

Unitech UT-1 and UT-2 Remote Batch Terminals

MANAGEMENT SUMMARY

Unitech manufactures a line of programmable terminals for remote batch, data entry, and combinations of these applications. They serve a broad spectrum of needs ranging from low-speed, low-volume usage to high-speed, high-volume usage. The firm was recently acquired by the Hartford Steam Boiler Inspection and Insurance Company of Hartford, Connecticut. Unitech will operate as part of the Radian Corporation, a wholly owned subsidiary of the Hartford operation. Radian, like Unitech, is based in Austin, Texas.

In October 1975, Unitech introduced the UT-2, a low-priced, fixed-configuration version of the UT-1 for low-volume usage. The UT-2 employs a Motorola 6800 microprocessor for terminal control in place of the Nova minicomputer. Deliveries of the UT-2 began in April 1976. Since the introduction of the UT-2, Unitech has extended its use of the microprocessor to the UT-1 family to provide low-priced alternatives to its minicomputer-based UT-1's. These newer models are aimed at users who do not need to perform the off-line functions supported by the more powerful minicomputer-based UT-1's.

Besides its availability as a remote batch terminal, the UT-2 is also available as a remote data entry terminal with one to four workstations and as a combination remote batch/data entry terminal. The data entry configuration uses CRT keyboard/display units as workstations and IBM 3740-compatible diskettes to capture the data. Each workstation can be assigned its own diskette, or all can share a single diskette via a primary/secondary station operating arrangement. Separate data entry and data communications programs control the operations. The ▷

Two user-programmable systems based on the Data General Nova minicomputer (UT-1) or Motorola 6800 microprocessor (UT-2). Data General software is available for the UT-1.

The configuration possibilities within this product line range from simple batch terminal emulation to a full-bore data entry system (an enhanced version of the UT-2, designated the UT-3), that will support up to 64 display/keyboard printer/keyboard workstations. Additional peripherals include 7- or 9-track tape, disk storage, and incremental plotters.

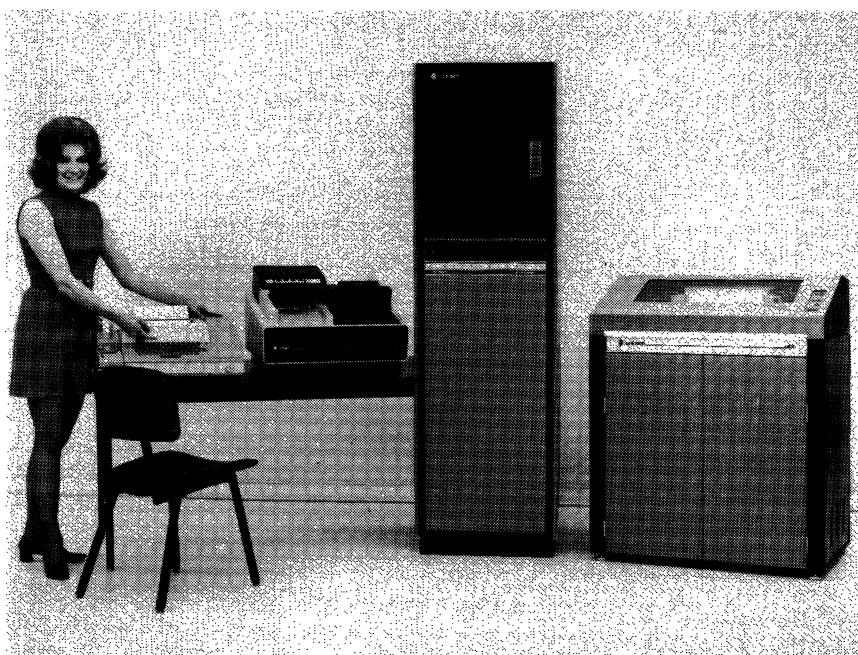
A basic UT-1 with a 300-lpm printer and a 285-cpm card reader rents for less than \$1200 per month, including maintenance, on a two-year lease.

A basic model UT-2 equipped with a 285-cpm card reader, a 300-lpm line printer, and a CRT rents for approximately \$750 per month, including maintenance, on a two-year lease.

CHARACTERISTICS

VENDOR: Unitech, Inc., 1005 East St. Elmo Road, Austin, Texas 78745. Telephone (512) 444-0541.

DATE OF ANNOUNCEMENT: 1970 (UT-1); October 1975 (UT-2). ▶



A typical Unitech UT-1 configuration includes (from left) an operator console (Teletype Model 33 ASR), card reader, optional magnetic tape drive, and line printer. The Data General minicomputer is housed in the central cabinet along with the tape drive.

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► user can specify any of several communications emulator programs, including one for the IBM 2780.

A typical terminal configuration for a Unitech terminal includes a card reader, a printer, a Teletype Model 33 ASR used as an operator console, a synchronous communications interface, and a software emulation package that emulates the functions of a prominent remote batch terminal produced by one of the leading mainframe manufacturers. Additional emulation packages are available at extra cost.

Performance varies widely among the various Unitech terminal configurations as the result of a broad range of reader and printer speeds. Transmission speeds up to 19,200 bits per second are supported; actual transmission speed is dependent on the communications program and the clock rate of the external modem.

Unitech offers a host of peripherals for its Nova-based terminals. The optional peripherals include optical mark readers, electrostatic printers and plotters, industry-standard 7- and 9-track magnetic tape drives, disk storage units, punched tape readers and punches, CRT display units, card punches, and incremental plotters. Software support for the optional peripherals is available at extra cost.

Though intended to serve primarily as a remote batch terminal, the Nova-based UT-1 can also be used to execute off-line programs using Data General's standard software for the Nova series minicomputers. User-written tasks can be linked to Unitech's UTEX communications software to achieve background-mode operations.

Unitech provides, at no extra charge, a basic Data General software package that can be run on a basic 8K-word UT-1 terminal; the package features a standard assembler and debugger. A more powerful set of Data General software is also available from Unitech at added cost for UT-1 terminal configurations with expanded memory. This set features a FORTRAN IV compiler and a disk operating system. The user is advised to contact the Data General Computer Users' Group for a listing of user-developed applications software.

