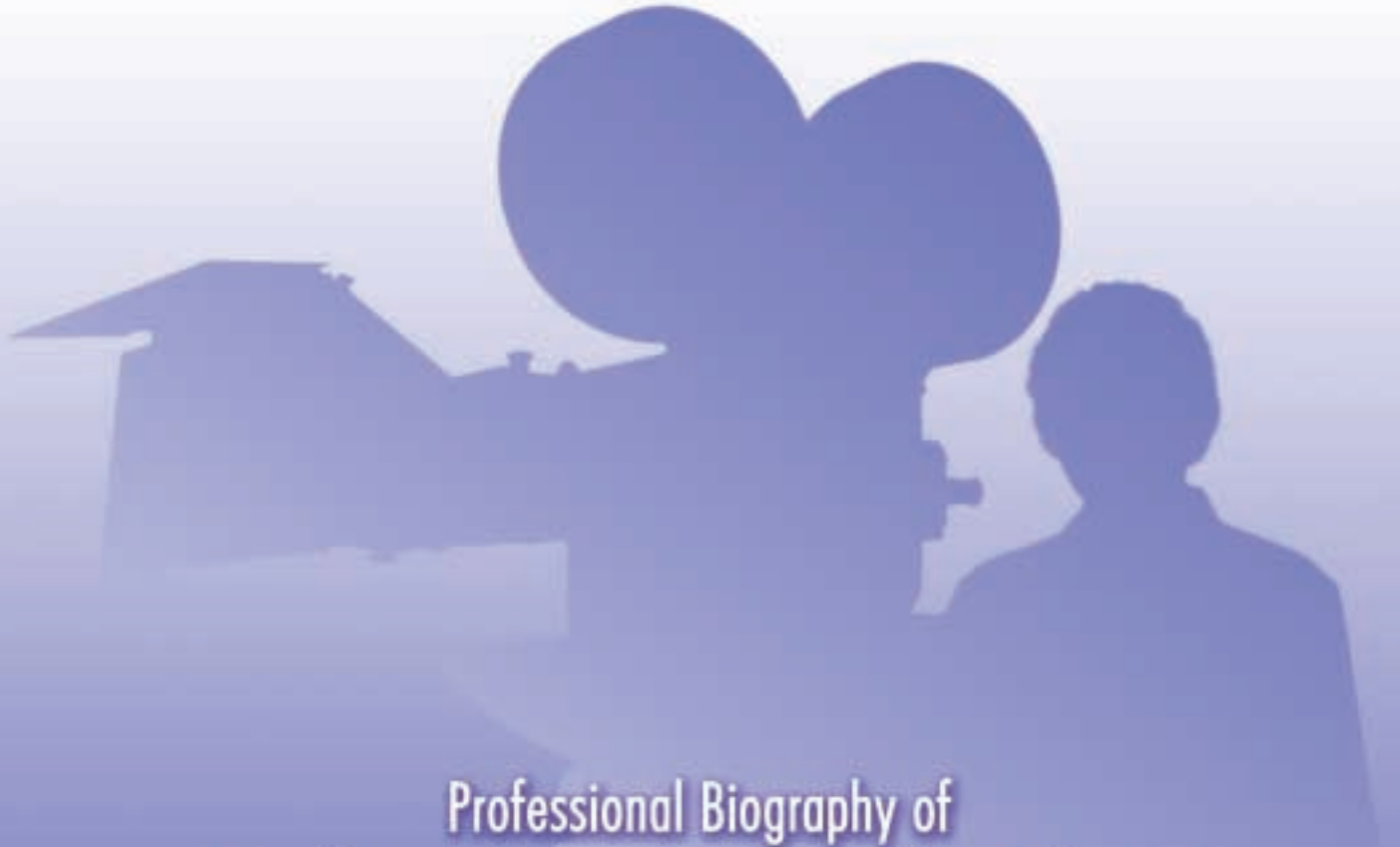

Professional Biography of

John A. Rupkalvis

Stereoscopic Imaging Consultant with

StereoScope™ International

Overview

PROFESSIONAL BIOGRAPHY OF JOHN A. RUPKALVIS

STEREOSCOPIC IMAGING CONSULTANT

CREATIVE CINEMATOGRAPHY, VIDEOGRAPHY, SPECIAL EFFECTS, DESIGN, ENGINEERING, COMPUTER GRAPHICS, VIRTUAL REALITY, GRAPHIC ARTS

Currently CEO of StereoScope International, which he founded in 1972, and Vice President of StereoMed, Inc., which he co-founded in 1978, John A. Rupkalvis has an extensive technical and artistic background in the fields of stereographic science and engineering, cinematographic, video, and computer technologies.

EDUCATION:

University of Minnesota B.A. Degree
University of Minnesota: Guest Lecturer, Video Systems
U.S.C. (University of Southern California), Cinema Dept., Certificate
U.S.C. Guest Lecturer, Special Effects 1982-1984
Winona School of Professional Photography, P.P.A. Certificate
Control Data Institute, Computer Technology, Certificate
Rochester Institute of Technology, Guest Lecturer
Minneapolis Art Institute, Certificate, Guest Lecturer
Bell & Howell School of Professional Cinematography, Certificate
Institute for Graphic Communication, Certificate, Guest Lecturer
Pasadena City College, Guest Lecturer

CHRONOLOGY:

1956-1958: On commission, designed three multimedia auditoriums which were built by the University of Minnesota. These employed several innovative features, including stereoscopic projection and six channel surround sound systems, which made use of his special acoustical design that compensated for audience size from 1 to 600 people.

1958-1960: Designed and built stereoscopic still photography systems and video projection systems. Conducted experiments with live audiences on the effects of varying screen size and distances on the perception of stereoscopic images; and the relationship of acoustics and audio tracking to stereoscopic parallax retention.

1960-1964: Photographic Engineering for Pako Corporation, including first failsafe system for tricolor developer exposure lamps in Kodachrome processor. Patent was later licensed by Pako to Eastman Kodak.

1964-1972: Senior Photographer and Photo Systems Technologist for the James Ford Bell Research Laboratory. Designed and operated photo studio and lab; considerable scientific analytical stereoscopic photography and cinematography. Several awards for artistic as well as technical accomplishments, by the Minnesota Commercial Industrial Photographers Association (MCIPA) and the Professional Photographers of America (PPA). One of several projects included stereoscopic projection to an audience inside a 70 ft. diameter inflated sphere.

1972-present: Founded StereoScope International, developing an extensive clientele for stereoscopic acquisition and display in film, video, publications, special effects, CGI, simulation, virtual reality, robot vision, telemetry, and other areas. Represented: polarized, anagyphic, Pulfrich, PLZT (Liquid Crystal), time parallax, temporal, prismatic, pellicle, reflex stereogram, free vision, lenticular, random dot, holographic, and nearly all other stereoscopic and autostereoscopic systems.

One of the first projects was an interactive 3-D projection television virtual reality system built for the University of Minnesota in 1972. Six years later, he did the only optical correction of the Viking Mars Lander telemetry for geometrically corrected stereoscopic images. During this time, he was stereoscopic consultant for the first Imax 3-D tests. Research in bluescreen, greenscreen, sodium, front and rear projection systems led to the development of several special effects systems, including the Gallery front projector developed for Nord Photo Engineering, and the first (and so far, only) stereoscopic front projection system.

The StereoScope special effects cinematography system (35mm & 70mm), the StereoScope television systems, the StereoScope animation and title production system, as well as several proprietary systems were all designed and developed.

He designed and constructed special 3-D television viewing systems for Alpha Productions, 3-D ImageTek, Wong, and others. He worked with Chris Condon in the design and engineering of the largest single film 3-D motion picture format in existence at that time: the over-and-under 10-perf pulldown 65mm camera.

An extensive list of national and international clients in entertainment, education, industry, medical, and governmental fields, includes StereoVision, Imax, 3-D Image Tech, Spatial Technology, NASA, JPL and many others. The installation of 3-D projection optical systems in several hundred theaters, auditoriums, screening rooms, and special venues around the world for StereoVision, Marks Polarizer, and Spatial Technology, is greater than the number of such installations by all other stereoscopic consultants combined.

1978-present: Co-founded StereoMed, Inc., designed and developed several stereoscopic medical systems, including the StereoMed camera, currently in use in several hospitals and clinics, the StereoMed View-Master reels, and the StereoMed FDA approved stereoscopic remote diagnosis system, which has been written up in several prestigious medical journals.

DURING THIS ENTIRE PERIOD HE AUTHORED over 250 papers and articles which were published in national and international professional journals and other publications, such as the SPIE Journal, the SMPTE Journal, American Cinematographer, Industrial Photography, Stereoscopy, Peterson's Photographic, etc. His achievements have been lauded by renowned experts such as David B. Eisendrath.

PROFESSIONAL ORGANIZATIONS

SMPTE (Society of Motion Picture and Television Engineers); served on Stereoscopic Motion Picture Standards committee.

SPIE (Society of Photo Instrumentation Engineers); Published paper on StereoScope 3-D cinematography system. Published paper on Human Vision and Stereoscopic Displays, co-chaired committee on the stereoscopic lexicon.

SPSE (Society of Photographic Scientists and Engineers); Chaired several committees, organized meetings.

PPA (Professional Photographers of America); Judge, National Exhibition; numerous awards.

MCIPA (Minnesota Commercial and Industrial Photographers Association); Judge, State Exhibition; numerous awards, including several first place and one Grand National.

ISU (International Stereoscopic Union); Published several articles in the international journal, including the definitive series on stereoscopy and autostereoscopy.

SCREEN CREDITS (Partial List)

35mm 3-D Motion Pictures

METALSTORM: Stereoscopic Consultant, 3-D Special Effects, Rotoscope Supervisor; Universal Pictures feature, StereoVision and StereoScope 3-D. Acclaimed by film critics as the best of the 3-D films with the best 3-D special effects.

PAMPLONA 3-D: Stereoscopic Consultant; StereoVision special venue 3-D film shot in Spain for Expo '92.

PATHÉ BÉBÉ: Stereoscopic Consultant; StereoVision feature shot in France

ROCK'N'ROLL HOTEL: Stereoscopic Consultant, Camera Operator; StereoVision and StereoScope 3-D feature.

THE WILD RIDE: Camera Operator, 3-D titles, Associate Stereoscopic Consultant; StereoVision and StereoScope 3-D.

REEBOK 3-D: Stereoscopic Consultant, 2nd Camera Operator; StereoVision 3-D for Reebok.

HEARTBEAT OF AMERICA: Stereoscopic Consultant, 3-D titles; StereoVision 3-D for Chevrolet.

PEUGEOT CORPORATE FILM: Stereoscopic Consultant; StereoVision 3-D shot in France.

JAI BHETALA: Stereoscopic Consultant, Camera Operator; StereoVision and StereoScope 3-D feature shot in India.

GRETCHEN'S SECRET: Director of Photography, Stereoscopic Consultant; StereoScope 3-D.

EDGE OF REALITY: Stereoscopic Consultant, 3-D Titles; StereoVision and StereoScope 3-D special venue film.

35mm Panavision Motion Picture

JOURNEY TO THE CENTER OF THE EARTH: Special Visual and Electronic Effects; Cannon Feature, Photography Directed by Oscar Winner David Watkins.

70mm 3-D Motion Pictures

T2-3D (TERMINATOR): Stereoscopic Consultant; Assignment by StereoVision for this special venue dual 70mm 3-D film directed by James Cameron, starring Arnold Schwarzennegger.

LA CONCIERTO POR LA TIERRA: Stereoscopic Consultant, 3-D Special Effects, 3-D Titles; First 3-D film in Showscan 60 fps 70mm.; first 3-D film with Rupkalvis time parallax system

FAMILY CIRCUS: Stereoscopic Consultant, Assistant Camera Operator; 70mm StereoVision 3-D for Renault.

BLASTRON: Stereoscopic Consultant, 3-D Special Effects Advisor, CGI Advisor; 70mm StereoVision 3-D for United Artists.

70mm Technirama Motion Picture

SPARTACUS: Camera Operator, Optical Printer designer; Universal Pictures 70mm feature, Technirama (Anamorphic VistaVision) to 65mm film optical printer restoration.

Live Stereoscopic 3-D Stage Production

PALM PILOT SHOW: featuring Pilobolus Dance Troupe. A live performance for 4000 people, cast on a 20x40 foot projection screen in full stereo. Process used a unique 14 kilowatt xenon projection system. Concept and execution by John Rupkalvis. Produced by Gerald and Doris Cain, Dynamite Films.

3-D Television

SMPTE 3-D HDTV: Director of Photography, Stereoscopic Consultant; StereoScope 3-D HDTV ; First demonstration of 3-D HDTV (1985 SMPTE Convention).

30th ANNIVERSARY OF ROCK'N'ROLL: Director of Photography, Stereoscopic Consultant, 3-D titles; Pulfrich 3-D television.

MAGIC MOUNTAIN U.S.A. (DAYDREAM): Stereoscopic Consultant, Camera Operator; StereoVision 3-D. Video transfer. Includes first wideangle 3-D roller coaster scene.

REACH FOR THE STARS: Stereoscopic Consultant, Camera Operator; StereoScope 3-D TV Music video in 3-D, with stereoscopic laser projection, directed by Oscar winner Martin Landau.

CINEMARIDE: Stereoscopic Consultant, video alignment advisor, CGI Consultant.
StereoVision 3-D. Video transfer.

NTT TELEPHONE SHOW OF TOKYO: Stereoscopic Consultant, Camera Operator, CGI Consultant; StereoScope 3-D television, shot in Japan.

3-D BIRTHDAY PARTY: Director of Photography, Stereoscopic Consultant, 3-D Special Effects, 3-D titles, CGI Supervisor; StereoScope digital 3-D television.

CARDIO STREET JAM: Director of Photography, Steadicam Operator; Aerobic music video with Pulfrich inserts.

STEREOSCOPIC CINEMATOGRAPHY: Producer, Director of Photography; program insert broadcast on the CBC network in Canada.

EFFECT OF AIRPORT X-RAYS ON FILM: Expert testimony described and illustrated by him in his video which was presented an the ABC, NBC, and CBS television networks.

GLORIA ESTEFAN MUSIC VIDEO: Special Advisor.

JON SECADA MUSIC VIDEO: Special Effects videography with StereoScope 3-D video micro videocam.

WHITNEY HOUSTON MUSIC VIDEO: Special Advisor.

3-D Television Conversions

BWANA DEVIL • KISS ME KATE • FORT TI • GORILLA AT LARGE
MORK & MINDY IN 3-D • THE ELVIRA SHOW
& several others

3-D Print Publication

CAPTAIN EO
STEREOSCOPIC ONE SHEET FOR FRIDAY THE 13TH PART 3 IN 3-D
SABRINA • 3-D GREETS (BAYLOW PRODUCTIONS)
SONOMA NEWSPAPER ADVERTISING • 3-D COSMIC
& several others

John A. Rupkalvis

References (Partial List)

Chris Condon, President, StereoVision Entertainment
Founder, Century Precision Optics
(818) 207-9498
(760) 431-2900

Bruce Austin, President, BAP Productions
Award Winning Film and Video Producer
Computer Game Producer (Sega, etc.)
(818) 842-0820

Herb Lightman, Producer
Former Editor, American Cinematographer
(530) 546-5238

Douglas Stanley
General Manager, C3D Television
(530) 889-2158

Andrew Woods, Research Engineer
Curtin University, Perth, W. Australia
6-189-266-7920

Anthony J. Coogan (Jackie Coogan Jr.), President/Producer
Stereo Media
(818) 559-6515

Mitch Francis, President
Cinemaride
(818) 761-1002

Dave Hewitt, Opticals
Imagination Effects
(818) 764-8362
(818) 207-9498

Don Iwerks, President
Iwerks Entertainment
(818) 841-7766

Andrew Gellis, Sr. Vice President
Imax Corporation
(310) 979-5611

PROFESSIONAL REFERENCES - *Domestic*

ABC TELEVISION
Don McCroskey, Former Manager,
Unilateral Broadcasting (Retired)

AGD GRAPHIC DESIGN GROUP
Melissa McDill, CEO

AIR TECH, INC.
George Otis, President

ALPHA PRODUCTIONS
John Lamb, President

APPLIED PHOTO SCIENCES, INC
Dr. Charles W. Wyckoff, President

AQUA DECK CO.
Marine Cine Systems
Leon Halfon, President

BAYLOW PRODUCTIONS
John Baylogh, President

BEYOND THE THIRD DIMENSION
Sean McDonald, President

BOB CARAN PRODUCTIONS
Bob Caran, Producer

BRICK PRICE MOVIE MINIATURES
Brick Price, President

BROADWAY/HOLLYWOOD PRODUCTIONS
Doris Chu, President

CALIFORNIA INSTITUTE OF THE ARTS
Scott Duncan,
Head of Film & Video Dept.

CHEVROLET 3-D
Len Walkowicz, Producer

CINEMA PRODUCTS CO.
Ed DiGiullio, President

CINEMA RIDE
Mitch Francis, President & CEO
Gary Packman, Chairman

CLIMACTIC ILLUSIONS
Janice Carlberg, Vice President

COMMUNICATION ARTS, INC.
Roger Kleitz, President

CONCORD NEW HORIZONS
Roger Corman, President

CUMMINGS INTERNATIONAL PRODUCTIONS
Craig S. Cummings, President

DIGITAL DIMENSION
Jim Cox, CGI Manager,
Stereoscopic Animator

E.O. STUDIOS
Earl Owensby, Producer

EASTMAN KODAK COMPANY
Frank N. McLaughlin, Manager,
C/P&FM Dye Transfer

EDEFX GROUP
Frank Tolin, Chairman

EFFECTS ASSOCIATES
Jim Danforth

FILM EFFECTS OF HOLLYWOOD
Linwood Dunn, ABC Ph.D., Founder

FORTI/LAYNE PRODUCTIONS
Brian Forti, Producer
Bruce Layne, Producer

4MC LABORATORY
Paul Rutan, Optical Printing
Department Manager

FOX BROADCASTING COMPANY
R . Scott Penza, Staff Publicity

FOX VIDEO
Jed Daly, Director of Acquisitions
20th Century Fox Video

FRIES ENGINEERING
Douglas Fries, President

FULL MOON PRODUCTIONS
Charles Band, President
Albert Band, Chairman

DAVID GERROLD
Screenwriter: Star Trek Scripts.
Award-winning Author, numerous books

GOLDFARB PRODUCTIONS
Howard Goldfarb, Producer

GRUMMAN AEROSPACE
Gamliel "Gam" Kagan,
Robotics Dept. Head

HINES LAB
Steve Hines, President

HOLLYWOOD OPTICAL SERVICES
Dave Hewitt, President

ILLUSIONS
Gregory Van der Veer, President

IMAX
Douglas Trumbull, Co-Chairman

INDUSTRIAL PHOTO EQUIPMENT CO.
Don Erkel, President

INTERNATIONAL MEDIFILM
Jerry Price, Producer

INTERNATIONAL VIDEO CONVERSIONS, INC.
Bill Hogan, Director

IWERKS ENTERTAINMENT
Don Iwerks, Executive V.P.

JPL (JET PROPULSION LAB)
Kevin Hussey (L.A. The Movie)

KABC - CHANNEL 7
Jeff Androsky, Producer

KENWORTHY SNORKEL CAMERA SYSTEMS
Paul Kenworthy, President

LEONETTI CINE (ULTRACAM)
Frank Leonetti, President

HERB LIGHTMAN
Producer

LLOYD'S CAMERA
Lloyd Bema , Owner

MAGIC VIEW INC.
Frank Wong, President

MAKEUP & EFFECTS LABORATORIES, INC.
Allan A. Apone, President

MARTIN CAMERA SYSTEMS
Jim Martin, President

M.C.N. LTD. (HDTV & 3-D
Marketing)
S. Mark Tabashnick, President

MIAMI FIVE STUDIOS
Charles W. Schane III,
Studio Manager

NBC TELEVISION
Craig Curtis, Former Chairman,
(Retired)

NEW MEDIA
Peter Beale, President

NORD PHOTO ENGINEERING
Roy Clapp, Chairman
Herb Matsura, President

NORRIS FILM PRODUCTS
Dan Norris, President

OMNIMAX
Don Jackson, Cinematographer

OPTICAL CAMERA SYSTEMS
John Monseau, President

OPTICAL RADIATION CORPORATION
(ORC)
Glenn Berggren, Vice President

MAX PENNER
3-D Camera Operator

PARAMOUNT STUDIOS
Zoran Perisic, Zoptic Inc.

