



# HOW INTERACTIVE BECOMES INTERACTION.



## VOYAGER™ 3000 INNOVATIVE DIGITAL CABLE TERMINAL

As broadband entertainment and interactive capabilities reach new heights, technological innovations abound within the cable industry. New advances in software, hardware and bandwidth promise not only a streamlined convergence of entertainment technologies, but a variety of options and capabilities for the marketplace. Staying flexible and open to new hardware and software applications is what Pioneer's Voyager 3000 digital cable set-top is all about.

With sophisticated "system-on-a-chip" processors, and a highly integrated design architecture, the Voyager 3000 represents the latest in digital set-top achievements by Pioneer. The Voyager 3000 is a powerful interactive system, allowing you to offer your customers advanced programming capabilities and two-way addressable applications. Inside and out, the Voyager 3000 gives you the power to turn your customers' interactive needs into true interaction.



### FEATURES AT A GLANCE



**Four-Digit Tuning**  
Offers customers increased programming and service, options, expanding operators service capacities.  
*(up to 1999 CHANNELS)*



**Smaller Set-Top Footprint**  
A substantially smaller footprint than other digital cable terminals, all while optimizing many of the latest features and functions.



**Unique Architecture**  
Voyager's integrated processors offer increased memory performance, more powerful graphics processing and advanced application capabilities.



## VOYAGER 3000 ADVANCED PRODUCT FEATURES

The Voyager 3000 offers many of today's most desired technological capabilities and features.

**Advanced Chip Integration** – Powered by **Broadcom's 7100** Dual-Processor CPU core chipset, the Voyager offers dedicated processing power to both graphics processing and session-based applications. In addition, the multi-function CPU offers MPEG decoder and a higher level of DAVIC 1.2 implementation, all on one chip, while decreasing the products overall footprint by 33%.

**Conditional Access and Signal Security** – Uses **PowerKEY™** multi-layer encryption system. Compliant with Harmony/DVB/ and DES Decryptor Codecs.

**More Channels, More Programming** – Allows for thousands of channels of programming, enabling operators to offer customers expanded VOD, PPV, interactive and session or venue-based services.

**Enhanced Memory Configuration** – The Voyager 3000 ships standard with 16MB RAM for applications/graphics, 2 MB RAM for MPEG decoding, 8 MB Flash ROM and 4 KB NVRAM for more reliable memory performance.

**Connections** – As with the Voyager 1000, the Voyager 3000 supports USB, S-video, Composite video, baseband stereo and boasts an optional IEEE 1394 (Firewire) port for peripheral hardware connectivity.

## SPECIFICATIONS AT A GLANCE

### Operating System

PowerTV™

### Processor

Broadcom™ BCM7100 Dual-Processor

### Frequency Range

54 MHz to 860 MHz

### Digital Video Format

MPEG-2 Video Decompression, MP@ML (ISO/IEC 13818-2) Variable bit-rate 1.5 to 15Mbps, with various levels of resolution: 704 X 480, 352 X 480 and 544 X 480

### Digital Audio Format

Dolby AC3, Musicam, MPEG-1  
PCM – PowerTV synthesized audio APIs

### Down Stream Control Signal

70 MHz to 130 MHz agile; QPSK modulation; 1.544 Mbps; 1 MHz bandwidth  
Input level: -16 to +15 dBmV RMS

### Up Stream Control Signal

8 MHz to 26.5 MHz agile; QPSK modulation; 256 Kbps or 1.544 Mbps; 1 MHz bandwidth; variable +55 dBmV RMS min.

### Input/Output (Rear Panel)

USB  
S/PDIF  
IEEE 1394 (optional)  
VCR commander port (serial port)  
Baseband Video – input/output  
Baseband Audio (L/R) input/output  
S-Video  
3/4 Channel RF input/output – (NTSC)  
AC Outlet – (400W, Switched)

### Memory

16MB SDRAM (optional 32MB SDRAM),  
8MB Flash ROM

### Dimensions

320mm x 252.6mm x 68.5mm  
12.6 in. x 10 in. x 2.7 in.



WHAT TELEVISION CAN BE.™



## VOYAGER™ 1000 INTERACTIVE DIGITAL CABLE TERMINAL

Ever increasing programming options and technologies have yielded sophisticated digital consumers who demand and expect more than just simple television broadcasting piped into a coaxial cable.

