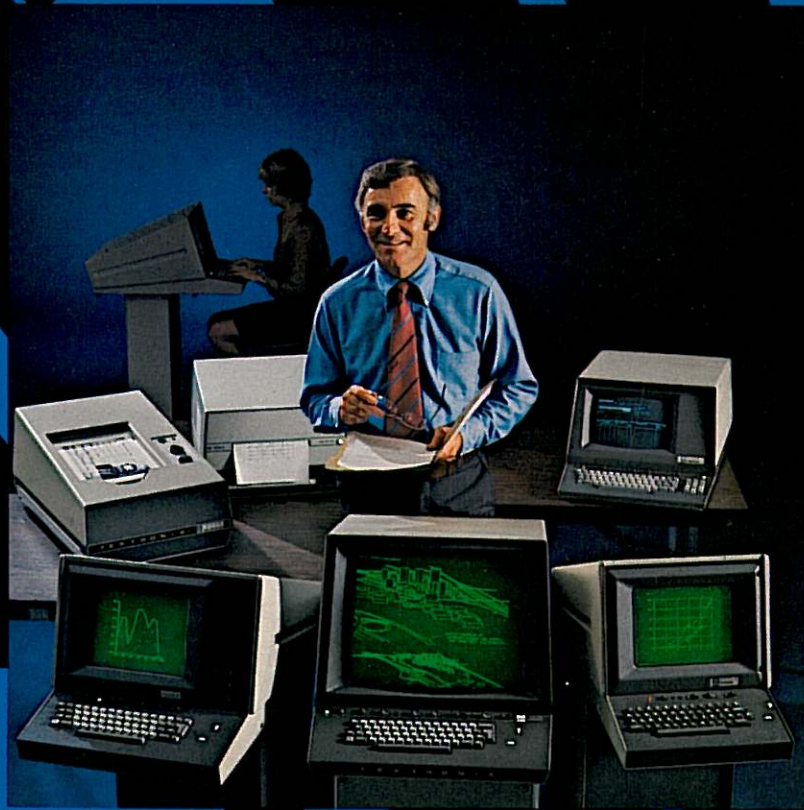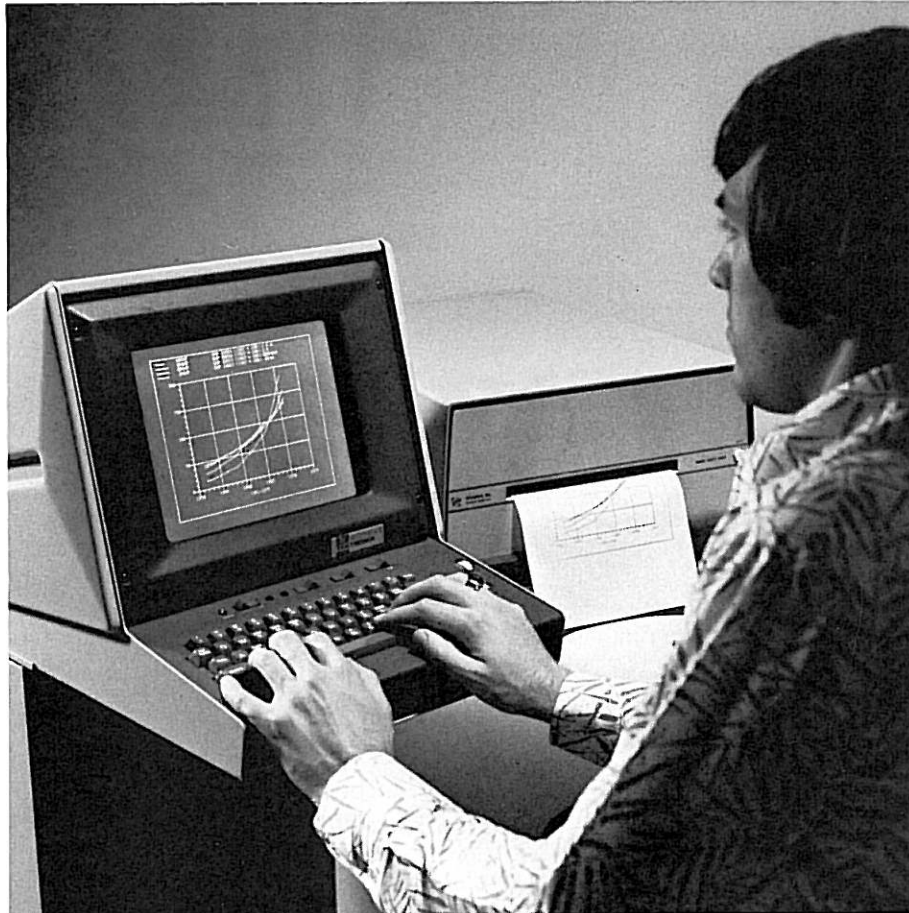# Tektronix
Computer Products

1974 Catalog

TEKTRONIX

4010-1

Low-cost Graphics
TTL, Alphanumerics

Despite its low price, the 4010 Computer Display Terminal is a data handling tool of great capacity and flexibility. The storage display tube has enabled simplification of terminal circuit design, keeping the 4010's price low. Yet Tektronix' pedestal minibus design opens the way to a variety of system concepts. You can start with a simple, low-cost terminal, leaving room for future expansion, or you may enlarge it with a variety of options for larger systems. With the 4010-1, permanent hard copies of displayed data can be obtained, using a 4610 Hard Copy Unit.

Physical Configurations. The keyboard and display unit may be secured at the top of the pedestal in a convenient free-standing model, or may be mounted on a desktop as much as four feet away. Or an extra-cost rackmount is also available.

The Keyboard. Data input at the 4010 console is through a TTY-style keyboard, featuring 63 printing characters (including upper case English alphabet and numerals), and standard ASCII control characters. Convenient rocker switches above the keyboard select Local or Line operation and (on the 4010-1) produce hard copies from the 4610. Independently-operated X and Y axes thumb-wheels position the Graphic Cursor in the Graphic Input Mode.

Operating Modes. Three operating modes can be selected from the keyboard or the computer. In Alphanumeric mode, 35 lines of 74 characters each constitute a full display screen. For short lines of data, a Margin 1 position after the 35th display line moves the left margin to screen center to display a second column of data. In Graphic Display mode, the terminal produces clear, accurate vector displays in response to computer commands. In Graphic Input mode, operator/computer interactivity is permitted.

Terminal Design Characteristics

Display Medium
Direct View Storage CRT

Display Area
7.5 inches wide by 5.6 inches high (19.05 cm. x 14.22 cm.)