PURCELL PRODUCTIONS
Joseph Purcell, President

REEBOK INTERNATIONAL
Saul Gould, Exec. Vice President

RSP PHOTOGRAPHY
Richard S. Paul, President

S.E. NELSON ADVERTISING, INC.
Roxanne Richards,
Production Manager

SENSORAMA VIRTUAL REALITY
Morton Heilig, President

PETER SHILLINGFORD PRODUCTIONS
Peter Shillingford, President

SHOWSCAN CORPORATION
Douglas Trumbull, Founder

BAYLEY SILLECK PRODUCTIONS
Bayley Silleck, Producer

SILVER STRAW PRODUCTIONS
David Lamb, Animator & CGI

SNOWFLAKE PRODUCTIONS
Richard Sweet, Producer

SPATIAL MEDIA, INC.
Peter Olson, President

SPATIAL TECHNOLOGIES, INC.
Daniel L S,mmes, President

SPROCKET VIDEO TECHNOLOGIES, INC.
Bill Hogan, President

STANFORD UNIVERSITY
Dr. Elliott C. Levinthal, Professor
Medicine & Genetics

STARLOG
David Hutchison, Science Editor

STEREOGRAPHICS CORPORATION
Lenny Lipton, President

STEREOMEDIA
Anthony "Jackie" Coogan,
President

STEREOVISION INTERNATIONAL, INC.
Chris Condon, President

STUDIO SPECTRUM, INC.
Ken Buckowski, President

PAUL TAYLOR PRODUCTIONS
Paul Taylor, Producer

TEKTRONIX, INC.
John Horn, Engineering Mgr.

TELSTAR PRODUCTIONS
Dr. Victor Kerns,
Program Consultant

TERMINATOR II (70m 3-D Venue)
Chuck Comisky, Executive Producer

3-D AMERICA
John Daniel Deeter, President
John F. Feeney, Exec. Vice President

3-D GREETS
John Baylogh, President

3-D IMAGETEK ORP.
Craig Crawford, President

TRANSFORMEDIA, INC.
Steve North, President

UNITED ARTISTS THEATERS
Dr. Richard Vetter,
Technical Director

UNITED COLOR LAB
Jack Wanamaker, President

UNIVERSAL STUDIOS
Enzo Martinelli, Former Dept. Head,
Chief Director of Photography,
Camera Department (Retired)

UNIVERSAL STUDIOS
Robert Harris,
Director of Restorations

VAN DER VEER PHOTOGRAPHIC EFFECTS
Tom Anderson,
Special Effects Supervisor

VIEW-MASTER, INC.
Gary Evans, Vice President

VIRTUAL VENTURES
Dave Blackburn, President

B. L. WINCH & ASSOCIATES
Dr. Bradley L. Winch, President

ZONE 3-D
Ray Zone, President

PROFESSIONAL REFERENCES - *Foreign*

ARANE (France)
Dominique Benichetti, Technical 3D

BAKELITE (France)
Patrick Besenval, Producer

BLUE SKY ACTION PHOTO
(Sweden)
Peter Degerfeldt, President

CED (Japan)
Hiroshi Akiba, General Affairs

CCG GmbH (Germany)
Dirk Vanoucek, Producer

DEN-El INCORPORATED (Japan)
Haruji Yoshinaga, Chief Producer

DENTSU INC. (Japan)
Akihisa Kitamura, Chief Producer

DENTSU-PROX (Japan)
M. Owari, President
Tadao Matsuno, General Manager
Hironori Yonezawa, Special Project Division

FILMOR INTERNATIONAL (Japan)
Maru Okuda, President

KMQ STEREOGRAPHIE (Germany)
Dr. Peter Quick, President

STEVEN HAHN (Korea)
Producer

IN DEPTH MOTION PICTURES, LTD - (Canada)
Noel Archambault, 3-D Consultant

MAX LINDER PRODUCTIONS
(France)
Maude Linder, Producer

MOVIERAMA INT'L., INV.
(Philippines)
Alejandro A. Tiu, President

NAVADOYA-ANAND, LTD., (India)

NAVARRA (Spain)
Alfonso Bañon Irujo, Director

NIKKATSU CORPORATION (Japan)
Yasushi Takeda, Ex. Managing Director

PHOTORELIEF (Canada)
Francois Beaulieu, President

PUSH ENTERTAINMENT (Canada)
Mark Holden, Senior Vice President
A. J. Vesak, Director of Photography

SKYWORKS JAPAN CO., LTD. (Japan)
Shin Matsushita, President

STEREO IMAGE TECHNIQUES LTD. (England)
Charles W. Smith, Technical Director

STEREOKINO (Russia)
Alexander S . MeIkumov, President

STEREOPTICS LTD. (India)
Thomas Easaw, President

TAMCO CO., LTD. (Japan)
Mora Matsushita, President
Shonosune Yoshida, Vice President
Hideo Horie Managing Director
Kuniyuki Tanaka, Video Section Mgr.

TECHNIMATION (England)
Ray Harryhausen,
Special Effects Animation
Charles H . Schneer, Producer

TELEMUNDO (Panama)

3D-MAGAZIN (Germany)
Alexander Klein, Redaktion (Editor)

TOEI CO., LTD. (Japan)
Toshiki Ushiseko, Producer

VISWA CHITRA STUDIO, LTD.,
(India)

WILDROSE FILMS, LTD. (Canada)
David C. Koyle, Producer

- **ACCURATE IMAGE REGISTRATION**
- **VARIABLE STEREO BASE**
- **INTERCHANGEABLE LENS CAPABILITY**
- **REFLEX CAMERA CAPABILITY**
- **COMPATIBLE WITH ALL SYSTEMS**
- **UNDISTORTED EXTREME CLOSEUPS**
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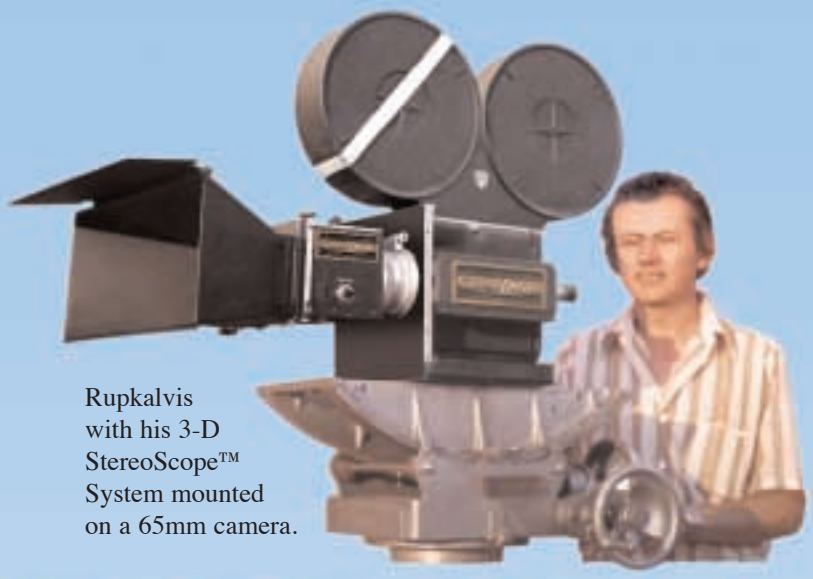
- **NO EYE STRAIN VIEWING**
- **OUALITY CONTROL SERVICE**
- **3-D TITLES & ANIMATION**



Rupkalvis with his 3-D StereoScope™ System mounted on a 65mm camera.

STEREOSCOPE™

Widescreen 3-D Cinematographic System

The **StereoScope™ System** offers several advantages for professional widescreen 3-D motion pictures. StereoScope™, in both 35mm and 70mm (65mm camera original), is an over-and-under process fully compatible with all other over-and-under 3-D processes. It is the most versatile system available today.

Some of the features of the camera device include:

• *Independently controlled wide range variable interaxial and variable convergence: a variable stereo base for undistorted perfectly registered stereo images from infinity all the way to the front of the camera device.*

• *Variable vertical and horizontal centers: Accurate frame spacing may be set for any aperture from Academy to full silent, including full scope. This also permits centers to be set for different lenses of different focal lengths, including telephoto (with a wide stereo base) and macro for extreme closeups (with a narrow stereo base).*

• *The device may be used with any professional camera. It is a proven device, and has been used for theatrical motion picture applications.*

• *This stereo optical camera device is part of a complete StereoScope™ system with utility from the field to special effects. StereoScope™ further provides an ideal solution for stereo video applications, including HDTV. Whether working in film or video, StereoScope™ uses conventional prime and zoom lenses in all applications.*

• *Perhaps most important, an on-site consulting service, provided by John A. Rupkalvis, developer of the StereoScope™ System. His many years of experience insure a high quality production, consistent with the most cost-effective operations.*

StereoScope™ and the 3-D consulting services of John A. Rupkalvis were used for the special effects in the sci-fi film "METALSTORM", including macrophotography, aerials, telephoto, animation, miniatures, blue screen, live action closeups, and full 3-D rotoscoping: disintegrations, lasers, sparks, hyperspace effects, etc.

'METALSTORM'

'Metalstorm': 3-D effects put major productions to shame... is easily the best executed and most visually inventive 3-D effort!"

David Chute
Herald Staff Writer

'METALSTORM'

'Metalstorm': BEST OF THE 3-D BUNCH... is the best yet of all the 3-D attempts.

Sheila Benson
Times Film Critic

StereoScope™ International
303 East Alameda Avenue Suite Q • Burbank, CA 91502
Voice and Fax: (818) 848-9601 email: stereoscope@earthlink.net

Product and company names mentioned herein may be trademarks of their respective companies.

World's First VR System?

In 1972, John Rupkalvis demonstrated a **true stereoscopic video-based virtual reality system.** This was before the term "virtual reality" was coined.

The viewer-operator would remotely control the camera to visually walk through architectural models, creating the virtual perception of being in a full-size building.

The following text is from an article that originally appeared in the **August, 1972** edition of *PMI-Photo Methods for Industry.*

John A. Rupkalvis is a visual communications consultant specializing in stereoscopic photo-imaging systems.

AT THE INVITATION of the Architectural School of the University of Minnesota, PMI author John Rupkalvis presented a large-screen (6x9 feet!) demonstration of live, closed-circuit, three-dimensional color TV. The two-and-a-half day presentation was part of the EVE - Environmental Video Event - a get- together of people with overlapping interests in environmental design/education and electronic media including video, cable, and computer technology. The 4 day convention included video workshops, tape and film showings, a computer aided video design demonstration by the Hybrid Computer Lab, a color video synthesizer by the Multimedia lab of the California Institute of the Arts, and new video tapes from the east and west coast.

Equipment used for the 3-D TV system included two Sony video cameras with monitor type CRT viewfinders, donated through Bryant Smith and Joel Goodman, University of Minnesota; a Dalto Amphicon 220 television projector, donated by the K & M Electronics Division of Todd Communications, Inc. the stereo optics were provided by John Rupkalvis. A Bolex stereo lens he modified for TV was used on one Sony, and a specially designed stereo lens with a 5mm interocular was used on the other camera. This resulted in four channels of video information. Although the cameras and projector were black & white, the matrix provided a sum and difference signal that, through use of filtration, was multiplexed parallel on each b&w channel so that color information was transmitted in terms of a difference signal to the projector. A color regeneration system fed by the difference signal was then used at the projection CRT and 45 degree axial polarization was added at this point. After going through the Schmidt catadioptric system the color 3-D image was then externally converged optically in the plane of the screen.

Architectural models were used as subject matter, with the camera traveling around and into the building representations. The Bolex stereo lens provided a 3-D perspective much like that of actually looking at the model, since it has an interocular of 65mm similar to that of human vision. The special stereo lens had an interocular similar to that of a grasshopper or miniaturized view, the same thing you would see if you could be reduced down to that size. This gave the 3-D image of the models the same appearance as if you were looking at the finished buildings life size!

The purpose of this demonstration was to explore new areas and act as a catalyst for new ideas regarding applications of spin-off systems in education and industry.

Paul Challacombe, Ed Williams, Jim Wiseman and Shuya Abe of the Multimedia Lab, California Institute of the Arts, demonstrated their $50,000.00 color video synthesizer. This is to TV what an electronic audio synthesizer is to hi-fi. The video synthesizer is used to create and compose color video pictures. John was quite interested in their system, and they were quite interested in his system. So, for the last day of the event they decided to interface the two systems. The output of the 3-D color video signal from John's TV camera system was fed to the input of the color video synthesizer along with the output of a Moog audio synthesizer. The output of the color video synthesizer was then fed back to the input of the 3-D color projection system. Video tapes made with the Buchla synthesizer were also used. The Buchla is a more sophisticated synthesizer that has about twice the range of the Moog. The visual impact of the resulting abstract and surrealistic color 3-D images on the large TV projection screen was verrry interesting. The word wild is too mild. □

John Rupkalvis is an eminent Midwest photographer and photographic equipment expert whose eminence was thrice noted in recent PMI columns by David B. Eisendrath.

PHOTO METHODS FOR INDUSTRY
AUGUST, 1972

StereoScope™ 3-D Camcorder System

Stereoscopic video is here!

Left and right images are totally discrete (zero crosstalk), and each has full screen, full field, full frame resolution images, suitable for transfer to any stereoscopic format (Anaglyph, Polarized, PUT, Prismatic, etc.) as well as conventional 2D formats. Time code permits frame-accurate editing on all systems. Uniquely versatile, the system can be handheld, but also allows unique mounts such as a bicycle, skateboard, rollerblades, skis, etc.) with either direct or remote controlled operation. Conventional controls include synchronized zoom and auto/manual focus.

Easily Handheld

Adjustable viewfinders provide real time stereoscopic viewing of the scene before, during, and after recording.

Both convergence and interaxial are continuously adjustable from 12 inches to infinity. Front and rear stereo microphones provide four discrete audio surround channels.

1/4 inch and 3/8 inch professional tripod mountings are provided.

(818) 848-9601
email: stereoscope@earthlink.net

3-D Binocular Viewfinder

Front Stereo Mic

Telescoping Rear Stereo Mic

Dual, Discrete
3-D Recording

Variable Convergence / Variable Interaxial

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StereoScope™ Bike Cam

A modification of the stereoscopic dual Hi-8 camcorder, this bicycle mounted unit produces very dramatic moving camera shots. A large battery is carried in the rear for lengthy use on locations. This also powers halogen lights for fill or night use.

In addition, this configuration has a special daylight video viewfinder. Through the use of lenticular optics, this provides a projected virtual image to be seen either monoscopically or stereoscopically form a normal riding position in bright sunlight or at night. This permits the image to be monitored in the peripheral part of the operator's vision, even while looking ahead for safe riding.

(818) 848-9601
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stereoscope@earthlink.net

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StereoMed™, Inc. Cameras

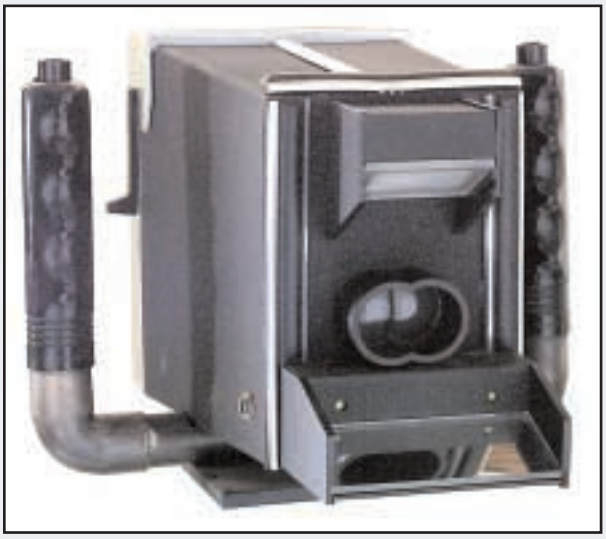
Rupkalvis designed and built the prototypes of these Polaroid®-based stereo cameras which provide useful, three dimensional views, particularly valuable in the dermatological and orthodontic fields.

At left, the normal, medium close viewpoint, or "mapping" camera.

Out of Focus
Out of Convergence

In Focus
In Convergence

Both cameras utilize a unique, automated, viewfinder-free framing, focus, and convergence system based on matching the illuminated arcs simply by moving the camera to the appropriate distance, as seen above.

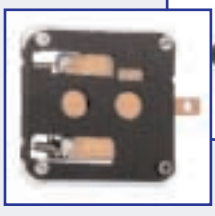


At left, the macro, close-up model features reflex strobe lighting.

On both cameras, the pushbuttons on the handles provide simplified operation. The left hand button charges the flash system and illuminates the framing system as described above. The right hand button both takes the picture and automatically starts the Polaroid® processing cycle.

At left, the film loading door is open on the SX-70® Polaroid® back.

At right, the illuminated StereoMed™ Viewer delivers true to life realism for more accurate medical diagnosis.



At right, the elegant shuttter and flash synchronization mechanism effectively eliminates exposure error.

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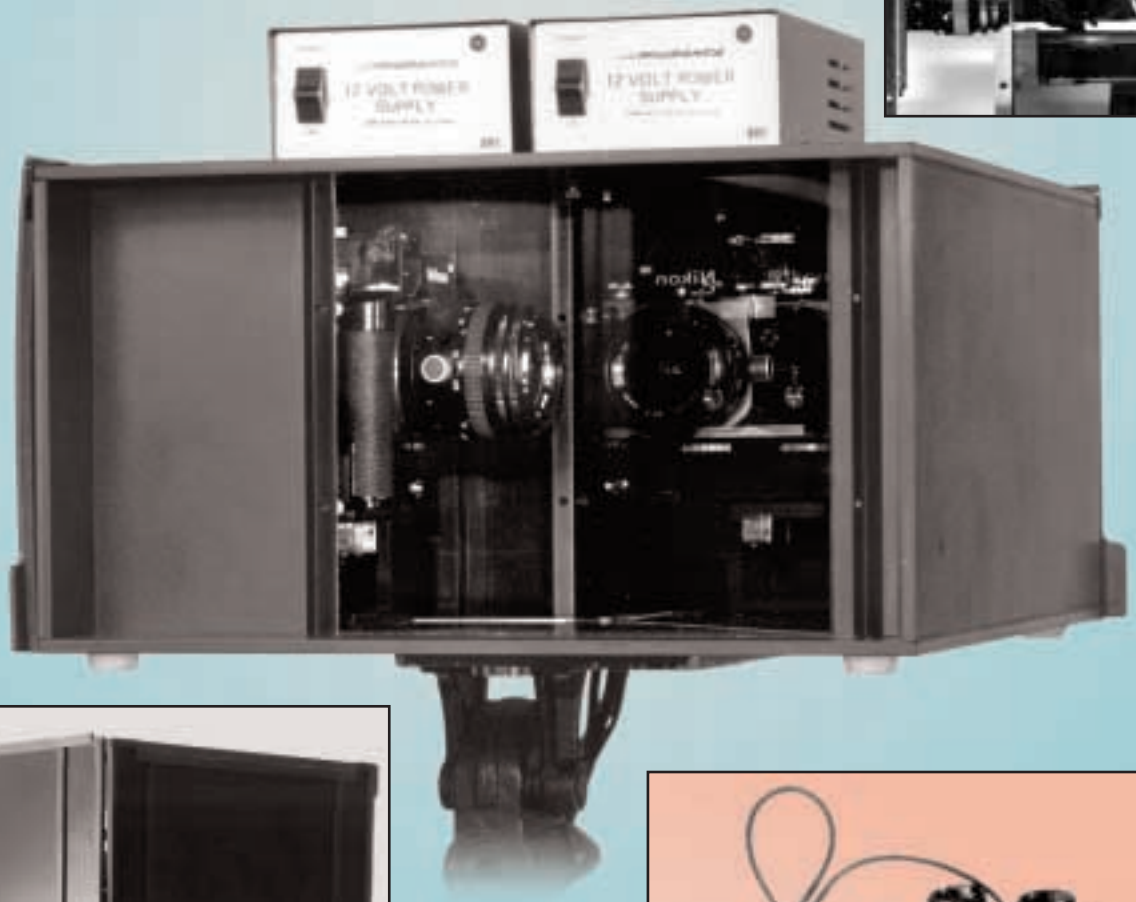
StereoMed™ Dual Nikon® Systems

StereoMed™, Inc. Beamsplitter Rig with fold-up side panels.