In response to these consumer demands, Pioneer Digital Technologies created the Voyager 1000 digital cable terminal. The first in a line of innovative digital set-top platforms developed by Pioneer for the broadband industry of tomorrow.

Advanced features, such as video decompression, superior picture quality, IP addressing, 32-bit processing, and increased channel capacity enhance the overall viewing experience and provide a versatile portal for interactive entertainment.

Together, you and Pioneer can offer an advanced level of entertainment that transforms traditional television viewing into a truly interactive experience. With the Voyager 1000, your customers will see "What Television Can Be."



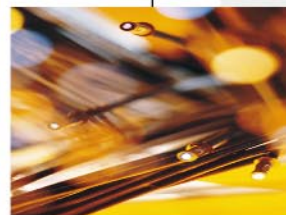
### FEATURES AT A GLANCE



**Superior Graphics**  
With native MPEG-2 Video decompression, the VOYAGER 1000 cable terminal offers superior graphics, performance and reliability.



**Modern, Elegant Design**  
Sleek contoured faceplate, with easy access, full-featured controls.



**Wide Bandwidth**  
860MHz tuner supporting both analog and digital signal services.



## VOYAGER 1000 ADVANCED PRODUCT FEATURES

Pioneer's Voyager 1000 digital cable terminal offers a robust selection of features and capabilities.

**Addressable Set-Top Communications** – uses IP addressing enabling the set-top to address the headend unit or act as a router for external communications to a personal computer or other consumer electronic devices.

**Supports Interactive and Session-Based Services** – Voyager contains a DAVIC-based return transmitter and “out-of-band” control channel, supporting services such as VOD or internet access, e-mail, and web browsing.

**Conditional Access and Signal Security** – Uses PowerKEY™ multi-layer encryption system. Renewable Security from ISO-7816 compliant smart card for a user installable upgrade path for renewable security.

## SPECIFICATIONS AT A GLANCE

### Operating System

PowerTV™

### Processor

Uses a 32-bit (RISC) MicroSparc™ II microprocessor

### Frequency Range

54 MHz to 856 MHz

### Digital Video Format

MPEG-2 Video Decompression, MP@ML  
Variable bit-rate 1.5 to 15 MBPS, with various levels of resolution 704 X 480, 352 X 480 and 544 X 480.

### Digital Audio Format

Dolby AC3, MUSICAM

### Down Stream Control Signal

70 MHz to 130 MHz agile; QPSK modulation; 1.544 Mbps; 1 MHz bandwidth

### Up Stream Control Signal

8 MHz to 26.5 MHz agile; QPSK modulation; 256Kbps or 1.544 Mbps; 1 MHz bandwidth; +20 dBmV RMS min.

### Input/Output (Rear Panel)

USB

S/PDIF

VCR commander port (serial port)

Baseband Video – output

Baseband Audio (L/R) output

S-Video

3/4 Channel RF input/output – (NTSC)

AC Outlet – (400W, Switched)

