

New Products From Runco, Revel, NAD, Pioneer, Linn & Lexicon

The Journal of Digital Audio & Video™ - September/October 1999

THE PERFECT VISION

Sony G90 **Size *Does* Matter!**



\$5.95 US • \$7.95 CAN

www.thepfectvision.com

THE PERFECT VISION

www.theperfectvision.com

SUBSCRIPTION, RENEWALS, CHANGES OF ADDRESS
Phone (888) 475-5991 (USA) or (973) 627-5162 (outside USA). *The Perfect Vision* Subscription Services, Box 3000, Denville, New Jersey 07834. Six issues: In the USA, \$32, Canada \$36 (GST included); outside North America, \$65 (includes airmail). Payments must be by credit card (Visa, MasterCard, American Express) or USA funds drawn on a USA bank, with checks payable to Absolute Multimedia, Inc.

EDITORIAL MATTERS

Address letter to: The Editor, *The Perfect Vision*, Box 235, Sea Cliff, New York 11579, or by e-mail to hp@theperfectvision.com. Address all other editorial matters to: The Executive Editor, *The Perfect Vision*, Box 141, Cool, California 95614, fax (530) 823-0156, email: sreynolds@theperfectvision.com.

DISPLAY ADVERTISING

Contact Anne Hart at the address below or e-mail: ahart@theperfectvision.com, or contact Mike Grelman at (925) 327-1304, fax (925) 327-1429 or e-mail: mgrllman@earthlink.net.

CLASSIFIED ADVERTISING

Please use the form in the back of the issue.

NEWSSTAND DISTRIBUTION AND LOCAL DEALERS

Contact Eastern News Distributors, Inc., at 250 West 55th Street, New York, New York 10019, phone (800) 221-3148.

PUBLISHING MATTERS

Contact Mark Fisher at the address below or e-mail: mfisher@theperfectvision.com.

COPYRIGHT Absolute Multimedia, Inc., Issue 26, September/October 1999.

The Perfect Vision (ISSN #0895-4143) is published bi-monthly, \$32 per year for US residents. Absolute Multimedia, Inc., 7035 Bee Caves Road, Suite 203, Austin, Texas 78746. Application to mail at Periodical Postage rates is pending at Austin, Texas, and additional mailing offices. POSTMASTER: Send address changes to *The Perfect Vision*, Subscription Services, Box 3000, Denville, New Jersey 07834. Printed in the USA.

Editor-in-Chief Harry Pearson

Executive Editor Sallie Reynolds

Senior Editors Greg Rogers, Video
Thomas O. Miiller, Audio
Greg Sandow, Music & Multimedia

Technical Editor, Audio Robert Harley

Assistant Editor Bob Gendron

Technical Consultant, Audio Richard Marsh

Contributing Writers Alice Artzt, Bill Cruce,
Thom Duffy, Neil Gader, Bob Gendron,
Robert Harley, Alen Koebel, Bruce Lawton,
Tom Martin, Andrew Quint,
Barry Rawlinson, Paul Seydor,
Jonathan Valin, Heidi Waleson

Art Director Nancy Josephson for Design Farm

Proofreader Aubin Parrish

Artists Gary Oliver, Illustrations
David Omer, Cover Photography
Steve Friedman, Benigni Photos

Absolute Multimedia, Inc.

Chairman and CEO Thomas B. Martin, Jr.

Publisher Mark Fisher

Finance & Administration Trish Kunz

Accounting Scott Pettit

Advertising Representatives Anne Hart,
Mike Grelman

Circulation Manager Steven Wayner

Legal Jim Robinson

Advisors Vito Colaprico (printing),
Richard Sabella (HP's business),
Howard Arber (HP's legal affairs)

Absolute Multimedia, Inc. - 7035 Bee Caves Road, Suite 203 - Austin, Texas 78746
(512) 306-8780 · Fax (512) 328-7528 · absolute_multimedia@msn.com

I N T H I S I S S U E

Issue 26, September/October 1999

This was a hard issue. Our third time out and maybe three's a jinx, maybe we got a little cocky. In any case, nothing jelled for the longest time. Then, because TPV has Twinkle-Dust Factor, something finally clicked, and the topic rose to the surface: We were questing for the Mythical Beast. The elusive, the magical and mysterious. The thing you want – It – ever and teasingly just beyond reach.

The experience of "art" is a mystery, after all, and requires that willing suspension of disbelief. Furthermore, we want this shimmering thing in our homes – so quotidian, the antithesis of the magic carpet. If It can ever happen at home at all, the process requires an extraordinary blend of multi-sensual cues with true artistic vision – more than ever we needed in strange, dark caves.

Paul Seydor tells you how film editors strive for It. Alen Koebel haunted INFO-COMM looking for It. Alice Artzt says she found It in Roberto Benigni. For Tom Miiller, It turned his "perfect" room into a Tiger. Greg Rogers says you might be able to find perfect color – but not without real know-how. Greg Sandow digs at the very heart of the experience before he finds a little of It.

HP points out that while Special Editions are supposed to have It, suppositions by nature create unassuageable desires. Jonathan Valin takes on the vision of the great Imago himself, Ingmar Bergman, in the hope that some spells work forever.

Why, you say, I might have It in my hands right this minute! But drat, you can't get the system to work – you keep punching buttons and get picture but no sound, sound but no video. Where are those simple, hunky knobs of yore that clicked so cleanly from off to on and let you know when you'd got there? For some of us, It might just be sound and vision at the same time – every time.

Still, we have good, solid stuff here: Controllers (maybe they're that great old knob in new skin, if we can figure out how to use them). DVDs. Projectors, line doublers. Even whole systems (Part 1, of course. This is still a *quest*. And we are yet ourselves.)

Highlights: Sandow in Cuba at the Buena Vista Social Club; Seydor on the Cutting Room Floor; Rogers on Color; Rogers on Runco & Sony; Miiller in the War Room with Revel; Rawlinson with the Alchemist of Linn. Valin with Queen Elizabeth (he'd rather be with Mrs. Brown). And HP with Kubrick and the Space Monsters. **SR**

VIEWPOINTS

6 Editorial

7 Editorial Notes

Can All That Counts Be Counted? A Forum Begins...
Janet's Index (A footnote to "Keeping It Real:
Producing Classical Music Videos," Issue 25)

9 Letters

The Problem with DVD: Digital Artifacts...Targeting
14-Year-Old Boys?...Down the Primrose Path...What
Not To See on DVD...Electronic Cinema

Columns

- 13 **Audio:** Death to Convention – Tom Müller
- 15 **Video:** We've Got What it Takes for Home
Theater – Greg Rogers
- 16 **Music & Multimedia:** The Vexed Question of
Multimedia – Greg Sandow
- 17 **Out of the Box:** Video Travels – Tom Martin
- 19 **Design Concepts:** The Human Interface
– Barry Rawlinson

JOURNAL

20 Industry News

INFOCOMM '99: An Insider's View – Alen Koebel

24 Exploring Film

Trims, Clips, and Selects: Notes from the Cutting
Room Floor – Paul Seydor

AUDIO

31 Featured Product

Lexicon MC-1 Controller: Sonic Flavors To Slake
Every Thirst – Robert Harley

35 Department

What You Should Know...About Controllers
– Robert Harley

41 Reviews

41 Revel Ultima Speaker System Episode One:
The Ancient Enemy – Tom Müller

48 Linn-AV5100 Tukan Multi-Channel System:
In Search of the Mythical Beast I
– Barry Rawlinson

51 NAD T770 Audio-Video Receiver: Just the
Basics, Done Well – Neil Gader

53 Manufacturers' Corner RPG



**"Do not keep anything...that
you do not know to be useful
or believe to be beautiful."**

– William Morris



MUSIC & MULTIMEDIA

- 55 I Want My DVD! Major Labels' Plans for
Classical Music on DVD – Heidi Waleson
- 57 Upscale Pop (on DVD) – Thom Duffy
- 59 Made for DVD: Puccini's *Turandot* – Greg Sandow
- 63 A (Classical) DVD Sampler – Greg Sandow
- 67 Surrounded! Roger Reynolds' *Watershed* (created
for DVD) – Greg Sandow & Barry Rawlinson
- 71 Pop with a Twist – Bob Gendron
- 77 Multimedia: A Close Encounter (*Voices of Light
& The Passion of Joan of Arc*) – Andrew Quint



VIDEO

- 81 Department
Video Insights: An Introduction to Digital
Video 2: Video Color Concepts – Greg Rogers
- 87 Reviews
87 Sony VPH-G90U Multiscan Projector
– Greg Rogers
- 90 Runco DTV-930 Multiscan Projector
– Greg Rogers
Measurements – Greg Rogers
- 94 IEV Turboscan 1500 Line Doubler – Bill Cruce
- 96 Pioneer Elite DVL-91 Combination
CD/LD/DVD Player – Bill Cruce
Measurements – Greg Rogers
- 99 **Further Thoughts:** DVDO iScan Plus Line
Doubler – Greg Rogers



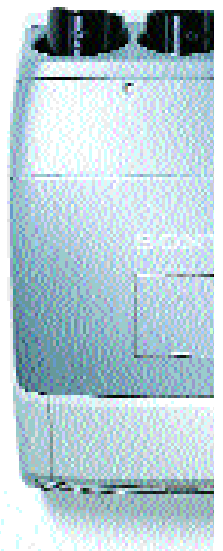
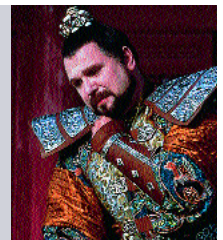
FILM & MOVIES

- 101 Personalities
Roberto Benigni – Alice Artzt & Bruce Lawton
- 105 HP's Movieola
Special Editions (DVDs): Kubrick & Alien box
sets...**Worth a Look:** Weir's *Gallipoli*; Ward's
What Dreams May Come; Vadim's *Barbarella*
- 110 Second Run
110 BioPics: *Elizabeth*; *Mrs. Brown*;
Gods & Monsters (DVDs) – Jonathan Valin
Comments by HP
- 114 Current Attractions
Kubrick's *Eyes Wide Shut* – HP
- 115 Film Forum
Bergman's *The Seventh Seal* (DVD)
– Jonathan Valin

SIGN OFF

- 118 For the Reader
Information about TPV
- 120 VisionWatch
Prognostications: Our staff predicts the future

Front Cover: Sony VPH-G90U Multiscan Projector





Follies & Frolics

.....

Let it be said, at this the half-way point of summer (as of the writing), the neighborhood multiplexes find themselves wishing they could either get rid of *Star Wars: The Phantom Menace* or at least move a surviving copy of it to one of their lesser screens. Most of you probably know the terms that George Lucas stuck the exhibitors with: (a) a 12-week minimum run and (b) on their biggest screens. It is even said that Lucasfilm is demanding 90 percent of the box-office gross for the entire 12 weeks. Unheard of terms. And not soon likely to be repeated.

Instead of being a *Titanic*-buster, as the marshmallow-cloud prognosticators foresaw, the fourth *Star Wars* installment looks a bit more like Dennis the Menace in its measuring up to the Cameron box-office juggernaut. And so we have the lovely irony wherein the biggest venues in the local plex may be less than half full, while across the hall, in a smaller theater, folks are getting turned away from the likes of *Wild, Wild West*, *Austin Powers*, *Big Daddy*, and other such intellectually stimulating and spiritually instructive treats. Me, I'm just glad that Lucas hasn't cornered the popcorn concession, demanding a cut there as well.

I had hoped to have a few "real" films under Current Attractions in this issue and was prepared to review one foreign flick no longer much about (*The Dream Life of Angels*) and even an artistic failure with plenty of meat on the bones (Mike Figgis' *The Loss of Sexual Innocence*). *Eyes Wide Shut* opened just in time for me to squeeze in a few observations.

But I was able to catch *Run, Lola, Run*, which is an exhilarating film, as full of energy as any dozen others and perhaps a signifier of where film is going at the end of the century. When I walked out of the theater, mind abuzz with the images I had just encountered, I felt almost a guilty pleasure, knowing that *Lola* marks the end of film as we know it. Well, maybe that's an exaggeration; but still, for some time movies have been abandoning traditional narrative formats for the hyped-up visual experience and *Lola* takes that hyped-up energy to the edge. And when you metaphorically peer over that edge into the abyss, you'll have to ask yourself, "Just where do the movies go from here?" Will they all become machine-gun fire multi-media collages, going even further than *Lola*, which is a multi-media treat (animation, live action, stupendously well-employed Dolby Digital, wall-to-wall-papered rock)?

I can't imagine this German import not becoming one of the most successful foreign/art-house films ever. Yes, it has subtitles (oh horrors!), but you hardly need them to keep up with the action, which has the virtue of being pure movement (cinema's forte) once *Lola* sets out on her run, repeated three times over with a different outcome each time. At issue is saving her dope-dealing boyfriend's life, which means she has to come up with \$100,000 (Deutsche Marks) within 20 minutes or else. There is a cast of characters whose paths she crosses (or doesn't) during each run, and as the camera pauses to contemplate each, you see a rat-a-tat barrage of still photographs of each's future, which changes according to the circum-

stances of the encounter with *Lola*. There are, additionally, two beautifully done bridge passages after the first and second runs, which show, slyly, why she gets another chance at changing the outcome. There is a surprising amount of heft, emotional meat on the bones, in this seemingly slight virtuoso exercise in the craft of film, and buried within its telegraphed shorthand staccato outbursts, a reservoir of deep feeling. And such mordant, dry, macabre humor to keep the tone ironic and post-modern. All this is in vivid, day-glo color, filmed in almost every medium one can think of, but done in such a way that it all coheres and makes perfect artistic sense (unlike, say, Oliver Stone's *Natural Born Killers*, where Stone is showboating with technique, failing to relate it to content). Like I said, it may well make you feel as high as a kite, but what in the world do you do for an encore?

