BEX INTERFACE GUIDE

How To Use This Manual

The Interface Guide explains how to connect a variety of devices to your Apple computer so that BEX can recognize and work with them. Some devices are standard items that are designed for and sold in the mainstream computer marketplace. Other devices are specialized sensory aids for the blind. Raised Dot Computing provides detailed interfacing information to fully support its software products. The Interface Guide does not attempt to explain how the Apple computer or other devices work; refer to your Owner's Manual for that information.

The first three Sections provide basic background concepts: read these to obtain an overview of the interfacing process. Section 5, the Interface Cookbook, provides quick recipes for each interface: what sort of interface card and cable is required, and, when appropriate, how to set switches on the external device. Section 6 provides a basic understanding of controlling the Super Serial Card, Apple IIc ports and Apple IIgs ports. Section 14 provides wiring diagrams and RDC code numbers for all the cables mentioned in the Interface Guide. The remaining Sections address specific devices in more detail.

Raised Dot Computing publishes the monthly RDC Newsletter in print, audio, and disk formats. We publish updates and corrections to interfacing information in the Newsletter. Your BEX purchase includes a complimentary one-year subscription: please return your registration card to start your subscription. If you have worked out a new interface, please provide us with the details so we can share it with others.

Section 1: Computers

There are three models of Apple II computers available on the market: The Apple IIgs, Apple IIe, and the Apple IIc. The Apple II Plus, predecessor to the Apple IIe, is no longer manufactured, but many are still in use.

Apple IIe Computer

The Apple IIe computer looks like a beige flattened typewriter with no printing mechanism. It is a low profile box with a keyboard in front. In back, there is a power switch, a jack for the power cord, and a jack for the video signal. There are also places in the back to feed in cables to circuit cards which are plugged into the computer. The lid pops off very easily to allow access into the interior.

The easiest part about setting up the Apple computer is connecting the power cord and the video monitor. Look at the back of the Apple. The power cord goes in the lower right hand corner. Immediately to the left of the power cord is the power switch. On the lower left hand corner of the back is a female RCA phono plug jack (male connectors have prongs, female connectors have holes). This is the video output jack. Use the video cable supplied with the computer to connect the video signal to your monitor. Plug the monitor into a wall socket. You have just interfaced your video monitor. Turn on the computer with the power switch. You should see a close bracket symbol (]) on the screen. Now turn off the computer so you can plug in the disk drives.

● *The Disk Drives*

The first part of the DOS Manual explains how to plug in your disk drives. Either one or two disk drives may be plugged into a single controller card. The disk that is plugged into the top jack of the controller card is disk drive one. The other disk is drive two.

Do not plug anything into the Apple when the power is on. Plug the controller card into slot six of the Apple. Once the disk drive is plugged in, the computer will load material from a disk each time the computer's power is

turned on. Insert the BEX Boot disk in drive one. Turn on the computer. When everything is working right, a greeting appears on the screen. If nothing, or garbage appears on the screen, you may have inserted the disk improperly. When in doubt, consult the Apple manual. Make sure that all the plugs are tightly connected. If it still doesn't work, try to find someone who knows how to connect an Apple. Read the first section of the DOS Manual to find out how to take proper care of the disks and of the disk drives.

- ### *The Apple IIe Slots*

Inside the Apple IIe there are 8 slots. Seven slots are in a row in the back, numbered 1 through 7. An additional slot, located near the brick-shaped power supply, is called the auxiliary slot. It is used for the 80 column card. There are literally dozens of different types of cards which can plug into the Apple. A different interface circuit card may be placed in each numbered slot.

- ### *The Extended 80 column card*

The Apple IIe is usually sold with a special circuit card called the extended 80 column card. This card plugs into the auxiliary slot. It allows the computer to display 80 vertical columns on the screen. It also doubles the memory of the computer, from 64K to 128K. BEX functions best with the extended 80 column card. If your computer does not have an extended 80 column card, seriously consider purchasing one.

Be aware that Apple also make an 80 column *text* card. This card allows 80 column display but does NOT contain the 64K of memory that BEX is hungry for. If you have an 80 column text card, consider replacing it with an extended 80 column card.

- ### *Slot 3 WARNING*

Outputting to slot three on the Apple IIe engages the card in the auxiliary slot. You can only use slot 3 if you don't have a card in the auxiliary slot. The

only exception is the Echo synthesizer. The Echo works in slot 3 only if the card in the auxiliary slot is an 80 column card. The Echo does not work in slot 3 if you are using a RAM drive in the auxiliary slot.

- ### *Echo Synthesizer*

The Echo synthesizer adds speech to the Apple IIe. You can plug the Echo into any free slot. When you boot up, BEX recognizes that an Echo is present, and voices the opening `Enter Configuration` prompt.

The Echo requires software called TEXTALKER in order to operate. There is a copy of TEXTALKER on your BEX disk. Raised Dot Computing also distributes two double sided disks called the EchostCricket Training Set. These disks contain instructions on the use of TEXTALKER. This material is especially useful when you want to use TEXTALKER without BEX.

Apple IIc

The Apple IIc has a single built-in disk drive included in a nice compact package. The Apple IIc uses an AC adapter to run off a wall socket. The keyboard's layout is similar to that of the Apple IIe. There are no slots for circuit cards in the Apple IIc: it has the equivalent of several circuit cards built-in.

There are two ports on the IIc. These ports are treated as if there were two serial cards in "slots" 1 and 2. The Apple IIc has 128K of memory. It is equivalent to the memory in an Apple IIe with an extended 80 column card in the auxiliary slot. The built-in disk drive is treated as if it was connected to slot 6.

More recent Apple IIc computers can contain additional RAM. It is also possible to hook up a 3.5 inch disk drive to an Apple IIc. For more information, see the Apple Memory Card, Z-RAM, and disk drive (3.5 inch) in the Cookbook section of this Interface Guide.

The Apple IIc also has a speaker with volume control knob and earphone jack, a game control plug, a plug for adding an external disk drive, a phono plug for an external video monitor, and a connector for an external color monitor.

- ## *Cricket Synthesizer*

The Cricket synthesizer adds speech to the Apple IIc. It must be plugged into port two of the Apple IIc. You must turn on the Cricket before you boot BEX in order for BEX to recognize that the system includes a Cricket.

The Cricket requires software called TEXTALKER in order to operate. There is a copy of TEXTALKER on your BEX disk. Raised Dot Computing also distributes two double sided disks called the EchostCricket Training Set. These disks contain instructions on the use of TEXTALKER. This material is especially useful when you want to use TEXTALKER without BEX.

- ## *Software Upgrade*

In the spring of 1986, Apple introduced the *3.5 ROM* version of the Apple IIc. If you got your Apple IIc earlier, you can get a 3.5 ROM upgrade from your authorized Apple dealer. Contact them for details. You must have the 3.5 ROM version of the Apple IIc to work with DECtalk or the Apple LaserWriter.

There's a very simple test to discover if your IIc has the 3.5 ROM feature. At any BEX menu, type Q. At the BASIC prompt, get into the *Apple monitor* by typing the following ten characters exactly:

]CALL -151 <CR>

The monitor now prompts you with a single asterisk character. Respond by entering two characters: exclamation point followed by <CR>.

* ! <CR>

The Apple IIc can respond in two ways. If it beeps and reprompts with a single asterisk, then *it lacks the 3.5 ROM upgrade.* On the other hand, if you are prompted with a single exclamation point, then the IIc does have the 3.5 ROM upgrade.

- ### *Second Disk Drive for the IIc*

A second disk drive can be connected to the Apple IIc. The connector is located in the middle on the back. A second disk drive is strongly recommended for use with BEX.

PPI Apple IIgs

The Apple IIgs is the most recent addition to the Apple II family. The Apple IIgs is a very sophisticated, flexible, and powerful computer that has the capability of emulating an Apple IIe. The Apple IIgs has some similarities to both the Apple IIe and the IIc. We recommend you read about both those computers to deepen your understanding of the IIgs.

The Apple IIgs is a large box with a separate keyboard. It can be purchased with a monochrome or a color monitor and 5.25 inch or 3.5 inch disk drives. Your Apple IIgs system must have at least one 5.25 inch floppy drive to use BEX.

On the back of the IIgs, there is a power switch, a jack for the power cord, and a number of connectors. These connectors are for the keyboard, a monochrome monitor or a color monitor, a *smart* disk port, a joystick, two serial ports, and a headphone jack. When you have an Apple IIgs color monitor, use the connector labeled with the Apple logo. When you have a monochrome monitor, use the RCA phono jack.

Built in to the Apple IIgs is a program called the *Control Panel.* As its name suggests, the Control Panel lets you set a variety of functions for the Apple IIgs, including its built-in slots and built-in ports, the speed at which the computer operates, the colors on the color monitor, how fast the keys repeat

when held down, and a host of other functions. Any changes you make to the Control Panel are stored in a battery-backed memory chip, so you don't have to reset the Control Panel every time you turn on the IIgs.

The built-in Control Panel program is incompatible with a speech synthesizer. Included with your BEX package is a talking control panel program written by Computer Aids Corporation. To use the built-in Control Panel program, simultaneously depress the command (or open-Apple) key, the control key, and the Escape key. *You* must set some Control Panel functions yourself, in particular, the slots and ports and the system speed.

● *Slots and Ports*

For a begining computer user, how the Apple IIgs controls its slots and ports can be confusing. The Apple IIgs is a hybrid between the Apple IIe (with its 7 real slots) and the Apple IIc (with its four ports). The Apple IIgs has 7 Apple IIe-style slots. (The IIgs also has a memory expansion slot, which shares some of the characteristics of the Apple IIe's auxiliary slot.) In addition to the slots, the IIgs also has ports. To quote the Apple IIgs manual, "Each of the ports on the back of the IIgs impersonates a particular slot with an interface card. The IIgs assumes you want the ports to be active unless you activate a particular slot by using the Control Panel."

Using the Control Panel, you tell the IIgs whether it should pay attention to the port, or to a circuit card that you have plugged into to the actual slot. For example, the IIgs has two serial ports, which are referenced as "slot 1" and "slot 2." When you insert an Apple Super Serial card in slot 1, you must change the Control Panel setting for slot 1 from `Printer Port` to `Your Card.` When you install an Echo synthesizer in slot 4, the Apple IIgs won't acknowledge that it exists until you specify that slot 4 is `Your Card` and not the `Mouse Port.`

The `What is in your computer` option at the Starting Menu states for each slot whether it is `Your card` or a `IIgs port.` Use this option to understand how your IIgs is set up.

● *Apple IIgs built-in functions*

Slot Number	Built-in function
slot 1	serial printer port
slot 2	serial modem port
slot 3	80 column card
slot 4	mouse port
slot 5	smart disk drive port
slot 6	disk drive port
slot 7	AppleTalk port

● *Apple IIgs System Speed*

The Apple IIgs can operate more than twice as fast as the Apple IIe or IIc. It can be switched between *fast* and *normal* speed, using the control panel program. BEX can operate at fast speed, so make sure the Control Panel is set this way.

● *Apple IIgs disk drives*

To use BEX with an Apple IIgs, you must have one 5.25 inch disk drives.

You can use both 5.25 inch and 3.5 inch disk drives on the IIgs, and they can be connected in two different ways. When you use 5.25 or 3.5 inch disk drives that connect to an actual disk controller card, you must plug that card into a slot, and set the Control Panel so that slot is `Your Card.`

Newer 5.25 and 3.5 inch disk drives may be *daisy chained.* These drives come with DB-19 connectors and a plug in the back (a good example is the external disk drive for the Apple IIc.) You plug one of these drives into the IIgs' `smart disk port,` and subsequent drives are plugged into the back of the previous drive. The important rule to follow is that 3.5 inch drives are plugged in first, closest to the computer in the daisy chain. Any 5.25 inch drives must be at the end of the daisy chain. Set the Control Panel so that slot 5 is Smart disk port.

The maximum capacity for the smart Disk Port is two 3.5 inch disk drives plus two 5.25 inch disk drives. Even though all the drives are physically connected in a line, the Apple IIgs references these drives as if they were in two different slots. The 3.5 inch drives are treated as though they are connected to slot 5, and the 5.25 drives are treated as though they were connected to slot 6.

Warning! | If you have a second 3.5 inch disk drive, you must set the size of the RAM drive in the control panel to zero. Failure to do this will result in the Apple IIgs automatically hiding the drive in a place where BEX cannot find it.

● *Apple IIgs System Memory*

The Apple IIgs comes with 256K, twice as much as a 128K Apple IIe or IIc. Most of the extra memory is used to support the emulation of the Apple IIe inside the Apple IIgs. BEX uses some of this memory to expand the Ready chapter to 20 pages for the IIgs. When you install more memory in an Apple IIgs by plugging a memory card into its memory expansion slot, BEX uses this memory as a RAM drive. BEX sets up a RAM drive no matter what size you give the control panel's ProDOS RAM drive.

Warning! | BEX will wipe out any other programs or data you have stored on the Apple IIgs. BEX uses all the memory that it finds.

● *Apple IIgs Echo Synthesizer*

We recommend the Echo IIb voice synthesizer for the Apple IIgs. The Apple IIgs comes equipped with advanced sound generation hardware; it can play beautiful music and you may have heard excellent sounding speech--but only in a demonstration. That type of speech is similar to a tape recording--the IIgs can only speak pre-programmed messages. TEXTALKER provides the Echo IIb with unlimited text-to-speech rules; the Echo can pronounce absolutely anything you ask it to say. Although its pronounciation may not be as good as a human's, the Echo's unlimited text-to-speech is what makes the Apple accessible to a person with visual impairments.

You may plug the Echo IIb into either slot 4 or slot 7. You must then be sure to use the Control Panel program to indicate that the Echo's slot is `Your Card.` Do not plug the Echo IIb in slot 3 if uou have expansion memory.

- ### *No Braille Keyboard*

BEX's Editor has a braille keyboard mode, where you can use six keys plus the spacebar for braille data entry. The braille keyboard mode does not and can not work with the Apple IIgs keyboard. It is a hardware limitation. If you plan to make extensive use of BEX's braille keyboard, do not use an Apple IIgs.

- ### *Apple IIgs Performance Updated from an Apple IIe*

An Apple dealer can perform a *board-lift* on an Apple IIe that turns the older machine into a IIgs. In our tests, this updated machine functions *exactly* like an Apple IIgs with just one exception: you still have the Apple IIe's keyboard. As far as BEX is concerned, this is a benefit. A true Apple IIgs can not use BEX's braille keyboard mode. An Apple IIe that has been updated to an Apple IIgs can use BEX's braille keyboard mode. For further information about the slots and ports, read the previous material on the Apple IIgs.

Apple II Plus

The Apple II Plus is one of the oldest Apple computers. While BEX can run on an Apple II Plus, its performance is limited.

The Apple II Plus keyboard cannot produce lower case letters. To get around this limitation, many Apple II Pluses have a wire going between the keyboard and the game port. This wire is called a `shift key modification.` BEX works with or without a shift key modification.

The keyboard buffer in BEX doesn't work with an Apple II Plus. Because of memory limitations, an Apple II Plus cannot be operated at BEX's Master Level.

- ***Slots on the Apple II Plus***

The Apple II Plus has eight slots, labeled 0 through 7. There is no auxiliary slot (as there is on the Apple IIe). Slot 0 can only contain a memory card. This card is either called a `language card` or a `16K RAM card.` BEX won't function on the Apple II Plus without this card. BEX requires 64K of memory to function. The Apple II Plus main board has 48K. The language card contains enough memory to bring the system up to the required 64K. There are additional RAM memory cards available for the Apple II plus, but BEX *does not* support the use of any of these.

For information about connecting a video monitor and a set of disk drives to the Apple II Plus, read the section on the Apple IIe.

Section 2: Sorting Out The Devices

The purpose of this section is to define the different catagories of devices encountered in the BEX configuration questions.

Remote Keyboard

This feature is not available at Learner Level. Some users may want to use something other than the Apple keyboard. They may want to use their VersaBraille keyboard as a substitute keyboard. If you want your device to be used for both input and output for the entire computer dialogue, answer YES to both `Do you have a remote keyboard?` AND `Do you have a braille device for all the material going to the screen?`

Echo or Cricket Speech

If you have an Echo or a Cricket in your computer system, then BEX asks you if you want Echo or Cricket speech. If your configuration has *Echo speech* or *Cricket speech,* then the computer speaks the entire computer dialogue.

SlotBuster Speech

If you have an SlotBuster in your computer system, then BEX asks you if you want SlotBuster speech. If your configuration has *SlotBuster speech* the computer speaks the entire computer dialogue.

Voice Output of the Entire Computer Dialogue

This feature is not available at Learner Level. If you do not have Echo or Cricket speech, you are asked, `Do you have a voice device for all the material going to the screen?` You can indicate that you want the entire computer dialogue directed to your serial voice device. Examples of serial voice devices are: an Echo GP, a Votrax, or a DECtalk.

Braille Output of the Entire Computer Dialogue

This feature is not available at Learner Level. When you configure, you are asked `Do you have a braille device for all the material going to the screen?` You can indicate that you want the entire computer dialogue directed to your serial braille device. This is useful for a

deaf-blind person, or someone who prefers working through their braille computer terminal. Examples of devices that can be used in this way are the VersaBraille, the Microbrailler, or the Cranmer Brailler.

Tape-based VersaBraille

This feature is not available at Learner Level. BEX has special software to transfer chapters between the Apple and the VersaBraille. By answering yes to the configuration question about the tape-based VersaBraille, you are providing information required by these VersaBraille-only options on the Main Menu. See the separate section on the tape-based VersaBraille for more information.

Remote serial device to input through slot

This feature is not available at Learner Level. You can send text directly from a serial device into a BEX chapter. For example, the output from an optical scanner (such as the Kurzweil Reading Machine) can be used to create a BEX chapter. The remote serial device has to be serial, it has to obey Xon/Xoff or hardware handshakes, and it has to be able to be initiated by some external switch or command. Examples of download devices are an IBM-PC (cabled to the Apple), a Kurzweil Reading Machine, a disk-based VersaBraille, or any other computer system that has a serial output port. More information is available later in this manual: Section 9 talks about the disk-based VersaBraille; Section 10 explains the KRM.

Printers

In conventional computer systems, a printer is primarily a device which accepts text from the computer and produces *hard-copy* inkprint on paper. BEX is designed to produce regular inkprint on dot matrix or daisy wheel

printers, large-print on certain dot matrix printers, braille on most embossers, and text output on various serial devices such as braille displays and serial voice synthesizers.

When you begin using BEX, you must first define your system configuration. When you answer the configuration questions about a printer, you are asked for a printer class. Here are the eight possible choices:

- ### *G - Generic Printer*

A generic printer is an inkprint device. By generic, we mean that BEX does not know what model of printer it is dealing with. BEX ignores any $$eX commands in your text. (The $$eX commands send out command sequences for specific brands of printers.)

- ### *S - Specific Printers*

A specific printer means that you declare the brand name and model of the printer. BEX executes any $$eX commands in your text. BEX accepts only one kind of specific printer in any one configuration.

- ### *L - Large Print Output*

BEX is able to generate Large Print on certain dot matrix printers when they are used with certain interface cards. See Section 4 on Printers for details on these important restrictions. BEX uses special graphics software to generate large print. Large print is also possible using the Apple LaserWriter Postscript Driver (see below).

- ### *B - Braillers*

BEX can output to a wide variety of braille output devices. Most braillers are described in Section 5, the *Interfacing Cookbook.*

● *V - Voice Output*

A *voice output* printer is just a shortcut to get voice output of larger sections of text. BEX supplies values for carriage width and form length. An example of a voice output printer is a DECtalk reading an entire chapter.

● *P - Paperless Brailler*

BEX has very special software for the tape-based VersaBraille. However, you can output to OTHER paperless braillers by indicating that you are printing to a paperless brailler. Examples are: Microbrailler or the disk-based VersaBraille 2. When you define a printer as a *paperless brailler* then BEX sends text without formatting it at all. This may be appropriate for sending information to other, print-oriented computers as well as to paperless braillers.

● *R - Review Class Printer*

The review class printer allows an Echo or Cricket user to find out exactly how a document will look when sent to a printer. You must configure to slot 3 (your 80 column card). See Section 5, Part 4 in the Learner Level DOX for more details.

● *A - Apple LaserWriter Postscript Driver*

BEX provides special software capable of making virtually typeset quality output (in normal or large print) when interfaced to an Apple LaserWriter. See Section 11 for more details on the Apple LaserWriter.

Disk Drives

There are two kinds of disk drive for the Apple computer. One kind is the 5.25 inch floppy disk drive. The other is the 3.5 inch disk drive. At the Learner and User Levels, BEX can only work with 5.25 inch floppy drives. At the Master Level, BEX can read or write data to a 3.5 inch disk drive. Even at the Master Level, BEX requires at least one 5.25 inch drive to boot the BEX program.

- ### *Extended Disk Systems*

This feature is available at the Master Level only. At the Master Level, you can configure with up to 8 different disk drives. These can be 5.25 inch floppy disk drives, 3.5 inch disk drives, RAM drives, or a Sider hard drive. See the Master Level DOX, Section 4.

- ### *3.5 inch disk drive*

This feature is available at the Master Level only. A 3.5 inch disk can hold 800k of information. BEX uses a program called AmDOS 3.5, written by Gary Little to read and write to a 3.5 inch disk. BEX cannot be loaded onto a 3.5 inch disk, so you must have at least one 5.25 inch floppy drive in your system.