### Memory

8MB DRAM, 4MB Flash ROM

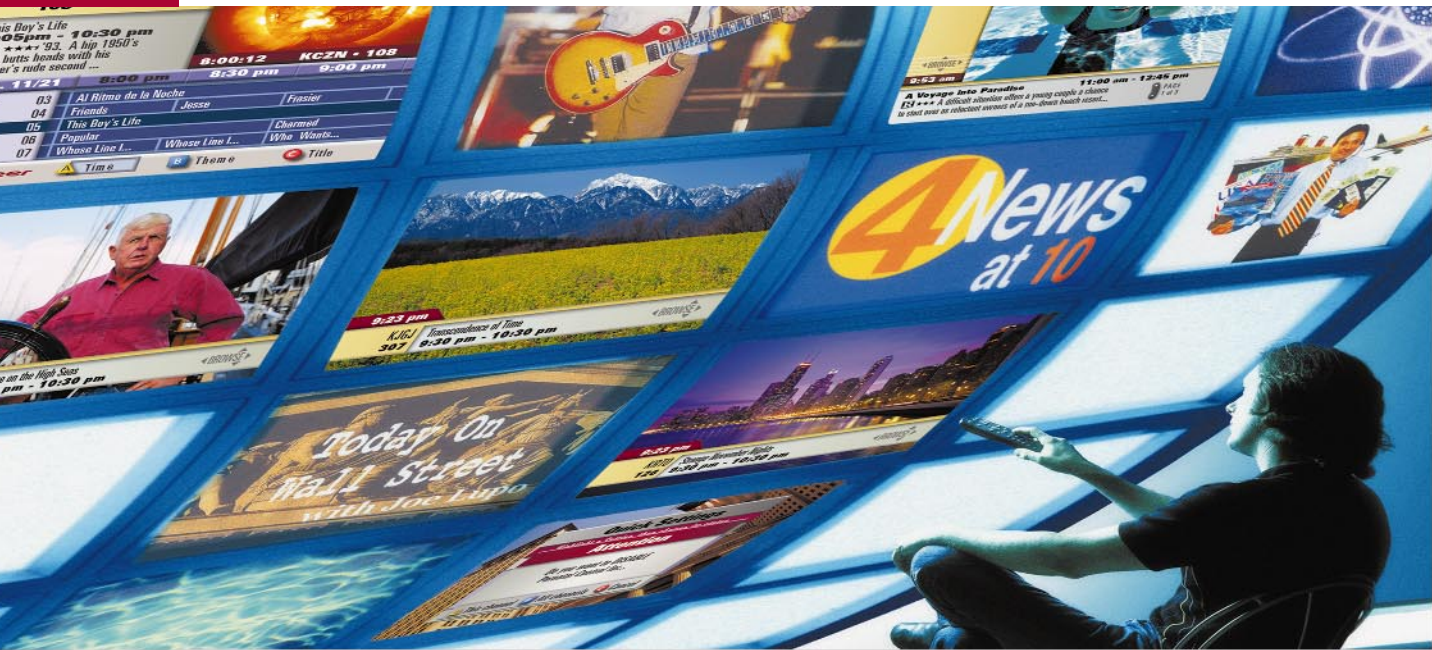
### Dimensions

380mm x 295mm x 48mm

15 in. x 11.6 in. x 2.7 in.



# HOW INTERACTIVE BECOMES INTERACTION.



## PASSPORT™ 3.0 APPLICATION SUITE



Pioneer's advanced set-top application suite gives your customers the power to harness the digital entertainment and services of today with the flexibility to expand as your system demands. Passport is a reliable, industry-proven technology—well designed, highly extensible software renowned for its quality and performance.

Passport offers a comprehensive array of powerful digital capabilities. Offering features such as integrated VOD, channel banners, Interactive Program Guide with advanced program scheduling and detailed program information.

Passport also offers other advanced features such as on-demand downloadable applications, HTML-based virtual channels, advanced parental control, and a variety of other session-based capabilities. Through Pioneer's innovative software, your customers will learn how interactive truly becomes interaction.

### FEATURES AT A GLANCE



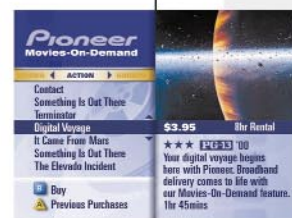
#### Interactive Program Guide (IPG)

A powerful and feature-rich guide offers viewers precise control over detailed programming and schedule information.



#### Quick Info™ Feature

Video scales slightly to reveal side and bottom display bars with full program descriptions and channel browsing capabilities.



#### Video-On-Demand (VOD)

Fully-integrated VOD capabilities allows operators to easily introduce channel or venue-based VOD services.



## TURNING INTERACTIVE INTO INTERACTION

With thousands of channels of programming available, the ease of “channel surfing” is becoming a thing of the past. Unlike other guide solutions, Passport is a native platform that minimizes usage of network bandwidth, allowing for video and guide operations to work in unison—seamlessly. It offers easy-to-use navigation capabilities customers need to make the most of high-capacity digital entertainment and services.

**Interactive Program Guide** – Quick and responsive navigation interface to select, search, or purchase programming. Gives users extensive programming information and access to a wide range of features while watching selected programming:

- **Advanced Scheduling** – Seven full days of programming data available for every channel.
- **Variable Channel Listings** – Search programming by “Theme” (i.e. sports, soap operas) and “Title” (i.e. alphabetically), in addition to channel and time.