Alphanumeric Mode Format
74 characters per line, 35 lines
2590 characters full screen

Character Set
63 printing characters (TTY ASCII Code)

Character Generation
5 x 7 dot matrix
MOS Read-Only Memory
1200 Characters per Second

Cursor
Pulsating 5 x 7 dot matrix

Graphic Display Mode
Vectors only
Vector Drawing Time, 2.6 ms.
1024 X by 1024 Y addressable points
1024 X by 780 Y viewable points

Graphic Input Mode
Thumb-wheel controlled cross hair cursor
3 through 1023 X, 0 through 780 Y

Input Power
110/220 VAC (LOW, MED, HI)
50 to 400 Hz, 110 W

Operating Temperature
+10 degrees to +40 degrees C

Physical Characteristics

Dimensions
Height, 41½ inches (103.41 cm.)
Width, 19 inches (48.26 cm.)
Length, 28½ inches (72.39 cm.)

Weight
Net, 78 pounds (35.10 kg.)
Shipping, 87 pounds (39.15 kg.)

Order Information
4010 Computer Display Terminal

Rackmount R4010 Computer Display Terminal
Rackmount configuration allows for separation of pedestal from keyboard and display portion of terminal in environments where this feature is necessary or desirable.

Rack Dimensions
Height:
    Display, 15¾ inches (40 cm.)
    Pedestal drawer, 8¾" (22.2 cm.)
Width, 19 inches (48.26 cm.)
Depth, 19¼ inches (48.89 cm.)

Note: Rackmounted instrument extends 10 inches from front of rack.

4010-1 Computer Display Terminal
(Compatible with 4610 Hard Copy Unit)

Rackmount R4010-1 Computer Display Terminal
(Compatible with 4610 Hard Copy Unit)

Details of Lease Arrangements for the 4010 and 4010-1 Are Found on Pages 40-41.

Minibus Extender
Up to five peripherals can be added to the 4010 or 4010-1 with a Minibus Extender.
Option 30.

The capabilities of the 4010 can be changed to adapt to a wide variety of computer systems and tasks. By using the right combination of interfaces, software, and peripheral equipment, the computer system can be made situation-perfect.

Interfacing. The 4010 is shipped with a Standard Data Communication Interface installed if no interface option is specified. The no-charge interface enables operation of the 4010 with most full duplex data communication systems. Option 1 for the 4010 is an Optional Data Communication Interface with added features for timesharing of other full or half duplex Data Communication system operations. Six additional options are offered to provide for connecting the 4010 at the TTY Port of the most commonly used minicomputers. For TTY Port Interface Options other than those listed on Pages 24-26, contact your Applications Engineer.

Interfaces Ordered Separately.
When an interface is ordered as a second interface with the original order, or ordered later as a separate item, order by the nine-digit part number shown on Pages 25-26.

Peripheral Equipment. A number of peripherals can be purchased to help computer systems fit every need, one of which is the 4610 Hard Copy Unit. This useful product makes permanent high-quality paper copies of any information displayed on the 4010-1 screen in a matter of seconds either manually or under program control.
See Page 19 for more information.

Also available is a time and dollar-saver, the 4911 Paper Tape Reader/Perforator Unit. This device enables pre-punched data or programs to be entered into the computer at non-rush hour times making the system operate more smoothly and efficiently. At the same time, it provides permanent off-line data storage space which would ordinarily clutter up the computer's core storage.
See Page 19 for more information.

Software. Tektronix provides hardware to fit your needs, but we won't leave you out in the computer jungle without a map. We know that the equipment will just sit there unless the right words are whispered into its ear. Therefore, we provide an extensive collection of software packages for your computer operation.

The following Plot-10 Software packages are designed to be used with the 4010 Graphic Display Terminal: Terminal Control System, Advanced Graphing-II, Display Multiplexer Utility Routines, Preview Routines for Calcomp Plotters, Minicomputer Software, 360/370 Graphics Software, Character Generation System, Decision Maker. For further information about the capabilities of each software package, and part numbers, see Pages 27 through 37.

Extended Performance Options.
Certain optional features are offered which give additional range to the 4010 terminal's performance. These include the Minibus Extender (Option 30), which allows a terminal to be connected to more than one interface or peripheral at a time. This increased potential means, among other things, that a terminal can communicate with more

than one computer, or have an Audio Recorder, in addition to a Computer interface. The Audio Recorder Interface (Option 32) is another Extended Performance option available which allows the use of a commercial tape recorder as off-line data storage. This interface also enables data to be moved from the recorder to the computer via the 4010 Graphic Display Terminal. Another option offered is the Display Multiplexer (Option 31) which allows the terminal to control as many as three storage display monitors at once.

Terminal options numbered Option 30 through 49 are described as Extended Performance Options. The addition of any Extended Performance Option to a Tektronix terminal requires the use of the Minibus Extender (Option 30). A Minibus Extender is included as part of the Dual Interface Capability (Option 36). Be sure you order Option 30 with any Extended Performance Option except 36.

Dual Interface capability is provided by Option 36. This option has three components: Optional Data Communication Interface (Part No. 021-0074-00), Minibus Extender (Part No. 018-0069-00) and Access Cover (Part No. 200-1288-01). The TTY Port Interface should be ordered by the option number. Teletype Port Interfaces not listed in this catalog are quoted upon request. Contact your Applications Engineer.
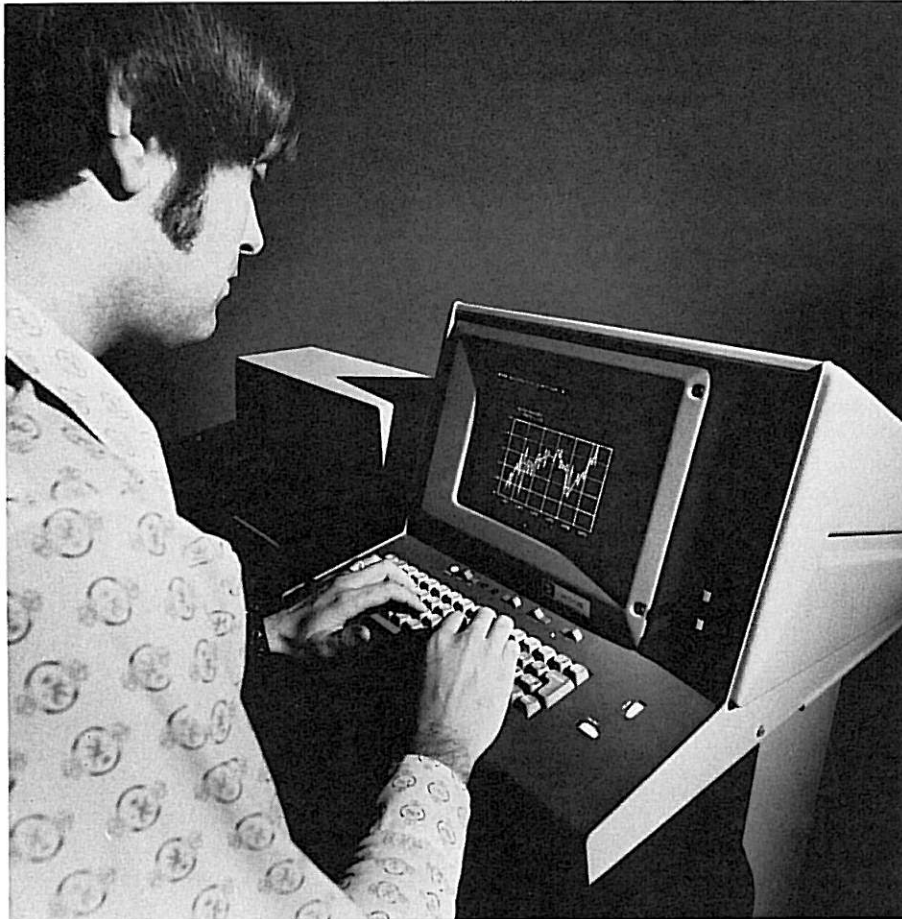
Convenience Options. In addition are options which are designed for convenience in operating the terminal. These include a wheel kit, viewing hood, a copy holder, and an access cover. For additional information, see Page 23.

