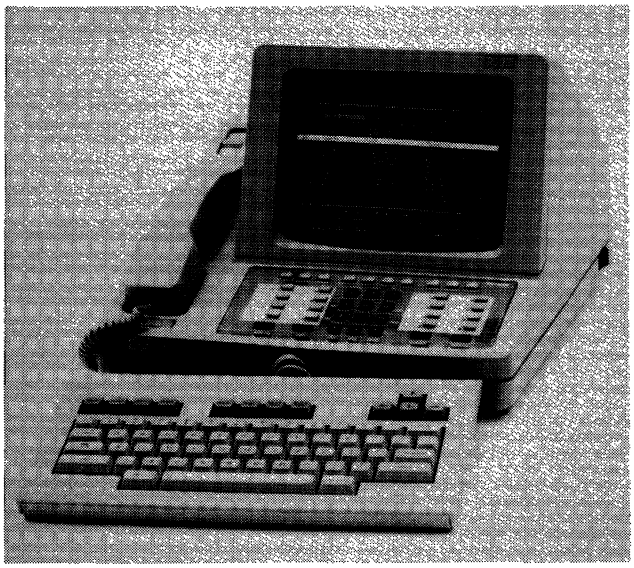
Rolm Cypress, Cedar and Juniper

MANAGEMENT SUMMARY

Rolm Corporation was founded in 1969 to manufacture and sell computers for military applications. The company entered the PABX market in 1974, and developed one of the first computer-controlled PABXs, called the Rolm CBX. In late 1984, IBM purchased Rolm; Rolm now operates as a fully owned subsidiary of IBM. However, even before the IBM takeover, Rolm had gained for itself a position of strength in the telecommunications arena. Rolm currently ranks with AT&T and Northern Telecom as a leader in the PABX market, with over 20,000 installations.

Rolm has continued to improve and enhance its CBX product over the years. Its current version of the CBX product is the CBX II. As part of these enhancements, Rolm has introduced three desktop workstation products that provide the user with the ability to integrate voice and data communications via a single workstation. These products are the Cypress, a personal communication terminal; the Cedar, a personal communication computer; and the Juniper, a personal communication enhancement product for use with the IBM PC. All three workstation products are designed for use exclusively with the Rolm CBX and CBX II; they are connected to the CBX system via ROLMlink, which allows the workstations to take advantage of the features inherent in the CBX via a single twisted-pair wire connection. The workstations also operate under Rolm's proprietary software, Personal Communication Software (PCS).

The Cypress was Rolm's first entry in the integrated voice/data terminal (IVDT) market. It followed by two years



The Rolm Cypress terminal is an integrated voice data terminal. Features include a 9-inch, retractable alphanumeric keyboard, an integrated handset with speakerphone, and personal communications software that improves productivity.

Rolm Corporation's Cypress, Cedar, and Juniper integrated voice/data workstations are designed for use with the company's PABX product, the CBX II. Cypress is a personal communication terminal that provides voice and data terminal capabilities. Cedar is a personal communication computer that provides the features of the Cypress plus IBM Personal Computer compatibility. Juniper is an add-on product that provides an IBM PC with voice/data capabilities.

MODELS: Cypress, Cedar, Juniper I, and Juniper II.
DISPLAY: The Cypress and Cedar contain a 9-inch integral display screen with a 25-line by 80-character display capacity. Juniper I and II utilize the display of the PC to which they are configured.
KEYBOARD: The Cypress and Cedar include a detachable, 68-key alphanumeric keyboard. Juniper I and II utilize the keyboard of the PC to which they are attached. All models also feature an integrated keyboard that includes a telephone dial pad, soft function keys, repertory dial keys, and line keys.
INTEGRATED HANDSET: The Cypress and Cedar include an integrated handset and a handsfree speakerphone, which is located to the left of the display. Juniper I and II provide a handset and a speakerphone on the Juniper add-on module.
COMPETITION: Northern Telecom Displayphone; AT&T BCT 515 and Personal Terminal Model 510; GTE XT300E ActionStation; InteCom/Wang Keystone; ITT Telecom InfoStation; Mitel SuperStation; Cygnet CoSystem; and others.
PRICE: Prices range from $895 (for the Juniper I) to $4,995 (for the Cedar).

CHARACTERISTICS

MANUFACTURER: Rolm Corporation, 4900 Old Ironsides Drive, Santa Clara, CA 95054. Telephone (408) 986-1000.

IN CANADA: Rolm Canada, 4 Lansing Square, Willowdale, Ontario, M2J 1T1. Telephone (416) 498-7656.

MODELS: Cypress, Cedar, Juniper I, and Juniper II.

DATE ANNOUNCED: Cypress—May 1983; Cedar and Juniper I—November 1984; Juniper II—October 1985.

DATE FIRST INSTALLED: Cypress—December 1983; Cedar and Juniper I—December 1984; Juniper II—First quarter 1986.

Rolm Cypress, Cedar and Juniper

Northern Telecom's Displayphone, the first commercially available IVDT. This delay allowed Rolm to endow the Cypress with features not found on the original Displayphone (Northern Telecom has since made several enhancements to its product). Basic features of the Cypress include a 9-inch display, upper keyboard with a dial pad, 10 soft function keys, a retractable 68-key alphanumeric keyboard, and an integrated telephone handset with 2-way speakerphone for handsfree operation. The Cypress emulates the Digital Equipment Corporation VT100 display terminal for asynchronous communications, and the IBM 3278 Model 2 for synchronous communications when the CBX is configured with the IBM 7171, 3708, or 3710 gateways. In June 1985, Rolm enhanced the Cypress with a one-touch, one-function interface for Lexis/Nexis users.

