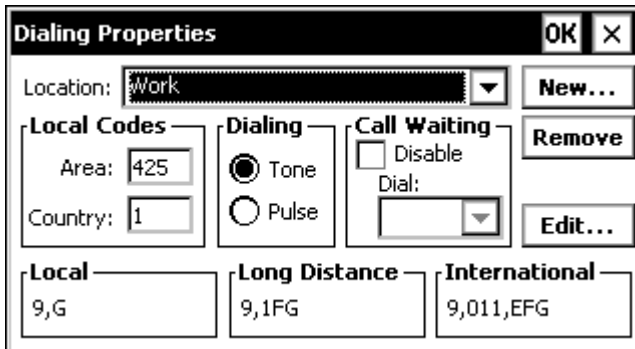
4) Select the Emulation tab to modify the emulation settings. Press OK
when you are finished.
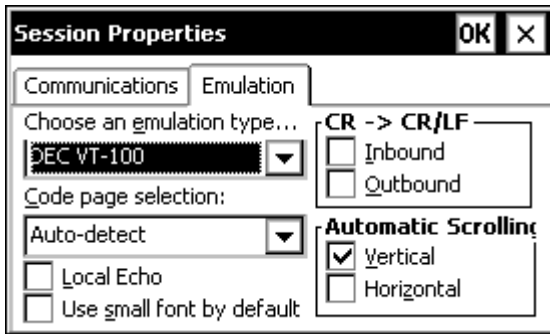
Help

Use the on-line Help [?] for more details about the Terminal program.

Section 5

MS-DOS Operating System

MS-DOS Operating System Overview

This section describes the operation of the Allegro using the MS-DOS™ 6.22 operating system.

▲ Running DOS

The Allegro boots to Windows CE by default when it is first turned on. To switch to DOS, tap the Start button and select *Programs | Boot to DOS*. Once you switch to DOS, it becomes the default operating system until you switch back to Windows CE. You can operate the Allegro by issuing standard DOS commands from the DOS prompt or through a file management program called FileScout (described in detail later in this section).

Going to Windows CE from DOS

To switch to Windows CE from DOS, type "WCE" at the DOS prompt. It is normal for the display to become dark for several seconds while Windows CE is loading.

▲ Programs for the Desktop PC and the Allegro

Desktop PC Program

The Allegro Utilities CD-ROM includes the Lynx™ Windows File Manager for installation onto your desktop PC. To run Lynx, the desktop PC must be running Windows 95 or higher and must have at least one serial port. To install Lynx on your desktop PC, insert the Allegro Utilities CD-ROM into your computer and select "Install Lynx" option. Follow the instructions given to you. The Lynx icon appears in the Start menu when installation is complete.

❖ *Note: If you have previously installed Lynx on your desktop PC we recommend that you uninstall it and install the updated version included on the Allegro Utilities CD-ROM.*

Allegro Programs

The following DOS programs are factory-installed on the Allegro:

❏ FileScout DOS File Management Utility

❏ Text Editor

❏ Terminal Program

❏ Commonly Used DOS Commands

The Lynx program, all of the Allegro programs, and the full set of the DOS commands are included on the Allegro Utilities CD-ROM.

Setting Up Communication

Communication functions are handled by the following programs:

On the desktop PC: Lynx™ File Management Utility

On the Allegro: FileScout™ DOS File Management Utility

▲ Establishing Communication Between Computers

Follow the steps listed below to set up communication between the desktop PC and the Allegro:

1) Connect one end of the serial communication cable to the serial port on the desktop PC and the other end to either one of the serial communication ports on the Allegro (COM1 or COM2).

2) Turn on both the desktop PC and the Allegro.

3) On the desktop PC, start Lynx from the Windows Start Menu. On the Allegro, run FileScout by typing "FS" at the DOS prompt and pressing <ENTER>.

4) On the desktop PC, set up the communication port from Lynx by selecting the *Transfer|Select COM Port* menu option. Select the port that the communication cable is connected to (COM1, COM2, etc.). Beneath the Remote screen a status box indicates which communication port has been set up on the PC.

5) On the Allegro, if you are using COM1 (the default) as the communication port, no additional set up is required. If you are using COM2, press <F5> Xfer from the FileScout menu to view the Transfer menu. Press <F1>, COM Port and select COM2.

6) To establish communication between the desktop PC and the Allegro, click on the Lynx "Connect" shortcut button or select the "Transfer/Connect to Remote" menu option. As communication is being established, the Connect button rotates and the Status box at the bottom of the Remote screen displays: trying…trying…trying… Comm established…Connected.

If communication is not made, an error message appears on the screen telling you that communication was not established. If this happens, make sure you have properly prepared the Allegro and the PC to communicate and try connecting again.

Once communication is established, the drives, folders, and files located on the Allegro are shown on the Lynx remote screen on the desktop computer. On the Allegro FileScout status line, the word "Connected" blinks every second to indicate that a connection is made with the computer. Refer to the information about Lynx later in this section for details.

❖ *Note: If you have been running Windows CE and using ActiveSync to transfer files, sometime during this process a screen may appear telling you to disconnect the COM port. To proceed with the Lynx connection, answer Yes (OK) to this notification.*

▲ Adjusting the Allegro Communication Parameters

In most cases, you can use the default communication parameters on the Allegro; no adjustments are required. If you need to make adjustments or are having trouble establishing communication between the Allegro and the desktop PC and need to check the settings, refer to the descriptions of the parameters below.

From FileScout press <F5> to view the Transfer screen. The following functions are listed at the bottom of the screen:

Function	Default	Description
F1 = COM Port	COM1	Set Up Communication Port
F2 = Baud	115.2K	Select Baud Rate
F3 = Cmd		Access the Commands
F4 = Recv		Receive Files From PC
F5 = Send		Send Files to PC
F6 = Lynx	On	Communication Mode

To change a setting, press the number associated with it or highlight the desired setting using the up and down arrow keys and press <ENTER>).

<F1> COM Port: Press <F1> to select COM1 or COM2. The active port is listed in the upper right corner of the FileScout screen.

<F2> Baud: We recommend that you leave the Allegro in "auto baud rate detection mode." In this mode, the Allegro establishes communication between the PC and the Allegro at 115.2 K baud (required to use Lynx). To change the baud rate, press <F2> and make a selection.

<F3>, <F4>, <F5>: When the Allegro is communicating with Lynx on the desktop computer, the FileScout Transfer functions F3, F4, and F5 are not used.

<F6> Lynx: To communicate with Lynx, the Allegro needs to be in the Lynx communication mode. When Lynx mode is on, the word "Lynx" is displayed at the top of the FileScout menu along with the active port as shown below:

FileScout v1.0   Lynx – COM1

When the Allegro is in Lynx mode, it checks at regular intervals to see if it is linked to a computer. When it detects a connection, the Allegro is treated as a remote computer by the desktop computer. To turn Lynx mode on or off, Press <F6> and make a selection.

❖ *Note: To use Auto Suspend, you must turn Lynx mode off. See System Setup Program, Power Management Screen, and Auto Suspend later in this section of the manual for details.*

Communicating with Other Desktop PC Programs

Some programs have integrated PC communication modules you will use instead of Lynx. DataLink and LandMark PC are two examples.

The FileScout Transfer screen has three functions that you may use with these programs: <F3> Command, <F4> Receive, and <F5> Send. Refer to the User's Manual for the program you are using for information on how to proceed.

Lynx Windows File Management Utility

Lynx is a Windows file management utility that runs on a desktop PC, allowing you to easily transfer files between your desktop PC and the Allegro Field Computer. Additional file management functions that can be performed remotely on the Allegro from your PC include:

❏ Creating and deleting files or folders

❏ Moving or copying files within the remote or local computer

❏ Viewing the contents of folders, the C: drive, or PC cards

▲ Lynx Screens

When you start Lynx from your Windows Start Menu, two Windows Explorer™-type screens are displayed. The top screen (Local) displays the contents of your PC. The bottom screen (Remote) displays the contents of the Allegro after a connection is established. A sample screen is shown below:
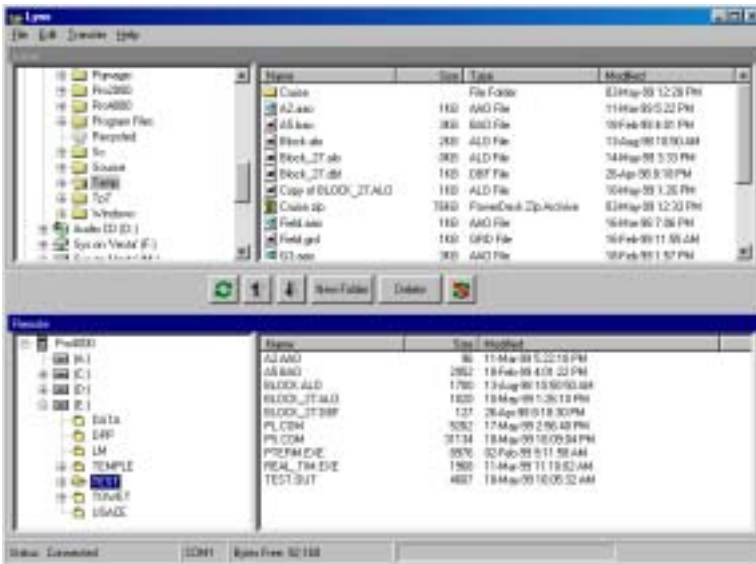
The Lynx display has the following features:

1) File, Edit, Transfer, and Help functions.

2) A tool bar with shortcut buttons is located between the local and remote screens.

3) Beneath the remote screen are four boxes that provide you with the following information: status, active communication port, bytes free on the Allegro, and file transfer progress.

Status: Connected	COM1	Bytes Free: 92,160	
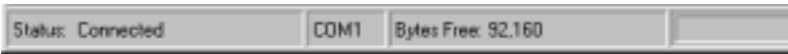
▲ Lynx Menu Options

Once communication has been established between the Allegro and the PC, you can use the Lynx menu options. Shortcut buttons are available for some of these options. The shortcuts are described later in this section.

File Edit Transfer Help

File Menu Options

The following options are available on the File Menu:

- File/New Folder: Creates a new folder or sub-folder on the local or remote computer. A dialog box is shown where you type in the new folder name.

- File/Delete: Deletes a file or a folder. Highlight the file or folder to be deleted. Select the delete menu option or the delete shortcut key. A dialog box asks you to confirm that the file should be deleted before this action is done.

- File/Filters: Allows you to view selected file types. You can set a filter for both the local and the remote computer separately. You can use a wildcard (*) in the filter specification. For example, if you want to use Lynx to transfer files from the Allegro with the file extension .dat, you would set the filter for the remote to *.dat in the remote filter dialog box. The file list for the remote display would list files with the extension .dat. All other files would not be shown on the display.

- File/Exit: Exits Lynx on the PC. Prior to exiting Lynx disconnect the communication link between the PC and the Allegro using Transfer/Disconnect or by pressing the Disconnect button.

Edit Menu Options

The edit options follow standard Windows protocol. Highlight the file or folder you want to perform the editing function on. You can select multiple files with Select All or by holding down the <Shift> or <Ctrl> key as you highlight the files. Choose the editing option you want to perform in one of the following ways:

1) Select the option from the Edit Menu (Edit/Cut for example).

2) Press the appropriate control key shortcut (Ctrl X for example).

The following functions are available on the Edit Menu option:

- Edit/Cut (Ctrl X): Cuts a file or folder. When a file or folder is cut from the remote display, the file disappears from the file list on the active display. When the file is pasted (moved) to the new location, the file list is updated. If you cut the file but you neglect to paste it, the file will still be on the drive from which it was cut.

- Edit/Copy (Ctrl C): Copies a file or folder.

- Edit/Paste (Ctrl V): Pastes a file or folder from the clipboard.

- Edit/Select All (Ctrl A): Selects all the files or folders on the local or remote screen.

❖ *Note: The edit menu options can be used to cut, copy, and paste files or folders within either the local or remote screen, but not between them. Use the transfer menu options for moving files between computers.*

Transfer Menu Options

The following functions are available on the Transfer Menu option:

- Transfer/Connect to Remote: Establishes a connection between the PC and the Allegro.

- Transfer/Send to Remote: Sends a file from the PC (Local) to the Allegro (Remote). Highlight the file or files to transfer. You need to rename files that are more than eight characters long before you transfer them to the Allegro. Select the "Send to Remote" menu option or press the shortcut button to send the file/s. On the Lynx screen the Status box indicates the transfer status and the Progress bar displays the file transfer progress. The file list on the Allegro is updated after file transfer is complete.

- Transfer/Receive from Remote: Sends a file from the Allegro (Remote) to the PC (Local). Highlight the file or files to transfer. Select the "Receive from Remote" menu option or press the shortcut button to send the file/s. On the Lynx display the Status box indicates the transfer status and the Progress bar displays the file transfer progress. The file list on the PC is updated after file transfer.

- Transfer/Cancel Transfer: This function is used to cancel a file transfer after it has been initiated.
- Transfer/Disconnect: Disconnects the communication link between the PC and Allegro. This action tells the Field Computer to stop waiting for additional commands from the PC. Otherwise you will have to press the ESC key on the Field Computer to return to normal function. If you need to communicate with more than one Field Computer, you must click the Disconnect button before switching the serial cable to the next Field Computer. When the communication link between the Allegro and the PC is disconnected, the Lynx Remote screen is cleared. On the Allegro, the Status line on the FileScout screen no longer displays "Connected" every second.
- Transfer/Select COM Port: Select the COM port that the communication cable is connected to on your PC.

Help Menu Option

The following functions are available on the Help Menu option:

- Help/Contents: A Table of Contents for Lynx Help.
- Help/Index: An Index for Lynx Help.
- Help/Using Help: Describes how to use Help.
- Help/MS-DOS Help: The MS-DOS 6.22 commands are listed and described. To read about a specific command in detail, select it from the menu. You can view or print this information.
- Help/About: Information about the Lynx program is given.

▲ **Shortcut Buttons**

In addition to the pull-down menu options, there are shortcut buttons. The Shortcut Tool Bar is located in the center of the Lynx display. You can use these buttons to quickly access commonly used functions.
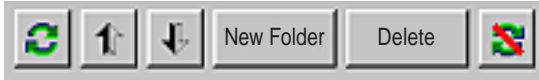
The Connect button is used to establish a connection between the PC and the Allegro (the same as the Transfer/Connect to Remote function).

The Up Arrow button is used to send a file from the Allegro to the PC (the same as the Transfer/Receive from Remote function).

The Down arrow button is used to send a file from the PC to the Allegro (the same as the Transfer/Send to Remote function).

The New Folder button is used to create a new folder or sub-folder (the same as the File/New Folder function).

The Delete button is used to delete a file or folder (the same as the File/Delete function).

The Disconnect button is used to disconnect the communication link between the computer and the Allegro (the same as the Transfer/Disconnect function).

FileScout DOS File Manager

FileScout is a DOS File Management Utility that runs on the Allegro. Instead of issuing commands at the DOS prompt, you select options displayed on menus to perform file management activities. Fewer keystrokes are required than with the standard DOS command line environment. FileScout provides the following functions:

❏ File management

❏ File transfer between computers

❏ Access to the following utilities: DOS System Setup, Text Editor, Terminal Emulator

To run FileScout, type "FS" at the DOS prompt and press <ENTER>.