- ### *RAM drives*

This feature is available at the Master Level only. A RAM drive is a circuit card for the Apple containing a large block of memory. The memory (called RAM) is treated like one or more disk drives. BEX works with the RamWorks, MultiRAM, Apple Memory Card, and Apple IIgs memory expansion. RAM drives greatly speed up your system, and allows you to use a larger memory.

- ### *Sider Hard Disk*

This feature is available at the Master Level only. A Sider hard drive provides 10 or 20 megabytes of storage for your system. BEX can only work with one Sider unit. The Sider is the only hard disk supported by BEX.

Section 3: Serial Cards and Ports

BEX is designed to work with the Apple Super Serial Card, the Apple IIc ports, and the Apple IIgs ports. Whenever possible, we recommend using a Super Serial Card, an Apple IIc port, or an Apple IIgs port.

Two applications must use either a Super Serial Card, a IIc port, or the modem port on the SlotBuster II card:

- tape-based VersaBraille transfers
- Remote serial device to input text through slot

When you are configuring a printer, BEX is much more flexible. BEX accepts any interface card for a printer. The only exception is large print output. BEX can generate large print output only with one of the following: an Apple Super Serial Card, an Apple IIc serial port, an Apple IIgs serial port, an Apple parallel card, a Grappler Plus parallel card, a Pro Grappler parallel card (version 2.0 or above) or a Slotbuster (serial or parallel).

Raised Dot Computing uses a *standard* set of interface parameters. These parameters are 9600 baud, 2 stop bits, no parity, auto linefeed, and hardware handshakes. Don't worry if you do not have to have a precise understanding of the technical talk about interfacing parameters. The most important information for computer novices is that an interface involves setting a series of communications parameters. Each device accepts or transmits data in a specific electronic form, which is defined by the communications parameters. Unless these parameters match in the two devices, then things may not work. If the parameters don't match, you may get garbage or no communications at all or missing chunks of your text.

The Apple IIc ports are set to the standard values when BEX is booted.

The Apple IIgs ports have circular, 8 pin jacks. Apple sells a short cable called the *Apple IIgs Adapter Cable.* This cable plugs into the IIgs port and presents a female RS-232 25 pin jack.

The parameters of the Apple IIgs ports are set by using the Control Panel program. Port 1 needs one change from its default parameters. Set the data bits/stop bits to 8/2. Port 2 needs three changes in the Control Panel: set the baud rate to 9600, set `add LF after CR` to yes, and set `data/stop bits` to 8/2. To cable a device to a IIgs port, follow the instructions for cabling to the Super Serial Card. Plug the appropriate cable to the Apple IIgs Adapter Cable.

The Super Serial Card has 14 little switches and a special switch called *the jumper block.* The jumper block is a "chip" with a white triangle on it. If the jumper block is pointing to the word `modem`, pull out the `chip`, turn it around, and re-insert it.

- Switch Bank: Settings
- Switch Bank 1: OFF OFF OFF ON OFF ON OFF
- Switch bank 2: OFF OFF ON ON ON OFF OFF

Unless you are instructed otherwise, always set the switches on your Super Serial Card this way. When you use the `What is in this computer` option in BEX's Starting Menu, you are told whether a Super Serial Card is set to `standard` or `non-standard` parameters.

Section 4: Printers

BEX does its best to make nice output, but you have the responsibility of making sure that your printer is ready to print. Since every printer is slightly different, we can't tell you exactly how to set up yours. Your best guide will be the manual for your printer. However, here are some general principles to keep in mind.

Troubleshooting Your Printer

● *No Output*

There are many reasons why you cannot get output to a printer. The printer may be defective. You may have the wrong cable. You may have the wrong switch settings on your interface card. You may have the wrong switch settings on your printer.

Before we take apart your computer system trying to diagnose your problem, lets deal with a common problem. When you configure BEX, you can describe up to four different printers. The BEX printer numbers, one through four, represent the order the printers were defined and *not* the slot numbers that the printers are connected to. If you have a printer attached to slot 2, do not answer 2 to the `Which printer:` prompt unless BEX printer number 2 is configured as the printer in slot 2. At the `Which printer:` prompt, enter a question mark followed by a carriage return to find out what printers are in your configuration.

If you cannot get BEX to send output to a printer, find out if the problem is with BEX or with the printer. For example, let's say that your printer is attached to slot 1. Press Q to Quit from BEX. Enter the following five characters: `PR#1 <CR>` Anything you type on your computer keyboard should go to the printer. This method of sending text to the printer completely avoids using BEX. There is a problem with your printer or with your interface card if typing `PR#1 <CR>` does not get text to your printer. Please do not call RDC. All we can do is tell you to call your computer dealer.

● *Garbled Output*

If the output on your printer is gar4, chances are that the switch settings on the interface card and/or your printer are wrong. Make sure the baud rate, data bits, and stop bits match on both devices.

● *Bad Format*

One common problem is fail to configure a brailler as a brailler. Be aware that none of the supplied configurations contain a brailler. If you have a brailler you must set up your own configuration.

A common problem is to configure with the wrong carriage width and form length. When you configure, BEX supplies suggested carriage widths and form lengths (just press return to these questions). If you give too long a carriage width, then some lines will be chopped in the middle of a word, while others will be quite short. If you give too long a form length, then every other page will be very short.

If you have problems with large print output, read the section on Large Print in this manual. Ask yourself the following questions: Have I set the switches in the printer correctly? Have I set the printer for 8 data bits? Have I configured properly?

- ## *Vertical Alignment*

The printer itself keeps track of where it is printing on the page. When you enter the printer number at the `Which printer:` prompt, BEX assumes that you have set the top of form correctly. Some printers have a top of form button you push to tell the printer: "OK, remember your current position as the top of the sheet." Less expensive printers use the position of the printhead when you turn the machine on. If you're visually impaired, you have to establish a landmark to use for setting top of form. An example is: the fold at the top of the sheet is even with the bottom of the tear bar.

Once you have established top of form, BEX swings into action. Using the form length you defined in your configuration, BEX keeps track of every carriage return it sends to your printer. If you have defined a form length of 58, for example, BEX knows that after sending 57 carriage returns, it's time to send a form feed character to the printer. This form feed character makes the printer advance to the next top of form, where BEX starts counting carriage returns again.

It's very tempting to use the platen knobs to roll your paper out, but it confuses the dickens out of your printer. Suppose you have a printout that's two and one-half sheets long. When BEX is done printing, the third sheet is halfway through the printer. As far as the printer knows, there are still

around 30 lines left on that sheet. If you manually roll the paper out, the printer has no way of accounting for the 30 lines. If you manually roll the paper so it looks like it's set for the right top of form and you use your printer before turning it off, the next time your output will only fill part of the sheet. The printer itself will generate a bogus form feed after it counts 30 lines.

The best way to proceed is to always use the printer's form feed button that advances the sheet to the next top of form. That way both the printer and BEX are operating from the same assumptions.

The form length is the maximum number of printed lines on each page. Generally, single spaced printer output is 6 lines per vertical inch (see your printer's manual). Double or triple spaced text counts the spacing lines as if they were printed. To figure out what form length to specify, first decide how long you want your top and bottom margins. As a rule of thumb, subtract your desired top and bottom margins from the paper length and multiply the resulting length by the number of lines per vertical inch to get the form length. For example, if you want top and bottom margins of 1 inch each on 11 inch paper, that would be 9 inches of printing. Nine inches of printing times 6 lines per vertical inch is 54. Use 54 to define your form length.

● *Horizontal Alignment*

The carriage width is the maximum number of characters on each line. Standard character output on printers is 10 or 12 per horizontal inch (see your printer's manual). You may be able to specify exactly which on your printer. If you specify a carriage width of 72 and you get 12 characters per inch output on your printer, then you can have 1-1/4 inch of margin of each side of the page. Of course, the exact margin depends on where the printing starts on the line.

When you define a carriage width of 72 for a printer in your configuration, you are actually telling BEX: "Print as many complete words as will fit in without exceeding 72 characters in this line, then send the printer a carriage return." Exactly where the first character on the line shows up depends on your printer. If the place that the printhead returns to is too far to the left for your taste, then tell BEX to use a left margin. See Learner Level Section 6.

Again, printers differ. On some printers, you can physically move the spot to which the printhead returns. Then, when you set top of form, you are also setting a left margin. If this is the case, then BEX (and you) don't need to worry about a margin. On many other printers, the printhead's lefthand resting place is very close to the edge of the paper. In this case, you do need to define a margin to make your output look standard.

Generic Printer

When you configure a generic printer, BEX does not know the model of printer. This means that BEX does not use any special codes which are peculiar to certain printers.

Configure as follows:

- Enter printer slot: # <CR>
- Enter printer class: G <CR>
- Enter carriage width: 72 <CR> (or whatever)
- Enter form length: 56 <CR> (or whatever)
- Do you want pause on form feed? N <CR>
- Do you want auto line feed? N <CR>
- Do you want to give an automatic set up sequence for this printer? N <CR>

The question `Do you want pause on form feed?` is really asking if you need to stop the computer from sending text to the printer at the end of a page. If you are manually inserting each sheet into the printer, answer YES. If you have tractor feed and continuous form paper, answer NO.

The question `Do you want auto linefeed?` is asking if you want BEX to add a line feed (a special control character) each time it sends out a carriage return. The first time you configure, answer NO. Most printers advance to the next line when they receive a carriage return. If the resulting printouts are all overstriking, then re-configure, answering YES to the auto linefeed question.

Unless your printer needs a special sequence of control characters to properly wake up, answer NO to the question `Do you need a set up sequence for this printer?` For information about your printer, check your printer manual.

Specific Printers

A specific printer means that you declare the brand name and model of the printer. BEX then executes any $$eX commands in your text. The only difference between *specific* and *generic* is that you can use these $$eX commands to change pitch, use boldface, use the printer's underlining, and have superscripts and subscripts. Please note that the Apple ImageWriter does NOT support superscripts and subscripts.

Configure as you would for a generic printer, only answer S for the printer class. You are asked if you have a dot matrix printer. The tables in BEX contain entries for the following printers:

- ### *Dot Matrix Printers*

- Apple ImageWriter
- ImageWriter II
- Epson FX-80
- Gemini 10X/15X
- Okidata Microline 92
- Panasonic KX-P1090
- Paper Tiger 460

- ### *Letter Quality Printers*

- Diablo 630
- Diablo 1650
- Brother HR 15/25

- Comrex CR-1
- Daisywriter 2000
- Olympia Electric RO
- Qume Sprint
- Radio Shack Daisy Wheel II
- Starwriter F10

There are hundreds of printers on the market. Obviously, this list only covers a small number of printers. There is hope if you have a printer which is not in this list. Your printer is probably compatible with a printer that is on this list. Check your printer manual. You may find a statement that the printer is "compatible with the FX-80" or "compatible with the Diablo 630." If so, then configure as an FX-80 or Diablo 630, and things should work.

If your printer manual is lacking any statement of compatibility, it still may be compatible. You will have to do some research in your printer manual. Look up the control codes for underlining and bold face printing.

If you have a letter quality printer, compare your printer's codes with the Diablo 630 and the Qume Sprint (the two most imitated letter quality printers). Here are the codes for Diablo 630: <ESC> E - underline; <ESC> R - stop underline; <ESC> W - shadow on; and <ESC> and - shadow off. Here are the codes for the Qume Sprint: <ESC> I - underline; <ESC> J - stop underline; <ESC> Kn - bold face on; and <ESC> M - bold face off. If your printer has identical codes, then configure as a Diablo 630 or as a Qume Sprint.

If you have a dot matrix printer, there is a good chance that your printer is compatible with the Apple ImageWriter or the Epson FX-80. Here are the codes for the Apple ImageWriter: <ESC> X - underline; <ESC> Y - stop underline; <ESC> to - bold face on; and <ESC>? - bold face off. Here are the codes for the Epson FX-80: <ESC> G - emphasized print on; and <ESC> H - emphasized print off.

If your printer does not match any of these combinations, do not panic. You can add to the table in BEX that contains the specific printer control codes. When you configure at the Master Level, you can use option *P* at the Starting Menu to list the contents of chapter PRINTERS on the Boot side. Page one is for letter quality printers, page two is for dot matrix printers. Each printer name starts with a backslash. The end of the table is indicated by two backslashes. Each item in the table is separated by a delete character. Use the

P option to learn the sequence of items in the table. Use the Editor to modify chapter PRINTERS. You can add a new printer to the list with the escape sequences of your printer. More details on this are in the Master Level, Section 5, Part 6.

Large Print

BEX can produce Large Print on some dot matrix printers at 14 or 18 point using special graphics software. Raised Dot Computing has extensive experience with the Apple ImageWriter. We find that it gives fast and high quality Large Print. Because Raised Dot does not have extensive experience with Large Print on many printers, we are at this time unable to give explicit instructions on any printer other than the ImageWriter. We would be very grateful to any BEX user that provided us with detailed notes on their equipment. In addition, BEX can also generate Large Print with a wide variety of font sizes on an Apple LaserWriter--see Section 11 for details.

● *Large Print with an ImageWriter or ImageWriter II*

The ImageWriter or ImageWriter II can be connected to an Apple Super Serial Card, an Apple IIc port, or an Apple IIgs port. Set the switches on the Super Serial Card to the standard. See the Cookbook section for the switch settings on the ImageWriter.

When you configure BEX, press carriage return to get the suggested values for all the spacing parameters. There are some new questions you are asked. Giving a `character spacing` greater than zero spreads out the letters on a line. The `line spacing` determines how close the lines are to each other. Start with the recommended values. Changing the font size changes the carriage width, form length, and line spacing. Here is a sample configuration using the 18 point font:

- Enter printer slot: # <CR>
- Enter printer class: L <CR>
- Enter Large Print printer code: 1 <CR> (1 is for ImageWriter)

- Enter font size: 18 <CR>
- Enter line spacing: 27 <CR>
- Enter extra spacing between characters: 0 <CR>
- Enter carriage width: 42 <CR>
- Enter form length: 24 <CR>
- Do you want pause after form feed: N <CR>
- Do you need a set up sequence for this printer? N <CR>

● *Large Print on Other Printers*

We are sorry that we cannot provided detailed instructions on working with other printers. We do know that the three biggest hurdles are getting the right interface card, getting auto linefeed right, and getting the data bits set right.

BEX can only generate Large Print with a small group of interface cards. You CANNOT make Large Print unless you have one of these interface cards:

- Apple Super Serial Card
- Apple IIc Serial Port
- Apple IIgs Serial Port
- Apple Parallel Card
- Grappler Plus
- Pro Grappler (version 2.0 or above)
- SlotBuster

If you do not have one of these interface cards and you want to generate Large Print, you will have to purchase a supported interface card. Please do not call us and ask us to support additional cards. We would need a circuit card in-house, extensive technical reports, and lots of time to support additional cards.

One distinct possibility is that you have a genuine supported card (such as a Grappler Plus), but BEX refuses to recognize it. Use the W option at the Starting Menu. If BEX says the card is *unidentified,* then use option R at the Starting Menu to force BEX to recognize the card. Please read Section 15 for more information about how to use this option.

We designed the Large Print driver for two kinds of printers, the Apple ImageWriter and the Epson FX-80. If you have a dot matrix printer, it is quite likely that your printer emulates the graphics mode of one of these two printers.

If your printer manual has an entry "`<ESC> G nnnn` - Print 1x8 graphics corresponding to the following nnnn data bytes" then it emulates an Apple ImageWriter. Just answer the question about `Large Print printer code` with 1 for Apple ImageWriter.

If your printer manual has an entry "`<ESC> L n1 n2` - Sets bit image graphics in the 960 mode, the next n1 + n2 bytes will be printed in dot graphics" then it emulates an Epson FX-80. Answer the question about `Large Print printer code` with 2 for the Epson FX-80.

Troubleshooting Large Print Problems

If you get a small corner of good printout, but then it garbles characters, you have a high bit problem. If there is a thin band of white in each sweep, you also have a high bit problem. Search through your printer manual for any reference to a switch to control *data bits.* Set the switch to *8 data bits.*

If your Apple makes a continuous squeal, then the carriage width you have specified is too great. Reconfigure your printer with a smaller number for carriage width.

If your Interface card is a Pro Grappler, make sure that it is marked version 2.0 or above. If not, obtain a new firmware chip from your dealer.

Braille Output

BEX can generate braille on a wide variety of braille devices. To configure for a braille device, answer the `printer class` question with B for braille

output. You are asked for a brailler type. Unless otherwise noted, each choice is discussed in Section 5, the *Interfacing Cookbook.* Here is the list of choices:

1	Braille Previewer
2	Braille Previewer with voice
3	Cranmer Brailler (see section 7)
4	MBOSS-1
5	Thiel Brailler
6	LED-120 using control-K
7	LED-120 not using control-K
8	recent LED-120
9	Personal Brailler
10	TSI VersaPoint
11	Ohtsuki brailler
12	Dipner Dots embossed (see section 12)
13	Dipner Dots printed (see section 12)
14	ETF-80 and IBM typewriter (write for instructions)
15	Camwill typeball (write for instructions)
16	PED plate embosser

The Braille Previewer (braille device 1) and the Braille Previewer with voice (brailler device 2) are designed to allow the user to check braille format on the screen before committing the file to paper braille. Braille Previewer is designed for a sighted user, Braille Previewer with voice is designed for a visually impaired user. Configure to slot 3 (your 80 column card). Give the carriage width and form length of your physical braille output device. When you output to these printers, the material is displayed on the screen in the same pagination as it would have if you output to a physical brailler. You can save a lot of braille paper by checking your material on the screen before brailling it. The Braille Previewers are useful for setting up a table of contents. Further details are in User Level, Section 6, Part 3.

When you output to a brailler, the paragraph symbol, centering, page numbering, and underlining adjust to braille standards. If you need more advanced braille formatting, Raised Dot Computing has developed the

TranscriBEX module for BEX. If your applications require difficult braille formats (such as textbook braille format or literary braille format), please ask about TranscriBEX.

Section 5: Interfacing Cookbook

This section gives an abbreviated guide to interfacing a number of common devices. Devices are listed in alphabetical order. Many devices are covered in more detail in later sections of this interface guide.

Unless otherwise specified, any Super Serial Card should be set at our standard switch settings (see Section 3). Unless otherwise specified, any Apple IIc port should be left at the parameters set when BEX is booted.

The primary means of getting data from the Apple to another device is the Print option on the Main Menu. The action of the print program is affected by the configuration and by the use of formatting indicaters. The behavior of the printer can be affected by special control sequences.

Unless otherwise specified, the primary means of getting data from another RS-232 device is Input through Slot on the Second Menu. This is described in Section 12 of the User Level DOX.

Raised Dot Computing sells the Apple Super Serial Card and all the cables mentioned here. Some cables are widely available elsewhere. For example, the 6M cable is a *9-wire straight male-to-male cable,* and the 6F is a *9-wire straight male-to-female cable.* Both are available from most computer stores. The cable codes herein are used only by Raised Dot Computing. Refer to Section 14 for the specifications of these cables.

Apple Memory Card

The Apple Memory Card is a card that can go in a *regular slot* of a IIe or IIgs. A variation on this circuit card can be placed in the Apple IIc. It is usually

placed in slot 5. Slot 7 and slot 4 are other likely candidates if slot 5 must have another card. If BEX does not recognize your card as a *Regular slot memory card,* then use option R at the Starting Menu. The Apple Memory Card cannot be used in the same system that has a Sider hard disk. At the Master Level, you can configure an Apple memory card as one of your disk drives (as a RAM drive). You can load the Main side software on the RAM drive. See Section 3 of the Master Level.

Cranmer Brailler

A 6M cable connects the Cranmer to a Super Serial card. A 2M cable connects the Cranmer to an Apple IIc. See Section 7 for more information on using the Cranmer.

Cricket Synthesizer

The Cricket adds speech to the Apple IIc. It must be plugged into port two of the Apple IIc. The Cricket also works in port 2 of the Laser 128. You must turn on the Cricket before you boot BEX in order for BEX to recognize that the system includes a Cricket.

The Cricket requires software called TEXTALKER in order to operate. There is a copy of TEXTALKER on your BEX disk. Raised Dot Computing also distributes two double sided disks called the EchostCricket Training Set. These disks contain instructions on the use of TEXTALKER. This material is especially useful when you want to use TEXTALKER without BEX.

Warning! | Do not place the Cricket directly on top of your computer or disk drive. Operation of the Cricket will interfere with the data transfer and your files may be scrambled.

DECtalk

Do not use the cable that comes with the DECtalk; this enclosed cable does not work with Apple computers. Instead, use a 6F cable to connect a Super Serial Card to DECtalk. If you have an Apple IIc, it must have the *3.5 ROM* upgrade. Use a 2F cable to connect the Apple IIc to DECtalk.

Cable to the outer port (the one closest to the corner) on DECtalk. This port works at 1200 baud with Xon/Xoff handshakes. When you declare your serial voice device to be DECtalk in your configuration, BEX automatically sets the Super Serial Card or IIc port to these parameters. In other words, set the Super Serial Card to the standard parameters, and BEX takes care of the baud rate and the handshakes.

Do you want Echo speech? N <CR>
Do you have a voice device for all the material going to the screen? Y <CR>
Enter voice device slot? # <CR>
Is this DECtalk? Y <CR>

You can also configure DECtalk as one of your printers so you can dump long files to DECtalk for recording purposes. Here's how:

Enter printer slot: # <CR>
Enter printer class: V <CR>

DEST scanner

Use a 6M cable to connect the DEST to the Super Serial Card. Use a 2M cable to connect the DEST to the Apple IIc. There are two sets of DIP switches on the DEST. Set the switches in group 1 to: off off off on on off on on (9600 baud, no parity, 8 data bits, Xon/Xoff, asynchronous communications.) Set group 2 to: all on. If you want to flag possible errors, set S2-6 to off.