Barco Vision Watch

In the first chapter of our adventure, Projector Installation: The Real Menace, I took a shot at Barco's official Long Island installation folks at Gavi. That was written on deadline. Between then and the time the folks at Gavi saw the unfavorable mention in the last issue, the company sent its men back again and again in an effort to get the 708 data-grade projector working at the level I needed in order to make solid and sound judgments about everything from laserdiscs and DVDs, enhanced and non, to HDTV when it finally arrives at the Sea Cliff studios.

Part of the problem the first time out was that Gavi's folk did not remount the Barco so that it was correctly distanced from the 8-foot Stewart screen. Instead, they used the ceiling-mounted plate Sony had installed for their projector. Thus, I couldn't get an accurately sized 4:3 picture, which meant I couldn't watch full-screen discs (this means anything before 1954 and Latter Day stuff either made for TV or not - IMAX, e.g.). Then on a subsequent visit, I found the team had put in an anamorphic widescreen setting without supplying another for standard widescreen discs. So non-anamorphic DVDs and laserdiscs looked really weird, being squeezed as they were into aspects that ranged up to 3:1 for a 2:35.1 disc. There have been more visits and now I am waiting for Gavi to get its color analyzer back (it's in California) so that we can check the grayscale and color temperature. I'm not satisfied with the colors as rendered - for one thing, the whites aren't as pure as I'd like, and either some transfers (mostly of foreign films) are a bit "pink" or the set isn't fully dialed in just yet.

Meaning? The installation of a front projector is tricky business, especially with the advent of anamorphically enhanced DVDs and of HDTV. And we shall be addressing the topic in detail sufficient unto the day.

HARRY PEARSON
EDITOR-IN-CHIEF

I: Can All That Counts Be Counted? A Forum Begins

We are running Charles Hansen's response to Issue 24 as the beginning of a forum in which we explore how we will blend the observational and the empirical (tests and measurement programs) in our video and audio sections. Our aim is not to overwhelm the reader with our expertise at the test bench or with our skill in the obfuscatory use of High End jargon – but to produce the clearest, most comprehensible and useful examination of the hardware we review and the concepts behind that hardware. Every reader should understand every line of text and every graph, no matter which he uses most to help him make his own judgments. If one serious reader does not understand, we believe we must simply learn to explain better. Over time, we will.

The editors will respond next issue.

Editor:

Congratulations on the rebirth of *The Perfect Vision*, a superb new beginning to an intriguing journal. As I was reading the first issue, I was struck by at least one marked similarity to *The Absolute Sound*, namely the satisfying richness of content that requires multiple readings to digest fully.

One thing that also struck me was the dichotomy between the methods used to review the video and audio performance of a component:

- 1) Objective observational methods are the only acceptable means to review audio equipment, whereas laboratory measurements must be relied upon to judge video equipment.
- 2) Long-term listening tests are much more sensitive in discerning meaningful differences in audio equipment, while instantaneous A/B switching is favored for comparing video equipment.
- 3) Any sort of signal manipulation has been traditionally frowned upon in the realm of High End audio, but in video “clever electronic prestidigitation” is able to create “unprecedented picture quality.”

This last point is particularly interesting, as it appears to contradict item one. If I read the review of the Pioneer DV-09 correctly, the measurements performed were unable to identify the source of the sharpness enhancement, instead requiring the use of objective observational methods. (By the way, the service guide for the Pioneer player describes the sharpness enhancement feature as selectively modifying the luminance signal with a non-linear gain element. A similar technique used in an audio component would be unacceptable to the High End community.)

As I consider these two different reviewing approaches for audio and video components, three distinct possibilities come to mind on the reasons for their need:

- a) The human brain processes audio and video information in completely different ways, and therefore different methods must be used to evaluate audio and video equipment; or,
- b) While analog audio has always had arbitrarily high-resolution capability, video has had format-prescribed resolution limits. This limited resolution may require different evaluation methods; or,
- c) In this early stage of video equipment, there are gross differences (and defects) in measurable performance parameters, just as in audio equipment of the 1950s. As these measurable defects are corrected (thanks to the feedback provided by the measurement capabilities of

Convergence Labs), meaningful differences in the observed performance of video equipment may or may not still exist.

At this point, I lean toward the last possibility as most likely. This view would seem to be supported by Jonathan Valin's comments on the Theta Voyager [Issue 24], in which he noted improvements in the following areas: video noise and grain; gradations of the gray scale; sharpness of image; focus of background subjects; depth of field.

Can all of these observed improvements in image quality be correlated with improved performance on the test bench? It seems unlikely, although I suppose we will have a partial answer in the next issue, when the Voyager is placed under the scrutiny of Convergence Labs' battery of tests [see Issue 25]. (I say “partial answer” because the correlative results from one unit do not necessarily apply to all models.)

I look forward to future issues, as these and other topics are explored in depth.

CHARLES HANSEN
AYRE ACOUSTICS, INC.

II: Janet's Index

And now a footnote to our interview last issue with Phillip Byrd and Janet Shapiro, producers of classical music television broadcasts. Janet talked about a terrific show she'd just finished, called *Can't Stop Singing*, a documentary about the 60th annual convention and contests of the Society for the Preservation and Encouragement of Barber Shop Quartet Singing in America, held this year in Atlanta, at the Georgia Dome. A few days ago, she sent me some statistics she'd prepared for the organization's board, to show them what goes into her work. I asked her if she'd share them here, and she agreed, provided I let her say the following:

“Although the show is a documentary, it contains a lot of straight performance as well. It exists in two forms: an 81-minute version for pledge time on PBS stations, which airs nationwide on PBS beginning August 11, and also in a slightly longer version that will air at an unspecified time after August without pledge breaks. [It's an honor, she'd explained, for a pledge show to be picked for national distribution outside those special weeks.]

“There will be a home video version. My role in the production was Producer and Editor, and I've poured my heart and soul into this show. *I want people to watch it!!!*”

Which they should – it's engaging from beginning to end and the quartets look and sound pretty fabulous.

Janet's stats, for her 87-minute show:

- Number of field crews: 4 (each with its own producer, shooter, audio tech, and PA)
- Number of field tapes: 86 30-minute tapes
- Amount of time needed to log and transcribe said field tapes: 2 months
- Number of pages of logs and transcriptions: 591
- Number of cameras at the Georgia Dome: 5
- Number of contest tapes: 67 90-minute tapes
- Amount of time to edit finished program: 2 1/2 months
- Number of video edits in finished program: 662
- Number of audio edits in finished program: 361
- Number of e-mails in my Barbershop folder when I last looked: 202

GREG SANDOW

LETTERS



The Problem with DVD: Digital Artifacts

Editor:

I have subscribed to your revival of *The Perfect Vision*, and not being familiar with the original, I can only say you seem to be off to a strong start. Your style feels more academically, intellectually driven than some of your competition, and I welcome this.

I'd like to address one point that Mr. Pearson makes in his Viewpoints editorial. "And we shall push, push, push for the highest quality images, either from an 'enhanced' DVD..." How hard are you willing to push? Are you satisfied with DVD now?

I find the digital motion artifacts of DVD too severe for a serious High End format. DVD's 10Mbps data rate is just not enough to carry a component digital standard definition video signal! With only few exceptions, every DVD I watch, on a wide variety of systems, is plagued by large-area low luminance chroma macroblocking. Also, pre-compression noise reduction removes much of the film grain within the image. Film grain is an integral part of an image; the type of film stock and its grain structure are often aesthetic choices made by directors of photography. How can reduction or removal of this element be aesthetically acceptable?

The popular press, and even some higher end journals, are head over heels over DVD. I will admit that it offers some true benefits such as component color space, progressive output capability, anamorphic presentation, and extended luminance/chroma channel bandwidth. But the digital artifacts are bad, they are visible, and they are unacceptable. But I hear no other voices to the contrary. This saddens me.

If *The Perfect Vision* is to "push, push, push," then I implore your magazine to [convince] manufacturers that our future digital formats must use milder data reduction methods. I fear for the future "enhanced DVD" format. Will we be saddled with a digital output channel that will max out at the low 19

Mbps data rate specified by the ATSC for 1080i transmission? Wouldn't it be better to output a wideband RGB or Y/R-Y/B-Y analog signal to feed our monitors?

Within the home, we should shoot for performance above the ATSC/Grand Alliance system and stay free of injurious motion artifacts caused by high data-reduction schemes. Please use your platform to strive for the finest images we can get - we are counting on you!

CHRISTOPHER MOORE
MANHATTAN BEACH, CALIFORNIA

Greg Rogers: I applaud your desire for high-quality video, but I can't agree with your sweeping generalization of DVD. You haven't provided a single example of a disc or player for which "digital artifacts are bad, they are visible, and they are unacceptable." That certainly is not the case with the vast majority of DVDs I buy or the players I use today. Early on there were some quite poor DVDs rushed to market to make a quick buck and some DVD players that were questionable in terms of MPEG artifacts and D/A converter output stages. Your characterization would have applied to them. But MPEG encoding on major studio releases is generally quite good today and MPEG decoding and signal processing in players is excellent. That said, there are still plenty of video quality problems on DVD, but I think you are barking up the wrong tree. I would spare you the usual advice to make certain your displays are calibrated, but I have no other explanation for what you see.

I believe if we want real improvements in DVD quality, we must have better transfers using high-definition down-conversion, no edge-enhancement artifacts, and use the 16.9 enhanced format for all widescreen movies. And stop recycling old transfers done on inferior telecine equipment or stored on D-2 composite video VTRs.

I'm not sure how much film-grain you have been able to see through dirty film transfers and the video noise of previous formats like laserdisc, and forgive me, VHS tape. But you are correct that

pre-processing to remove noise is an important part of the MPEG compression process. But if that means cleaning up dirt on film, and using better telecine equipment with less noise, then I think it's a pretty good tradeoff.

When it comes to future high-definition DVD formats I'm not as worried about the ATSC bit-rates as I was a year ago. From what I've seen of pre-recorded HDTV, multiple-pass MP@HL MPEG encoding is working well and encoders will be even better by the time 720p gets to DVD. The jury is still out on real-time high-definition MPEG encoding.

Targeting 14-Year-Old Boys?

Editor:

I've just skimmed through Issue 24, and already TPV is better than just about anything else out there. A few weeks ago a friend and I were discussing the lamentable state of *Home Theater* magazine, which apparently has decided that its target audience is 14-year-old boys.

...I'm now using one of the Panasonic DVD players, which does a pretty good job. My monitor is the Toshiba 35-inch direct view, and I heard that the Sony DVD player looks a little soft when not in 16.9 enhanced mode (although that appears not to be a problem with the S7700). I'd be tempted to spring for a Theta Voyager if I had 6 grand to spare!

I've seen all the films in your "Best of 1998" list except *Central Station*, *Gods and Monsters*, *Elizabeth*, and *The Object of My Affection*. I've been pleasantly surprised to see that the library of DVD films isn't entirely made up of blockbusters. I had never seen *Picnic at Hanging Rock* before and was knocked for a loop by it. What an incredible, haunting film! I've also been picking up a goodly number of laserdiscs at giveaway prices. Speaking of which, is DTS a consumer failure? I see that Ken Crane's is dumping its DTS laserdiscs, which can't be a good sign.

RICHARD GALLAGHER
RGALLAGH@IX.NETCOM.COM



Down the Primrose Path Toward Perfect Vision Forever?

Editor:

I've been with TPV since the first issue, and was thankful, even delighted, when you covered the remaining issues on my subscription from five years back. That's perfect honesty. Now that you know my credentials, here's my wish list, which I hope will help you keep your focus on the perfect vision:

1. Reviews must be brutal in their criticism of any company whose film transfer falls short of DVD's promise. It wouldn't hurt to take up a page or two with three ongoing lists: (near) perfect transfers, adequate transfers, and lousy transfers, arranged alphabetically by company.

If magazines like this have any goal in life at least one has to be to speak truth to power and put more pressure on the industry to do what's right instead of extending its rip-offs further into every new technology.

2. In keeping with that goal, editors must not allow a DVD review to get longer and longer because its author is rehashing plot-lines or attempting to create a "think" piece about the film's story content, idea content, the director's *oeuvre* - or lack thereof. I know, everyone wants to strut his insights. But there are other magazines for doing that. Your bi-monthly shouldn't eat up precious space that way. We're after the perfect movie vision, not the perfect movie insight. In the July/August issue it took 14 pages (about 14,000 words) to cover a mere 18 DVDs because of such noodling on. At that rate, you'll cover not much more than 100 DVDs per year. The list sure won't grow fast at that rate. More important, the story content of most DVDs isn't strong enough to begin to justify buying all the expensive equipment that TPV reviews. Everyone should re-read Morrell's thoughts about what constitutes the viewing experience under various conditions.
3. If there's anyone to supply them, add more think pieces that illuminate the problems and weaknesses of the medium. Morrell's "Theory of Relativity" is a good example.