❖ *Note: When the system is initially booted, the path is set as follows: Path = C:\;C:\UTIL;C:\DOS;A:\. If the path is overwritten by the user and A:\; is not included in the path statement, the Allegro will not be able to access files on drive A:. The drive must be specified as part of the path command.*

▲ FileScout Main Screen

When you execute FileScout a screen similar to the following appears:

```
┤█  FileScout v1.0   Lynx - COM1  ├
C:\                         Ins=Mark
Files: 22  Used: 7.726M  Free: 12.75M

 [DATA]
 [DOS]
 [NETWARE]
 [UTIL]
 AUTOEXEC.BAT    435    04-03-00 09:07
 CKCOM    .EXE  81.39K  03-12-96 10:26
 CKMEM    .EXE  101.3K  03-12-96 10:26
 CKPRO    .CER   177    08-02-92 15:34
 CKPRO    .RPT  6263    08-02-92 15:34

Move     Rename    MarkAll   UnmrkAll  Util
Drives   Edit      Copy      MkDir     Xfer
```

Title: The name and version of the program, communication mode, and active COM port are indicated on the first line of the display. On the sample screen shown on the previous page, the program name and version number is FileScout v1.0c. The word Lynx is shown, indicating that the Lynx communication mode is turned on. The active communication port is COM1.

First Status Line: On this line the current drive, directory and subdirectory (if applicable) are listed. If a function is being performed (make directory, etc.) information about the function is also shown. On the sample screen above, the current drive is C:\.

Second Status Line: This line displays the number of files stored in the current directory, the number of bytes used by these files, and the number of bytes free on the current drive. If a function is being performed, this line displays information concerning the function.

Folders and Files: A list of folders and files within the current active folder are displayed in the box underneath the second status line. Folder names have square brackets around them. On the above sample screen, [DOS] and [DATA] folders, and AUTOEXEC.BAT and CKCOM.EXE are files stored on the C: drive.

Function Keys: The ten function key options are listed at the bottom of the screen.

▲ Selecting Folders or Files in FileScout

Press the keys described below to move the highlight bar to the folder or file you want to select (to copy, view, execute etc.).

Up or Down Arrow Keys
Use the arrows to move the highlight bar up or down one position.

<PgUp> and <PgDn> Keys (Page Up or Page Down)
These keys are used to move the highlight bar up or down one screen.

ENTER Key
The <ENTER> key is used to execute an implied command. The command that takes effect when <ENTER> is pressed depends on which file or folder is highlighted. There are three implied commands:

1) Change drive: To change drives press <F1>. A list of available drives is shown. Highlight the drive you want to select and press <ENTER>. The letter of the current drive is displayed on the first status line.

2) Change folder: To change folders, highlight the desired name and press <ENTER>. The path (drive and folder) of the current folder is shown on the first status line.

3) Run a program or batch file: To run a program or batch file, highlight the desired filename and press <ENTER>. FileScout prompts you to enter any parameters that the program may need on the second status line. If the program does not require any parameters, press <ENTER> again. If you need to enter program parameters, type the parameters as you would at the DOS prompt then press <ENTER>. You can enter up to 10 parameters or a maximum of 80 characters. Press <ESC> if you want to abort the execution of the program or batch file.

▲ FileScout Functions

The file management functions and utilities provided by FileScout are accessed with the function keys. If you are going to work with a directory or file, select it first then press the function key associated with the desired function.

The FileScout functions are described on the following pages. To select a function, press the function key associated with it. To abort a function, press <Esc>.

<F1> Drives: Press <F1> and a list of available drives is shown. Highlight the drive you want to select and press <ENTER>. The letter of the selected drive is displayed on the first status line on the FileScout main screen.

<F2> Edit: The edit function is used to edit existing text files. Highlight the file you want to edit and press <F2>. The file is opened in the Text Editor. To create a new text file, see the description for <F10> Utilities, option 2, Editor.

<F3> Copy: This command copies a file or a group of files. Highlight a file or mark a group of files to be copied using <Ins> and press <F3>.

You are asked to enter the destination for the files to be copied to on the second status line. Enter the destination path (drive and directory). If you wish to rename a file, include the name within the destination path. Press <ENTER> to copy the files.

<F4> MkDir: This command is used to create a new subdirectory in the current directory path. When <F4> is pressed, you are asked to enter the name of the new subdirectory on the second status line. Enter the name and press <ENTER>.

<F5> Xfer: Use this function to set up communication parameters and establish communication between the Allegro and another computer. When you press <F5> the following communication functions are shown:

Function		Description
F1 =	COM Port	Set Up Communication Port
F2 =	Baud	Select Baud Rate
F3 =	Cmd	Access the Commands
F4 =	Recv	Receive Files From PC
F5 =	Send	Send Files to PC
F6 =	Lynx	Toggle Lynx On and Off

Refer to *Establishing Communication Between Computers* and *Communicating with Other PC Programs* earlier in this section for details about these functions.

<F6> Move: This command moves a file or a group of files to other drives or directories. Highlight a file or mark a group of files to be copied using <Ins> and press <F6>.

You are asked to enter the destination for the files to be moved to on the second status line. Enter the destination path (drive and directory). Press <ENTER> to move the file(s).

❖ *Note: You cannot move files to the ROM drive (A:)*

<F7> Rename: To rename a file, highlight the desired file and press <F7>. Enter the new filename and press <ENTER>. If you do not want a filename to have an extension, type the filename ending with a period. For example, "MYFILE." would be listed in the directory without an extension.

<F8> Mark All: Marks all the files on the current directory.

<F9> Unmark All: Unmarks all the files on the current directory.

<F10> Util: Pressing <F10> accesses eight additional utility functions. A list of the functions is shown in a pop-up box. To select a utility, type the number associated with it or highlight the desired utility and press <ENTER>.

1.	Terminal	Causes the Allegro to act as a dumb terminal. This is useful if you have a serial device such as a bar code wand or GPS receiver attached to the Allegro and you want to verify whether or not the Allegro is receiving serial data from the device.
2.	Editor	Executes the Text Editor. Use this function when you are creating a new text file (must be 64 K or less). After selecting this function, you must enter a name for the file to be edited on the second status line and then press <ENTER>. This text editor function differs from the <F6> edit function, which is used to edit existing files only. (See *Text Editor* later in this section for details.)
3.	SetUp	Executes the DOS SetUp program. (See *DOS Setup Program* later in this section for details.)
4.	File Filter	Displays all or a subset of files on the current directory. You can set a mask on the types of files you want to display. For example, if you only want to display files with the extension .DAT, you would use the File Filter utility to set the mask "*DAT." The default setting for the File Filter is "*.*" which shows all files. When you select the File Filter utility, the current setting is displayed on the second status line. If you want to change this setting, press the <BkSp> (backspace) key to delete the existing setting and type in the new setting. The File Filter represents a file specification (1-8 character name). You can use the characters "?" (for only one character) and "*" (for any number of characters) in the filename. An extension can be used to specify a group of files.
5.	Sort by Extension	Sorts your files by name or by extension. You can toggle between the two options.
6.	Program Return Switch	When you exit from a program, you can choose to have the Allegro return immediately to FileScout or return to the DOS prompt. If you set it up to return to the DOS prompt, you must type "Exit" and press <ENTER> to return to FileScout.
7.	Shell to DOS	Lets you temporarily access the DOS prompt without exiting from FileScout. To get back into FileScout, type "Exit" and press <ENTER>.
8.	Boot to WinCE	Boots to Windows CE from DOS.

<Ins> Mark: The insert key <Ins> is used to mark and unmark a file. To mark a file, move the highlight bar to the desired filename and press <Ins>. A mark character (>) is placed to the left of the filename. To unmark a file, move the highlight bar to the desired marked file and press <Ins>. The mark sign is removed from the left of the filename.

<Del> Delete: The delete key <Del> deletes (erases) a file, a group of files, or a subfolder. To delete a file, highlight the file and press <Del>. To delete a group of files, first mark all the files to be removed and press <Del>. Before you can delete a subfolder, you must delete all of the files in it, then highlight the subfolder and press <Del>.

When the <Del> key is pressed, you are asked to confirm the deletion of the file(s) or subfolder. You must type in <Y> followed by <ENTER> if you want to proceed with the deletion. Any other keystroke aborts the file deletion.

❖ *Note: You cannot delete files from the ROM drive (A). If you try, it first appears as if the files were deleted, but after the next DOS operation the files reappear in the directory.*

<Esc> Escape: The escape key <Esc> is used to abort functions if the program is at a prompt awaiting your input. Escape also exits the FileScout program. If you are exiting the program, you are asked to confirm that you want to exit. You must press <Y> at this prompt followed by <ENTER>.

Text Editor

There is a full screen text editor available that runs on the Allegro. The text editor allows you to create and edit text files up to 64 K in size. It is useful for editing the AUTOEXEC.BAT and the CONFIG.SYS files.

▲ Starting a New Text File

Press <F10> Util from FileScout to bring up the Utilities menu. Select 2 "Editor" to execute the Text Editor program.

Enter a name for the new file on the second status line after the word File: and press <ENTER>.

A blank page appears on the screen. You can now create a new file using the editing rules described later in this section.

Blank Screen

▲ Accessing an Existing File

To access an existing file, select the desired file from the FileScout directory then press <F2>. This keystroke executes the Text Editor and opens the file that is highlighted.

▲ Editing a Document

Cursor Movement

The circular key is used along with the BLUE and GOLD shift keys to move the cursor around the document.
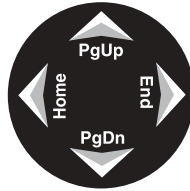
To move the cursor one character at a time, the arrow keys are used:

To the right	Right Arrow
To the left	Left Arrow
Up one line	Up Arrow
Down one line	Down Arrow

To move the cursor to the start or end of a line:

To the beginning of a line	BLUE key + <Home>
To the end of a line	BLUE key + <End>

To move the cursor one screen

To previous screen	BLUE key + <PgUp>
To next screen	BLUE key + <PgDn>

To move the cursor to:

The beginning of the file	<Ctrl> + BLUE key + <PgUp>
The end of the file	<Ctrl> + BLUE key + <PgDn>

To pan the display:

Right	GOLD key + Right Arrow
Left	GOLD key + Left Arrow
Up	GOLD key + Up Arrow
Down	GOLD key + Down Arrow

Function Keys

The function keys are used for editing files as follows:

Function	Description
F1	Paste
F2	Mark
F3	Undelete Line
F4	Undelete Character
F5	Print Block
F6	Cut
F7	Delete to End of Line
F8	Delete Line
F10	External Display
Esc	Exit
Ins	Insert

Inserting and Overwriting Text

You can enter text in insert mode or overwrite mode. Insert mode is the default. The word "Ins" is displayed at the bottom right corner of the display.

To insert text, position the cursor at the point where the new text is to start and begin typing. The existing text moves to the right as new text is inserted.

To switch to overwrite mode, press the <Ins> key. The word "Ins" changes to "Ovr" and the cursor changes to a block cursor. In overwrite mode, all the text to the right of the cursor is overwritten with new text.

To switch back to insert mode, press the <Ins> key again.

Deleting Text

Text can be deleted one character at a time or one line at a time. To delete the character at the cursor, press the <Del> key. The character is removed from the screen, and the text from the right is shifted left one character. To delete to the left of the cursor, press the <BkSp> (backspace) key.

To delete a line, position the cursor anywhere on the line to be removed and press the <F8> key. The line is deleted and the lines below it move up. The line just deleted is placed in a buffer until another line is deleted and takes its place. The last line deleted can be pasted back into the document using the undelete line command, <F3>.

Undeleting Text

Text deleted with the <Del> or <BkSp> key can be restored at the cursor location *as long as the cursor has not moved to another line.* (Once the cursor is moved using the arrow keys the text is lost and cannot be recovered.) To undelete the removed text, press the <F4> key. Text removed using <F7> (clear to end of line) cannot be recovered.

Lines deleted using the <F8> key can be pasted back anywhere in the document by pressing the <F3> key.

Working With Blocks of Text

To mark a section of text as a block, press <F2>, the mark command, and use the arrow keys to block the text. Blocked text is displayed in reverse video.

Blocks of text can be cut (saved in a scratch buffer), pasted (copied from the scratch buffer to the current cursor location), or sent to a line printer.

To cut a block of text once it has been marked, press <F6>, the cut command key. The text is saved in a buffer and removed from the screen. The text to the right of the block is shifted to the left.

To paste a block of text from the scratch buffer, position the cursor where the text should be inserted and press <F1>, the paste key. To print a block of text, you need to select a block of text and press <F5>, the print key, while the block is marked. The marked text will be sent to the printer.

To copy a block of text, first mark it, and then cut it, then paste it back in the original position. Now you can move the cursor to where you want the block copied and paste it again.

Saving and Exiting

To exit the Text Editor, press <Esc>. The program asks you if the current text should be saved:

"Save Changes [Y/N]?"

At this point, if an <N> is pressed, the program exits without saving the text. If a <Y> is pressed, you are asked to enter a filename. If the file already has a name, the name is shown on the screen. Use the backspace key to delete or modify the name. Pressing <ENTER> instructs the program to save the text in a file with the name specified and exit. The <Esc> key can be used at any time to abort the exit command.

❖ *Note: You cannot edit files on the A: drive.*

Terminal Emulation Program

The Terminal Emulation program is used to test communication protocol settings and hardware connections between the Allegro and another device such as a bar code wand, GPS receiver or another computer.

Connect the device to the Allegro and set up the communication parameters.

Press <F10> Util from FileScout to bring up the Utilities menu. Select 1 "Terminal" to execute the Terminal Emulation program. The following screen appears:

```
┌─────────────────────────────────────┐
│ PTERM v1.0   —   COM1,9600,8,N,1     │
│                                      │
│                                      │
│                                      │
│                                      │
│                                      │
│                                      │
│                                      │
│                                      │
│                                      │
│  HELP  PARAMS  FILE  SCREEN  EXIT    │
└─────────────────────────────────────┘
     F1      F2      F3     F4     F5
```
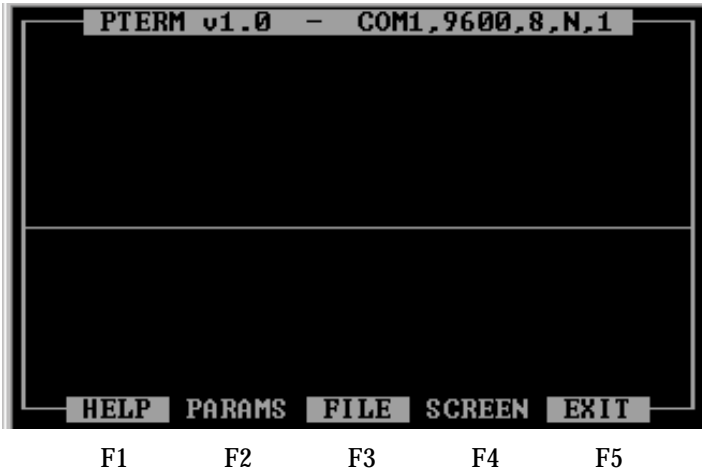
Communication Parameters

In the heading at the top of the screen the default settings for the communication port, baud rate, data bits, parity, and stop bit are shown. The communication port, baud rate, and parity can be adjusted if necessary through the <F2> Params function. The data bits (8) and stop bit (1) cannot be adjusted.

Screen Viewing Options

You have three screen viewing options accessed through the <F4> Screen function. Keep pressing <F4> until the screen option you want is listed. The screen you select automatically comes up after a delay of a few seconds.

- *Split Screen: Binary/ASCII (default)* shows binary data coming in on the top section of the screen and ASCII data on the bottom section of the screen.

- *Split Screen: Remote/Local* shows the data coming in from the remote device on the top section of the screen and the data going out from the Allegro to the remote device on the bottom section of the screen. For example, if you are connected to another computer, characters you type on the Allegro keyboard appear on the local section of the screen as well as on the remote computer screen (assuming a terminal program is being run on the remote computer). Conversely, If you type characters on the remote computer keyboard, they appear on the remote section of the Allegro screen.