Manuals
A User's Manual (Part No. 070-1225-00) is supplied and a Maintenance Manual (Part No. 070-1183-00) is available at extra cost.

5

4012

High Resolution
Upper, Lower Case

The 4012 Computer Display Terminal adds keyboard selection of the full ASCII set of 96 upper and lower case printing characters, or the 63 character TTY subset. In addition, the 4012 offers higher resolution graphics in two operational modes. Another advantage of the terminal is copying capability from the 4610 Hard Copy Unit.

The Display. The Tektronix storage display tube permits circuit simplification, making the 4012 easy to operate, inexpensive to maintain, and economical to purchase.

The Keyboard. Alphanumeric and control key entries are made directly from the keyboard. The TTY upper case subset is enabled by a special TTY Lock Key. Character repeat is available by merely holding a key down. The graphic cross-hair cursor is controlled by keyboard thumb-wheels.

Physical Configurations. The keyboard and display unit may be secured to the top of the pedestal in a convenient free-standing model, or may be mounted on a desktop as much as four feet away. Or, an extra-cost rackmount version is also available.

The Pedestal. The 4012 pedestal contains the Power Supply and the Terminal Minibus. The Minibus adaptability makes the 4012 an extremely versatile data-handling device.

Operating Modes. Alphanumeric mode uses the full upper and lower case ASCII character set, or the TTY upper case subset. In Graphic Display mode, vector displays are drawn in response to computer commands. In Graphic Input mode, the thumb-wheel controlled cross-hair cursor can be positioned on the display, for operator/computer interactivity.

Design Characteristics

Display Medium
Direct View Storage CRT

Display Area
8 inches wide by 6 inches high
(20.32 cm. x 15.24 cm.)

Alphanumeric Mode
Format
74 characters per line
35 lines per display
2590 characters per display

Character Set
96 printing characters on a 7 x 9 dot Matrix
(Full ASCII Code)

Graphic Display Mode
Vectors Only
Vector Drawing Time 2.6 ms

Graphic Matrix
1024 X by 1024 Y addressable points
1024 X by 780 Y viewable points

Graphics Input Mode
Thumb-wheel controlled cross-hair cursor
3 through 1023 X, 0 through 780 Y

Input Power
110/220 VAC (LOW, MED, HI)
50 to 400 Hz, 110 W

Operating Temperatures
+ 10 degrees C to + 40 degrees C

Physical Characteristics

Dimensions
Height, 41.5 inches (103.41 cm.)
Width, 19 inches (48.26 cm.)
Depth, 29 inches (73.66 cm.)

Weight
Net, 90 pounds (40.50 kg.)
Shipping, 107 pounds (48.15 kg.)

Order Information
4012 Computer Display Terminal

Rackmount R4012 Computer Display Terminal
Rackmount configuration allows for separation of pedestal from keyboard and display portion of terminal in environments where this feature is necessary or desirable.

Rack Dimensions
Height:
Display, 15¾ inches (40 cm.)
Pedestal drawer, 8¾" (22.2 cm.)
Width, 19 inches (48.26 cm.)
Depth, 19¼ inches (48.89 cm.)

Note: Rackmounted instrument extends 10 inches from front of rack.

Details of Lease Arrangements for the 4012 are found on Pages 40-41.

Minibus Extender
Up to five peripherals can be added to the 4012 with a minibus extender. Option 30.

The capabilities of the 4012 can be changed to adapt to most computer systems and tasks. By using the right combination of interfaces, software, and peripheral equipment, the computer system can be made situation-perfect.

Interfacing. The 4012 is shipped with a Standard Data Communication Interface installed if no interface option is specified. The no-charge interface enables operation of the 4012 with most full duplex data communication systems. Option 1 for the 4012 is an Optional Data Communication Interface with added features for timesharing of other full or half duplex Data Communication system operations. Six additional options are offered to provide for connecting the 4012 at the TTY Port of the most commonly used mini-computers. For TTY Port Interface Options other than those listed on Pages 24-26, contact your Applications Engineer.

Interfaces Ordered Separately.
When an interface is ordered as a second interface with the original order, or ordered later as a separate item, order by the nine-digit part number shown on Pages 25-26.

Peripheral Equipment. A number of peripherals can be purchased to help computer systems fit every need, one of which is the 4610 Hard Copy Unit. This copy machine makes permanent high-quality paper copies of any information displayed on the 4012 screen in a matter of seconds, either manually or under program control. See Page 19 for further information.

Also available is a time and dollar-saver, the 4911 Paper Tape Reader/ Perforator Unit. The 4911 enables pre-punched data or programs to be entered into the computer at non-rush hour times making the system run more smoothly and efficiently. At the same time, it provides permanent off-line data storage space which would ordinarily clutter up the computer's core storage. See Page 19 for more information.

Software. Tektronix provides hardware to fit your needs, but won't leave you out in the computer jungle without a map. Therefore, we provide an extensive collection of software packages for your computer operation.

The following Plot-10 Software packages are designed to be used with the 4012 Graphic Display Terminal: Terminal Control System, Advanced Graphing-II, Display Multiplexer Utility Routines, Preview Routines for Calcomp Plotters, Mini-computer Software, 360/370 Graphics Software, Character Generation System, Decision Maker. For further information about the capabilities of each software package, and part numbers, see Pages 27 through 37.