In May 1986, the Cypress was again enhanced with screen-dialing capabilities and additional terminal emulations. Screen dial gives users the ability to autodial telephone numbers or account codes from a host data application screen by touching a preset repertory dial key. Users can program up to 11 repertory dial keys or use a keyboard command for screen dialing.

In November 1984, Rolm introduced two additional desktop workstation products, dubbed Cedar and Juniper (now known as Juniper I). The Cedar combines the features found on the Cypress with IBM Personal Computer capabilities. The Cedar includes 512K bytes of memory and two 5¼-inch, double-sided, double-density diskette drives. In addition to supporting Rolm's Personal Communication Software, the Cedar supports most "off-the-shelf" IBM PC

Juniper II is an IVDT enhancement product designed for use with the IBM Personal Computer family. The Juniper II consists of a specially designed ROLMphone 240, a cable connection to the PC, Rolm Personal Communication Software, and a plug-in option card that occupies a single slot in the PC. The Juniper II is shown here connected to an IBM PC AT.

NUMBER INSTALLED TO DATE: Information not available.

CONFIGURATION

The Rolm Cypress, Cedar, and Juniper I and II are designed for use in conjunction with the Rolm VS CBX and CBX II. The workstations are connected to the CBX via the ROLMlink feature, which provides for a single twisted-pair link to the CBX. The Rolm workstations can communicate with both asynchronous and synchronous hosts; synchronous IBM host communication is possible via the IBM 7171, 3708, or 3710 gateways. Figure 1 illustrates the configuration possibilities of the CBX including the Cypress, Cedar, and Juniper workstations.

The Cypress is a personal communication terminal that integrates a 9-inch CRT, an integrated telephone handset and speakerphone, integrated keyboard with soft function keys and telephone dial pad, and a retractable alphanumeric keyboard. Personal data is stored on a removable Personal Data Module. Rolm Personal Communication Software (PCS) is contained at the Cypress Load Module, which resides at the switch; when the Cypress is powered up, the PCS software is downloaded to the unit. One Cypress Load Module is required per 50 Cypress workstations.

The Cedar is a personal communication computer that integrates a 9-inch CRT, a telephone handset and speakerphone, an integral keyboard with soft function keys and telephone dial pad, a retractable alphanumeric keyboard, two 5¼-inch diskette drives, and 512K bytes of memory. The Cedar is compatible with the IBM Personal Computer, utilizes the MS-DOS operating system, and supports most application software programs written for the IBM PC. Personal data is stored on a removable Personal Data Module. Rolm Personal Communication Software (PCS) is contained at the Cedar Load Module that resides at the switch; when the Cedar is powered up, the PCS software is downloaded to the unit. One Cedar Load Module is required per 50 Cedar workstations.

The Juniper I and II are personal communication options that integrate the voice/data capabilities of the Cypress and Cedar with an IBM PC or PC XT (Juniper I), or with an IBM PC, PC XT, PC AT, or IBM-compatible PC (Juniper II). The Juniper products consist of a specially modified ROLMphone 240-key set, a cable for connection to the PC, PCS software on a diskette, and an option card that plugs into a single expansion slot in the PC.

TRANSMISSION SPECIFICATIONS

The Rolm Cypress, Cedar, and Juniper I and II can accommodate asynchronous data transmission, over a single twisted-pair of telephone wires via ROLMlink to a Rolm CBX, at speeds up to 19,200 bps. Synchronous transmission is possible when the CBX is configured with the IBM 7171, 3708, or 3710 gateway. The Cypress includes an RS-232-C serial port for the attachment of a printer. The Cedar includes a parallel printer port. Simultaneous voice and data transmission is possible over the twisted-pair wire.

The telephone portion of the Cypress, Cedar, and Juniper I and II is powered by the Rolm CBX. In the event of a power failure, a battery backup feature will allow the Rolm workstations to continue to operate as telephones, without the benefit of the display and soft keys. In addition, Cedar contains its own battery backup capability that prevents the loss of data and/or applications for approximately five minutes after the power outage.

The CBX II provides the Rolm workstations with a modem pooling feature, which eliminates the need for a modem at every workstation. In addition, the modem pooling feature

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application software programs. Also, the Cedar's retractable alphanumeric keyboard is equipped with IBM PC key mappings.

The Juniper I is designed to provide integrated voice/data capabilities to users who have already purchased IBM PCs or PC XTs. Juniper consists of a specially modified ROLMphone 240, a cable that provides the PC attachment, Rolm PCS software on a diskette, and an option card that plugs into a slot in the PC. Juniper I can be used with the IBM PC or PC XT.

In October 1985, Rolm introduced the Juniper II, an enhanced version of the original Juniper I. Juniper II provides all of the capabilities of Juniper I, and expands the microcomputer compatibility of the Juniper product family by providing IBM PC AT compatibility, as well as compatibility with other IBM-compatible microcomputers (e.g., Compaq). Additional advantages of Juniper II include compatibility with third-party asynchronous communications applications and much of IBM's PC-based office software, and connectivity to the IBM Token-Ring Network.

Introduced in June 1986, the ROLMbridge 5250 Link Protocol Converter allows all Rolm desktop products to emulate the IBM 5291 display terminal. ROLMbridge 5250 is a card set that resides in the Rolm VS CBX or CBX II. It provides access to an IBM System/36 or System/38 via a twinax cable connection while providing the ROLMlink interface to the CBX.

Via ROLMlink, the Rolm desktop workstations can access the myriad of features available on the CBX and CBX II. These features include transmission speeds up to 19.2K bps, modem pooling, simultaneous voice and data transmission over a single twisted-pair telephone wire, and data network management. The Personal Communications Software (PCS), Rolm's proprietary software package supported by all of the Rolm workstation products, provides the user with data access, voice access, automation of desktop functions, and security features.