My favorite would be a discussion of whatever technical factors cause some TV sets/monitors to have that wonderful 3-D window-on-reality look while others don't even come close.

I've seen cheap TVs in motels have that "see through" look and super-expensive units that did not - at all. So it doesn't take HDTV or DVD to get there. But what causes it and why don't all sets have it? Whatever the answer is goes to the heart of attaining the perfect vision.

4. Please, don't go back totally to the "good old days" of TPV. Avoid space eaters such as long, long rambling interviews and general articles about the history of film, TV, Technicolor, formats, etc., unless the discussion is directly and explicitly relevant to illuminating specific problems with attaining the perfect vision in current media.

An example of relevance would be the parts of Allen Daviau's interview where he reveals how slovenly movie houses can be. Since the goal is to "recreate" the theater experience in the home, it's relevant to know what the theater "standard" really is. For those interested in film as film, there are other magazines. An example of irrelevance would be his own favorite film scenes. How does that help achieve the perfect vision?

5. As we go once more down the primrose path toward another technological bait and switch, TPV can't be too critical when any manufacturer violates DVD's implied promise of perfect (or near perfect) vision at low cost. That would include manufacturers who reportedly "cripple" the DVD player's video high-frequency output, supposedly because viewers don't know enough to turn down their set's sharpness (edge) control. Why not have three lists for front end equipment, too?

After more than a decade of CD hype, aren't we all more than a little disgusted when no reasonably priced hardware can completely reproduce the content of the best software, forcing the consumer to fulfill the promise by buying more and more expensive equipment to more "perfectly" decode the damn thing? From a marketing perspective, it's a perverse inversion of the

standard "give them the razor and sell them the blades" tactic. Here, even when the blades are great, must all the reasonably priced handles be so designed that you can't avoid cutting yourself?

6. Finally, a modest proposal for all readers looking down that primrose path. Given the increasingly high cost of recreating a good movie theater and the difficulty of choosing compatible equipment, and assuming your video purchases have nothing to do with showing a profit, wouldn't it be wiser to buy the small movie theater your town isn't using any more? Several audio/videophiles could even go into this together.

The owners' families would reserve the best seats. You could let everyone else in for a buck and pay the mortgage and film rental costs with income from something that has nothing to do with any kind of vision but that is nevertheless endlessly popular - popcorn. It's just a thought.

Best wishes for great cash flow in the future.

MIKE ROBBINS

PITTSBURGH, PENNSYLVANIA

MROBBINS@POLESHIFT.ORG

HP: *So your credentials consist solely of "perfect honesty?" I might add that you write well and make your points cogently. And as you probably suspected when pen you first picked up, I am far from being in agreement with the bulk of your thinking, to the point of saying perhaps the letter should have best been addressed to some other magazine (Widescreen Review perhaps?).*

1. *Agreed. I've been, since the re-installation of a big home-theater projection system, sorting the DVDs in my collection into quite distinct categories. You'll be reading about this in an upcoming issue. My biggest problem to date? Drawing the line between the A+, A, and A- categories of excellence.*
2. *If there were other magazines capable of strutting their "insights" on film better than I can muster as editor of this one, I will cease. But I don't believe that. Content is at the heart of the magazine. I quite agree that the assessment of movies should never be routine or mere assessments of the plot line. That said, I'll note that the magazine is in*

transition (I've said this before) and the film section is far from its final form. There will be a "mix" of reviews, short to long, with more material being covered, but I'm not running a catalog of quickie impressions. Other magazines, as you so helpfully noted, do that.

3. No problem here. We will talk at some length about the differences. (Another reason why the perception of movies ought to be taken into account in our reviews, thus adding to their length.)
4. I remain unrepentant. We shall continue to cover film technology because it is at the heart of the experience of cinema in the home. The "old" TPV had it right.
5. Agreed.
6. Not unless we're recreating a Cinema equipped local theater. Oh, Paul Allen, the nation looks to you.

What Not To See on DVD

Editor:

The Perfect Vision exceeds all my expectations in terms of its control of the subject and originality. I predict it will be a great success. I found "Outtakes" especially useful [Issue 25]. DVDs vary enormously in quality and are bought blindly. Alerting buyers is thus a great service. My candidates for disappointments are Fox Lorber films. For a few, such as *Tampopo*, they got the original print used for transfer to video. But in most cases - e.g., *L'Enfer*, *Ran*, *Nostalgia*, *Swept Away* - they just dumped video (with its 200? lines) onto DVD.

ED EPSTEIN
MANHATTAN

Edepstein@worldnet.att.net

Digital Cinema: The Good & the Bad of It

Editor:

...It was... a surprise to see TPV on the shelf of my local Borders. Somehow I guess I hadn't really expected you to hew to the publication schedule right out of the gate. Guess this means you're really back.

Once again, an outstanding read - probably even more so than the first "new" issue, although I have to admit that I skipped the more technical articles on first pass in favor of the letters page, movie reviews, and Allen Daviau interview. Daviau's story about the \$130 projector lenses at local multiplexes is a

heartbreaker. Of course, I always welcome think pieces on the differences between theater viewing and home-theater viewing, though this issue's article on the topic reminded me that TPV had run a similarly provocative piece back in the day. Did you see Walter Murch's article in *The New York Times* a month or so back about the implications of a digital cinema?

Greg Rogers remains nothing if not exhaustive in both knowledge and temperament. Good to see him handling his end of things - he'll keep the hardware guys on their toes. (I saw him beat a Sony rep into submission at CES over the lack of blacker-than-black display on the DVP-S7700.)

Speaking of hardware, saw Texas Instruments' DLP Cinema in action over last weekend in Secaucus [the digitized *Star Wars*]; was impressed. Particularly stunning was the richness of color and the eye-blinding brightness of whites on the screen. The line structure was occasionally visible, however, and the darkest scenes looked murky, with little in the way of shadow detail. I suspect that movies that don't have *Star Wars* in the title might not lend themselves quite this well to digital projection.

Of course, we're showing this off to a generation of filmgoers whose standards have been systematically lowered by a lack of even a token effort at 70mm exhibition and poor quality 35mm theatrical prints. It's no wonder that, with no 70mm blow-ups for comparison's sake, lots of folks think this system looks "better" than 35mm film. It's comparable to a clean 35mm print, and it's not much else. Any thoughts?

BRYANT FRAZER
bfrazier@panix.com

Bryant Frazer is a film critic (and pen pal of HP's) whose website, Deep Focus, contains his intelligent and stimulating writing about movies. HP considers him one of the best young film critics in the country. Vide, his review of David Cronenberg's Videodrome for starters.

John Eargle: Lossy Data Compression & DVD Sound

Editor:

I want to thank *The Perfect Vision* for the excellent coverage of surround sound by Robert Harley and Tom Miiller in your May/June issue. I hadn't intended to discuss lossy data compression as such, but the subject did come up obliquely in TOM's DVD reviews. I'd like

to make the following additional comments:

I consider the major lossy data compression systems (AC-3, DTS, and MPEG2) to be virtually on a par with each other. If I had felt that AC-3, for example, was not up to the job required of it in producing the Delos DVDs, then the DVDs would not have been issued at all. As it is, I have A/B'd the *1812 Overture* surround sound mix via all three of the above-mentioned lossy systems, and they all sound, to a first approximation, like the uncompressed original.

My remark about future media and the prospects of not "worrying about any lossy data compression" reflects not so much a current problem with those systems, but rather the simple fact that future systems will not require them. I think everyone would be in agreement that, all else being equal, lossless is better than lossy.

JOHN EARGLE
DELOS RECORDS

TV Is TV

Editor:

Have received two issues of TPV. Both have remained in the plastic wrap. I am no fan of TV. I believe that analog recordings on vinyl are all that is needed to satisfy the needs of music lovers. Digital recordings and TV are not part of my life, and will not become a part.

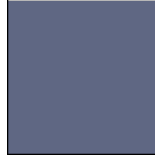
RODNEY ABBOTT-BUCHANAN
Rabsba@earthlink.net

HP: Do you think I care? The point of The Perfect Vision is film and the content of other media we experience via television. This is not an either/or proposition and I think you are being bone-headed, but it's your life to live as narrowly as you choose.

RAB: Sir: I did not ask for TPV. *La Strada* is Film. I do not think Film is the content of the Digital Age. Film is an analog experience from the get go to the end of the optic nerve. The Digital experience does not accomplish that which is Film. I was at Hi Fi '97, my first and only. Digital-ready speakers and sub-speakers to demo wall of noise with special visual effects is not Film. I am a character in the film *Clean Slate*, you can use my outhouse anytime - yes I concur with a narrow path through the woods - much better than a crowded four-lane highway. ☺



A U D I O



Death to Convention

.....

When we embarked upon the re-launch of *The Perfect Vision*, I envisioned the experience as a great adventure – an opportunity to explore uncharted territory in home entertainment. Everywhere I looked and listened, there were new experiences, as the emergence of digital technology shattered the old notions of what is possible in home audio.

I didn't expect that the most challenging adventure would be developing an editorial approach that would do justice to the topic. As I planned the audio section for each issue before me and the ones beyond, I came face to face with a harsh reality – there weren't enough pages to cover the subject using conventional techniques. Indeed, our subject matter is so rich that using the conventional approach of reviewing consumer equipment one product at a time would yield superficial coverage of the available products at best, while we were forced to ignore many of the fascinating issues that underlie those products.

We needed a new way.

For inspiration, I turned to two wildly different sources: *Star Trek* and law school. By way of analogy, most audio reviewing today is similar to the episodic structure of a TV series such as *Star Trek: The Next Generation*. Each episode is a whole story, with a beginning and an ending. And next week the crew is off on another adventure that typically has nothing to do with last week's. In contrast, *Star Trek: Deep Space Nine* is serial in structure. While elements of each show are episode specific, there is a dominant plot structure running from week to week that makes *DS9* serial. That's what we need in TPV's audio section: a review structure that is open enough to feature products while using those same products to explore the larger plot that is our quest to accurately recreate the sound of the original event, be it music or movie.

You may well wonder what law school has to do with any of this. Even lawyers who love the law will tell you that law school was a nightmarish experience. One of our principle objectives at TPV is to provide guidance to the intelligent reader who is interested in home entertainment. This objective flies square in the face of the reality that even if you read every publication available on consumer electronics, you could not read a review of every product you might be interested in.

Faced with this limitation, I found myself in a situation not unlike my first year of law.

Rather than teaching us the law, our professors taught us how to *think* about the law. There are too many "rules" for any student to sit down and absorb them all – just as there are too many audio products for any reviewer to cover. And, like the law, the results obtained from an audio product are, to a degree, fact specific. What is needed is a broader perspective in approaching each product.

In law school, they taught us to read cases and discover for ourselves the issues within those cases. Only then could we begin to comprehend the use of rules in the law. Similarly, it is the issues presented by each product and each system that must be our starting point in understanding multi-channel audio. If we reviewers can understand and share the larger issues with you readers, you won't need a review of every product to guide you. You will be better equipped to guide yourselves. And an informed marketplace produces better products through economic force.

And how do we fuse the structure of *DS9* and approach of law school in the audio review section? Crudely, at first, I suspect. There isn't a manual that tells us how to do this. So like Indiana Jones in *Raiders of the Lost Ark*, we're going to make it up as we go along.

In this issue, you can read the first installments of two serial system reviews – one by Barry Rawlinson and the other by me. Rawlinson, with his design background, will approach the Linn system he is reviewing from a different and invaluable perspective. Meanwhile, I'm off on a journey to confront humankind's ancient enemy as I review an evolving system based on Revel loudspeakers.

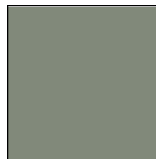
I envision an audio section that will provide more context and insight than is possible with a conventional review structure. There are limitations with this approach, of course. The most significant is that we will be covering a smaller number of products than if we just limited our reviews to 1,500 words and grabbed every product we could get (worse yet would be writing 3,000 word reviews that cared not for the larger issues – think about it). Because of this limitation, we must be highly selective in choosing the products for review. We want products of high performance that have something to teach us.

This then is our manifesto of freedom from the old conventions of audio reviewing.

But what did you expect? TPV is not a conventional magazine!



TOM MILLER



We've Got What It Takes for Home Theater

IVX Dead! Enough said. Too much was written about it when it was alive, so we don't need to talk more about a company that just didn't get it.

Video at *The Perfect Vision* is about Home Theater, and to me that means a large screen picture. Sorry, but a 32" TV just can't be home theater, can it? I'm not talking just about picture quality; I've spent endless hours looking at the best picture quality available, on 13" and 19" professional broadcast monitors. No, it's the emotional experience of a large screen that fills our field of vision with images of a different reality. That's the reaction we get at the cinema and what we need to experience home theater. So unless you can sit close to a RPTV, home theater means a front projector with at least a six foot wide, 16.9 or 1.85 screen.

In this issue I review front projectors from Sony and Runco that will really make your home-theater experience happen. But you can't have large screens without HDTV or upconverters, unless you want to stare at scan lines. And that doesn't quite capture the cinema experience, either. So Bill Cruce looks at the IEV Turboscan line doubler with lots of features at a budget price. And I take another look at the DVDO line doubler, with almost no features, but a sensational price at \$700.