Dipner Dots

Dipner Dots is a method of producing braille on a slightly modified letter quality printer. You can also produce "printed" (simulated) braille dots on either a letter quality printer or a dot matrix printer. BEX contains all the necessary software to produce Dipner Dots. See Section 12 on Dipner Dots for more information.

Disk Drives (5.25 inch)

BEX requires at least one floppy (5.25 inch) disk drive to boot the software. The Apple IIc has one built-in 5.25 inch disk drive. You can plug an additional drive into the Apple IIc. The Apple IIe and Apple II Plus require a separate disk controller card to run the disk drives. Each controller card can work with two disk drives. It is typical to have two disk drives interfaced in slot 6.

On an Apple IIgs, you can plug a floppy disk controller card in slot 6. Or you can plug disk drives to the *Smart Disk Port* on the back of the IIgs. The Smart Disk Port can attach up to a maximum of four disk drives in a daisy chain: two 3.5 inch drives and two 5.25 inch drives.

Disk Drive (3.5 inch)

Warning! BEX requires at least one 5.25 inch disk drive to boot the software.

At the Master Level, BEX can read and write data onto 3.5 inch disks. BEX can only handle one or two 3.5 inch disk drives attached to one controller card. If BEX does not recognize the controller card as a 3.5 inch disk drive, then use option R at the Starting Menu. On the Apple IIgs, you have to set the control panel RAM drive size to zero in order to use a second 3.5 inch drive.

At the Master Level, you can read ProDOS textfiles from 3.5 inch disks. BEX uses a software patch called AmDOS 3.5 to be able to use 3.5 inch disks. For more information about using 3.5 inch disks, see Master Level Section 3.

Disk Drive (RAM)

At the Master Level, BEX can use a variety of RAM drives. BEX can use regular slot cards like the Apple Memory card, auxiliary slot cards, like the RamWorks card, or Apple IIgs expansion memory. For more information about using RAM drives, see Master Level Section 3.

Echo Synthesizer

There are several models of Echo synthesizer. The Echo 2, Echo Plus, and Echo IIb have a slot card that connects to an external speaker. They all work the same with BEX. The Echo GP is a serial voice synthesizer (see below). The Echo card plugs into any free slot (including slot 3). Do not use an Echo in slot 3 in an Apple IIe if you also have an auxiliary slot RAM drive. When you boot up, BEX recognizes that an Echo is present, and voices the opening `Enter Configuration:` prompt. Make sure that a speaker is connected to the Echo card.

The Echo requires software called TEXTALKER in order to operate. There is a copy of TEXTALKER on your BEX disk. Raised Dot Computing also distributes two double sided disks called the EchostCricket Training Set. These disks contain instructions on the use of TEXTALKER. This material is especially useful when you want to use TEXTALKER without BEX.

Echo GP

Plug the Echo GP directly into the Super Serial Card. You need a 2F cable to connect the Apple IIc to the Echo GP. There are four switches on the bottom of the Echo GP. Set them all to on. Follow the configuration questions in the DECtalk section, except answer NO to `Is this DECtalk?`

IBM-PC

You can send text from the IBM-PC to the Apple computer by cabling the two computers. Use a 9F cable to connect an IBM serial port to an Apple Super Serial Card. If you are using an Apple IIc, use a 10F cable.

To use Input through Slot on the Apple, configure with a Download Device. Use Input through Slot, and give a new chapter name. Enter the following on the IBM-PC:

```
A> MODE COM1:96,N,8,2,P
A> MODE LPT1:=COM1:
```

As the IBM begins to transmit, you should hear the Apple squeal. Press Q on the Apple when the transmission is finished.

ImageWriter

Use a 6M to connect the Super Serial Card to the ImageWriter. Use a 2M to connect an Apple IIc to the ImageWriter.

The switches on the ImageWriter are located under a plastic flap near the print head. When you face the front of the the machine, the switch assembly is upside down. In the chart of switch settings that follows, "op" is short for open; "cl" is short for closed.

- ImageWriter Switch Bank: Settings
- Bank 1: op op op op cl cl op op

- Bank 2: cl cl op op

ImageWriter II

You must purchase an Apple peripheral cable to connect an Apple IIc or IIe to the ImageWriter II. This cable is available from your local Apple dealer.

The switches on the ImageWriter II are located in front of the print head. Switches 2-5 and 2-6 should not be changed from their factory settings--that's why "dc" (don't change) appears in the chart below.

- ImageWriter II Switch Bank: Settings
- Bank 1: op op op op op cl op op
- Bank 2: cl cl op op dc dc

Kurzweil Reading Machine

Select the appropriate cable as follows:

- Cable Code: Interface
- 46: Model 3 KRM and Super Serial card
- 56: Model 3 KRM and Apple IIc
- 4M: SSC and Series 400 (serial number under 38053)
- 5M: Series 400 (serial number under 38053) and IIc
- 6M: SSC and Series 400 (serial number over 38053)
- 2M: Series 400 (serial number over 38053) and IIc

Connect the cable to the lower port on the Model 3 Reading Machine, or the middle port on the Series 400.

When you declare your `download device` to be a Kurzweil Reading Machine, BEX automatically sets the interface to 4800 baud and 1 stop bit. This is the most common setting for the Kurzweil Reading Machine. See Section 10 on the Kurzweil Reading Machine for more information.

LaserWriter

Use a 6M cable to connect a Super Serial Card to the Apple LaserWriter. If you have an Apple IIc, it must have the *3.5 ROM* upgrade. Use a 2M cable to connect the Apple IIc to the Apple LaserWriter.

BEX can either work with the *special* Diablo emulation mode, or directly generate Postscript files. See Section 11 on the LaserWriter for more information.

LED-120

Use a 6M cable to connect an LED-120 to the Super Serial Card. Set the baud rate on the Super Serial Card to 1200 baud by setting the first four switches in bank one to: OFF ON ON ON. Use brailler code number 8.

Older LED-120 braillers require time delays at the end of a line and at the end of a page. Use brailler code number 7. You are asked `Do you need a time delay for each page?` Answer YES.

Very old LED-120 units do not advance to a new page without receiving a control-K. Use brailler code number 6 if you have one of these collector's pieces.

Microbrailler

Use a 6F cable to connect the Microbrailler to the Super Serial Card. Use a 2F cable to connect the Microbrailler to the Apple IIc. Connect to the DTE port on the Microbrailler. Set all the switches on the Microbrailler for the DTE port to ON. Use the `input through slot` and `print to a`

`paperless brailler` features of BEX to transfer information between the MicroBrailler and BEX, described in Section 9 on the disk-based VersaBraille.

MBOSS-1 Brailler

The MBOSS-1 can be ordered as either parallel or serial. Order the serial version. Use a 6M cable to connect the MBOSS-1 to the Super Serial Card. Use a 2M cable to connect the MBOSS-1 to the Apple IIc. In the chart of switch settings that follows, "op" is short for open; "cl" is short for closed.

- Switch Bank: Settings
- Bank 41: op op cl cl op cl op op
- Bank 42: op op op cl cl op op op op op

MultiRAM

A MultiRAM is a memory card that acts just like a RamWorks. See the text on the RamWorks card.

MultiRAM-CX

A MultiRAM-CX is a memory card that acts just like a Z-RAM. See the text on the Z-RAM.

Ohtsuki Brailler

The Ohtsuki Brailler can use either serial or parallel interfaces. The parallel interface seems to be the most straightforward. A Grappler Plus parallel card works fine. Set the Ohtsuki bank one to: on on off on off off

To connect the Ohtsuki brailler to a Super Serial Card, use a 6M cable. The serial card needs non-standard switch settings.

- Switch Bank: Settings
- SSC Bank 1: off on on on off on on
- SSC Bank 2: off on on on on off off
- Ohtsuki bank 1: on on off on off on
- Ohtsuki bank 2: on off off off off off off on
- Ohtsuki bank 3: off on off on on on

The Ohtsuki responds to a variety of useful escape sequences (see the Ohtsuki manual). The set up sequence `<ESC> l T` sets the line spacing so 25 lines of print and braille fit on a page.

PED Plate Embosser

Use a 6F cable to connect the PED to the Super Serial Card. Use a 2F cable to connect the PED to the Apple IIc. BEX automatically sets the port to 1200 baud and 1 stop bit. BEX also generates the extra spaces and control characters required by the PED. Answer Yes to the `pause on form feed` and `auto linefeed` configuration questions. You have to generate one page (plate) at a time. When a new plate is set in the machine, press the Apple spacebar to punch the next plate.

Personal Brailler

Use a 6F cable to connect the Personal Brailler to the Super Serial Card. Use a 2F cable to connect the Personal Brailler to the Apple IIc.

Care must be used in setting the switches on the Personal Brailler, since Enabling Technology has reversed the conventional meaning of on and off for a rocker switch. A rocker switch has two ends. One is always flush with the surface, the other is raised from the surface. When the end of the switch on the side marked on is *raised*, the switch is on.

The Personal Brailler has 4 banks of switches, with 8 switches per bank. The fourth bank is set by the factory to control timing the unit. Never change bank four unless you know what you are doing. Here are the switch settings for the other three banks:

- Switch Bank: Settings
- Bank 1: OFF ON ON ON ON ON ON OFF
- Bank 2: ON OFF ON OFF OFF OFF OFF OFF
- Bank 3: OFF OFF OFF OFF ON OFF OFF OFF
- Bank 4: Do Not Change!

To find out if you have set the switches correctly, hold down the *on line* button as you power up. You will get a status report. This report should say (among a list of entries): 9600 baud, parity marking, and duplex full. The report also contains the software version for the Personal Brailler. We have tested this with Personal Brailler version 2.4. Field reports indicate that these switch settings do not work on earlier versions of the Personal Brailler. Contact Enabling Technology Company for assistance.

RamWorks

RamWorks is a memory expansion card for the Apple IIe. It fits in the auxiliary slot (where the 80 column card goes). You can retire your 80 column card. Don't worry: the RamWorks card performs all the functions of an extended 80 column card. If you have an Echo in slot 3 then move it: the use of a RamWorks card clashes with an Echo in slot 3. See Master Level DOX Section 4 for information about using an auxiliary slot RAM drive.

Romeo Brailler

A 6M cable connects the Romeo to a Super Serial card. A 2M cable connects the Romeo to an Apple IIc. There are a number of built-in configurations in the Romeo, choose "Apple serial". Use the keypad on the Romeo to set up the Romeo. Because different units may vary, consult your manual for the appropriate sequences. When you configure BEX, choose 9 for Personal Brailler.

Sider Hard Disk

You must have an Apple IIe or Apple IIgs to use a Sider with BEX. Only one Sider unit can work with BEX. A Sider cannot be used in the same system that has an Apple Memory Card (an auxiliary slot RAM card is no problem). The Sider Interface Card is usually installed in slot 7. The installation procedure is very complicated and requires the services of a sighted person. See Section 13 for the details.

SlotBuster

The SlotBuster is a multifunction card for the Apple IIe or Apple IIgs. A SlotBuster can contain a voice synthesizer, a serial port, a parallel port, a modem port. The serial and parallel ports can have memory buffers.

When you boot up, BEX recognizes that a SlotBuster is present, it uses the voice synthesizer and voices the opening `Enter Configuration` prompt. BEX works with the SCAT screen review software for the SlotBuster. BEX treats the SlotBuster as a built-in voice device, like the Echo or Cricket.

The serial and parallel ports are output only. They can be used for printers, including large print. You cannot use the SlotBuster serial port for VersaBraille transfers or Input through Slot. The serial port acts like a Super Serial Card set at the standard parameters.

The SlotBuster modem port cannot be used to output to printers. The modem port works with VersaBraille transfers and Input through Slot. The serial port acts like a Super Serial Card set at the standard parameters. To cable a device to the modem port, use the cable appropriate for the Super Serial card, and add a 3F cable adapter.

TED-600

We have no cabling or switch setting details for working with the TED-600. We would appreciate receiving a detailed field report.

Configure BEX as a brailler type 7 (an LED-120 not using control-K). You will be asked `Do you need a time delay for each page?` Answer No.

Thiel Brailler

Use a 6F to connect the Thiel to a Super Serial Card. Use a 2F cable to connect a Thiel to an Apple IIc. Plug the cable into the Thiel connector marked host computer. Configure a class B printer, type 5. Establish the carriage width and form length that you want; the values here override the values you set in the Thiel's internal configuration.

To set the parameters on the Thiel, you have to go through a configuration dialogue in braille. All the critical parameters on the Thiel are set from a simple YES/NO keyboard. Set the line-local switch to local. To begin the dialogue, hold down the YES button for a few seconds and then release. The Thiel dialogue has gone through several revisions; this is how we answer the questions on our unit:

Start of the setup-program:
Dialog in deutscher sprache?
Outprint in german language? NO

Display parameters? NO
Select Fixed Parameters? NO
Change Character Set? YES
Character system ASCII? YES
Character system German? NO
Character system US-ASCII? YES
Change format of printing? YES
6-dot presentation? YES
Continuous Print? NO
Page length 13 inches? NO
Page length 12 inches? NO
Page length 11 inches? YES
Change line spacing? NO
26 lines per page is possible, change number? NO
Number of characters per line: 42; change number? NO
Word Wrap? YES
indent following line overflow? YES
Paperfeed at end of page? YES
Change computer connection? YES
Allow escape sequences? YES
Change baudrate? YES
9600 baud? YES
Change data format? YES
Parity on? NO
Number of stopbits 1? NO
Number of stopbits 1/2? NO
Number of Stopbits 2? YES
Change Synchronization? YES
Synchronization: Xon/Xoff? NO
Synchronization DTR? YES
Synchronization DTR-positive? YES
Half-Duplex? YES
Change mode of read key? NO
Selftest? NO

The Thiel displays all the selected parameters and ask `Save Parameters`? Answer YES.

These parameters are remembered even if you turn off the power. Use the wheel on the side of the unit to set the top of form. Feed in the paper until the page perfor Not is just above the printing bar. Press the TOF (top of form) key while still in local. Now flip the switch to line. The Thiel is ready to emboss.

VersaBraille (tape-based)

Setting the parameters on the VersaBraille requires setting up several overlay chapters on VersaBraille tape. See Section 8 on the tape-based VersaBraille for much more information. Here is the cable chart:

- Interface: Cable Code
- B VersaBraille to Super Serial Card: 1M
- C or D VersaBraille to Super Serial Card: 16
- B VersaBraille to Apple IIc: 2M
- C or D VersaBraille to Apple IIc: 26

VersaBraille II (disk-based)

Use a 6M cable to connect the VersaBraille II DTE port to the Super Serial Card. Use a 2M cable to connect the VersaBraille II DTE port to the Apple IIc. See Section 9 on the disk-based VersaBraille II for more information.

VersaPoint

Use a 9M cable to connect the VersaPoint to the Super Serial Card. Use a 10M cable to connect the VersaPoint to the Apple IIc. If you have any questions about the cables between the Apple and the VersaPoint, contact Raised Dot Computing.

There are no parameter switches on the VersaPoint. You configure it by answering questions. Once configured, the parameters are retained even if the power is turned off. Put the unit on-line. Hold down the LF switch as you turn on the unit. The prompting message `TSI VersaPoint Set Up Menu` is displayed. For each communications parameter, the VersaPoint displays a default setting. To change the displayed value for a communications parameter, press the LF button. To accept the displayed

value and go on to the next parameter, press the FF button. When you have specified all the parameters, press the TF button.

Configure as follows:

Braille output: Yes

Recall default set up: No

Language: English

Page Length: 11

Line Length: 42

Lines/Page: 25 or 26

Auto wraparound: off

Auto line-feed: off

Interface: Serial

Baud rate: 9600

Bits/char: 7

Xon/xoff: off

DTR: high

DSR: off

After you press the TF button, you are asked `Store set up: yes` Press the FF button to permanently save the communications parameters in the VersaPoint.

Votrax synthesizers

Call Votrax for interfacing information. Their toll-free line is (800) 521-1350. Ask for technical assistance. You probably need a special cable. Get the information on the cable and have a local computer store make it for you.

Z-RAM

A Z-RAM is a memory card for the Apple IIc. Despite the instructions that come with the device, have a trained technician install the card for you. The Z-RAM is treated as an auxiliary slot RAM card. See Section 4 of the Master Level DOX for more information.

Section 6: Controlling Apple Serial Interfaces

On the Apple II computer, there are three primary methods to establish a serial interface connection: the Super Serial Card, which can be plugged into a slot in the II plus, IIe, or IIgs; the two serial ports built-in on the IIc; and the two serial ports built-in on the IIgs.

Three Apple Serial Interfaces

● *Super Serial Card*

The Super Serial Card can be controlled in two ways: by changing the switch settings, or by sending it special command sequences. When the SSC is powered up, it follows the parameters set by the switches. You can override these parameters with command sequences. RDC recommends that you set the jumper block to terminal; set bank one to: OFF OFF OFF ON OFF ON OFF; and set bank two to: OFF OFF ON ON ON OFF OFF. This sets the SSC

for 9600 baud, 8 data bits, 2 stop bits, no parity, auto linefeed, and hardware handshakes. The Super Serial Card uses a 35 pin D-style connector. RDC has an assortment of 25-pin cables designed to connect the Super Serial Card to a wide variety of peripheral devices.

- ### *Apple IIc Serial Ports*

There are two serial ports on the back of the Apple IIc. These ports are actually two built-in serial cards set up as if they were in slots 1 and 2. The serial ports have circular, five-pin DIN jacks. Raised Dot Computing has an assortment of five-pin DIN cables designed to connect the Apple IIc to a number of voice and braille devices.

Apple IIc ports do not have any switches. Their behavior is determined by internal memory locations. Ordinarily, these internal settings are very difficult to modify. BEX is designed to make it easy for you to change the parameters. When you boot BEX, the ports are both set as communication ports with these parameters: 9600 baud, 8 data bits, 2 stop bits, no parity, and auto linefeed. These settings work with all the interfaces described in this manual.

- ### *Apple IIgs Serial Ports*

There are two serial ports on the back of the Apple IIgs. As far as BEX is concerned, these ports work just like a Super Serial Card except for Input through Slot, and tape-based VersaBraille transfers. For these functions, you must use a Super Serial Card.

The Control Panel program determines how the ports behave, and whether the IIgs is using the actual port or an interface card in its companion slot. Port 1 is called the Printer Port. Port 2 is called the Modem Port. The default setting for the printer port is 9600 baud with auto linefeed--the same as RDC'S standard parameters (except data/stop bits should be set to 8/2). The default setting for the modem port is 1200 baud with no auto linefeed. To set port 2 to match the RDC standard parameters, use the Control Panel program to set the baud rate to 9600 baud and data/stop bits to 8/2. Answer the yes to the question `add LF after CR?` Use the `What is in`

`this computer` option in the Starting Menu to determine if you have set the IIgs ports to the standard values.

The IIgs serial ports have strange, circular, eight-pin jacks. Raised Dot Computing does *not* sell cables that plug directly to the Apple IIgs eight-pin jacks. Apple sells a short cable called the *Apple IIgs Adapter Cable.* One end fits the 8-pin Apple IIgs port; the other end is just like the tail on the Super Serial Card. Plug a cable designed for the Super Serial Card into the Adapter Cable.

Serial Command Sequences

A command sequence is a series of characters sent to the serial interface that sets or changes its mode of operation. The command sequences for the SSC are the same or very similar to the command sequences for the Apple IIc ports and the Apple IIgs ports. We'll first list all the command sequences common to all three interfaces, and then provide information that's specific to each one.

● *Determining the command character*

All these sequences start out with a single special character called the command character. The command character is a control-I on the Super Serial Card with the switches set according to RDC standards. By changing the switches, you can change the command character on the SSC to control-A.

Caution! | On the Super Serial Card, the command sequences must finish with <CR>.

BEX sets the command character to control-A on the Apple IIc.

The command character for the IIgs is *either* control-I or control-A, depending on the Control Panel setting. Within the Control Panel, you may select either Printer Port or Modem Port. When you do, you are presented with a list of parameters about the port. The first item is `Device connected:` You

can toggle the answer here between *Printer* and *Modem.* When the device connected is a printer, then the IIgs port command character is control-I. When the device connected is a modem, then the command character is control-A. BEX finds out how you have defined your ports when it builds in control sequences into your configuration. If you modify the device connected parameter after your create a configuration, you may confuse BEX. It is best to leave port 1 as a printer port and port 2 as a modem port.

Here's a quick sample of a command sequence: To set the baud rate, enter the command character, followed by a number from 1 to 15, followed by an uppercase *B,* and for an Apple Super Serial card, finish with a carriage return. For example, control-I8B <CR> sets the baud rate to 1200 for the SSC. For an Apple IIc port, control-A8B sets the baud rate to 1200.

There are several ways of passing this command sequence to the serial card. You can write a chapter that contains the command sequence. Use the Control-C Editor command followed by a letter to enter a control character into your chapter. For the IIc sample, you'd press four keys: control-C A 8 B.

Or you can configure with an automatic set up sequence. For a set up sequnce, just enter the sequence directly (no control-C). Finally, you can enter the sequence at the BASIC prompt. First enter PR#N followed by the sequence.

- ***Baud Rate***

Use these codes to control how fast information flows through the serial interface.