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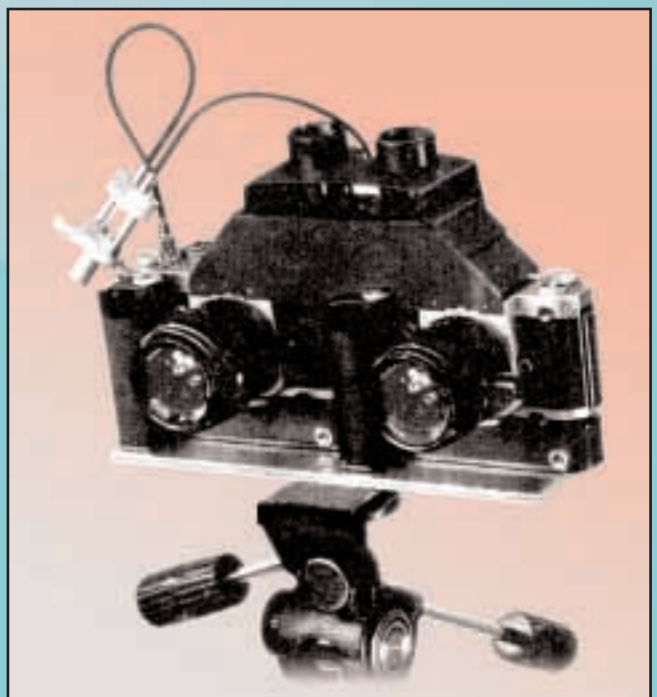

StereoMed™, Inc. rig with stereoscopic viewfinding

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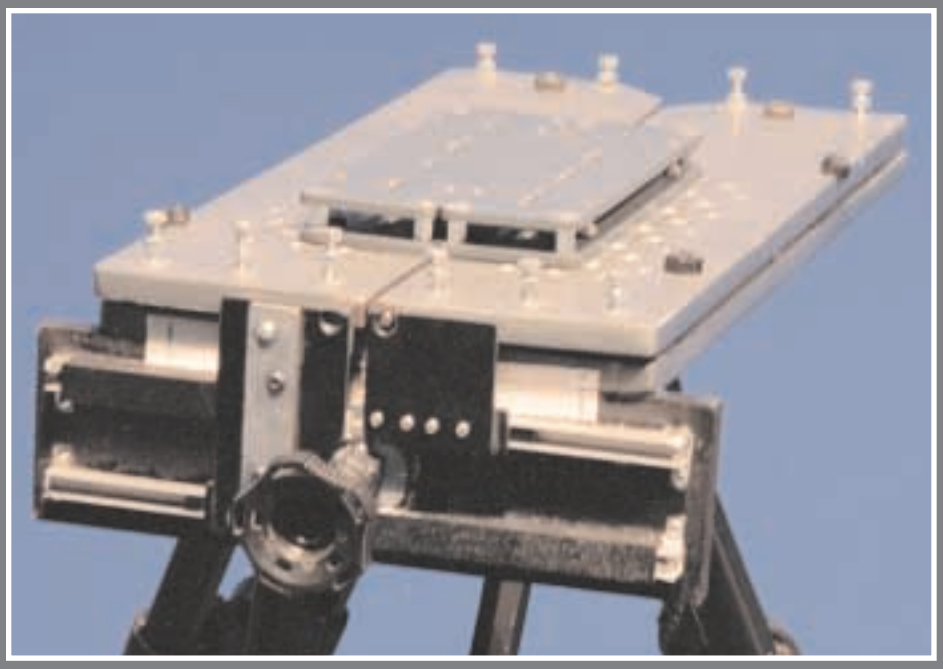
Side by Side Dual Camera Stereo Baseplate



This rig accepts very heavy cameras. May be used with micro video cameras as well as 65mm film cameras, and anything in-between. Features bi-directional rack-and-pinion convergence control for precise adjustment.

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ENG Stereo Camera Rig

At right, dual broadcast cameras with rack-and-pinion convergence control and genlocked video.

At left, operator P.O.V. shows the triple viewfinder system. The top LCD screen shows combined and superimposed images for precise convergence control.

Bottom viewfinders with lenses allow for Stereoscopic viewing of images.

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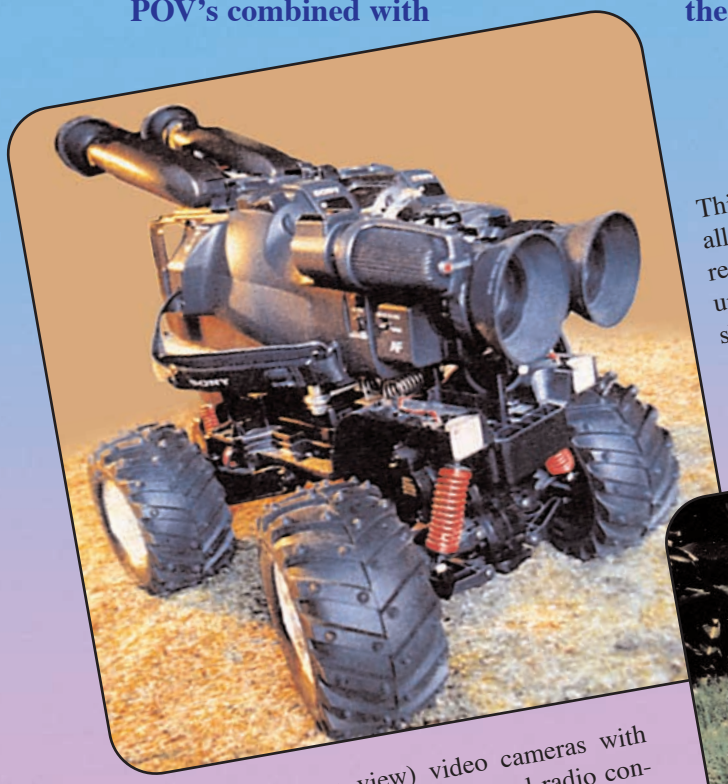
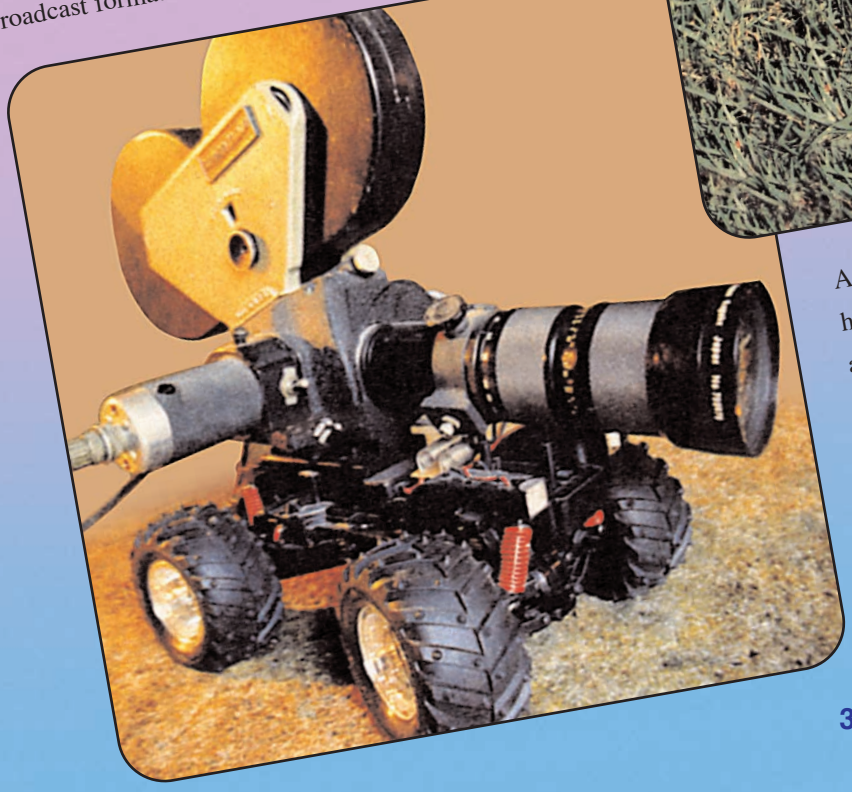
STEREO ROBOT CAMS

These radio controlled devices allow the dramatic results that can be obtained from near-to-the-ground POV's combined with the added impact of stereoscopic video imaging.



This robotic rig, fitted with a Dual Hi-8 stereoscopic camcorder, allows remote controlled (RC) driving as well as remote-controlled recording directly on-board. The more normal interaxial gives the unusual (and effective!) perspective of someone laying down on a skateboard.

Narrow interaxial (cat's eye view) video cameras with matching video transmitters and a six channel radio control receiver. Discrete channels of video are transmitted to a remote monitor or video recorder, in either composite or YC (S-video) form. Thus, the images are compatible with VHS, Hi-8, S-VHS, DV, or even a high-end professional broadcast format such as Betacam or D-1.



A 35mm motion picture camera mounted to the high torque radio controlled chassis. Canting the angle toward one side permits filming in Pulfrich or other time parallax stereo systems. Alternately, a camera fitted with a StereoVision 3-D lens may be used.

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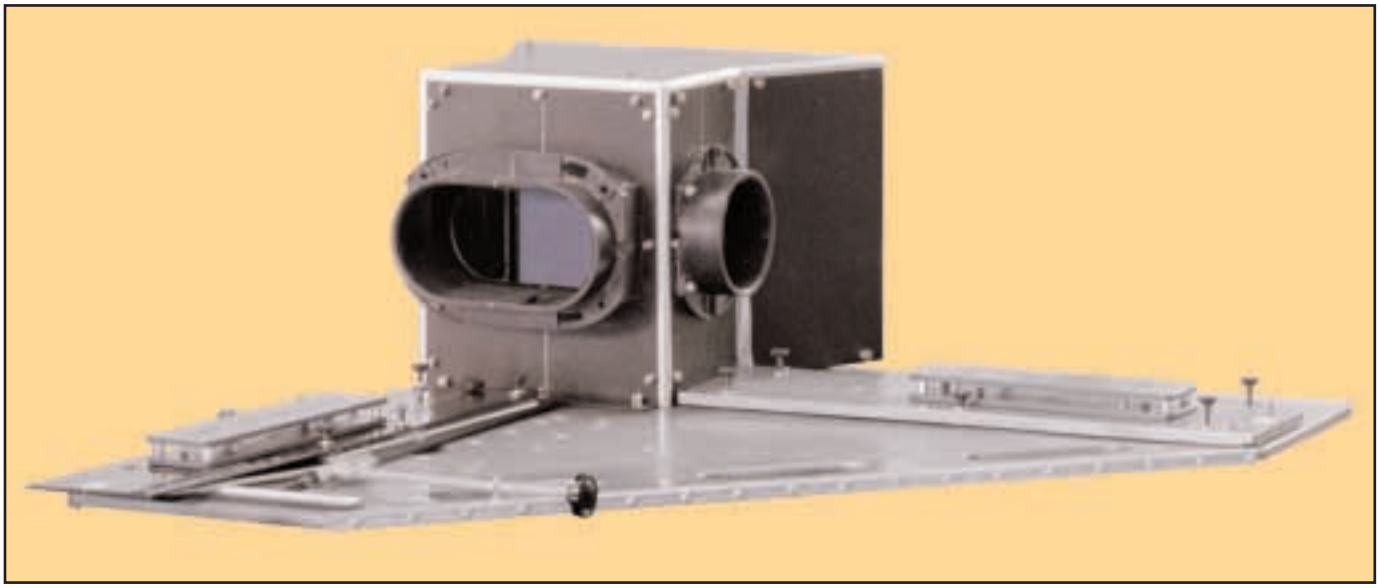
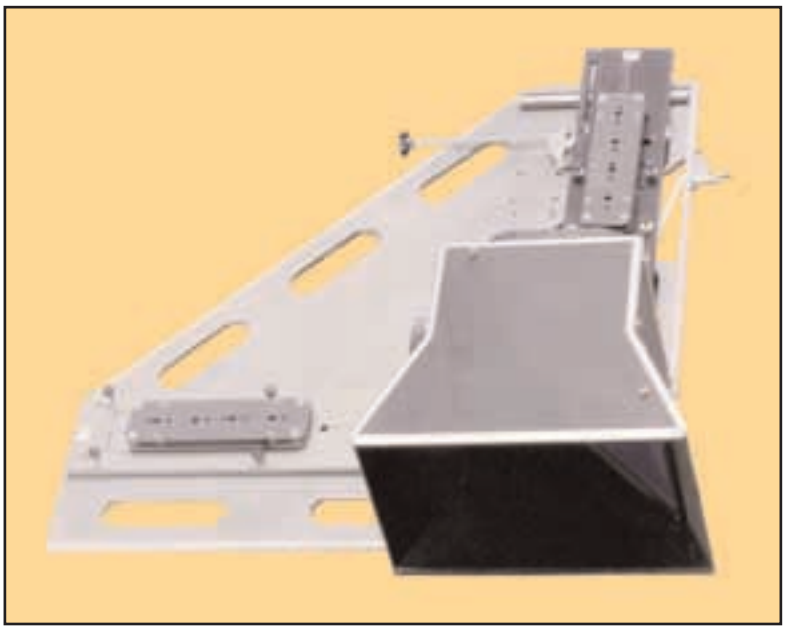
Stereoscopic Beamsplitter Rig



This unit can be used with nearly any still film, still digital, motion picture, or video camera in any format.

The circular port accepts the reference camera lens. Full adjustments on the second camera mount allow separate and independent control for each stereoscopic function:

1) variable stereo base
2) variable convergence



Features dual adjustable camera mount platforms for independent convergence and stereo base control. Crank operated worm gear drive provides precision movement. Flock-lined cabinet for flare control and reflected image elimination. Triangle shape for maximum strength, light weight, and operator access. Hand grips on all sides for ease in portability.

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3-D Video Shoot
Miami, Florida

Video Cameras on a StereoScope™ Beamsplitter rig.

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NTT Telephone Show, Tokyo, Japan

At the right, John Rupkalvis adjusts a 3-D video camera rig for a stereoscopic production shown throughout Japan at NTT auditoriums. The production used pedestal-mounted polarized viewers to decode large screen stereo television projections.

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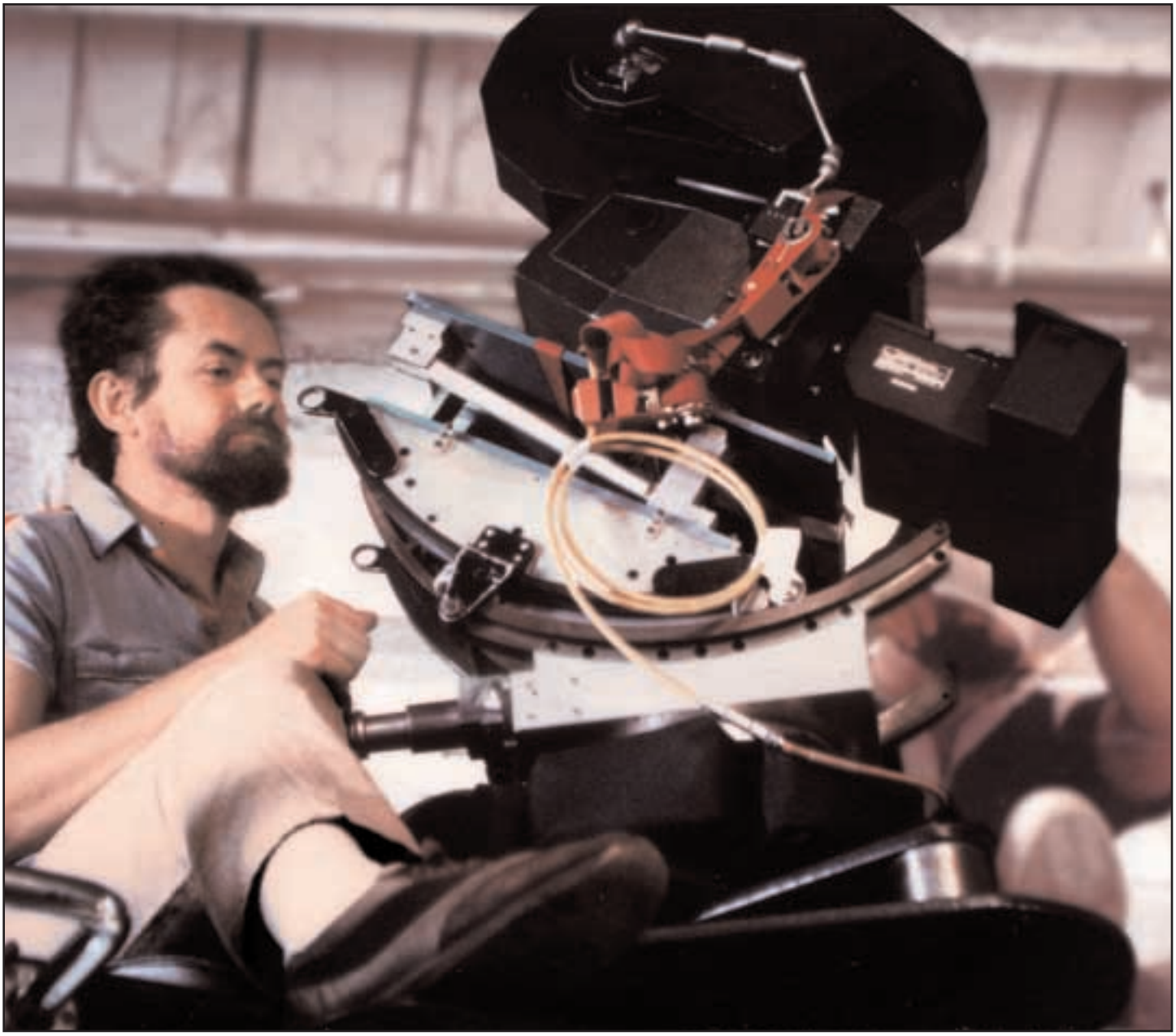

On the Set of *Rock 'n' Roll Hotel©*

John Rupkalvis using a StereoVision™ Lens on the Leonetti Ultracam®.