Rolm has continued to enhance data features offered on its IVDTs. This is evidenced in the additional terminal emulations offered by Cypress, and compatibility of third-party communication software offered by Juniper II. The Rolm IVDT's consistent user interface and strong data capabilities have allowed them to gain acceptance as an integral part of companies office automation strategy by enabling easy migration from voice to data.

COMPETITIVE POSITION

As was mentioned earlier in this report, Rolm is a leader in the PABX market, a market that is currently enjoying fairly strong growth. Unfortunately, the same cannot be said for the IVDT market. Shortly after the introduction of the Northern Telecom Displayphone in 1981, the IVDT became a hot item in the trade press and in the industry. The concept of merging a telephone with a data terminal for simultaneous voice and data transmission from a single

provides data queuing via the CBX II, eliminating the need to redial a data call when all computer ports are busy. When all computer ports are busy, the CBX II will queue the calls on a first-in first-out or priority basis, and then audibly signal the user when a port becomes available.

DATA FEATURES

Data access features on the Cypress, Cedar, and Juniper I and II are available via the Rolm Personal Communication Software (PCS). These features include:

- **autodial—provides single-key access to terminal profiles; terminal configuration is set with respect to terminal type, transmission rate, parity, echoplex, and enter-key value;**
- **autolog—provides for single-key automatic logon and log-off; logon sequences are set and stored;**
- **screen dial—the ability to autodial a telephone number or account code from any host data application screen (Cypress only);**
- **access to multiple host computers—provides for access to asynchronous hosts via Digital Equipment Corporation VT100 display terminal emulation, and access to synchronous hosts via IBM 3270 emulation (with an IBM gateway); it also provides access to Lexis/Nexis databases via a certified interface; additional terminal emulations of ADDS Viewpoint+, Digital VT220, and Data General Dasher D210 are available on Cypress only;**
- **asynchronous file transfer—provides the ability to send and record a file, plus automatically answer incoming calls (Cedar and Juniper I and II only);**
- **recording of an on-line session (Cedar and Juniper I and II only); and**
- **local printing—provides for screen printing on all models, and session and pass-through printing on the Cypress and Juniper I and II.**

PCS also provides password protection against unauthorized use of personal data (such as terminal profiles, logons, reminders, and private telephone numbers). Data network management is provided via the Rolm CBX; statistics on data traffic, status reporting, and control of network access are all part of the CBX's network management facilities. The Cypress and the Cedar also include a Personal Data Module (PDM), a removable unit that contains 8K bytes of nonvolatile RAM. Personal data such as logon sequences, phone lists, and terminal profile are stored on the PDM, and may be removed by the user and installed in another unit. The Juniper models do not include a PDM, but do contain 8K bytes of nonvolatile RAM for the storage of personal data that can easily be backed up to diskette and restored in another unit. PDMs can also be backed up to diskette and restored on a Cedar or Juniper allowing data to be transferred to any one of the Rolm family of IVDT products.

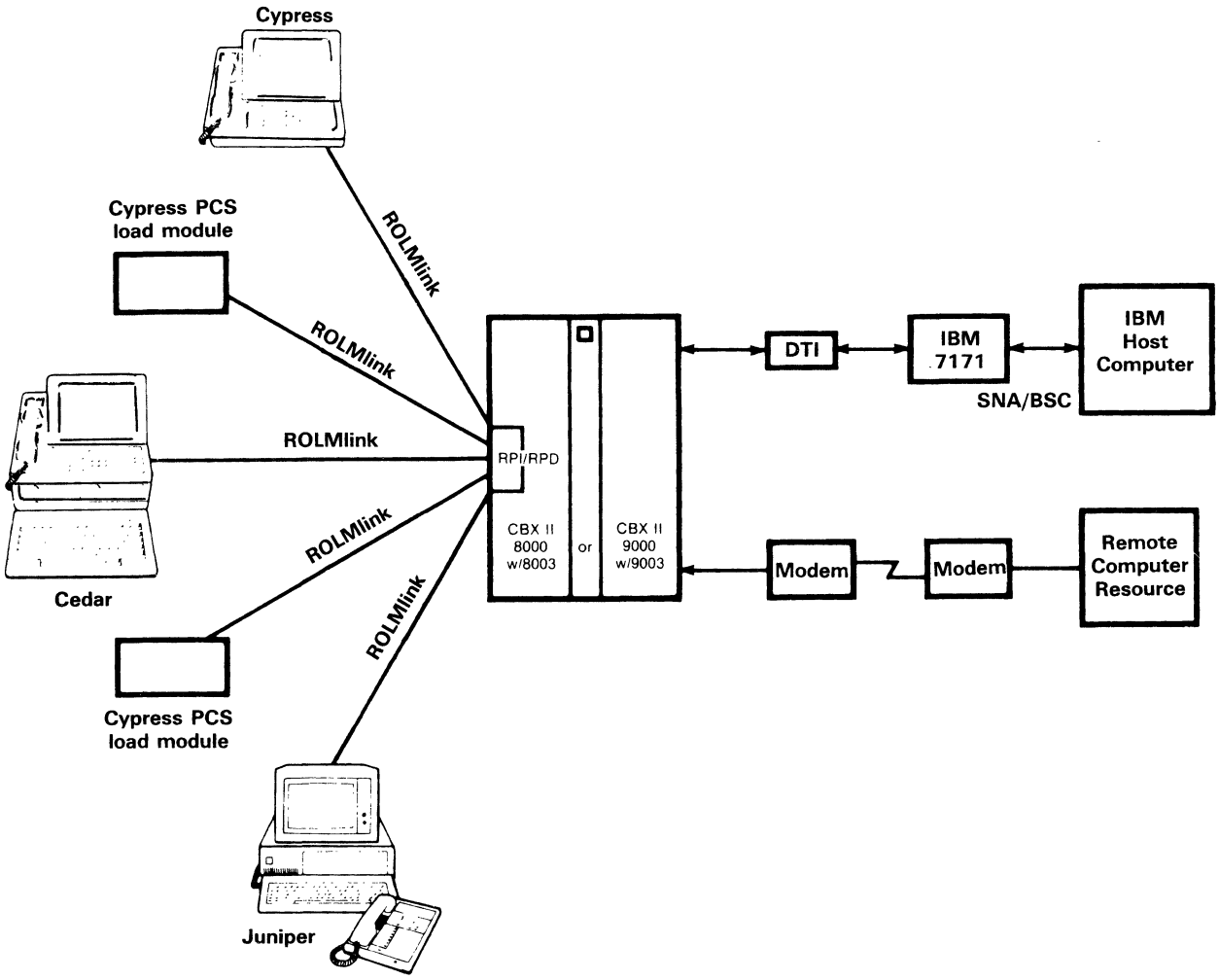
The Cedar also supports many application software programs written for the IBM Personal Computer.