Baud Rate	Sequence
50 baud	<command> 1 B
75 baud	<command> 2 B
110 baud	<command> 3 B
135 baud	<command> 4 B
150 baud	<command> 5 B
300 baud	<command> 6 B

600 baud	<command> 7 B
1200 baud	<command> 8 B
1800 baud	<command> 9 B
2400 baud	<command> 10 B
3600 baud	<command> 11 B
4800 baud	<command> 12 B
7200 baud	<command> 13 B
9600 baud	<command> 14 B
19200 baud	<command> 15 B

- ### *Data bits and stop bits*

To set the data bits and stop bits, enter the command character, followed by a number from 0 to 7, followed by the letter D. For example, enter control-I0D to set the port for 8 data bits and 1 stop bit. The codes are as follows:

Data Bits	Stop Bits	Sequence
8	1	<command> 0 D
7	1	<command> 1 D
6	1	<command> 2 D
5	1	<command> 3 D
8	2	<command> 4 D
7	2	<command> 5 D
6	2	<command> 6 D
5	2	<command> 7 D

- ### *Parity*

To set the parity, enter the command character, followed by a number from 0 to 7, followed by the letter P. For example, to set even parity, enter control-I3P. The codes are as follows:

Parity	Sequence
None	<command> 0 P
Odd	<command> 1 P
None	<command> 2 P
Even	<command> 3 P
None	<command> 4 P
Mark (1)	<command> 5 P
None	<command> 6 P
Space (0)	<command> 7 P

- ## *Additional Super Serial Card-Specific Controls*

- ## *Additional Command Sequences*

The SSC has many features; check its manual for the full details.

- <command> X <space> E <CR> - Turn on Xon/Xoff (software) handshakes
- <command> X <space> D <CR> - Disable software handshakes
- <command> L <space> E <CR> - Enable auto linefeed
- <command> L <space> D <CR> - Disable auto linefeed

- ## *Super Serial Card Switch Settings*

In switch bank one, the first four switches control the baud rate. The following chart lists *all* the possibilities.

Baud Rate	SW 1-1	SW 1-2	SW 1-3	SW 1-4
50	ON	ON	ON	OFF
75	ON	ON	OFF	ON
110	ON	ON	OFF	OFF
134.5	ON	OFF	ON	ON

150	ON	OFF	ON	OFF
300	ON	OFF	OFF	ON
600	ON	OFF	OFF	OFF
1200	OFF	ON	ON	ON
1800	OFF	ON	ON	OFF
2400	OFF	ON	OFF	ON
3600	OFF	ON	OFF	OFF
4800	OFF	OFF	ON	ON
7200	OFF	OFF	ON	OFF
9600	OFF	OFF	OFF	ON
19200	OFF	OFF	OFF	OFF

The sixth switch in bank one determines if you are emulating eariler Apple serial cards (ON for no; OFF for yes). Assuming that you are not emulating obsolete equipment, the fifth switch determines if you are in communications mode (ON) or printer mode (OFF). The RDC standard switch setting is for printer mode. This switch determines if your command character is control-A or control-I. The last switch in both banks together determines the hardware handshaking lines.

In bank two, switch 2-1 is for stop bits: ON for one bit, OFF for two stop bits. When switch 2-2 is ON, then there is a .25 second time delay at each carriage return. This is a last resort for primitive printer interfaces.

Switches 2-3 and 2-4 control the carriage width and the video screen. Here's a chart of the possibilities:

Line Width	SW 2-3	SW	2-4
40	ON	ON	ON
72	OFF	ON	OFF
80	OFF	OFF	ON
132	OFF	OFF	OFF

Auto linefeed is controlled by switch 2-5. When switch 2-5 is on, then a linefeed is sent after each carriage return. Switch 2-6 controls interrupts. Unless you know to how to play with interrupts, leave this alone.

- ***Apple IIc Additional Sequences***

Remember that the control character for the Apple IIc is control-A. A carriage return is not required at the end of a sequence. Here are some additional sequences for the Apple IIc that are not on the Super Serial Card:

- \<command> I - Also direct printer output to the screen
- \<command> # N - Set the line length to
- \<command> L - Enable auto linefeed
- \<command> K - Disable auto linefeed

Xon/Xoff handshaking only works if your Apple IIc has the 3.5 ROM. Read section 1 to find out if your Apple IIc has the 3.5 ROM.

- ***Apple IIgs Additional Sequences***

Remember that the control panel determines the command character for the Apple IIgs. A carriage return is not required at the end of a sequence. If a sequence has a space on it, the space can be omitted. Here are some additional sequences for the Apple IIgs that are not on the Super Serial Card:

- \<command> # N - Set the line length to
- \<command> LE - Enable auto linefeed
- \<command> LD - Disable auto linefeed

Section 7: Cranmer Brailler

The Serial Card and Cable

Use a Super Serial Card or an Apple IIc port. If you have an Apple Super Serial Card, set it for the standard parameters (see Section 3 for details).

You need a 6M cable to connect the Cranmer Brailler to the Super Serial Card. You need a 10M cable to connect the Cranmer Brailler to an Apple IIc port.

Devices like the Cranmer Brailler add a new wrinkle to braille. When you are producing regular braille, there would never be a situation when you press the space bar while you are brailling a letter. Most of the commands to the brailler are made by pressing the space bar while brailling a character. This is called chording. See the Cranmer Brailler manual for a fuller explanation.

Connect the cable from the serial card to the brailler. Turn on the Apple with the BEX disk or with the Apple master disk. Insert a piece of paper in the brailler. Turn on the Cranmer Brailler. The brailler should make a double beep (like a door bell). Braille an H chorded with the space bar followed by a regular H. There should be a pleasant beep. Braille an R chorded with the space bar. The brailler makes a soft beep.

Type a control/reset on the Apple. The Apple beeps and shows a close square bracket character. On the Apple, type PR#2 <CR> (if the serial card is in slot 2). Use PR#A for port one on the Apple IIc. The brailler should wake up and emboss an er sign (dots 1-2-4-5-6). Anything you type on the Apple comes out on the unit in *computer braille.* If you are not getting anything in braille, something is wrong. It may be the switch settings, the cable, the serial card, your use of the brailler, or the brailler itself. One possible problem may be the internal switches in the Cranmer. There is a way to test the internal switches. Turn the Cranmer off and then on again. Enter chord-H H Chord-B dropped F chord-R R. Now type a word on the Apple. If they show up on the Cranmer, then the internal switches in the Cranmer need changing. The switch settings for use with BEX should be: OFF ON OFF OFF OFF OFF ON OFF.

Setting the BEX Configuration

When you are asked for the printer slot, give the appropriate number. Answer B (for brailler) for the printer class. Give brailler type 3 (for Cranmer Brailler). Give a carriage width up to 42 (depending on your application) and form length 25. It is critical that you match the form length in the configuration with the page length of the Cranmer. The default page length on the Cranmer is 25 lines.

Operation of the Brailler

When you are ready to send grade two braille to the Cranmer, turn on the brailler. Next enter chord-H H chord-S Y chord-R. When you print, give the appropriate printer number. The brailler should start up.

When it gets to the end of a page, the brailler beeps. Put in a new page. Press a chord-(dots 4-5) to indicate a new page is inserted properly. To force a page eject, enter a chord-(dots 4-5-6).

If you do not enter a chord-S Y when you start up the brailler, you will have trouble with the Cranmer buffer. When characters are sent to the brailler, they are stored in the brailler memory buffer. The chord-S Y tells the brailler to wipe out part of the buffer when the buffer is almost full. If you run into problems, you can clear the buffer with a chord-N followed with a chord-(dots 1-2-3-4-5-6).

Reprinting Pages on the Cranmer

You can reprint a sheet on the Cranmer when using BEX. It takes a little longer at the page change, but it gives you extra insurance in case the paper jams.

When you set up a configuration, reserve two printer descriptions for the Cranmer. For one of the descriptions, follow the script given previously. For the other description, use the same answers, but answer YES to the question

about pause on form feed. Use the first description for routine brailling. Use the second description if you want "insurance" against a messed up page.

When you turn on the Cranmer, issue four commands: chord-H H; chord-(number sign) C 7; chord-S Y; chord-R. At each page change, simply insert the next sheet, press chord-(dots 4-5) on the Cranmer, and press the spacebar on the Apple. The Cranmer has to be set for 7 data bits to be able to move by lines in its buffer. That is why the command chord-(number sign) C 7 is required in the start-up commands.

If you wish to reprint a sheet, insert a new sheet and then issue five commands. On the Cranmer keyboard, enter: chord-(dots 3-6); chord-E; M B; M U 25 chord-Q; and finally P 25 chord-Q. You've just instructed the Cranmer to enter Command Mode, then enter the Editor, move to the bottom (end) of the buffer, move up 25 lines, and finally print 25 lines. To resume printing with the next sheet, insert a new sheet, press chord-(dots 4-5) and chord-R on the Cranmer, then press the Apple spacebar. Because this procedure can be tricky if you are not use to the editor mode on the Cranmer, you might want to have a practice "fire-drill" to make sure you can reprint a page.

Section 8: Tape-Based VersaBraille

The Equipment

- ### *The Serial Interface*

For the purposes of this discussion, assume you are using slot 1 on the Apple for the Super Serial Card. Actually any free slot except slot 3 will do. If you have an Apple IIc, either port 1 or port 2 can be used. You would use a Cricket in port 2, so these examples will use port 1. If you have an Apple IIgs,

you must install a Super Serial Card to use the VersaBraille transfer functions.

There are a number of critical parameters that describe how communication is conducted between two machines. On the Super Serial Card, these parameters are set by flipping little tiny switches. On the VersaBraille, the parameters are set from the keyboard.

Set the Super Serial Card for the standard parameters. See section 3 for details.

- ### *Cable Adapter*

To connect the Apple and the VersaBraille, you need a cable adapter. These are available from Raised Dot Computing. If you have a new VersaBraille cable with a male end, *you still need a cable adapter.* If you have a model C or D VersaBraille, you need a 1F adapter. If you have a model B VersaBraille, you need a 1M adapter. The sex of the VersaBraille end of the cable adapter depends on the sex of the VersaBraille interface cable.

Interfacing to the Apple IIc

If you have an Apple IIc and a model C or D VersaBraille, you need a 2F cable. If you have an Apple IIc and a model B VersaBraille, you need a 2M cable. This cable connects the Apple IIc to the VersaBraille I/O cable.

Connecting Things Together

Place the VersaBraille next to the Apple computer. Connect the cable adapter to the serial card on the Apple. Connect the VersaBraille interface cable to the cable adapter and the VersaBraille. Connect the VersaBraille to the power cube.

Turn on the Apple. Then turn on the VersaBraille. It is a good idea to always turn on the VersaBraille after the Apple when they are wired together. When you want to turn them off, first eject the VersaBraille tape. Turn off the VersaBraille, and then turn off the Apple. The VersaBraille should be last on and first off. If you turn on the Apple when the VersaBraille is turned on, you will not damage any equipment, but you may confuse the VersaBraille. The VersaBraille may start to format a tape if it thought it received a format command from an Apple being turned on.

Setting Up an Overlay

Load the master overlay tape into the VersaBraille. Press the braille select switch. Inspect the table of contents when the tape loads. The first chapter is called *terminal.* The second chapter is called *duplicate.* Load the first chapter (when the table of contents says *terminal,* press the advance bar). The display says "terminal loaded." (On a model B VersaBraille, the display says "open new chapter." Ignore this message). Eject the master overlay tape. Do not turn the power off. Load your newly formatted tape.

Now you want to change the communications parameters on the VersaBraille. The "switch settings" are controlled by software. They are not physical switches, but electronic pulses stored on tape that can be loaded to and saved from the VersaBraille's memory. Nevertheless, try to imagine that the VersaBraille has 17 or 18 different "switches" that control the communications parameters.

Type a chord-R E on the VersaBraille. Remember that *chord* means pressing the space bar at the same time you braille a letter. A *chord-R* means striking dots 1-2-3-5 and the space bar all at once. To change the parameters, you use just two buttons, the word button (the one with the single stroke beneath it), and the advance bar (the one just above the braille display). The first characters tell what switch is being examined. The second group of characters gives the switch setting. For example, if the display shows `b 1200,` this means that the baud rate is set at 1200. Press the word button several times until the display shows `b 9600.` You just changed the baud rate to 9600 baud. To advance to the next switch, press the advance bar.

Communications Parameters

- `b 9600` - baud rate. It starts at 300 or 1200. Press the word button until you set it at 9600.
- `d 8` - It may show 7 or 8 data bits. Set at 8 data bits
- `p n` - parity. Set at no parity
- `s 2` - stop bits. Set at 2 stop bits.
- `t c` - translator. Set at computer braille
- `ll` - line length. Ignore this, just press the advance bar.
- `pl` - page length. Ignore this setting as well.
- `ci` - carriage return input. Ignore.
- `cr` - carriage return delay. Ignore.
- `et` - end transmission character. Ignore
- `dx h` - duplex. Set at half duplex.
- `hs dtr` - handshake. Set at hardware handshakes
- `ai` - ASCII control character input. Ignore.
- `co` - carriage return output expansion. Ignore.
- `ak` - acknowledge. Ignore.
- `dci` - device control character input. Ignore.
- `cts` - clear to send handshake. Ignore.
- `cd` - carrier detect. Ignore.

Actually, you do not have to scan all the parameters. You can stop after *handshake.* Type a chord-R S to go back to whatever you were doing before changing parameters. You must type chord-R S to get out of the "parameter setting mode." If you don't, the VersaBraille beeps at almost any button you push.

Saving the Overlay

Press the *new chapter button* (the one with the little square). Type TERM as a chapter title. Do not press the advance bar. Type a chord-O to save the overlay on the new tape. You have just saved a one page chapter called

TERM on the VersaBraille tape. This chapter contains the instructions and parameters for communicating with the Apple computer.

Using the VersaBraille as a Computer Terminal

Press the new chapter button. Enter an arbitrary chapter name like DEMO. Press the advance bar. The display should be blank except for the cursor in the first character position. Enter a chord-R R to put the VersaBraille in remote. Enter a chord-U to set the VersaBraille at upper case lock.

Press Control-Reset on the Apple. The computer should show a close square bracket on the display. If you are using port two on the Apple IIc, follow the instructions for using slot 2. If the serial card is in slot 2, then type PR#BUT <CR>. Then type IN#BUT <CR>.

You should see an er sign on the VersaBraille display. The er is the braille equivalent of the close square bracket. This is known to computer people as the *BASIC prompt.* The computer is trying to tell you that it's ready to execute any legal command. At this point, the VersaBraille should be in complete control of the Apple. For example, you can braille CATALOG carriage return on the VersaBraille to get the Apple disk catalog. To braille a carriage return on the VersaBraille, you use two characters: a "special symbol" followed by an M. Just to keep things interesting, the "special symbol" is different for each VersaBraille model. On a model B, use dots 4-5-6; on a model C, use dot 4; and on a model D, use *chord* dots 4-5-6.

When you can braille the Apple commands on the VersaBraille's keyboard and get the Apple to respond, then the connection is working normally.

● *Troubleshooting*

Sometimes people call to say that they cannot get the transfer functions working. It is critical to get the VersaBraille working as a computer terminal first.

If there are problems, review this procedure, especially if you have never used the communications features of the VersaBraille before. The first things to suspect are the switch settings on the serial card and the communications parameters on the VersaBraille. The second thing to suspect is the cable adapter. Have your adapter checked out by a technical person to make sure that it is connected right. If RDC supplied it, contact us about getting a free replacement. Next, make sure the serial card is functioning right. You may get someone else to lend you a spare card. Finally, there may be a problem with the VersaBraille. It is our experience that this is quite unlikely.

Setting Up Two More Overlays

To operate the VersaBraille with BEX, you need two more overlays. One overlay is for transfers To the VersaBraille. The other overlay is for transfers From the VersaBraille.

Make sure the modified terminal overlay is still loaded. If you have turned off the VersaBraille since the last session, load the chapter TERM that you put on your new tape. Type a chord-R E. Press the advance bar until you see `t c`. Press the word button twice so it says `t n`. Press the advance bar several times until the first characters are `ak`. Press the word button so the display shows `ak y`. Now type chord-R S. Press the new chapter button. Type the chapter name TO VB. Do not press the advance bar. Type a chord-O to save this overlay.

When the tape stops moving, type a chord-R M. This wipes out the overlay from the VersaBraille memory. Eject the tape. Load the master overlay tape and load the second chapter, called duplicate. Eject the master overlay tape and load your own tape. When tape has been loaded, type chord-R E. Change the first four parameters. These should be `b9600, d8, pn, and s2.` When you have set these four parameters (using the word button and the advance bar), type chord-R S. Press the new chapter button. Type the chapter name FROM VB. Do not press the advance bar. Type chord-O to save the overlay.

You have just set up the three overlays that you need to work with the Apple. If all goes well, you may not have to set the communications

parameters again for a long, long time. Save the new overlay tape in a safe place. Better yet, make additional copies of these three overlays on other tapes. If you load the overlays from your new tape, there is no need to change the parameters. Remember that if an overlay is loaded, and you want to load another one, you first have to get rid of the first overlay. Type a chord-R M to get rid of the first overlay.

Using the VersaBraille with BEX

● *Setting up your Configurations*

When you test the VersaBraille interface for the first time, establish a configuration with Echo, Cricket, or other voice output.

Answer Yes to the configuration question `Do you have a tape-based VersaBraille?` Give the model type (But, C or Do) and the slot number. Answer No to the question about a set up sequence unless you know specifically what sequence you will use. (If you choose to use non-standard switch settings on the Super Serial Card, you could establish the appropriate parameters with an automatic set-up sequence.)

While it is possible to use the VersaBraille for both input and output for the Apple, we don't recommend it--especially not as your first interface. It's quite tricky to use the VersaBraille both as a computer terminal and as a source or receiver of whole chapters. More details on this appear last in this section.

● *Transferring from the VersaBraille*

Cable the VersaBraille to the Apple. Turn on the Apple, turn on the VersaBraille. Give a voice or screen configuration name on the Apple. On the VersaBraille, load the FROM VB overlay. Put the VersaBraille in remote; type chord-R R.

To start the transfer, use the `From VersaBraille` option on the Main Menu. If you are transferring a grade two chapter, press <CR> to accept the default No answer to the `Do you want control characters?` question. Press <CR> to the question about VB page breaks. The computer says `Enter chord-X H at the VB chapter name`

It is time to pay attention to the VersaBraille. You did load the FROM VB overlay, didn't you? Eject the overlay tape and load the tape containing the chapter you want to send to the Apple. Find the chapter title in the table of contents. Do not press the advance bar to enter the chapter. Just stay in the table of contents. Enter a chord-X H on the VersaBraille. The rest is automatic. You should hear the VersaBraille tape begin to move the moment you enter chord-X H.

If you want to send an entire tape to the Apple, use the chord-X T command instead of the chord-X H command on the VersaBraille. If you are sending a full VB tape to the Apple, then you need to use two data disks to receive the material. Once the transfer starts, replace the program disk in drive one with a second data disk. The program automatically switches disks when the first data disk gets too full.

● *Transferring to the VersaBraille*

Cable the VersaBraille to the Apple. Power on the two devices. Use a screen or voice configuration. On the VersaBraille, load the TO VB overlay. When it is loaded, type a chord-R R (that puts the VersaBraille in remote). Eject the tape, and load the tape you want to send the chapter or chapters to.

On the Apple, use the To VersaBraille option on the Main Menu. Give the name of the chapters you are transferring. Press <CR> to the question about defining VB page breaks (unless you really know what you are doing). When it asks for a maximum page size, give a number under 950. Once you answer this question, the rest should be automatic. The VersaBraille is in local when the transfer is over. Enter another chord-R R if you want to send more material to the VersaBraille.

The VersaBraille as a Computer Terminal (Again)

To use the VersaBraille as a computer terminal with BEX, first cable the Apple and the VersaBraille together. Turn on the Apple, then turn on the VersaBraille. Load the TERM overlay chapter. Eject the tape and load a new tape. Open a new chapter. Type chord-R R chord-U (putting VersaBraille in remote, upper case lock). You'll boot BEX and establish a new configuration. When BEX prompts `Enter configuration,` enter four characters: `*V1 <CR>` (The digit one indicates you're interfacing through slot 1.) You should be able to answer the configuration questions through the VersaBraille. Answer Yes to the question about a remote keyboard. Answer Yes to the question about having a braille device for the computer dialogue.

Section 9: Disk-Based VersaBraille II

If you have a VersaBraille II Plus, you will need to get the appropriate cable from TSI.

For a VersaBraille II, use an Apple Super Serial Card, an Apple IIc serial port, or an Apple IIgs serial port. The standard parameters work fine. Use a 6M cable for the Super Serial Card or the Apple IIgs cable adapter. Use a 2M cable for an Apple IIc. Connect to the DTE port on the VersaBraille.

VersaBraille Parameters

Use the menus on the VersaBraille to set the VersaBraille communications parameters. Enter P for parameters, and S for serial. There is one very strange item in this list--you must specify 7 data bits. It may be difficult to understand why you need to set the Super Serial Card to 8 data bits while the VersaBraille is set to 7 data bits. This is a case where our previously stated rule of making parameters match is broken. Without a doubt, this is the trickiest aspect of the interface. The other parameters are straightforward:

9600 baud
7 data bits
2 stop bits
full duplex
no parity
DC IN no
DC OUT no
DTR handshake
DSR yes
CTS yes
RTS handshake

To send text from the VersaBraille II to the Apple, you use BEX's option I - Input through slot on the Second Menu. To send text from BEX to the VersaBraille II, you use a BEX printer defined as a class P - Paperless brailler. Establish a configuration that includes the serial card you use for VersaBraille-Apple communications. You specify this card twice in your configuration. The first time is when you answer Y to the `Do you have a remote serial device to input text through slot?` question. The second time is when you configure one of your printers as a Paperless brailler. More details on this and the actual data transfer appear in User Level Section 11.