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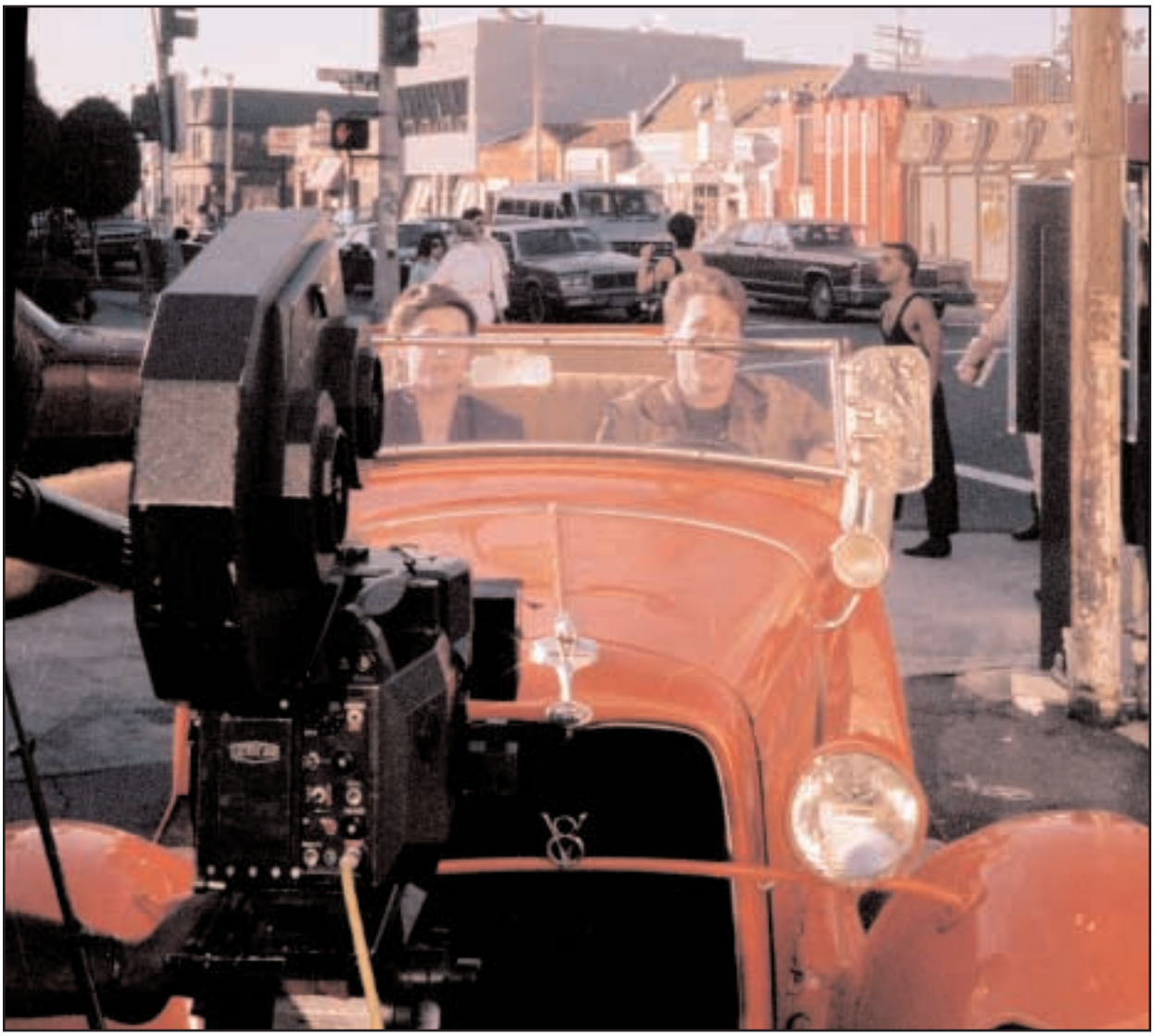

StereoVision™ Camera Car POV of Picture Car

The moving camera puts the audience in the drivers seat. Motion parallax adds to the other depth cues in 3-D.

Rupkalvis operates Leonetti Ultracam® for this scene from the movie *Rock 'n' Roll Hotel*©.

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Live Action 3-D

Stage presentations can be enhanced with large stereoscopic images of the events taking place on the stage. Actors that would be too far away for large auditoriums and outdoor presentations, such as rock concerts, are easily seen when magnified to the big screen.

This example shows anaglyph shadowgraphs of the dance troupe "Pilobolus," performing behind a 20 x 40 ft (6 x 12 meter) rear projection screen to an audience of 4,000 people.

John Rupkalvis designed this system and was stereoscopic consultant.

It was produced by Gerald and Doris Cain, Dynamite Films, for the Palm Pilot® handheld computer company.

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Macro Stereo Lens

Above, a “C-Mount” side-by-side lens with 5mm interaxial for extreme close-ups in 3-D.

Focusing is adjustable with a special system designed for this configuration.

The lever shown at the top of the lens controls a unique detent-free iris control offering continuous in-between stops for accurate exposure settings.

This lens may be used with any film or video camera utilizing a “C-Mount” system designed for this configuration. Also, this lens is useable with any film or video camera utilizing a “C-Mount” system.

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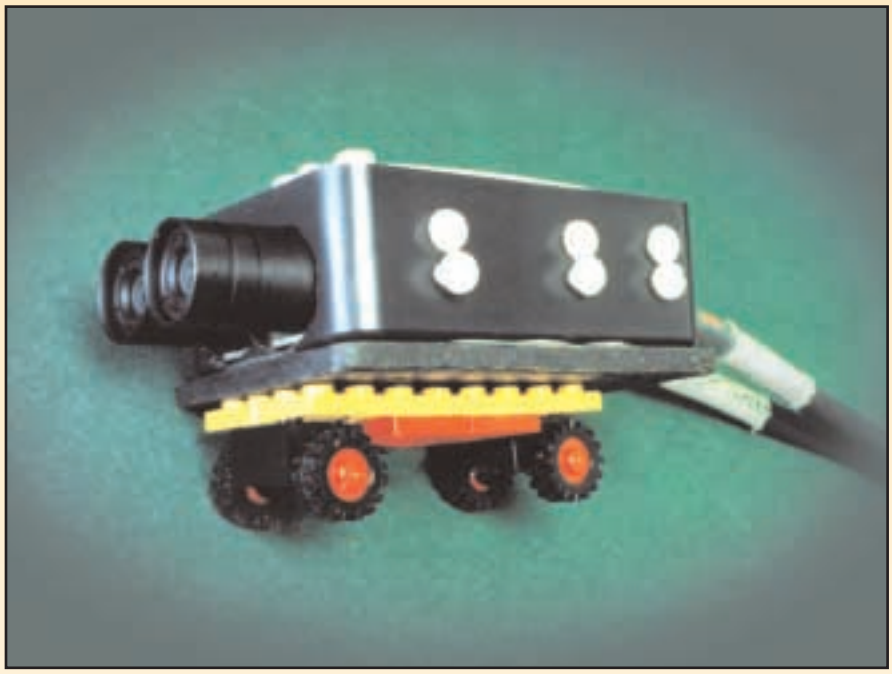
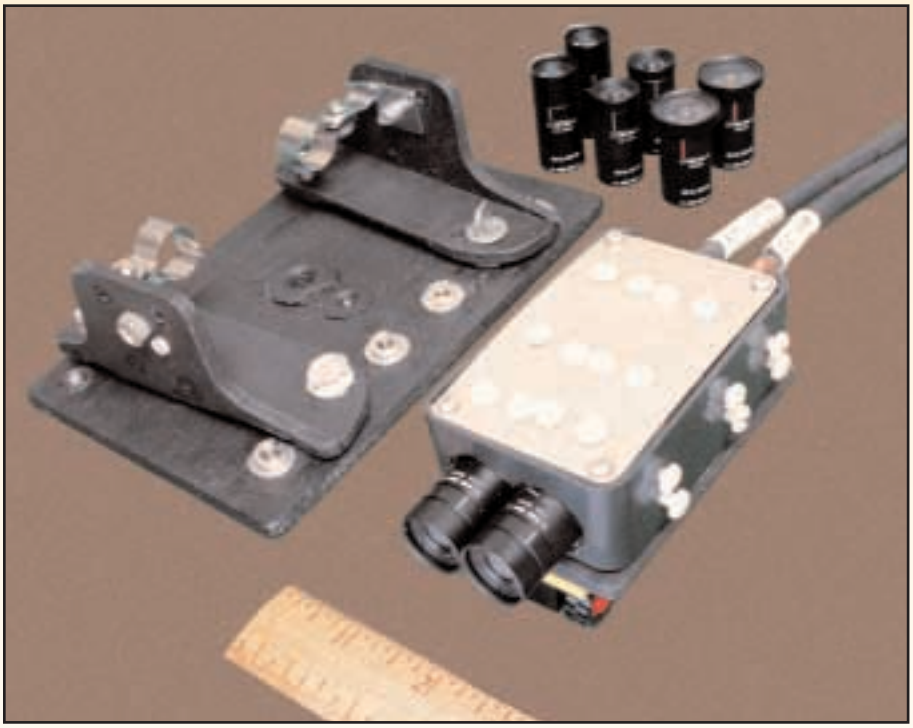
Stereo Mouse Cam (3-D Lipstick Cam)

Miniature “lipstick” video cameras in a matchbox-sized package mounted on a Lego® chassis and wheels.





This system provides a stereoscopic “mouse-eye” view when pushed along a desk, floor, wall, even the ceiling. Radio control and/or motorized versions can be custom designed and fabricated on request.

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Tabletop Macrostereo Video System

A pair of ultra small video cameras mounted side by side in a frame, featuring adjustable convergence and interchangeable focusing prime lenses. With a stereo base of only about 5/8 of an inch (about 16mm), close-up and extreme close up video images can be made. Yet, there is sufficient range that distant backgrounds (all the way to infinity!) can be included for comfortable viewing. These cameras may be mounted on nearly anything, and even handheld.

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Stereoscopic Coherent Fiber Optic Imager

Dual interchangeable “C-Mount” lenses may be positioned for a wide range of stereo bases. Image combining lens can be rotated on the camera for either side-by-side or over and under orientations, in either parallel or transposed configurations.

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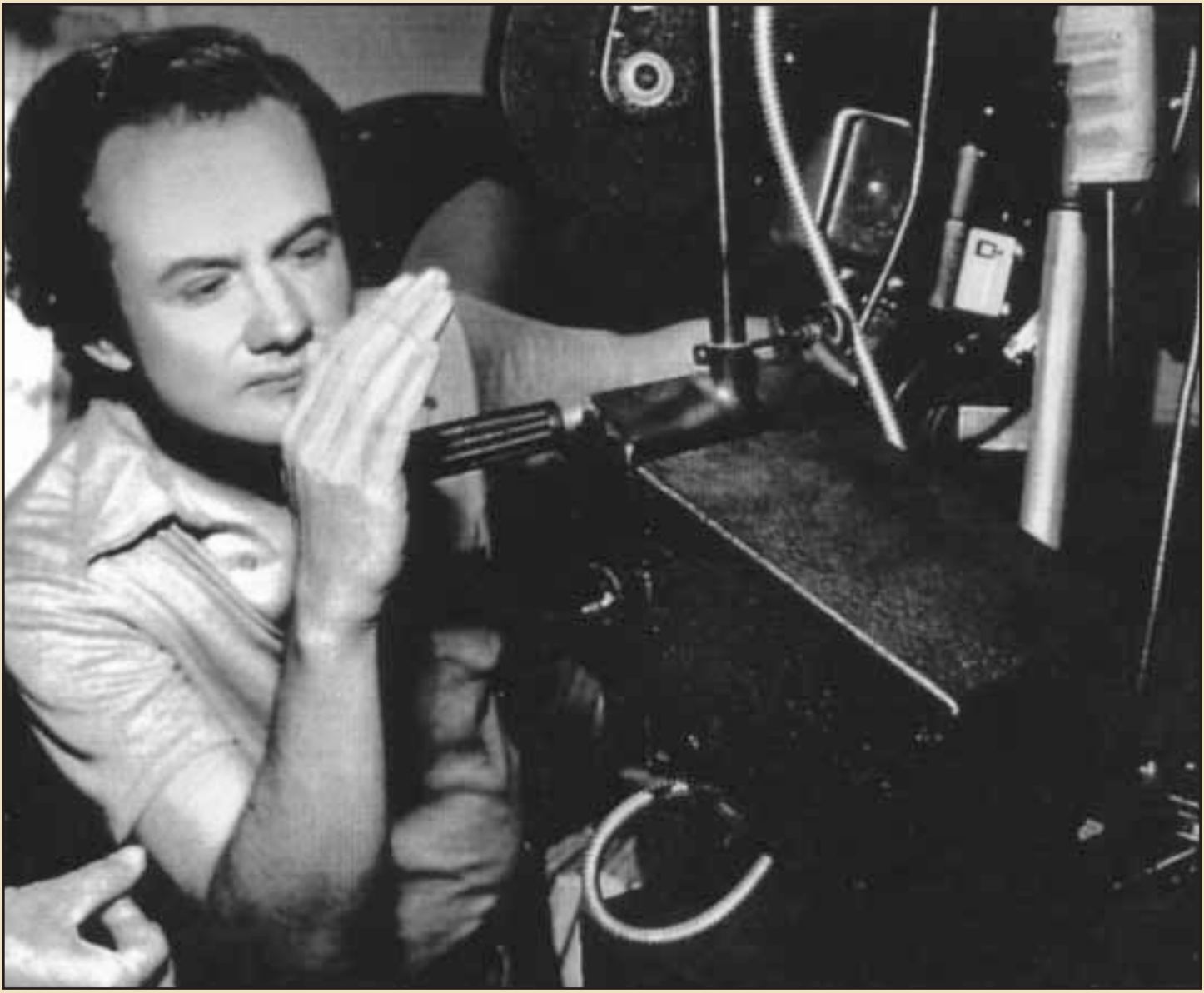

John Rupkalvis Aligning 3-D Cine Images on Steadicam™ Videotap Monitor

Moving camera images are especially effective in 3-D production. The fluid movement of the Steadicam™ system can be particularly effective in maximizing a shot's 3-D potential.

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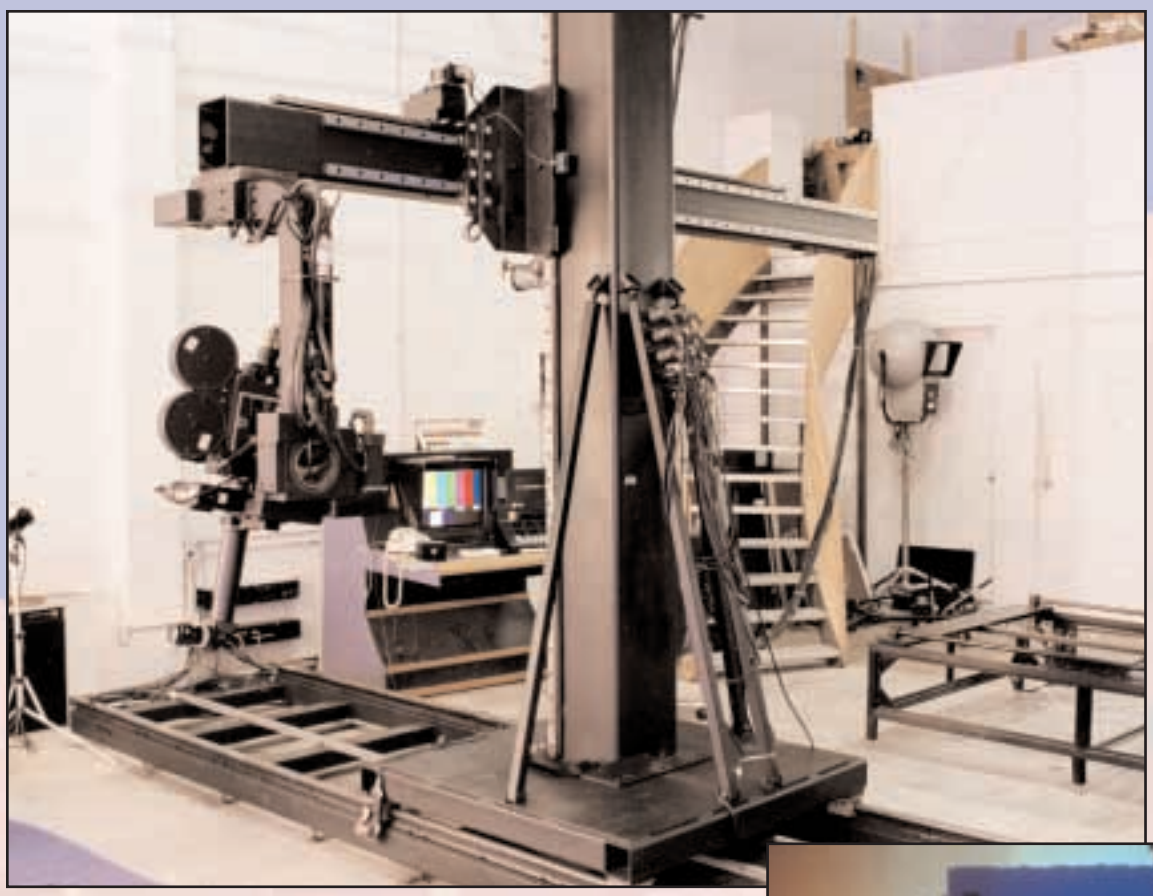

IMC®
Pre-Programmed, Dual-Pass Stereoscopic System

On the set of a children's fairy tale video production, this computer-controlled, six-axis, motion-control system was fitted with a periscopic lens and relay optics. The top image shows the system equipped with a film camera, and the bottom blue screen shows a video setup. Two parallel passes are programmed and filmed to create the stereo base needed, with movements and position scaled to the needs of the application, in this case, a miniature. This technique was used to simulate flying down the streets of a miniature city on a flying carpet. The film was later transferred to a stereoscopic video.

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StereoScope™ Cartop Pulfrich 3-D Video Rig

Camera angled at approximately 45 degrees forward and to the side yields very effective forward-looking Pulfrich scenes. Parallel Pulfrich view may be achieved by pointing the camera straight to the side. Rear-facing POV's are achieved by turning the camera 45 degrees to the rear.

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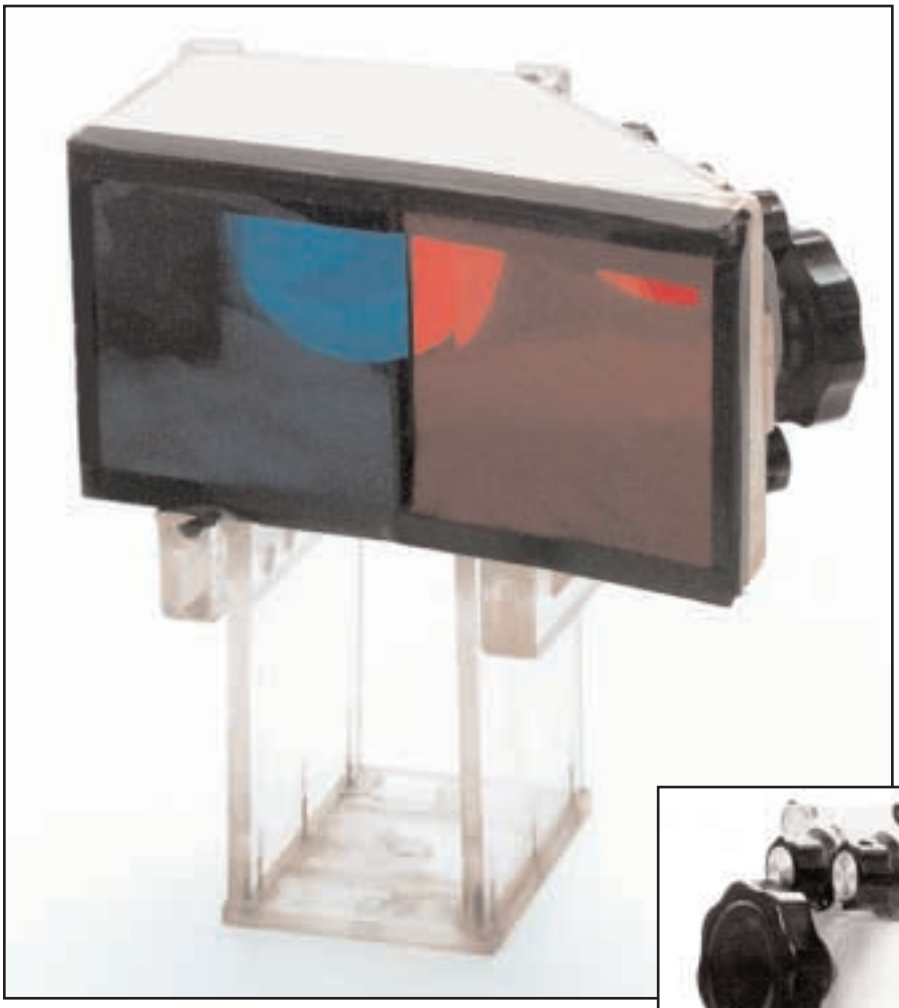
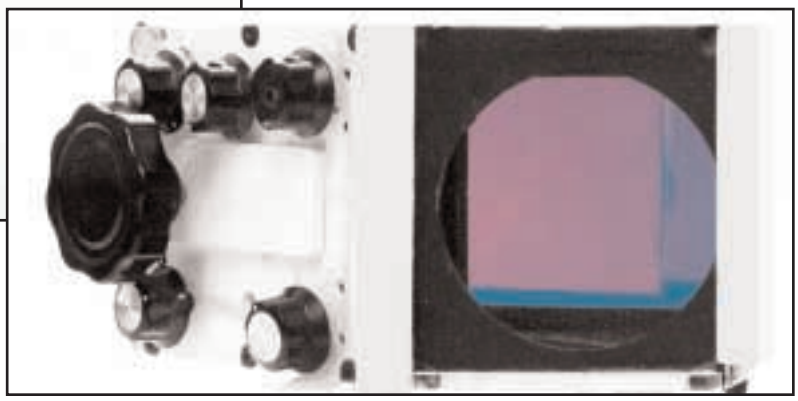
Anaglyph Imager Attachment



Attachment for any still-film, digital-still, motion picture camera, video camera or camcorder provides real-time, high-cancellation WYSIWYG anaglyphs. A true beamsplitter device (***not*** an image splitter), this unit features a dichroic beamsplitter and a worm gear convergence drive.