- *Single Screen: Remote/Local* shows the data coming in from the remote device and the data going out from the Allegro to the remote device together on the same screen. The data from the local device is in inverse type.

Saving the Data to a File
If you want to save the data output to the Allegro from another device to a file, press <F3> File, and enter a path and filename.

Troubleshooting
If you are not seeing what you expect on the screen, make sure the communication parameters on both devices are set up correctly and that the device is securely connected to correct port on the Allegro.

System Setup Program

The Setup program is used to configure your Allegro Field PC. Most of the parameters you configure through the Setup program are only in effect when you are using the DOS operating system. The same parameters are set up independently in Windows CE using the Control Panel.

The parameters you edit with Setup include:

- System Date and Time
- Processing Speed
- Keyboard Configuration
- Display Configuration
- Auto-Panning (On or Off)
- Power Management

Executing Setup

The easiest way to invoke the Setup program is by pressing the <GOLD> key plus the <S> from any screen in DOS. The main menu screen pops up.

Setup is resident on the system ROM (A:) and can be executed from FileScout or directly from DOS. You can also execute Setup during the POST (Power On Self Test) by pressing the <Del> key before DOS boots up.

Executing Setup from FileScout
From the FileScout main menu, press the <F10> Utility key. The Utility menu appears. Press <3> to select the Setup option. The Setup main menu screen is displayed.

Executing Setup from DOS
To run the Setup program from DOS, type:

>   Setup   <ENTER>

The Setup main menu screen is displayed.

If you receive an error message after issuing this command, check to ensure that drive A: is referenced in your path statement in the AUTOEXEC.BAT file. If it is not referenced, you will need to type "A:Setup" at the DOS prompt.

▲ Setup Program Screens

Main Menu Screen

When you execute Setup, the main menu screen is displayed. Five System Setup screen options are listed. Use the up or down arrow keys to highlight the screen you want to view and press <ENTER>.

```
                  System Setup
            BIOS Setup Software
                  Ver 2.0X6

            >Configuration
             Power Management
             Keyboard/Display
             System Information
             Restore Defaults


            ↑↓ =Move        Enter=Select
            Esc=Exit
```
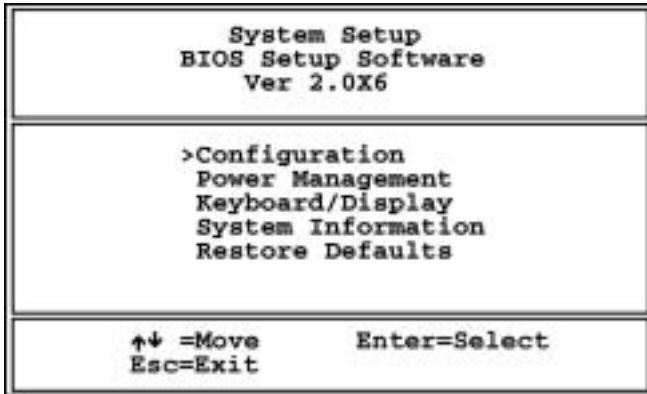
The parameters and options found on the Setup screens are described on the following pages. The default values are underlined. You can select and edit the parameters using the keystrokes listed below.

Key	Function
Arrow Keys ←↑↓→	Move between parameters.
F1	Scroll through options starting with the previous value.
F2	Scroll through options starting with the next value.
ENTER	Select highlighted option.
ESC	Exit current Setup screen and return to the main menu.

```
                    Congiguration

                Date:>Mar 16, 2001

                Time: 14: 12: 44


                Boot Options: C: then A:



        ←↑↓→=Move          F1=Prev
        ESC =Exit          F2=Next
```
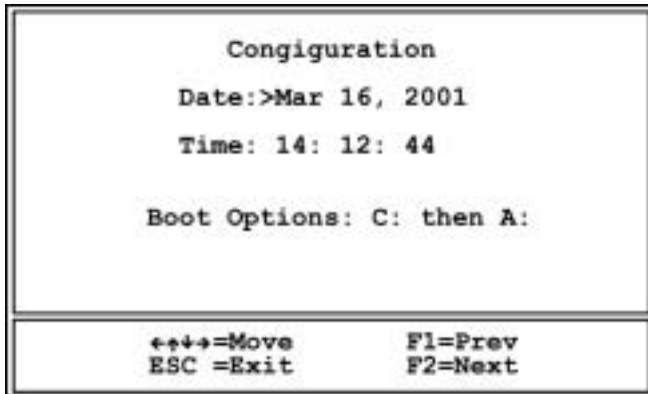
Configuration Screen

❏ **Date: Month=Jan-Dec, Day=1-31, Year=1980-2099**

❏ **Time: Seconds=0-59, Minutes=0-59, Hours=0-23**

Time is expressed in the standard 24-hour format (military time).

❏ **Boot Options: <u>Windows CE</u>, C then A, A then C**

The Allegro boots to Windows CE by default. You can change this
default and have the Allegro boot to DOS by selecting one of the other
two options, which also determine the primary and secondary boot
drives. The system always boots from the primary drive unless it is
malfunctioning in which case it attempts to boot from the secondary
drive.

```
                Power Management

        Power Key:        >Susp/Res
        Auto Suspend:      50 Min
        PC Card Suspend:  On
        CPU Performance:  High
        Power Manager:    On
        Com1 Output:      RS-232
        Memory Test:      Off
        Battery Capacity  3800
        Vehicle Mode:     Off

        ←↑↓→=Move          F1=Prev
        ESC =Exit          F2=Next
```
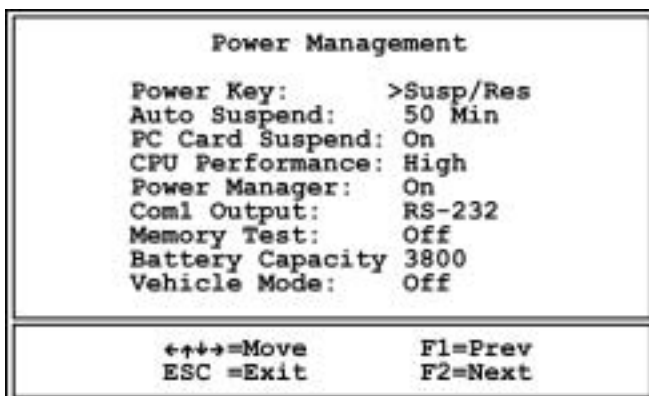
Power Management Screen

❏ **Power Key (On/Off Key): <u>Suspend/Resume</u> or On/Off**

In Suspend/Resume mode, the system becomes suspended when the On/Off key is pressed or when the preset Auto Suspend time interval is reached (5 to 75 minutes, see below). The screen turns off and the processor stops running, but the system does not reboot. When you press the On/Off key again, the Allegro resumes where it left off.

In On/Off mode, the system clears and reboots when the On/Off key is pressed. If external power is connected to the Allegro, the Allegro goes into a semi-low power state where it appears to be off, but it is actually on. Any event that normally causes the Allegro to turn on (pressing the On/Off key, com port ring in, etc.) causes the Allegro to reboot. When the external power is removed, the Allegro powers off.

❏ **Auto Suspend: <u>Disable</u> or 5 to 75 Minutes**

If Auto Suspend is turned off, the Allegro stays on until you turn it off or the batteries are drained. If Auto Suspend is assigned a time limit, the Allegro turns off when the time limit passes with no activity.

❖ *Note: Lynx mode must be turned off to use Auto Suspend. Refer to Setting up Communication, Adjusting the Allegro Communication Parameters earlier in this section of the manual for details.*

❏ **PC Card Suspend: <u>On</u> or Off**

This setting determines whether the PC card remains powered on when the system is suspended, allowing ATA Flash cards and other I/O cards to operate in Suspend/Resume mode. If you are using one of these cards and want to use Suspend/Resume mode, Select "On" for this setting. For SRAM cards, this can be set to "Off."

❏ **CPU Performance: Hyper, <u>High</u>, Medium, Low, Miser**

This function sets the 486 processor clock speed for varying levels of power/performance. When the processor runs faster, it requires more power and drains the battery more quickly. For maximum time between battery charges, set this function to the lowest level that still gives adequate performance for your application. If battery charge is not a concern, set Performance to "High" or "Hyper."

❏ **Power Manager: <u>On</u> or Off**

The Power Manager can help extend battery life by automatically speeding up and slowing down the 486 processor based on system activity. Activities include key presses, serial port transfers, and video updates. The Power Manager should work fine for most applications, but in some cases it may need to be turned "Off." For example, for applications that control their own power management, we recommend that you set the Power Manager to "Off."

When the Power Manager is "Off," the processor runs at the same speed all the time regardless of activity. The following table gives clock speeds in MHz for the five performance levels with the Power Manager "On" or "Off."

Performance Setting	Power Manager On Processing/Idle	Power Manager Off
Hyper	100/4	66
High	66/4	33
Medium	33/2	16
Low	16/1	8
Miser	8/1	2

❖ *Note: When alkaline batteries are used, the processor speed is limited to 33 MHz for all settings. When the alkaline batteries are low, the maximum speed drops to 16 MHz.*

❏ **COM1 Output: <u>RS-232</u> (not user editable)**

This setting is reserved for future use.

❏ **Memory Test: <u>Off</u>**

The Memory Test validates that the memory is working okay. It takes longer to boot up the Allegro when it is on, so it is best to only turn it on occasionally and leave it off most of the time.

❏ **Battery Capacity: 2500 - 4500 mAh (not user editable from Setup)**

This field displays the current setting for battery capacity in milliamp-hours. This setting effects the gauging circuitry and should be set to accurately reflect the capacity rating of the NiMH rechargeable battery pack in use. It can only be set in the popup window that is invoked when the battery is replaced. Refer to *Section 2, Hardware Features, Batteries* for details.

❏ **Vehicle Mode: On or <u>Off</u>**

Vehicle Mode should be turned on when the Allegro is connected to a vehicle's power supply. The battery charge management is adapted for continuous external power, preventing the NiMH battery pack from being overcharged. Refer to *Section 2, Hardware Features, Batteries* for details.

```
┌─────────────────────────────────────────┐
│              Keyboard                    │
│        Key Tone:   >Medium               │
│        Key Click:   On                   │
├─────────────────────────────────────────┤
│              Display                     │
│                                          │
│  Auto Pan: Enabled    Backlight: Off     │
│  Heater:   Auto       BL Brit:   14      │
│  Video:    B/W 1      LED Brit:  Dim     │
│  Contrast: 35         Font Size: 8x12    │
├─────────────────────────────────────────┤
│        ←↑↓→=Move         F1=Prev         │
│        ESC =Exit        F2=Next          │
└─────────────────────────────────────────┘
```

Keyboard/Display Screen

❏ **Key Tone: Low, <u>Medium</u>, High**

Sets the frequency of the speaker for key clicks.

❏ **Key Click: <u>On</u> or Off**

When "On" is selected, an audible beep is sounded when a key is pressed. When "Off" is selected, there is no sound.

❏ **Auto-Pan: <u>Enabled</u> or Disabled**

When auto-panning is "On," the screen pans as the cursor moves beyond the visible window. When it is "Off," the screen does not pan when the cursor leaves the visible window. You can move around the screen manually using the GOLD key + arrow key combinations on the keyboard. (Refer to *Display, Section 2*, for more details.) You can toggle auto-panning on and off from the keyboard by pressing the GOLD key + <Ins>.

❏ **Heater: <u>Auto</u> or Off**

The heater setting should be set to "Automatic" when temperatures are at or below freezing and the display begins to get sluggish. When the heater setting is "Auto," the Allegro monitors the display temperature every five minutes. If the temperature is less than -3° C then the heater is turned on. When the temperature is above -3° C, the heater is turned off. The Allegro does this automatically. When the heater is on it uses 250 mA of current. When the heater setting is "Off," the heater is always off.

❑ **Video Map (Text Mode Only):** <u>B/W1</u>, B/W2, Gray Scale

This feature controls how CGA colors are mapped to the LCD: black and white (B/W1 or B/W2) or 16 shades of gray (Gray Scale).

Both B/W settings map the attribute byte for each character on the screen to either black on white (normal) or white on black (inverted). Values for the foreground and background attributes are computed based on RGBI content. The attribute with the highest value is assigned black and the other is assigned white. In general, lighter colors map to black, darker colors map to white. These settings apply to text mode only. Graphics mode is always mapped to shades of gray.

"B/W1" is more power efficient but it requires that the video stream used by an application program go through the BIOS instead of being written directly to memory. Some programs do this and some do not. "B/W2" requires more processing overhead, but should work with all application programs because it does not require the video stream to go through the BIOS. If the application program does not display accurately with the video set to "B/W1," try switching to "B/W2."

❑ **Contrast: 0 to <u>34</u> to 63 ratio**

This field adjusts the LCD character/screen contrast from 0 to 63. The contrast can be adjusted in the field without getting into the Setup program. To decrease the contrast, press the GOLD key + <F4>. To increase the contrast, press the GOLD key + <F5>. Automatic temperature compensation for the display is set at 34.

❑ **Backlight: On or <u>Off</u>**

The display backlight can be turned on and off from this field or directly from the keyboard by pressing the GOLD key + <F3>. The brightness can also be adjusted (see instructions below).

❑ **Backlight Brightness: 1 to <u>14</u> ratio**

This field adjusts the backlight brightness from 1 to 14. Because the backlight uses power, set it to the lowest setting that allows you to adequately view the display.

❖ *Note: In some cases, the use of alkaline batteries may reduce the maximum brightness of the backlight.*

❑ **LED Brightness: <u>Medium</u>, Dim, Bright**

This field lets you adjust the brightness of the LED indicators to suit the lighting conditions you are working in. In some conditions, they can interfere with the visibility of the display if they are too bright.

❏ **Font Size: 8x8, 8x12, 10x12, 16x16**

This field lets you select the font size for text mode. The units are character width x height in pixels.

```
            System Information

        Base Memory:      640K
        Extended Mem:     15360K

        Bios Version:     2.00
        PIC Version:      21.00
        CPU Version:      0.3

        Heater Status:    OFF
        Cmos Battery:     Good

                 ESC=Exit
```

System Information Screen

❏ **Base Memory**

Total amount of Base Memory in the system

❏ **Extended Memory**

Total amount of Extended Memory in the system

❏ **BIOS Version**

BIOS version installed in the Allegro

❏ **PIC Version**

PIC version installed in the Allegro

❏ **CPU Version**

SC400 processor version installed in the Allegro

❏ **Heater Status**

Reflects the physical status of the heating element in the display

❏ **CMOS Battery**

Charge status of the lithium CMOS battery

```
┌──────────────────────────────────────────┐
│  ┌────────────────────────────────────┐  │
│  │                                    │  │
│  │                                    │  │
│  │          Reset CMOS to             │  │
│  │        factory defaults?           │  │
│  │           (Y or N)                 │  │
│  │                                    │  │
│  │                                    │  │
│  │                                    │  │
│  └────────────────────────────────────┘  │
│  ┌────────────────────────────────────┐  │
│  │                                    │  │
│  │                                    │  │
│  └────────────────────────────────────┘  │
└──────────────────────────────────────────┘
```
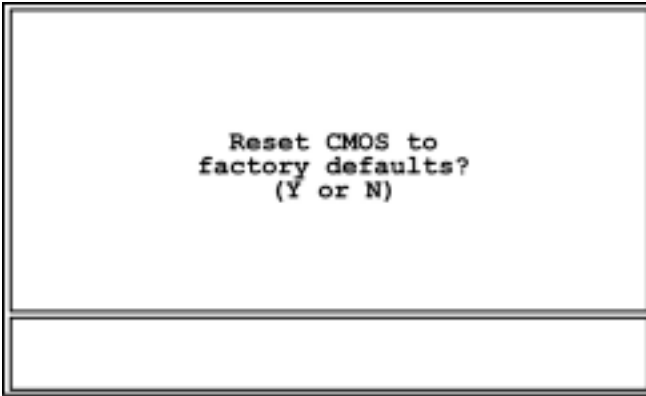
Restore Defaults Screen

This screen allows you to return all the System Setup Parameters to the factory defaults. If you wish to do this, press "Y." The defaults are restored and the Allegro automatically reboots to Windows CE (unless the default operating system has been changed to DOS).