Section 10: Kurzweil Reading Machine

The Kurzweil Reading Machine (KRM) is a device which takes printed material, reads it and speaks it using synthetic speech. It can also output the text on an RS-232 serial line. The text can be saved as a BEX chapter by using the Input through Slot option on the Second menu. Once the text is stored as a BEX chapter on disk, it can be translated and sent to a braille device, or any other combination of BEX options.

You need a Apple Super Serial Card or an Apple IIc port. You need a special cable to connect the serial card with the KRM. These cables are available from Raised Dot Computing. Select the appropriate cable as follows:

- Cable Code: Interface

- 4F: Model 3 KRM and Super Serial card
- 5F: Model 3 KRM and Apple IIc
- 4M: SSC and Series 400 (serial number under 38053)
- 5M: Series 400 (serial number under 38053) and IIc
- 6M: SSC and Series 400 (serial number over 38053)
- 2M: Series 400 (serial number over 38053) and IIc

You must establish the appropriate BEX configuration. When BEX prompts: `Do you have a remote serial device to input through slot?`, answer Yes. Then BEX asks, `Is this a Kurzweil Reading Machine?` When you answer Yes, then BEX automatically sets communications for 4800 baud and 1 stop bit. This is the most common setting on the KRM.

Connect the cable to the lower port on the Model 3 Reading Machine, or the middle port on the Series 400.

On the Second Menu, pick I for Input through slot. The program prompts for the name of the chapter you are creating on the Apple. When you supply the name, BEX indicates that it is ready to receive text.

Start the KRM dump: Press Set Special command 45 The KRM responds `text output mode.` Press the page button. The text is spoken and sent to the Apple. The Apple makes a noise during the data transfer--like the noise made during Replace characters. Its pitch depends on how fast the characters are moving, so it may grind or chirp.

Controlling Data with Series 400 KRM'S

What happens during the transfer of data depends in part on your KRM model. There's less manual intervention with the newer, series 400 KRM. As the KRM sends text to the Apple, BEX is collecting characters in the page buffer. When these characters add up to approximately 3300, BEX sends the KRM a signal to stop, saves the page buffer to disk, gets ready to receive more data, and sends the KRM an "I'm ready now" signal. Your only concern is not overfilling the disk: thirty BEX pages is the limit on one data disk. Most printed material contains less than 3300 characters on a page. It's pretty easy

to keep track of how many print pages you're scanning on the KRM; after you've scanned thirty print pages, press Q on the Apple keyboard. BEX saves the last page buffer and builds a directory; you can then insert a fresh disk, choose option I, and start on a new chapter.

Controlling Data with Model 3 KRM'S

More manual intervention is required for the older, model 3 KRM'S. These models don't understand BEX's "Hold it" and "I'm ready now" signals. To get around this limitation, you press P on the Apple keyboard which forces BEX to store the page buffer. If you press P while the KRM is in the middle of scanning a page, you'll lose data: get in the habit of pressing P after the KRM has finished scanning each print page. When you've scanned thirty pages or are done scanning the document, press Q on the Apple keyboard. BEX saves the last page buffer and builds a directory; you can then insert a fresh disk, choose option I, and start on a new chapter.

You can manually insert short comments into the text. When the transfer has stopped, press T, which signals that you wish to enter some text. The Apple beeps as a prompt. Type in text from the keyboard, signalling the end of the text by entering <CR>. The text is inserted in the BEX chapter. This feature is intended to allow the entry of page numbers or other critical marking information.

Reformatting scanned data

The chapter that you have just created has a carriage return at the end of each print line. Usually you want to strip these off. Use option R - Replace characters on the Main Menu; when BEX prompts `Use transformation chapter:` specify the chapter named KRM on your BEXtras disk. This strips off the carriage returns, and tries to put in paragraph ($p) indicators. You can then edit the chapter. You can fix any errors from the KRM, and adjust the paragraph markers. You can run the

chapter through the Grade 2 translator and send the braille chapter to a VersaBraille or other braille device.

Troubleshooting

If you follow the procedures in this section, and the text comes out as garbage, then your KRM is set for a baud rate other than 4800 baud. This means it's time for the favorite game of all interfacers: "baud rate roulette"! Re-configure, and answer NO to the `Is this a KRM?` question. BEX now leaves the SSC or IIc port alone, so it's set to 9600 baud. Try communicating with the KRM at 9600 baud--if it works, you're in luck. Otherwise, write a BEX chapter with the command sequence that changes baud rate for the SSC or IIc port--see Section 6 for what characters to use. Print this chapter to the download device slot--you can establish a New printer on the fly with N if you have to. Experiment with printing various baud rate commands to the slot until you discover the KRM'S baud rate. Now, re-configure again, answer NO to the `Is this a KRM?` question and answer YES to the `Do you want to send an automatic set-up sequence?` question. Enter the same command sequence that worked when you printed it.

Section 11: Apple LaserWriter

Use a 6M cable to connect a Super Serial Card to the Apple LaserWriter. If you have an Apple IIc, it must have the *3.5 ROM* upgrade. Use a 2M cable to connect the Apple IIc to the Apple LaserWriter.

There is an important little knob on the side of the LaserWriter. It has four settings: AppleTalk, Special, 9600, and 1200. AppleTalk is for the Macintosh. Special means Diablo Emulation mode. The 9600 and 1200 settings are for working directly with PostScript, a graphics and typesetting language built into the LaserWriter. BEX can either work with the *special* Diablo emulation mode, or directly generate PostScript files. In Diablo emulation mode, you can produce high quality print output that looks very clear and sharp. The *9600* mode can be used to generate virtual typeset quality.

Diablo Emulation Mode

Set the four position mode switch on the LaserWriter to special. This sets the Diablo 630 emulation mode. Configure as follows:

Enter printer slot: # <CR>
Enter printer class: G <CR>
Enter carriage width: 65 <CR>
Enter form length: 55 <CR>
Do you want pause on form feed? N <CR>
Do you want auto line feed? N <CR>
Do you want a set up sequence for this printer? Y <CR>
control-I X (space) E control-I 255 N <CR> <CR> <CR> <CR> (8 spaces) <ESC> 9 <CR> <CR> <ESC> T <DEL>

Besides the nine spaces explicitly marked, there are no other spaces in this sequence. This sequence sets Xon/Xoff handshakes, line length 255, and sets the left margin and the top margin. You can vary the number of spaces and carriage returns in the sequence to set the left margin and the top margin to your taste. Escape 9 sets the left margin. By preceding the command with 8 spaces, this sequence sets the left margin at 8 spaces from the left edge of the paper. Escape T sets the top margin. By preceding the command with a total of 6 carriage returns, this sequence sets the top margin (top of form) at 6 lines from the top edge. If you are using an Apple IIc, substitute control-A for control-I in the above sequence.

The good news is that once you set up your configuration, you don't have to worry about sending out the sequence; it's all done automatically!

The only other thing to mention about using the LaserWriter in Diablo emulation mode is that you need to end each file with a form feed, or the last page won't be printed. You can use Multi-function print and specify one copy. That does the exact same thing that Print does--except it adds the desired form feed at the end of the print cycle.

PostScript Driver

The Apple LaserWriter is actually a very powerful computer. It uses a language called PostScript. BEX can directly generate PostScript code to give the LaserWriter detailed instructions on what type font to use, how to output characters, and how to go to the next line or page. This facility was put into BEX to allow Raised Dot Computing to produce its own manuals quickly. However, BEX falls quite short of using the LaserWriter to its full potential.

When we want to make something look very nice, we use the JustText software on the Macintosh. When we want large print very quickly from Apple disks, we use the BEX PostScript driver. Here are some of the biggest limitations with the BEX software: It is very hard to change font size and line spacing within the text. This makes it tough to make nice looking headings. In addition, BEX makes decisions on how to break words into lines based on fixed spacing (rather than proportional spacing). This can cause some ugly lines (especially when a line contains many capital letters). Why are we telling you about these problems? We want you to know that the BEX PostScript driver was written for a particular purpose. If you need fancier format on the LaserWriter, do as we do: shift to other software.

Set the four position mode switch on the LaserWriter to *9600.* This tells the LaserWriter to expect PostScript code from the serial port at 9600 baud.

Configure as follows:

Enter printer slot: # <CR>
Enter printer class: A <CR>
Apple LaserWriter PostScript Driver
Enter font size: 16 (or whatever) <CR>
Enter line spacing: 20 (or whatever) <CR>
Enter carriage width: 68 (or whatever) <CR>
Enter form length: 32 (or whatever) <CR>
Do you want pause on form feed? N <CR>
Do you want auto line feed? N <CR>
Do you want a set up sequence for this printer? N <CR>

Notice that you do not have to give any set up sequence. BEX automatically sets the Super Serial Card for Xon/Xoff handshakes.

BEX supplies suggested values for all the parameters (except font size) if you press a carriage return after each question. Your configuration can have several printers using PostScript if you need to quickly generate output at several different font sizes. For example, printer one could be 8 point, and printer two could be 16 point. A BEX configuration cannot contain both PostScript printers and Specific printers.

To generate the output, print your BEX file to the appropriate printer number. You do not need to put a form feed at the end of your text, BEX makes sure that the last page is sent out.

There are some word processing commands which allow the user to switch between typefonts. Here is the list:

- $$ep - normal (Times-Roman)
- $$eb - boldface (Times-Roman)
- $$ei - italics (Times-Roman)
- $$eu - bold-italics (Times-Roman)
- $$ec - Courier

Raised Dot Computing has written a separate manual on the use of the PostScript Driver. Please write for a copy if you would like more information about this interface.

Section 12: Dipner Dots

Dipner Dots Embossed

Randy Dipner of Colorado has pioneered the idea of making simple modifications to a daisy wheel printer to produce braille. To produce Dipner Dots, you must have a daisy wheel printer (dot matrix printers do not work). The Dipner Dot method uses a single character, such as a period or center dot, to emboss dots into lightweight paper that is backed by a soft roller. BEX has all the software needed to produce grade two braille with this method. Although you do not produce Library of Congress quality dots, the dots are quite readable. This is absolutely *not* recommended for schools or transcriber

groups. But it may be very appropriate for a blind professional in an office setting.

The most important modification needed for the printer is to change the roller. There are two approaches. One is to wrap some soft material around the existing roller. But then, switching from print to braille and braille to print is a bit of a production. It is recommended that you have a spare roller wrapped with soft material. Then, switching modes means literally switching rollers, which can be done in a few seconds. You do not need a removable roller if you are sheet-feeding your printer.

If you decide to go this route, there are two steps. First, buy a spare roller for your printer. This may cost about $100. Next, get in touch with the nearest Ames Supply. Ames sells printer and other computer supplies. Ask to have your roller re-covered with "low resilience" material. Ask for "30-Durometer rubber." Durometers are the unit of measurement of resilience. This should cost between $10 and $15. There are about 12 Ames Supply Houses around the country, one of them is located at 2537 Curtis St., Downers Grove, IL 60515.

You can take an ordinary roller and wrap it with soft material, such as several layers of "flannel rubber sheeting" available from medical supply houses. Make a layer several millimeters thick. Some of the early experiments in this area used bicycle inner tubes. This has been improved upon. If you do wrap your roller, you may mess up your form length. The form length is based on the number of times the roller spins per page. If you change the diameter of your roller, the form length changes.

Configure BEX as follows:

Printer slot: # <CR>
Printer class: B <CR>
Brailler type: 12 <CR>
This means Dipner Dots embossed.
Is that what you want? Y <CR>
Enter carriage width: 40 <CR> (or whatever)
Enter form length: 25 <CR> (or whatever)
Do you want pause on form feed? N <CR>
Do you want auto linefeed? N <CR>
What character are you using? <period> <CR>
Do you want a set up sequence for this printer? N <CR>

BEX automatically sets the spacing for standard braille. You may find that other characters besides a period improve the quality of the braille. Try using epoxy or nail polish to fill in the at sign or a degree sign if you want to change the spacing between dots.

To improve the quality of the embossing, remove your printer's ribbon. It is recommended that you have a printwheel reserved for braille production. The character that you are using to punch dots may get too worn down for regular inkprint use.

Printed Braille Dots

Closely related to embossed Dipner Dots is the ability to generate flat braille on an inkprint printer. Instead of trying to produce tactile braille, it is possible to print a pattern of inkprint periods that simulate braille.

Making inkprint dots requires no physical modification of any of the printer parts. Answer the configuration questions as you would for embossed braille, only use brailler number 13 (printed braille dots) instead of brailler number 12. BEX automatically adjusts the spacing on most letter quality printers to make closely spaced printed braille dots. If you have a dot matrix printer, you need to find the escape sequences to print compressed letters and to compress the vertical spacing. We used the following set up sequence to get proper spacing on an ImageWriter: `<ESC> Q <ESC> T <zero> 8`

Section 13: Sider Hard Disk

Equipment Requirements

A Sider hard disk is a product sold exclusively by First Class Peripherals. First Class Peripherals can be reached at (800) 538-1307 Ext. 240. You must be at the Master Level of BEX to use one. You cannot install a hard disk on an

Apple IIc. This means you must have an Apple IIe (with an extended 80 column card) or IIgs. You need at least one 5.25 inch disk drive. Use of the Sider is incompatible with a regular slot RAM card, such an Apple Memory Card. They both change the disk operating system at the same spot. The program crashes if both are in your system.

Use the Sider instruction manual. This material is intended to be supplementary.

BEX works with only one Sider drive. You can use either the 10 megabyte or the 20 megabye drive. It is possible to cable two Sider hard disks together, but you cannot access any information from a second Sider using BEX.

Fundamental Concepts

The Sider works with up to four different operating systems (DOS 3.3, CPSTM, ProDOS, and PASCAL). When you format the Sider, you instruct it on how to divide up the space on the disk for the different systems. If you don't plan to use some of these operating systems, then you may want to minimize their allocated space.

BEX uses DOS 3.3. The Sider partitions memory into units called *volumes*. The Sider can allocate two sizes of volumes for DOS 3.3: small and large. The small volumes are 140,000 bytes (about the size of a floppy disk); the large volumes are about 400,000. You choose how the DOS 3.3 space is divided. My own preference is all small partitions except for about 10 large partitions.

As far as BEX is concerned, the volumes can be thought of as independent disk drives with permanently installed floppies. Volume 1 contains essential utility programs for the Sider. The BEX program takes up 2 more small volumes. The rest of the volumes are free for your data. It is imperative that you take the time to read the Sider User's Guide to learn more about how the Sider is set up and partitioned.

RDC has found no way to do the installation without the assistance of a patient sighted person. The installation process should take 2-4 hours. Once you've completed installation, BEX is completely accessible.

Installing the Hardware

Use the instructions that come with the Sider to connect the Sider to your Apple IIe. Install the interface card in slot 7 (the floppy disk controller should be in slot 6). The Sider should have a termination plug (one inch long jack) in the bottom plug, and the cable to the interface card in the top plug. The Sider has its own power cord. Pay close attention to the ventilation needs of the Sider.

Check for Recognition

Before we go any further, we have to make sure that BEX recognizes the disk controller card as being a Sider. Keep the Sider turned off. Insert your BEX boot disk in the booting floppy drive (slot 6, drive 1). Turn on the Apple. The disk will not boot. Press control reset followed by: `PR#6 <CR>`

At the Starting Menu, press W to find out what BEX thinks is in slot 7. If the display shows `unidentified card` in slot 7, then use option R to force BEX to recognize the Sider.

Formatting the Sider

As stated above, the formatting procedure requires the assistance of a sighted person. An attempt to use TEXTALKER causes the installation program to crash. Again, carefully review the Sider instruction manual before formatting.

With the Sider turned off, turn on the Apple computer. Press a Control-Reset on the Apple. Insert the disk labeled Installation Utilities into floppy drive one. Type:

PR#6 <CR>

Now turn on the Sider. After a few pauses, the installation program gives you some informational screens. Press <CR> to move through these screens.

The program asks: `Is this Sider 1 or 2?` Answer 1. You would only answer 2 if you had a SECOND Sider. BEX only supports one Sider. Next the program asks: `Is this a 10MB or 20MB disk?` Answer appropriately.

You are presented with a visual display of how the disk is to be divided. It took me a few tries to get the hang of this program. Please pay close attention. Basically, you have to work backward.

To compress one partition, enlarge the partition to its left. If you want to minimize the Pascal space, use the <CR> to move the "cursor" to the ProDOS square. Next press an L to indicate that you want the largest ProDOS size. This squeezes Pascal to its smallest possible size. If you don't want any ProDOS space, move the "cursor" to CPSTM and ask for the largest size. To compress CPSTM, ask for the largest size for DOS-LV.

Now comes the moment of decision: how to divide up the DOS 3.3 space. If you are going to do a lot of copying of data back and forth between Sider and floppies, ask for a lot of "DOS-SV" space (the size of a small volume is about the same as a floppy). If you have a lot of big documents that don't fit on one floppy, ask for a lot of "DOS-LV" volumes.

When the various partitions are assigned to your liking, press an I. The program asks whether you wish to continue.

The program displays a lot of numbers that you must copy down in the back of your Sider Manual. If you have problems and call Sider's technical support, you may be asked for these numbers. It is important to write down the total number of DOS volumes that you have set up. You will need that number during the BEX configuration. The total number of DOS volumes depends on how you have divided up the Sider's space.

You are asked to insert the Support Utilities for Apple DOS 3.3 into the floppy drive. This is the flip side of the disk that is presently in the drive. Once this disk is in the drive, type:

GO <CR>
The initialization begins. This takes from 30 to 60 minutes (depending on the size of your Sider).

Copying BEX onto the Sider

BEX allows you to copy the Boot side and the Main side onto any Sider volumes. In this example, we copy the BEX Boot side onto volume 2, and the Main side onto volume 3. But you could use other volumes on your system. Note that you never want to use volume 1 since that is where the support programs are stored.

When initialization is over, the Sider's Main Menu is presented. Choose option 5 (Support Utilities). This takes you to the Support Utilities Menu. Choose option 3, DOS File Utilities. This takes you to a program similar to FID.

Insert the BEX boot disk into floppy drive 1. Choose option 1, copy files. Copy from slot 6, drive 1, volume 0 to slot 7, drive 1, volume 2. Answer the filename prompt with an equal sign followed by a carriage return. This has the effect of choosing all the files. Answer N to the question about prompting, then press two returns to start the copying. Here is what the screen looks like:

Copy Files
Source slot => 6
Drive => 1
Volume => 0
Destination Slot => 7
Drive => 1
Volume => 2
Filename? = <CR>
Do you want prompting? N
Insert Disks. Press <ESC> to return to the
Master Menu or any other key to Begin

When the Sider has finished copying the Boot side, choose option 7 to reset the slot, drive, and volume defaults. Insert the Main BEX disk in floppy drive

1. Copy from slot 6, drive 1, volume 0 to slot 7, drive 1, volume 3. Copy all the files using the equals sign.

When all the files are copied, choose option 11 to Quit. This takes you back to the Master Menu. Press <CR> (this takes you to option 3 of the Master Menu). You get the BASIC prompt. Type the following:

```
UNLOCK HELLO DOS <CR>
NEW <CR>
10 PRINT CHR$(4);"RUN HELLO,V2"<CR>
SAVE HELLO DOS <CR>
RUN <CR>
```

If you are not storing the Boot side on volume 2, then modify line 10 accordingly. If all goes right, BEX starts to load. If you have an Echo, then BEX starts to talk. You can dismiss your sighted friend. Give her or him some potato chips and a beer.

Setting Up the BEX Configuration

At the configuration prompt, enter an ampersand (and) and press <CR> to set up a Master Level configuration. Answer the questions as you would normally. When you are asked if you have an `extended disk system,` answer Yes. Here is a sample dialogue:

```
Do you have an extended disk system? Y <CR>
Virtual drive 1 is for the Main disk program disk.
For virtual drive 1
Enter slot: 7 <CR>
Sider Hard Disk
How many volumes: 48 <CR>
For virtual drive 49
Enter slot: 6 <CR>
Enter drive: 1 <CR>
For virtual drive 50
Enter slot: 6 <CR>
Enter drive: 2 <CR>
```

For virtual drive 51
Enter slot: 0 <CR>
Boot side volume: 2 <CR>
Main side volume: 3 <CR>

You must list the Sider slot as the first drive slot. For the question about how many volumes, use the number from the Sider initialization (the sum of the small and large DOS 3.3 volumes). For the questions about the Boot side volume and the Main side volume, give the volume numbers where you copied the program disks. Next you are prompted for information about more drives. Give the slots and drives of your other floppy drives. When you have no more drives, answer 0 to the disk slot prompt.

Keep your BEX disk in drive one of your floppy the first time you use BEX. BEX copies the serialization information onto the hard disk.

Using the Sider

When you boot up your system, you are presented with a Master Menu. Press return to get into BEX. Give your new configuration name (the configuration that refers to the Sider). You should get correct serialization information.

To switch from Starting Menu to Main Menu, just press the space bar. To switch from Main Menu to Starting Menu, just press the space bar.