Extended Performance Options.
Certain optional features are offered which give additional range to the 4012 terminal's performance. These include the Minibus Extender (Option 30) which allows a terminal to be connected to more than one interface or peripheral at a time. This increased potential means, among other things, that a terminal can communicate with more than one computer, or have an Audio Recorder, in addition to a Computer Interface. The Audio Recorder Interface (Option 32) is another Extended Performance option available which allows the use of a commercial tape recorder as

off-line data storage. This interface also enables data to be moved from the recorder to the computer via the 4012 Graphic Display Terminal.

Another option offered is the Display Multiplexer (Option 31) which allows the terminal to control as many as three storage display monitors at once.

Terminal options numbered Option 30 through 49 are described as Extended Performance Options. The addition of any Extended Performance Option to a Tektronix terminal requires the use of the Minibus Extender (Option 30). A Minibus Extender is included as part of the Dual Interface Capability (Option 36). Be sure you order Option 30 with any Extended Performance Option except 36.

Dual Interface capability is provided by Option 36. This option has three components: Optional Data Communication Interface (Part No. 021-0074-00), Minibus Extender (Part No. 018-0069-00) and Access Cover (Part No. 200-1288-01). The additional TTY Port Interface should be ordered by the option number. Teletype Port Interfaces not listed in this catalog are quoted upon request. Contact your Applications Engineer.

Convenience Options. In addition are options which are designed for convenience in operating the terminal. These include wheel kits, viewing hood, a copy holder, and access cover. For additional information, see Page 23.

Manuals
A User s Manual (Part No. 070-1460-00) is supplied and a Maintenance Manual (Part No. 070-1461-00) is available at extra cost.

4013

High Resolution
APL, ASCII, TTY

APL (A Programming Language), a highly inter-active problem-solving language, lends itself ideally to graphic displays of computer data.

The 4013 Computer Display Terminal gives you the choice of APL Language, in addition to the complete ASCII upper and lower case characters set and the TTY subset. The 88 symbol APL set includes the complete upper case italic alphabet, number set, special APL function symbols, and APL composites.

Another advantage of the 4013 is copying capability from the 4610 Hard Copy Unit.

The Display. The 4013, like other 4010 series Terminals, has all the advantages of the storage display tube such as high resolution display as well as other features.

The Keyboard. The 4013 keyboard has APL symbols on the top surfaces of the keys, and the ASCII symbol differences on the forward surfaces. Graphic cross-hair cursor controls and character repeat are also featured on the 4013 keyboard.

Physical Configurations. The 4013 keyboard and display unit may be secured to the pedestal base, or may be detached and mounted on a desktop as much as four feet away. An extra-cost rackmount version is also available.

The Pedestal. The Power Supply and Terminal Minibus are contained in the pedestal. The Minibus contains space for up to five additional options and/or interface cards.

Operating Modes. The 4013 offers Alphanumeric mode, Graphic Display mode for computer outputs, and the interactive Graphic Input mode.

Design Characteristics

Display Medium
Direct View Storage CRT

Display Area
8 inches wide by 6 inches high
(20.32 cm. x 15.24 cm.)

Alphanumeric Mode
Format
    74 characters per line
    35 lines per display
    2590 characters per display
Character Set
96 printing characters on a 7 x 9 dot Matrix
(Full ASCII Code)
88 character APL set

Graphic Display Mode
Vectors Only
    Vector Drawing Time 2.6 ms
Graphic Matrix
    1024 X by 1024 Y addressable points
    1024 X by 780 Y viewable points

Graphics Input Mode
    Thumb-wheel controlled cross-hair cursor
    3 through 1023 X, 0 through 780 Y

Input Power
    110/220 VAC (LOW, MED, HI)
    50 to 400 Hz, 110 W

Operating Temperatures
    + 10 degrees C to + 40 degrees C

Physical Characteristics

Dimensions
Height, 41.5 inches (103.41 cm.)
Width, 19 inches (48.26 cm.)
Depth, 29 inches (73.66 cm.)

Weight
Net, 90 pounds (40.50 kg.)
Shipping, 107 pounds (48.15 kg.)

Order

4013 Computer Display Terminal

Rackmount R4013 Computer Display Terminal

Rackmount configuration allows for separation of pedestal from keyboard and display portion of terminal in environments where this feature is necessary or desirable.

Rack Dimensions
Height:
    Display, 15¾ inches (40 cm.)
    Pedestal drawer, 8¾″ (22.2 cm.)
Width, 19 inches (48.26 cm.)
Depth, 19¼ inches (48.89 cm.)

Note: Rackmounted instrument extends 10 inches from front of rack.

Details of Lease Arrangements for the 4013 are found on Pages 40-41.

Minibus Extender
Up to five peripherals can be added to the 4013 with a minibus extender. Option 30.

The capabilities of the 4013 can be changed to adapt to most computer systems and tasks. By using the right combination of interfaces, software, and peripheral equipment, the computer system can be made situation-perfect.

Interfacing. The 4013 is shipped with a Standard Data Communication Interface installed if no interface option is specified. The no-charge interface enables operation of the 4013 with most full duplex data communication systems. Option 1 for the 4013 is an Optional Data Communication Interface with added features for timesharing of other full or half duplex Data Communication system operations. Six additional options are offered to provide for connecting the 4013 at the TTY Port of the most commonly used mini-computers. For TTY Port Interface Options other than those listed on Pages 24-26, contact your Applications Engineer.

Interfaces Ordered Separately. When an interface is ordered as a second interface with the original order, or as ordered later as a separate item, order by the nine-digit part number shown on Pages 25-26.

Peripheral Equipment. A number of peripherals can be purchased to help computer systems fit every need, one of which is the 4610 Hard Copy Unit. This useful product makes permanent high-quality paper copies of any information displayed on the 4013 screen in a matter of seconds, either manually or under program control, depending on storage. See Page 19 for more information.

Also available is a time and dollar-saver, the 4911 Paper Tape Reader/Perforator Unit. This device enables pre-punched data or programs to be entered into the computer at non-rush hour times making the system operate more smoothly and efficiently. At the same time, it provides permanent off-line data storage space which would ordinarily clutter up the computer's core storage. See Page 19 for more information.

Software. Tektronix provides hardware to fit your needs, but we won't leave you out in the computer jungle without a map. Therefore, we provide an extensive collection of software packages for your computer operation.