Bill also reviews another DVD/LD combi player. I suppose its time to admit that laserdisc is dead, but some of us have an awful lot of laserdiscs lying around that we may never see on DVD. How about *Hold Me, Thrill Me, Kiss Me*, with Max Parrish, Sean Young, and Timothy Leary? Not likely to make it to DVD, but it's a great LD title.

Finally, there's something missing from the video coverage in this issue. Part 2 of Christy Warren's review of the Runco 5800 HD-ready RPTV. It's hard to evaluate high-definition picture quality without an HD source. We didn't solve that problem until right before our editorial deadline. So rather than rushing something with little time for evaluation, we postponed that report until next time.

Speaking of HDTV: As we went to print with the Unity Motion review in the last issue, they were closing their doors in St. Louis. Now as this is written, Unity Motion, under a new management team, is officially trying to refinance, restructure, and return to business. As I wrote in the review, they delivered some excellent hardware but needed programming for success. The key was HBO, and Unity Motion just couldn't seem to get together with them and make something happen. We'll stay

tuned, but it won't be long before DirecTV and the Dish Network will be delivering HDTV via their satellite systems. Unity Motion will have to find some sort of niche to make another run at it. How about an all HDTV sports network?

Movie Trivia

So much for my career in trivia games. When last we met, I dropped the names of a couple of sci-fi film characters into Video Insights and the Unity Motion review (Issue 25). I forgot there were really two characters from different movies in the Unity review. One was trivial, Scotty from *pick your favorite Trek film*, but the other was a bit more difficult. Unfortunately, I asked for just two movie titles instead of three. The first person to identify Prof. Barnhardt from *The Day the Earth Stood Still* and Scotty, was Neil Bulk from New Jersey. He wins the AVIA *Guide to Home Theater* DVD. But Rick Connolly came through a day later and also identified the "Toys for Ellie" clue as Jody Foster's character in *Contact*. So Rick also got a copy of AVIA courtesy of its authors at Ovation Software (www.ovationsw.com). Now remind me not to try this again!

16.9 DVDs Gaining Momentum

Paramount followed up *The 10 Commandments* and *Star Trek Insurrection* with 16.9 enhanced transfers of *A Simple Plan*, *Varsity Blues*, and *Barbarella* (review, this issue). I was feeling really good about Paramount until I heard that "King of World" Cameron's chick-flick was going to be released in a 2.35:1 aspect ratio, but without a 16.9 enhanced transfer! Is that any way to treat the biggest money maker of all time? Well, I was one of the four people on the planet that found the movie boring, so I doubt that they'll miss my \$30.

Fox finally joined the party with a spectacular boxed-set of the four *Alien* films (review this issue), all in the higher-resolution 16.9 DVD format. And Criterion has announced their intention to use 16.9 whenever possible on future releases. Their first 16.9 enhanced title is July's release of *Insomnia*. Criterion pioneered widescreen and special editions on laserdisc, so it's great to see them commit to the highest-quality DVD format.

It must be getting lonely over at the Mouse. First DIVX dies and now Mickey may be the last company to switch to 16.9 enhanced DVDs. Oh, sorry! I wasn't going to talk about DIVX or companies that just don't get it.



GREG ROGERS



The Vexed Question of Multimedia...

.....

...is it just a random mesh of sight and sound, or does something really new emerge? This gets another look in this issue from Andrew Quint, who saw a performance in New York that made him think the much-hyped phenomenon might be real.

And I, along with anyone else who's seen the Wim Wenders film *Buena Vista Social Club*, now better understand something simpler, but still important: How an extra visual dimension can help us understand music.

This is Wenders' latest film, and its title ought to ring a bell with people interested in Latin music, world music, or just plain good music, thanks to the Nonesuch Records CD also called *Buena Vista Social Club*. It's a Ry Cooder project (another of his explorations of cross-cultural musical styles), recorded in Cuba and featuring older Cuban musicians who hadn't performed for quite a while. I'd had the CD for some time, along with others spun off from it, including something credited to the Afro-Cuban All-Stars (featuring some of the same people), and a recent solo album spotlighting Ibrahim Ferrer, a Cuban singer with a tenderness, sly wit, and radiant sense of rhythm that mark him, for me, as an exceptional treasure.

Wenders' movie might be called a high-class "making of," and it helped me understand something about the musical project I hadn't quite grasped. Ferrer apart, my first reaction to the CDs was to think the music was nice, but a little sloppy and informal, traits I normally don't mind (I love rock & roll, and how could I, if I didn't like sloppy and informal?), but which struck me here as odd, maybe because I thought Cuban music should be hot and tight. Adding to my puzzlement was a recent trip to Cuba, where I spent a week tracking down Cuban classical music for two articles I wrote for the *Wall Street Journal*, and which appeared there in May. It's not that I heard any of the Buena Vista musicians (my loss), or even any musicians like them (again my loss). But I got a shot of Cuba in my blood, heard a lot of other Cuban things on CD, and even spoke to a Cuban musicologist, who – maybe I took this out of context – suggested that the Buena Vista recordings aren't all that remarkable to anyone who knows Cuban music well.

And then I saw the Wenders film. I'll tease Wenders about one exaggeration, harmless but misleading – his many shots of old American cars. These, it's true, are a famous sight in Cuba, especially Havana, and for good reason. When the Castro revolution hit in 1959, Cuba was economically and politically close to the United States (it was virtually an American colony, with Havana essentially controlled by the Mafia). American cars were naturally what people drove. When the US broke relations with the Castro government, American car imports stopped, and Cubans for a while had neither money nor the chance to buy anything else. They kept driving their old Chevys and Oldsmobiles, and still drive them, holding them together with spit and ingenuity.

These ancient vehicles are a famous sight on just about any Havana street. But they're not the most common sight. Most cars in Havana are creaky Russian ones, boxy and cantankerous, imported during the years when the Soviet Union was Cuba's ally. They're no

fun to look at, and Wenders simply left them out, a pardonable decision cinematographically, but not an accurate picture of what he surely saw.

But the wonder of the *Buena Vista* film, apart from the sheer delight of watching it, is how it changed my hearing of the music. (I should note that it's shot in grainy video, but since Wenders is an artist, the grainy video becomes an artistic element. It helps convey the otherworldliness of Havana, a city literally crumbling, but jumping with life. The colors are intentionally distorted, too, for an extra distancing effect.) I knew, for instance, that the musicians weren't young. But to see them – genial old coots in their seventies, eighties, and even nineties – makes them come alive.

We hear them tell their stories, too, and we realize something else. These aren't just musicians. They're top entertainers from another time, who know their business cold, even if they haven't practiced it in quite a while. So for them, the *Buena Vista Social Club* recording isn't just a job. It's recognition. Even more, it's a kind of unexpected personal gravy. Never did they think they'd play again, least of all with international attention. But they're prepared. The old shticks – pianist Rubén González plays a solo moving up the keyboard, and when he passes the highest note, keeps on playing in the air – work just as well in Carnegie Hall as they did in old Havana nightclubs.

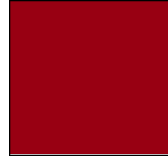
A trip to New York for a Carnegie performance is the climax of the film, and for the musicians, we sense, the climax of their careers. "Que linda, linda, linda, linda!" cries one of them, walking up Broadway. "How gorgeous, gorgeous, gorgeous, gorgeous!" They all go to the observation deck near the top of the Empire State Building, and here – with Wenders scoring a coup for both delight and honesty, by filming his stars exactly as they are – we see them searching for the Statue of Liberty, even though none of them knows where it is or what it looks like, not even the one who swears he visited it, many, many years ago.

Of course I wanted to love their music. And I learned to hear it differently. What was sloppy once (though I should stress that not all of it is), is now adorable, in the spirit of the search for the Statue. What was lively gets promoted to completely irresistible, and what's most important, most of the players and the singers gain individual voices. They had them all along, of course, but once I saw the movie, their individuality was magnified. "That's the one who prays to Santeria gods...those are the guys who can't stop playing dominoes...he's the one who's 90, and can't stop grinning. He says he's working on his sixth child!"

Not that all of this, in some metaphysical subliminal form, wasn't in the music anyway (and of course was part of the reason so many people hear these CDs with such delight). But the movie brought it out for me in implicit stereo, 3D, surround, and holographic hypertrue reality.

Go see the movie if it's playing at an art house near you. And get the CDs, all on Nonesuch: *Buena Vista Social Club*, *Buena Vista Social Club Presents Ibrahim Ferrer*, and "A *Toda Cuba le Gusta*," credited to the Afro-Cuban All-Stars.

GREG SANDOW



Video Travels

.....

A certain fascination tags along with any complex technology when it penetrates a new area of our lives. This is true in part because we get to see familiar things in unfamiliar places. And in part because of the sheer amazement that these new forms of technology work at all. Making a technology portable frequently triggers this sense of awe. I recall when Sony introduced its first portable CD player, not long after the introduction of CDs to the market, and it was only slightly larger than a jewel case. While this seems trivial now that you can purchase such a machine in a blister pack at Walgreens, at the time it seemed miraculous. Similarly, when a technology can be delivered remotely, it seems quite special. In the mid-Sixties, my father took me to his office to see a new accessory attached to the corporate mainframe computer: the facsimile machine. It wasn't just surprising; it seemed almost impossible.

ViaTV VC 105 Videophone

At about the same time, during the 1963-64 New York World's Fair, AT&T demonstrated videophones to the general public. In the early years of the space age, you couldn't help but feel that videophones were right around the corner. Yet somehow this dream never materialized, even as the PC era progressed. In the mid-90s videophones re-emerged, but were rather expensive (over \$2,000/pair). This has changed with agreement on the H.324 protocol and the advent of consumer videophone adapters such as the ViaTV VC 105 from 8x8 Corporation.

Using low-cost video compression and modem chips, the VC 105 brings the cost of a pair (obviously you need two to make the video element work) of videophones under \$500. The VC 105 is a small box containing a video camera as well as the compression and communications electronics needed to make video work over conventional phone lines. Operation is straightforward: You connect the VC 105 to your TV and a phone, dial an owner of another H.324-compatible device (which could be a PC-based system or a set-up like the VC 105), and press a button to start the video call. After about 30 seconds, an image of the scene at the location you've called shows up. You talk

through the phone and listen through the phone and TV speakers.

Every time I used the VC 105, I had the feeling of using a technology one generation away from being really useful. At this stage, the technology is okay, but every session involves a set of distracting compromises. First of all, you have to choose between moderate resolution and the ability to follow motion. Most of the time, you'll probably set up the VC 105 so that the picture is relatively clear and live with an update of the picture every few seconds (sort of like sending still pictures regularly). Second, no matter what you do, the picture is pretty fuzzy (maximum 352x288 pixels, but in practice more often 176x144). This might seem like a minor factor, but it decreases the sense of "thereness" in the interaction.

Third, and maybe the biggest factor in my experience, the effort needed to set up a call is a problem. The steps don't seem that cumbersome on paper, but in practice you have to make at least two phone calls to get a video call going.

Even with these limitations, I found that the VC105 significantly lengthened calls (we would stay on the line longer). As I've said before, discussing downloadable music: Higher bandwidth communications (whether xDSL or


cable) should make a huge difference to this technology.

Panasonic DVD-L50D PalmTheater

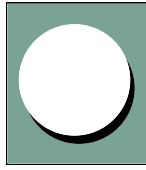
With the advent of DVD, truly portable video solutions suddenly abound. I've been using a notebook computer with built in DVD for about a year, and have found it very useful for watching movies when traveling. At the roughly 24" viewing distance that feels comfortable with a computer, my 14.1" screen is actually quite large (and the latest 15" screens are even better). At this distance, I estimate that a notebook-based video system is equivalent in viewing angle to an 84" wide front-projection system.

If you don't have a notebook computer, or think a notebook is too large to carry where you are going, Panasonic has a solution. The DVD-L50D is a DVD drive with a footprint slightly larger than typical portable CD players. It is a bit thicker than these CD players are, too, because it has a 16.9, 5" TFT LCD display and a pair of speakers above the disc lid. But at around 1/3 the size of a notebook computer, it is still quite portable.

I found that the DVD-L50D worked well. The picture was bright and clear, though on occasion the LCD produced edge artifacts (because LCDs are relatively slow). The headphone sound was solid, and even through the mini-speakers, was usable (my kids and I watched a DVD one night on vacation and the sound was adequate for a three-listener situation). The screen size might seem tiny, but with a normal viewing distance, my calculation is that it is equivalent to a 20" screen. Maybe not home theater, but completely usable. And, the DVD-L50D can play CDs (like all DVD players). It has a full set of audio and S-Video outputs so that you can use it as a conventional DVD player, whether you are at home or in a hotel room.

Sometimes new technologies just work right from the beginning. 

TOM MARTIN



The Human Interface

I recall as a seven-year-old switching on the system that my father had designed, made, and housed in a meticulously crafted and veneered cabinet. One satisfyingly large circular knob served as on/off switch and volume control, another selected between radio (wireless!) wavebands, and a third tuned the radio. All immediately obvious to me and everybody else in the household, and as a result, the radiogram received constant use. A similar state of affairs existed at school, where from my earliest days our teachers' efforts were complemented daily by BBC schools broadcasts. What concerns me here is the immediate accessibility of programming – to anyone with the wit to turn a knob.