If you do not want to reset the defaults, press "N."

Startup Files

AUTOEXEC.BAT and CONFIG.SYS startup files containing default configuration information are factory installed on the C: drive of the Allegro. Each time you turn on or reboot into DOS on the Allegro, DOS searches for these files and carries out their commands.
(Note: If the Allegro is booted from the A: drive, the CONFIG.SYS and AUTOEXEC.BAT files on C: are not executed.)

❖ *Important Note: It is important that the existing CONFIG.SYS and AUTOEXEC.BAT files located on the Allegro's C: drive are not replaced. If you need to change these files for your application, carefully follow the directions given in the Startup File section.*

CONFIG.SYS File
The CONFIG.SYS file is a text file that contains special commands that configure the Allegro's hardware components. DOS starts, it carries out the commands in the CONFIG.SYS file. The CONFIG.SYS file is located in the root directory of drive C:.

The following commands can be used only in the CONFIG.SYS file:

Buffers	Files
Country	Install
Device	Lastdrive
Devicehigh	Numlock
Dos	Shell
Drivparm	Stacks
Fcbs	Switches

The following commands are commonly used in the CONFIG.SYS file and can also be typed at the command prompt:

Break
Rem
Set

The following special CONFIG.SYS commands are used only to define multiple configurations within the CONFIG.SYS file. For more information about defining multiple configurations, refer to the DOS help in the Lynx Help menu.

   Include
   Menu color
   Menudefault
   Menuitem
   Submenu

The CONFIG.SYS file can also contain the following special characters:

; Specifies that the current line is a descriptive comment and should not be carried out. Insert this character at the beginning of the line. (You can also insert a comment by using the REM command.)

? Specifies that DOS is to ask for confirmation before carrying out the current command. Insert this character immediately after the command you want to prompt for, without any intervening spaces, but before the equal sign (=). For example, to have MS-DOS ask for confirmation before carrying out the DOS=HIGH command, you would change the command to read: DOS?=HIGH. To have MS-DOS ask for confirmation before carrying out the DEVICEHIGH /L:1,7280=MYFILE.SYS command, you would change the command to read as follows:

DEVICEHIGH? /L:1,7280=MYFILE.SYS

Default CONFIG.SYS File on the Allegro
The CONFIG.SYS file is stored in the root directory of the C: drive. A backup copy is also stored in the C:\UTIL directory. The file is configured as follows:

```
device = C:\DOS\HIMEM.SYS/testmem:off
device = C:\DOS\EMM386.EXE on x=a000-c1ff x=e000-efff
     noems ram=c200-dfff
dos = high,umb
devicehigh=c:\dos\power.exe off
buffers = 20
files = 20
break = on
lastdrive = g
```

```
REM CardSoft(TM) 3.1 PCMCIA DRIVERS
devicehigh=C:\util\CARDSOFT\SS365SL.EXE
devicehigh=C:\util\CARDSOFT\CS.EXE
devicehigh=C:\util\CARDSOFT\CSALLOC.EXE
devicehigh=C:\util\CARDSOFT\ATADRV.EXE /S:1
devicehigh=C:\util\CARDSOFT\MTSRAM.EXE
devicehigh=C:\util\CARDSOFT\MTDDRV.EXE
devicehigh=C:\util\CARDSOFT\CARDID.EXE
REM End of card drivers
```

Changing the CONFIG.SYS File

You can modify the CONFIG.SYS file using a text editor. If you need to make changes or additions to the CONFIG.SYS file, we recommend that you modify the existing CONFIG.SYS file found in the root directory on the C: drive.

You can add command lines to your CONFIG.SYS file that tell the system to automatically load a specified program. If you need to add additional device drivers or commands, add them at the end of the existing CONFIG.SYS file. Nothing should be placed before the first three lines in the file. The lines that set up the PC Card drivers should be left in place and unaltered in order for the PC Card to operate properly. For more information on the CONFIG.SYS file, refer to the MS-DOS Help on the Allegro or in Lynx on your PC.

AUTOEXEC.BAT Batch Files

An AUTOEXEC.BAT batch file or batch program is a text file that contains one or more MS-DOS commands that are automatically executed when the computer is rebooted. When you reboot the computer, the commands are carried out as a group.

Any MS-DOS command you use at the command prompt can also be put in a batch program. In addition, the following MS-DOS commands are specially designed for batch programs:

Call	If
Choice	Pause
Echo	Rem
For	Shift
Goto	

You can use the COMMAND /Y command to step through a batch program line by line, and can selectively bypass or carry out individual commands. This functionality is useful for tracking down problems in batch files. For more information, see COMMAND in the MS-DOS Help on the Allegro or in Lynx on your PC.

Default AUTOEXEC.BAT File on the Allegro
The AUTOEXEC.BAT file is stored in the root directory of the C: drive. A backup copy is also stored in the C:\UTIL directory. The file is configured as follows:

    Path = c:\;c:\util;c:\dos; a:\:
    prompt pg
    loadhigh doskey
    loadfont

Changing the AUTOEXEC.BAT File
You can modify the AUTOEXEC.BAT file using a text editor. If you need to make changes or additions, we recommend that you modify the existing AUTOEXEC.BAT file found in the root directory on the C: drive. Place additions at the end of the existing AUTOEXEC.BAT file. Please note that the loadfont program must be included in the AUTOEXEC.BAT file to enable you to use the four fonts in DOS. Do not remove it. For more information on the AUTOEXEC.BAT file, refer to the MS-DOS Help on the Allegro or in Lynx on your PC.

Bypassing Startup Files <F5>

If you have problems that you suspect are related to commands in your CONFIG.SYS or AUTOEXEC.BAT files, you can temporarily bypass both files or bypass individual commands within the files.

Bypassing All Commands
To bypass all the commands in both files, follow these steps:

1) Reboot the Allegro by pressing the <ON/OFF> key for **8** to **10** seconds (just until the screen clears). After the system starts, DOS displays the following message:

        Starting MS-DOS...

2) While this message is on your screen, quickly press and release the <F5> key. DOS displays the following text:

        MS-DOS is bypassing your CONFIG.SYS and
        AUTOEXEC.BAT files.

The Allegro will start with a basic configuration instead of your usual configuration. For example, device drivers for PC cards will not be loaded and environment variables will be set to their default values.

Bypassing Individual Commands

If you suspect your problems are related to a specific command, you can view each command individually and bypass only the command you think may be causing the problems. To review individual commands, follow these steps:

1) Reboot the Allegro by pressing the <ON/OFF> key for 8 to 10 seconds (just until the screen clears). After the system starts, DOS displays the following message:

>   Starting MS-DOS...

2) While the text is on your screen, quickly press and release the <F8> key. One by one DOS displays each command in your CONFIG.SYS file followed by a prompt. To accept a command, press <Y> for yes. To bypass a command, press <N> for No.

3) When DOS finishes processing the CONFIG.SYS file, the following prompt appears:

>   Process AUTOEXEC.BAT [Y, N]?

Press <Y> for yes, if you also want to view the commands in your AUTOEXEC.BAT file.

DOS Utility Programs and Device Drivers

A subset of the most commonly used DOS commands is stored on the C: drive of the Allegro. A full set of the DOS commands is located on the Allegro Utilities CD-ROM.

You can access information about the DOS commands using one of the following methods:

- On your PC, the Lynx File Management Utility has a MS-DOS Help function. Select Help/MS-DOS Help to run this function. The Help is a DOS program that runs in a DOS window. Use your mouse to click on a topic of interest. A description of the command or function is shown as well as the correct syntax and an example of how to use it.

- MS-DOS Help is also located on the Allegro. From FileScout, select DOS/Help to run the program. Use the arrow keys to select a topic of interest and press <ENTER>. A description of the command or function is shown as well as the correct syntax and an example of how to use it.

- On the Allegro there is also the "fasthelp" command. If you want to know the syntax of a particular command, at the DOS prompt type in the name of the command, a space, and then /?. The syntax of the command is displayed on the screen. Use the screen panning function to view the information.

▲ DOS Commands and Functions

A list of the DOS command and functions that are available to you follows. These commands may be transferred to the C: drive on the Allegro using Lynx (refer to *Section 5, Utility Programs* for details).

Key
*	*The function is factory installed on the C:\DOS directory. All of the files in the DOS directory have been marked as "read only" to prevent accidental erasure.*

+	*The function is an internal DOS function contained in the command processor program (command.com).*

#	*The function is located on the Utility Disks only.*

*	ANSI.SYS	A device driver that allows a common set of commands to control the keyboard and screen.
#	APPEND	Allows programs to open data files in specified directories as if they were in the current directory.
*	ATTRIB	Displays or changes file attributes.
+	BREAK	Sets or clears extended CTRL+C checking.
+	CHDIR	Changes the current directory.
+	CD	Short name for CHDIR command.
*	CHKDSK	Checks a disk and displays a status report.
+	CLS	Clears the screen.
*	COMMAND	Starts a new instance of the MS-DOS command interpreter.
+	COMP	Compares the contents of two files or sets of files.
+	COPY	Copies one or more files to another location.
+	CTTY	Changes the terminal device used to control your system.
+	DATE	Displays or sets the date.
*	DEBUG	Starts Debug, a program testing and editing tool.
	DEFRAG	Reorganizes the files on a disk to optimize the disk.
+	DEL	Deletes one or more files.
*	DELTREE	Deletes a directory and all the files and sub-directories in it.
+	DIR	Displays a list of files and sub-directories in a directory.
*	DOSKEY	Edits command lines, recalls MS-DOS commands, and creates macros.
#	DRVSPACE	Creates and manages drives compressed by using DriveSpace.
*	EDIT	Starts MS-DOS text Editor, which creates and changes ASCII files.
*	EMM386	Enables or disables EMM386 expanded memory support.
+	ERASE	Deletes one or more files.
+	EXIT	Quits the COMMAND.COM program (command interpreter).
*	FASTHELP	Provides summary Help information for MS-DOS commands.

*	FASTOPEN	Decreases the amount of time needed to open frequently used files and directories.
*	FC	Compares two files or sets of files, and displays the differences between them.
*	FDISK	Configures a hard disk for use with MS-DOS.
*	FIND	Searches for a text string in a file or files.
*	FORMAT	Formats a disk for use with MS-DOS.
	GRAPHICS	Loads a program that can print graphics.
*	HELP	Provides complete, interactive Help information for MS-DOS commands.
*	HIMEM.SYS	A device driver that controls programs and data in extended memory.
#	INTERLNK	Connects two computers via parallel or serial ports.
#	INTERSVR	Starts the Interlnk server.
*	LABEL	Creates, changes, or deletes the volume label of a disk.
+	LOADHIGH	Loads a program into the upper memory area.
+	LH	Short name for LOADHIGH command.
+	MKDIR	Creates a directory.
+	MD	Short name for MKDIR command.
*	MEM	Displays the amount of used and free memory in your system.
*	MODE	Configures a system device.
*	MORE	Displays output one screen at a time.
*	MOVE	Moves one or more files. Also renames files and directories.
#	MSD	Provides detailed technical information about your computer.
+	PATH	Displays or sets a search path for executable files.
*	POWER	Turns power management on and off.
*	PRINT	Prints a text file while you are using other MS-DOS commands.
+	PROMPT	Changes the MS-DOS command prompt.
*	QBASIC	Starts the MS-DOS QBasic programming environment.
+	RMDIR	Removes a directory.

+	RD	Short name for RMDIR command.
+	REN	Renames a file or files.
+	RENAME	Renames a file or files.
+	REPLACE	Replaces files.
*	SCANDISK	Checks a drive for errors and repairs any problems it finds.
+	SET	Displays, sets, or removes MS-DOS environment variables.
*	SETVER	Sets the version number that MS-DOS reports to a program.
#	SHARE	Installs file-sharing and locking capabilities on your hard disk.
*	SORT	Sorts input.
*	SUBST	Associates a path with a drive letter.
*	SYS	Copies MS-DOS system files and command interpreter to a disk you specify.
+	TIME	Displays or sets the system time.
*	TREE	Graphically displays the directory structure of a drive or path.
+	TYPE	Displays the contents of a text file.
*	UNDELETE	Restores files previously deleted with the DEL command.
#	UNFORMAT	Restores a disk erased by the FORMAT command.
+	VER	Displays the MS-DOS version.
+	VERIFY	Directs MS-DOS to verify that your files are written correctly to a disk.
+	VOL	Displays a disk volume label and serial number.
*	XCOPY	Copies files (except hidden and system files) and directory trees.

Make Space Utility Program

MKSPACE.BAT is a batch program that removes DOS utility programs that are not commonly used from the DOS directory on the C: drive of the Allegro. This utility frees up approximately 1 M of space on the C: drive. MKSPACE.BAT is located on the Allegro in C:\DOS. Below is a list of the utility programs that are removed when the MKSPACE.BAT program is run.

    debug.exe   qbasic.hlp
    deltree.exe   qbasic.ini
    edit.com   qbasic.exe
    edit.hlp   scandisk.exe
    fc.exe   scandisk.ini
    find.exe   setver.exe
    help.com   sort.exe
    help.hlp   subst.exe
    label.exe   tree.com
    more.com
    move.exe

When you run the MKSPACE program, the following messages are shown on the Allegro screen:

    This program will delete
    DOS commands (910K) from
    Drive C:\ that are not
    commonly used!

    DOS commands can be
    added to the drive
    from the Allegro Utilities
    CD-ROM when or if desired.
    Remove DOS Commands?

If your response is yes, the following message is shown:

    DOS Commands Removed.

If your response is no or you do not respond within 10 seconds, the following message is shown:

    Either No was selected
    or 10 sec without action.

    No DOS Commands
    were removed!

Serial Printing Utility Program

SERPRN.EXE is a DOS utility program that allows you to set up an Allegro serial communication port to send output to a printer. If a program is designed to use a parallel printer port, SERPRN redirects the parallel port settings to a serial port. It also sets the communication parameters and software and hardware handshaking.

This program can be used in place of the Mode command. Like the Mode command, you can call SERPRN from the AUTOEXEC.BAT file so printing is automatically set up.

The parameters you can specify when executing this program are listed below.

COM1   COM port to be used (COM1 or COM2)
9600   Baud rate (1200, 2400, 4800, 9600, 19200, 38400, 56800, 115200)
n   Parity (n - none, e - even, o - odd, m - mark, s - space)
8   Number of data bits (7 or 8)
1   Number of stops bits (1 or 2)
x   Enables XON/XOFF handshaking
c   Enables CTS hardware handshaking
d   Enables DSR hardware handshaking
q   Enables quiet mode
z   Disables the redirection of the COM port
?   Displays help
t   Sets time out (number between 1 - 15)

To execute this program, type the command followed by your parameter choices. The syntax and the default settings (no handshaking) are shown below:

Serprn com1 9600 n 8 1 x

A space must separate each parameter. The first parameter is always the COM port followed by the communication parameters (these can be entered in any order). The hardware and software handshaking can be used separately or together. Normally, only one handshaking method is used at a time.