Fine mirror mount adjustments are effected through use of the external knobs.

Stereoscopic anaglyph functions are performed in real time. The resulting camera image is ready to use without further processes or manipulations.

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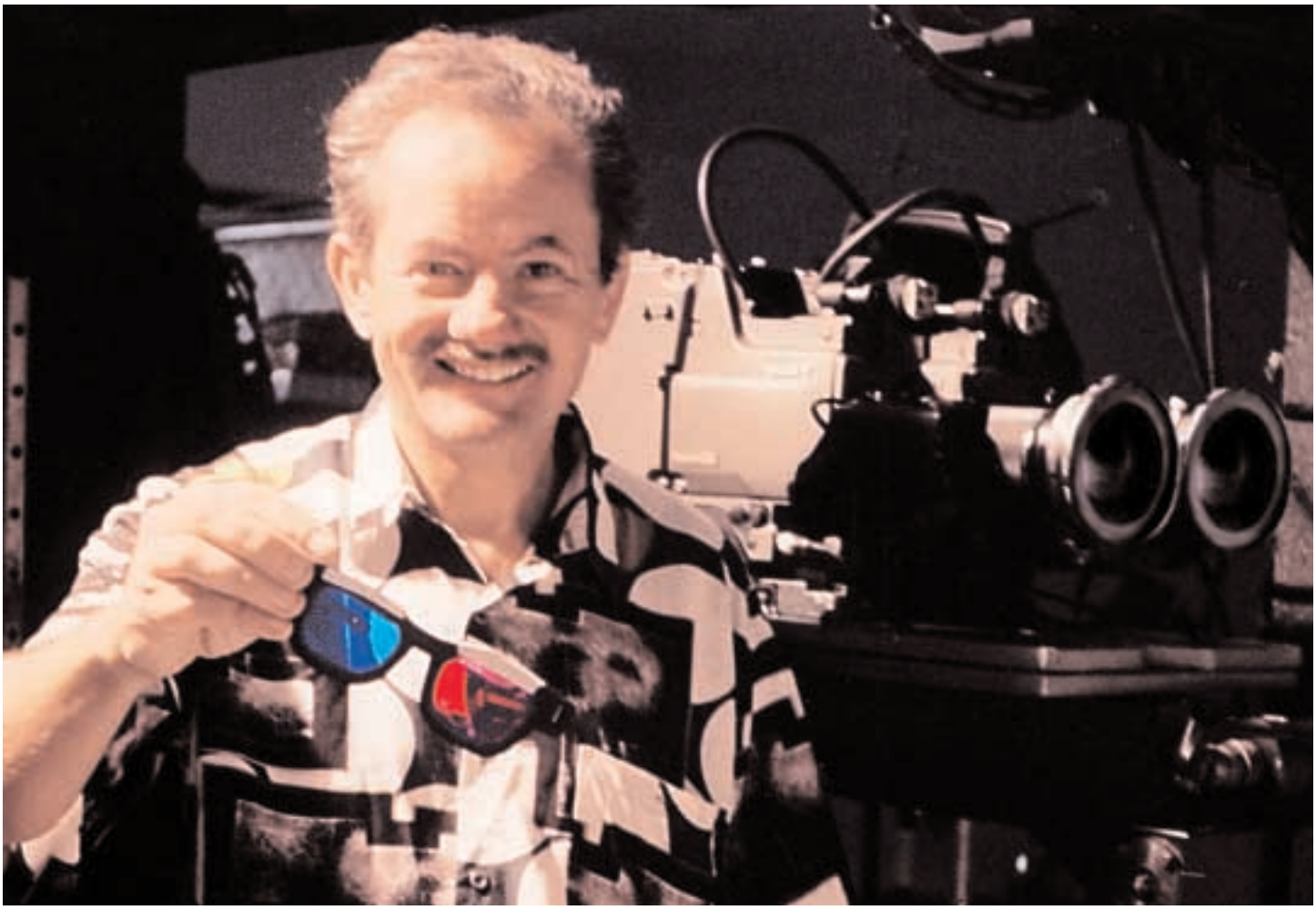
StereoScope™ Anaglyph Video in Miami



Rupkalvis with dual Sony® BVP-90 video cameras on StereoScope™ dual-camera, side-by-side video rig. This platform is equipped with rack-and-pinion convergence control. While this particular production employed an anaglyphic approach, this system can be used for any stereoscopic application, including streaming video.

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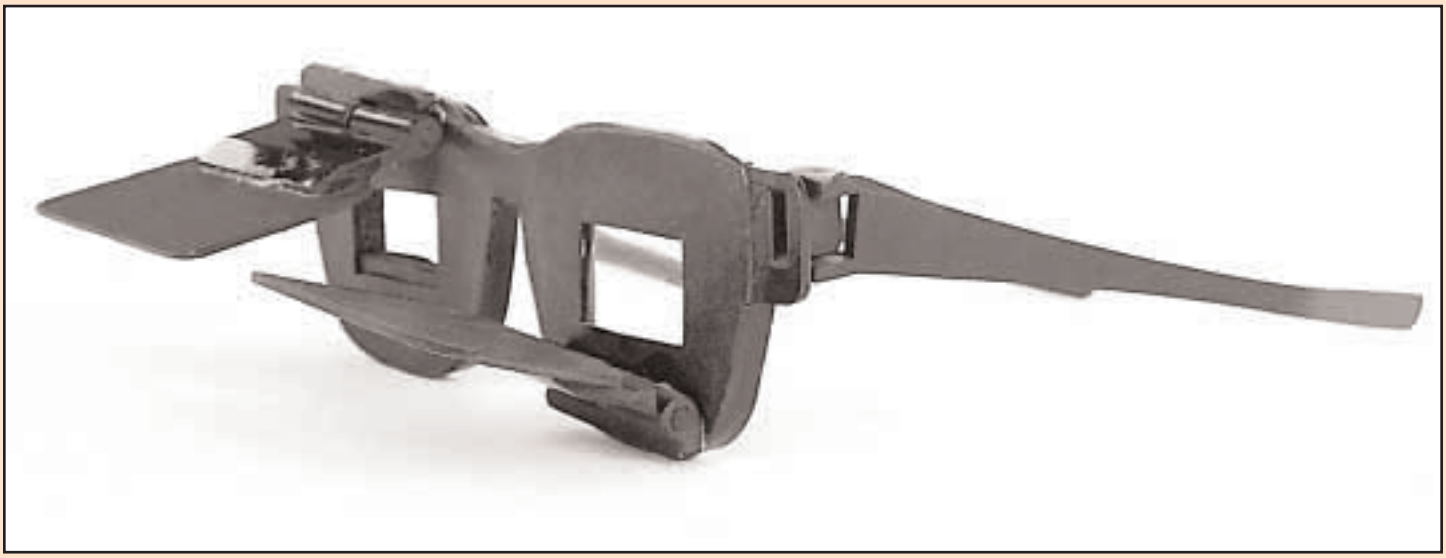
Self-Occluding Prismatic TV Viewing Glasses

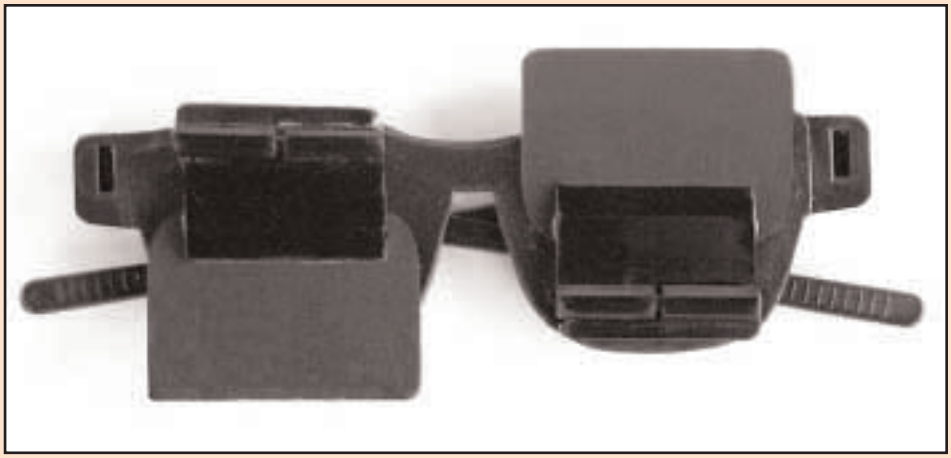
"Blinder" style occlusion flaps eliminate extra images from over-and-under configuration stereoscopic 3-D videos viewed with them.

An alternate style, using polarized filters, does not require the occluders, but does require a filter over the television receiver or monitor screen.

Both versions permit flicker-free 60Hz stereoscopic television viewing with no temporal distortion.



Hinged design allows folding for compact storage when not in use.



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Dual LCD Stereoscopic Video Viewer

Hand-held video viewer allows for the stereoscopic viewing of discrete image 3-D videos. Similar to a 35mm stereo slide viewer concept, except for having full motion video.

Above, the lens housing has been removed to show viewing screens.

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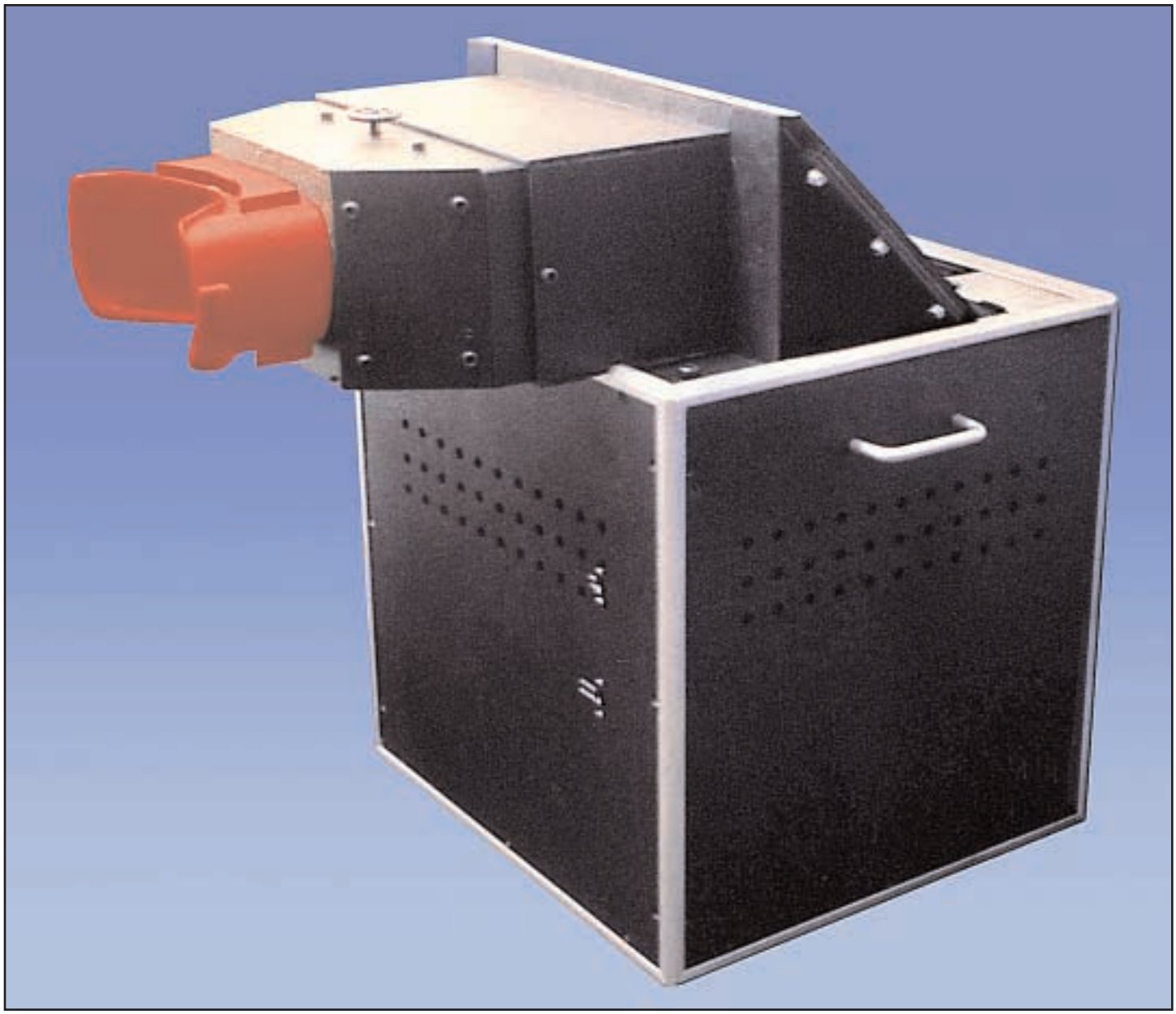

StereoScope™ 3-D Videotek™ Monitor Viewer

Designed and Built for 3-D Imagetek™ Corp.

This side by side type stereoscopic viewer features its own built-in high resolution television monitor based on a .25 dot pitch Sony® Trinitron® CRT. It includes adjustable interocular spacing and focus to precisely match the individual operator's vision.

Similar systems can be custom configured to your requirements, including options such as the use of other video displays (LCD, plasma, etc.)

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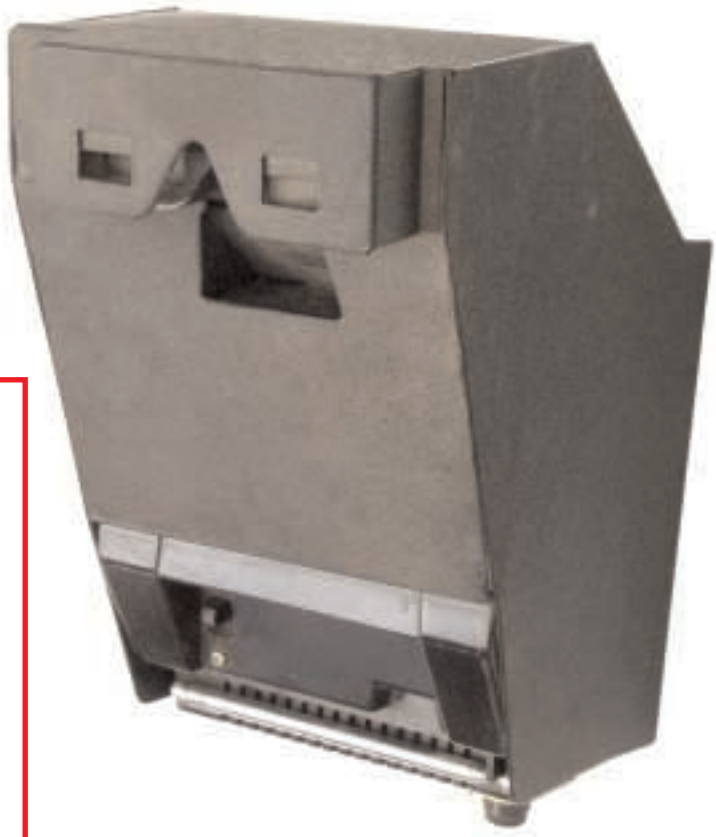
Video View-Scope™



Hand-held stereoscopic video viewer allows 3-D viewing of over-and-under 3-D videos. Similar to View-Master® concept, except for having full motion video.

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Stereoscopic LCD Video Monitor

5.6 inch active matrix LCD-based portable 3-D video monitor. Provides essential stereoscopic monitoring in the field or in studio production applications, as well as throughout the post-production process. In addition, this unique monitor may be used in the office, screening room, or anywhere an image should be viewed in 3-D.

Passive polarized glasses give flicker-free view of 60 Hz stereoscopic high resolution images. Adjustable base allows the monitor to be positioned at any angle.

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Stereoscopic CRT Video Monitor

Dual Mitsubishi® .28 pitch 13 inch monitors form the basis for this high resolution stereoscopic monitor. Passive polarized glasses make for simple viewing, such as in P.O.P. countertop and kiosk applications.

(operational prototype)

Alternatively, wide screen LCD monitors can be the basis of a much smaller unit (about 1/4 the size of the CRT based unit) that can serve to preview conventional NTSC as well as wide screen high definition stereoscopic video.

(conceptual image)

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Modified Verascope®
Stereoscopic 35mm
Still Film Camera

Production-oriented modifications include the addition of a rapid film advance lever, a flip open lever for the rewind, a bubble level which is visible through the viewfinder window, and non-parallel machined inside chamber walls to prevent internal reflections.

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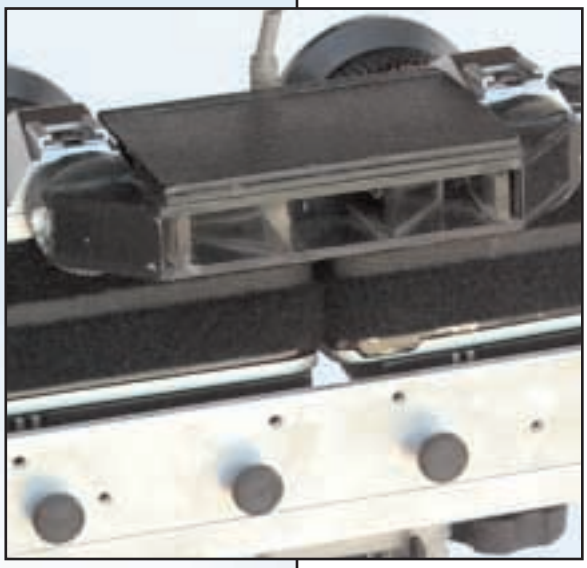
Motorized Dual 35mm Horizontal Film Camera Rig



Two Olympus® OM-10 cameras, each attached to an Olympus® 2 Winder, are synchronized via an electronic circuit that allows for single or a burst of multiple exposures to be fired. A mirror box with relay lenses allows the images from both cameras to be viewed stereoscopically. Convergence is independently controlled from the rear, as well as the single button that simultaneously electronically fires both cameras.