Now let us travel forward in time to the advent of remote control of these same functions, and let me give you an example of the problems we have encountered.

I know an intelligent woman who holds a degree from a solid university; she has a good position with a large company; she is responsible for a number of subordinate employees and several large accounts whose annual billings run into several millions. And yet on several occasions she has been unable to receive the television program of her choice because of the perceived complexity of her system. This television is connected to a cable feed and a VCR with their own separate controls, both remote and otherwise – fewer inputs than my father's radiogram. And yet she tells me that sometimes a week has passed before she could coax picture and sound from the thing.

This is clearly bad design. For good design by its very nature is all encompassing, while bad design is exclusionary. If you cannot see the emperor's new clothes, the fault does not lie in you. Some manufacturers have tried to address this problem by using analog reproductions of those vintage controls on their remote control handsets, but even those suffer from a cognitive disconnection.

When we communicate with each other, we unconsciously use the teaching model – we say what we're going to say, then we say it, then we say what

we've said. We do this using implicit languages; if we can see each other, we use body language and timbre of voice to confirm reception; when we cannot see each other we use semantic redundancy – “Did I tell you I spoke to Larry? He said he's doing well – he sounded well – did he speak to you? Did you think he sounded well?”

And so we find that our better communication channels contain 100 percent redundancy. Writing may contain only 80 percent redundancy, or less – a good example is the use of irony. When Swift proposed that the problem of famine in Ireland might best be solved by urging the populace to eat their babies, he relied upon the contextual cognitive disconnection between his public position as a vehemently pro-Irish representative to the English Parliament, together with his reputation as a humanitarian, to provide a key with which to decode the real message: that we are all one; therefore allowing harm to come to another is to visit violence upon ourselves – all this reliant upon context, a questionable assumption founded upon the premise of a common culture.

This may explain why irony is emerging today in American culture to the degree it has long been apparent in the older, more homogenous European cultures.

Now, if you are not sure of the context within which your recipient will receive the message, you can build into the message another layer of redundancy geared to the recipient's reception. This is called *mirroring* by psychologists; the rest of us know it from “When in Rome, do as Rome does.” It is perhaps the greatest politeness to adopt the mores of your recipient, even if you consider those mores abhorrent, because the common context thus formed will lead to better communication.

And that's my agenda for remote control. When I first use the equipment, I want to use a large rotary switch with an audible “click” to turn it on, and I want both the remote and the system to confirm that command to my senses – without having to turn on a separate display, which will simply introduce


another variable to the equation. I want next to be informed of the signal chain I have invoked – and I'm quite happy to have system memory reinstate whatever I was using when I switched the system off – anything rather than a baffling lack of activity.

Next I may wish to select a different source; again I'll choose a large rotary control that satisfyingly clicks as it moves between clearly labeled, illuminated positions. And now I may wish to connect other monitors, video or audio, in various ways dependent on the source programming format and, of course, my whim.

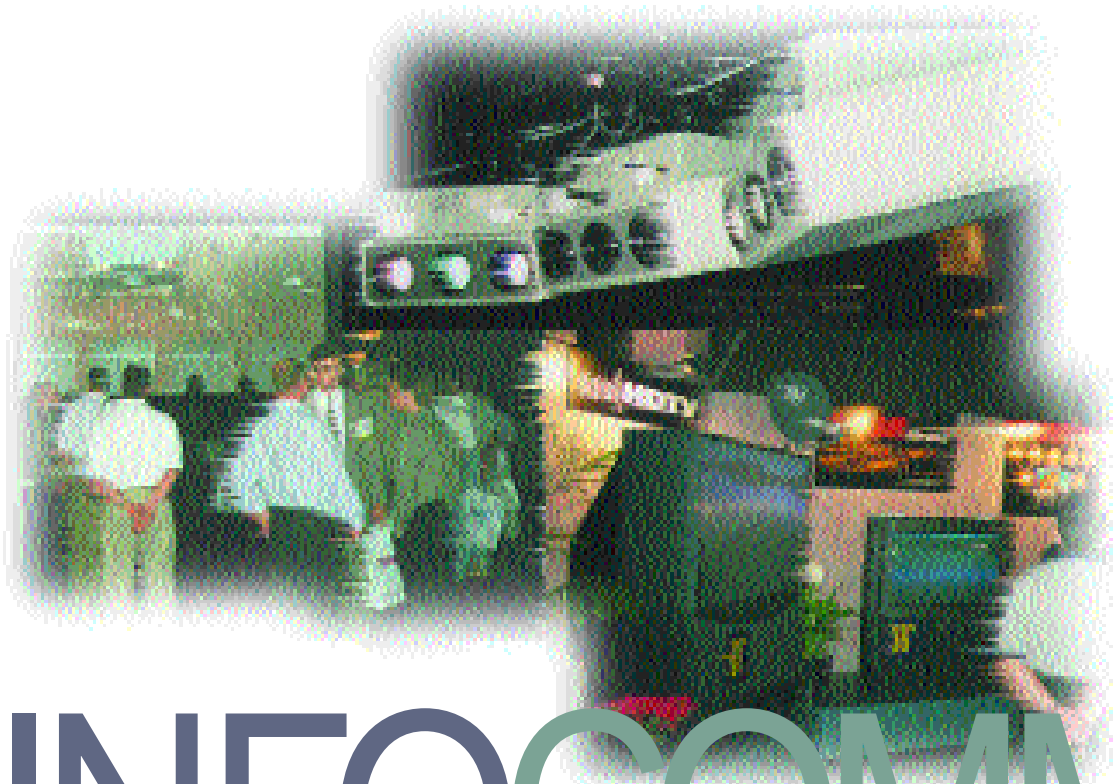
You can see that by allowing the on/off knob to also control volume, I've arrived back at my father's radiogram control panel: three rotary switches scaled for human hands, with back-lit labels illuminated as the knobs are turned.

By now you may have decided that I'm a reactionary Luddite, and you may infer that I can't cope with the micro-processor age. You would be partially correct, but only in the first assumption. My point is to make the experience as comfortably familiar as Linus' blanket.

So where do we go from here? No, I'm not suggesting that we should all have remotes styled after 1950s illuminated fascia panels. I suggest that we are missing the tactile interface with these complex devices, the subconscious feedback that adds to the richness of our environment. Although it may seem grandiose, I am going to draw a parallel between this feedback and body language, which conveys a surprisingly high proportion of our communications and adds to the redundancy that is so vital to consistent communication. This is the missing element from our connection to the machine, and no box of M&Ms can supply it.

I don't know the solution: That's going to take a serious investigation to define. But I know this problem is being vigorously addressed elsewhere – have you noticed the eagerness of the voice that greets AOL users? And the resigned tone of its “Goodbye”? Or that the GUI (graphic user interface) of current computers includes a satisfying snick every time you click the mouse?... 

BARRY RAWLINSON



INFOCOMM

When most people hear "Orlando, Florida" they think of Disney-world, Universal Studios, palm trees, and flamingos. They *don't* usually think of darkened, carpeted convention halls filled with flashy images projected onto huge screens. But that's almost all I saw in Orlando when

I visited last June to attend INFOCOMM International 1999. This annual trade show, sponsored by the International Communications Industries Association (ICIA), is the most important event of its kind for vendors of presentation products. An estimated 25,000 people attended the show this year - most of them "information and communications" professionals but some consumers as well. More than 450 exhibitors were on hand, many to introduce new products. The most exciting such products were displays - cutting-edge projectors and direct-view monitors. While most of these are designed for the needs of audio-visual professionals - and priced accordingly high, the same technologies will soon find their way into more-affordable consumer products, the kind you and I can buy in a retail store. No matter how you look at it, the show is an important event

in the world of displays.

As with many trade shows, the city hosting Infocomm changes each year. But the general organization of the show remains much the same wherever it occurs. This year it was the huge halls of the Orange County Convention Center that were filled with manufacturer's exhibits. The largest booths, some threatening to scrape the ceiling, were those of the projector manufacturers. Many of these contained screens of nearly theater proportions displaying high-definition material, much of it from recent blockbuster movies, projected by the brightest projectors available. Surrounding these were the smaller booths of manufacturers with more humble space requirements. Line the aisles between with plush carpet and your picture of this trade show is almost complete. (Did I mention the indigestible food?)

This year's Infocomm presented over 90 projectors in its annual Shoot Out, as well as a handful of direct-view

Separated from the main exhibit halls was the ICIA Projection Shoot-Out. This event-within-an-event is a showcase of Infocomm. It is also quite misunderstood: It was created to allow potential buyers of display equipment – potential because nothing can be bought at the show – to compare the performance of products from different manufacturers under identical conditions. No one actually *wins* the Shoot-Out, and there are no prizes – in fact, participants are strictly prohibited from declaring themselves winners. Nevertheless, it's an important event for manufacturers and buyers alike because it is rare to see similar display products together in one place. This year, over 90 projectors were presented, as well as a handful of direct-view CRT monitors and plasma-display panels. Products were divided into multiple categories according to image resolution and display application. Projectors in a given category were fed identical signals for display on identical side-by-side low-gain screens. For the first time, the Shoot-Out included a high-definition "HDTV Demo" category whose entries consisted, for the most part, of high-brightness, large-venue projectors (the screens were large - 27 x 15 feet). The Shoot-Out also included categories for scan converters and video upconverters. (See the sidebar.)

Since I work as an engineer for Electrohome Projection Systems, an exhibitor at the show, my view of Infocomm is that of an industry insider, an advantageous perspective from which to report the event. Of course, it carries with it the danger that I could be perceived as biased toward my company's products or against those of its competitors. To set this aside, let me assure the reader that, apart from supplying a relatively low volume of OEM projectors for the very High End of home theater, Electrohome does not make products that directly compete in the categories of most interest to this report.

Significant New Products and Trends

Among the multitude of new display products introduced at Infocomm, I have selected a handful as "significant" because they demonstrate the most important trends taking place in the display industry. They also turn out to be the most relevant to those attempting

VIDEO UPCONVERTERS

Video upconverters have become important products for home theater. A large number of these were introduced this year at INFOCOMM, almost all of them scalars. Unlike simpler line doublers or quadruplers – which output progressive signals with either double or quadruple the number of lines in each original interlaced video field – scalars offer a range of progressive output formats and scan rates to better match the characteristics of a given display device.

The new products this year at the show included Analog Way's Trans-Scaler, Communications Specialties' Deuce Pro, Extron's DVS 100, Faroudja's DVP3000 and DVP3000U, Focus Enhancement's QuadScan, Inline's IN1402, IN1403, and IN1404, RGB Spectrum's DTQ and VLI 200, and YEM's DVS-1000. Space prohibits describing all of these products, so I focus here on only a few of the most noteworthy.

Communications Specialties' Deuce Pro, with a suggested list price of \$4,995, is a much-improved version of its popular Deuce video scalar. The product adds a component/RGB input, VGA pass-through, stereo audio switching, RS-232, and an internal power supply. Compatible with NTSC and PAL signals, it outputs RGB in ten different formats up to 1365 x 1024, at three selectable refresh rates. Performance improvements include a two-line comb filter, noise reduction, and a sharpness control. Extron's DVS 100, with a list price of \$2,325, includes a component input and a three-line adaptive Y/C separator. It can decode NTSC, PAL, and SECAM and provides a total of 17 RGB output formats, including 480p, 720p, and 1080p. Faroudja's DVP3000, with a suggested list price of \$19,995, converts 480i (NTSC) to one of eight output formats, including 720p, 1080i, and 1080p HDTV. In addition to Faroudja's renowned film-mode deinterlacing, the DVP3000 includes "Directional Correlation Deinterlacing" to eliminate motion artifacts from video-originated material. Another significant feature is the ability to upconvert 480p signals from future progressive-scan DVD players. A component output is also included for connecting to HDTVs. The DVP3000U (\$21,995) adds 580i (PAL) and 580p input compatibility and the ability to output at 100Hz.

A total of 11 upconverters were entered into the Projection Shoot-Out this year, including several of the new products described above. The upconverter Shoot-Out was divided into two categories - 31.5 kHz output and 64 kHz output. Each product was fed identical input signals and the output was projected onto identical side-by-side screens – using 8" CRT projectors in the 31.5 kHz category and 9" CRT projectors in the 64 kHz category. Video material consisted of colorbar and multiburst test patterns, color and black-and-white movie scenes, and VCR playback of video-originated scenes, including fast-forward and reverse previews, as well as paused frames. These images permitted only a limited evaluation of performance (scaling quality with other output formats was not tested, for example). Accordingly, I ranked products simply as "good," "adequate," or "poor" based strictly on the test images shown. In the 31.5 kHz category, I rated two products "good:" the Astro Systems SC-2025A line doubler and the Chromatek Biraster 3428 line doubler. Both displayed the test patterns competently, had few objectionable deinterlacing artifacts, and handled VCR playback well. I rated the Communication Specialties Deuce as merely "adequate" because of its relatively poor high-frequency luma response and smeary

continued on page 23

ALAN KOEBEL

to recreate the theater experience in the home.