Generally, an output list is shown after SERPRN is invoked informing you how the utility has set the communication port. You can disable the output listing with the quiet mode parameter (q).

Example uses of SERPRN are shown below.

Syntax

        Serprn com1 9600 n 8 1 x t10

Output

        HM/JS Parallel to Serial Redirector
        COM1 9600 n 8 1
        LPT1 redirected to COM1
        Handshaking XON

If the program is called with only the COM port specified, the program default settings are used.

Syntax

        Serprn com1

Output

        HM/JS Parallel to Serial Redirector
        COM1 9600 n 8 1
        LPT1 redirected to COM1
        No Handshaking

If the program is called without any command line parameters, a status report is shown listing the settings that are currently in use for the serial port.

Syntax

        Serprn

Output

        HM/JS Parallel to Serial Redirector
        COM1 9600 n 8 1
        LPT1 redirected to COM1
        Handshaking XON CTS DSR

If the program is called with the ? parameter in the command line, it returns a list of the available command line parameters.

Section 6

Technical
Reference

Specifications

Processor

- AMD SC 400, 486 AMD processor, 100 MHz

Operating Systems

- Microsoft Windows CE® 3.0

- MS DOS® 6.22

Programs (for Allegro and PC)

- Windows CE

  - Desktop PC: Microsoft ActiveSync®

  - Allegro Suite: PTab™ Spreadsheet, Calculator, Terminal Program, Microsoft Windows Explorer®, Microsoft InBox® Email, Microsoft Pocket Internet Explorer®, and Microsoft Pocket Word®

- DOS Utilities

  - Desktop PC: Lynx™ File Transfer Utility

  - Allegro Utilities: FileScout™ DOS File Manager, Text Editor, Terminal Program

Physical Specifications

- Size: 10" high x 5.25" wide at display x 3.1" wide at narrowest point x 1.5" deep (256 mm x 133 mm x 79 mm x 38 mm)

- Weight: 1.78 lbs or 28 oz (807 grams)

- Operating Temperature: -22 to 130° F (-30 to 54° C)

- Storage Temperature: -30 to 140° F (-35 to 60° C)

- Waterproof: Passes MIL-810E-512.3 and IP67 leak (immersion) tests. To pass these tests, the Allegro is submerged under 2 meters of water for 2 hours.

- Shockproof: Passes MIL-810E-512.4 shock (drop) test. To pass this test, the Allegro is dropped on each face and corner from 5 feet onto 2 inches of plywood backed by concrete.

Communication Ports

- Two 9 pin D RS-232 ports; up to 115 Kbaud transfer rate; 5 V power at 250 mA for external devices on COM1 (DTR pin #4)

- Two IrDA ports for wireless communication; 115 kbps communication speed; one located on the top and one on the bottom of the case; the bottom port has docking pins to connect to a docking cradle; IrDA ports run under Windows CE only

Display

- LCD has an EL backlight with adjustable brightness capability for visibility in low lighting or changing light conditions
- Automatic contrast adjustment with temperature compensation
- Display heater for operation in cold environments; can be set to turn on automatically when temperature is -3° C
- LCD has extended temperature range to work better in cold or hot environments
- CGA graphics in DOS mode
- Resolution is 320 pixels wide x 200 pixels high
- Active viewing area: 3.8" wide x 2.4" high (4.5" diagonal)
- Touchscreen for use with Windows CE; includes an onboard mini stylus and a full size stylus
- In DOS text mode the following font sizes are user selectable with a hot key: 25 lines by 40 characters, 16 x 40, 16 x 32, or 12 x 20
- Virtual DOS full screen in memory: 25 lines x 80 characters, with panning
- Touchscreen Disable button allows you to clean the screen

Keyboard

- Large keys for use with gloved hands
- 12 Function keys located directly under the display; convenient for use in applications as soft keys
- Special keys include: Windows Start, Task Manager, and Touchscreen Disable; Reset and DOS Break
- Large round rocking arrow button
- Unshifted forward and backward tab keys
- Numeric keys are large and centrally located
- All printable ASCII characters are on the keyboard
- All extended ASCII characters are accessible through ALT# # # key sequences
- Keys have a snappy tactile feel

Case Design

- Ergonomic with balanced weight distribution
- Rugged, 100% sealed against water and dust
- The Allegro floats

- Designed for one-handed operation (right or left)
- Rings at all 4 corners of the case for straps
- Adjustable handstrap and shoulder strap
- Multiple strap orientations possible

Memory/Storage

- 16 M or 32 M low power EDO DRAM
- 24 M non-volatile solid state disk storage; data are secure without battery backup

PC Card Slot

- User accessible
- 16 bit PC Card (not 32 bit card bus)
- Accepts Type I or II 3V/5V PC cards (does not accept 3V only cards)
- Compatible with SRAM, I/O, or ATA Flash cards
- Compact Flash card adapter is available

Power

- Rechargeable NiMH high capacity battery pack
- NiMH batteries last 12 to 20 hours depending on the application (maximum continuous use is 30 hours)
- Alkaline battery holder uses 3 AA alkaline cells (optional accessory)
- Intelligent battery charge status indicators, low battery warning
- Resume mode allows you to resume where you left off when you turn the Allegro on
- Adjustable performance/power management
- Power manager automatically switches unit into low power mode for optimum efficiency
- Separate power input connector for charging and direct power input, 5.5 x 2.1 mm, 10-20 V DC
- Rapid internal smart-charging in 3 to 5 hours; automatic switch to trickle charge mode to preserve charge and protect battery

Sound

- Standard PC speaker circuits
- Produces basic computer sounds and plays WAV files
- Volume can be controlled when playing WAV files
- Sound Blaster Pro compatible

Clock

- Internal battery-backed real time clock

- +/- 3 minutes per month accuracy

Certifications

- CE Mark approval

- FCC Class A

Expandability

- Custom expansion pods allow you to integrate additional components as they become available. Options include an RF network, animal ID reader, bar code scanner, GPS receiver, parallel port, and analog sensor input. Expansion pods replace the PC card door and are sealed.

<u>*Specifications are subject to change without notice.*</u>

Glossary of DOS Terms

Following is a glossary of some basic terms relating to the operating systems, memory, and data storage options.

AUTOEXEC.BAT File
An AUTOEXEC.BAT startup file contains default configuration information. There is an AUTOEXEC.BAT file on both the Allegro's C: and A: drive. The Allegro usually boots from the C: drive. Therefore, the AUTOEXEC.BAT on the C: drive is activated first. It does not chain to A:. You can modify this file as needed for your application.

Byte
A byte is the amount of space it takes to store one character.

CONFIG.SYS File
A CONFIG.SYS startup file contains default information that configures the hardware components on a computer. There is a CONFIG.SYS file on both the Allegro's C: and A: drive. Because the Allegro boots from the C: drive on default, the commands in the CONFIG.SYS located on the C: drive are activated. You cannot chain to other CONFIG.SYS files using MS-DOS. You can modify the CONFIG.SYS file on drive C: if required.

Disks and Disk Drives
Computer disks can be classified into two basic groups: Diskettes and hard drives (also called fixed drives). The Allegro uses a solid state hard disk and PC card for program and data storage. The solid state disk is non-volatile.

DOS
DOS is an acronym for Disk Operating System. DOS consists of a set of commands or code which tells the computer how to process information. DOS runs programs, manages files, controls information processing, directs input and output, and performs many other related functions.

File
A file is a defined set of related information electronically stored on your Allegro or PC. Examples: a letter, a database, or a program. Computer files are stored either in the computer's internal memory (RAM and ROM) or on storage media, typically disks (diskettes and hard drives).

Disk-On-Chip (Hard Disk)
A disk-on-chip is a solid state disk drive. The C: drive on the Allegro is a disk-on-chip. It can be read from and written to just like the hard drive on a PC but has no moving parts and does not require power to maintain contents.

Kilobyte
One kilobyte (K or KB) is thought of as one thousand bytes (the actual figure is 1,024 bytes).

Megabyte
One megabyte (M or MB) is thought of as one million bytes (the actual figure is 1,048,576 bytes). The Allegro comes with 16 M of RAM and 24 M of disk storage.

PCMCIA Card (PC Card)
PCMCIA is an acronym for Personal Computer Memory Card Interface Association. When the proper software (device drivers) is installed on the Allegro, an SRAM card or ATA FLASH card may be inserted in the slot provided. A PC card may also be a modem, RF transceiver, GPIB interface or several other possible devices. The Allegro device drivers automatically detect these devices when they are installed in the PC card slot.

RAM (Random Access Memory)
RAM is often referred to as the computer's workspace. This is where programs are executed or run. RAM can be written to, read from, erased, etc. Its storage ability is temporary in nature, only holding information while the system has power.

ROM Disk (Read Only Memory)
ROM disks are different from RAM disks in that they are written to only once; upon original creation. Thereafter, they can only be read from much like a write-protected floppy disk. If you attempt to write to a ROM disk the Allegro displays an error message. The ROM drive in the Allegro is the A: drive.

MS DOS
MS DOS™ 6.22 is Microsoft Corporation's version of DOS. It is embedded in the Allegro's ROM (Read Only Memory) and can run entirely from within ROM.

Windows CE
Windows CE is a compact, scalable operating system from Microsoft similar to Microsoft Windows running on a desktop PC.

ASCII Character Sets ⇨ DOS

When in DOS, any character code from the IBM standard (0-127) or extended (128-255) character set may be entered by pressing and holding the <ALT> key while keying in the character code on the number keys. The ALT-nnn function can be enabled (default) or disabled through the extended BIOS function 2E11h.

▲ Standard ASCII Character Set

Dec	Hex	Sym.	Dec	Hex	Sym.	Dec	Hex	Sym.	Dec	Hex	Sym.
0	00		32	20		64	40	@	96	60	`
1	01	^A	33	21	!	65	41	A	97	61	a
2	02	^B	34	22	"	66	42	B	98	62	b
3	03	^C	35	23	#	67	43	C	99	63	c
4	04	^D	36	24	$	68	44	D	100	64	d
5	05	^E	37	25	%	69	45	E	101	65	e
6	06	^F	38	26	&	70	46	F	102	66	f
7	07	^G	39	27	'	71	47	G	103	67	g
8	08	^H	40	28	(	72	48	H	104	68	h
9	09	^I	41	29	)	73	49	I	105	69	i
10	0A	^J	42	2A	*	74	4A	J	106	6A	j
11	0B	^K	43	2B	+	75	4B	K	107	6B	k
12	0C	^L	44	2C	,	76	4C	L	108	6C	l
13	0D	^M	45	2D	-	77	4D	M	109	6D	m
14	0E	^N	46	2E	.	78	4E	N	110	6E	n
15	0F	^O	47	2F	/	79	4F	O	111	6F	o
16	10	^P	48	30	0	80	50	P	112	70	p
17	11	^Q	49	31	1	81	51	Q	113	71	q
18	12	^R	50	32	2	82	52	R	114	72	r
19	13	^S	51	33	3	83	53	S	115	73	s
20	14	¶	52	34	4	84	54	T	116	74	t
21	15	§	53	35	5	85	55	U	117	75	u
22	16	^V	54	36	6	86	56	V	118	76	v
23	17	^W	55	37	7	87	57	W	119	77	w
24	18	^X	56	38	8	88	58	X	120	78	x
25	19	^Y	57	39	9	89	59	Y	121	79	y
26	1A	^Z	58	3A	:	90	5A	Z	122	7A	z
27	1B	\	59	3B	;	91	5B	[	123	7B	{
28	1C	^\	60	3C	<	92	5C	\	124	7C		
29	1D	^]	61	3D	=	93	5D	]	125	7D	}
30	1E	^^	62	3E	>	94	5E	^	126	7E	~
31	1F	^_	63	3F	?	95	5F	_	127	7F	←

▲ Extended ASCII Character Set

Dec	Hex	Sym.	Dec	Hex	Sym.	Dec	Hex	Sym.	Dec	Hex	Sym.
128	80	Ç	160	A0	á	192	C0	└	224	E0	α
129	81	ü	161	A1	í	193	C1	┴	225	E1	β
130	82	é	162	A2	ó	194	C2	┬	226	E2	Γ
131	83	â	163	A3	ú	195	C3	├	227	E3	π
132	84	ä	164	A4	ñ	196	C4	─	228	E4	Σ
133	85	à	165	A5	Ñ	197	C5	┼	229	E5	σ
134	86	å	166	A6	ª	198	C6	╞	230	E6	µ
135	87	ç	167	A7	º	199	C7	╟	231	E7	τ
136	88	ê	168	A8	¿	200	C8	╚	232	E8	Φ
137	89	ë	169	A9	⌐	201	C9	╔	233	E9	Θ
138	8A	è	170	AA	¬	202	CA	╩	234	EA	Ω
139	8B	ï	171	AB	½	203	CB	╦	235	EB	δ
140	8C	î	172	AC	¼	204	CC	╠	236	EC	∞
141	8D	ì	173	AD	¡	205	CD	═	237	ED	ø
142	8E	Ä	174	AE	«	206	CE	╬	238	EE	ε
143	8F	Å	175	AF	»	207	CF	╧	239	EF	∩
144	90	É	176	B0	░	208	D0	╨	240	F0	≡
145	91	æ	177	B1	▒	209	D1	╤	241	F1	±
146	92	Æ	178	B2	▓	210	D2	╥	242	F2	≥
147	93	ô	179	B3	│	211	D3	╙	243	F3	≤
148	94	ö	180	B4	┤	212	D4	╘	244	F4	⌠
149	95	ò	181	B5	╡	213	D5	╒	245	F5	⌡
150	96	û	182	B6	╢	214	D6	╓	246	F6	÷
151	97	ù	183	B7	╖	215	D7	╫	247	F7	≈
152	98	ÿ	184	B8	╕	216	D8	╪	248	F8	°
153	99	Ö	185	B9	╣	217	D9	┘	249	F9	•
154	9A	Ü	186	BA	║	218	DA	┌	250	FA	·
155	9B	¢	187	BB	╗	219	DB	█	251	FB	√
156	9C	£	188	BC	╝	220	DC	▄	252	FC	η
157	9D	¥	189	BD	╜	221	DD	▌	253	FD	²
158	9E	₧	190	BE	╛	222	DE	▐	254	FE	□
159	9F	ƒ	191	BF	┐	223	DF	▀	255	FF	

BIOS Messages

▲ Power On Self Test

When the Allegro powers up, it goes through a series of internal tests and diagnostics. This is called the Power On Self Test (POST). During these tests, messages are displayed on the screen or a series of beeps are heard. If you see an error message during this process, try resetting the Allegro by holding the <On/Off> key down for 8 seconds. If the error persists, contact our Customer Service Department.

Files Located on the Solid State Disk

The main data and program storage used in the Allegro is a solid state disk-on-chip manufactured by M-Systems™. It operates much the same as the hard drive in a desktop PC, but with no moving parts.

The following files are factory installed on the solid state disk. Copies of these files are also located on the Allegro Utilities CD-ROM. The drive designations are C: for DOS and C_Drive for Windows CE.