VOICE FEATURES

Enhanced voice access and automated desktop functions are available on the Cypress, Cedar, and Juniper I and II via the Rolm Personal Communication Software (PCS). Voice access features include:

- **dynamic operation—applicable CBX II features are displayed on soft keys; the display of CBX II features changes according to the state of the workstation (dial tone, ringing, connected, etc.);**

Rolm Cypress, Cedar and Juniper



workstation seemed at the time (and still does seem) to be a good one. Predictions began to be made—predictions of explosive growth for this fledgling market. The predictions, however, were often based on the premise that the IVDT would be the first universally accepted *executive workstation.* By combining a data terminal with the executive's most important business tool—the telephone—it was believed that the IVDT would be *the* device to find a niche among the white-collar segment of the industry, a segment that the computer vendors had been having a difficult time reaching.

By now the industry realizes that this was the wrong market to target. Due to a lack of acceptance by the executives that were supposed to buy these devices by the hundreds, the market has crept along at a snail's pace. To exacerbate the problem, there has also been a lack of strong applications for these devices; users have yet to find that one application that IVDTs are ideal for, and thus would trigger a buying spurt that would spur the expected growth of the market. To date, the IVDT still ranks as a neglected stepchild to the personal computer and the standard display terminal.

- **incoming call description—provides for a display of the phone extension of the calling party, and the name of the calling party;**
- **multiple phone lines—up to four extensions are available;**
- **message waiting indicators—provides a message center capability, a camp-on message capability, and access to Rolm PhoneMail;**
- **prompts and error messages—provides the user with visual prompts and explanatory error messages; and**
- **configurable repertory dial keys—provides up to 11 repertory dial keys, one-touch dialing, and one-touch access to CBX II features.**

Automated desktop features include:

- **personal phone list—allows the user to store approximately 200 telephone numbers (name, number, and identifying tag); the list can be alphabetically sorted by name or tag, and autodialing can be done from the list;**
- **reminders—allows the user to enter into memory the date, time, and text of a message; reminders may be set up to one year in advance, and visual and audible signals are available to alert the user to a reminder;**

Rolm Cypress, Cedar and Juniper

Still, the IVDT remains a sound concept, and applications for these devices have been most plentiful when coupled with a PABX. Thus, the IVDT seems a logical product to be produced by the traditional PABX vendors. In addition to Rolm and Northern Telecom, AT&T, Mitel, InteCom (with Wang), ITT, and GTE have introduced IVDTs, with varied degrees of success. Another group of vendors, however, have found the going rough. These vendors are a group of high-technology start-ups who hoped to take advantage of the expected growth of the IVDT market. The doldrums that have afflicted the IVDT arena have caused these companies some problems. Zaisan, a once promising firm based in Houston, sought bankruptcy protection despite the critical acclaim won by its products, the ES.1 and ES.3. Cygnet, a firm which manufactures the CoSystem, an equivalent of the Juniper, has run into financial difficulties and is now selling the CoSystem on a component basis. Only Davox, which from the start targeted the IBM 3270-replacement market for its IVDT products, seems to have found success from this group. For the time being, it would seem logical that only the PABX vendors will remain strong players in this market—at least until the next sign of an explosion.

ADVANTAGES AND RESTRICTIONS

Among the aforementioned PABX vendors, Rolm provides the most complete line of IVDT products with the Cypress, Cedar, Juniper I, and Juniper II. Northern Telecom has upgraded the Displayphone family to include three models, including one designed for use with its popular and successful SL-1 PABX; however, it lacks a product comparable to Juniper. AT&T provides a pair of IVDTs, including a model with a touch-sensitive screen (the Personal Terminal Model 510).

One key advantage of the Rolm desktop workstation family is its integration with the CBX and CBX II products via ROLMlink. The Cypress, Cedar, and Juniper products are able to take full advantage of the range of features found on the Rolm CBX products via a single twisted-pair wire. This allows the Rolm IVDTs to transmit data at speeds up to 19,200 bps, as opposed to the 300/1200 bps speeds found on most nonproprietary IVDTs. The modem pooling feature of the CBX II eliminates the need for a modem at every workstation. In addition, the CBX II provides the workstation user with information regarding network use that assists the network administrator in controlling and managing the data network.

The Rolm desktop products provide a significant advantage for users in the legal industry. All Rolm desktop products include a Mead Data Central-certified interface with the Lexis/Nexis database. Cypress and Juniper II provide an additional one-touch, one-function interface for Lexis/Nexis users.

