



# 6000 Series Data Sheet

## 6200A Colorgraphic Computer Terminal

- Fully integrated Colorgraphics capability
- High resolution color display
- Powerful Colorgraphic Programming Language
- State-of-the-Art Raster Scan Technology
- Modular, Microprocessor-Controlled Architecture
- Teletype™ ASR-37 compatible (RS-232C and full ASCII)
- Independent Color Alphanumeric and Graphic Displays
- Interactive Graphic Input Option
- Hardcopy Interface

The Ramtek 6200A is a sophisticated, interactive computer terminal which provides the computer user with high resolution, raster scan Colorgraphics. The Ramtek 6000 Series provides to the computer graphics marketplace a highly-modular and flexible graphics terminal which gives you full color output from your computer. Ramtek gives you high resolution, cost-effective Colorgraphics today.

The 6200A Colorgraphic Computer Terminal integrates the latest in raster scan graphics and microprocessor technology with an interpretive graphics programming language to provide a comprehensive Colorgraphics terminal. The Colorgraphic Programming Language is a powerful set of user-oriented commands that are easy to learn and easy to use. This offers graphics users an efficient way to add color to their existing graphics applications. It allows non-graphics users an effective way to move immediately to Colorgraphics.

The 6200A has full color graphic and alphanumerics capabilities. The independent graphic and alphanumeric random access memories (RAM) may be viewed/either together or separately This provides maximum flexibility to the user.

The bright, flicker-free color display may be easily viewed in typical ambient light conditions. And, in addition, Colorgraphics maximizes the utility of the information displayed.

Teletype compatibility allows the user immediate access to his computer system. The 6200A has several options available to increase the graphics utility of the terminal in the computer graphics movement.

### DISPLAY

Type: High Resolution RGB Monitor, P22 Phosphor  
Non-Interlaced Raster Scan (Repeat Field)  
60 Hz Refresh Rate

Size: CRT 330mm (13") Diagonal  
Visible Raster—255mm (10") x 191mm (7.5") Y  
51 Pixels/in. x 34 Pixels/in. Y  
4:3 Aspect Ratio



### GRAPHICS

Origin: 0,0 Lower Left Corner  
Displayable Pixels: 512 (X) by 256 (Y), 1.5:1 Rectilinear  
Vector Speed (max): HORIZ 20  $\mu$ s/Pixel  
VERT 66  $\mu$ s/Pixel  
ANGLE 112  $\mu$ s/Pixel

Text Characters: 128 Displayable ASCII Characters  
7 x 10 Character Cell  
5 x 7 Character Matrix

Vector Type: Solid (Patterned Vectors/Fill Optional)  
Cursor: Blinking—Crosshair  
Blink Mode: Defined Graphic Entity Hardware (Optional)  
Color PROM: Primary Color Table—8 Colors  
White, Red, Green, Blue, Magenta, Cyan, Yellow,  
Black  
Alternate Color Table  
One Black and Seven White

### ALPHANUMERIC

Origin (Home): Upper Left Corner  
Format: 72 Columns by 25 lines, 1800 Total Characters  
Font: 96 Displayable ASCII Characters  
7 x 10 Character Cell  
5 x 7 Character Matrix  
On-The-Fly Character Generation

Cursor: Underline with Selectable Blink  
Color PROM: Green (Default)  
Primary Color Table—8 Colors  
White, Red, Green, Blue, Magenta, Cyan, Yellow,  
Black  
Alternate Color Table  
One Black and Seven White

Display Modes: Reverse Background, Blink, and Underline  
Edit Mode: Overstrike Replaces With Last Character and Color

### KEYBOARD

Detachable, 51 cm (2 ft.) Cable Standard  
Alphanumeric Group—61 Keys  
User Function Group—12 Keys  
Terminal Control Group—16 Keys  
Cursor Control Group—12 Keys  
Data Communication Control Group—5 Switches  
Parity Switch: Odd, Even, or No Parity  
Communication Mode Switch: Full Duplex and Local Echo  
TTY Mode Switch: On—64 Character ASCII or  
Off—Full ASCII

Local/Remote Switch  
Speed Switch: 110, 300 or Selectable (1200 Baud Default)  
Auto Repeat, N-Key Rollover

### TERMINAL INPUT/OUTPUT

Data Communications:  
Serial Asynchronous—EIA Standard RS 232C and CCITT /V24  
Data Rate:  
External Switch Selectable:  
110, 300 and Selectable (1200 Baud Default)  
Internal DIP Switch Selectable:  
50, 110, 134.5, 150, 300, 600, 1200, 1800, 2400, 4800  
or 9600 Baud  
Operation above 1200 baud may require nulls or handshake  
protocol to insure proper terminal operation.