The dominant display technology today for home-theater screens larger than 40" diagonal is CRT (Cathode Ray Tube) projection. It is used in almost every rear-projection TV and most HDTVs just recently introduced. But it is an old technology near its limit and its days are numbered. The display industry, driven by the desire of business professionals to make presentations in fully lit rooms, has been hard at work replacing CRT projection with brighter and friendlier alternatives. These alternatives are Liquid Crystal Display (LCD) projection and Digital Light Processing (DLP), the latter invented by Texas Instruments. Both of these technologies use discrete pixels to form images and both use a lamp as the source of the light projected on the screen. These considerations have made it possible to design small, portable projectors with much higher light output than a CRT projector – just the thing for the mobile presenter. Most of the projectors at Infocomm were of this type. One of the standouts in light output per unit weight was the U2-1080 from PLUS Corp. Based on DLP technology, this small, ultra-portable projector weighs less than 6

Projectors in a given category were fed identical signals for display on identical side-

pounds yet puts out 800 ANSI lumens of light - three to five times as much as a CRT projector can provide. (I will explain the meaning of "ANSI" below.) The native resolution of the image is also relatively high – 1024 x 768 (XGA format). Unfortunately, there are trade-offs for the small size of ultra-portable projectors. Input connection options and features are usually more limited than with larger models. Also, in some cases performance may have been compromised to minimize the projector's size and weight.

Although light-output ratings for small LCD and DLP pro-

jectors are usually much higher than for CRT projectors, they do not always appear as bright as you might think from the numbers. When displaying video images, which typically have a much lower average picture level (APL) than graphics images, a CRT projector can put more of its energy into high-lights of the image – an ability indicated by its "peak lumen" rating. This makes the image appear brighter than you would expect from the projector's ANSI lumen number, which represents the brightness achievable with a full-white image. Nevertheless, an LCD or DLP projector rated at 1000 ANSI lumens – a number that is now quite common – looks brighter on video images than a typical 9" CRT projector.

One area where CRT projectors still have the edge is black level. Despite years of steady improvement, neither LCD nor DLP has yet managed to achieve, on small screens, the deep blacks achievable with CRT. That is reason enough for some to choose a CRT projector for their home theater. A promising new choice introduced at the show was the HD 2000 from Chromalux. Like DWIN's HDP-500, this 7" CRT projector has no fans – the projector's metal chassis serves as a heat-sink. Designed by Arthur R. Tucker – one of the pioneers of the projection industry – it includes a built-in line doubler. Chromalux claims peak and ANSI light outputs of 1100 and 800 lumens, respectively. Since the projector was not shown operating, I could not confirm these numbers. Eight hundred ANSI lumens would be an astounding output from any CRT projector, much less one using 7" tubes. In a bid to improve domestic harmony, the projector's plastic cover is available in custom colors to match any décor.

Despite late arrivals like the HD 2000, it is clear that the total replacement of CRT-projection by LCD and DLP, even for home theater, is close at hand. The quality of images from LCD and DLP projectors at the show this year was dramatically better than last year. Colors were more saturated, whites were more accurate, blacks were deeper (although not yet *quite* good enough), and overall uniformity was improved. The final nail in the projection-CRT coffin may be this: Texas Instruments showed a prototype of a rear-projection HDTV

Notable New Display Products at INFOCOMM '99					
Manufacturer	Model No.	Price	Technology	Light Output (ANSI lumens)	Pixel Format (H x V)
Barco	BarcoReality 6300DLC	\$20,995 (w/o lens)	LCD projection	2,000	1280 x 1024
Chromalux	HD 2000	N/A	7" CRT projection	800	Not applicable
Davis	DL X10	N/A	DLP projection	1000	1024 x 768
Epson	PowerLite 9000i	N/A	LCD projection	1,600	1280 x 1024
JVC Professional	DLA-G15	\$20,000 est.	LCD projection	1,500	1365 x 1024
NEC	PlasmaSync 5000W	\$22,995	Plasma, 16.9, 50" diagonal	N/A	1365 x 768
PLUS Corp.	U2-1080	N/A	DLP projection	800	1024 x 768
Princeton	AF3.0HD	\$4,100	CRT, 30" diagonal	N/A	Not applicable
Revox	E-542	\$17,000 est.	Plasma, 16.9, 42" diagonal	N/A	848 x 480
Sanyo	PLC-EF10N	\$23,995	LCD projection	2,300	1280 x 1024
Toshiba	TLP-770	\$9,995	LCD projection	1,800	1024 x 768

based on DLP with a native resolution of 1280 x 720 pixels (16.9). Hitachi and Mitsubishi have signed agreements to develop consumer HDTVs based on this technology for sale in late 2000. The image quality of the prototype was, to my eyes, excellent. If the consumer versions can match it, and do so

For the first time, the Shoot-Out included a high-definition

affordably, we may not have reason to mourn the passing of CRT for long.

Given the arrival of HDTV and the ramp-up of HDTV programming over the next few years, there is little reason to consider buying an LCD or DLP projector today with less than XGA resolution. The gain in detail on high-definition images with XGA is, in my opinion, well worth the typical 30 percent price increase over comparably equipped SVGA models. If the price can be justified, SXGA (1280 x 1024) projectors are, of course, much better, but are currently available only with LCD technology. Several notable models of LCD projectors with SXGA resolution were introduced at the show, including Sanyo's PLC-EF10N and Barco's BarcoReality 6300DLC. While neither would be my first choice for a home theater, they are significant in one respect: They both include a form of digital video connection. Such a connection bypasses the traditional conversion steps between analog and digital most video signals must take between the video source and the display. A digital connection provides the cleanest possible way to send the signal and, as importantly, eliminates a lot of the fussy set-up issues involved with getting an image to look good. The Sanyo projector provides a digital connection called "PanelLink," which is becoming a standard way to connect computers to flat-panel monitors. The Barco product provides an optional FireWire connection. FireWire (IEEE 1394) is the standard that will very likely be used to connect consumer DTV products together, from HDTVs to digital VCRs to surround processors. The important point is this: What is available on these professional projectors *now* will become available on consumer projectors, in one form or another, *soon*.

The trend to digital connectivity is not just restricted to projectors. Plasma display panels (PDPs) are getting in on the act, too. A prime example introduced at the show is the Revox E-542. Advertised as the world's thinnest PDP, at a 2-inch depth, it consigns all user-connections to an external box that sends digital video signals and power to the display over a single cable up to 40' long. The control box has a slot to accept a FireWire interface card to be developed later this summer.

Speaking of PDPs, they were definitely one of the hot technologies at the show. They are being increasingly considered for use in corporate boardrooms and for point-of-sale displays. In the consumer world, more and more people are considering them worthy alternatives to large direct-view CRT monitors and rear-projection units for home theater. The more affordable panels are those with "standard" resolution - 852 x 480 at 16.9 aspect ratio. The most recent of these at the show had better contrast ratios, higher brightness, and more accurate colors than last year's models. Nevertheless, they weren't turning heads the way their high-definition sib-

chroma transitions. Barco's VSE-20 line doubler, Extron's DVS-100 scaler, and RGB Spectrum's DTQ scaler all earned a "poor" rating, mostly because of their inability to cleanly handle VCR playback (particularly in the case of the DTQ). If VCR playback is discounted, they each earn a rating of "adequate." In the 64 kHz category, I considered only one product "good," the Communication Specialties Deuce Pro. I rated Analog Way's Smart Cut II scaler "adequate" because of some instability during VCR preview modes and because of relatively poor high-frequency luma response. Extron's Sentosaxi earned a "poor" rating because of a considerable number of obvious deinterlacing artifacts. I likewise rated Focus Enhancement's QuadScan "poor," in this case mostly because of its unstable response to VCR playback - the image was not steady even during regular play. If this is ignored, its overall performance is adequate. Lastly, Barco's VSE-40 also earned a rating of "poor" because of its relatively poor high-frequency luma response combined with an excessively noisy picture.


This comparison of upconverters should be taken with caution because the source material and conditions imposed by the Shoot-Out were too limited to evaluate the performance of the products thoroughly. If you're in the market for an upconverter, try to audition the products yourself using test material and sources you are intimately familiar with.

AK

lings were. Last year, only one high-definition PDP was introduced at the show. This year, *five* were introduced, which is a good indication of the way this technology may be maturing. NEC's PlasmaSync 5000W was the standout. This 50" diagonal 16.9 panel, with a resolution of 1365 x 768, had the best looking image I've seen yet from a PDP.

While PDPs are unquestionably getting better, they still have problems. One of the more notable is a tendency to produce noise in dark areas of the image. The only panel I saw not showing this noise - the Revox E-542 - had obvious contouring (discrete steps in the grayscale) in the dark regions of the picture, leading me to suspect that the noise may be an intentional trade-off to reduce the visibility of contouring. PDPs also tend to show rather obvious deinterlacing and resizing artifacts, although this may simply be a function of the image processing electronics rather than a property of PDP technology itself.

An Ideal Cinema?

This report wouldn't be complete without mentioning a landmark event at this year's show. Hughes-JVC and Miramax Films teamed up to give show attendees a "digital sneak preview" of Miramax's *An Ideal Husband* before its release on film. Shown in its entirety, the movie was projected onto a theater-sized screen by a Hughes-JVC ILA-12K projector. "ILA" stands for Image Light Amplification and is Hughes-JVC's answer to the problem of projecting a high resolution electronic image with extremely high brightness. Digital Light Processing (DLP) is the competing answer from Texas Instruments. While the image I saw from the Hughes-JVC projector was not perfect, the resolution, color saturation, and contrast were all good enough to give me confidence that electronic projection - whether based on ILA or DLP technology - will be equal to the task when digital cinema becomes an every-day reality. When that day arrives, the technologies exhibited each year at Infocomm will have found their ultimate expression. 

What does a film editor do?
And what effect does this have on the final version



NOTES FROM THE CUTTING

Sometimes I think that every position on a moviemaking crew comes with its special privileges, its perks, as it were. If you're the script supervisor, you stand right next to the director as the film is shot, noting which takes are to be printed and any remarks the director may have about them. From this position you watch the script come to life before the camera. If you're the director of photography or the production designer, you play large, determining roles in how the film will look. The actors literally give a flesh and blood reality to characters whose only previous existence is on paper. The writer, of course, has written the screenplay; if it's an original screenplay, then he has invented the story. The most important position of all, it goes without saying, is that of the director, who realizes the story before the cameras and oversees every aspect of preproduction, production, and post-production.

It is the special privilege of the editor that he or she is the person who first gets to see the movie *as a movie*. Before it passes through his hands, it is only a collection of long takes from various angles, of various sizes, without dramatic shape or rhythm. Having said that, I wouldn't want to suggest that the editor alone

gives it shape and rhythm. The screenplay has a structure, as does each scene; and in most of the scenes, the director has built tempo or range of tempos. But these things have no real cinematic existence until they leave the editor's bench. One of the most continually exciting and personally rewarding aspects of an always interesting job is that first time I run a scene after I've cut it. Suddenly, as if by magic, I'm looking at a real movie where there was none before, or at least the beginnings of a movie.

Outsiders are sometimes surprised to learn that most movies are shot out of sequence and that editing begins the moment there is a complete scene to cut, which is to say with the first day of shooting. It makes no sense to wait – you can cut just one scene at a time anyhow. And it would be bad economics to let the interest on the loans increase while the footage just piles up. What directors want and need is to have a first cut finished as soon as possible after the completion of principal photography. As it usually takes longer to edit a scene than it does to film it, cutting must begin immediately.

Editing as you go along gives everyone involved the opportunity to assess how the project is shaping up – are the performances working, as the scenes accumulate do they tell a story, does

PAUL SEYDOR

there appear to be a movie here at all? Sometimes technical problems develop – shots go out of focus, the director loses the light at the end of the day and doesn't get some angles he fears he needs, the negative gets damaged in the lab. When this sort of thing happens, it is imperative that the director see the scene cut together as soon as possible so he can determine if additional shots are needed or, perish the thought, the entire scene needs to be rescheduled.

I'm often struck by the number of people, including those in the movie industry itself, who have little or no idea what a film editor actually does. "Oh, you cut out all the bad parts," is the usual salvo when I'm introduced as a film editor. Almost as frequent and worse: "Oh, they say an editor can make or break a film." The one conceives the job more or less as glorified bean counting, the other invests it with far more power than it actually has. When I tell people that I usually do my work on my own, as first cut is done while shooting is going on, which means the director is filming while I'm editing, they're often taken back. Doesn't that almost mean that *you're* directing the film, not the director? Of course not. An editor's power to radically alter a scene is much less than people often think. For one thing, you want to keep your job, so you'd have to be egotistic to the point of professional suicide even to try to cut a scene much differently from the more or less clear intent with which it was shot, at least on first cut or without discussing your ideas in advance with the director. For another, you're limited by the material itself. A well-placed reaction shot can make a character appear more or less sympathetic; if you're given a fairly wide range of readings (not usual, but not atypical either), you can pitch a performance higher or bring it down by your selection of takes; you have the option of playing dialog on or off camera. But it's the really unusual film that would allow the editing as such to transform the direction into something else entirely.

I've had directors tell me many times that I've "saved" a scene. This is always flattering, but also a little puzzling, and I usually reply that I didn't shoot any new footage, so whatever I did was there to be found in the material. For one of the most valuable things a good editor can contribute is a fresh perspective. That, of course, and his basic talent for storytelling, his taste and sensitivity in shaping performances, and his imagination in how the shots can be most effectively combined. Sometimes colleagues tell me they like to hang around the set to soak up the feel of the movie, but I've never found them convincing. Anyone who has spent any time on a film set soon finds out there is little "feel" for the story to be picked up there – not with production assistants, camera crews, sound recordists, costumers, assistant directors, service people, and the countless other crew members necessary to the making of a movie milling about.