Another key feature found on the Cypress and the Cedar is the Personal Data Module (PDM). All personal data (phone list, terminal profile, logon sequences, etc.) is stored in the PDM, which is a removable unit with 8K bytes of nonvolatile RAM. Juniper personal data as well as Cypress

- **calculator—allows the user to convert the telephone dial pad into a five-function calculator;**
- **messages—allows the user to take camp-on messages, and to autodial from a message list to return a call; the workstation automatically logs the date, time, and name of the caller; and**
- **account codes—provides an interface to the call detail recording feature (which logs calls to user-specified account codes for billing); an account name and code can be entered into memory.**

COMPONENTS

CRT DISPLAY UNIT: The Cypress and Cedar both include a 9-inch (diagonally measured) integral display. The display format is 25 lines of 80 characters each, with the 25th line serving as a status line. Characters are displayed in green phosphor, and formed using a 7-by-9 dot matrix in a 9-by-12 character field. Visual attributes available include underline, bold, blink, and reverse video. The Cedar also provides two graphics display modes (IBM mode), in addition to the standard text mode (Cedar mode). These include medium resolution (320 by 200 pixels) and high resolution (640 by 200 pixels). In IBM mode, characters are formed on the Cedar using a 7-by-7 dot matrix in an 8-by-8 character field. Eight shades of gray are available with the medium-resolution screen. The Cypress can display a 256-character set; the Cedar displays 512 characters (256 Cedar mode, 256 IBM mode). IBM mode is selected by application software on the Cedar.

The Juniper I and II utilize the display screen of the personal computer to which they are attached.

HANDSET/SPEAKERPHONE: On the Cypress and Cedar, a telephone handset and a digital two-way handsfree speakerphone are integrated to the left of the display unit. On the Juniper I and II, the telephone handset and speakerphone are located on the add-on module (the specially designed ROLMphone 240).

UPPER KEYBOARD/JUNIPER I/II KEYBOARD: On the Cypress and Cedar, an upper integral keyboard contains a standard 12-key telephone dial pad, 10 soft function keys, 11 configurable (repertory) dial keys, four line keys, and three phone function keys. On the Juniper I and II, the above-mentioned keys are located on the add-on module (key set).

ALPHANUMERIC KEYBOARD: The Cypress and Cedar include a retractable, movable, 68-key alphanumeric keyboard. Four cursor control keys and eight function keys are included. Overlays for Digital Equipment Corporation VT100 and IBM 3270 keys are available. The Cedar keyboard also includes IBM PC key mappings.

The Juniper I and II utilize the alphanumeric keyboard of the personal computer to which they are attached. Overlays for Digital VT100 and IBM 3270 keys are available for both Juniper products. A Lexis/Nexis overlay is available for Juniper II.

DISKETTE DRIVES: The Cedar includes two 5¼-inch diskette drives with a 360K-byte capacity.

PRICING

The Rolm Cypress, Cedar, and Juniper I and II workstations are available for purchase only; quantity discounts are available. Sales and installation are available through Rolm or a Rolm-authorized distributor.

Rolm Cypress, Cedar and Juniper

and Cedar PDMs, can be stored to diskette allowing data to be easily transferred from one unit and installed in another, so personal information can be stored in multiple Rolm workstations.

For users who already have made a significant investment in IBM PCs (or IBM-compatible PCs), the Juniper I and II convert the PCs to IVDTs, providing the microcomputer with voice/data capabilities. The Juniper I and II occupy only one slot in the PC, allowing the user to continue to upgrade the PC with additional peripherals.

In effect, the Rolm desktop workstations provide the Rolm CBX user with a variety of features and functions without having to purchase a number of different terminals and PCs from different sources. Add to this the link with IBM, and the future capabilities of the Rolm workstations are very interesting to contemplate. □

A three-month warranty, from the date of installation, is standard for all models. While under warranty, defective units may be returned to Rolm; they will be repaired and returned within five days of the receipt of the unit by Rolm. Two service options, Mail-In and On-site, are available.

The "contact" program is an integral part of the Mial-In option. Each customer provides an individual (the contact) who is trained to assume responsibility for the diagnosis and return of defective units, and the replacement of field-replaceable units. The contact becomes the customer's Cypress, Cedar, or Juniper in-house expert, available to answer questions on operation and provide user training. The customer is required to maintain a pool of spare units.

Under the On-Site option, the Rolm distributor is responsible for troubleshooting, replacement of field-replaceable units, and maintenance of a pool of spare units. All customer calls for repair or replacement of failed units will be answered by the distributor within 24 hours.

EQUIPMENT PRICES

	Purchase Price ($)
Cypress	1,795
Cedar	4,995
Juniper I	895
Juniper II	1,295 ■

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MANAGEMENT SUMMARY

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The Rolm Cedar is an IBM PC-compatible integrated voice/data workstation. Features include a 9-inch display, retractable alphanumeric keyboard, integrated handset with speakerphone, two diskette drives, and 512K bytes of memory.

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DATE FIRST INSTALLED: Cypress—December 1983; Cedar and Juniper I—December 1984; Juniper II—First quarter 1986.

NUMBER INSTALLED TO DATE: Information not available. ➢

Rolm Cypress, Cedar, and Juniper

proprietary software, Personal Communication Software (PCS).

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The Cedar is a personal communication computer that integrates a 9-inch CRT, integral telephone handset and speakerphone, integral keyboard with soft function keys and telephone dial pad, retractable alphanumeric keyboard, two 5¼-inch diskette drives, and 512K bytes of memory. The Cedar is compatible with the IBM Personal Computer, utilizes the MS-DOS operating system, and supports most application software programs written for the IBM PC. Personal data is stored on a removable Personal Data Module. Rolm Personal Communication Software (PCS) is contained at the PCS Load Module, which resides at the switch; when the Cypress is powered up, the PCS software is downloaded to the unit. Only one PCS Load Module is required per CBX.

The Juniper I and II are personal communication options that integrate the voice/data capabilities of the Cypress and Cedar with an IBM PC or PC XT (Juniper I), or with an IBM PC, PC XT, PC AT, or IBM-compatible PC (Juniper II). The Juniper products consist of a specially modified ROLMphone 240-key set, a cable for connection to the PC, PCS software on a diskette, and an option card that plugs into a single expansion slot in the PC. The Juniper add-on unit consists of an integral handset and speakerphone, and a keyboard with telephone dial pad.