C:
AUTOEXEC.BAT
CONFIG.SYS
COMMAND.COM
NK.BIN (hidden)

C:\UTIL
AINFO.EXE
AINFO.TXT
ATAINIT.EXE
AUTOEXEC.BAT
CARDINFO.EXE
CONFIG.SYS
DDEFRAG.EXE
DINFO.EXE
PE.COM
PTERM.EXE
SERPRN.EXE
SERPRN.TXT
WCE.EXE

C:\UTIL\CARDSOFT

ATADRV.EXE	IBMTOK.CLB
CARDID.EXE	INTELLAN.CLB
CARDID.INI	LINKSYS.CLB
CBDAS.CLB	LINKSYS2.CLB

CS.EXE	MTDDRV.EXE	XIRCOM.CLB
CSALLOC.EXE	MTSRAM.EXE	
CSALLOC.INI	PROXIM.CLB	
DLINK.CLB	SOCKETEA.CLB	
GENATA.CLB	SS365SL.EXE	
GENMODEM.CLB	SUNDISK5.CLB	
IBM3270.CLB	TDKLAN2.CLB	
IBMLAN.CLB	WD.CLB	

C:\DOS

ANSI.SYS	FC.EXE	PRINT.EXE
ATTRIB.EXE	FIND.EXE	QBASIC.EXE
CHKDSK.EXE	HELP.COM	QBASIC.HLP
CHOICE.COM	HELP.HLP	QBASIC.INI
DEBUG.EXE	HIMEM.SYS	SCANDISK.EXE
DEFRAG.EXE	LABEL.EXE	SCANDISK.INI
DELTREE.EXE	MEM.EXE	SETVER.EXE
DOSHELP.HLP	MKSPACE.BAT	SORT.EXE
DOSKEY.COM	MODE.COM	SUBST.EXE
EMM386.EXE	MORE.COM	TREE.COM
EDIT.COM	MOVE.EXE	UNDELETE.EXE
EDIT.HLP	POWER.EXE	XCOPY.EXE

C_Program Files

PTAB.EXE
CALC.EXE

C_My Docs

Solid State Disk Utilities

Some disk-on-chip utility programs are factory installed on the solid state disk. They are also included on the Allegro Utilities CD-ROM. When in DOS, these files allow you to view the status of the disk and to reprogram it if necessary ➪ DOS.

Name	Type	Description
DDEFRAG	EXE	Used to defragment the contents of the C: drive. Run this on a monthly basis to keep the solid state disk running at optimum performance.
DFORMAT	EXE	Used to format the Disk on Chip. May be needed if the C: drive is corrupted.
DINFO	EXE	Gives the user information about the disk including: * Drive Letter * Disk Size * Software Version * True FFS Compatibility * Firmware Size
DOCxxxx	EXB	The Flash File System (FFS) binary code. The small xxxx in the file name is the version number of this file. The file extension will always be .EXB. This file will be needed if the disk is corrupted and needs to be completely reprogrammed at the lowest level.
DUPDATE	EXE	This is the program used to reprogram the disk's binary flash file system. This file will be needed if the disk is corrupted and needs to be completely reprogrammed at the lowest level.

PC Card Utilities and Drivers

▲ Factory Installed Programs and Drivers ➪ DOS

In DOS, the PC card slot is operated by CardSoft™ PC card utility programs and device drivers from System Soft™. They are factory installed on the C: drive of the Allegro and are also located on the Allegro Utilities CD-ROM.

These programs and drivers are listed below (for the proper loading order, see the sample CONFIG.SYS file in *Section 5*).

❖ *Note: All of the ".CLB" are descriptor files that gives the PC Card device drivers the information they need to correctly use the associated card type and brand.*

Name	Type	Description
ATADRV	EXE	Device driver for ATA Flash cards and hard drives.
CARDID	EXE	Device driver to determine the type/brand of card in the system.
CARDID	INI	Information file that contains a list of all of the card types and brands that the cardid program can identify.
CARDINFO	EXE	Utility program that can tell you about the card that is currently plugged into the Allegro. CARDINFO /V gives additional information.
CS	EXE	The card services device driver.
CSALLOC	EXE	Device driver to allocate the needed memory.
CSALLOC	INI	Information files for the CSALLOC program.
MTDDRV	EXE	Memory Technology device driver.
MTSRAM	EXE	Device driver for SRAM type cards.
SS365SL	EXE	Socket service device driver.
CBDAS	CLB	
DLINK	CLB	DLINK brand network cards
GENATA	CLB	Generic ATA Flash and hard drive cards
GENMODEM	CLB	Generic modem card

Name	Type	Description
IBM3270	CLB	IBM 3270 network cards
IBMLAN	CLB	IBM network cards
IBMTOK	CLB	IBM token ring network cards
INTELLAN	CLB	Intellan denwork cards
LINKSYS	CLB	Link Systems network cards
LINKSYS2	CLB	Link systems network cards
PROXIM	CLB	Proxim network cards
SOCKETEA	CLB	
SUNDISK5	CLB	Sundisk (Sandisk) cards
TDKLAN2	CLB	TDK network cards
WD	CLB	Western Digital cards
XIRCOM	CLB	Xircom network cards

▲ Programs for Other PC Card Types and Brands

The following files are on the Allegro Utilities CD-ROM only. These programs are used to create a configuration file for PC cards that cannot use any of the .CLB files listed above. If you feel that you need to use these, contact our Customer Service Department for details.

Name	Type	Description
ATAINIT	EXE	Used to reconfigure an ATA card.
CONFIG	EXE	
CS_APM	EXE	
CSD_VER	TXT	
CV_VER	TXT	
VCB	EXE	

Communication Cable Schematic

A wiring diagram for the serial communication cable is shown below.
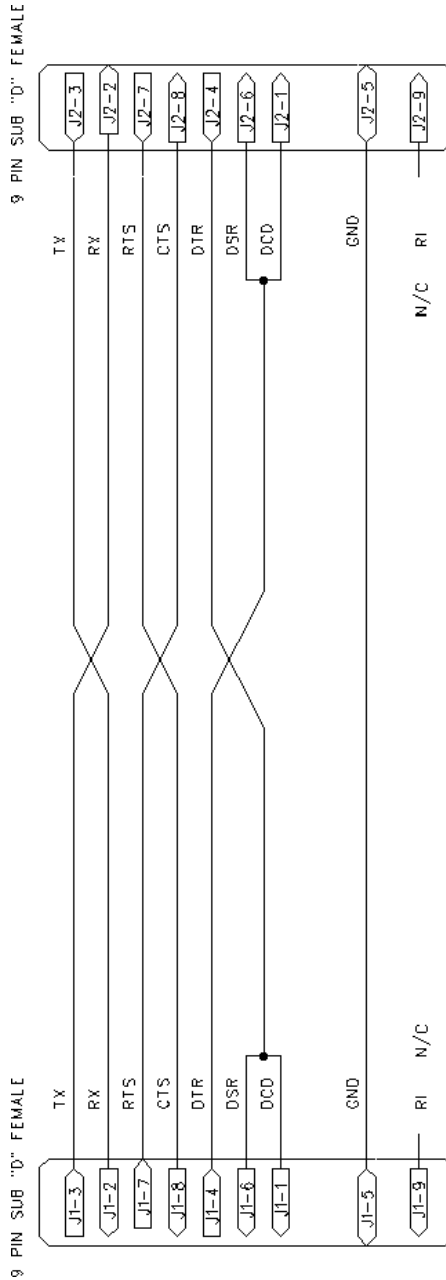
Section 7

Software Developer's Guide for Windows CE

Software Development Tools

▲ Microsoft eMbedded Visual Tools

To develop Windows CE programs to run on the Allegro Field PC, you need Microsoft's Embedded Visual Tools 3.0, which includes eMbedded Visual Basic® and eMbedded Visual C++®. These tools can be downloaded free of charge from Microsoft's web site:

www.microsoft.com/mobile/downloads/emvt30.asp

Note: the download size is over 300 MB

Take note of the desktop PC system requirements that are listed on the same web site page.

Embedded Visual Tools are also available free on the Allegro Utilities CD-ROM (you are charged shipping and handling fees). Go to the following web site for on-line ordering:

www.microsoft.com/mobile/development/beginnerdev/tools.asp

A data sheet explaining the features of Microsoft eMbedded Visual Basic and eMbedded Visual C++ is located at this web site:

www.microsoft.com/windows/embedded/ce/tools/factsheet.asp

Installation

To install the development language you are going to use (eMbedded Visual Basic or eMbedded Visual C++), follow the installation instructions that came with the development language from Microsoft.

▲ Allegro Software Development Kits (SDKs)

The Allegro SDK's are located on the Allegro Utilities CD-ROM. There is one for eMbedded Visual Basic users and one for eMbedded Visual C++ users. (Note: The SDKs that come with eMbedded Visual Tools will not work with the Allegro Field PC.)

Installation

Select *Browse* from the Allegro Utilities CD-ROM and locate the SDK folder. Two SDK files are available: Allegro SDK for Visual Basic.exe and Allegro SDK for Visual C++.exe. Double-click on the SDK that is appropriate for your development language. (If you have installed both languages, install both Allegro SDK's.)

▲ Selecting the Platform

When you begin to write a new application, choose the Allegro CE/DOS Field Computer as the platform to compile to.

▲ Windows CE Toolkits

Microsoft has provided Windows CE Toolkits for their Visual Basic and Visual C++ tools in the Visual Studio. Microsoft is shifting away from these tools for CE development. There is not a reference to these tools on their website, but you can still find them in distribution.

You can use the Windows CE Toolkits to develop programs for the Allegro. You need one of the following sets of tools:

1) - Microsoft Visual Basic® 6.0
   - Microsoft Windows CE Toolkit for Visual Basic® 6.0
   - Allegro Software Development Kit for Visual Basic® 6.0

2) - Microsoft Visual C++® 6.0
   - Microsoft Windows CE Toolkit for Visual C++® 6.0
   - Allegro Software Development Kit for Visual C++® 6.0

Installation

To install the Windows CE Toolkits you want, complete the following:

1) Install the development language you are using (Visual Basic or Visual C++). Follow the installation instructions that came with the development language.

2) Install the Microsoft Windows CE Toolkit that goes with the development language.

3) Install the Allegro SDK by selecting *Browse* from the Allegro Utilities CD-ROM. Two SDK files are available in the SDK folder: Allegro SDK for Visual Basic.exe and Allegro SDK for Visual C++.exe. Double-click on the SDK that is appropriate for your development language. The SDK is automatically installed within the Toolkit.

▲ VBScript

VBScript is Microsoft's Visual Basic Scripting Edition. It is a scaled down version of Visual Basic without the full functionality. It is a powerful, easy to learn tool that can be used to customize programs to meet your needs.

Install VBScript

The files needed to install VBScript are placed on your Allegro by the factory. To install VBScript complete the following steps:

1) Press on the *Start* menu bar.

2) Select the *Programs* folder.

3) Select the *Utilities* folder.

4) Press on the *Install VBScript* option and wait for VBScript to be installed on your Allegro.

Uninstall VBScript

To uninstall VBScript from your Allegro, complete the following steps:

1) Press on the *Start* menu bar.

2) Select the *Settings* option.

3) Select the *Control Panel* folder and wait for it to open.

4) Tap twice on the *Remove Programs* icon.

5) Select *VBScript* in the "Programs" box and tap on the Remove button.

VBScript should now be uninstalled on your Allegro.

For information on using VBScript to alter programs, refer to the user's manual of those specific programs that can be customized by using VBScript.

Installing Applications

Both eMbedded Visual Basic and eMbedded Visual C++ have features that allow you to install a new application onto the Allegro. Follow the instructions that came with these development languages. There are also third party installations programs that can be used.

▲ Using InstallShield

InstallShield Professional 6.X and InstallShield Professional Windows Installer Edition 2.X from InstallShield Software Corporation can be used to build a Windows Installer setup. Follow the steps outlined below:

1) Install InstallShield on your desktop computer.
2) Install the InstallShield Object for Windows CE. (If it is not included with your version of InstallShield, you can download it for free from InstallShield Software Corporation's web site.)
3) Create a new InstallShield project.
4) Click on the "Components" tab (the icon that looks like a pie).
5) Select one of the required components for your setup, such as "Program Files."
6) Right-click and select "Insert Install Shield Object..."
7) Select the "Windows CE" object from the list and click "Add Object."
8) Configure the CE Object using the wizard (see details below).
9) Repeat steps 5 through 8 for each CE component required by your setup.
10) Build the InstallShield media using the "Media Wizard" and run it.

Configuring the CE Object

To configure the CE Object for the Allegro, select the closest platform type available when you add the CE application files to the wizard's "Files Panel." For Allegros with Microsoft Windows CE 2.12, select *all* of the platform types listed (Handheld PC, Handheld PC Pro, Palm-size PC 2.01, Palm-size PC 2.11 and Pocket PC). For Allegros with Microsoft Windows CE 3.0, select the "Pocket PC" platform.

Editing the .inf File

The Allegro uses a 486 equivalent processor. You need to manually edit the .inf file that is produced that describes each of the platforms, processors, and version of CE. There is an entry in this file that looks like the sample below. Change the "VersionMax=" from 2.11 to 2.12. If you do not do this, when the program is installed onto the Allegro, the installer reports an error message that this version is not for the Allegro, and halts the installation process. For Allegros with Microsoft Windows CE 3.0, this change is not required.

```
[CEDevice.HPCPro_486]
ProcessorType = 486 ; i486
UnsupportedPlatforms = "HPC","Palm PC"
VersionMin=2.11
VersionMax=2.12
```

Creating Installations for Multiple Devices

Because the platform type specified is not an exact match for the Allegro, it is possible for to install the generated the CAB files onto a different device type. If you are trying to create an installation that installs one set of files onto a Handheld PC running Windows CE 2.0 and another set of files onto an Allegro running CE 2.12, it is possible for the wrong set of files to get installed onto the devices. It is best to create a different installation file for each device.

Options for Program and File Storage

For program and data storage, the Allegro has 16 M or 32 M of RAM, a user-accessible PC card slot, and a non-volatile data storage disk referred to as C_Drive in Windows CE. The data and programs that are stored on this disk are secure without any battery back up.

Most other Windows CE machines use RAM for program execution and program and data storage. Unlike the Allegro, they do not have an internal disk-on-chip. These devices may store data on a PC card.

When designing a program for the Allegro, application developers should give the user a choice of where to install the application, and where to store the application's data.

Power Management

Windows CE was designed with battery operation in mind. The operating system handles power very nicely on its own. Windows CE puts the processor to sleep when there are no active threads using the processor. When writing applications, the programmer should be careful to not use any functions that keep the threads active when they are not in use.

Power Management Tips:
- Do not spin in a loop
- Use the Wait APIs such as WaitForSingleObject()
- Sleep() may also be used effectively

Windows CE References

▲ Reference Books

The following books about program development for Microsoft CE are available:

Essential Windows CE Application Programming, Robert Burdick, Author, Wiley Computer Publishing, 1999

Microsoft Windows CE Developer's Kit, Alice Turner, Project Editor, Microsoft Press, 1999

Microsoft Windows CE Programmer's Guide, Ava Chen, Managing Editor, Microsoft Press1998

Programming Microsoft Windows CE, Douglas Boling, Author, Microsoft Press, 2001

The Windows CE Technology Tutorial, Chris Muench, Author, Addison Wesley, 2000

Windows CE 2 Programming for Dummies, Nick Grattan, Author, IDG Books Worldwide, 1998

Windows CE Developer's Handbook, Terence A. Goggin, Author, Sybex, 1999

Windows CE From the Ground Up, Jean Louis Gareau, Author, Annabooks, 1999

These books can be ordered from AnnaBooks at:

> www.annabooks.com

> Phone: 1-800-462-1042

The books from Microsoft Press can also be ordered at:

> www.mspress.microsoft.com

> Microsoft Press
> A Division of Microsoft Corporation
> One Microsoft Way
> Redmond, WA 98052-6399

▲ Web Sites

www.microsoft.com/windowsce
www.microsoft.com/embedded

www.vbce.com
www.vcce.com

Section 8

Software Developer's Guide for DOS

Introduction

This section of the manual includes technical information for DOS programmers. The power management information enables programmers to run the Allegro Field PC as efficiently as possible in terms of speed and power consumption. The keyboard and video interrupt functions can be used to control the keyboard and video screens. The extended BIOS functions, a hardware interrupt listing chart, I/O port mapping, AT scan codes, and keyboard key-code tables are also shown in this section.