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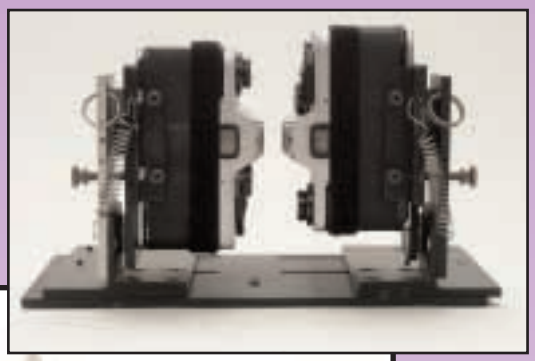
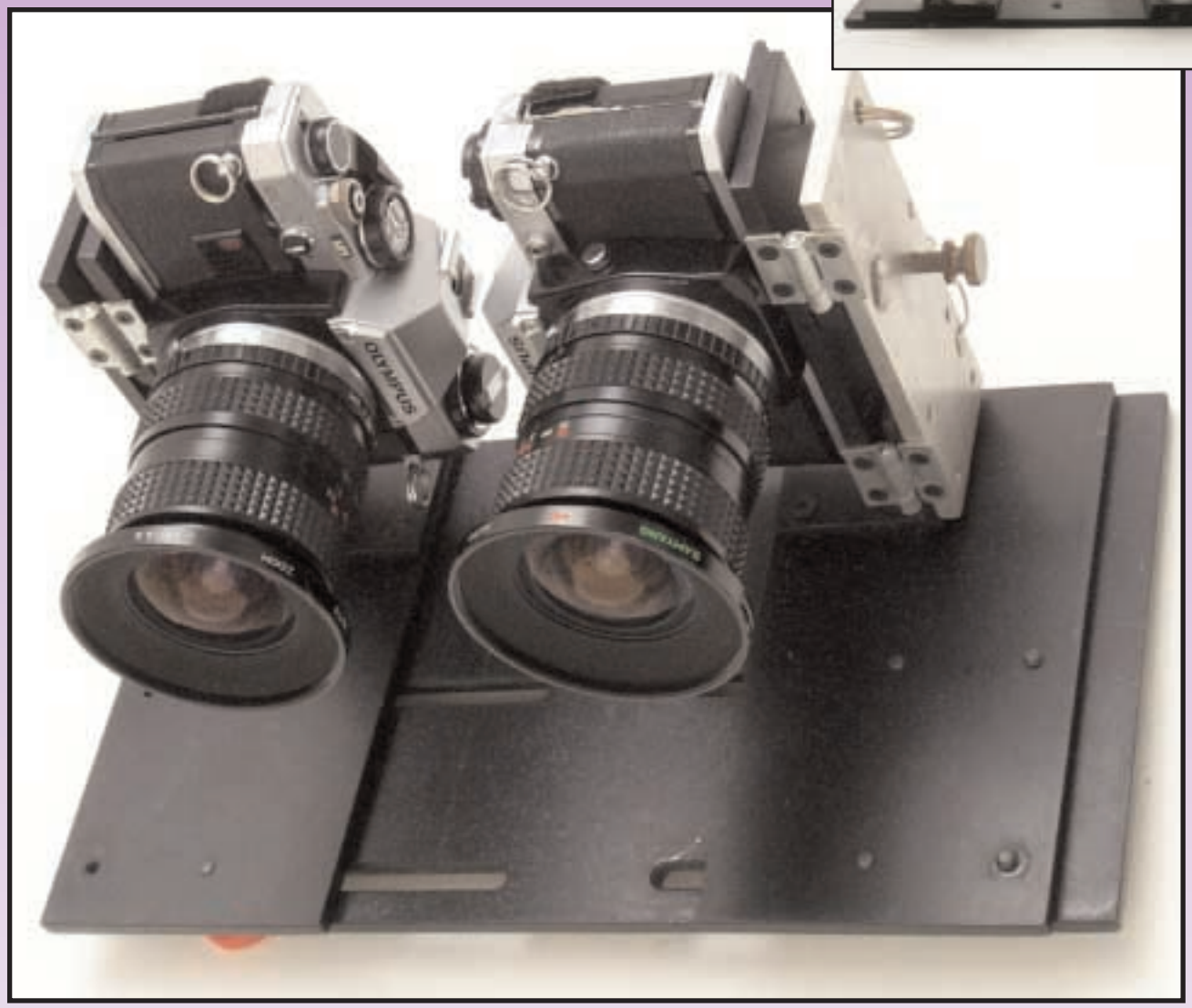
Dual 35mm Vertical Still Camera Rig





Fitted with a pair of Olympus® OM-10 cameras, this 35mm camera stereo mount results in vertical 24 x 36mm slides or negatives. This rig features adjustable convergence, stereoscopic viewfinding, and an adjustable stereo base.

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A Velcro®-covered plate allows two cameras to be mounted base-to-base for maintaining a stereo base as narrow as 63.5 mm (2.5 in).

This results in normal stereo perspectives, and makes the orthostereo condition possible.

The mirror viewfinding system allows for stereoscopic viewing of the SLR images in the camera viewfinders.

Normal Stereo Base 35mm Still Film Camera Assembly

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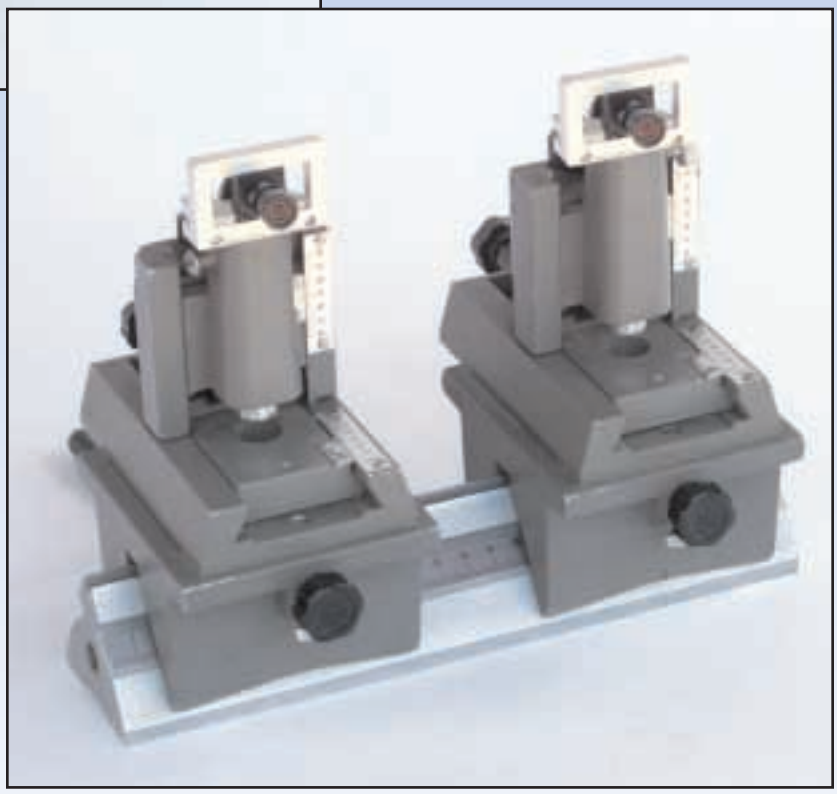
0.25 Meter Optical Bench Mount

A pair of 35 mm still film cameras on a side-by-side 0.25 meter optical bench. The mounting allows XYZ translations, with a +/- 15mm range in each axis.

Any camera pair may be used on this easily portable bench, such as these miniature video cameras.



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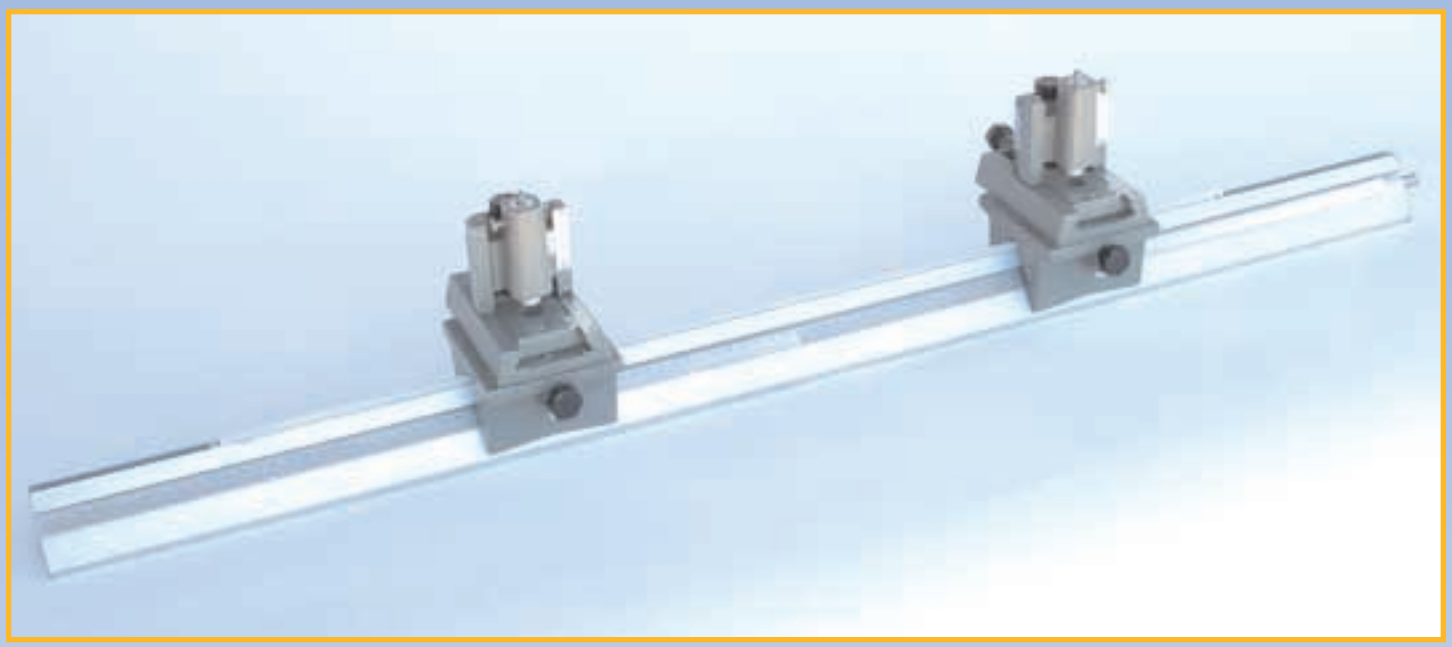
Full Meter Optical Bench Mount



A one meter long Beck-Ealing Zeiss configuration meehanite optical bench serves as the extremely stable foundation for a wide range of stereo bases with any pair of cameras.

At left, two 35mm film cameras are shown mounted for hyperstereo photography. Alternatively, one camera may be mounted to one of the translators, and the other used to drive it in measured 1mm increments down most of the length of the bench as shown at right. This application allows the bench to serve as a transverse rail for multiple image lenticular stereoscopic photography. For example, a medium-format camera, mounted to this bench, was used to produce the images from which the three dimensional theater lobby poster for *Jurassic Park: The Lost World*© was made. This poster showed a stereoscopic image of a Tyrannosaurus Rex, which was modeled by Stan Winston.

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WIRELESS RF STEREO LINK

RADIO CONTROL PERMITS SYNCHRONOUS HYPERSTEREO IMAGES OF RAPIDLY MOVING DISTANT SUBJECTS, SUCH AS TRAINS, AIRPLANES, SURFERS, SKIIERS, MOUNTAIN CLIMBERS, FIREWORKS, ETC.

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Medium Format Stereoscopic Rig

A pair of Optika IIa® cameras mounted together for large 6 x 9 cm hyperstereo negatives or transparencies. This is a larger film area than that of Imax® and 50% larger than that of the Hasselblad®. This configuration features adjustable convergence and dual handgrips, with remotely triggered shutters via release buttons in the grips.

For action shots with narrower stereo bases, the cameras may be mounted on the beamsplitter rig. A single camera may also be mounted on the optical bench slide bar for still-life stereo pairs.

These cameras feature SLR viewing, interchangable 120 film backs, and interchangable lens boards. They include both front leaf and rear focal plane shutters, as well as an extension bellows for closeups.

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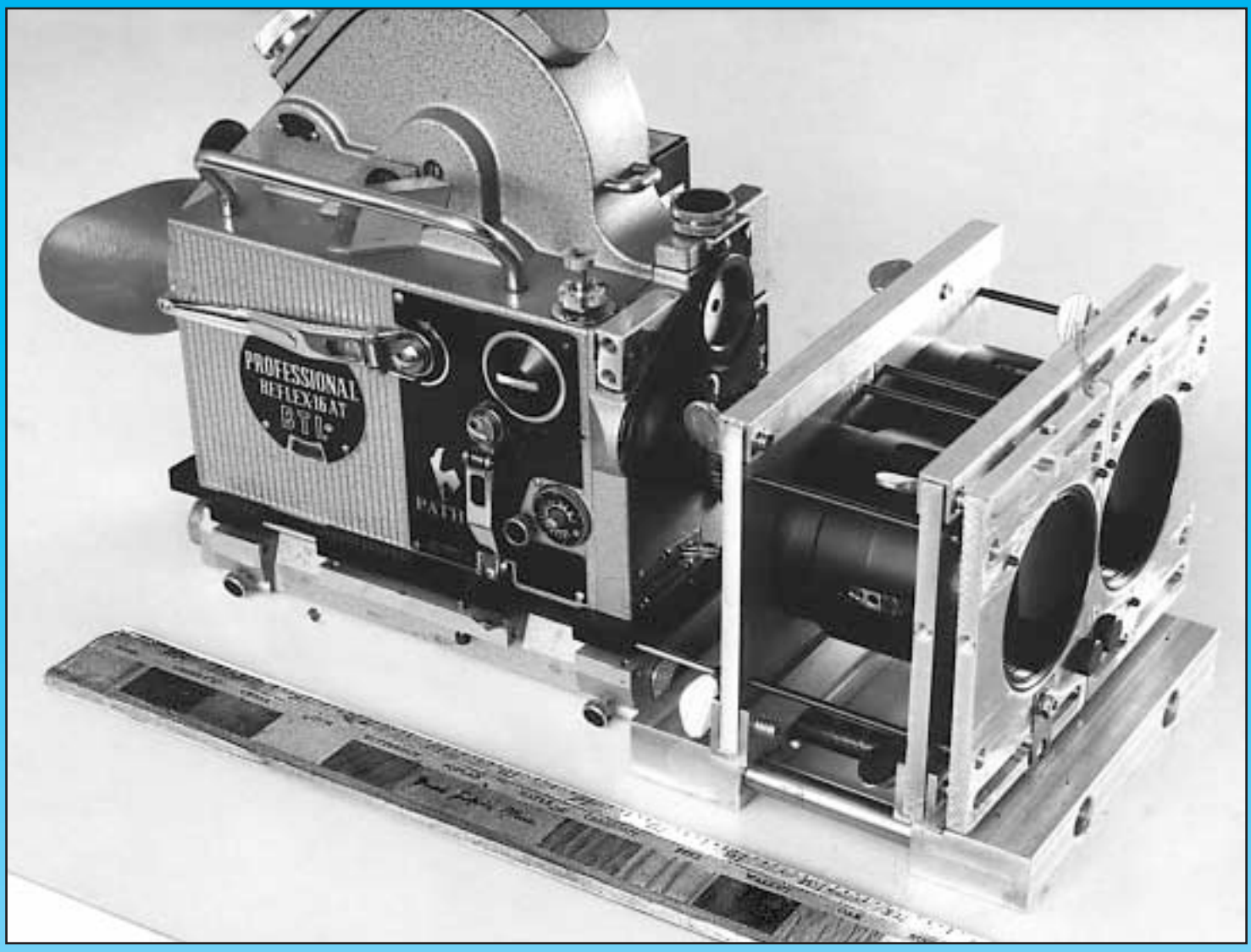
StereoScope™ 16mm 3-D System



Compact system shown on a Pathé® 16mm movie camera. Dual rhombic prism image splitter would normally yield a tall, narrow, door-shaped image. However, in this configuration the anamorphics restore the shape to a conventional 1.33:1 horizontal aspect ratio. This conforms to the NTSC broadcast television standard image.

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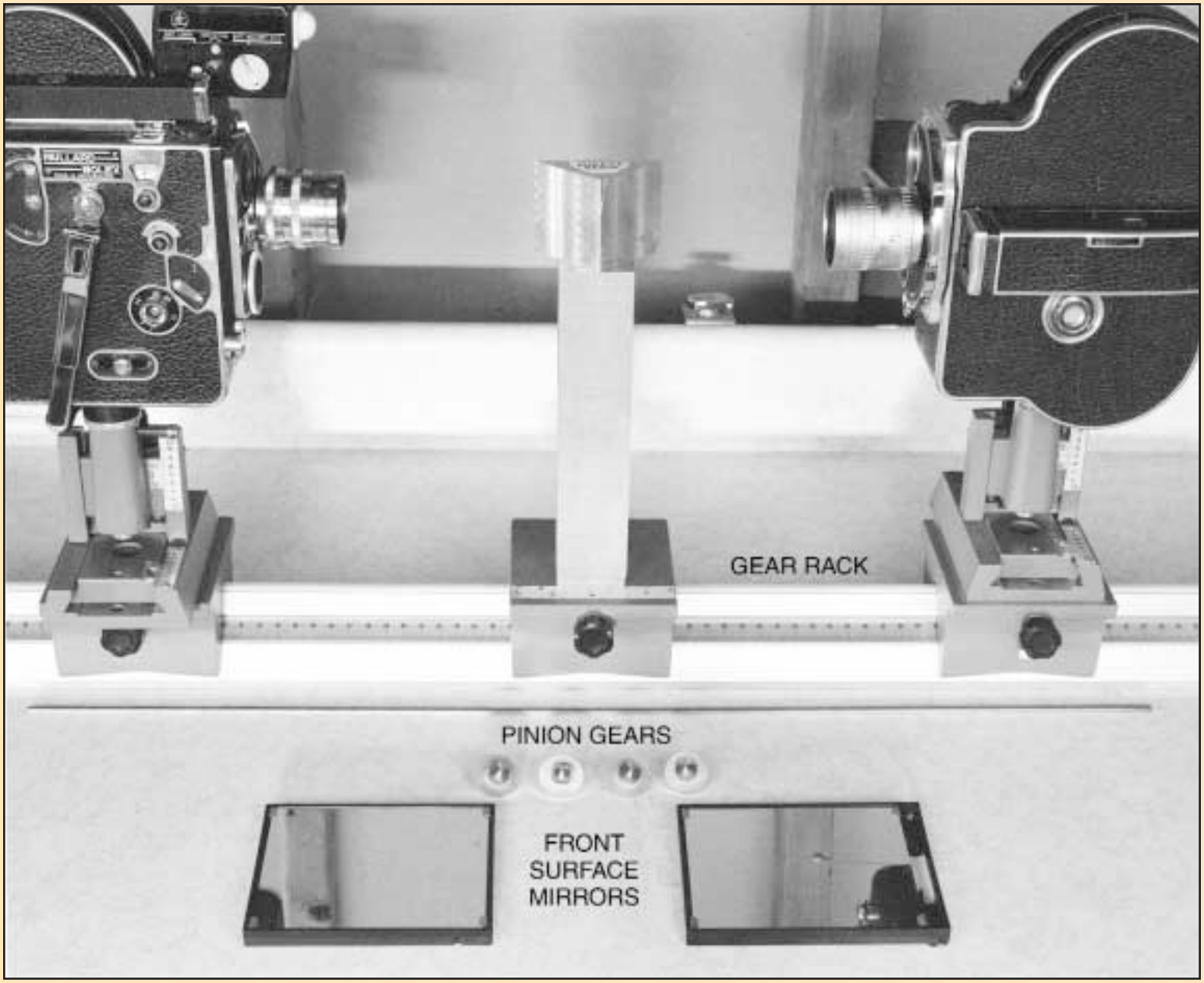
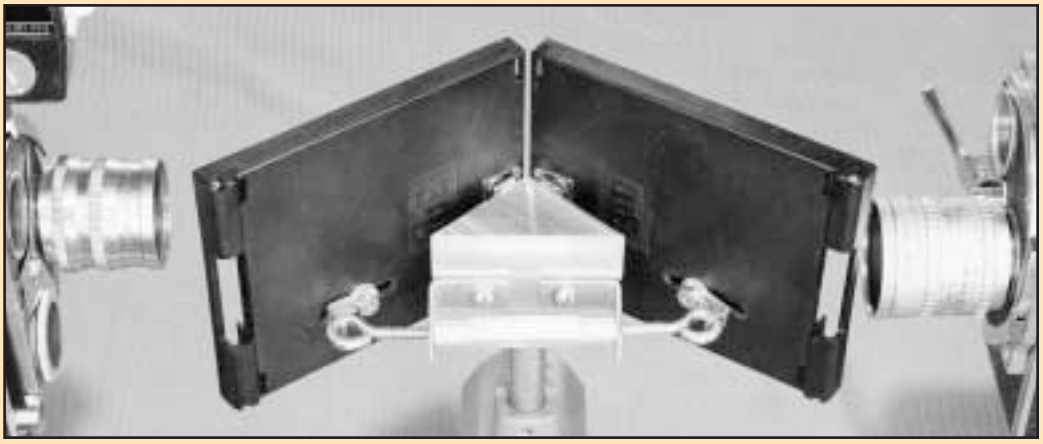
Parallel Total Reflection Stereoscopic System



A pair of Bolex® 16mm cine cameras are mounted on the Beck-Ealing® optical bench in a NaturalVison® configuration for minimal light loss.