TRANSMISSION SPECIFICATIONS

The Rolm Cypress, Cedar, and Juniper I and II can accommodate asynchronous data transmission, over a single twisted-pair of telephone wires via ROLMlink to a Rolm CBX, at speeds up to 19,200 bps. Synchronous transmission is possible when the CBX is configured with the IBM 7171, 3708, or 3710 gateway. The Cypress includes an RS-232-C serial port for the attachment of a printer. The Cedar includes a parallel printer port. Simultaneous voice and data transmission is possible over the twisted-pair wire.

The telephone portion of the Cypress, Cedar, and Juniper I and II is powered by the Rolm CBX. In the event of a power failure, a battery backup feature will allow the Rolm workstations to continue to operate as telephones, without the benefit of the display and soft keys. In addition, Cedar contains its own battery backup capability that prevents the loss of data and/or applications for approximately five minutes after the power outage.

Rolm Cypress, Cedar, and Juniper

chased IBM PCs or PC XTs. Juniper consists of a specially modified ROLMphone 240, a cable that provides the PC attachment, Rolm PCS software on a diskette, and an option card that plugs into a slot in the PC. Juniper I can be used with the IBM PC or PC XT.

In October 1985, Rolm introduced the Juniper II, an enhanced version of the original Juniper I. Juniper II provides all of the capabilities of Juniper I, and expands the microcomputer compatibility of the Juniper product family by providing IBM PC AT compatibility, as well as compatibility with other IBM-compatible microcomputers (e.g., Compaq). Additional advantages of Juniper II include the ability to change switch settings to expand compatibility with third-party asynchronous communications applications and much of IBM's PC-based office software, and coexistence with the IBM Token-Ring Network.

Via ROLMlink, the Rolm desktop workstations can access the myriad of features available on the CBX and CBX II. These features include transmission speeds up to 19,200 bps, modem pooling, simultaneous voice and data transmission over a single twisted-pair telephone wire, and data network management. The Personal Communications Software (PCS), Rolm's proprietary software package supported by all of the Rolm workstation products, provides the user with data access, voice access, automation of desktop functions, and security features.

COMPETITIVE POSITION

As was mentioned earlier in this report, Rolm is a leader in the PABX market, a market that is currently enjoying fairly strong growth. Unfortunately, the same cannot be said for the IVDT market. Shortly after the introduction of the Northern Telecom Displayphone in 1981, the IVDT became a hot item in the trade press and in the industry. The concept of merging a telephone with a data terminal for simultaneous voice and data transmission from a single workstation seemed at the time (and still does seem) to be a good one. Predictions began to be made—predictions of explosive growth for this fledgling market. The predictions, however, were often based on the premise that the IVDT would be the first universally accepted *executive workstation*. By combining a data terminal with the executive's most important business tool—the telephone—it was believed that the IVDT would be *the* device to find a niche among the white collar segment of the industry, a segment that the computer vendors had been having a difficult time reaching.

By now the industry realizes that this was the wrong market to target. Due to a lack of acceptance by the executives that were supposed to buy these devices by the hundreds, the market has crept along at a snail's pace. To exacerbate the problem, there has also been a lack of strong applications for these devices; users have yet to find that one application that IVDTs are ideal for, and thus would trigger a buying spurt that would spur the expected growth of the market. To date, the IVDT still ranks as a neglected stepchild to the personal computer and the standard display terminal.

The CBX II provides the Rolm workstations with a modem pooling feature, which eliminates the need for a modem at every workstation. In addition, the modem pooling feature provides data queuing via the CBX II, eliminating the need to redial a data call when all computer ports are busy. When all computer ports are busy, the CBX II will queue the calls on a first-in, first-out or priority basis, and then audibly signal the user when a port becomes available.

DATA FEATURES

Data access features on the Cypress, Cedar, and Juniper I and II are available via the Rolm Personal Communication Software (PCS). These features include:

- **autodial—provides single-key access to terminal profiles; terminal configuration is set with respect to terminal type, transmission rate, parity, echoplex, and enter-key value;**
- **autolog—provides for single-key automatic logon and log-off; logon sequences are set and stored;**
- **access to multiple host computer—provides for access to asynchronous hosts via Digital VT100 display terminal emulation, and access to synchronous hosts via IBM 3270 emulation (with the IBM gateway); also provides for access to Lexis/Nexis databases via a certified interface;**
- **asynchronous file transfer—provides the ability to send and record a file, plus auto answer (Cedar and Juniper I and IIonly);**
- **recording of an on-line session (Cedar and Juniper I and II only); and**
- **local printing—provides for screen printing on all models, and session and pass-through printing on the Cedar and Juniper I and II.**

PCS also provides password protection against unauthorized use of personal data (such as terminal profiles, logons, reminders, and private telephone numbers). Data network management is provided via the Rolm CBX; statistics on data traffic, status reporting, and control of network access are all part of the CBX's network management facilities. The Cypress and the Cedar also include a Personal Data Module (PDM), a removable unit that contains 8K bytes of nonvolatile RAM. Personal data such as logon sequences, phone lists, and terminal profile are stored on the PDM, and may be removed by the user and installed in another unit. The Juniper models do not include a PDM, but do contain 8K bytes of nonvolatile RAM for the storage of personal data.