Installation and service are provided by Unitech and by third-party maintenance in some remote locations. Unitech provides technical direction and support to help ensure customer satisfaction.

USER REACTION

In our July 1978 supplement, a mail-in survey form was included covering RJE/Distributed Batch terminals. A total of six responses were received including four users with 15 UT-1 units and two users that had a total of five UT-2 terminals. The ratings of all of the UT-1 responses were in agreement, but one user that had UT-2's provided significantly lower ratings. Consequently, Datapro contacted two more UT-2 users by telephone in September 1978. These two UT-2 users rated the equipment with a ▶

► DATE OF FIRST DELIVERY: 1971 (UT-1); April 1976 (UT-2).

NUMBER DELIVERED TO DATE: Over 275 UT-1's; over 50 UT-2's.

SERVICED BY: Unitech.

CONFIGURATION

UT-1: The standard *microprocessor-based UT-1* includes a 400-cpm card reader; 600-lpm chain printer or 480- to 600-lpm drum printer; Teletype ASR 33 teleprinter or CRT display console; synchronous communications interface; and UCX communications software, an emulator program for one of the prominent batch terminals produced by leading mainframe manufacturers. An optional 30-cps console teleprinter (DEC LA-36 DECwriter II) is available in place of the other standard consoles.

Optional peripherals that can be substituted for the standard peripherals include a 285-, 600-, or 1000-cpm card reader; a 300-lpm chain or train printer; and a 1000-lpm chain printer. A card punch can be added to the standard configuration. Options include Univac or Burroughs card/keypunches.

The *minicomputer-based UT-1* is available in a wide range of system configurations built around a Data General Nova minicomputer and including any of the three consoles offered with the microprocessor-based version. The Nova 2/10 minicomputer is typically used; however, other members of the Nova family, including the 800 and 1200 Series, can be substituted for the 2/10. Special configurations of the UT-1, tailored to user specifications, are available on a custom basis. The standard Nova 2/10-based UT-1 contains 8K words (16K bytes) of core memory, expandable to 32K words in 8K-word increments.

In addition to the peripherals available with the microprocessor-based UT-1, the Nova-based UT-1 can accommodate industry-standard 7- or 9-track magnetic tape drives, fixed or removable disk storage units with capacities of 2.5, 5, or 10 million bytes each, and a variety of incremental plotters, as well as interfaces for user-supplied plotters.

Unitech also provides CRT keyboard/display units, Teletype teleprinters, and LA-36 DECwriter II's for use as workstations via a 4-port asynchronous multiplexer which is expandable to 64 ports.

The minicomputer-based UT-1 is supported by Unitech and Data General software packages for applications that include off-line processing and specialized tasks not currently supported by the microprocessor-based version of the UT-1.

All UT-1 configurations feature a real-time clock and auto-load.

UT-2: The UT-2 is a fixed-configuration terminal that includes a microprocessor, a 285-cpm card reader, an 80-200-lpm line printer, a Teletype ASR-33 teleprinter console, a synchronous communications interface that operates at up to 9600 bps, and UCX communications software (an emulator program for one of the prominent batch terminals produced by leading mainframe manufacturers).

Substitutes for the standard Teletype ASR 33 console include a display unit and the 30-cps LA-36 DECwriter II. A 300-lpm chain printer can be substituted for the standard printer.

TRANSMISSION SPECIFICATIONS

Transmission is synchronous in the half- or full-duplex mode at speeds up to 9600 bits/second for the UT-2 and 19,200 bits/second for the UT-1. The communications interface is ▶

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► similar degree of satisfaction to those of the UT-1. The UT-1 and UT-2 ratings are combined in the following table:

	<u>Excellent</u>	<u>Good</u>	<u>Fair</u>	<u>Poor</u>	<u>WA*</u>
Overall performance	3	4	0	1	3.1
Ease of operation	2	5	1	0	3.1
Hardware reliability	2	5	0	1	3.0
Maintenance service	2	3	2	1	2.8
Terminal software	1	7	0	0	3.1
Vendor technical support	0	7	0	1	2.8

*Weighted Average based on 4.0 for Excellent.

All applications reported on were point-to-point, with approximately 75 percent being leased lines and the remainder being dial-up. Transmission speeds in use varied between 2000 bps and 19.2K bps with the most prevalent being 4800 and 9600 bps. Predictably, the predominant number of mainframes involved were IBM, although Amdahl, Control Data, and Univac were also represented.

EBCDIC was the most common code utilized; a small number of ASCII applications were also reported. All systems, with the exception of one 19.2K bps line, were implemented using Bisynchronous protocol; no use of IBM SDLC was discovered.

One user accounted for all of the Poor ratings. This user claimed that response time to service calls was extremely poor, and that the quantity of calls required was excessive. Of the four UT-2 units installed at this firm, the user was satisfied with the performance of only one. One terminal was said to be non-operational for approximately 60 percent of the time during a three-month period. Another unit was reported to be down for 12 consecutive days. This user rated Terminal software as Good, Ease of operation as Fair, and all other categories as Poor. This situation was not encountered in Datapro's investigation of other UT-2 users. Unitech has been taking over total service responsibility; this user may have been caught in the transition.

Some strong points cited by all of those surveyed (with the one exception) included cost effectiveness and reliability. A disparity exists with the comments concerning configuration flexibility and software; most rated these items as strengths, but some rated them as weaknesses. As usual, the feelings about vendor field-level support varied with geography; however, those users we talked with, as well as those who returned questionnaires, were complimentary with regard to factory-level support. Several mentions were made about the documentation being deficient, but those contacted were quick to mention that factory support (usually by phone) got them out of a bind in short order. Some notable quotes include: "Pleased with the equipment and would definitely recommend it; Very satisfied; and Honey of a box." □

► designed to EIA Standard RS-232C. Transmission parameters such as speed, code, control codes, line discipline, blocking/deblocking, etc., are a function of the communications software (i.e., the emulator program).