BEX treats each volume in the Sider as a separate disk drive. To scan the contents of volume 18, enter 18 to the chapter prompt. If you refer to drive 1, you are redirected to either the Main volume or the Boot volume (depending on whether you are in the Boot side or the Main side). Your floppy drives are the last few drive numbers. If you have 48 Sider volumes and two disk drives, then floppy drive 1 is treated as drive 49, and floppy drive 2 is treated as drive 50. The BEX default drive is the last drive, which should be a floppy drive.

For example, you can enter 18TEST to the chapter prompt for the Editor. This opens a chapter called TEST on volume 18 of the Sider. If you want to

print this chapter, you can just enter 18 to the chapter prompt to scan volume 18.

Of course, it may take some time getting used to having many megabytes of storage on a hard disk at your disposal. You may find it useful to learn how to use auto chapters to automate file manipulation on the Sider. The zero drive number in the target code was designed to make things easier for a Sider user.

One major problem with using the Sider is keeping track of all the chapters that you store in the different Sider volumes. The Whole Disk Catalog on the Page menu allows you to output a range of volumes (drive numbers). Use option W on the Page Menu. You are prompted for a drive number. Answer with + followed by a drive number followed by a carriage return. You are then prompted for the final drive number. For example:

Page Menu: W
Whole disk catalog
Which drive: +8 <CR>
through: 13 <CR>
(the computer lists the BEX chapters in volumes 8 through 13)

If you want a printout, you can use the Master Level feature to turn on a printer with the control-B P printer number command. For example, to turn on printer two, type three characters: control-B P 2. To turn off the printer at the end, type control-B P D.

If you are at the Master Level, you can replace the plus sign with an ampersand to save the catalog in a chapter. You will be prompted for a chapter name at the end of the catalogs. This feature has a limit of 2048 characters. It is recommended that you only catalog 3 or 4 volumes at a time. Here is an example of using this feature:

Page Menu: W
Whole disk catalog
Which drive: &8 <CR>
through: 11 <CR> L
(the computer lists the BEX chapters in volumes 8 through 11 beeping for each character absorbed)

Chapter: CAT <CR>
Chapter CAT now contains the list of BEX chapters on volumes 8 through 11.

Operating System Differences

BEX uses a variation of DOS 3.3 to speed up disk access. The Sider uses a more conventional version of DOS 3.3. You will notice that some accesses to floppy disks are slower on the Sider. On the Sider, you do not get the free sector count at the top of a catalog, but you can press # at any menu to check the sector count on a Sider volume.

Section 14: Cable List

All these cables and adapters are available from Raised Dot Computing. Write or call for a price list.

Cable Adapter 1F

VersaBraille C or D to SSC

Male RS-232 on Apple end, female RS-232 on VersaBraille end; wires 1, 2, 3, 5, 6, 7, and 20 all straight through. Connect 4 on Apple end to wire 20. Do not connect wire 4 on VersaBraille to anything.

Cable Adapter 1M

VersaBraille B to SSC

Same as 16, except male on VersaBraille end.

Cable 2F

DECtalk to IIc

Echo GP to IIc

Microbrailler to IIc

PED to IIc

Personal Brailler to IIc

VersaBraille C or D to IIc

Thiel to IIc

3 foot cable, 5 pin DIN on Apple IIc end, female RS-232 on other end. Using Apple's pin numbering system: Apple pin 1 wired to RS-232 pins 5 and 6; Apple pin 2 wired to RS-232 pin 3; Apple pin 3 wired to RS-232 pin 7; Apple pin 4 wired to RS-232 pin 2; Apple pin 5 wired to RS-232 pin 20.

Cable 2M

Cranmer to IIc

DEST to IIc

ImageWriter to IIc

LaserWriter to IIc

MBOSS-1 to IIc

VersaBraille B to IIc

VersaBraille 2 to IIc

Same as 26, except male on RS-232 end.

Cable Adapter 3F

VersaBraille C or D to Cranmer

[SlotBuster Modem Port to SSC cable]

Male RS-232 to female RS-232 cable adapter; wires 1 and 7 straignt through. Swap wires 2 and 3. Swap wires 6 and 20. On each end, short wires 5 and 6.

Cable Adapter 3M

VersaBraille B to Cranmer

Same as 36, except male on VersaBraille end.

Cable 4F

KRM 3 to SSC

12 foot cable, male RS-232 on the Apple end, female RS-232 on KRM end. Wire 7 straight through, swap wires 2 and 3. Short wires 4 and 5 on the Apple end. Short wires 6 and 20 on the Apple end.

Cable 4M

KRM 400 to SSC

Same as 4F except male on the KRM end.

Cable 5F

KRM 3 to IIc

12 foot cable, 5 pin DIN on Apple IIc end, female RS-232 on the KRM end. Using Apple's pin numbering system: Apple pin 1 wired to RS-232 pin 20; Apple pin 2 wired to RS-232 pin 2; Apple pin 3 wired to RS-232 pin 7; Apple pin 4 wired to RS-232 pin 3; Apple pin 5 wired to RS-232 pins 5+#6.

Cable 5M

KRM 400 to IIc

Same as 5F except male on the KRM end.

Cable 6F

DECtalk to SSC

Microbrailler to SSC

PED to SSC

Personal Brailler to SSC

Thiel to SSC

10 foot straight male to female cable, RS-232 each end. Connecting wires 1, 2, 3, 4, 5, 6, 7, 8, and 20.

Cable 6M

Cranmer to SSC

DEST to SSC

ImageWriter to SSC

LaserWriter to SSC

LED-120 to SSC

MBOSS-1 to SSC

Ohtsuki to SSC

VersaBraille 2 to SSC

10 foot straight male to male cable, RS-232 each end. Connecting wires 1, 2, 3, 4, 5, 6, 7, 8, and 20.

Gender Adapter 7F

KRM 3 to VersaBraille C or D

Female RS-232 each side, connecting all pins straight through.

Gender Adapter 7M

KRM 400 to VersaBraille B

Male RS-232 each side, connecting all pins straight through.

Cable 9F

IBM-PC to SSC

10 foot female to male cable, RS-232 each end. Connecting wires 1, 2, 3, 4, 5, 6, 7, 8, and 20. Short wires 4 and 20 on both ends.

Cable 9M

VersaPoint to SSC

Same as 96, except male on both ends.

Cable 106

DECtalk to IIc

Echo GP to IIc

IBM-PC to IIc

Microbrailler to IIc

PED to IIc

Personal Brailler to IIc

VersaBraille C or D to IIc

Thiel to IIc

8 foot cable, 5 pin DIN on Apple IIc end, female RS-232 on other end. Using Apple's pin numbering system: Apple pin 1 wired to RS-232 pins 5 and 6; Apple pin 2 wired to RS-232 pin 3; Apple pin 3 wired to RS-232 pin 7; Apple pin 4 wired to RS-232 pin 2; Apple pin 5 wired to RS-232 pins 4 and 20.

Cable 10M

Cranmer to IIc

DEST to IIc

ImageWriter to IIc

LaserWriter to IIc

MBOSS-1 to IIc

VersaBraille B to IIc

VersaBraille 2 to IIc

VersaPoint to IIc

Same as 106, except male on RS-232 end.

No Cable Used

Cricket to IIc

Echo synthesizer to Apple

Echo GP to SSC

KRM 3 to VersaBraille B

KRM 400 to VersaBraille C or D

Section 15: Forcing Card Recognition

When you use option W - What is in this computer, BEX tells you about the interface cards plugged into the slots of your Apple. BEX recognizes different types of interface cards through their own unique hardware and software profiles. Option R - Recognition of cards on the Starting Menu lets you teach BEX about interface cards whose profiles BEX does not know. However, if you provide BEX with incorrect information, you can cripple BEX's abilities to communicate with peripheral devices. Therefore, it's very important that you read through this entire section before you start using Recognition of cards.

Cards and devices BEX already knows about

As shipped to you, BEX can recognize all members of the Echo family and the SlotBuster multi-function card. BEX recognizes a variety of disk controller cards, including the Sider hard disk. For RAM drive use at the Master Level, BEX recognizes auxiliary slot memory expansion cards on the Apple IIe and their cognates on the Apple IIc; memory expansion slot cards on the Apple IIgs; and regular slot memory cards in the Apple IIe or IIgs.

Finally, BEX recognizes a *select* group of printer interface cards: the Apple Super Serial Card, the Grappler parallel card, the Apple Parallel Card, and built-in ports on the Apple IIc and IIgs. When BEX doesn't know the unique

profile of a card, then it reports `Unknown card` in that slot with What is in this computer.

When Not to Use Recognition of Cards

You must have an interface card to control communication between the Apple and any peripheral. For every printer class *except* large print, BEX does not care about the exact interface card. When you configure most printers and braillers, BEX checks to make sure that an interface card is *present* in a particular slot. Unless you're configuring large print, BEX allows you to proceed even if the card is not recognized. You don't need to use Recognition of cards in this situation.

When BEX does not recognize a member of the Echo family, an 80-column card, or an auxiliary slot memory expansion card, Recognition of cards cannot help you. In the unlikely event this happens to you, please call our Technical Support line so we can help you.

The Fussy Interfaces

BEX requires a *particular* make and model of interface card for large print printing. BEX also requires specific interface cards for tape-based VersaBraille transfers and option I - Input through slot. When BEX reports an `Unknown card` in slot 4, then BEX won't let you specify slot 4 when configuring a tape-based VersaBraille, or large print printers. We refer to these applications as the *fussy interfaces.*

How Recognition of Cards Works

As mentioned earlier, BEX recognizes interface cards by their unique profile. The binary file named CARDS.BIN on the Boot side contains the profile information for all the cards BEX recognizes. When you use option R - Recognition of cards, BEX modifies the information in the CARDS.BIN file. The information in the CARDS.BIN file is BEX's "final authority." If you tell BEX to put erroneous information in that file, then BEX would behave incorrectly.

Here's an overview of how Recognition

But just recognizing the profile is not the whole story. For the fussy interfaces, BEX depends on finding a particular arrangement of *hardware* in the interface card. Many interface cards claim to be *compatible with* a well-known brand name card, for example, the Grappler parallel interface card. Ninety percent of the time, this compatibility does not mean that the hardware is the same. When you use Recognition of cards to teach BEX about a new card, you are *not* teaching BEX about the hardware on the card. Instead, you're telling BEX to pretend that the hardware on the card acts *exactly* like the hardware on a card BEX knows about already. If the new card's hardware is not *exactly* the same, then BEX won't perform correctly.

However, if you use Recognition of cards and realize you made a mistake, or if the recognized card does not work properly, there is an Undo feature. This feature only works on the last card recognized. The Undo feature is discussed below.

Why Recognition of Cards?

Recognition of cards lets you keep BEX up-to-date about the unique profiles of cards whose hardware BEX can work with. Card manufacturers are constantly improving their products. When Orange Micro designs a new and better Grappler Plus card, they change its unique profile. But Orange Micro takes care to maintain hardware compatibility: they don't want people who have used Grappler cards in the past to encounter nasty surprises.

The Circuit Cards BEX Recognizes

Here is a list of the card types BEX recognizes when you use this option:

- 1 - Super Serial Card
- 2 - Grappler parallel card
- 3 - Apple parallel card
- 4 - SlotBuster card
- 5 - built-in serial port
- 6 - 5.25 inch disk drive
- 7 - 3.5 inch disk drive
- 8 - Sider hard disk
- 9 - Regular slot memory card

There are many card types that BEX does not recognize. Cards such as mouse and joystick cards, clocks, co-processors, and modems are not relevent to BEX. If your card is "0 - None of the above" then BEX cannot do anything with your card anyway; do not use Recognition of cards on it.

When your card *is* one of the types listed above and is not recognized, then you need to use Recognition of cards.

Warning!	Be careful. Follow our instructions carefully. This option can cripple your BEX disk. Never use this option on your Master BEX disk. If you feel hesitant about using it, call our technical support. Never use Recognition of cards to explore all the possibilities of a circuit card. If you have used Recognition of cards and your card still does not work right, call technical support, and tell us you have used Recognition of cards.

Recognize one card at a time

If you recognize more than one card at once, remember that only the last recognition can be undone. When you have more than one card that needs recognition, make certain you have an unaltered copy of CARDS.BIN on your Master BEX Disk. Use option F - FID on the Boot side to copy the

CARDS.BIN file onto another disk. Recognize your cards one at a time. Start with the card you are most confident about, and test that feature thoroughly before advancing to the next card. If you make a mistake, you have a back-up copy of CARDS.BIN and can start over.

Recognizing an Unknown Card

When you are certain of the function of your unrecognized card, move to the Starting Menu and press R. When all your cards are recognized, BEX tells you so and returns you to the Starting Menu. When one or more of your cards are not recognized, BEX asks for the slot number of the unrecognized card. Press ? <CR> if you are uncertain, and BEX tells you the number of the slots where the card is not recognized.

When you enter the slot number, BEX gives you a numbered list of the cards it recognizes, and asks for a number. You must enter a digit followed by <CR> to proceed. As a safety measure, BEX cancels recognition of cards and returns you to the Starting Menu when you enter ? <CR> or just <CR>, or zero <CR>. When you are certain of the card type, tell BEX that your card is one of those listed by entering the number of the card type. BEX then enters that card's profile into CARDS.BIN, listing it as the card type you specified.

Here's what the dialogue looks like:

Starting: R
This option forces BEX to recognize one
of your circuit cards. Only use this
option when you are sure the unknown
card acts like one card from the
following list.
Enter Slot: ? <CR>
Slot 4 is not recognized
Slot 7 is not recognized
Enter Slot: 4 <CR>
I know this card acts like this number:
1 - Super Serial Card
2 - Grappler parallel card
3 - Apple parallel card

4 - SlotBuster card
5 - built-in Apple serial port
6 - 5.25 inch disk drive
7 - 3.5 inch disk drive
8 - Sider hard disk
9 - Regular slot memory card
0 - None of the above
Which card is in slot 4:
When you enter ? <CR> or 0 <CR> or just <CR> at this prompt, BEX returns you to the
Starting Menu. When you enter the card type number, BEX writes that recognition to disk:
Which card is in slot 4: 2 <CR>
Grappler parallel card

> After BEX returns you to the Starting Menu prompt, your card is recognized.
> You may use option W - What is in this computer to confirm your forced
> recognition.
>
> Reboot, and configure any of the fussy interfaces. Test these features
> thoroughly. If the features do not work, the usual reason is a problem with
> the card. Call for technical support, and *tell us* that you have used option R -
> Recognition of cards. In order for us to assist you, we need to know exactly
> what card you have, and that you have forced recognition of that card.

Undoing a Recognition

> Once you have recognized a card, BEX gives you the option of undoing the
> last recognition. The next time you use option R - Recognition of cards, BEX
> tells you that you have forced recognition on a slot number, and asks you if
> you want to undo that recognition. When you accept the Y answer, BEX
> cancels the recognition, and erases the entry for that card in CARDS.BIN.
> When you enter `N <CR> C you go immediately to the C
> Enter Slot:` prompt.
>
> You may undo only the last recognition. If you enter `N  <CR>` at the undo
> prompt, and then recognize a second card, you cannot undo the first
> recognition.

Using FID to Start Over

There is one final method of undoing a Recognition of Cards when you need to undo a recognition other than the last. Since you have used Recognition of cards on a working copy of your BEX Disk and have not altered your Master BEX Disk in any way, you can use option F - FID on the Starting Menu to copy the CARDS.BIN file to your working backup.

FID is not a BEX operation; after you use FID, you must reboot to return to BEX. You must specify both the source and destination slot and drive number when you use any option on the FID Menu. So that FID recognizes file names, you need to press the Caps Lock key before typing any file name. Also, if you use an Echo, it is a good idea to use most or all punctuation mode while in FID.

To replace your altered copy of CARDS.BIN with the original version, first move to the Starting Menu. Place your original BEX disk in drive 1 and your backup in drive 2. Now you're ready to enter FID: FID dialogue is all uppercase, so following sample is transcibed in reverse capitalization mode

starting menu: f
fid
reboot to get back into bex
file developer enter option: <CR>
choose one of the following options:
1 copy files
2 catalog
3 space on disk
4 unlock files
5 lock files
6 delete files
7 reset slot & drive
8 verify files
9 quit
file developer
enter option: 1 <CR>
copy files
source slot? 6 <CR>
source drive? 1 <CR>
destination slot? 6 <CR>

destination drive? 2 <CR>
filename? cards.bin <CR>
insert disks. press <ESC> to return to
main menu or any other key to begin <CR>
file cards.bin
file cards.bin already exists.
type in a new file name for the copy or <return> to replace existing file or <ctrl-c><return> to
cancel copy <CR>
file locked
do you wish to replace it anyway? y <CR>
done
press any key to continue

You have copied the original version of CARDS.BIN on your working BEX copy. Now you start over, using Recognition of cards again if you need to. If you had used Recognition of cards correctly for previous cards, you will need use option R - Recognition of cards on them again.

Interface Manual Supplement 1991

BEX 3.1 -- January 1991 Supplement

BEX 3.0 was issued in October, 1987. Since that time many items of equipment have come to the marketplace. This supplement brings the BEX manual up to date with many of these new items. This supplement was taken from articles that appeared in the Raised Dot Computing Newsletter. Raised Dot will continue to publish supplements of information in the Newsletter.

Audapter

The Audapter is a high quality voice synthesizer made by Personal Data Systems, and available from RDC. It comes with your choice of Apple or IBM cables. The Apple cable has a female, 25 pin jack. To connect the Audapter cable to a Super Serial card, use a 6M cable; to connect to an 8 pin Apple; use an 11M cable, to connect to an original Apple IIc, use a 10M cable.

For best results in using BEX with the Audapter, we recommend using SPEX. See the March/April 1989 Newsletter for details on SPEX.

When you use a serial device like the Audapter with BEX, you must configure BEX to output to this device. To access the configuration process and get output to this device, enter period, asterisk, or ampersand, followed by the slot number to which the Audapter is connected. If you want a Master level configuration with speech to an Audapter in slot 2, type &2. When you're asked: *Do you have a voice device for all the material going to the screen?*, answer Y. Give the slot number through the Audapter is connected. Answer N when asked if the device is a Dec-Talk. Answer N to an automatic sequence.

Set the Super Serial Card and the printer ports to RDC standard parameters. See section on Serial Interfaces.

Apple IIc Plus

The Apple IIc Plus is the new version of the Apple IIc. It comes with a built-in 3.5 inch disk drive. You need to purchase an external 5.25 inch disk drive to run BEX if your copy of BEX comes on 5.25 inch disks. If your copy of BEX comes on 3.5 inch disks, you can use BEX (as a one drive system) without an external disk drive. Using BEX on a one drive system is awkward, since you need to swap your program disk and your data disk frequently.

The serial ports on the Apple IIc Plus use the smaller 8 pin circular jacks that are used on the Apple IIgs and on the Macintosh. By contrast, the original IIc has larger 5 pin circular jacks. RDC sells a cable adapter, (our 12F cable) which plugs into the Apple IIc Plus serial ports allowing you to use a peripheral cable designed for an original Apple IIc. RDC also sells the 11M and 11F cables. These cables go directly from the Apple IIc Plus ports to many popular devices. The 11F cables to the DECtalk, the Thiel, and the IBM-PC serial port. The 11M cables to the Apple LaserWriter, the MBOSS-1, VersaBraille II, and the VersaPoint. Our 11M is the same as Apple's A9M0333 cable, only longer. The 11F is the same as the 11M, only with a female jack.

● *Voice Problems*

The synthesizer of choice for the Apple IIc Plus is the Cricket (also known an an Echo IIc). There are some persistent reports of problems getting the Cricket to talk on an Apple IIc Plus. When you do a cold boot (turn on the power) on the Apple IIc Plus, the Cricket synthesizer often does not wake up talking. But the Cricket does work when you do a warm boot (enter control-Reset-open-Apple or type PR#6 from the BASIC prompt). If you hear BEX beep to give the configuration prompt but the Cricket is silent, enter control-reset then depress the caps lock key and type RUN followed by a carriage return. BEX should come up talking.

Apple IIgs

RDC now sells cables that go directly to the Apple IIgs ports. The October 1987 edition of the Interface Guide says to buy a peripheral adapter cable and then to buy the appropriate cable for the Apple Super Serial Card. Instead, you can buy our 11F or 11M cables to connect your serial peripherals to the Apple IIgs serial ports.

The Apple File Exchange

Through a feature called *Apple File Exchange* (AFE), the Macintosh and the Apple II can exchange 3.5-inch disks. Using this feature, you can prepare text on your Macintosh at home and make braille or large print copies with BEX on the Apple II at school.

● What You Need

Your Apple II must have a 3.5-inch disk drive. In order to read 3.5-inch disks into BEX, you need BEX version 3.0 or 3.1. To transfer material from BEX to the Macintosh, you need a copy of Raised Dot's QTC program disk (Quick

Textfile Converter). A copy of QTC is sent free of charge when you mail in your BEX registration card. However, if your QTC disk got lost in the ozone, send $15 to RDC. You also need a supply of 3.5-inch disks which have been formatted by a ProDOS program. You can format ProDOS disks with QTC or with many other ProDOS disk utility programs. Last but not least, you need a copy of the *Apple File Exchange* program. It is located on one of the Utilities Disks that come with the Macintosh System Software. If you have not done so already, copy the *Apple File Exchange* software onto your Macintosh hard disk.