Peripheral Port 1 (PER 1): DCE, RS 232C, Bit Serial Differential  
Peripheral Port 2 (PER 2): DCE, RS 232C, Bit Serial TTL

Video Outputs (BNC):  
R, G, B — Graphic and/or Alphanumeric, RS 170 Compatible  
Voltage Levels  
B/W — Alphanumeric Only  
Hardcopy — A/N and/or Graphic



MNEMONIC	INSTRUCTION	MNEMONIC	INSTRUCTION
ALARM	SOUND AUDIBLE ALARM	SBG	SELECT BACKGROUND COLOR
ALPHA	SELECT ALPHA EXECUTION STATE	SBL	SET BLINK
BARX	DRAW HORIZONTAL BAR CHART	SBU	SET BLINKING UNDERSCORE
BARY	DRAW VERTICAL BAR CHART	SCOP	SET CURRENT OPERATING POINT
BOX	DRAW RECTANGLE AND FILL	SCOPX	SET COP X COMPONENT
CAC	CLEAR ALTERNATE COLORS	SCOPY	SET COP Y COMPONENT
CAD	CLEAR ADDITIVE WRITE	CUR	SET CURSOR ADDRESS
CBL	CLEAR BLINK	SCURX	SET CURSOR X COMPONENT
CBU	CLEAR BLINKING UNDERSCORE	SCURY	SET CURSOR Y COMPONENT
CDH	CLEAR DOUBLE HEIGHT	SDH	SET DOUBLE HEIGHT
CDW	CLEAR DOUBLE WIDTH	SDW	SET DOUBLE WIDTH
CGLOFF	TURN INTERPRETER OFF	SWIN	SET WINDOW
CGLON	TURN INTERPRETER ON	TCOM	SET TERMINAL COMMUNICATION PARAMETERS
CHANGE	CHANGE CHARACTER CONTROL CODES	SFG	SET FOREGROUND COLOR
CIRCLE	DRAW CIRCLE	SFH	SET FONT HEIGHT
CONICE	DRAW CONIC TO END POINT	SFW	SET FONT WIDTH
CONICP	DRAW CONIC PARTIAL	SHS	SET HORIZONTAL SPACING
CRB	CLEAR REVERSE BACKGROUND	SHTAB	SET HORIZONTAL TAB
CVA	CLEAR VISIBLE ALPHA	SI	SET INDEX REGISTER
CVC	CLEAR VISIBLE CURSOR	SIX	SET INDEX X COMPONENT
CVU	CLEAR VISIBLE UNDERSCORE	SIY	SET INDEX Y COMPONENT
DOT	WRITE GRAPHIC ELEMENTS	SPBL	SET PLOT BASELINE
ERASE	ERASE REFRESH MEMORY	SPS	SET PLOT SPACING
EWIN	ERASE WINDOW	SPW	SET PLOT WIDTH
FILL	FILL CONVEX POLYGON	SRB	SET REVERSE BACKGROUND
GRAPH	SELECT GRAPHIC EXECUTION STATE	SSC	SELECT SUBCHANNELS
HOME	HOME CURSOR	SVA	SET VISIBLE ALPHA
HSCR	HORIZONTAL SCROLL	SVC	SET VISIBLE CURSOR
INIT	INITIALIZE INTERPRETER	SVS	SET VERTICAL SPACING
LED	SET KEYBOARD LED'S STATE	SVSC	SELECT VISIBLE SUBCHANNELS
LINE	DRAW LINKED VECTORS	SVTAB	SET VERTICAL TABS
LPF	LOAD PROGRAMMABLE FONT	SVU	SET VISIBLE UNDERSCORE
PLOTX	DRAW HORIZONTAL PLOT	TEXT	WRITE TEXT
PLOTY	DRAW VERTICAL PLOT	TTY	SET TTY WINDOW
PTEXT	WRITE PROPORTIONAL TEXT	TTYOFF	TTY EMULATOR OFF
RASTER	WRITE RASTER DATA	TTYON	TTY EMULATOR ON
RCUR	REPORT CURSOR POSITION	VALPHA	VIEW ALPHANUMERIC REFRESH SYSTEM
RECT	DRAW UNFILLED RECTANGLE(S)	VBOTH	VIEW BOTH REFRESH SYSTEMS
RESET	RESET INTERPRETER	VGRAPH	VIEW GRAPHIC REFRESH SYSTEM
RLINE	DRAW RADIAL VECTORS	VSCR	VERTICAL SCROLL
SAC	SELECT ALTERNATE COLORS	VTEXT	WRITE VARIABLE TEXT
SAD	SET ADDITIVE WRITE		
SBC	SET BLINKING CURSOR		