And if the editor is hanging out there, he plainly isn't editing the film, which is what he should be doing. I prefer to approach the raw footage with as little knowledge as possible of what went into getting it. It doesn't matter if the star was sick and not on best behavior; it does me no good to know that certain essential setups were never filmed owing to inclement weather or a camera breakdown. All that makes for interesting dinner conversation or frustrated venting over a drink, but is of no consequence

one way or another when it comes to working with the footage.

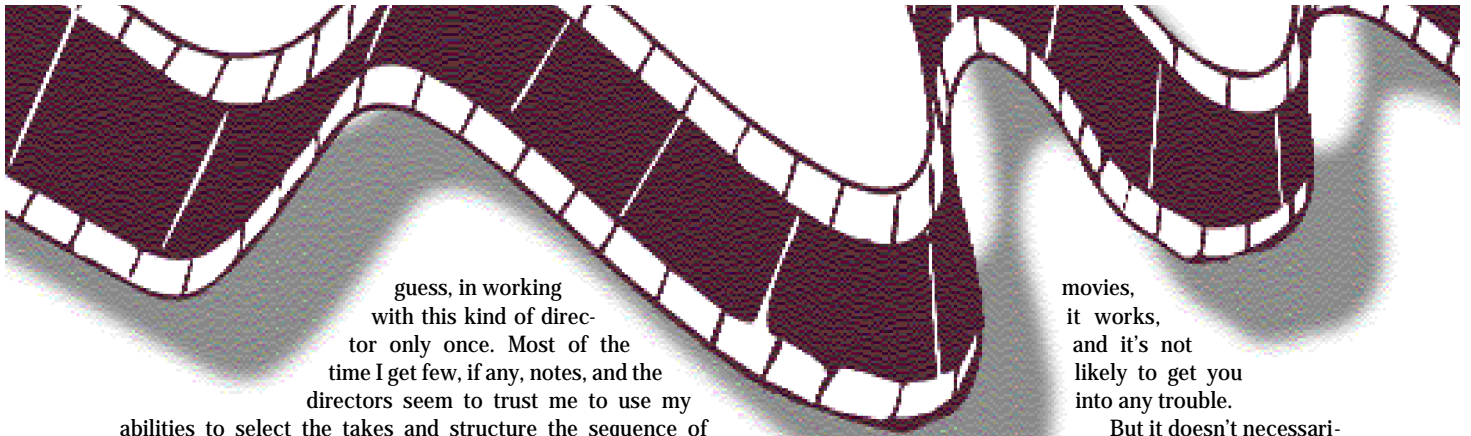
Every film is in fact three films: the film that is written, the film that is directed, and the film that is edited. Sometimes they're all the same film, sometimes they're not, and I can't think of any necessary correlation in quality between when they are and when they aren't. I do know that the only film you finally have is the raw footage that has been developed and is waiting to be cut. Everything else is academic.

Early in my career I was on a job interview; present were the director, the producer, and the two writers who were also associate producers. One of the writers asked me who I thought should get the right to final cut. Talk about being on the spot. I replied that insofar as it devolves to a single person, I believe it must be the director. (Whatever problems I have with the auteur theory, I nevertheless believe that the director is the overall "author" of a film, because a screenplay is not a final anything – it awaits realization on film, for which the director is responsible.) But I went on to say that my experience suggests it is the film itself that determines the final cut, the film itself that soon becomes the last, best arbiter. A movie that is good or has a chance of becoming any good eventually develops a life of its own. And every director and every editor who are good keep themselves alert to this process and bend their egos to helping this emergent organism assume the shape it desires, to letting it, in a word, *live*.

The director with the greatest editorial imagination of them all, Sam Peckinpah, used to say that he knew what he saw in the material, he wanted to see what others saw in it. Of one of his favorite editors, Robert Wolfe, Sam once told me, "Bob will come back with 20 ideas. I might hate ten of them, but that still leaves ten that I'd never have thought of that'll make my movie better."

Different directors work differently. Some give you copious notes at dailies, right down to which specific line readings they want and how they'd like the shots used. I've been lucky, I

Before
it passes
through the editor's hands, a film
is a collection of
long takes from
various



guess, in working with this kind of director only once. Most of the time I get few, if any, notes, and the directors seem to trust me to use my abilities to select the takes and structure the sequence of shots. (On at least two projects I had put the films into first cut before I ever met the directors in person.) This makes the job more difficult because more challenging, but also more rewarding because more creative.

Different editors also work differently. Perhaps because when I first started editing in 1982, the editors I worked with – Roger Spottiswoode and John Bloome – cut on a movieola, I continued to use one right up until I switched to the Avid computer in 1995, the way most films are cut these days. I like the Avid for the same reason I liked the movieola, as opposed to the KEM or flatbed: the quick access to all the footage.¹ I've never been one of these editors who watch the dailies and take notes on the so-called "best" takes or readings, then build or have their assistants build a "selects" reel and cut from that. For one thing, typically you watch dailies at the end of what has been a long day of editing (if you're the editor) or shooting (if you're the director). Hardly the best conditions under which to be making editing selections. For another, I'm never really certain where I want something to be played until I reach that point in the scene. It's all very well to feel that a reading of this or that line was much better in the medium shot than in either the close-up or the master shot, but what if the medium shot is emotionally or psychologically the wrong place to be at that point in the scene? Perhaps the isolation of a close-up is what's called for or the tie-in of the over-the-shoulder or the distance of the master. Then you've got to search through the other takes and find a reading that works or alter the cut accordingly. I like to have the fastest possible access to all the footage at whatever point I am in the scene. As important as individual moments are – in my opinion, they are the very lifeblood of truly vital movie-making – scenes are more important, and you usually have to sacrifice the incidental to the overall.

Editing is a curious process of the intuitive and the intellectual, the instinctive and the ratiocinative. For every decision you make has both immediate and long-range implications. There's an old saw – one that, dull though it has become, is alas still in too much use – that goes, once you go in, stay in. This refers to the classic way of editing a scene, where you begin with the masters, then move to the medium shots, the over-the-shoulder angles, going progressively tighter until you conclude with the close-ups. And when you get close in, stay close in. You see a lot of cutting like this, especially in older movies and quite a bit of television. It's certainly a serviceable way to edit

¹ Takes are stored individually for a movieola (i.e., an upright viewing-machine); they are stored in 1,000-foot reels for flatbed viewing. The former obviously allows for much faster access to a given piece of film.

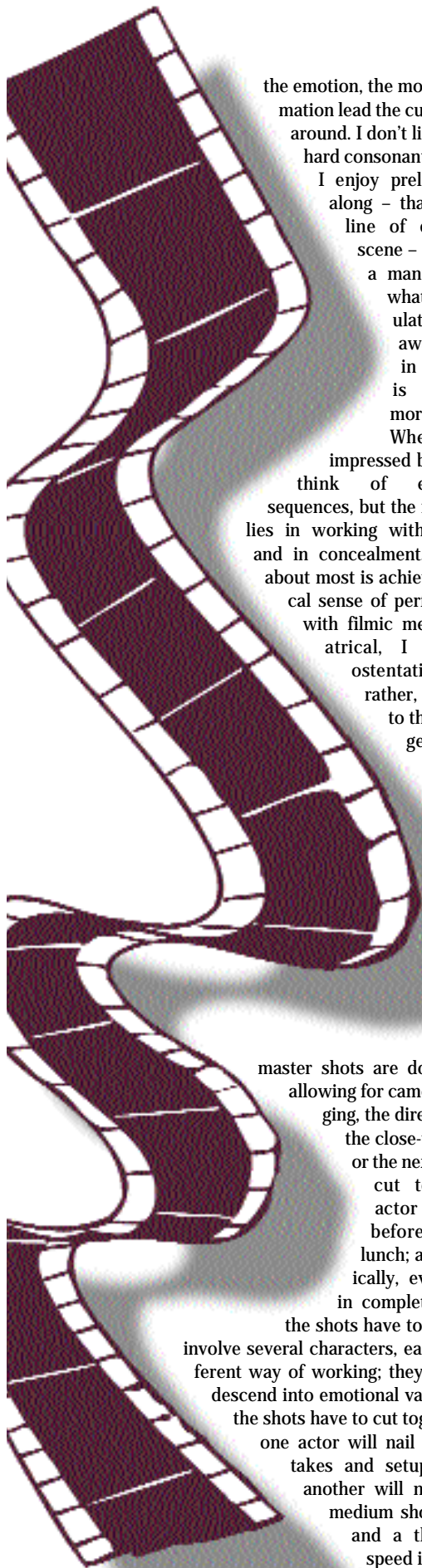
movies, it works, and it's not likely to get you into any trouble.

But it doesn't necessarily make for terribly exciting or dynamic moviemaking, nor does it allow you to avail yourself of anything like the full expressive use of the filmic language at your disposal. One of the most valuable lessons I learned from studying Peckinpah, for example, is how dropping back to the master shot or even an establishing shot in the middle of scene can let it breathe, or alternately can give it a beat that will then invest your close-ups with even greater force and intensity.

Some editors and directors don't like what are called jump-ins and jump-outs, that is, going from one size to another without an angle change or a cutaway. Yet this is one of my favorite procedures. These are, admittedly, difficult cuts to make work, but when they do work, you gain an expressiveness that you don't otherwise have. In the movie I'm currently doing, for example, Ron Shelton's *Play It to the Bone*, Lolita Davidovich has a scene in which her character is talking about the things she enjoys. Ron covered the passage pretty thoroughly, as he usually does. But there were two takes in particular, a loose over-the-shoulder looking at Lolita past Woody Harrelson and an isolating close-up, both from the same angle, that contained readings that are especially effective. Lolita sustained the speech through both readings and either take could have been dropped in with hardly a second thought. If I had to choose one or the other, I would have selected the looser angle because she is responding to something Woody's character has asked her and it felt wrong to me to play the whole speech in the isolation of the close-up. Yet I also felt that the end of the speech is slightly more effective in the tighter angle and I wanted to play the whole speech on her, without cutting to a reaction and back again. So I simply cut from the looser to the tighter angle at an unobtrusive spot. The performance plays as seamlessly as if in one, but the shift to the close-up gives the last part of the speech just the right subtle emphasis, drawing us closer to the character and her dreams, than would have been the case had I been doctrinaire about jump-ins or, for that matter, had I worked with selects, which would have forced me to choose one or the other take before the cutting part of process began.

Do editors have styles of their own? I suppose they must, but I don't imagine they can be very well defined ones, otherwise they'd be terribly limited. As I think about my own, I can state a few – preferences I'd rather call them, as they're nothing so hard and fast as principles. I prefer my cuts to be as seamless, even as invisible as possible. I generally like to knit the scenes internally, which means that I prefer to have

The editor shoots no new footage; whatever he does was in the film all along.



the emotion, the mood, the action, the transformation lead the cut, rather than the other way around. I don't like to let picture cuts fall on hard consonants, as that emphasizes a cut.

I enjoy prelaps to pull the narrative along – that is, starting an incoming line of dialog over an outgoing scene – provided it doesn't become a mannerism. I generally detest what I call the never-let-a-modulation-die-out-before-you-cut-away school of editing, which in our attention-deficit age is becoming more and more common.

When most people are impressed by editing they usually think of elaborate action sequences, but the real art of editing lies in working with performances and in concealment. What I care about most is achieving a theatrical sense of performance but with filmic means. By theatrical, I don't mean ostentatious "acting"; rather, I am referring to the continuity you get from a performance on stage, the building up and releasing of tension and emotion in an unbroken arc of time and space. This can be achieved on film, but it is more difficult because films are made in pieces and over time. Usually the master shots are done first. In a long scene, allowing for camera setups, lighting, and rigging, the director may not get around to the close-ups until the end of the day or the next day. Yet the shots have to cut together. Sometimes one actor will have his close-ups before lunch, the other after lunch; and emotionally, psychologically, even physiologically they're in completely different places. Yet the shots have to cut together. When scenes involve several characters, each actor has his or her different way of working; they reach emotional peaks or descend into emotional valleys at different times. Yet the shots have to cut together. More often than not, one actor will nail the scene in the first few takes and setups (meaning the master), another will not hit his stride until the medium shots and over-the-shoulders, and a third finally comes up to speed in the close-ups. Yet still the

shots have to cut together.

It's a funny thing about matching in editing. Most lay moviegoers who pay attention to editing admire the elegance of the shot matching; most editors brag about the mismatches they manage to get away with. What experienced editors care most about matching is the mood and emotion of the performance from one shot to the next. (Even a volatile performance that swings between extremes must have the integrity of its changes.) Neophytes usually worry about quite trivial matters – how much of the cigarette was burned away in this shot as opposed to the previous one. The second scene I ever had to cut was in a movie called *The Best of Times*. Kurt Rus-

The screenplay has a structure. Each scene has a structure – a range of tempos. But these things have no real cinematic existence until they leave the editor's

sell and Robin Williams are at a bar drinking beer out of bottles. The scene was covered from every conceivable angle and size except that there were no singles – that is, a shot that contains only one character. Every shot was some variety of a two-shot, which means not only that both actors were plainly visible, but so were their beer bottles. What a learning experience! Every time I wanted to make a cut, one bottle or the other got in the way. Soon enough I discovered what every editor discovers – the hell with matching. You cut for mood, emotion, for the feeling of the moment, and then later correct any mismatches you can't live with.