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High Speed Stereoscopic System

A Bolex® stereo lens is mounted on a Red Lake® Hycam® ultra high speed film camera to record high speed images stereoscopically.

One of the reasons for high-speed imaging is to allow more detail to be observed in rapidly moving subjects.

The addition of stereo reduces ambiguity and allows even more detail to be perceived, for a much better concept of what is happening.

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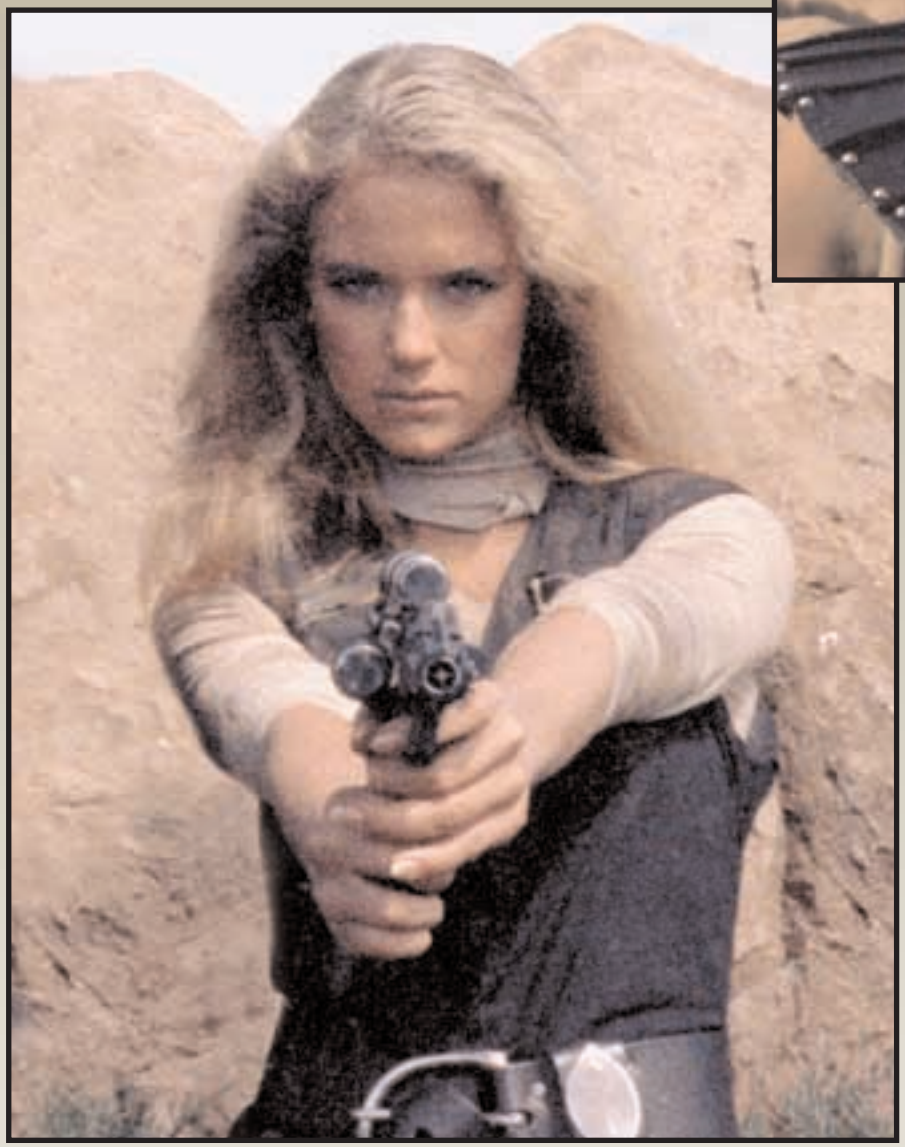
Scenes from *Metalstorm©*

Special effects costuming shown on some of the key players.



Above, Kelly Preston poses with prop gun.

At upper right, R. David Smith is shown in full effects costume which included a fully-functional prosthetic arm that was featured in several of the off-screen stereoscopic 3-D effects.

Special effects costumes were designed and built by Make-up Effects Labs (MEL)™.

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Scenes from 3-D Movie *Metalstorm*

Highly acclaimed by critics, the stereoscopic film *Metalstorm* had many examples of stereoscopic techniques. In this scene, the effective use of props enhance the storyline as well as the 3-D impression.

Properly done, pyrotechnical effects are much more effective in 3-D than in flat films.

In addition to being stereographer on the film, John Rupkalvis was the stereoscopic consultant in several other areas, such as the design of scenes to serve as background plates for rotoscoping, which he also supervised.

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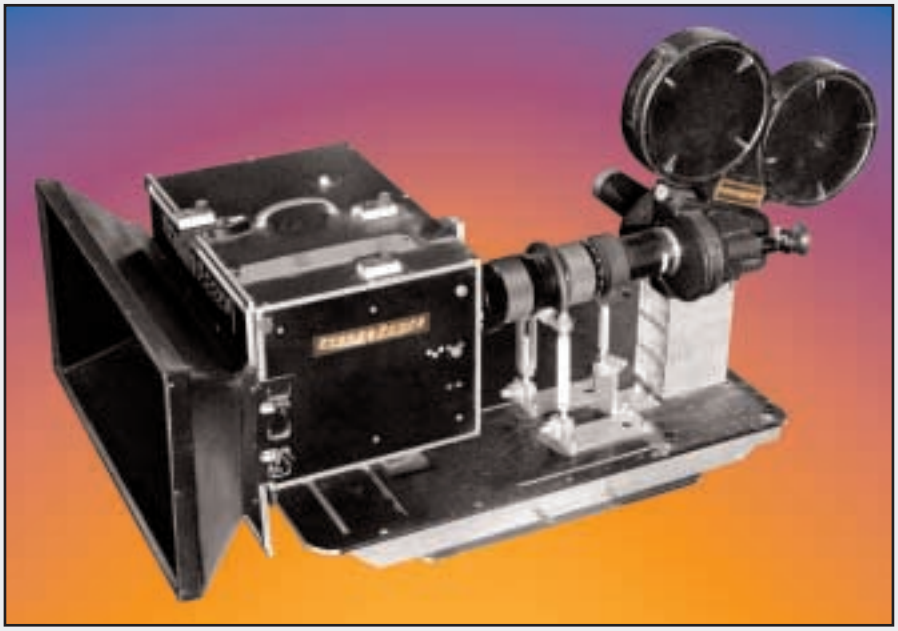
StereoScope™ Film System for *Metalstorm*™ Special Effects

Metalstorm© shot of full-sized Skycycle and actor in front of bluescreen. Rupkalvis (right) helps rock ship.

The StereoScope™ optical system used for shooting miniatures, special effects, and some of the live action scenes in *Metalstorm*©.

The extreme versatility of the StereoScope™ film system resulted in stereoscopic imaging that was accomplished completely ***in-camera***, resulting in significant cost savings. The optical registration of the StereoScope™ system is so accurate that several layers were combined in optical printing.



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Helicopter-Mounted StereoVision™ Lens

Rupkalvis supervised the helicopter mountings for this StereoVision™ system on location with the film *Metalstorm©*. This rig allowed real-time stereoscopic monitoring using videotaps and prism glasses to multiplex the over/under 3-D image. At lower right, Rupkalvis (center) with his helicopter crew.

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Jai Bhetala

Color and detail in actors' costumes combine with costume jewelry and movement to contribute to realism.

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Jai Bhetala

Princess tosses ball to StereoVision™ lens for “off the screen” POV shot.
Camera operated by John Rupkalvis.

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StereoScope™ Filming for East Indian Production

Careful staging of scenes such as this will result in “lion in your lap” thrill effect.

While India is known for its lion populations, *Animal Actors* in California supplied the trained lion for this scene.

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StereoVision™ Filming of Chase Scene

Moving subjects, such as this trailer-mounted police car, are very convincing in stereo.

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StereoVision™ Rig on Roller Coaster at Six Flags® Magic Mountain®

Front mounted StereoVision™ equipped camera with wide angle lens provides a visceral point of view shot...

...while a rear mounted unit adds the human element by showing passengers and their reactions.

3-D cinematography reveals the excitement of the roller coaster with a "you are there" appeal impossible in any other medium - except being on the ride itself.

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Speed-Rail® Rigging for 3-D Shot of Following Car

Speed-Rail® is especially useful for stereo camera rigs on moving vehicles. StereoVision™ Lens equipped camera makes for lightweight solution.

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Crane-mounted Stereoscopic Camera Rig

A crane is an excellent platform for high-angle stereoscopic views. In this example from the filming of the 3-D production *Daydreams*©, a group of helium-filled balloons (foreground) are about to be brought directly under the StereoVision lens-equipped camera. They will be released so that they float up to the camera.

Correctly done, this results in a dynamic off-the-screen effect.

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Commercial Application of Stereoscopic Imaging

The StereoVision™ lens is used for commercial as well as entertainment presentations. In this application, *Heartbeat of America*©, a film made for Chevrolet® was exhibited in 3-D to the public at several auto shows. This is another of the numerous productions where John Rupkalvis was the stereoscopic consultant.

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Pre-setting Focus on *Edge of Reality*©

Star target assures accurate focus, very critical in stereo, prior to slating the shot.

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StereoVision™ Filming of Snowboarder for *Edge of Reality*© Using Per Peterson Rig

The Per Peterson Rig allows rapid following of the action while maintaining stability.

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StereoVision™ Lens On *Edge of Reality*© Shoot

Particulate matter, like snow-spray, is very effective in 3-D. A sheet of Plexiglas® (above left, in the foreground) placed in front of the lens protects it while allowing the snow or other splashed particles to come right up to the lens.

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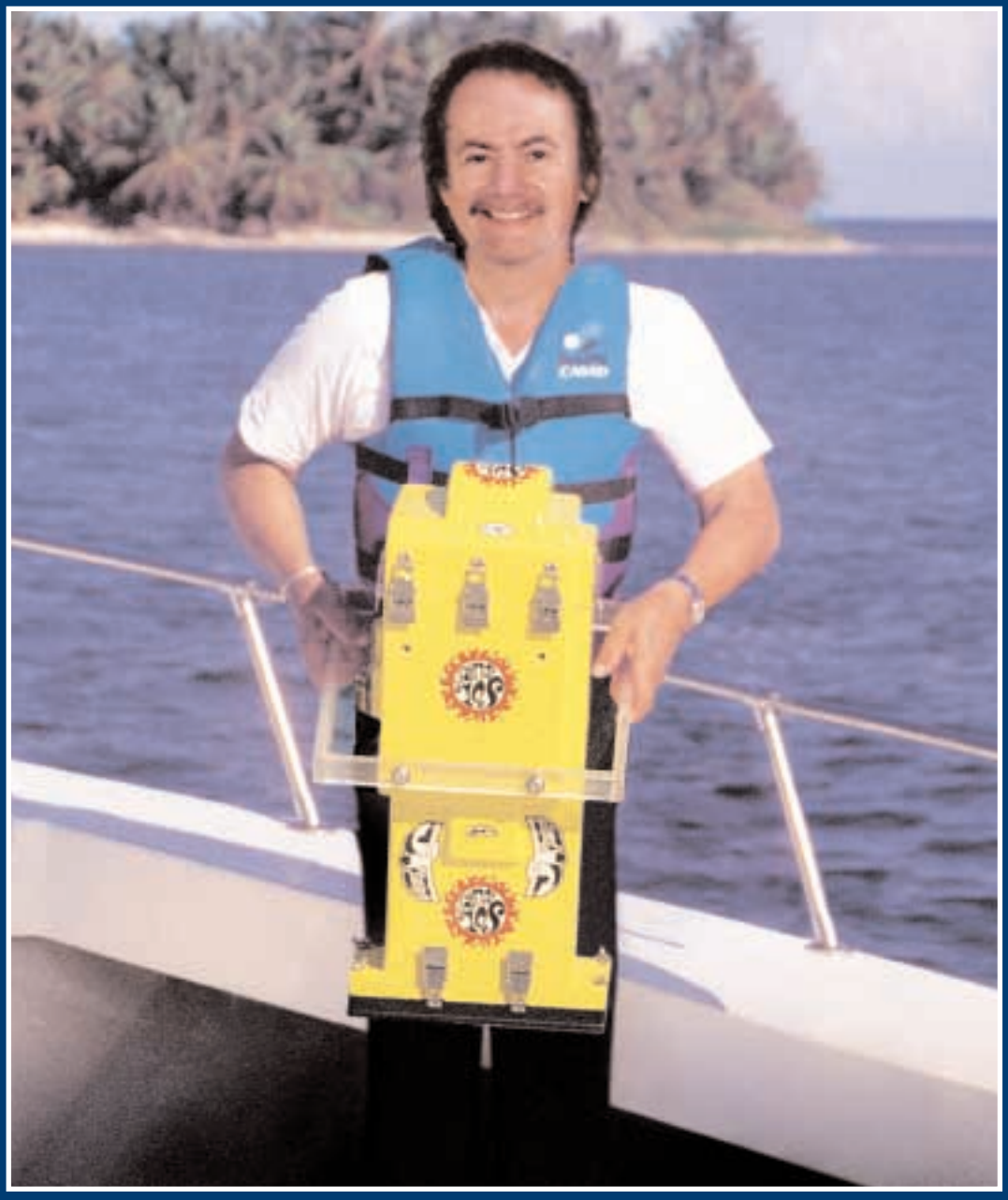

Belize Underwater Expedition

Rupkalvis with underwater housing containing 200 fps Photosonics® 35mm Cine Camera fitted with an 11mm StereoVision™ 3-D lens.

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Stereoscopic Production Alignment Light

This multi-function device is used on stereoscopic 3-D production sets. It allows the operator and the stereographer to quickly and accurately set the stereoscopic camera system.

An illuminated star target functions to allow critical focus to be set on a ground glass or video screen, even when the lenses are stopped down. It may also be used to check the front and back limits of the depth of field range. In addition, an independently switchable halogen point light source produces a specular highlight for “catchlight” fine focusing.

When the light is turned to a vertical orientation, a bubble level on the top of the unit permits it to be held perfectly straight. In this position, the vertical line may be used for setting convergence. It also serves to allow close and far parallaxes to be checked on the ground glass or video

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3-D ALIGNMENT ON m&m® SHOOT

Multi-function light serves both as a focusing aid and a convergence guideline. The top picture shows light oriented for focusing on specular highlight.

In the image to the right, Rupkalvis sets convergence on StereoVision™ lens utilizing the vertical line on the multi-function light.

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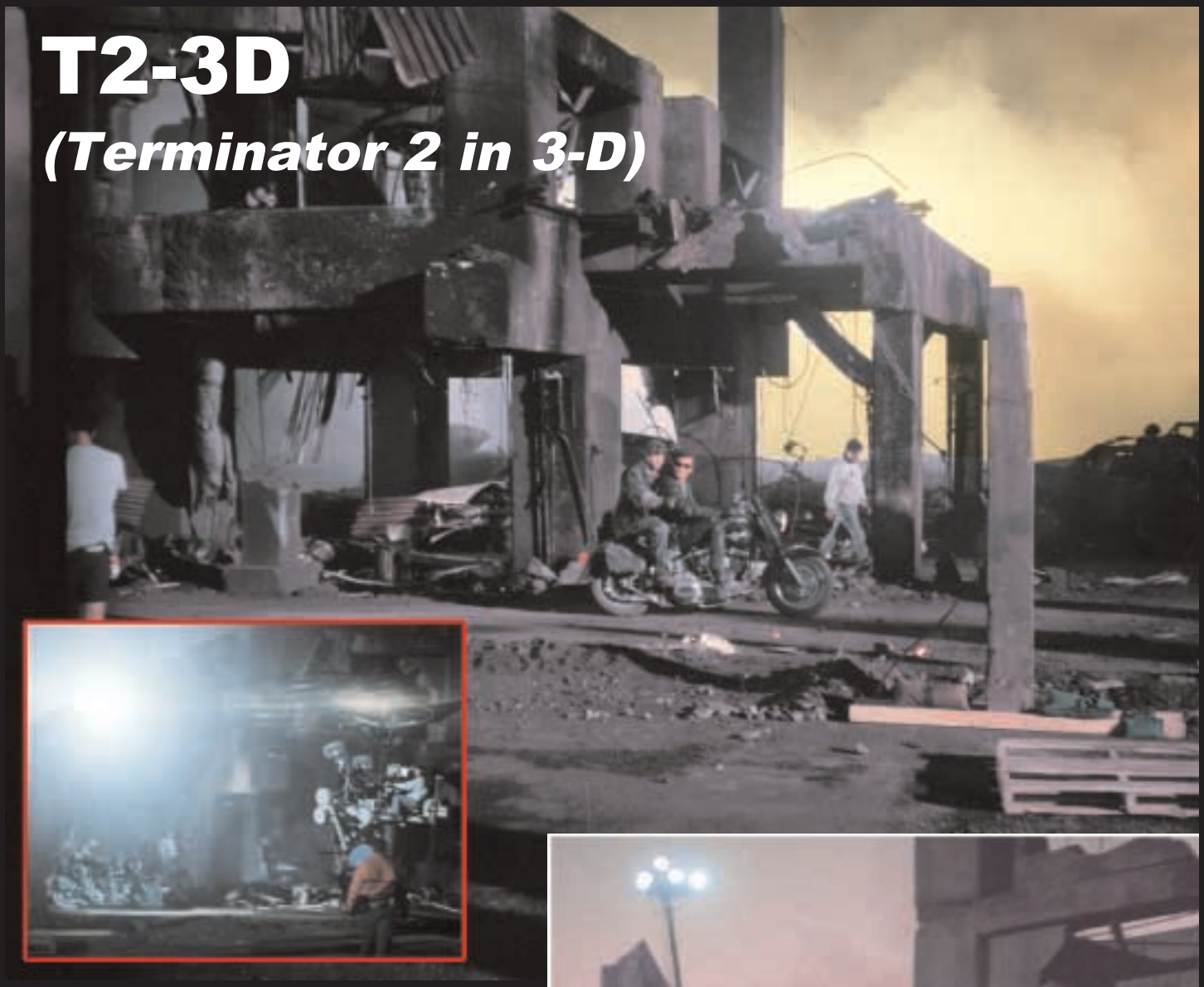
T2-3D
(Terminator 2 in 3-D)



Rupkalvis served as stereographic consultant on this Universal® three-screen 3-D production helmed by James Cameron of *Titanic* fame. StereoVision™ lenses were fitted to Panavision® and Arriflex® cameras, and used to produce Steadicam™ footage, which was subsequently blown up to 70mm. The resulting footage was inserted into the production, a Universal special venue mixed media presentation.

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La Concierto Por La Tierra in 3-D Showscan®

In addition to serving as stereo consultant on this Showscan® (70mm format at 60 fps) production, John Rupkalvis also designed a special time parallax stereoscopic imaging technique for a spur of the moment sunset shot where there was no time to assemble the dual camera system. Bayley Silleck, the executive producer, stated that Rupkalvis' single-camera time-parallax shot resulted in the best 3-D scene in the entire film. Rupkalvis also created the main title, in 3-D. Pictured are the special Cinema Products™ 65mm cameras on the Hines stereo beamsplitter rig.