**PHYSICAL SPECIFICATIONS**

Table-Top Configuration

Weight: Terminal 60.0 kg (130 lbs.)  
 Keyboard 3.2 kg (7 lbs.)  
 Total Shpg. 80.0 kg (175 lbs.)

Dimensions:

Terminal—483mm H (19") x 533mm W (21") x 838mm (33")  
 Keyboard—318mm H (12.5") x 533mm (21") x 318mm D (12.5")

Power Requirements:

Input Voltage—108-130 VAC at 47 to 66 Hz  
 Power Consumption—550W (max)  
 Fusing—15 Amps (fast blow)

**ENVIRONMENTAL SPECIFICATIONS**

Temperature, Free Space Ambient

Non-Operating—20° to 65°C (4° to 149°F)  
 Operating—5° to 40°C (41° to 104°F)

Relative Humidity: 20-80% (non-condensing)

**PRODUCT SUPPORT**

Warranty: 90 days parts and labor

Installation: Terminal installation can be performed by the owner/user.  
 Refer to reference manual supplied with unit for detailed instructions. Installation can be provided upon request and at the prevailing rates by Ramtek.

Documentation Supplied:

6000 Series Installation & Adjustment Procedure  
 6000 Series Programming Manual  
 6000 Series Theory of Operations, Vol. I

**OPTIONS**

- 6002 SELECT Baud Rate  
 SELECT baud rate position may factory pre-set to baud rate other than standard 1200 baud (default) position.
- 6003 Host Interface Option  
 Current Loop or Differential operation may be selected instead of standard TTL.
- 6801 Scratchpad Memory Extension  
 12K bytes of RAM may be added to existing 4K bytes of RAM for a total of 16K bytes of Scratchpad RAM space.
- 6804 Interactive Joystick  
 Includes 4' cable
- 6805 Special Graphics Color PROM  
 A custom PROM may be ordered which will have colors selected from the 6000 Series Color Chart. Specify special colors on Selection Chart and include with order.
- 6811 Graphic Blink Overlay  
 An overlay which allows the user to "blink" graphic entities on the display. This option does preclude the normal use of the alternate color PROM.
- 6901 Subroutines Firmware  
 CALL Invoke A Subroutine  
 DEL Delete Subroutines Line Numbers  
 FKEY Assign A Function Key To A Subroutine  
 GOTO Transfer Control Within Subroutine  
 RET Return From A Subroutine  
 SEND Formatted Output From Terminal
- 6902 Patterned Vectors/Fill Firmware  
 LPL Load Patterned Line  
 PLINE Patterned Line  
 PFILL Patterned Fill