The following Plot-10 Software packages are designed to be used with the 4013 Graphic Display Terminal: Terminal Control System, Advanced Graphing-II, Display Multiplexer Utility Routines, Preview Routines for Calcomp Plotters, Mini-computer Software, 360/370 Graphics Software, Character Generation System, Decision Maker, and APL Graph. For further information about the capabilities of each software package, and part numbers, see Pages 27 through 37.

Extended Performance Options. Certain optional features are offered which give additional range to the 4013 terminal's performance. These include the Minibus Extender (Option 30) which allows a terminal to be connected to more than one interface or peripheral at a time. This increased potential means, among other things, that a terminal can communicate with more than one computer, or have an Audio Recorder, in addition to a Computer, Interface. The Audio Recorder Interface (Option 32) is another Extended Performance option available which allows the use of a commercial tape recorder as off-line data storage. This interface also enables data to be moved from the recorder to the computer via the 4013 Graphic Display Terminal. Another option offered is the Display Multiplexer (Option 31) which allows the terminal to control as many as three storage display monitors at once.

Terminal options numbered Option 30 through 49 are described as Extended Performance Options. The addition of any Extended Performance Option to a Tektronix terminal requires the use of the Minibus Extender (Option 30). A Minibus Extender is included as part of the Dual Interface Capability (Option 36). Be sure you order Option 30 with any Extended Performance Option except 36.

Dual Interface capability is provided by Option 36. This option has three components: Optional Data Communication Interface (Part No. 021-0074-00), Minibus Extender (Part No. 018-0069-00) and Access Cover (Part No. 200-1288-01). The additional TTY Port Interface should be ordered by the option number. Teletype Port Interfaces not listed in this catalog are quoted upon request. Contact your Applications Engineer.

Convenience Options. In addition are options which are designed for convenience in operating the terminal. These include wheel kits, a viewing hood, a copy holder, and an access cover. For additional information, see Page 23.

Manuals
A User's Manual (Part No. 070-1476-00) is supplied and a Maintenance Manual (Part No. 070-1477-00) is available at extra cost.

4014-1

Big 19-inch Display, 8512 ASCII or TTY Characters

Tektronix introduces the only 19" Computer Display Storage Terminal in the industry, allowing over three times more graphic and alphanumeric data display than ever before. The 4014 offers the complete ASCII upper and lower case character set, plus the TTY upper case subset.

Also available is the 4014-1 Computer Display Terminal. This model is compatible with the 4610, Option 2 Hard Copy Unit which provides permanent copies of display information.

The Display. A direct view 19 inch storage display tube allows up to 8512 alphanumeric characters, and four different character sizes. The 4014 has two display modes and the option of five vector types for graphic display.

The Keyboard. Alphanumeric and control key entries are made from the keyboard, where the TTY lock key and graphic crosshair cursor controls are also located. Holding a key down causes character repeat.

Physical Configuration. The display unit (with keyboard) is secured to the pedestal to form a desk-height unit. An optional cable is available to allow desktop mounting of the display unit.

The Pedestal. The 4014 pedestal contains power supply and control circuitry, character generator, plus communication interfaces and optional interface space.

Terminal Design Characteristics

Display Medium

Direct View Storage CRT

Display Area

15 inches wide by 11 inches high (38.10 cm. x 28.04 cm.)

Alphanumeric Mode

Four Program—selectable Formats

1. 74 characters per line with 35 lines per display.
2. 81 characters per line with 38 lines per display.
3. 121 characters per line with 58 lines per display.
4. 133 characters per line with 64 lines per display.

Character Set

96 characters (Full ASCII upper and lower case).
63 character TTY subset.

Alphanumeric Cursor

Pulsating 7 x 9 dot matrix

Vector Mode

Vector drawing time, 5000 inches per second.
1024 X by 1024 Y addressable points.
1024 X by 780 Y viewable points.

4014 Enhanced Graphics Module, Option 34

4096 X by 4096 Y addressable points.
4096 X by 3120 Y displayable points.

Dotted and dashed line vectors (four variables) Point plot mode. Incremental plot-mode. Program control of Writing Beam Brightness.

Interactive Graphic Mode

Thumb-wheel controlled cross-hair cursor.

3 through 1024 addressable points horizontally.

0 through 780 addressable points vertically.

Input Power

110/220 VAC (LO, MED, HI)
50 to 400 Hz, 350 Watts

Physical Characteristics

Weight

150 pounds net (67.50 kg.)

10

Dimensions

Height, 43½ inches (110.49 cm.)
Width, 20 inches (50.80 cm.)
Length, 32½ inches (82.55 cm.)

Order Information

4014 Computer Display Terminal

4014-1 Computer Display Terminal
(Compatible with 4610, Option 2
Hard Copy Unit)

Minibus Extender
Up to five peripherals can be added
to the 4014 with a minibus extender.
Option 30.

Details of lease arrangements for
the 4014 are found on Pages 40-41.

The capabilities of the 4014 can be
changed to adapt to most computer
systems and tasks. By using the
right combination of interfaces, soft-
ware, and peripheral equipment,
the computer system can be made
situation-perfect.

Interfacing. The 4014 is shipped with
a Standard Data Communication
Interface installed if no interface
option is specified. The no-charge
interface enables operation of the
4014 with most full duplex data com-
munication systems. Option 1 for
the 4014 is an Optional Data Com-
munication Interface with added fea-
tures for timesharing of other full or
half duplex Data Communication
system operations. Six additional
options are offered to provide for
connecting the 4014 at the TTY Port
of the most commonly used mini-
computers. For TTY Port Interface
Options other than those listed
on Pages 24-26, contact your
Applications Engineer.

Interfaces Ordered Separately.
When an interface is ordered as a
second interface with the original
order, or ordered later as a separate
item, order by the nine-digit part
number shown on Pages 24-26.

Peripheral Equipment. A number
of peripherals can be purchased to
help computer systems fit every
need, one of which is the 4610,
Option 2 Hard Copy Unit. This copy
machine makes permanent high-
quality paper copies of any informa-
tion displayed on the 4014-1 screen,
either manually or under program
control.

Also available is a time and dollar-
saver, the 4911 Paper Tape Reader/
Perforator Unit. This device enables
pre-punched data or programs to
be entered into the computer at non-
rush hour times making the system
run more smoothly and efficiently.
At the same time, it provides per-
manent off-line data storage space
which would ordinarily clutter up
the computer's core storage.
See Page 19 for more information.

Software. Tektronix provides hard-
ware to fit your needs, but we won't
leave you out in the computer jungle
without a map. Therefore, we pro-
vide an extensive selection of soft-
ware packages for your computer
operation.