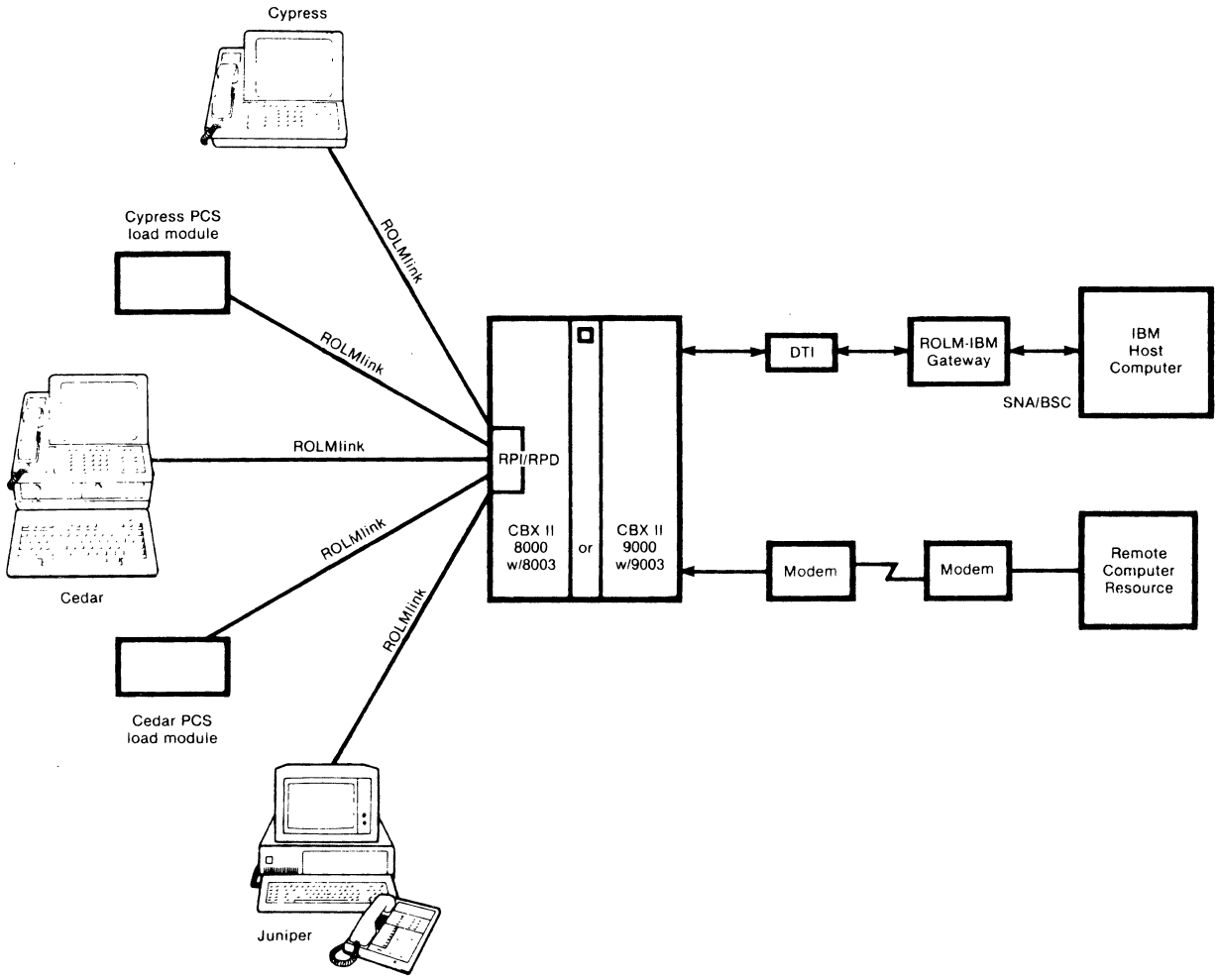
The Cedar also supports many application software programs written for the IBM Personal Computer.

VOICE FEATURES

Enhanced voice access and automated desktop functions are available on the Cypress, Cedar, and Juniper I and II via the Rolm Personal Communication Software (PCS). Voice access features include:

- **dynamic operation—applicable CBX II featues are displayed on soft keys; the display of CBX II features changes according to the state of the workstation (dial tone, ringing, connected, etc.);**
- **incoming call description—provides for a display of the phone extension of the calling party, and the name of the calling party;**

Rolm Cypress, Cedar, and Juniper



Still, the IVDT remains a sound concept, and applications for these devices have been most plentiful when coupled with a PABX. Thus, the IVDT seems a logical product to be produced by the traditional PABX vendors. In addition to Rolm and Northern Telecom, AT&T, Mitel, IneCom (with Wang), ITT, and GTE have introduced IVDTs, with varied degrees of success. Another group of vendors, however, have found the going rough. These vendors are a group of high-technology start-ups who began to appear, hoping to take advantage of the expected growth of the IVDT market. The doldrums that have afflicted the IVDT arena have caused these companies some problems. Zaisan, a promising firm based in Houston, declared for bankruptcy protection despite the critical acclaim won by its products, the ES.1 and ES.3. Cygnet, a firm which manufactures the CoSystem, an equivalent of the Juniper, has run into financial difficulties and is now selling the CoSystem on a component basis. Only Davox, which from the start targeted the IBM 3270-replacement market for its IVDT products, seems to have found success from this group. For the time being, it would seem logical that only the PABX vendors will remain strong players in this market—at least until the next sign of an explosion.