Apple IIgs

● *From Macintosh to BEX*

There are two kinds of situations for taking data from the Macintosh to BEX. You may be handed a disk created by someone else and asked to put it into braille or large print. In this situation, you do not have any way of controlling the system of creating format. You may find a number of interesting problems and have to improvise solutions. Obviously, we cannot offer simple advice that will handle every situation. BEX's Replace characters option can clean up most data debris quickly and easily. Once you have created a transformation chapter, you can use it again when more data comes from the same source.

If you are doing the data entry yourself, you can save time by working out a system of data entry codes more compatible with BEX. If you are doing data entry just for BEX (i.e., you are not going to be using the data on the Macintosh), feel free to use BEX's $$ commands. For example, use *and* to mark emphasis and $$c to mark centering. Enter two carriage returns at the start of each paragraph. As we will see, these can be changed into BEX paragraph indicators.

There are six steps:

1. Bring some ProDOS formatted 3.5-inch disks with you to your Macintosh.

2. Use your Macintosh word processor to create a "text-only" document. When you click on "Save As", see if your word processor has a button labeled "file format". If so, click on "text-only" as a file format. If the word processor allows it, ask that carriage returns appear only at paragraphs.

3. Quit the Mac word processor and launch Apple File Exchange. There is nothing on the screen that mentions how to deal with ProDOS disks. Now insert a ProDOS disk into your Mac disk drive. The screen will change to guide you through the task of translating your Macintosh files into ProDOS files. In effect, the act of inserting the ProDOS disk is the secret handshake that gets you into a hidden portion of the Apple File Exchange software. Tell AFE to translate the text-only files you've created, and occupy yourself for a while. The translation to ProDOS format is fairly slow.

4. Take the ProDOS data disk with you to your Apple II. Boot BEX version 3.0, using a configuration that includes at least one 3.5-inch disk drive.

5. Insert the ProDOS data disk in your 3.5-inch disk drive. Then use Read textfiles on the Second Menu to copy the ProDOS textfiles into BEX chapters.

6. Edit the chapter and check out the <CR> situation. If there's just one <CR> at the start of each paragraph, use Replace characters to change <CR> to the BEX paragraph indicator

(space, dollar sign, p, space). If there is a <CR> after every line (every 50 to 80 characters) and paragraphs start with two <CR>s, use Replace characters with the FIX TEXT transformation chapter to adjust the format information.

● *From BEX to the Macintosh*

AFE can read only *ProDOS* textfiles--it can't read DOS 3.3 textfiles. Fortunately, our shareware utility QTC can copy DOS 3.3 textfiles or BEX chapters into ProDOS textfiles. Before you use QTC to make ProDOS textfiles from your BEX chapters, give some thought to the format you want on the Macintosh.

The first job is creating Apple II files in which BEX's $$ commands have been replaced by format closer to what you want on the Macintosh. For finest

control, you can use Replace characters on your BEX chapters to create reformatted BEX chapters. Change

indicators to one <CR>, and change BEX tabs and $$p# commands to control-I characters (the tab character). Alternatively, you can use Write textfile on BEX's Second Menu. This option prints the chapter to disk, placing two <CR>s and five spaces at the start of each paragraph. You can change this default format with $$ commands. Ordinarily, the <CR>s at the start of each paragraph are the only <CR>s you get; you do not get a <CR> after each line defined by a carriage width, and <CR>s in your original chapter turn into spaces. You can also change this with $$ commands. See User Level page 10:6 for some suggestions.

Once you have created reformatted BEX chapters or DOS 3.3 textfiles on disk, follow these four steps:

1. On the Apple II, use QTC to copy the reformatted BEX chapters or DOS 3.3 textfiles to a 3.5-inch ProDOS disk.

2. On the Macintosh, launch AFE and insert the ProDOS 3.5-inch disk in the Mac drive. Select the ProDOS textfiles you've created for translation.

3. Wait for the disk format translation to finish.

4. Quit AFE and launch your Mac word processor. Do not attempt to directly "double click" on the data file. Since the data file does not have a legitimate "file creator," you would get an error message. Instead, launch into the application program, and once in the application, open the orphan data file. Since the file translation is "text-only," you will lose some formatting information. You can use your Mac word processor to establish headings, emphasized text, page numbering, etc.

Braille Blazer

The Braille Blazer cannot produce braille that is 40 cells across. You need to tell BEX that you have a carriage width of 34.

If you are getting a blank page after each braille page it means that BEX and the Braille Blazer are both trying to decide when to flip the page. Tell the Braille Blazer it has zero lines/page (in the printer menu) so it will stop flipping to page.

The Braille Blazer has both parallel and serial connections. To set up the Braille Blazer for parallel connection to the Apple, do a total reset. To do this, hold down all three buttons on the right-hand side as you power on. When you release the buttons, the Braille Blazer voice asks you if it is okay to reset. To go ahead with the total reset, press the three buttons again. After you have done this, the Braille Blazer is all set up for the parallel port.

The Braille Blazer uses voice for the dialogue in its configuration menu system. The three buttons on the right side are, from top to bottom: on/off line, line feed, and form feed. Press all three buttons at the same time to get into the configuration menu. If you want to change a value, press the form feed button; the form feed button means "change." If you are satisfied with a value and want to advance to the next question, press the line feed button; the line feed button means "advance." If you want to back up to the previous question, press the on/off line button; the on/off line button means "back up." To exit a menu or a sub-menu, press all three buttons together.

When you enter the configuration menu system, the choices available are speech menu, printer menu, serial menu, service menu, and quit (to take the Blazer back to being an embosser).

Here is the dialogue to set the brailler to serial:

- *Press all three keys* Configuration
- Speech config *Change*
- port: serial *Change*
- port: off *All 3 keys*
- Printer config *Change*
- port: Parallel active *Change*
- port: Serial active *Advance*
- Left margin: 0 *Advance*
- Right margin: 34 *Advance*
- Top margin: 0 *Advance*
- Bottom margin: 0 *Advance*
- Lines/page: 25 *Change*

- Lines/page: 26 *Change*
- Lines/page: 27 *Change*
- Lines/page: 28 *Change*
- Lines/page: 29 *Change*
- Lines/page: 30 *Change*
- Lines/page: 0 *Advance*
- Page length: 11 *All three keys*
- Serial config *Change*
- 9600 baud *Advance*
- bits per char: 8 *Change*
- bits per char: 7 *Advance*
- Stop bits: 1 *Change*
- Stop bits: 2 *Advance*
- Parity: none *Advance*
- Handshake: software *Change*
- Handshake: hardware *All 3 keys*
- Service Menu *Advance*
- Exit

For a serial connection to the Apple, use an 6M cable. Set your Super Serial Card to standard parameters.

Braille 'n Speak

By cabling the Braille 'n Speak to an Apple II computer, you can transfer data between the two devices. The Braille 'n Speak is able to transmit data to the Apple via the *Input Through Slot* option of BEX. Likewise, the *Print* option of BEX enables you to send a file to the Braille 'n Speak. The only software needed is BEX.

● *Equipment Requirements*

An Apple IIe or Apple IIgs requires a Super Serial Card for *Input through Slot.* If you have an Apple IIc or and Apple IIc Plus, you use the printer port. You also need the proper cables for interfacing the Braille 'n Speak to the Apple.

- ## *Cabling and Interface Cards*

To cable the Braille 'n Speak's IO cable to the Super Serial Card, you need a universal null modem adapter (RDC 3F cable) between the IO cable and the SSC connector. To connect to an Apple IIc, you need a 2F cable and a 3F cable. To connect to an Apple IIc plus, you need a 11F and a 3F cable.

Set the Super Serial Card to RDC's standard parameters (see the separate section on Serial Interfaces).

- ## *Braille 'n Speak to Apple*

Configure BEX at the User or Master Level. Answer *yes* to the question *Do you have a remote device to input through slot?* Give the slot number for the Super Serial Card (or the Apple IIc or IIc+ port) that you will be connecting to the Braille 'n Speak. Press N to answer no to the automatic set-up sequence question. Answer *no* to the question *Is this a Kurzweil Reading Machine?*

Include in your configuration a *printer* for output to the Braille 'n Speak. Define a printer using the same slot as your *remote serial device.* How you configure this printer determines the format of the Braille 'n Speak file once it's downloaded. If you want every BEX character, including $$ commands, in your Braille 'n Speak file, configure this printer as a class P - Paperless brailler. It works well to define this *transfer printer* as a Thiel brailler; then BEX underlining commands do not interfere with your Braille 'n Speak data. If you avoid BEX underlining in the material that you send out, a Generic printer is fine. Use the carriage width and form length of your choice. If you want to keep form feed characters out of your data, use form length zero.

Use Input through Slot on BEX's Second Menu to get BEX to listen to the Braille 'n Speak. See User Level Section 12 for more information about Input through Slot. Once you supply a target chapter name and press <CR>, BEX prompts you to start the transfer.

Make sure the Braille 'n Speak is set for 8 data bits, 2 stop bits, no parity, 9600 baud, and hardware handshaking. To set the Braille 'n Speak to 2 stop bits,

enter chord-P S 2. If hardware handshaking does not work, change to software handshaking.

Braille Blazer

On the Braille 'n Speak, open the file you want to send to BEX. Turn the serial port on by issuing chord-P, dropped E. If the file is in grade 2 braille and you want to send print to BEX, turn the translator on. Otherwise turn it off. Move the cursor to the beginning of the text you want to transfer. Press chord-T, Z to send everything from the cursor to the end of the file. The Apple speaker begins to buzz, to let you know that BEX is receiving data. When the transfer is over, the Braille 'n Speak says *okay*, and the Apple speaker and disk drives are quiet. Press Q on the Apple keyboard to save the chapter. This brings you back to the Second Menu. For further details on Input through Slot, read Section 12 of the User Level Dox.

● *Apple to Braille 'n Speak*

To send a file from BEX to the Braille 'n Speak, create a file on the Braille 'n Speak and turn on the serial port. At BEX's Main Menu press P for Print. Enter the name of the BEX chapter you wish to transfer. When you've finished selecting your chapter(s), BEX prompts you for a printer number. Give the number for the *transfer printer* you set up in your configuration.

If your *transfer printer* is a brailler, you get one <CR> and two spaces at the start of each paragraph; if it is a Generic printer, you get two <CR>s and five spaces. If you want something different, place $$s# and $$i# commands before your text (for example, $$s2 $$i0 for starting paragraphs with two returns and no spaces).

When you create a file on the Braille 'n Speak, it asks if you want to turn on the translator. If you are sending a print file, answer *no.* If you are sending a grade two braille file, answer *yes,* to turn on the braille translator.

DoubleTalk

The DoubleTalk has two kinds of voice synthesizers in it: a TexTalker (Echo) compatible synthesizer and a high-quality SlotBuster compatible synthesizer. BEX only recognizes the SlotBuster compatible synthesizer. This means when you use BEX, you cannot make use of the TexTalker style speech in the DoubleTalk.

When BEX asks *Do you want SlotBuster Speech?*, BEX is asking if you want to use DoubleTalk speech.

You can control the DoubleTalk by issuing control sequences that start with a control-E. The sequence 0 B sets the size of the internal memory buffer in the DoubleTalk to zero. The BEX Editor works better with a zero buffer size. You can set the buffer size to zero as part of a set up sequence in your configuration, or you can type 0 B at a BEX Menu.

Eureka A4

The Advanced Eureka A4 is a multipurpose, talking computer/notetaker manufactured by Robotron Access Products in Melbourne, Australia. By cabling the Eureka to an Apple II computer, you can transfer data between the two devices. The Eureka is able to transmit data to the Apple via the *Input Through Slot* option of BEX. Likewise, the *Print* option of BEX enables you to send a file to the Eureka. The only software needed is BEX.

● *Equipment Requirements*

An Apple IIe or Apple IIgs requires a Super Serial Card for *Input through Slot.* If you have an Apple IIc or and Apple IIc Plus, you use the printer port. You also need the proper cables for interfacing the Eureka to the Apple.

● *Cabling and Interface Cards*

To cable the Eureka to Super Serial Card, you need a straight-through male to male cable (RDC 6M). To connect the Apple IIc and IIc plus to the Eureka, you need an additional cable to go between the straight-through cable and the computer. For the Apple IIc, you need a 2M cable; for the Apple IIc plus, you need a 11M cable.

Set the Super Serial Card to RDC's standard parameters (see the separate section on Serial Interfaces).

- ## *Eureka to Apple*

Configure BEX at the User or Master Level. Answer *yes* to the question *Do you have a remote device to input through slot?* Give the slot number for the Super Serial Card (or the Apple IIc or IIc+ port) that you will be connecting to the Eureka. Press N to answer no to the automatic set-up sequence question. Answer *no* to the question *Is this a Kurzweil Reading Machine?*

Include in your configuration a *printer* for output to the Eureka. Define a printer using the same slot as your *remote serial device.* How you configure this printer determines the format of the Eureka file once it's downloaded. If you want every BEX character, including $$ commands, in your Eureka file, configure this printer as a class P - Paperless brailler. It works well to define this *transfer printer* as a Thiel brailler; then BEX underlining commands do not interfere with your Eureka data. If you avoid BEX underlining in the material that you send out, a Generic printer is fine. Use the carriage width and form length of your choice. If you want to keep form feed characters out of your data, use form length zero.

Use Input through Slot on BEX's Second Menu to get BEX to listen to the Eureka. See User Level Section 12 for more information about Input through Slot. Once you supply a target chapter name and press <CR>, BEX prompts you to start the transfer.

DoubleTalk

On the Eureka press F4 to get into Communications. Now press the following to set the Eureka's parameters to match the Apple's:

Shifted F1 for Setup;
Shifted F1 again to select 9600 baud;
Shifted F2 to select 8 data bits;
Shifted F3 to select no parity;
Shifted F4 to select 2 stop bits;
Shifted F5 to select Xon/Xoff;
Shifted F6 to select VT100;
press the space Bar, and Eureka says, *Set up done.*

Now press shifted F2 to select Comms Mode, and press F3 to choose *Text.* Then press the Space Bar, and Eureka says, *Mode done.*

To send a file from the Eureka press shifted F3. Eureka says, *Enter name.* Enter the name of the file you wish to send and then press F8. Eureka responds, *Sending (filename).* When the Eureka has successfully sent the file, it informs you by saying, *Done.*

While material is being transferred, you hear buzzing noises from the Apple. When the Apple is quiet and the Eureka has said, *Done,* press *Q* on the Apple keyboard. BEX saves the chapter to disk and returns you to the Second Menu. Enter J to Jump to the Main Menu. You now have a BEX chapter sent from the Advanced Eureka.

● *Sending a Chapter from BEX to the Eureka*

Get the Eureka ready to receive data. All the parameters for the Eureka are the same as for sending data to BEX. The difference is that you direct the Eureka to receive (F3) rather than send. Enter the name of the file for saving data sent from BEX.

Now direct BEX to send the text you want. Use BEX's Print option. As far as BEX is concerned, you are printing to a printer. List the chapter name(s) you wish to send. When prompted for the printer number, give the number for the *transfer printer* you configured and press return.

IBM-PC Connection: Transferring Plain ASCII Files

If you have an Apple II and a PC next to each other, you can send files from one machine to the other. You tell one computer to print, and the other machine to take the data from the cable and put it in a file. The only software you need is BEX on the Apple, and DOS on the IBM-PC.

● *Equipment Requirements*

On the PC, you need a serial port. On the Apple end, you need an Apple Super Serial Card for an Apple IIe or Apple IIgs. If you have an Apple IIc or and Apple IIc Plus, you do not need a Super Serial Card. You also need a cable to connect between the Apple and the PC.

● *Cabling and Interface Cards*

To connect the IBM serial port to an Apple Super Serial Card, use a male to female straight through cable. RDC sells this as the 6F cable. To connect the IBM serial port to an original Apple IIc, use RDC's 2F cable. To connect the IBM serial port to an Apple IIc Plus, use RDC's 11F cable. You may also need a length of straight through male to female cable to lengthen the IIc cable to reach the PC. If you have an IBM with a 9 pin serial port, you need a 9 pin to 25 pin serial adapter.

Set the Super Serial Card to RDC's standard parameters (see the separate section on Serial Interfaces).

● *IBM-PC to Apple*

Configure BEX at the User or Master Level. Answer *yes* to the question *Do you have a remote device to input through slot?* Answer *no* to the question *Is this a Kurzweil Reading Machine?*

Configure one of your printers as a Generic Printer, with the same slot number as your Super Serial Card (or IIc serial port) connected to the PC.

Use Input through Slot on BEX's Second Menu to get BEX to listen to what the IBM will print. See User Level Section 12 for more information about Input through Slot. Once you supply a target chapter name and press <CR>, BEX prompts you to start the transfer.

On the IBM-PC, you must have access to both a data disk and your DOS disk. If you have a hard disk, the directory containing DOS should be in your standard path. If you do not have a hard disk, you can place you DOS disk in drive A and your data disk in drive B.

At the DOS prompt type:

MODE LPT1:=COM1 <Enter>
MODE COM1:96,N,8,2,P <Enter>
PRINT B:[filename.ext] <Enter>

The first time you print, the PC tells you:

NAME OF LIST DEVICE PRN =:
Just press <Enter> at this point. You should hear a buzzing sound from the Apple. When the IBM is finished sending, press Q on the Apple keyboard to close the BEX chapter.

The first step in dealing with the received IBM file is to delete the linefeed characters using Replace Characters. The BEXtras disk has the transformation chapter FIX TEXT that does a good job of placing BEX paragraph symbols in a textfile from the PC.

DoubleTalk

- ### *Apple to IBM-PC*

While the transfers from the IBM to the Apple can run at 9600 baud, transfers in the opposite direction require a slower baud rate. On a genuine, original IBM-PC/XT, we were limited to 1200 baud. On an Epson Equity II XT clone, we could use 2400 baud. Test the transfer at a high rate, then lower the rate until you get good data. The following instructions are for 1200 baud. This method only works with up to 65,000 characters.

On the IBM-PC, type the following:

MODE COM1:12,N,8,1,P <Enter>
COPY COM1 B:[filename.ext] <Enter>

Now the IBM is ready for data; it will wait forever. The IBM-PC recognizes the end of a file when it encounters the <control-Z> character. You must send a control-Z to tell the IBM-PC that the transmission is over and that the material should be saved to disk. Create a BEX chapter named Z consisting of five characters:

<space> $f <space> <control-Z>
The form feed indicator ensures that BEX finishes printing the entire last page. To type a control character in BEX's Editor, first press control-C and then press the plain letter. In this case, press control-C Z to create one <control-Z>. If you have an Apple IIc, create a BEX chapter named SETUP that consists of the following 18 characters:
<control-A> 1 D <CR> <control-A> 7 P <CR> <control-A> 8 B <CR> <CR> <CR> <space> $f <space>
(The only spaces are shown with <space>; others are added for clarity.)

If you have a Super Serial Card, create a BEX chapter named SETUP that consists of the following 18 characters:

<control-I> 1 D <CR> <control-I> 7 P <CR> <control-I> 8 B <CR> <CR> <CR> <space> $f <space>
(The SSC version uses control-I in place of control-A.)

These commands set the serial interface to 7 data bits, 1 stop bit, space parity, and 1200 baud. On the Apple IIc, the new parameters stay until you send a new control sequence. On a Super Serial Card, the new parameters stay until you press control-Reset.

To actually send the data, print three chapters in a row: SETUP, your data, and then Z. About the time when BEX gets back to the Main Menu, the disk should spin on the IBM indicating that the transmission is over and was successful.

ImageWriter LQ

The default baud rate on the ImageWriter LQ is 19,200 baud. To switch to 9,600 baud, reverse switches 2-1 and 2-2 on the ImageWriter LQ. Large print is formed with smaller dots than on the ImageWriter I or II, so the print is lighter. You can get attractive near-letter quality with the set up sequence: a2nL005T32. This sets vertical spacing to 4.5 lines per inch, so use a form length of 42 for 11 inch paper.

Index

HumanWare sells two braillers carrying the Index label, the Index Classic and the Index Advanced. The Index Classic interfaces just like the Index Advanced, except the Index Classic cannot do graphics.

The Index brailler can interface with a serial connection or a parallel connection. With the Apple II, we recommend using the serial port. Set the S/P switch to S (serial). [If you do want to use a parallel connection, set the S/P switch to P (parallel), and then connect a parallel cable between the Index and your parallel card in your Apple.

There are two banks of switches on the back of the brailler. Bank one has 8 switches and bank two has 10. Set Bank one to: off on on off off off on on. This is for 9600 baud, 7 data bits, no parity, 2 stop bits, and DTR handshakes. Set bank two to: on off off on on off off off off off. [We do not know what the switches in bank two do.]

If you have a Super Serial Card, set it to RDC standard parameters. (See the separate section on Serial Interfaces). Use a straight through male-to-male cable (RDC code 6M). If you are using an Apple IIc serial port, use a 2M cable. If you are using an Apple IIgs serial port, use an 11M cable.

There are four rocker switches on the top, and a power switch in the back. The left switch is for off line/on line. The next switch controls some built-in reformatting. For use with BEX, both of these switches should be pointing to the front (on-line and normal). The other two switches control paper movement when the printer is off line.

One potentially confusing aspect of the device is the many resets and the way escape sequences work. Usually, a device only registers the settings of communications parameter dip switches at power on. This is not true with the Index. A square reset button on the back is provided so you can change the communications parameters on the fly. For example, you can switch from DTR to Xon/Xoff handshakes by changing a dip switch and then pressing the reset button. There is no need to turn the Index off and then on again.