The following Plot-10 Software
packages are designed to be used
with the 4014 Computer Display
Terminal: Terminal Control System,
Advanced Graphing-II, Display Mul-
tiplexer Utility Routines, Preview
Routines for Calcomp Plotters,
Mini-computer Software, 360/370
Graphics Software, Character Gen-
eration System, Decision Maker.
For further information about the
capabilities of each software pack-
age, and part numbers, see Pages
27 through 37.

Extended Performance Options.
Certain optional features are offered
which give additional range to the
4014 terminal's performance. These
include the Minibus Extender
(Option 30) which allows a terminal
to be connected to more than one
interface or peripheral at a time.
This increased potential means,
among other things, that a terminal
can communicate with more than
one computer, or have an Audio
Recorder, in addition to a Computer
Interface. The Audio Recorder
Interface (Option 32) is another
Extended Performance option avail-

able which allows the use of a
commercial tape recorder as off-
line data storage. This interface
also enables data to be moved
from the recorder to the computer
via the 4014 Graphic Display Ter-
minal. Another option offered is
the Display Multiplexer (Option 31)
which allows the terminal to control
as many as three storage display
monitors at once. Also offered is
Enhanced Graphics Module (Option
34), which allows 12-bit address-
ability (4096 X by 4096 Y) of the
display screen. Also, the option
allows for dotted and dashed line
vectors, incremental plot, and point
plot with control over plotted point
brightness, i.e., grey scaling.

Terminal options numbered
Option 30 through 49 are described
as Extended Performance Options.
The addition of any Extended
Performance Option to a Tektronix
terminal requires the use of the
Minibus Extender (Option 30). A
Minibus Extender is included as part
of the Dual Interface Capability
(Option 36). Be sure you order
Option 30 with any Extended
Performance Option except 36.

Dual Interface capability is provided
by Option 36. This option has three
components: Optional Data Com-
munication Interface (Part No.
021-0074-00), Minibus Extender
(Part No. 018-0069-00) and Access
Cover (Part No. 200-1288-01). The
additional TTY Port Interface should
be ordered by the option number.
Teletype Port Interfaces not listed
in this catalog are quoted upon
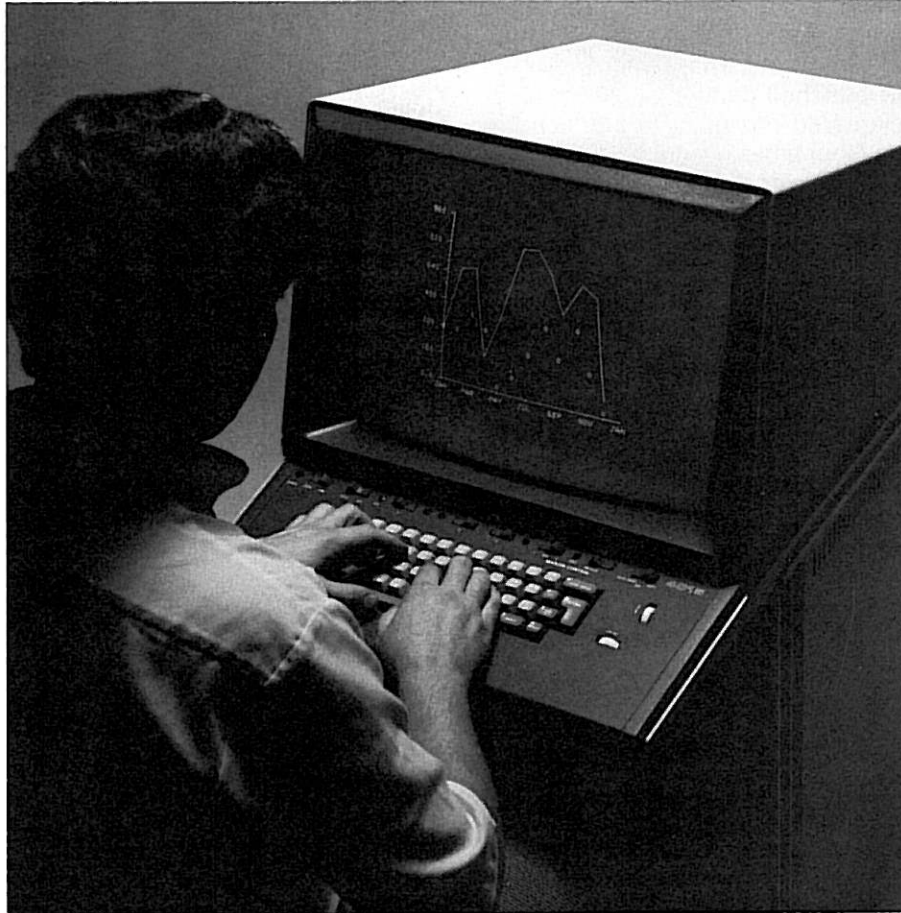request. Contact your Applications
Engineer.

Convenience Options. In addition
are options which are designed for
convenience in operating the ter-
minal. These include wheel kits,
viewing hood, and a copy holder.
For additional information, see
Page 23.

Manuals

A User's Manual (Part No.
070-1647-00) is supplied and a
Maintenance Manual (Part No.
070-1648-00) is available at extra
cost.

4015-1

Big 19-inch Display
APL, ASCII, TTY

The 4015 Computer Display Terminal adds the powerful problem-solving APL language to the increased display power of the 19 inch screen, along with the full ASCII upper and lower case set and TTY subset.

Also available is the 4015-1 Computer Display Terminal. This model is compatible with the 4610, Option 2 Hard Copy Unit which provides permanent copies of display information.

The Display. The 19 inch display is a direct view storage tube with a capacity of 8512 characters. The 4015 has four different sizes of character display, two display modes and five vector types for graphic display.

The Keyboard. APL characters are depicted on the top surfaces of the keys, with ASCII symbol differences on the forward surfaces. The TTY Lock key and graphic cross-hair cursor controls are also on the keyboard. Character repeat is also included.

Physical Configuration. The keyboard and display unit is secured to the top of the pedestal to form a desk-height unit. An optional cable is available for desktop use of the keyboard and display unit.

The Pedestal. The 4015 pedestal contains a power supply, control circuits, character generator, plus communication interfaces and option interface space.

Operating Modes. The 4015 functions in three modes. The 4015 offers Alphanumeric mode, Graphic Display Mode for computer outputs, and the interactive graphic input mode. Data received may be displayed alphanumerically or graphically.

Terminal Design Characteristics

Display Medium
Direct View Storage CRT

Display Area
15 inches wide by 11 inches high (38.10 cm x 28.04 cm.)

Alphanumeric Mode

Four Program—selectable Formats
1. 74 characters per line with 35 lines per display.
2. 81 characters per line with 38 lines per display.
3. 121 characters per line with 58 lines per display.
4. 133 characters per line with 64 lines per display.