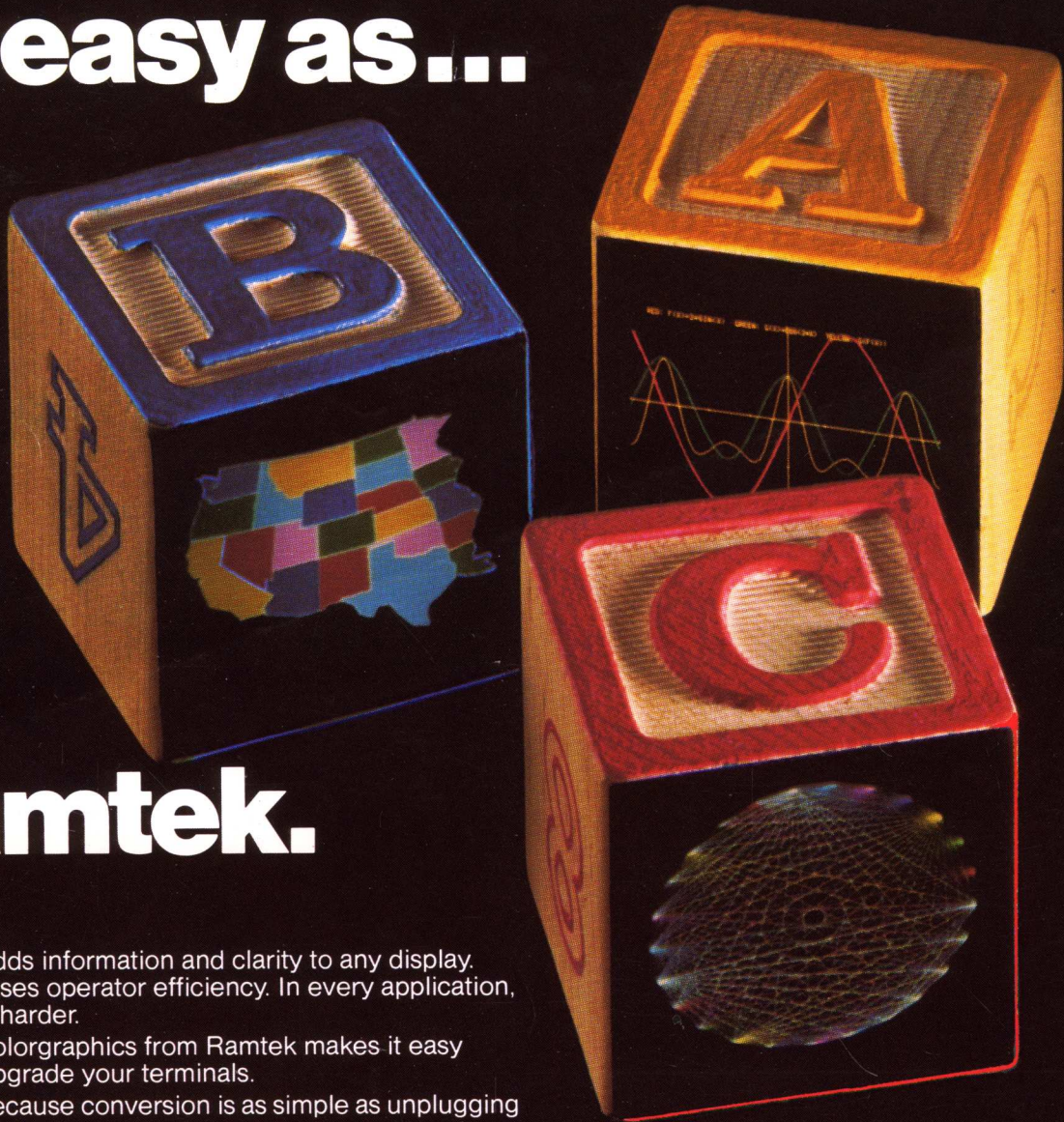


**Our Experience Shows**

585 North Mary Avenue  
 Sunnyvale, California 94086  
 (408) 735-8400



# No one can let you plug in to Colorgraphics as easy as...



## Ramtek.

Color adds information and clarity to any display. Color increases operator efficiency. In every application, color works harder.

Now, Colorgraphics from Ramtek makes it easy for you to upgrade your terminals.

Easy, because conversion is as simple as unplugging the old and plugging in the new.

Easy, because writing programs is so uncomplicated you can be displaying your first colorgraphics in half-an-hour.

Easy, because Colorgraphics is the only complete family of raster scan colorgraphics terminals.

Easy, too, because stand-alone colorgraphics terminals let you develop your color software without costly CPU overhead.

Finding out more is just as easy. Call your nearest Ramtek Office. Or, write: Ramtek, 585 N. Mary Ave., Sunnyvale, CA 94086.

**The complete terminal family is ready to plug in.**

**A. The 6110**, our lowest-priced true colorgraphics terminal. **B. The 6200A**, more capabilities per dollar than any comparable terminal. **C. The 6310**, the highest resolution raster scan color terminal made.

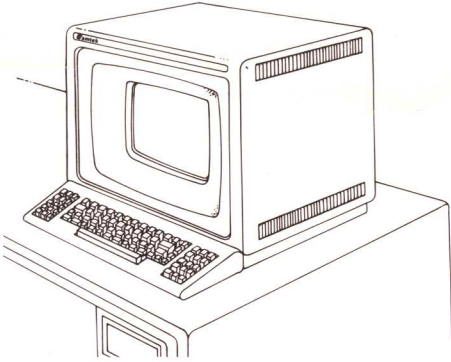
**ramtek**  
Our experience shows

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# The Colorgraphics computer terminal family is the beginning of a new era in computer graphics.