DEVICE CONTROL AND SOFTWARE

All operations are executed under the direction of the operating software, which is divided into three categories: UTEX (UT-1) or UCX (UT-2) communications packages; UTEX control packages (for the UT-1 Nova Series); and standard software produced by Data General for its Nova family of minicomputers. The UTEX and UCX communications packages are emulation programs that simulate batch terminals produced by other manufacturers. UTEX control packages are a collection of control programs that support on- and off-line terminal operation and digital plotting.

The currently available UTEX and UCX communications packages include:

- UTEX or UCX HASP—Emulates the functions of an IBM System/360 Model 30 computer operating as a HASP multileaving terminal in an IBM System/360 or 370 HASP communications environment.
- UTEX/2770—Emulates the functions of an IBM 2770 Data Communications System and supports communications with an IBM System/360 or 370 computer or another Unitech UT-1 terminal.
- UTEX or UCX 2780—Emulates the functions of an IBM 2780 Data Transmission Terminal and supports communications with an IBM System/360 or 370 computer, an IBM 2780, an IBM System/3, or another Unitech UT-1 or UT-2 terminal.
- UTEX or UCX UVC—Emulates the functions of a UNIVAC 1004 with Phase II or RMS board and supports communications with a Univac 1106 or 1108 computer running under Exec II or Exec 8.
- UTEX or UCX CDC—Emulates the functions of a Control Data 200 User Terminal and supports communications with a CDC 3000, 6000, or Cyber 70 Series computer under CDC Export/Import.
- UTEX/GRTS—Emulates Honeywell GE 115.

UTEX control packages for the Nova-based UT-1 terminals include:

- UTEX/MOS—The Unitech Terminal Multidevice Operating System is an operating system that controls the transmission and reception of data files between the host computer and the UT-1 peripherals.
- UTEX/UPLT—This family of on-line and background-mode programs supports digital plotting. The programs permit transmission of compressed vendor data from the host computer to the UT-1 terminal, with vector-to-plotter command conversions performed in the terminal. Extensions of UTEX/UPLT provide support for electrostatic printer.

The Data General-produced standard operating software, provided by Unitech with each Nova-based UT-1 at no extra cost, includes an assembler, symbolic debugger, single-user BASIC compiler, math subroutines, and diagnostics. Additional Data General software is available for UT-1 terminals with expanded memory at added cost. The added software includes a relocatable assembler, a relocatable linking loader, an editor, a floating-point interpreter, a FORTRAN IV compiler, time-sharing BASIC, and a disk operating system. FORTRAN for the UT-1 is a full implementation of the ANSI Standard X3.0-1966 language with extensions for its real-time application.

Unitech's software is normally provided on punched cards in hexadecimal format, whereas Data General's software is

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► normally provided on punched tape. The Data General Computer Users' Group is also available to Unitech users as a source for a rapidly expanding library of customer-developed applications software.

PERIPHERALS

A variety of *printers* provide the following speeds and print positions:

Print Speed	Print Positions	Printer Type
60-200 lpm	132	Serial impact
300 lpm	132/136	Chain; drum optional
480-600 lpm	132	Drum
600 lpm	132/136	Chain
1000 lpm	132/136	Chain
1250 lpm	132/136	Drum

A 64-character set of print symbols is standard; other are available as options.

The line printers are produced by Data Printer and Data-products, while the electrostatic printer/ plotters are produced by Varian and Versatec.

Five *card readers* (Documentation) are available, which operate at speeds of 285, 400, 600, 1000, and 1200 cards per minute. Two *card punches* provide rated speeds of 35 to 60 cards/minute (Univac) 1710 VIP) and 50 cards/minute (Burroughs B 9212).

The *disk drives* are produced by Wangco, Caelus, or Diablo and use removable disk packs, similar to those of the IBM 2315, with a capacity of 2.5, 5, or 10 million bytes.

The *diskette drive* for the UT-2 is produced by CDC and is format-compatible and interchangeable with the IBM 3740.

Either 7- or 9-track industry-compatible *magnetic tape drives* can be attached. Recording densities are 200, 556, or 800 bits/inch for the 7-track units and 800 bits/inch for the 9-track units. Tape speeds are 12.5, 25, 37.5 or 45 inches/second. The tape drives are produced by Wangco as the Model 10 series.

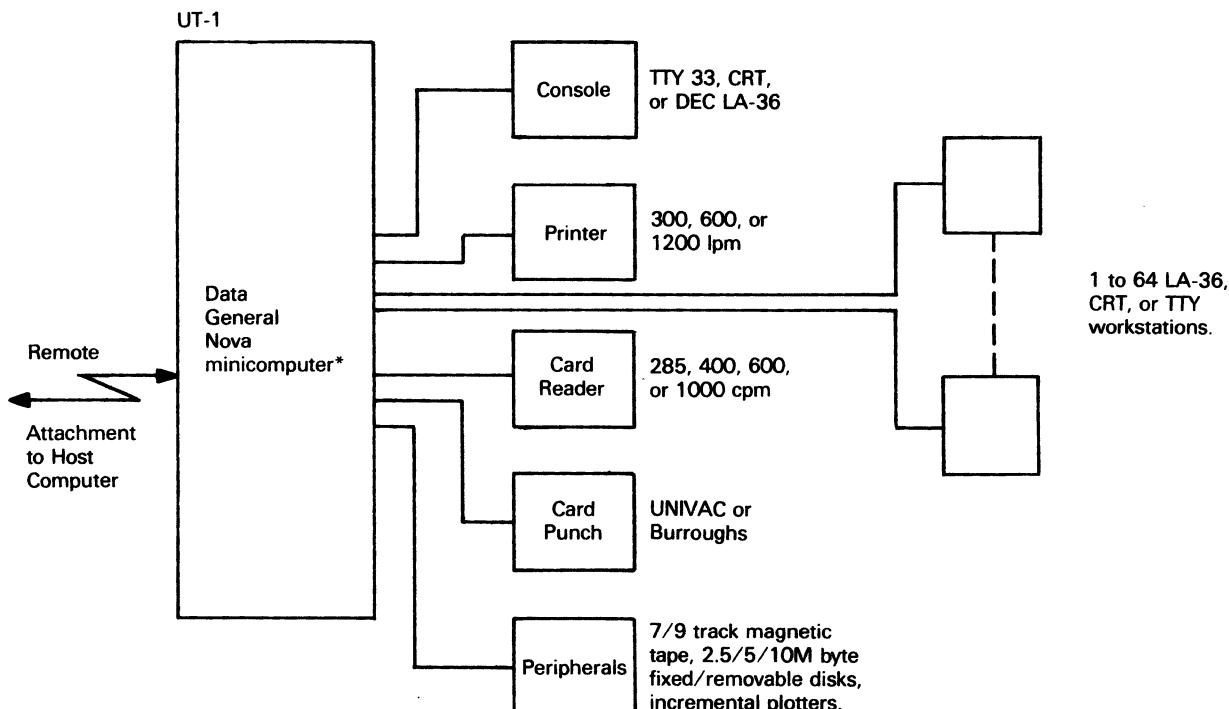
Punched tape units are available that will accommodate 5-, 6-, or 7-, or 8-level fanfold or reel-to-reel, paper or Mylar tape. Reader speeds are 150 or 300 characters/second. The punch operates at 75 or 120 characters/second.