On most devices, when you send an escape sequence, the device reverts to its old behavior when you turn it off and then on again. Not the Index. It keeps information from escape sequences in non-volatile memory. For example: `8M39` changes the built-in left margin to three. [The `8` puts the Index in set-up mode, `9` takes the Index back from set-up mode, and the `M3` actually changes the left margin.]

If you wanted to restore the Index back to its default value, don't press the reset button on the back. Instead, you need to do a system reset. Turn the Index off. Hold the form feed and paper rocker switches away from you and turn on the unit. This clears away any parameter changes established by escape sequences.

Kurzweil Personal Reader

The Kurzweil Personal Reader is a high quality scanner with optical character recognition and voice synthesizer. When you interface BEX with the KPR, you can go directly from inkprint to disk (and then on to braille).

You can also use the Personal Reader as a high-quality voice synthesizer to listen to long sections of text.

The Kurzweil Personal Reader (KPR) is a very different device than the old Kurzweil Reading Machine (KRM). The KRM did not have handshaking, was very hard to configure, did not go faster than 4800 baud, and spoke everything that was sent down the serial port. The KPR, on the other hand, does have handshaking, is easy to configure, can send and receive at 9600 baud, and can scan silently. When you work with the KPR, please ignore everything written in the BEX manuals about the KRM.

● *Equipment Requirements*

In addition to the KPR itself, you need an Apple Super Serial card (or Apple IIc or IIc plus port) and a male-to-male serial cable that swaps wires 2 and 3. If you have a straight-through cable -- 6M for the Super Serial Card, 2M for the IIc, or 11M for the IIc plus -- plug a null modem (RDC 3F) on one end of the cable.

Set the Super Serial Card to RDC standard parameters (see the separate section on Serial Interfaces).

● *From the KPR to the Apple*

Configure BEX at the User or Master Level. Answer *yes* to the question *Do you have a remote serial device to input through slot?* Answer *no* to the question *Is this a Kurzweil Reading Machine?*

To prepare the KPR to send text to the Apple, use the Communications Mode to establish the following serial parameters: 9600 baud, 8 data bits, 2 stop bits, no parity, and *Xon/Xoff* (software) handshakes. (The KPR refers to hardware handshaking as *CTS;* it allows the user to choose either of these protocols, to choose the two in combination, or to choose no handshaking at all. Xon/Xoff works best with BEX and it is the default.)

Use Input through slot on BEX's Second Menu in order for BEX to receive the material coming from the KPR. See User Level Section 12 for more

information about input through slot. Once you supply a target chapter name and press , BEX prompts you to start the transfer.

Tell the KPR to send text. For block transmission, press the *marking* key three times. When the KPR prompts *transmit from mark,* you specify one of the 8 markers; the KPR sends everything from that mark up to your current cursor out to BEX. The Apple starts buzzing; when the Apple is silent, you press *Q* on the Apple keyboard to close the chapter. The material is saved to disk. You are now ready to begin file manipulation.

Laser Computers

The Laser 128, Laser 128EX and Laser 128EX/2 are Apple compatible computers. Experience has shown that these computers do not work well with Echo/Cricket synthesizers. Visually impaired persons are advised to buy genuine Apple computers. Sighted users may find these computers to be satisfactory alternatives to Apple computers.

Macintosh Connection: Transferring Plain Text Files

This part describes how to move data in both directions across a cable between a Macintosh and an Apple II, using BEX and a Macintosh communications program. This method applies only to plain ASCII data.

● *Cabling and Interface Cards*

The Macintosh has both a modem port and a printer port. The printer port is one-way (you cannot send data to the Mac through the printer port). For connection to the Apple, use the Mac modem port, which can send data both ways.

Set your Super Serial Card for RDC standard parameters.

You need a cable to go from the Macintosh modem port to your Apple II computer. To cable the Apple II to the Macintosh, obtain the cable designed for connecting an ImageWriter II to your Apple (Super Serial Card, Apple IIc port, or Apple IIc+ port). Conveniently, the ImageWriter II cable is the correct cable for the Macintosh modem port. These cables are available from your local computer store.

● *Macintosh Communications Software*

One Macintosh telecommunications program that works well for Apple II transfers is Hayes Smartcom II, available from most sources of Macintosh software. Smartcom is good for communicating through the phone lines to a computer across the country, or through a direct connection to a computer on the next desk. To save settings for different kinds of connections and on-line systems, Smartcom lets you save small files called "Smartcom documents." A Smartcom document is similar in function to a BEX configuration. After you have saved a Smartcom document for Apple II transfers, you just click on its name the next time you need to set up an Apple transfer.

Smartcom sends or receives only "straight text files." For example, it cannot transfer to BEX a Microsoft Word file in its native format. You would need to save it as a text file first.

Laser Computers

● *Setting Up Smartcom II for Apple II Transfers*

This set-up is for transfers both to and from the Apple II. There are several categories of parameters to set. Under connection, select "direct connect," and choose "modem" as the Mac port.

Under "settings," there are three menus: "speed and format," "autotype protocol," and "preferences." Select speed and format parameters of 9600

baud, 8 data bits, 2 stop bits, and no parity. The Smartcom term "autotype" refers to the process of sending a Mac text file to another computer. For autotype protocol select normal, and answer yes to "Xon/Xoff flow control." Don't select "insert returns" or "insert linefeeds."

In the preferences menu, don't select "display alert when clearing the peruse buffer." Do not ask for "time delays"; BEX does not need them.

One more preference to select is "file creator type." This preference is very handy for transfers to the Mac. It tells Smartcom what file creator type to "stamp" on the files it receives. Every Mac file is stamped with a file creator type, indicating which program created it. When you ask to look at a data file on the Mac, you don't have to say what program you want to use; the Mac operating system just examines the file creator type and loads the appropriate application program for that data file. At Raised Dot we use Microsoft Word. To save files from the Apple as Microsoft Word files, we select file creator type "MSWD." If you do not know the four-letter code, click on "find type" and then select the icon for the application (program) you want to work with.

● *Setting Up the BEX Configuration*

This BEX configuration is for transfers in both directions. In a BEX configuration at the User or Master level, set up a "remote device to input text through slot." There are several follow-up questions; answer no when asked if it is a Kurzweil Reading Machine.

Your configuration should also reserve a printer for outputting to the Mac. How you define this "transfer printer" for transfers from BEX to the Mac depends on what sort of format you want, or need, in the Mac file. If you want to suppress BEX page numbering and other page oriented formatting, set the BEX form length to zero. If you need to suppress BEX underlining, configure your transfer printer as a brailler. If you need to suppress form feeds, configure your transfer printer as a Cranmer Brailler. No matter what, your printer description must set up the Apple for software handshaking. In defining your printer, answer yes for an automatic set-up sequence. For a Super Serial Card, type the sequence `<control-I> X E <CR>`. For an Apple IIc or IIc+ port, type `<control-A> X E <CR>`.

● *Transferring Material to BEX*

First tell BEX to receive data. Use Input through Slot on BEX's Second Menu. After you type a target chapter name and press <CR>, BEX prompts you to start the transfer. Then move to the Mac to begin sending.

Get into Smartcom with two clicks on the name of the Smartcom document you saved for Apple transfers. Then click on the keyboard symbol. We use this icon for sending out files. Do not use the "send" icon (the outgoing envelope), which is designed for a different kind of transfer. Select the name of the file to send. Notice that Smartcom lets you select only files that are straight text. Once you have selected the file, the transfer begins. You hear the buzzing sound BEX makes to tell you it is receiving characters. When the transfer is over, press Q on the Apple keyboard to close the BEX chapter.

● *Transferring Material to the Macintosh*

Get into Smartcom. Click on the disk symbol. Use this icon for receiving files. Do not use the "receive" icon (the incoming envelope), which is designed for a different kind of transfer. Type in the name you want to give the Macintosh file followed by a carriage return. From BEX, use the print option. List the chapter(s) you want to send into one Mac file. At the "which printer?" prompt, give the number for the transfer printer you configured. When you get back to the Main Menu, the transfer is over.

Some Macintosh programs may want your data file to have a carriage return at the start of each paragraph but no other carriage returns. If you need this kind of data, place the two commands $$l0 (letter l) and $$s1 (digit 1) at the start of your BEX data. You can place them in a separate BEX chapter which is first on your list of chapters to print.

On the Macintosh, click on the disk symbol again to close the Mac file. You can select the disk symbol a third time to set up a transfer to another Macintosh file, or you can quit from Smartcom to examine your BEX data on the Macintosh computer.

Ohtsuki

The Ohtsuki Brailler is a combined brailler and inkprint printer. By setting its switches or by sending it escape sequences, you can change its output format. You can change between braille and print, just braille, or just print. Besides getting the Ohtsuki to operate, you need to know how to change its mode of operation.

- ## *Equipment Requirements*

The Ohtsuki works with either an Apple IIe or Apple IIgs. The Ohtsuki requires either a parallel card or Super Serial Card. RDC recommends interfacing the Ohtsuki with a parallel card. If you use a Super Serial Card, you need a straight-through cable (RDC's 6M). RDC does not know how to interface the Ohtsuki to an Apple IIc; if you need to work with an Apple IIc, you are on your own.

- ## *Interfacing with a Parallel Card*

The Ohtsuki has three banks of switches. Set bank one to: on on off on off off. Do not worry about the other two banks of switches on the Ohtsuki. (They are used for a serial connection.) If you use a Grappler Plus card, set the switches on the card to: off off on on.

- ## *Interfacing with a Super Serial Card*

To connect the Ohtsuki to a Super Serial Card you need a 6M cable. Set the Super Serial Card to the following non-standard switch settings:

Bank 1: off on on on off on on
Bank 2: off on on on on off off.

The switches on the Ohtsuki should be as follows:

Ohtsuki bank 1: on on off on off on
Ohtsuki bank 2: on off off off off off off on
Ohtsuki bank 3: of on off on on on.

> Note: on an Apple IIgs, you must use the control panel program to set the slot you are using to *your card.*

● *Using the Ohtsuki with BEX*

Make sure your BEX configuration contains a printer designated as an Ohtsuki. Prepare a grade two BEX chapter to test the Ohtsuki interface. Use option P on the Main Menu to Print the chapter. At the *which printer?* prompt, first enter a question mark followed by a carriage return. Now enter the correct number followed by a carriage return. If everything is set up correctly, you should get nice print and braille output.

● *Printing Difficulties*

If the Ohtsuki does not print anything at all, there are some tests you can do. First, make sure the paper is loaded and the Ohtsuki is *selected* (ready to receive data). Press the SEL button to get the Ohtsuki to receive data.

If you still do not get any output, check your cables to make sure they are plugged in securely. Make sure that the switches on the Ohtsuki are set correctly.

Go to the Starting Menu. Press W for *What is in the computer?* BEX informs you as to what cards are in each slot. Look for a parallel card, a Super Serial Card, or an "unknown card". (Do not worry if BEX says you have an "unknown card"; BEX can output just fine to an "unknown card".)

If you put the card in slot 3, move it to another slot. On an Apple IIgs, you may have to use the control panel program to get BEX to see your card.

Laser Computers

Now use option V at the Starting Menu to *View a Configuration.* Select the configuration you made which contains the Ohtsuki. Make sure that an Ohtsuki is indeed configured. Note the slot designated for it; this should match the slot number you found by using *What is in the computer?* If the slot numbers do not match, then set up a new configuration with the correct slot number.

● *Testing a Direct Connection*

If things still do not work, you need to find out if the problem is with BEX or with the hardware. Send some characters to the Ohtsuki without using BEX. If this fails, you know there is a problem with the card, the cable, or the Ohtsuki.

Press Q from the Main Menu of BEX to get to the closed bracket (]) BASIC prompt. Type the following: `PR#1 <CR>`. (The number after the number sign should be the slot number for the parallel or serial card for the Ohtsuki.) If you are using a SlotBuster, also type `<control-I> 1O` (digit 1, letter O). Now type a few words and press the carriage return. If you get output to the Ohtsuki, then all the hardware is working correctly. If so, again examine the configuration and what's in the computer. Check your chapter for any escape codes or control characters which could cause problems.

If you do not get any output with this test, then there is something wrong with the equipment setup. It could be a switch setting or the wrong cable, or something more serious. You might have a problem with the Ohtsuki, the parallel or serial card, the cable, or with your computer.

● *Paper Problems*

The Ohtsuki is a continuous form printer and cannot use single-feed sheets of paper. Furthermore, the Ohtsuki requires special paper with little notches at the perfs between the sheets. If you do not have this type of paper, contact American Thermoform Corporation at (213) 723-9021. Raised Dot does not sell braille paper for use with the Ohtsuki.

- ***Switching Ohtsuki Modes with Set-Up Sequences***

The Ohtsuki has a number of different modes. You independently control the *input* mode (what type of text you are sending it) and *output* mode (for braille or print output or both, and for line spacing). Using the switch settings described above, the Ohtsuki's default is to accept grade two input and to output grade two braille and back translated print on alternate lines.

You control the modes with *escape sequences.*

You can have BEX send out an escape sequence of your choice automatically by defining an *automatic set-up sequence* in your configuration. A set-up sequence gets sent to the printer whenever you start to print.

- ***Selected Ohtsuki Escape Sequences***

Since you can control input and output modes independently, you have a lot of choices! The following escape sequences assume your dip switches are set as given above. They're just a few of the possibilities--not a substitute for a careful reading of the Ohtsuki's manual.

The escape key is represented by . Press the escape key to begin these codes. Do not type spaces unless specifically instructed to do so. The blank spaces are for readability.

`l T` -- Set the output line spacing so that 25 lines of braille and print fit on a page. Make sure you use a lower case l followed by upper case T.
`B` -- Set for braille output only.
`O` -- Set for "ASCII braille" input (no translation).
`X` -- Input is inkprint text, do grade one translation for braille output.
`P` -- output inkprint only

- ***Page Format Considerations***

Getting the carriage width and form length right depends on the output mode. For braille only, use a carriage width of 41 (or 42) and a form length of 25. For braille and print, use a smaller carriage width. If you use the `l  T` sequence, then you can have braille and print with 25 lines per page.

To use the Ohtsuki for just print output, configure it as a "Generic printer." Give a carriage width of 90 and a form length of 58 and an automatic set-up sequence of `P`. We cannot give any recommendations about carriage width for Ohtsuki-generated grade one braille. If the carriage width is set too wide, then the brailler truncates the end of a line. If the carriage width is set too short, you waste paper. Each user has to find a carriage width that works best for them.

Portabraille

The Portabraille, made by Southland Manufacturing, is very similar to the APH Pocketbraille. By cabling the Portabraille to an Apple II computer, can transfer data between the two devices. The Portabraille is able to transmit data to the Apple via the *Input Through Slot* option of BEX. Likewise, the *Print* option of BEX enables you to send a file to the Portabraille. The only software needed is BEX.

● *Equipment Requirements*

An Apple IIe or Apple IIgs requires a Super Serial Card for *Input through Slot.* If you have an Apple IIc or and Apple IIc Plus, you use the printer port. You also need the proper cables for interfacing the Portabraille to the Apple.

● *Cabling and Interface Cards*

To cable the Portabraille's IO cable to the Super Serial Card, you need a straight through cable between the IO cable and the SSC connector. To

connect to an Apple IIc, you need a 2F cable. To connect to an Apple IIc plus, you need a 11F cable.

Set the Super Serial Card to RDC's standard parameters (see the separate section on Serial Interfaces).

● *Portabraille to Apple*

Configure BEX at the User or Master Level. Answer *yes* to the question *Do you have a remote device to input through slot?* Give the slot number for the Super Serial Card (or the Apple IIc or IIc+ port) that you will be connecting to the Portabraille. Press N to answer no to the automatic set-up sequence question. Answer *no* to the question *Is this a Kurzweil Reading Machine?*

Include in your configuration a *printer* for output to the Portabraille. Define a printer using the same slot as your *remote serial device.* How you configure this printer determines the format of the Portabraille file once it's downloaded. If you want every BEX character, including $$ commands, in your Portabraille file, configure this printer as a class P - Paperless brailler. It works well to define this *transfer printer* as a Thiel brailler; then BEX underlining commands do not interfere with your Portabraille data. If you avoid BEX underlining in the material that you send out, a Generic printer is fine. Use the carriage width and form length of your choice. If you want to keep form feed characters out of your data, use form length zero.

Use Input through Slot on BEX's Second Menu to get BEX to listen to the Portabraille. See User Level Section 12 for more information about Input through Slot. Once you supply a target chapter name and press <CR>, BEX prompts you to start the transfer.

Make sure the Portabraille is set for 8 data bits, 2 stop bits, no parity, 9600 baud, and hardware handshaking. To set the Portabraille to 2 stop bits, enter chord-P S 2.

Laser Computers

On the Portabraille, open the file you want to send to BEX. Turn the serial port on by issuing chord-P, dots 2-6 Y. Move the cursor to the beginning of the text you want to transfer. Press chord-T Z to send everything from the cursor to the end of the file. The Apple speaker begins to buzz, to let you know that BEX is receiving data. When the transfer is over, the Portabraille says *okay*, and the Apple speaker and disk drives are quiet. Press Q on the Apple keyboard to save the chapter. This brings you back to the Second Menu. For further details on Input through Slot, read Section 12 of the User Level Dox.

● *Apple to Portabraille*

To send a file from BEX to the Portabraille, create a file on the Portabraille and turn on the serial port. At BEX's Main Menu press P for Print. Enter the name of the BEX chapter you wish to transfer. When you've finished selecting your chapter(s), BEX prompts you for a printer number. Give the number for the *transfer printer* you set up in your configuration.

If your *transfer printer* is a brailler, you get one <CR> and two spaces at the start of each paragraph; if it is a Generic printer, you get two <CR>s and five spaces. If you want something different, place $$s# and $$i# commands before your text (for example, $$s2 $$i0 for starting paragraphs with two returns and no spaces).

Romeo

Here are my favorite formulas for working with the Romeo embosser. To set up the Romeo for Apple use, set off line, then enter: 0.2E, 4.7E, 1.0E, and 1.1E (The Romeo goes on line). Sometimes the Romeo locks up and you have to do a total reset. The total reset wipes out any changes to the stored configurations. First set off line, then enter 0.0E, 95E, 98E, 99E.

Ted 600 or Tri 170

Set the Apple and the brailler for 4800 baud, half duplex, and Xon/Xoff.

Serial Interfaces

An essential element of serial interface is having the correct parameters for the Super Serial Card and serial ports of the IIc, IIc plus, or IIgs. If these are incorrect, transfer of data between the computer and serial device cannot take place. You may get garbage characters or no communication at all or missing chunks of text.

● *Required parameters*

Raised Dot Computing uses a standard set of interface parameters. These parameters are 9600 baud, 8 data bits, 2 stop bits, no parity, auto linefeed, and hardware handshakes. The Apple IIc and IIc plus ports are automatically set to these standard values when you boot BEX.

The parameters of the Apple IIgs ports are set by using the Control Panel Program. Port 1 needs one change from its default parameters. Set the data/stop bits to 8/2. If you want to use port 2 as a printer port instead of a modem port, you need to make three changes via the Control Panel Program. Set the baud rate to 9600, set *add LF after CR* to yes, and set *data/stop bits* to 8/2.

● *The Super Serial Card*

The Super Serial Card has 14 little switches and a special switch called *the jumper block.* The jumper block has a white triangle on it. If the jumper block is pointing to the word *modem,* gently pull out this chip, turn it around so that it is pointing to the word *terminal,* and re-insert it.

The various parameters of the Super Serial Card are set by the 14 switches on the card. The parameters of the Super Serial Card must match the RDC standard parameters. The switch settings are as follows:

- Switch Bank 1: OFF OFF OFF ON OFF ON OFF
- Switch Bank 2: OFF OFF ON ON ON OFF OFF.

Unless you are instructed otherwise, always set the Super Serial Card and the IIc, IIc plus, and IIgs ports as recommended. When you use the *What is in this computer* option at BEX's Starting Menu, you are told whether or not the Super Serial Card or the ports are set at RDC standard parameters.

For further details about setting various parameters for the Super Serial Card, the IIc and IIc plus ports, and the IIgs ports, consult Section 6 of the Interface Guide.

VersaBraille II Plus

When you print from the Apple to the VersaBraille II Plus, you may have to slow the baud rate to 4800 baud. A set up sequence of control-I 12 B <CR> sets the Super Serial Card to 4800 baud, and a set up sequence of control-I 14 B <CR> sets the Super Serial Card back to 9600 baud. For an Apple IIc port, use control-A instead of control-I. For an Apple IIgs port. For an Apple IIgs, use a control-I for a "printer port", and a control-A for a "modem port".

VersaPoint

The text in the Interface Guide does not describe the different set-ups in the VersaPoint. The VersaPoint contains 5 set-ups: one permanant set up zero, and 4 changeable sets numbered 1 through 4. Set up zero is designed to match RDC standard parameters.

When you change parameters, you are first asked which set up you want to load (0-4), then you get to change the set ups, and finally you are asked where you want to store the altered set up (1-4).

The potentially confusing element is that the default set up (the one that is engaged when you turn on the unit), is the last one that you *load.* For example, if you load set up 0, change the baud rate, and store in set up 4, then set up 0 is still the default set up. To make set up 4 the default set up, go into the set up menu briefly just to load set up 4.

You can use a 6M or a 9M cable to connect the VersaPoint to a Super Serial Card. You can use a 2M or a 10M cable to connect a VersaPoint to an original IIc. Use an 11M cable to connect a VersaPoint to an Apple IIgs serial port or to a Apple IIc Plus serial port.