Power Management

The Allegro has several power management functions integrated within the BIOS. Applications can use these functions to greatly enhance performance and operating time between battery charges. There is an internal automatic Power Manager, which can be set off or on, and five levels of performance, from 0 (miser) to 4 (hyper).

There is a trade-off between battery operating time and performance. As the processor speed is increased the Allegro uses more power, causing the batteries to drain more quickly. For optimal power management, the processor should be run at high speed only when there is actual processing to be done, and run at low speed or stopped (sleep mode) the rest of the time. It is analogous to driving a car. Think of the processor as the car engine and the battery as the car fuel tank. When you press the gas pedal, the engine runs faster and in turn uses fuel more quickly.

On most computers that run DOS, the processor is running at full throttle all of the time, even when there is no work to be done. While the processor is waiting for input, it is running at full speed in circles (programmers call this a spin loop). This is a tremendous waste of power, yet when DOS was designed desktop computers did not run on batteries and so power saving was not a concern. It is a serious problem in a battery-operated system. Properly controlling CPU power during idle times has a dramatic effect on battery operating time. It can be handled at either the BIOS/operating system level, or at the application level.

Starting and stopping the processor as needed is a simple concept, but can be difficult to implement effectively. The problem is determining when the processor is not doing any real work and can be safely shut down. When writing an application, the programmer usually knows when the processor is idly waiting for input, and by using Allegro's power management API can design a very power efficient program. If the program has not been designed to use power management, the Allegro BIOS attempts to manage power automatically. However, the BIOS does not know for sure what the processor is doing. It can only guess based on the level of activity it can see. For this reason, it is better to design power management into the program itself.

For applications that do not take advantage of the Allegro power API, the BIOS Automatic Power Manager can greatly extend operating time and should be used when possible. In our experience, it works quite well with most applications. However, because the BIOS can only guess what the processor is doing, in some cases it may shut activities down when it should not and vice versa. If the program is misbehaving with Power Manager enabled, try disabling it. If the problem disappears, then there may be a conflict with your program and the Power Manager. If you encounter a situation where you cannot use the Power Manager, the next best thing for power savings is to set the performance level to the lowest possible setting in which the program still functions properly.

If you are writing an application for Allegro, we strongly encourage designing power management into your program. Any time the processor is waiting for input, you may want to put it to sleep. The most common case where this technique is used is while waiting for a keystroke. See the Allegro Getch() example for a means to shut the processor down while waiting for a keystroke. A rule of thumb is whenever the processor may be waiting for 50 milliseconds or more for input it should be put to sleep.

Another case where power management can be used is when an application temporarily needs to perform some high speed processing of data. The Allegro_CpuBusy() function can be used to override the Power Manager and put the processor into high speed mode while the processing is taking place. The Allegro_CpuDone() function is used to restore settings when processing is completed.

The user from the System Setup program can control the power management for DOS operation (refer to Section 5, DOS Operating System, System Setup Program for more details). It can be controlled programmatically through the Extended BIOS Functions (later in this section) as illustrated by the examples on the following pages written in C and Assembly language. Note that these examples are for DOS operation only.

Allegro Get Keystroke Function (Allegro_Getch())

The following function can be used to put the Allegro to sleep while waiting for a keystroke.

```
char Allegro_Getch(void)
{
    while(!kbhit())        // do sleep function until key is pressed
    {
        _asm
        {
            push    ax
            push    bx
            mov     ax, 2F19h
            mov     bl, 10000000b    //load regs for sleep call
            int     10h              //call sleep function
            pop     bx
            pop     ax
        }
    }
return(getch());
}
```

Allegro CPU Busy Function (Allegro_CpuBusy)

This function overrides the Power Manager and causes the CPU to enter a high power state. It remains in this state until the Allegro_CpuDone function is called. It is used to temporarily speed up the CPU when data needs to be processed rapidly.

```
void Allegro_CpuBusy (void)
{
    _asm
    {
        push        ax
        push        bx
        mov         ax, 2E0Bh
        mov         bl, 0             // setup regs for function call
        int  10h                      // call cpu busy function
        pop         bx
        pop         ax
    }
}
```

Allegro CPU Done Function (Allegro_CpuDone)

This function is called to restore the Power Manager to the normal state after a CPU busy call.

```
void Allegro_CpuDone (void)
{
    _asm
    {
        push        ax
        push        bx
        mov         ax, 2E0Bh
        mov         bl, 1           // setup regs for function call
        int   10h                   // call cpu done function
        pop         bx
        pop         ax
    }
}
```

Keyboard and Video

A programmer can use the keyboard and video interrupt functions to control the keyboard and video screens. These functions are described below.

▲ Keyboard Intercept Functions

BIOS interrupt 15h function 4Fh can be hooked to intercept raw (not yet translated) scan codes from the keyboard, which are contained in the AL register. The scan codes at this level are unique to the Allegro. Refer to the system scan codes in the Scan Code Tables found at the end of this section.

BIOS interrupt 15h function 4Eh can be hooked to intercept translated scan codes from the keyboard, which are contained in the AX register. The scan codes at this level are standard 2 byte scan/ASCII character codes. The keys on the keyboard can be remapped to output alternate characters through this interrupt.

▲ Video

The Allegro display is a CGA-compatible 320 x 200 pixel monochrome LCD. Text mode (BIOS video mode 3) supports four fonts which will display 40 columns x 25 lines, 40 x 16, 32 x 16, or 20 x 12 for the small, medium, large, or extra large fonts respectively. Font may be toggled with a hot key or set programmatically through the BIOS int 10h function 2E14h. A virtual 80 x 25 display with panning capability is supported for all fonts. Text attributes can be set to black/white, where CGA colors are mapped to either full on or full off, and gray shades, where CGA colors map to various shades of gray. This setting can be changed either in the System Setup program or through BIOS int 10h function 2F23h.

Graphics modes supported are CGA mode 4 (320x200 pixel) with four shades of gray, and CGA mode 6 (640x200 pixel) where pixels are either on or off. Standard BIOS interrupt 10h functions are used to set the video mode. Only modes 3, 4, and 6 are supported.

An autopan function can be enabled or disabled to cause the display to pan with the cursor around the 80 x 25 virtual window. Extended BIOS functions can be used to locate the display anywhere on the virtual window. In this way multiple "pages" can be set up on the single 80 x 25 window.

Extended BIOS Functions

Extended BIOS services are available through the use of an extended interrupt function BIOS call. The functions are placed in register AH. The subfunctions are placed in register AL. You then invoke INT 10h. When the subfunction requires data input (for example, to set the contrast), the data byte or word is generally passed in register BL or BX. The output byte is returned in register AL. An unsuccessful operation exits the function with the carry bit set.

Function	Sub-Function	Meaning
AH = 2Eh	AL = 00h	Pan left
	AL = 01h	Pan right
	AL = 02h	Pan up
	AL = 03h	Pan down
	AL = 04h	Pan XY - text mode
	AL = 06h	PC card power while in suspend
	AL = 07h	Suspend system
	AL = 0Ah	Get Allegro status byte
	AL = 0Bh	CPU busy/done
	AL = 0Ch	Disable BIOS power manager
	AL = 0Dh	Enable BIOS power manager
	AL = 0Fh	Get CPU version
	AL = 10h	Get keypad shift flag settings
	AL = 11h	Set keypad shift flag settings
	AL = 12h	Get Allegro ID
	AL = 14h	Select font size (text mode only)
	AL = 15h	Perform system hard reset
	AL = 19h	Set LED brightness
	AL = 1Ah	Get battery % charge
	AL = 20h	Get BIOS version
	AL = 24h	BIOS Setup pop-up window
	AL = 26h	Get/set vehicle mode
AH = 2Fh	AL = 00h	Read status byte
	AL = 01h	Read video contrast
	AL = 0Ch	Set backlight off
	AL = 0Dh	Set backlight on
	AL = 0Eh	Set heater off
	AL = 0Fh	Set heater auto
	AL = 10h	Set key beep off
	AL = 11h	Set key beep on
	AL = 12h	Power down system
	AL = 13h	Put system in reboot mode
	AL = 14h	Put system in resume mode
	AL = 15h	Set auto sleep duration
	AL = 16h	Set video contrast
	AL = 18h	Get performance level
	AL = 19h	Set performance level
	AL = 1Ah	Set auto-panning off
	AL = 1Bh	Set auto-panning on
	AL =1Eh	Read miscellaneous BIOS setup bytes
	AL =23h	Video attributes

▲ Function AH=2Eh

Note: The behavior of the panning sub-functions 00 - 03 depends on the current font size and video mode.

Subfunction: AL = 00h (pan left)

Pans screen left. If screen is at leftmost limit, no action is taken. Returns nothing.

Subfunction: AL = 01h (pan right)

Pans screen right. If screen is at rightmost limit, no action is taken. Returns nothing.

Subfunction: AL = 02h (pan up)

Pans screen up. If screen is at top of 25 row virtual display, no action is taken. Returns nothing.

Subfunction: AL = 03h (pan down)

Pans screen down. If screen is at bottom of 25 row virtual display, no action is taken. Returns nothing.

Subfunction: AL = 04h (pan xy - text mode only)

Locates the upper left corner of display window to row/column specified on the virtual 80x25 display. Call with BH=row, BL=column. Range of row/column values depends on font size. The display window must be contained within 80 x 25 virtual display. (0,0) is top left corner. Returns nothing.

Subfunction: AL = 06h (pc card power while in suspend)

Determines whether to leave PC Card powered when the system is suspended or to turn power off. Some cards may draw substantial current even when suspended and may need to be powered down during suspend so the Allegro's batteries are not drained.

Call with:	BL=00h	return current setting in AL
	BL=01h	power off during suspend
	BL=02h	power on during suspend (default)

Subfunction: AL = 07h (suspend Allegro)

Suspends the Allegro to low power suspend state and remains there until a valid wakeup event occurs. Calling this function is identical to pressing the on/off key when the system is in suspend/resume mode. Returns nothing.

Subfunction: AL = 0Ah (get Allegro status byte)

Returns status bye in AL where:

   b7-b1 = reserved
   b0 = power manager setting 1=on, 0=off

Subfunction: AL = 0Bh (set cpu busy/done)

Applications should set CPU busy when a block of processing needs to be performed. CPU busy overrides power manager and keeps the CPU running fast for as long as it is set. CPU done should be called after CPU busy to tell the CPU that processing is complete and the Allegro can return to a lower power state. WARNING: CPU busy will drain the batteries rapidly and should only be enabled when needed. Returns nothing.

Call with: BL=00h   CPU busy
        BL=01h   CPU done

Subfunction: AL = 0Ch (disable BIOS power manager)

Disables automatic power management functions in the BIOS. The Allegro generally uses less power with power manager enabled. Returns nothing.

Subfunction: AL = 0Dh (enable BIOS power manager)

Enables automatic power management functions in the BIOS. The system generally uses less power with power manager enabled. Returns nothing.

Subfunction: AL = 0Fh (get CPU version)

Returns CPU version as follows: AL=version major (b7-b4)+version minor (b3-b0).

Subfunction: AL = 10h (get keypad shift flag settings)

Returns current shift flag settings in AL. See Subfunction AL=11h.

Subfunction: AL = 11h (set keypad shift flag settings)

The keyboard shift flags (<Ctrl>, <Alt>, <Shift>) can be individually controlled such that when the key is pressed it will register as either left, right, or both scan codes. The <alt>-nnn function can be enabled/disabled with this function.

Call with: BL=b7-b0 where:

b1,b0	=	01	right <Shift> only
		10	left <Shift> only
		11	both (Default)
b3,b2	=	01	right <Alt> only
		10	left <Alt> only
		11	both (Default)
b5,b4	=	01	right <Ctrl> only
		10	left <Ctrl> only
		11	both (Default)
b6	=	0	disable <Alt>-nnn
		1	enable <Alt>-nnn (default)
b7	=		reserved

Subfunction: AL = 12h (get Allegro ID)

Returns offset of Allegro ID string in AX. Segment is F000.

Subfunction: AL = 14h (select font size in text mode)

Call with:	b1	=	00h	return current setting in AL
		01h	set 8 x 8 pixels
		02h	set 8 x 12 pixels
		03h	set 10 x 12 pixels
		04h	set 16 x 16 pixels

Subfunction: AL = 15h (perform system hard reset)

No arguments, when called does a hard reset.

Subfunction: AL = 19h (set LED brightness)

Call with:	b1	=	00h	return current setting in AL
	=	01h	dim
	=	02h	medium
	=	03h	bright

Subfunction: AL = 1Ah (get battery % charge)

Returns AL = % C, range 0 to 100%.

Subfunction: AL = 20h (get BIOS version)

Returns offset of BIOS version string in AX.
Segment is F000.

Subfunction: AL = 24h (BIOS Setup popup window)

Invokes the BIOS Setup window. Control is passed to the BIOS Setup utility. The function returns when the user exits the Setup utility. The video state is automatically saved and restored during this call. Returns nothing.

This function requires the BIOS video save buffer to be available. If the buffer is not available because another system popup window is in use (such as the "battery change" window), this call is ignored.

Subfunction: AL = 26h (get/set vehicle mode)

Disallows battery charging when vehicle mode is ON and the battery gauge percent charge register is greater than 90% (refer to subfunction 1A). This prevents excessive overcharging when the Allegro is connected to an external power supply where the power is cycled on and off frequently, such as in a vehicle. When vehicle mode is OFF, charging is allowed no matter what value is in the percent charge register.