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The *10 PERF*™ 65mm StereoVision™ Cine Camera

This one-of-a-kind StereoVision™ 65mm camera features a 10 Perf™ pulldown movement. Combined with the StereoVision™ over-and-under large-format 3-D lenses, dual 5 perf. stereo image pairs are recorded on a single 65mm film. These images have exactly the same film area as the far more cumbersome, 65mm dual-camera, dual-film 3-D systems in use at Disney®, Universal®, and other major studios. Production proven, with half the loading time, single unit interchangeable stereo lenses, and single camera ease of use, the StereoVision™ 10-Perf™ system is far more cost efficient than any dual system. Pictured above, *Victoria Silliphant* poses for a camera test of the system.

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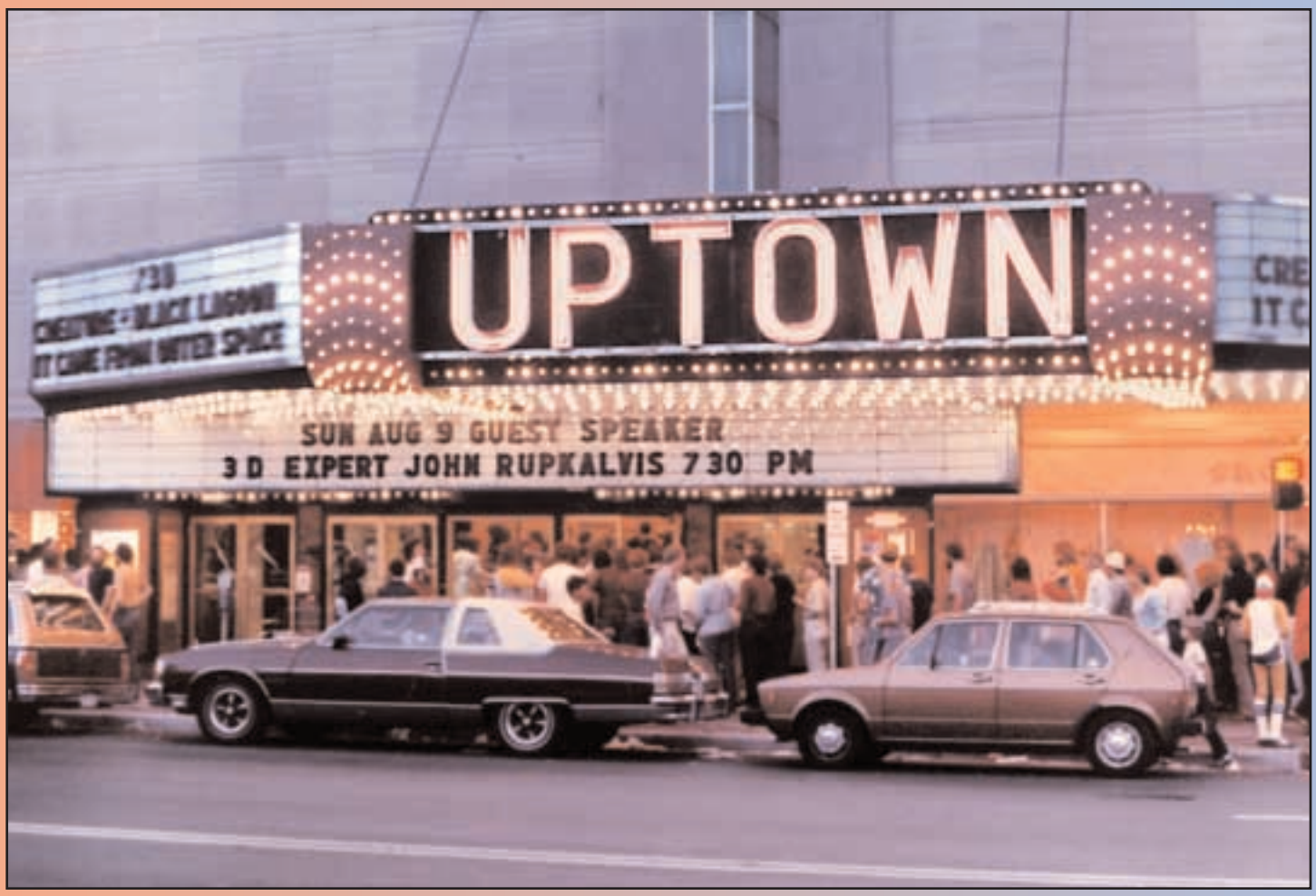

Interest in 3-D Movies Brings Out Large Crowds

Rupkalvis is available for special presentations and tutorials on all types of stereoscopic imaging in all venues and media, such as cinema, video, HDTV and CGI. Professional and amateur groups are all welcomed. Quotes are available on request.

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Rupkalvis with StereoVision™ Lens on Panavision® 65mm Camera

Shooting on the film *Family Circus*, sponsored by Renault®, Rupkalvis operates this large format stereoscopic system.

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• Stereoscopic miniDV cam. Currently manual, miniature digital hand-held or tripod mounted unit features proportional leadscrew-driven adjustable convergence, two interaxials, and real time stereoscopic viewing. Finished unit will also include synchronous record start and synchronous zoom control.

• Stereoscopic macro stereo system with line or RF transmission, 15.8mm (5/8 inch) stereo base, passive polarizer type stereoscopic monitor for real time WYSIWYG viewing.

• Stereoscopic telephoto miniDV system. Features one meter (39 inch) stereo base, switchable spot and field tracking, synchronous zoom, synchronous auto start, passive polarizer type stereoscopic monitor for real time WYSIWYG viewing.

• Stereoscopic geometrically linear video camera. Coupled laterally tracking lenses permit variable inter-axial. Coupled laterally tracking CCD's permit adjustable parallel convergence with absolutely no toe-in. The result is complete real-time control of the stereopsis while maintaining geometrically correct images in all directions. Absolutely no keystone distortion.

• Stereoscopic model railroad system with stereoscopic engine cab view POV and RF transmission. Stereoscopic WYSIWYG viewing.

• Several other proprietary StereoScope™ devices and systems.

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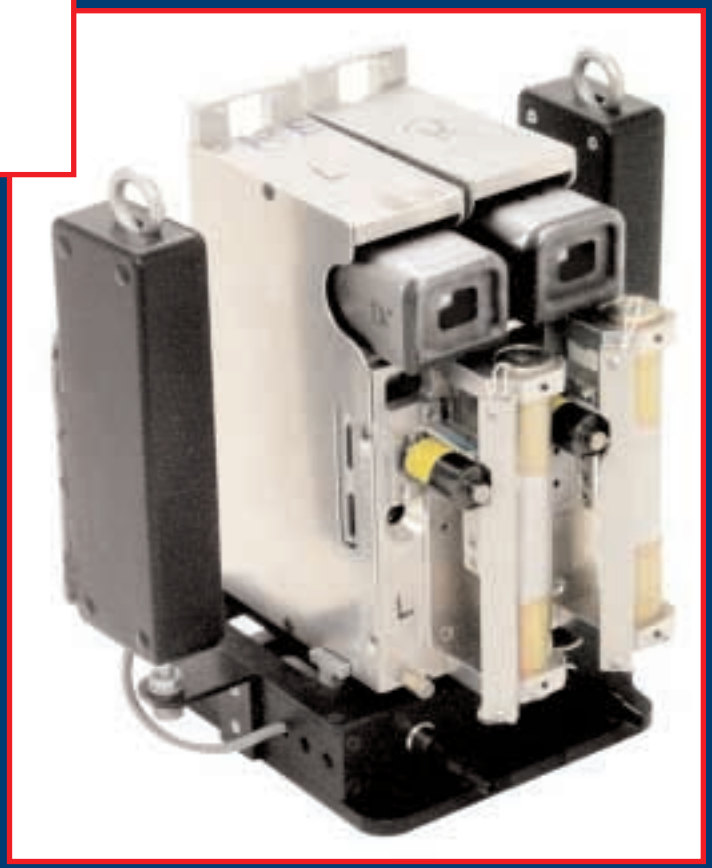
Handheld Mini-DV Rig

Basic handheld Mini-DV Rig with leadscrew-driven convergence and pushbutton control of synchronized record and zoom functions.



Solenoid actuated control system with cross-linked stereoscopic functions.

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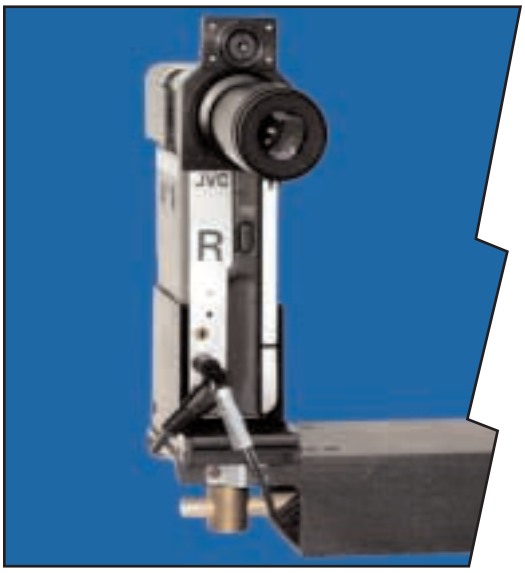
Wide Base Stereo

Mini DV

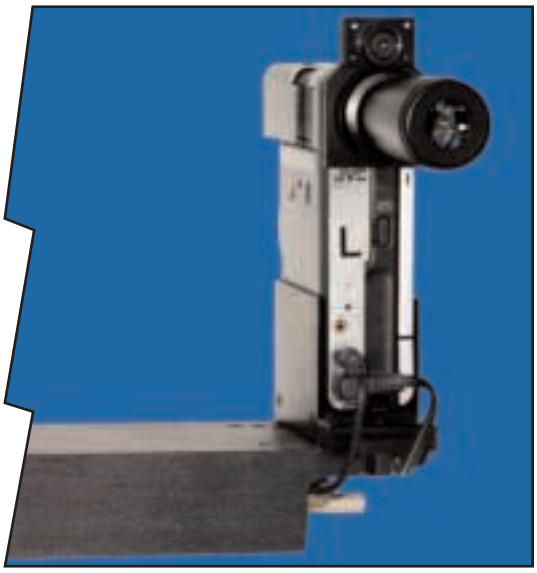
Extreme Telephoto Rig

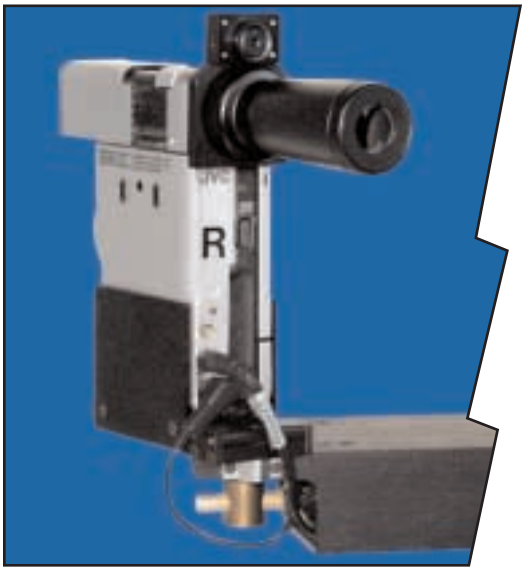


Above, the operator point of view of the rig.

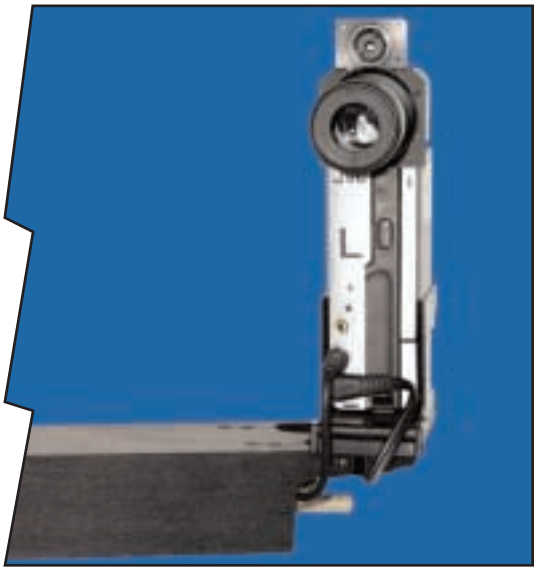
The handgrip controls provide synchronized record start, zoom, and convergence functions.

The Monitor provides superimposed as well as stereoscopic viewing with choice of camera video output or a wide field spotting mode for tracking moving objects.





At left and right, details of the wide stereo base in parallel (top pair) for the most distant subjects, and at full convergence (bottom pair), for closer subjects. Motorized convergence allows convergence tracking over a long range.



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3-D Model Railroad Cams

Macro stereo video cameras mounted to a model railroad engine provide a “down-the-track” POV with startling realism.

The visual impression is that of actually riding on the miniature train as if it were full size.

May be modified to be used on various guages, such as “HO,” “O,” “G,” and “1.”

"HO"
SCALE
16.5mm

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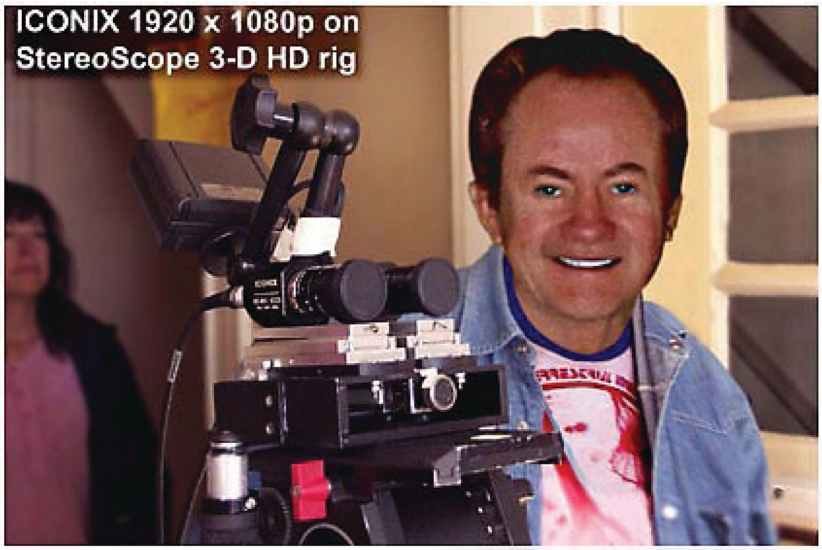
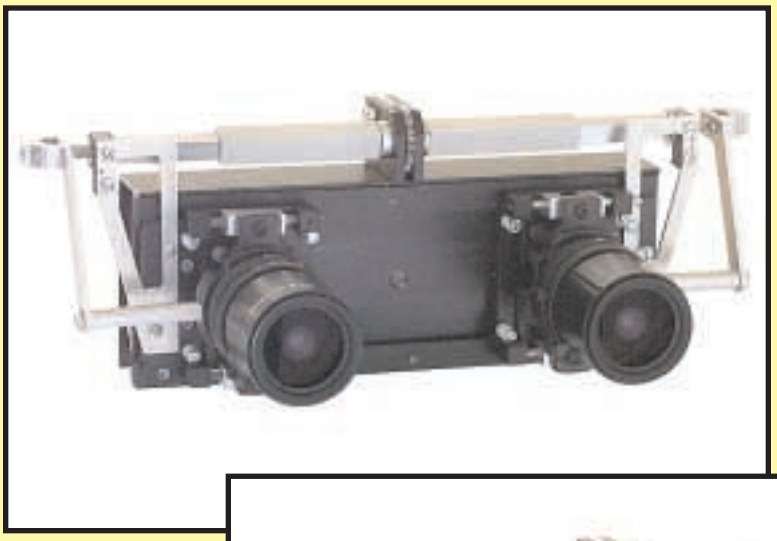
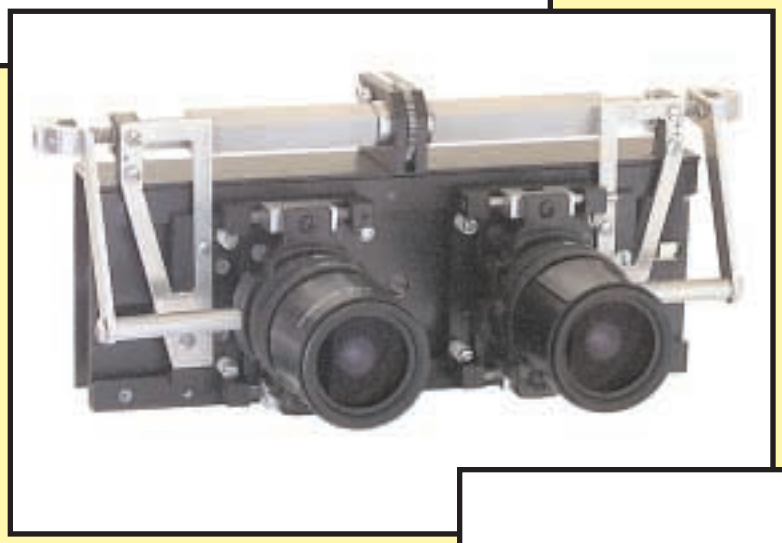
3-D HD PRODUCTION



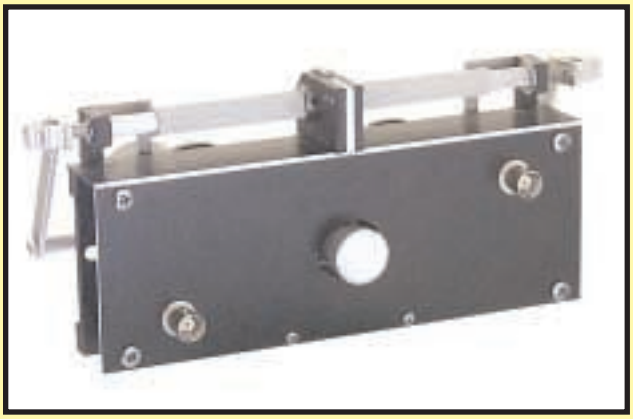
High Resolution Integral Stereo Video Camera

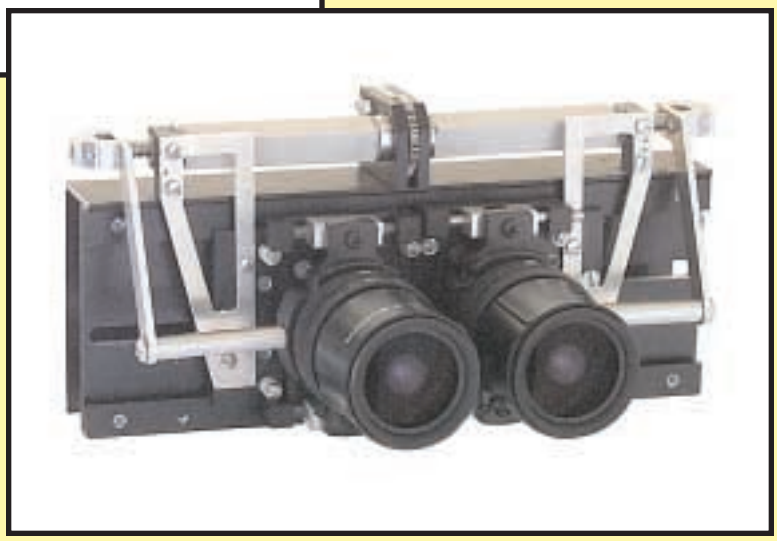


Color video cameras in one housing, coupled for both adjustable stereo base and adjustable convergence. Zoom shift lenses are cross-coupled to allow for lateral image shift convergence with no toe-in; no keystone distortion. Two sets of zoom lenses (four individual zoom lenses) cover ranges of 1.5 to 3.4 mm and 4 to 10 mm.



Both composite and Y/C (S-Video) discrete outputs for either discrete or multiplex applications.





Automatic or manual white balance, switchable gamma control ($\gamma = 0.6$; $\gamma = 1.0$), flicker reduction circuits, sensitivity control, backlight compensation, electronic shutter speeds from 1/60th the 1/10,000th of a second, AGC, and auto or manual exposure.

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