A wide variety of *incremental plotters* is available, including the CalComp 500, 600, 700, 800, 900 and 103X series plotters; the Houston Instruments Models DP-1, DP-3, DP-5, DP-7 and DP-8 and the Unitech Econoplot (Hewlett-Packard). Electrostatic printers for graphic use include models produced by Varian and Versatec. Interfaces are provided for each of these units and are also available to accommodate user-supplied units.

Keyboard/display units, produced by Unitech (Model ICB-1) provide a screen capacity of 1920 characters arranged in 25 lines of 80 characters each. The character set consists of 64 or 96 ASCII characters displayed in white against a dark background. Characters are formed via a 7-by-9 dot matrix.

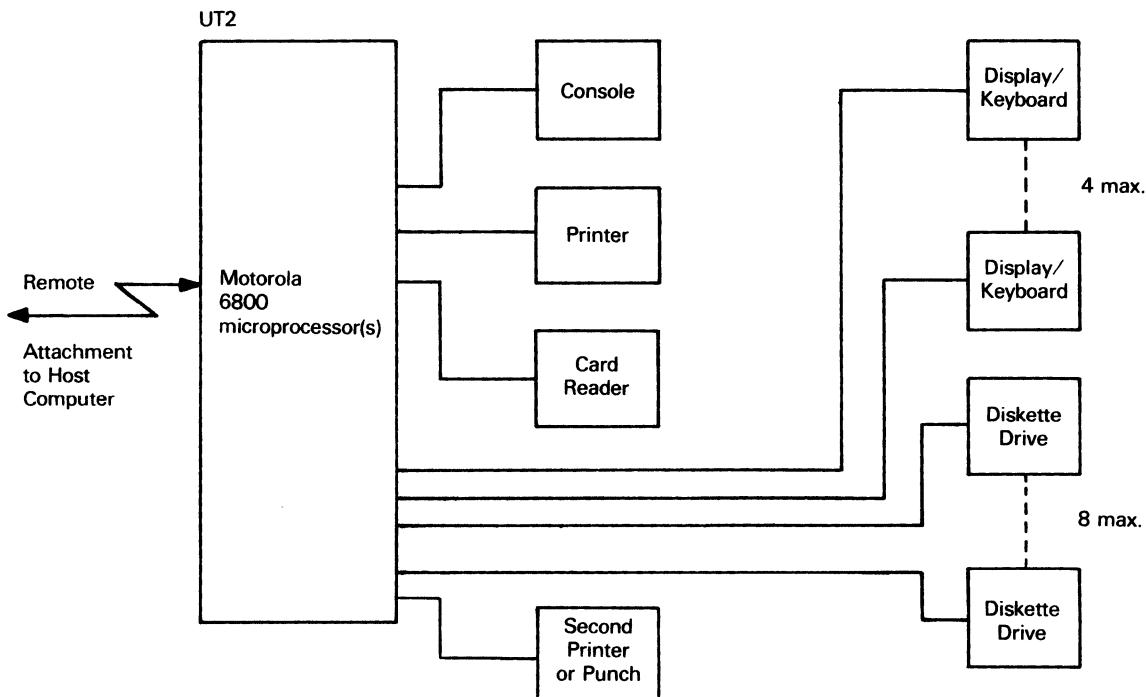
PRICING

The Unitech terminals are available for purchase or on a two- to five-year lease that includes prime-shift maintenance. A separate maintenance contract is available for purchased units. All models are microprocessor-based configurations that include a synchronous communications capability up to 19,200 bps (UT-1) or 9600 bps (UT-2) and one software emulator. Additional emulator programs rent for \$50 per month and license for \$1,000 each.



*A microprocessor-based version is available; this version supports only the console, printer, card reader, and card punch.

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	Monthly Rental*	Purchase	Monthly Maint.
► UT-1/114 (includes 600 lpm chain printer)	\$1,177.85	\$37,400	\$317.65
UT-1/115 (same as UT-1/114 with CRT console)	1,187.85	37,700	320.75
UT-1/104B (same as UT-1/114 but 480-600 lpm drum printer)	1,077.85	33,400	309.65
UT-1/105B (same as UT-1/114 with CRT console and 480-600 lpm drum printer)	1,087.85	33,700	312.75
UT-1 Peripheral Options**—			
Card Reader:			
285 cpm	-26.05	-1,100	-0.75
600 cpm	31.50	1,000	8.50
1000 cpm	77.80	2,000	31.80
Line Printer:			
1000 lpm chain	214.90	5,400	90.70
240-300 lpm drum; for UT-1/104 or UT-1/105	-83.20	-2,400	-28.00
300 lpm chain, for UT-1/114 or UT-1/115	-167.00	-6,000	-29.00
Console Teleprinter (30 cps LA-36 DECwriter II in place of ASR-33)	15.00	500	4.25
Card Punch Interface; for customer-supplied UNIVAC 1701/1710 VIP	94.50	3,000	25.50
Card Punch (Univac 1710 VIP)	By Quotation		
Card Punch (Burroughs B 9212)	By Quotation		
UT-2/112 (includes 285 cpm card reader, 300 lpm printer, and CRT)	745.15	22,450	228.80
UT-2 Peripheral Options**—			
ASR-33	-10.00	-300	-3.10
Teleprinter (30 cps LA-36 DECwriter II)	5.00	200	1.15
60-200 lpm serial printer	-144.45	-4,850	-32.90
600 lpm chain printer	207.20	7,200	41.60
400 cpm card reader	66.25	2,300	13.35
UT-2 Data Entry Station Cluster (includes one CRT workstation, one diskette drive, and a synchronous communications interface)—			
Each additional CRT workstation (KB-1)	257.35	8,100	71.05
Each additional diskette drive	69.30	2,200	18.70
Printer Options:			
60-200 lpm serial printer	36.85	1,100	11.55
	201.18	5,500	74.68