▲ Function AH=2Fh

Subfunction: AL = 00h (read status byte)

Output: AL = Status Byte, where:

```
Bit  7  6  5  4   3  2  1  0
         \  |  /       |  |  |__ Reserved
          \ | /        |  |
           \|/         |  |_____ Backlight          0: OFF
            |          |                            1: ON
            |          |
            |          |_____ Heater             0: OFF
            |                                       1: ON
            |
            |_____ Key Beep           0: OFF
                                                    1: ON

                                 CPU AutoSuspend Duration
                                    0000:   DISABLE
                                    0001:   5 MIN
                                    0010:   10 MIN
                                    0011:   15 MIN
                                    0100:   20 MIN
                                    0101:   25 MIN
                                    0110:   30 MIN
                                    0111:   35 MIN
                                    1000:   40 MIN
                                    1001:   45 MIN
                                    1010:   50 MIN
                                    1011:   55 MIN
                                    1100:   60 MIN
                                    1101:   65 MIN
                                    1110:   70 MIN
                                    1111:   75 MIN
```
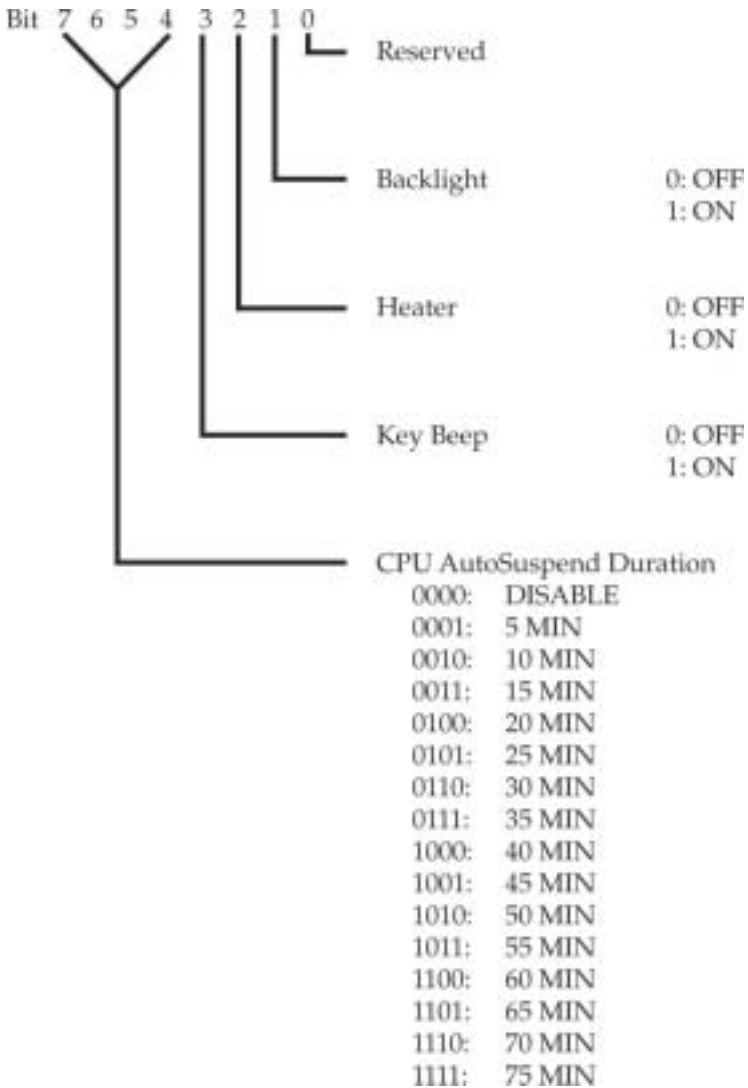
Subfunction: AL = 01h (read video contrast)

Output: AL = Video Contrast
The range of video contrast is from 0 to 63.

Subfunction: AL = 0Ch/AL = 0Dh (turn backlight off/on)

AL = 0Ch turns the display backlight off. AL = 0Dh turns the display backlight on. Returns nothing.

Subfunction: AL = 0Eh/AL = 0Fh (set heater off/auto)

AL = 0Eh turns the display heater off. AL = 0Fh sets the display heater to automatic. Returns nothing.

❖ *Note: In automatic mode, the heater is active when the display temperature is below -3° C.*

Subfunction: AL = 10h/AL = 11h (set key beep off/on)

AL = 10h turns the key beep off. AL = 11h turns the key beep on. Returns nothing.

Subfunction: AL = 12h (power down system)

This function causes the Allegro to immediately power off just like it does when the <On/Off> key is pressed and the Allegro is in On/Off mode. If external power is connected to the Allegro, this function causes the Allegro to go into a semi-low power state where it appears to be off, but it is actually on. Any event that normally causes the Allegro to turn on (pressing the On/Off key, com port ring in, etc.) causes the Allegro to reboot. When the external power is removed, the Allegro powers off.

Subfunction: AL = 13h (put system in reboot mode)

When it is executed, the Allegro is set to reboot mode. In this mode the on/off key will cause power to be turned off. Returns nothing.

Subfunction: AL = 14h (put system in suspend/resume mode)

When it is executed, the Allegro is set to suspend/resume mode. In this mode, the power is not completely shut off. The Allegro is still running but at very low power, so it appears to be off. When the key is pressed, the Allegro will resume where it left off.

Subfunction: AL = 15h (set auto suspend duration)

This subfunction requires an input value to set the auto suspend duration. The input value is passed in the BL register. There is no output.

If BL =	00h	auto suspend is disabled	08h	duration = 40 min
	01h	duration = 5 min	09h	duration = 45 min
	02h	duration = 10 min	0Ah	duration = 50 min
	03h	duration = 15 min	0Bh	duration = 55 min
	04h	duration = 20 min	0Ch	duration = 60 min
	05h	duration = 25 min	0Dh	duration = 65 min
	06h	duration = 30 min	0Eh	duration = 70 min
	07h	duration = 35 min	0Fh	duration = 75 min

Subfunction: AL = 16h (set video contrast)

This subfunction requires an input value to set the video contrast ratio. The input value is passed in the BL register and has a range of 00h to 63h. Returns nothing.

Subfunction: AL = 18h (get performance level)

The purpose of this function is to read the current performance level.

Output: AL =	00h	miser
	01h	low
	02h	medium
	03h	high
	04h	hyper

Subfunction: AL = 19h (set performance level)

This subfunction requires an input value to set the performance level. The input value is passed in the BL register. Valid register values are shown below.

BL =	00h	miser
	01h	low
	02h	medium
	03h	high
	04h	hyper

No value is returned to the AL register.

❖ *Note: If the eighth bit is set (e.g., 1XXXXXXX, X = 0 or 1), the system is put into a low power mode (i.e., "sleep") until a system timer tick occurs which restores the system to normal power. Timer ticks occur once every 55 milliseconds. The performance level is not changed when the sleep function is called. It is commonly used in applications to save power while waiting for a keystroke.*

Subfunction: AL = 1Ah/AL = 1Bh (set auto-panning off/on)

There is no output for these subfunctions. AL = 1Ah turns auto-panning off. AL = 1Bh turns auto-panning on.

Subfunction: AL = 1Eh (read miscellaneous BIOS setup bytes)

Input: None

Output: AL = Miscellaneous System Setup Flags

Miscellaneous System Setup Flags Bit information:

        bit 0   0 = reboot mode, 1 = suspend/resume mode
        bit 1   reserved
        bit 2   reserved
        bit 3   reserved
        bit 4   reserved
        bit 5   0 = auto-panning active,
                      1 = auto-panning inactive
        bit 6   reserved
        bit 7   0 = black and white, 1 = gray scale (video)

Subfunction: AL = 23h (video)

This routine sets the display to black and white or to 64 gray shades.

        BL =   00h   black and white 1
                  01h   gray scale (16 shades)
                  02h   black and white 2
                  03h   return current setting in AL

This function controls how the BIOS maps CGA colors to LCD gray scale. B/W 1 and B/W 2 map all colors to either black on white or white on black to increase viewability for some programs. B/W 1 is faster than B/W 2 but will only work on programs, which go through the BIOS for video text output. B/W 2 should work on all programs but is less efficient than B/W 1.

❖ *Note: This function is applicable only to text mode.*

Hardware Interrupt Listing

The following chart shows the interrupt-level assignments in decreasing priority.

Level	Function
Microprocessor NMI Interrupt Controllers CTRL 1 CTRL 2	Parity or I/O Channel Check

IRQ 0
   IRQ 1
   IRQ 2
	Timer Output 0
	Keyboard (Output Buffer Full)
	Interrupt from CTRL 2

IRQ 8
       IRQ 9
       IRQ 10
       IRQ 11
       IRQ 12
       IRQ 13
       IRQ 14
       IRQ 15
	Real Time Clock Interrupt
	Not Used*
	Not Used*
	Expansion Port UART
	Touchscreen
	Not Used
	Not Used*
	Not Used*

IRQ 3
   IRQ 4
   IRQ 5
   IRQ 6
   IRQ 7
	Serial Port 2
	Serial Port 1
	Sound Chip
	Not Used
	Not Used*

*PC Card IRQ assigned by Card and Socket Services.

I/O Port Mapping

Address	Function
080	Diagnostics Port
2F0 - 2F3	System Control Registers
2F8 - 2FF	COM2:
300 - 31F	Internal - Do Not Use
3D0 - 3DF	CGA Display
3E0 - 3E7	PC Card Controller

A T Keyboard Scan Codes

The scan codes on the Allegro keyboard have been configured as shown in the following chart:

Shft, Ctrl, Alt	Can be configured to use scan codes for either right, left, or both sides (default) of AT keyboard (see extended BIOS function 2E11h)
Home, PgUp PgDn, End, Ins, Del	Uses scan codes from dedicated (gray) keys on AT keyboard
Arrow Keys	Uses scan codes from dedicated (gray) keys on AT keyboard
Number Keys	Uses scan codes from top row keys of AT keyboard (not the 10-key keypad)

Keyboard Legend			System Scan Codes (hex)	Character Codes		AH/AL	(hex)
Normal	**Blue**	**Gold**		**Normal**	**Shift**	**Ctrl**	**Alt**
F1			3B	3B/00	54/00	5E/00	68/00
	F6		40	40/00	59/00	63/00	6D/00
		F11	57	85/00	87/00	89/00	86/00
F2			3C	3C/00	55/00	5F/00	69/00
	F7		41	41/00	5A/00	64/00	6E/00
		F12	58	86/00	88/00	89/00	8C/00
F3			3D	3D/00	56/00	60/00	6A/00
	F8		42	42/00	5B/00	65/00	6F/00
		Backlight	75				
F4			3E	3E/00	57/00	61/00	6B/00
	F9		43	43/00	5C/00	66/00	70/00
		Contrast +	77				
F5			3F	3F/00	58/00	62/00	6C/00
	F1		44	44/00	5D/00	67/00	71/00
		Contrast -	76				
Tab			0F	0F/09	0F/00	94/00	A5/00
	Back Tab		5B	0F/00	0F/00		
Ctrl			1D				
Alt			38				

Keyboard Legend			System Scan Codes (hex)	Character Codes		AH/AL	(hex)
Normal	Blue	Gold		Normal	Shift	Ctrl	Alt
Esc			01	01/1B	01/1B	01/1B	01/00
	Brk		70				
BkSp			0E	0E/08	0E/08	0E/7F	0E/00
	TS		7C				
7			08	08/37	08/37		7E/00
	7		08	08/37	08/37		7E/00
8			09	09/38	09/38		7F/00
	8		09	09/38	09/38		7F/00
9			0A	0A/39	0A/39		80/00
	9		0A	0A/39	0A/39		80/00
Ins			52	52/E0	52/E0	92/E0	A2/00
	?		61	35/3F	35/3F		35/00
↑			48	48/E0	48/E0	8D/E0	98/00
	PgUp		49	49/E0	49/E0	84/E0	99/00
		Pan Up	72				
4			05	05/34	05/34		7B/00
	4		05	05/34	05/34		7B/00
5			06	06/35	06/35		7C/00
	5		06	06/35	06/35		7C/00

Keyboard Legend			System Scan Codes (hex)	Character Codes		AH/AL	(hex)
Normal	Blue	Gold		Normal	Shift	Ctrl	Alt
6			07	07/36	07/36	07/1E	7D/00
	6		07	07/36	07/36	07/1E	7D/00
←			4B	4B/E0	4B/E0	73/E0	9B/00
	Home		47	47/E0	47/E0	77/E0	97/00
		Pan Left	71				
→			4D	4D/E0	4D/E0	74/E0	9D/00
	End		4F	4F/E0	4F/E0	75/E0	9F/00
		Pan Right	73				
1			02	02/31	02/31		78/00
	1		02	02/31	02/31		78/00
2			03	03/32	03/32	03/00	79/00
	2		03	03/32	03/32	03/00	79/00
3			04	04/33	04/33		7A/00
	3		04	04/33	04/33		7A/00
Del			53	53/E0	53/E0	93/E0	A3/00
	!		5F	02/21	02/21		78/00
↓			50	50/E0	50/E0	91/E0	A0/00
	PgDn		51	51/E0	51/E0	76/E0	A1/00
		Pan Down	74				

Keyboard Legend			System Scan Codes (hex)	Character Codes		AH/AL	(hex)
Normal	Blue	Gold		Normal	Shift	Ctrl	Alt
Blue			7E				
0			0B	0B/30	0B/30		81/00
	0		0B	0B/30	0B/30		81/00
.			34	34/2E	34/2E		43/00
	-		C	0C/2D	0C/20	0C/1F	82/00
Enter			1C	1C/0D	1C/0D	1C/0A	1C/00
	Enter		1C	1C/0D	1C/0D	1C/0A	1C/00
A			1E	1E/61	1E/41	1E/01	1E/00
	\		2B	2B/5C	2B/5C	2B/1C	2B/00
B			30	30/62	30/42	30/02	30/00
	/		35	35/2F	35/2F		35/00
C			2E	2E/63	2E/43	2E/03	2E/00
	:		6B	27/3A	27/3A		27/00
D			20	20/64	20/44	20/04	20/00
	*		5D	09/2A	09/2A		7F/00
E			12	12/65	12/45	12/05	12/00
	~		55	29/7E	29/7E		55/00
F			21	21/66	21/46	21/06	21/00
	<		69	33/3C	33/3C		33/00

Keyboard Legend			System Scan Codes (hex)	Character Codes		AH/AL	(hex)
Normal	Blue	Gold		Normal	Shift	Ctrl	Alt
G			22	22/67	22/47	22/07	22/00
	>		6A	34/3E	34/3E		34/00
H			23	23/68	23/48	23/08	23/00
	(		5C	0A/28	0A/28		80/00
I			17	17/69	17/49	17/09	17/00
	)		5E	0B/29	0B/29		81/00
J			24	24/6A	24/4A	24/0A	24/00
	+		65	0D/2B	0D/2B		
K			25	25/6B	25/4B	25/0B	25/00
	=		0D	0D/3D	0D/3D		83/00
L			26	26/6C	26/4C	26/0C	26/00
				64	2B/7C	2B/7C	2B/1C	2B/00
M			32	32/6D	32/4D	32/0D	32/00
	&		6D	08/26	08/26		7E/00
N			31	31/6E	31/4E	31/0E	31/00
	{		59	1A/7B	1A/7B		59/00
O			18	18/6F	18/4F	18/0F	18/00
	}		6E	1B/7D	1B/7D		6E/00

Keyboard Legend			System Scan Codes (hex)	Character Codes		AH/AL	(hex)
Normal	Blue	Gold		Normal	Shift	Ctrl	Alt
P			19	19/70	19/50	19/10	19/00
	%		62	06/25	06/25		
Q			10	10/71	10/51	10/11	10/00
	@		6C	03/40	03/40	03/00	79/00
R			13	13/72	13/52	13/12	13/00
	#		68	04/23	04/23		7A/00
S			1F	1F/73	1F/53	1F/13	1F/00
	$		67	05/24	05/24	05/34	7B/00
		DOS Setup	78				
T			14	14/74	14/54	14/14	14/00
	[		1A	1A/5B	1A/5B	1A/1B	1A/00
U			16	16/75	16/55	16/15	16/00
	]		1B	1B/5D	1B/5D	1B/1D	1B/00
V			2F	2F/76	2F/56	2F/16	2F/00
	^		66	07/5E	07/5E		7D/00
W			11	11/77	11/57	11/17	11/00
	,		33	33/2C	33/2C		33/00
X			2D	2D/78	2D/58	2D/18	2D/00
	;		27	27/3B	27/3B		27/00

Keyboard Legend			System Scan Codes (hex)	Character Codes		AH/AL	(hex)
Normal	Blue	Gold		Normal	Shift	Ctrl	Alt
Y			15	15/79	15/59	15/19	15/00
	'		29	29/60	29/60		29/00
Z			2C	2C/7A	2C/5A	2C/1A	2C/00
	,		28	28/27	28/27		28/00
		Toggle Font	7D				
Space			39	39/20	39/20	39/20	39/20
Shift			2A				
	CapsLk		3A				
Gold			7F				
_			63	0C/5F	0C/5F	0C/1F	82/00
	"		60	28/22	28/22		28/00
Task			7A	BF/00	EF/00	FF/00	FF/00
	Start		7B	CF/00	DF/00	AF/00	AF/00
		Toggle Font	7D				

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