**Support for PPV and VOD Services** – Designed to maximize buy rates for operators and to offer complete convenience to subscribers.

**VCR Programming** – Set up recordings via the IPG with the touch of a button or easily set up custom recordings in the “General Settings” area.

**Two-Way Application Ready** – Support for real-time, two-way applications such as video-on-demand, e-mail, network games and Web browsing.

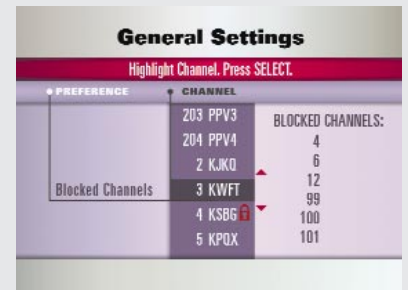
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## FEATURES AT A GLANCE



### Channel Banner Browsing

Gives viewers current programming information on other channels while watching the current selection, all without having to change channels.



### Advanced Parental Control

Offers configurable timers, channel blocks and PIN security features for easier parental administration of cable viewing.

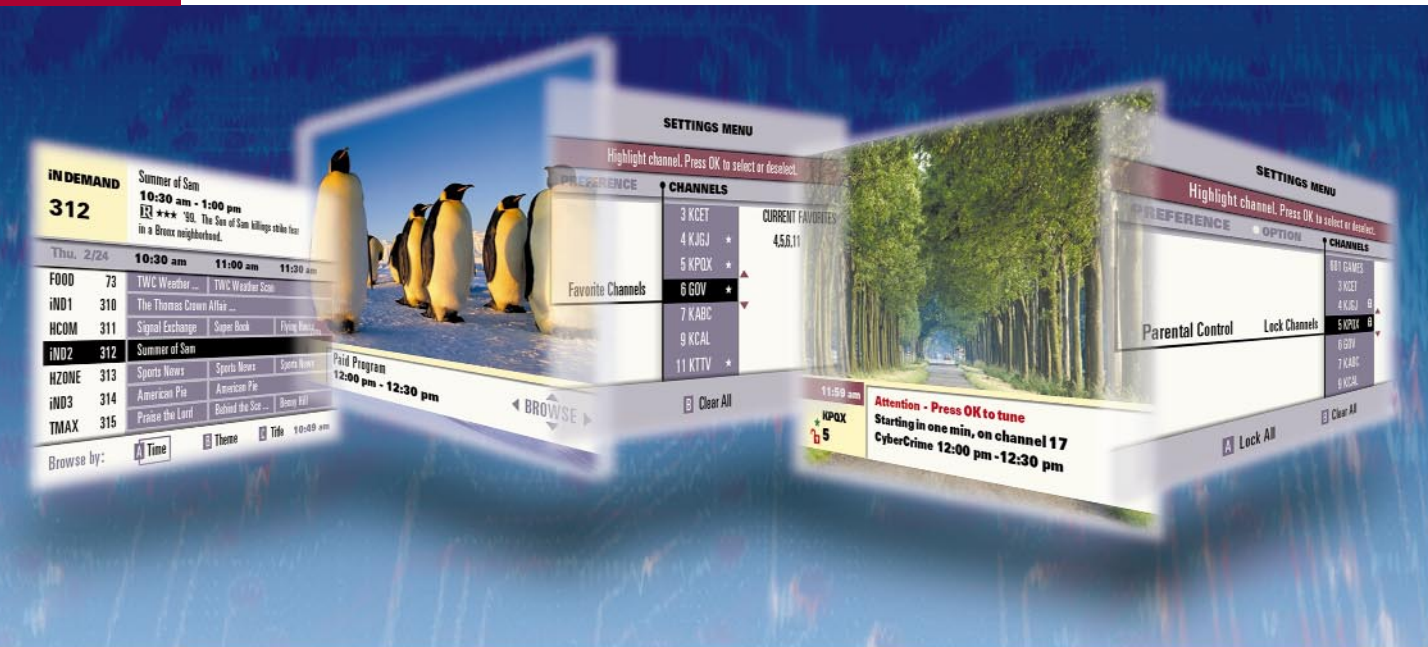


### Advanced Pay-Per-View

Purchase events up to seven days in advance with detailed on-screen reporting of pending and completed purchases.