*Monthly rental, including prime-shift maintenance, under a two-year lease.

**Used in place of the standard peripherals; add (or subtract) the indicated prices to (or from) the standard configuration prices. ■

Unitech Remote Batch/Data Entry Terminals

MANAGEMENT SUMMARY

Since its inception, Unitech has been dedicated to the remote batch market, developing a large family of batch terminals built around Data General's Nova series minicomputers. Unitech's offerings include both standard off-the-shelf and custom-tailored configurations for specific user applications. The terminals are designed to serve a broad spectrum of applications ranging from low-speed, low-volume usage to high-speed, high-volume usage.

In October 1975, Unitech introduced the UT-2, a low-priced, fixed-configuration version of the UT-1 for low-volume usage. The UT-2 employs a Motorola 6800 microprocessor for terminal control in place of the Nova minicomputer. Deliveries of the UT-2 began in April 1976. Since the introduction of the UT-2, Unitech has extended its use of the microprocessor to the UT-1 family to provide low-priced alternatives to its minicomputer-based UT-1's. These newer models are aimed at users who do not need to perform the off-line functions supported by the more powerful minicomputer-based UT-1's.

Besides its availability as a remote batch terminal, the UT-2 is also available as a remote data entry terminal with one to four workstations and as a combination remote batch/data entry terminal. The data entry configuration uses CRT keyboard/display units as workstations and IBM 3740-compatible diskettes to capture the data. Each workstation can be assigned its own diskette, or all can share a single diskette via a primary/secondary station operating arrangement. Separate data entry and data

Pair of user programmable systems based on Data General Nova minicomputer or Motorola 6800 microprocessor.

Configurational possibilities range from an emulating batch terminal to a multi-user data entry system supporting up to 64 display/keyboard, printer/keyboard workstations. Additional peripherals include 7/9 track tape, disk storage, and incremental plotters. Standard Data General software is available for UT-1.

A basic microprocessor-based UT-1 with 300 lpm printer and 285 cpm card reader costs about \$1,000 per month, including maintenance, on a two-year lease.

A microprocessor-based UT-2 RJE/data entry configuration with 4 CRT workstations, 4 diskette drives, and a 300 lpm printer costs \$1,214 per month, including maintenance, on a two-year lease.

CHARACTERISTICS

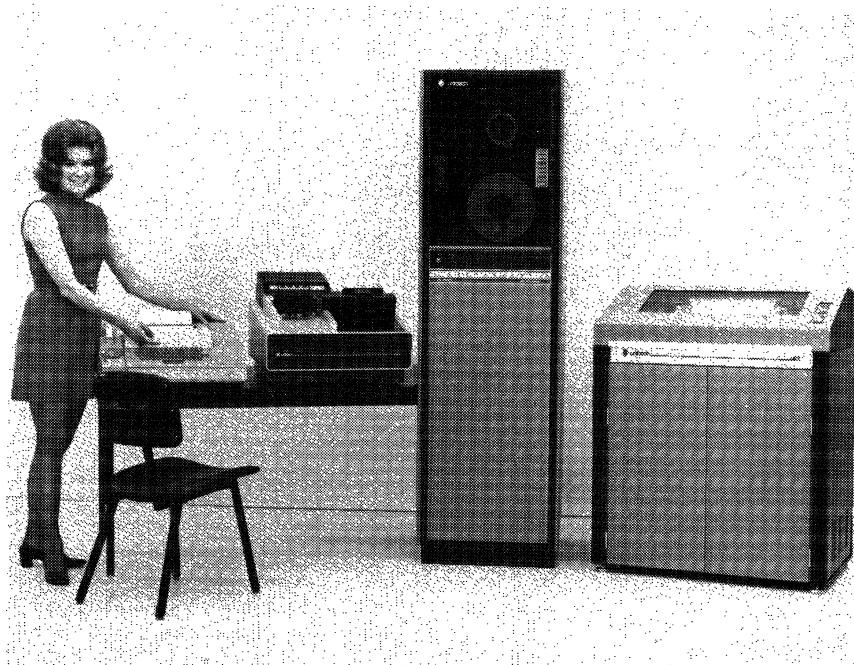
VENDOR: Unitech, Inc., 1005 East St. Elmo Road, Austin, Texas 78745. Telephone (512) 444-0541.

DATE OF ANNOUNCEMENT: 1970 (UT-1); October 1975 (UT-2).

DATE OF FIRST DELIVERY: 1971 (UT-1); April 1976 (UT-2).

NUMBER DELIVERED TO DATE: Over 200 (UT-1).

SERVICED BY: Unitech and Sorbus.



A typical Unitech UT-1 configuration includes (from left) an operator console (Teletype Model 33 ASR), card reader, optional magnetic tape drive, and line printer. The Data General minicomputer is housed in the central cabinet along with the tape drive.

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Customer deliveries of the Unitech UT-1 began in early 1971. Over 200 terminals are now installed or on order. About 25 percent of these are located overseas. Current lead time on orders is 90 to 120 days, depending on the configuration.