Character Set
96 characters (Full ASCII upper and lower case)

63 character TTY subset.

88 character APL set

Alphanumeric Cursor
Pulsating 7 x 9 dot matrix.

Vector Mode
Vector drawing time, 5000 inches per second.

1024 X by 1024 Y addressable points.

1024 X by 780 Y viewable points.

4015 Enhanced Graphics Module, Option 34

4096 X by 4096 Y addressable points.

4096 X by 3120 Y displayable points.

Dotted and dashed line vectors (4 variables). Point plot mode. Incremental plot-mode Program control of Writing Beam Brightness.

Interactive Graphic Mode
Thumb-wheel controlled cross-hair cursor.

3 through 1024 addressable points horizontally.

0 through 780 addressable points vertically.

Input Power

110/220 VAC (LO, MED, HI)
50 to 400 Hz, 350 Watts

Physical Characteristics

Dimensions

Height, 43½ inches (110.49 cm.)
Width, 20 inches (50.80 cm.)
Length, 32½ inches (82.55 cm.)

Weight

150 pounds net (67.50 kg.)

Order Information

4015 Computer Display Terminal

4015-1 Computer Display Terminal

(Compatible with 4610, Option 2
Hard Copy Unit)

Minibus Extender

Up to five peripherals can be added
to the 4015 with a minibus
extender.

Option 30

Details of lease arrangements for
the 4015 are found on Pages 40-41.

The capabilities of the 4015 can be
changed to adapt to most computer
systems and tasks. By using the
right combination of interfaces,
software, and peripheral equip-
ment, the computer system can be
made situation-perfect.

Interfacing. The 4015 is shipped with
a Standard Data Communication
Interface installed if no interface
option is specified. The no-charge
interface enables operation of the
4015 with most full duplex data com-
munication systems. Option 1 for
the 4015 is an Optional Data Com-
munication Interface with added fea-
tures for timesharing of other full or
half duplex Data Communication
system operations. Six additional
options are offered to provide for
connecting the 4015 at the TTY Port
of the most commonly used mini-
computers. For TTY Port Interface
Options other than those listed
on Pages 24-26, contact your
Applications Engineer.

Interfaces Ordered Separately.
When an interface is ordered as a
second interface with the original

order, or is ordered later as a sep-
arate item, order by the nine-digit
part number shown on Pages 25-26.

Peripheral Equipment. A number
of peripherals can be purchased to
help computer systems fit every
need, one of which is the 4610,
Option 2 Hard Copy Unit. This copy
machine makes permanent high-
quality paper copies of any infor-
mation displayed on the 4015-1
screen, either manually or under
program control.

Also available is a time and dollar-
saver, the 4911 Paper Tape Reader/
Perforator Unit. This device enables
pre-punched data or programs to
be entered into the computer at
nonrush hour times making the sys-
tem run more smoothly and effi-
ciently. At the same time, it provides
permanent off-line data storage
space which would ordinarily clut-
ter up the computer's core storage.
See Page 19 for more information.

Software. Tektronix provides hard-
ware to fit your needs, but won't
leave you out in the computer jungle
without a map. Therefore, an
extensive collection of software
packages are provided for your
computer operation.

The following Plot-10 Software
packages are designed to be used
with the 4015 Graphic Display Ter-
minal: Terminal Control System,
Advanced Graphing-II, Display
Multiplexer Utility Routines, Pre-
view Routines for Calcomp Plotters,
Minicomputer Software, 360/370
Graphics Software, Character Gen-
eration System, Decision Maker,
and APL Graph. For further informa-
tion about the capabilities of each
software package, and part
numbers, see Pages 27 through 37.

Extended Performance Options.
Certain optional features are
offered which give additional range
to the 4015 terminal's performance.
These include the Minibus Extender
(Option 30) which allows a terminal
to be connected to more than one
interface or peripheral at a time.
This increased potential means,
among other things, that a terminal
can communicate with more than
one computer, or have an Audio
Recorder, in addition to a Computer,
Interface. The Audio Recorder
Interface (Option 32) is another

Extended Performance option avail-
able which allows the use of a
commercial type recorder as off-line
data storage. This interface also
enables data to be moved from the
recorder to the computer via the
4015 Graphic Display Terminal.
Another option offered is the Display
Multiplexer (Option 31) which allows
the terminal to control as many as
three storage display monitors at
once. Also offered is Enhanced
Graphics (Option 34) which allows
12-bit addressability (4096 X by
4096 Y) of the display screen. The
option also allows for dotted and
dashed line vectors, incremental
plot, and point plot with control over
plotted point brightness, i.e., grey
scaling.

Terminal options numbered
Option 30 through 49 are described
as Extended Performance Options.
The addition of any Extended
Performance Option to a Tektronix
terminal requires the use of the
Minibus Extender (Option 30). A
Minibus Extender is included as part
of the Dual Interface Capability
(Option 36). Be sure you order
Option 30 with any Extended
Performance Option except 36.

Dual Interface capability is provided
by Option 36. This option has three
components: Optional Data Com-
munication Interface (Part No.
021-0074-00), Minibus Extender
(Part No. 018-0069-00) and Access
Cover (Part No. 200-1288-01).
The additional TTY Port Interface
should be ordered by the option
number. Teletype Port Interfaces
not listed in this catalog are quoted
upon request. Contact your
Applications Engineer.

Convenience Options. In addition
are options which are designed for
convenience in operating the ter-
minal. These include wheel kits,
viewing hood, and a copy holder.
For additional information, see
Page 23.

Manuals

A User's Manual is supplied (Part No.
070-1649-00) and a Maintenance
Manual (Part No. 070-1650-00) is
available at extra cost.

4023

Refreshed Alphanumerics
Upper and Lower Case

14

The Tektronix 4023 is a general purpose, alphanumeric, refreshed terminal with all the built-in features of a refreshed terminal—it is quiet, bright, and buffered plus it has other features which are oriented towards rapid, error-free data base entry and retrieval operations.

The 4023 keyboard provides selection of the full ASCII set of 96 printing characters, or the 63 character TTY upper case subset.

The memory (buffer) of the 4023 allows space for 24 lines with 80 characters each, providing a total of 1920 characters. Standard terminal features permit the cursor to be addressed to any one of the 1920 character positions.

The 4023 can communicate directly with a computer, bypassing the buffer; or it can communicate via the buffer. Communicating directly to the computer is a character-by-character process; whereas, in buffered communications the data can be sent as one complete block.

Function Control and Numeric Pad. A cluster of 12 keys to the right of the keyboard serves a dual purpose. Normally these keys provide control for editing, transmission, cursor movement, etc. However, pressing the NUM LOCK key located in the bottom right corner of the key cluster, enables the 12 keys to function as a numeric pad.