# HOW INTERACTIVE BECOMES INTERACTION.



## PASSPORT™ - DCT APPLICATION SUITE



As cable programming has grown, especially with the advent of high-volume digital channel capacities, so has the consumer demand for better and easier navigation solutions across platforms in the digital cable industry.

On behalf of that demand, Pioneer developed Passport-DCT for Motorola's DCT-2000 series of set-tops. Passport-DCT contains many of the features and capabilities previously only offered on Passport for Pioneer's Voyager™ and SA's Explorer™ terminals.

Passport-DCT offers customers such amenities as VOD, four-digit tuning, a scrollable interactive program guide, banner browsing, last channel functions, favorite channel tuning, support for one-way and two-way (impulse) pay-per-view — providing customers extensive control over their digital entertainment.

### FEATURES AT A GLANCE



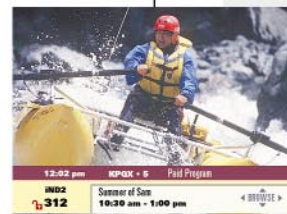
#### Interactive Program Guide (IPG)

Gives your subscribers easy access and control over highly detailed programming and schedule information.



#### PPV and VOD Support

Features one-way and two-way PPV and IPPV along with VOD service capabilities.



#### Channel Banner Browsing

Banner browsing allows subscribers to review scrollable program information about other channels while watching the present selection.



## PASSPORT-DCT OFFERS ADVANCED FEATURES

Pioneer's Passport-DCT offers many advanced features and configurable controls to DCT-2000 users.

**Interactive Program Guide** – Clear user navigation screens to select, search or purchase programming days in advance.

- Variable Channel Listings – Search programming by “Theme” (i.e. sports, soap operas) and “Title” (i.e. alphabetically), in addition to channel and time.
- Larger Scrollable Field – subscribers can review up to seven full lines of program information at a time.

**Tuning** – Up to four digit tuning; tunes to one-digit or two-digit channels automatically after a short time-out; favorite channel tuning; last channel tuning; and tuning from the guide.

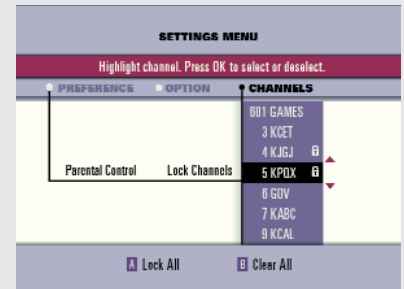
**Channel Skipping Feature** – Allows customers to designate unwanted channels from channel browsing cycle.

**Two-Way Application Ready** – Support for real-time, two-way applications such as VOD, e-mail, network games and Web browsing.

**Digital Music Services** – Channel-based tuning to digital music services with song title information.

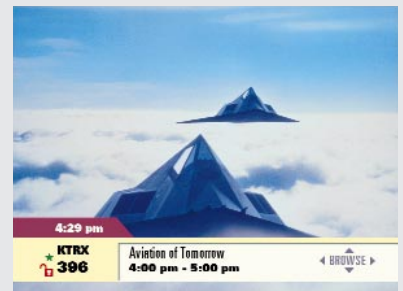
**Graphical User Interface** – Animated graphic transitions provide intuitive cues for user navigation.

## FEATURED MENU ITEMS



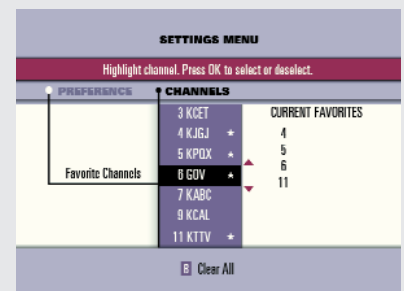
### Advanced Parental Control

Offers configurable timers, channel blocks and PIN security features for complete parental administration.



### Channel Banner Browsing

Gives viewers programming information on other channels while watching the current selection, all without having to change channels.



### Favorite Channel Tuning

Ability to tune to the next favorite channel in sequence via dedicated remote control FAV (favorite) button.