Installation and service are provided by Unitech and by Sorbus. Unitech provides technical direction and support to help ensure customer satisfaction.

USER REACTION

Datapro conducted telephone interviews with seven users of Unitech UT-1 terminals. These users reported on their

► CONFIGURATION

UT-1: The standard *microprocessor-based UT-1* includes a 400-cpm card reader; 600-lpm chain printer or 480- to 600-lpm drum printer; Teletype ASR 33 teleprinter or CRT display console; synchronous communications interface; and UTEX communications software, an emulator program for one of the prominent batch terminals produced by leading mainframe manufacturers. An optional 30-cps console teleprinter (DEC LA-36 DECwriter II) is available in place of the other standard consoles.

Optional peripherals that can be substituted for the standard peripherals include a 285-, 600-, or 1000-cpm card reader; a 300-lpm chain or train printer; and an 800- or 1250-lpm drum printer. A card punch can be added to the standard configuration. Options include Univac or Burroughs card keypunches.

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All UT-1 configurations feature a real-time clock and autoload.

UT-2: The UT-2 is a fixed-configuration terminal that includes a microprocessor, a 285-cpm card reader, a 125-lpm line printer, a Teletype ASR-33 teleprinter console, a synchronous communications interface that operates at up to 4800 bps, and UCEX communications software (an emulator program for one of the prominent batch terminals produced by leading mainframe manufacturers).

Substitutes for the standard Teletype ASR 33 console include a display unit and the 30-cps LA-36 DECwriter II. A 300-lpm chain printer can be substituted for the standard printer.

The UT-2 is also available in a data entry configuration, as well as a combined data entry/remote batch configuration that combines the standard UT-2 remote batch and data entry configurations. The data entry configuration can include one to four CRT display workstations and one to four IBM 3741-compatible diskette drives. Optional printers include a 30-cps serial printer (LA-36) and a 60-to 200-lpm, or 125-lpm line printer.

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➤ experience with a total of 23 terminals. Their ratings are summarized below.

	<u>Excellent</u>	<u>Good</u>	<u>Fair</u>	<u>Poor</u>	<u>WA*</u>
Overall performance	5	2	0	0	3.7
Ease of operation	5	2	0	0	3.7
Hardware reliability	3	3	1	0	3.3
Maintenance service**	4	3	0	0	3.6
Software & technical support	4	2	1	0	3.4

* Weighted Average on a scale of 4.0 for Excellent.

** Maintained by Sorbus.

These highly satisfied users cited ease of operation, high reliability, and the system's small physical size as the key advantages of the UT-1 over competitive terminals. One user commented, "It runs like a champ," and another said it provides the "Most bang for the buck." Still another user who used the terminal's plotting capability extensively (concurrently with transmission) cited that feature as one of the main reasons why he placed his order.

The users were hard put to come up with disadvantages. Only one user reported a serious problem. He complained that 90 percent of his maintenance calls were due to a recurring card reader (Documentation) problem; it repeatedly failed to interpret the last three columns correctly. He also remarked that he experienced software problems occasionally. Another user mentioned the lack of immediate availability of some spare parts.

These high user ratings and generally complimentary remarks for the Unitech UT-1 and its vendor endorse the product as a cost-effective, reliable terminal that merits serious consideration by other prospective users. □

➤ TRANSMISSION SPECIFICATIONS

Transmission is synchronous in the half- or full-duplex mode at speeds up to 4800 bits/second for the UT-2 and 19,200 bits/second for the UT-1. The communications interface is designed to EIA Standard RS-232C. Transmission parameters such as speed, code, control codes, line discipline, blocking/deblocking, etc., are a function of the communications software (i.e., the emulator program). The following table shows the relationship between the transmission speed and modem type; although Bell System modems are shown, equivalent modems from independent manufacturers can be used.

<u>Transmission Rate</u>	<u>Bell System Modem</u>
2,000	201A
2,400	201B/C
3,600	203A
4,800	208A/B
7,200	209A
9,600	209A
19,200	303B

DEVICE CONTROL AND SOFTWARE

All operations are executed under the direction of the operating software, which is divided into three categories:

UTEX (UT-1) or UCEX (UT-2) communications packages; UTEX control packages (for the UT-1 Nova Series); and standard software produced by Data General for its Nova family of minicomputers. The UTEX and UCEX communications packages are emulation programs that simulate batch terminals produced by other manufacturers. UTEX control packages are a collection of control programs that support on- and off-line terminal operation and digital plotting.

The currently available UTEX and UCEX communications packages include:

- UTEX or UCEX HASP—Emulates the functions of an IBM System/360 Model 30 computer operating as a HASP multileaving terminal in an IBM System/360 or 370 HASP communications environment.
- UTEX/2770—Emulates the functions of an IBM 2770 Data Communication System and supports communications with an IBM System/360 or 370 computer or another Unitech UT-1 terminal.
- UTEX or UCEX 2780—Emulates the functions of an IBM 2780 Data Transmission Terminal and supports communications with an IBM System/360 or 370 computer, an IBM 2780, an IBM System/3, or another Unitech UT-1 or UT-2 terminal.
- UTEX or UCEX UVC—Emulates the functions of a UNIVAC 1004 with Phase II or RMS board and supports communications with a Univac 1106 or 1108 computer running under Exec II or Exec 8.
- UTEX or UCEX CDC—Emulates the functions of a Control Data 200 User Terminal and supports communications with a CDC 3000, 6000, or Cyber 70 Series computer under CDC Export/Import.

UTEX control packages for the Nova-based UT-1 terminals include:

- UTEX/UTMOS—The Unitech Terminal Multidevice Operating System is an operating system that controls the transmission and reception of data files between the host computer and the UT-1 peripherals.
- UTEX/U PLOT—This family of on-line and background-mode programs supports digital plotting. The programs permit transmission of compressed vector data from the host computer to the UT-1 terminal, with vector-to-plotter command conversions performed in the terminal. Extensions of UTEX/U PLOT provide support for electrostatic printers.