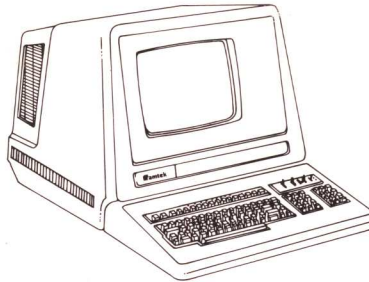
"If you are looking for true color graphics, there is no lower priced way to make the switch from monochrome or black-and-white than the new 6110 Colorgraphics"



## The 6110 Colorgraphics

- 320 x 240 x 3 graphics matrix.
- Medium resolution 13" color monitor.
- 72 x 25 alphanumerics format.
- TV compatible format.
- Eight graphics colors.
- Pedestal configuration.
- Ideal for educational, business and process control applications.

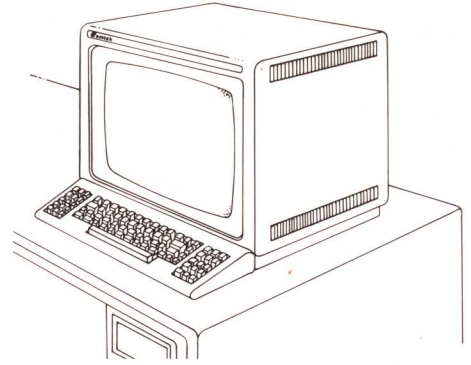
"The user who is looking for a versatile, general-purpose graphics terminal will soon discover that the 6200A Colorgraphics offers more features for the money than anything else around."



## The 6200A Colorgraphics

- 512 x 256 x 3 graphics matrix.
- High resolution 13" color monitor.
- 72 x 25 alphanumerics format.
- Eight selectable colors.
- Desktop or rack mount configuration.
- Ideal for general computer graphics applications.

"The critical fact about the Colorgraphics 6310 is performance. With an 800 x 600 displayable matrix it is simply the highest resolution raster scan color terminal on the market today."



## The 6310 Colorgraphics.

- 800 x 600 x 3 graphics matrix.
- Ultra-high resolution 19" color monitor.
- 72 x 24 alphanumerics format.
- User programmable colors.
- Color zoom/pan over the full 1024 x 1024 memory.
- Pedestal configuration.
- Ideal for high resolution computer graphics applications such as scientific research and computer aided design.

### Color does more for you

1. You can display more information on the screen at one time.
2. You get another dimension for data display.
3. You react faster to changes in data.
4. You have many more choices when coding graphics and alphanumerics.
5. It's less boring for the user; efficiency increases.

### Two terminals in one

Dual architecture gives you separate memories for graphics and alphanumerics. Each terminal can function as either a teletype or a graphics terminal or both simultaneously. Increases your flexibility in how you can assign work stations and the kinds of tasks that can be performed at each.

### TTY compatible

The family is RS 232 and CCITT (V 24) compatible. A serial asynchronous communications interface minimizes host interface problems.

### Total compatibility

The Colorgraphics family is upward and downward compatible in software, options and peripherals. There is no wasted effort, wasted money or retraining required to shift from one model to the next.

### They stand alone

Powerful terminal-resident firmware provides an easy-to-use interpreter. You can develop your Colorgraphics software off-line, without costly host computer overhead.

### From Ramtek, Who Else?

Ramtek has been the innovator in raster scan color imaging and graphics technology from the first. Nobody knows more about it. Nobody gives you more ways to take advantage of its potential—at an affordable price.

### You get true Raster Scan Colorgraphics

Every plot point is addressable. In a character graphic system the entire character cell must be one color. With raster scan, each pixel (picture element) can be a different color. It adds versatility and effectively increases color resolution.

### Easy to program

Ramtek's Colorgraphics programming language is an extremely high-order language. Commands are brief and intuitive. Complex graphics operations, such as drawing a circle require only a single command. Operator training time is reduced to a minimum.

### Easy on the user

60Hz, non-interlaced repeat field operation makes the display flicker-free. Operators can look at the display for longer periods without fatigue. The bright, easy-to-read display permits use in a wide range of lighting conditions.

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