# BUILDING TOWARDS A BETTER BROADBAND.



## BROADBAND OUTLOOK PIONEER SYSTEMS & TECHNOLOGY

Through the efforts of the telecommunication and cable industries, digital convergence looms ever closer to becoming a consumer reality. Pioneer New Media Technologies stands poised to deliver on the promise of the broadband digital home network.

For over 25 years, Pioneer has been developing many of the innovative digital core technologies that will comprise the in-home digital network of the near future. From our Voyager™ digital set-top, digital content will flow seamlessly between digital devices. These consumer electronic devices ranging from digital A/V components to CD/DVD jukeboxes, DVD-RW digital recorders, HDTV plasma screens, even off-line devices such as portable players— all of which will be accessible and controlled by Pioneer's Passport.™

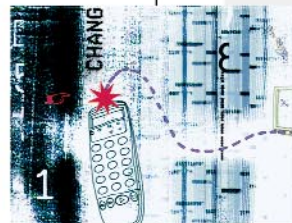
As digital convergence progresses, you can rely on Pioneer New Media Technologies to continue it's efforts in creating innovative broadband products and solutions.



### DIGITAL ADVANCEMENTS



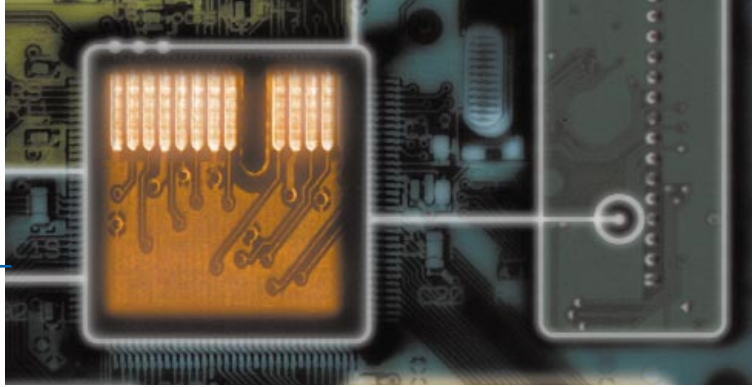
**Pioneer Digital Firsts**  
First consumer laserdisc video player, first interactive cable television, and developers of the DVD-R and DVD-RW media formats and recorders.



**Voyager and Passport**  
Pioneer's cable technology will enable interoperability throughout the digital environment in the home, office and on the road.



**Digital Expertise**  
Of all cable manufacturers, only Pioneer has the expertise in all digital disciplines—including consumer electronics, to achieve true interoperability in the broadband era.



## A BRIEF GLIMPSE OF THE DIGITAL FUTURE

Pioneer New Media Technologies— a driving force behind the development, adoption, and integration of digital products and services has a distinct vision of where broadband convergence will take us. The following is a brief glimpse of what Pioneer has in store for your digital home:

**Voyager™** – Will function as gateway technology for digital content deployment, transmission and reception.

**Passport™ Application Suite** – Will evolve its current capabilities to become the network user interface for all in-home digital devices and peripherals.

**Pioneer CD/DVD Changers** – Will serve as functional data storage for audio, video and data playback and accessible archiving.

**Pioneer CD-R & DVD-RW Recorders** – Will become the standard portable medium for networked data storage and digital video recording or playback.

**Pioneer Plasma Displays** – Will be the high definition window into the interactive digital home network.

## DIGITAL BENCHMARKS

### **Pioneer Helps Create World's First Two-Way Addressable Cable System**

In 1977, Pioneer develops commercial interactive CATV system "QUBE" with Warner Cable Communications.

### **Pioneer Creates the World's First Laserdisc Player**

In 1977, Pioneer announces and delivers its first consumer optical video disc player (Laserdisc).

### **New Interactive Cable TV System Deployed in the U.S.**

In 1989, Pioneer begins distribution of second generation interactive cable television systems.

### **Pioneer and Industrial DVD-Video**

In 1991, Pioneer launches the world's first true industrial DVD-Video player and remains the world's leading DVD player manufacturer.

### **Industry's First DVD-Recordable Format**

In 1997, Pioneer ships industry's first DVD-Recordable drives and media.

### **Rewriting History with DVD-RW Format**

In 1998, Pioneer announces industry's first 4.7GB DVD-R and RW writer.