- **multiple phone lines—up to four extensions are available;**
- **message waiting indicators—provides a message center capability, a camp-on message capability, and access to Rolm PhoneMail;**
- **prompts and error messages—provides the user with visual prompts and explanatory error messages; and**
- **configurable repertory dial keys—provides up to 11 repertory dial keys, one-touch dialing, and one-touch access to CBX II features.**

Automated desktop features include:

- **personal phone list—allows the user to store approximately 200 telephone numbers (name, number, and identifying tag); the list can be alphabetically sorted by name or tag, and autodialing can be done from the list;**
- **reminders—allows the user to enter into memory the date, time, and text of a message; reminders may be set up to one year in advance, and visual and audible signals are available to alert the user to a reminder;**
- **calculator—allows the user to convert the telephone dial pad into a five-function calculator;**

Rolm Cypress, Cedar, and Juniper

ADVANTAGES AND RESTRICTIONS

Among the aforementioned PABX vendors, Rolm provides the most complete line of IVDT products with the Cypress, Cedar, Juniper I, and Juniper II. Northern Telecom has upgraded the Displayphone family to include three models, including one designed for use with its popular and successful SL-1 PABX; however, it lacks a product comparable to Juniper. AT&T provides a pair of IVDTs, including a model with a touch-sensitive screen (the Personal Terminal Model 510).

One key advantage of the Rolm desktop workstation family is its integration with the CBX and CBX II products via ROLMlink. The Cypress, Cedar, and Juniper are able to take full advantage of the range of features found on the Rolm PABX products via a single twisted-pair wire. This allows the Rolm IVDTs to transmit data at speeds up to 19,200 bps, as opposed to the 300/1200 bps speeds found on most nonproprietary IVDTs. The modem pooling feature of the CBX II eliminates the need for a modem at every workstation. In addition, the CBX II provides the workstation user with information regarding network use that assists the network administrator in controlling and managing the data network.

The Rolm desktop products provide a significant advantage for users in the legal industry. All Rolm desktop products include a Mead Data Central-certified interface with the Lexis/Nexis database. Cypress and Juniper II provide an additional one-touch, one-function interface for Lexis/Nexis users.

Another key feature found on the Cypress and Cedar is the Personal Data Module (PDM). All personal data (phone list, terminal profile, logon sequences, etc.) is stored in the PDM, which is a removable unit with 8K bytes of nonvolatile RAM. The PDM may be removed from one unit and installed in another, so personal information can be stored in multiple Rolm workstations.

For users who already have made a significant investment in IBM PCs (or IBM-compatible PCs), the Juniper I and II provide IVDT functions. The Juniper I and II also occupy only one slot in the PC, allowing the user to continue to upgrade the PC with additional peripherals.

In effect, the Rolm desktop workstations provide the Rolm CBX user with a variety of features and functions, without having to purchase a number of different terminals and PCs from different sources. Add to this the link with IBM, and the future capabilities of the Rolm workstations are very interesting to contemplate. □

- **messages—allows the user to take camp-on messages, and to autodial from a message list to return a call; the workstation automatically logs the date, time, and name of the caller); and**

- **account codes—provides an interface to the call detail recording feature (which logs calls to user-specified account codes for billing); an account name and code can be entered into memory.**

COMPONENTS

CRT DISPLAY UNIT: The Cypress and Cedar both include a 9-inch (diagonally measured) integral display. The display format is 25 lines of 80 characters each, with the 25th line serving as a status line. Characters are displayed in green phosphor, and formed using a 7-by-9 dot matrix in a 9-by-12 character field. Visual attributes available include underline, bold, blink, and reverse video. The Cedar also provides two graphics display modes (IBM mode), in addition to the standard text mode (Cedar mode). These include medium resolution (320 by 200 pixels) and high resolution (640 by 200 pixels). In IBM mode, characters are formed on the Cedar using a 7-by-7 dot matrix in an 8-by-8 character field. Eight shades of gray are available with the medium resolution screen. The Cypress can display a 256 character set; the Cedar displays 512 characters (256 Cedar mode, 256 IBM mode). IBM mode is selected by application software on the Cedar.

The Juniper I and II utilize the display screen of the personal computer to which they are attached.

HANDSET/SPEAKERPHONE: On the Cypress and Cedar, an integral telephone handset and digital two-way handsfree speakerphone are integrated to the left of the display unit. On the Juniper I and II, the telephone handset and speakerphone are located on the add-on module (the specially designed ROLMphone 240).

UPPER KEYBOARD/JUNIPER I/II KEYBOARD: On the Cypress and Cedar, an upper integral keyboard contains a standard 12-key telephone dial pad, 10 soft function keys, 11 configurable (repertory) dial keys, four line keys, and three phone function keys. On the Juniper I and II, the above-mentioned keys are located on the add-on module (key set).

ALPHANUMERIC KEYBOARD: The Cypress and Cedar include a retractable, movable, 68-key alphanumeric keyboard. Four cursor control keys and eight function keys are included. Overlays for Digital VT100 and IBM 3270 keys are available. The Cedar keyboard also includes IBM PC key mappings.

The Juniper I and II utilize the alphanumeric keyboard of the personal computer to which they are attached.

DISKETTE DRIVES: The Cedar includes two 5¼-inch diskette drives with a 360K-byte capacity.

PRICING

The Rolm Cypress, Cedar, and Juniper I and II workstations are available for purchase only; quantity discounts are available. Sales and installation are available through Rolm or a Rolm-authorized distributor.

A three-month warranty, from the date of installation, is standard for all models. While under warranty, defective units may be returned to Rolm; they will be repaired and returned within 48 hours of the receipt of the unit by Rolm. Two service plans are available: standard and premium. Under the Standard Service Plan, the customer provides "contacts," who are responsible for the diagnosis and return of defective units, and the replacement of field replaceable units. A contact is the customer's Cypress, Cedar, or Juniper expert, who is available to answer questions on operation and provide user training. The customer is required to maintain a pool of spare units. Under the Premium Service Plan, the Rolm distributor is responsible for troubleshooting, replacement of field replaceable units, and maintenance of a pool of spare units. All customer calls for repair or replacement of failed units will be answered by the distributor within 24 hours.

Rolm Cypress, Cedar, and Juniper

EQUIPMENT PRICES

	Purchase Price ($)
Cypress	1,950
Cedar	4,995
Juniper I	1,495
Juniper II	1,295 ■