Editing Capabilities. Insert character and line, delete character and line, erase to end, erase page. Editing is speeded by tab, back tab, and repeating character keys.

Field and Data Formatting. Displayed data can be arranged to resemble the source document. Forms information can then be rapidly retrieved, updated, edited, and entered. Visual field formats include: inverted, blinking, blacked, and dim fields. Logical formats include: transmittable, non-transmittable, protected, non-protected, and non-alpha fields.

Interfacing. Provided by two data communications interfaces for telephone line connection. One is the Standard Data Communications Interface supplied with the 4023 if no interface option is specified. Compatible with RS-232C this interface provides switch-selectable input/output data rates of 110, 150, 300, 600, 1200, 4800, or 9600 baud. Local echo is also switch selectable. Option 1 for the 4023 is an Optional Data Communications Interface with added features for timesharing or other Data Communication system operations.

Design Characteristics
CRT
Refreshed CRT, 12 inch diagonal

Display Area
9 inches wide by 5.5 inches high
(22.86 cm. x 13.97 cm.)

Phosphor Type: P-4 (white)

Video
Composite Video, compatible with standard interlaced 525 line monitor.

Refresh Rate: 60 Hz

Cursor Type
7 by 10 dot matrix, non-destructive remote or local control.

Character Generator
5 x 7 dot matrix

Character Size
80 mils by 120 mils (0.80 inch wide by 0.12 inch high)

Character Code
128 ASCI, 96 printing upper and lower case characters.

Characters Per Line: 80

Lines Per Display: 24

Refreshed Buffer: MOS RAM

Intensity
Normal 30 foot lamberts, dim 15 foot lamberts for background identification

Keyboard 64/96 ASCI upper and lower case, two key roll-over, auto-repeat for any keys depressed over 0.3 second.

Input/Output Standard Data Communications Interface is RS-232C compatible Full Duplex, Serial Asynchronous, Start/Stop, LSB first, Baud rate Transmit/Receive selectable 110-9600 with backpanel switch, Transmission code is 128 ASCII upper/lower case.

Power Requirements
115/230 (hi, med, lo) VAC, 50 to 400 Hz, nominal 220 watts

Physical Characteristics
Dimensions
Height, 13 inches (33 cm.)
Width, 18 inches (46 cm.)
Depth, 23 inches (58 cm.)
Weight
Net, 46 lbs. (21 kg.)
Shipping, 67 lbs. (30 kg.)

Order Options
4023 Computer Display Terminal
(Including Standard Data Communications Interface)

Option 1
Optional Data Communication Interface

Option 31
Ruling Character Set (factory installed)

Option 32
Audio Recorder Card

Details of lease arrangements for the 4023 are found on Pages 40-41.

Interfacing. The 4023 is shipped with a Standard Data Communication Interface installed if no interface option is specified. Option 1 for the 4023 is an Optional Data Communication Interface with added features for timesharing or other Data Communication system operation.

Hard Copy Compatible
The 4623 Hard Copy Unit is designed to produce permanent high quality, 8½″ x 11″ copies from the 4023 refreshed Alphanumeric terminal.

Installation is easy and simple. The 4623 is plug-to-plug compatible to the 4023 and produces excellent

quality copies at the touch of a single switch.

Colors available include red, gold, green and tan, matching color options available on the 4023 terminals. Color, which must be specified at the time of ordering, is available at no extra charge. If no option is specified, tan will be shipped.

Four channel input, which accommodates up to four 4023's, is standard, allowing copying capabilities (and cost-savings) from one to four terminals.

Characteristics
Copy Size
Adjusted to 8½ x 11 inches for horizontal raster display.

Copy Time
Approximately 18 seconds for first copy. Additional copies of the same display take about 8 seconds each.

Remote Signal Inputs
Remote Copy. A logic level "LO" (ground closure) initiates a copy command.

Output Signal Characteristics
$\overline{\text{Busy}}$ (Open Collector. Low during copy time.)

$\overline{\text{HCU}}$ (open collector, low when Hard Copy power is on.)

Warmup Time: 20 minutes
Ambient Temperature
0°C to +35°C is recommended
Power Source
(Factory-wired options)
100VAC 50-60 Hz
115VAC 50-60 Hz
200VAC 50-60 Hz
230VAC 50-60 Hz

Physical Characteristics
Dimensions
Height, 11 inches (27.9 cm)
Width, 16 inches (40.6 cm)
Depth, 25½ inches (64.7 cm)
Weight
Approximately 65 lbs. (29.48 kg)

Order Options
4623 Hard Copy Unit
Option 56—gold
Option 57—red
Option 58—green

Option 1—Copy Counter (automatically counts copies the 4623 makes)

Paper
One roll 3M Type 777 Dry Silver paper is included with each Hard Copy Unit. Refills are available

from Tektronix, Inc.
One roll, Part No. 006-1603-00
One carton of 4 rolls, Part No. 006-1603-01

Standard Accessories
User's Manual (Part No. 070-1662-00); one 10 ft., 15 pin interconnecting cable (Part No. 012-0504-00) and Maintenance Manual (one mailed free upon request with order).

Optional Accessories
Maintenance Manual
Part No. 070-1697-00

10 foot, 15 pin interconnecting cable
Part No. 012-0504-00

20 foot, 15 pin interconnecting cable
Part No. 012-0504-01

50 foot, 15 pin interconnecting cable
Part No. 012-0504-02

200 foot, 15 pin interconnecting cable
Part No. 012-0504-03

Extended Performance Options.
Certain optional features are offered which give additional range to the 4023 terminal's performance. These include the Ruling Character Set (factory installed, Option 31) which allows for quick drawing of solid horizontal and vertical lines to resemble documents. Also offered is the Audio Recorder Interface (Option 32) which allows the use of a commercial tape recorder for off-line data storage. This interface also enables data to be moved from the recorder to the computer via the 4023.

Convenience Options.
In addition, options are available that are designed for convenience in operating the terminal. One option is the Logic Extender Card (Part No. 067-0659-00), a design and maintenance tool that permits monitoring of the terminal bus lines via light emitting diodes. It catches momentary signals for monitoring and permits the exercising of the various bus lines. Also available are the 72 Pin Extender Card (Part No. 067-0696-00), which allows for extending any logic card outside the terminal pedestal for easy access, and the pedestal (Part No. 016-0568-00), which provides a base upon which to mount the 4023 for user convenience.

4023 Manuals
A User's Manual (Part No. 070-1621-00) is supplied and a Maintenance Manual (Part No. 070-1617-00) is available at extra cost.