The Data General-produced standard operating software, provided by Unitech with each Nova-based UT-1 at no extra cost, includes an assembler, symbolic debugger, single-user BASIC compiler, math subroutines, and diagnostics. Additional Data General software is available for UT-1 terminals with expanded memory at added cost. The added software includes a relocatable assembler, a relocatable linking loader, an editor, a floating-point interpreter, a FORTRAN IV compiler, time-sharing BASIC, and a disk operating system. FORTRAN for the UT-1 is a full implementation of the ANSI Standard X3.0-1966 language with extensions for its real-time application.

Unitech's software is normally provided on punched cards in hexadecimal format, whereas Data General's software is normally provided on punched tape. The Data General Computer Users' Group is also available to Unitech users as a source for a rapidly expanding library of customer-developed applications software.

Unitech Remote Batch/Data Entry Terminals

► PERIPHERALS

A variety of *printers* provide the following speeds and print positions:

Print Speed	Print Positions	Printer Type
125 lpm	132	Serial impact
60-200 lpm	132	Serial impact
300 lpm	132	Chain; drum optional
480-600 lpm	132	Drum
700/1800 lpm	132/136	Drum
1250 lpm	132/136	Drum
600 lpm	132	Chain

A 64-character set of print symbols is standard; others are available as options.

The line printers are produced by Data Printer (chain type) and Dataproducts (drum type), while the electrostatic printer/plotters are produced by Varian and Versatec.

Five card readers (Documentation) are available, which operate at speeds of 285, 400, 600, 1000, and 1200 cards per minute. Two card punches provide rated speeds of 35 to 60 cards/minute (Univac 1710 VIP) and 150 cards/minute (Burroughs B 9212).

The disk drives are produced by Wangco or Diablo and use removable disk packs, similar to those of the IBM 2315, with a capacity of 2.5, 5, or 10 million bytes.

The diskette drive for the UT-2 is produced by CDC and is format-compatible and interchangeable with the IBM 3740.

Either 7- or 9-track industry-compatible magnetic tape drives can be attached. Recording densities are 200, 556, or

800 bits/inch for the 7-track units and 800 or 1600 bits/inch for the 9-track units. Tape speeds are 12.5, 25, 37.5, 45, or 150 inches/second. The tape drives are produced by Wangco as the Model 10 series.

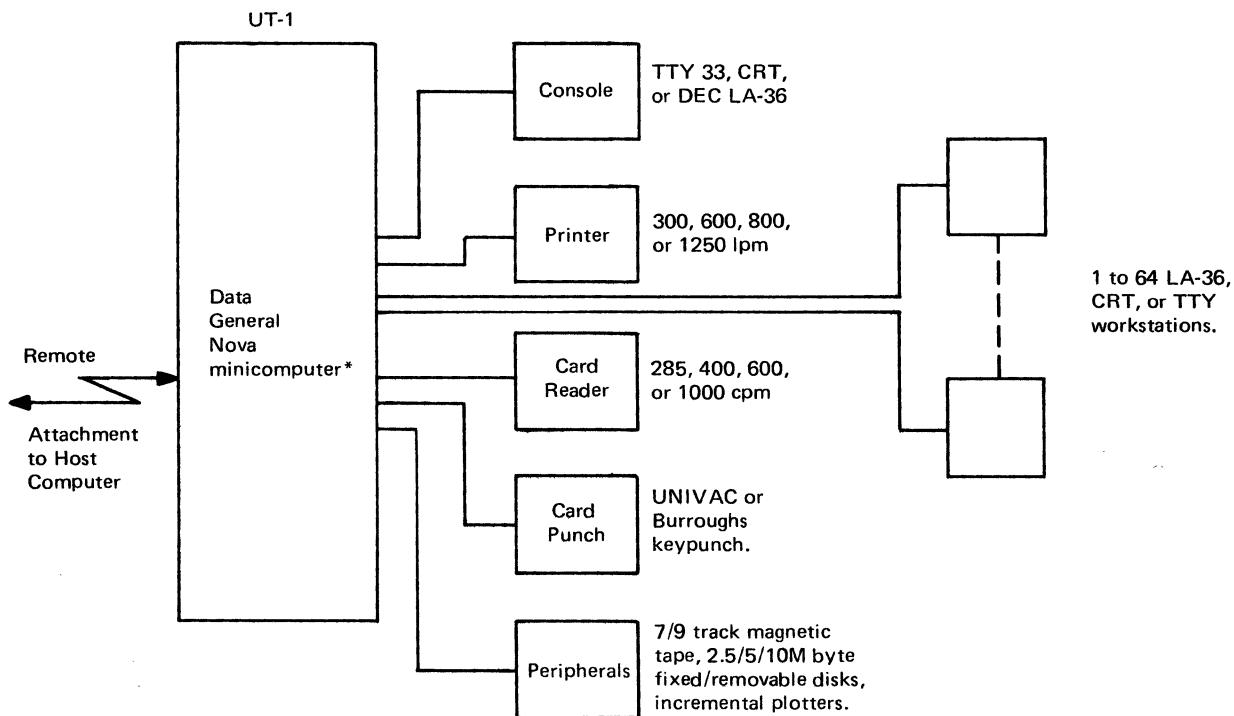
Punched tape units are available that will accommodate 5-, 6-, 7-, or 8-level fanfold or reel-to-reel, paper or Mylar tape. Reader speeds are 150 or 300 characters/second. The punch operates at 75 or 120 characters/second.

A wide variety of *incremental plotters* is available, including the CalComp 500, 600, 700, 800, and 900 series plotters; the Houston Instruments Models DP-1, DP-3, DP-5, and DP-7; the Xynerics Models 500 and 1100; and the Unitech Econoplot (Hewlett-Packard). Electrostatic printers for graphic use include models produced by Varian and Versatec. Interfaces are provided for each of these units and are also available to accommodate user-supplied units.

Keyboard/display units, produced by Beehive Electronics, provide a screen capacity of 2000 characters arranged in 25 lines of 80 characters each. The character set consists of 64 or 96 ASCII characters displayed in white against a dark background. Characters are formed via a 5-by-7 dot matrix.