### **Pioneer Makes Innovative Displays**

In 1999, 50-inch HDTV-ready plasma displays are introduced.

### **Pioneer Launches Digital Cable**

In 1999, Pioneer introduces Voyager 1000 digital cable terminal and Passport Application Suite to U.S. cable market.

### **Next Generation of Digital Cable**

In 2000, Pioneer develops its newest digital set-top terminal, the Voyager 3000.



# INNOVATION IN NEW MEDIA TECHNOLOGIES.



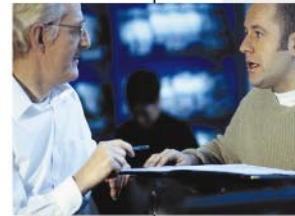
## PIONEER'S DEDICATION TO TECHNOLOGICAL LEADERSHIP.

Pioneer first entered the cable television field over twenty-five years ago, working alongside Warner Cable Communications applying two-way interactive technology. Since those early days, Pioneer has maintained a reputation for product quality and reliability. With its steadfast dedication towards technological development, Pioneer continues to be an innovative leader in the cable television industry.

Developing a wide range of digital products and applications including interactive cable set-tops and software, plasma displays, DVD players/recorders and GPS car navigation systems, Pioneer has become one of the world's preeminent manufacturers of audio/video products for home, commercial and industrial use.

These ground-breaking advances are clear milestones in Pioneer's commitment to a long-term broadband strategy. By creating interoperability and functionality between our core digital technologies, Pioneer will offer fully-integrated solutions for consumer entertainment.

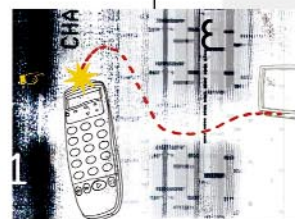
### LEADERSHIP IN INDUSTRY



**Dedication to Digital**  
Pioneer offers digital expertise in several disciplines: home audio/video components, digital set-tops, optical data storage, and high definition plasma television.



**Industry Innovations**  
Among Pioneer's digital accomplishments: first consumer laserdisc player, first interactive CATV, developers of DVD-R and DVD-RW media and recorders.



**Pioneer's Vision**  
In the future, you can be sure that Pioneer will continue to dedicate its technological expertise to the converging digital entertainment environment.



## PIONEER'S DIGITAL CABLE DIVISIONS

Pioneer has many divisions creating the digital technologies that will help the cable industry in the years to come. Chief among them are the divisions under Pioneer Digital Technologies (PDT).

PDT was established in San Diego in 1996, and is a subsidiary of Pioneer Corporation. The company is an engineering-based advanced products development division, responsible for hardware and software design, as well as development for the next generation of cable set-top boxes.

PDT now has three locations dedicated to developing advanced digital software applications and digital terminals:

**PDT Burbank, California** – Developers of Passport™, Pioneer's broadband software application suite for interactive digital set-tops.

**PDT Salt Lake City, Utah** – Pioneer's Network Systems division is focused on the development of network control systems to support Pioneer's advanced digital set-top products.

**PDT San Diego, California** – Developers of Pioneer's innovative digital cable hardware, such as the VOYAGER series of digital cable terminals.

## TIMELINE AT A GLANCE

**1938** – Pioneer is founded in Tokyo

**1947** – Pioneer is incorporated as Pioneer Electronic Corporation.

**1973** – Pioneer establishes Pioneer Communications of America (PCA) in the U.S. to pursue CATV business.

**1975** – Pioneer begins full-scale research into optical video disc technology and media.

**1977** – Pioneer develops first commercial interactive CATV system "QUBE" with Warner Cable Communications.

**1977** – Pioneer announces its first optical video disc player.

**1985** – Pioneer begins sales of one-way addressable impulse PPV in Queens, New York.

**1989** – Pioneer begins distribution of second generation interactive CATV systems.

**1991** – Pioneer launches the world's first true industrial DVD-Video player and remains the world's leading DVD player manufacturer.

**1997** – Pioneer introduces the BAV-2000, Advanced Analog Set-Top Box.

**1999** – Pioneer deploys Voyager 1000 digital set-top and Passport Application Suite.

**2000** – Pioneer develops the Voyager 3000 next-generation digital set-top.