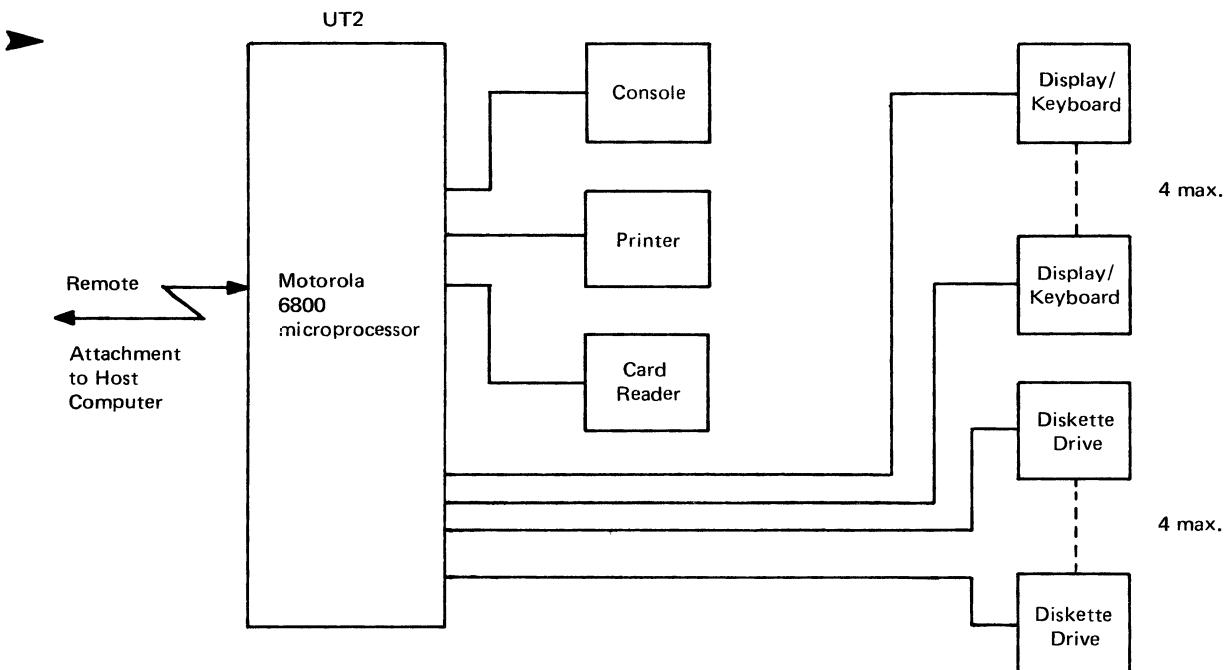
PRICING

The Unitech UT-1 and UT-2 terminals are available for purchase or on a two- to five-year lease that includes prime-shift maintenance. A separate maintenance contract is available for purchased units. Unitech declined to release detailed pricing information for all its individual terminal models and for the optional peripheral units. However, the company has furnished the following representative prices for standard configurations.



*A microprocessor-based version is available; this version supports only the console, printer, card reader, and card punch.

Unitech Remote Batch/Data Entry Terminals



UT-1 Models***

	<u>Monthly Rental*</u>	<u>Purchase</u>	<u>Monthly Maint.</u>
UT-1/114 (std. configuration)	\$1,132	\$36,500	\$292
UT-1/115 (same as UT-1/114 with CRT console)	1,142	36,800	295
UT-1/104 (same as UT-1/114 but substitutes 480-600 lpm drum printer for 600 lpm chain printer)	1,100	35,500	284
UT-1/105 (same as UT-1/114 with CRT console and 480-600 lpm drum printer substitutions)	1,111	35,800	287
UT-1 Peripheral Options**—			
Card Reader:			
285 cpm	-31	-1,000	-8
600 cpm	31	1,000	8
1000 cpm	62	2,000	16
Line Printer:			
1250 lpm drum	465	15,000	120
700-1800 lpm drum	202	6,500	52
240-300 lpm drum	-99	-3,200	-26
300 lpm chain	-164	-6,000	-26
Console Teleprinter, 30 cps (LA-36 DECwriter II)	43	1,700	4
Card Punch Interface (to customer-supplied Univac 1701/1710 VIP)	93	3,000	24
Card Punch (Univac 1710 VIP)	462	14,900	119
Card Punch (Burroughs B 9212)	760	24,500	196

UT-2 Models***

UT-2/101 (std. configuration)	594	18,350	172
UT-2 Peripheral Options**—			
CRT Console	10	300	3
Teleprinter, 30 cps (LA-36 DECwriter II)	35	1,500	0
60-200 lpm serial printer	-33	-1,000	-10
300 lpm chain printer	99	3,000	30
UT-2 Data Entry Station Cluster (includes one CRT workstation, one diskette drive, and a synchronous communications interface)—	228	6,600	76
Each additional CRT workstation	86	2,600	26
Each additional diskette drive	38	1,000	15
Printer options:			
30 cps LA-36 DECwriter II	99	3,000	30
60-200 lpm serial printer	211	6,400	64
125 lpm printer	238	7,200	72
UT-2/DESC/RJE Systems—			
UT-2/003/11 RJE Data Entry Terminal (std. UT-2 configuration and one CRT/diskette workstation with sync. communications interface)	700	19,650	214
UT-2/012/44 RJE Data Entry Terminal (includes CRT console, 300-lpm chain printer, and four CRT/diskette workstations with sync. communications interface)	1,214	36,250	380
UT-2/101/22 RJE Data Entry Terminal (includes ASR 33 console, 285-cpm reader, 125-lpm printer, and two CRT/diskette workstations with sync. communications interface)	894	26,550	283

* Monthly rental, including prime-shift maintenance under a two-year lease.

** Used in place of the standard peripherals; add or subtract (-) the indicated prices to or from the standard configuration prices.

*** All models are microprocessor-based configurations that include a synchronous communications capability up to 19,200 bps (UT-1) or 4800 bps (UT-2) and one software emulator. Additional emulator programs rent for \$50 per month and license for \$1,000 each. ■