In the scene I just described, the only cut I don't like is the one I absolutely had to make for the match alone: after one of the actors delivered his line, I had to wait for him to raise the bottle to his lips because that is where it was in the incoming take that was best for the next line. I'd have rather cut away sooner, but there was no other way without leaving a mismatch so grotesque as to throw any moviegoer right out of the moment. When I ran this scene for Garth Craven, one of my mentors, he remarked, "Never give an actor a prop."

Garth did not, I must add, say this to the detriment of the actor; it was just commiseration between editors. The takes in question were made hours apart; no actor can be expected to turn in a good performance at the same time as he's trying to keep precise track of what are supposed to be casual swigs of beer during a long scene in a neighborhood bar. That's one of the things editors are for.

There was a time when studio previews served an admirable and necessary function, or complex of functions. They let you observe how your movie played in front of an

audience for the first time. There are always surprises. Things you worried were unclear the audience tracked perfectly; things you never imagined would be a problem turn out to require a lot more thought and work. Previews were useful for studios, too, helping them determine the kind of movie they had, the more effectively to market it.

But in our marketing-obsessed age, where high among the Monday morning headlines, even in Podunk, USA, are the weekend grosses of the latest movies, the principal function of previews now is to let the marketing people tell the filmmakers how to "fix" their movies to make them easier to market. One of my favorite minor spectacles of our time is watching rich, powerful studio executives and movie producers hang on the every word of teenagers in focus groups for some scrap of a clue as to anything objectionable that might make the movie under discussion unpalatable to the 16-25 age group. They pay slavish attention to witless comments built around words like "rad," "awesome," or "icky" as they bring the common denominator lower and lower.

The studios don't care about older moviegoers any more, and you have only to look at the latest products - this is being written as the summer approaches - to see where their sights are set. Previews have become a degraded and degrading process that only the most powerful or committed of directors can withstand and prevail against. It's the only part of the editing process that I actively hate, and every editor and director I know feels exactly the same way.

Most movies are now cut on computers, rather than on film itself, and only assembled as films relatively late in the process. Does this affect the way movies are edited? I suppose it must, but when I look at my work before and after Avid, I don't see any differences that I can attribute to the technology alone. When Avids first appeared, you did see a great many more dissolves because, unlike film, the computer lets you see the dissolve immediately.² A far bigger influence than the tools themselves is the whole home-video market.

Fifty years ago, Jack Warner used to say that the life of a movie was basically three months, which may explain why the studios were so careless in handling and storing the master negatives once movies had their theatrical runs. But the video market has not just given theatrical movies a whole new lease on life, it has practically *become* their life. Most people now see movies on video, whether via cable or through rentals. (The best single thing about the advent of DVD is the hope among many of us that it will supplant videotape as the preferred viewing medium, so that home viewers will have decent picture and sonic reproduction.)

This cannot help but affect the way movies are made. I can't recall that I've ever cut with anything other than theatrical viewing in mind, but just the other day something happened that gave me pause. I wanted to end a particularly intimate scene by dropping back to an extreme long shot that Ron Shelton had filmed. I use big screen (30") monitors, but when I cut in the long shot, I realized I couldn't even see the two actors. For all I or anyone else knew, I was cutting to a different scene or I was doing a time cut. The actors completely disappeared, and I thought that when the movie shows on television this is exactly what will happen there as well. And because the medium I was using to cut the film is video, it was driven home to me more forcibly than before. I

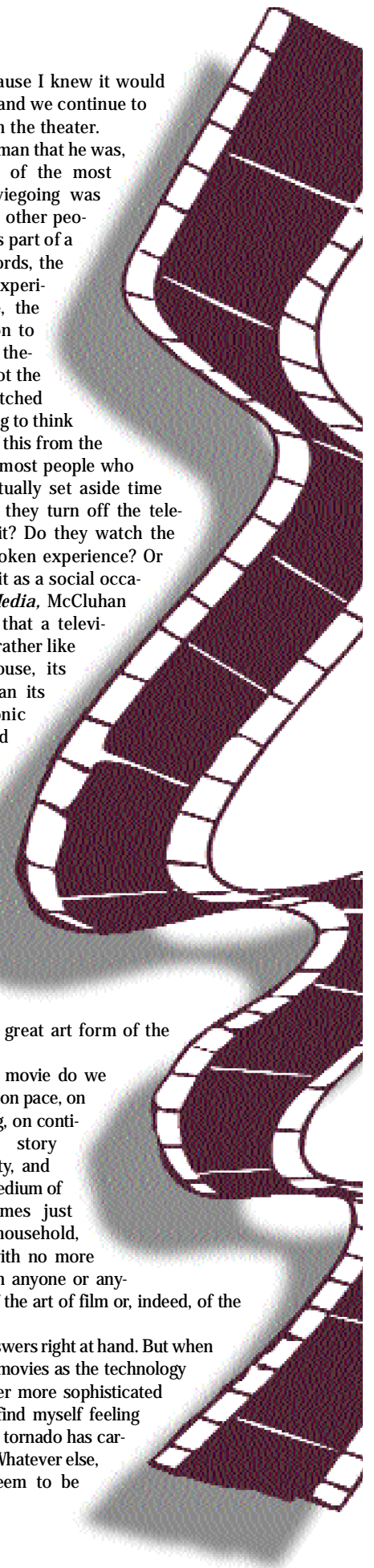
made the cut anyway, because I knew it would be effective in the theater, and we continue to make movies for viewing in the theater.

Peckinpah, old theater man that he was, always believed that one of the most important aspects of moviegoing was leaving your house, joining other people, and seeing the movie as part of a large audience: in other words, the communal aspect of the experience, and also, of course, the giving of your full attention to the movie that being in a theater demands. But this is not the way most movies are watched these days, and it is sobering to think through the implications of this from the editorial point of view. Do most people who watch movies at home actually set aside time and watch the movie? Do they turn off the telephone or at least silence it? Do they watch the movie as an integral, unbroken experience? Or do they, as I suspect, treat it as a social occasion? In *Understanding Media*, McLuhan argued, correctly, I think, that a television in the home becomes rather like another person in the house, its content less important than its presence as an electronic device with sounds and images of its own that it brings to the party. People talk, go to the refrigerator, pause the movie for any number of valid and invalid reasons. This is the reality of what the movie experience has become after a hundred years during which it was hailed as the great art form of the Twentieth Century.

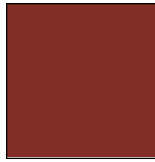
Why, then, in making a movie do we continue to lavish such care on pace, on tempo, on rhythm, on timing, on continuity of performance, story through-line, narrative clarity, and all the rest? If through the medium of television, a movie becomes just another member of the household, merely one of the party, with no more claims to our attention than anyone or anything else, what becomes of the art of film or, indeed, of the film experience itself?

I haven't any brilliant answers right at hand. But when I contemplate the future of movies as the technology of home video becomes ever more sophisticated and widely available, I do find myself feeling rather like Dorothy after the tornado has carried her far, far from home. Whatever else, Toto, this really doesn't seem to be Kansas any more.

² In computerized editing, the movie is only edited in the video/computer domain; the final product is still film, which is assembled from a cut-list generated by the computer with numbers corresponding to each piece of negative.



A U D I O



F E A T U R E D P R O D U C T



Lexicon MC-1 Controller Sonic Flavors To Slake Every Thirst



Lexicon is unique among companies building multi-channel digital controllers (see "What You Should Know About Controllers," which follows this review). Rather than approach the product category after designing two-channel analog preamplifiers, Lexicon enters the multi-channel arena with a decades-long history of creating professional digital-signal-processing gear.

Lexicon introduced the world's first digital-delay line in 1971, the Precambrian era in digital audio. Lexicon's chief technologist, Dr. David Griesinger, has spent his career studying surround sound, reverberation, human hearing, and the relationship between the physical properties of sound and our perception of them. In the academic audio community, Griesinger is considered one of the leading authorities on the perception of acoustic environments.

It's no wonder, then, that Lexicon's new flagship MC-1 Music and Cinema Processor is packed with an extensive array of multi-channel surround-sound modes. Moreover, many of these surround modes are designed for music listening, not just multi-channel film-sound. With 7.1 channels and signal processing that is unique among surround-sound controllers, the MC-1 raises some interesting questions about multi-channel music reproduction.

For those of you familiar with Lexicon's DC-1 and DC-2 controllers, the MC-1 is a significant re-design. The MC-1 has more inputs, better

DACs and analog circuitry (which increased the signal-to-noise ratio from 98 dB to 110 dB), a "broadcast spec" video board, and the unit will receive and decode 24-bit/96-kHz input signals.

The MC-1 is an eight-channel device, with line-level outputs for the usual left, center, right, surround left, surround right, and subwoofer signals, plus additional outputs for rear left and right signals. In its optimum configuration, the 7.1-channel MC-1 will drive seven power amplifiers and seven loudspeakers (plus any number of subwoofers).

Three RCA jacks marked "Expansion Ports" accept stereo PCM signals at up to 96kHz sampling and 24-bit word length. Expansion Port A feeds the left and right channels, Port B feeds the center and subwoofer channels, and Port C drives the left and right surround channels. These inputs bypass the DSP in the MC-1, including the bass management functions. The idea is to provide an input for high-resolution multi-channel digital sources. Unfortunately, it's unlikely that DVD-Audio and SACD players will provide unencrypted high-resolution digital output on RCA jacks. Still, you can use one expansion port to connect those DVD players that can output 24/96, realizing a simpler signal path than is available through the MC-1's conventional digital inputs.

Bass management in the MC-1 is a little more flexible than usual, offering three crossover frequencies (40 Hz, 80 Hz, 120 Hz), but no slope adjust-

ROBERT HARLEY

ment. A "Bass Split" feature takes bass information filtered from the center channel (assuming you have a small center speaker) and directs it to the left and right channels.

Inside, the MC-1 uses AD converters and DACs from a company called AKM. Both are delta-sigma devices that are supposedly better performing than the converters used in most controllers. Note that both are always in the signal path, meaning that all analog signals are converted to digital upon entering the MC-1 and then converted back to analog at the output. If you have a High End turntable or digital source (I used a Krell KPS-25s and a Mark Levinson No.31.5 transport and No.360s processor), the MC-1's digital conversions will degrade the sound quality. There's no "bypass" mode that directs an analog signal to the output unaltered. This is, in my view, a serious shortcoming.

I've used many controller and A/V receiver remotes; this is one of the best. The MC-1 needs a good remote because the machine is extremely complex. There are four layers of menus incorporating 17 submenus. This operational complexity goes with the territory on a controller with as many features as the MC-1. No fewer than 24 effects are provided, including simulated acoustic spaces (Concert Hall, Night Club), various film-soundtrack modes (Dolby Digital, THX 5.1, DTS), Lexicon's Logic 7 processing, and music surround.

Logic 7 Digital Signal Processing for Movies and Music

Logic 7 is Lexicon's proprietary technique for generating multi-channel playback from two-channel sources. Logic 7 processing can also "enhance" existing 5.1-channel programs such as Dolby Digital and DTS for seven-channel reproduction. Lexicon promotes Logic 7 as a universal format for distributing multi-channel music over two-channel formats such as CD and television or radio broadcasts. These programs can be Logic 7 encoded to achieve the full surround-sound effect, or unencoded (such as on existing CDs) and still create surround-sound playback.

When reproducing 5.1-channel sources (Dolby Digital and DTS) with Logic 7 and seven loudspeakers, the MC-1 sends the right surround signal to the right side and right rear speakers, and the left surround signal to the left side and left rear speakers. This is identical to wiring two surround speakers to each surround channel. But as sound effects pan toward the rear, the Logic 7 algorithm uses equalization to "steer" surround signals between the two side and two rear speakers. Specifically, effects moving from the left to rear pan smoothly from the left front loudspeaker to the left side, then from the left side to both left and right rear speakers. When effects are moving toward the rear, Logic 7 adds a 3dB treble cut (shelf filter) to the side speaker. As the sound further pans to the rear, the frequency at which the shelf filter begins attenuating is lowered, further reducing the treble sent to the side speaker. When the sound is fully to the rear, a 6dB per octave, 400Hz low-pass filter is applied to the side speakers. The result is an apparent separation between the side and rear channels that heightens the feeling of envelopment, and of sounds in motion.

Lexicon's Music Surround Modes

The music-surround modes are as innovative as Logic 7. The music modes are divided into two categories, ambiance

extraction and ambiance generation. In the latter modes, the MC-1 generates new signals (reverberation) that drive the side and rear speakers. In the extraction modes, the MC-1 simply recovers ambiance information from the existing signal for reproduction by the side and rear speakers. The extraction modes are much more subtle, and, in my view, more musically appropriate. Nonetheless, the ambiance-generation modes driving seven loudspeakers can produce some startling results.

The music modes use a variety of processes to increase the sense of spaciousness and create a feeling of being enveloped in an acoustic larger than that of your listening room. Some of the MC-1's modes use a crosstalk-cancellation trick to widen the soundstage. Crosstalk occurs when sound from the left speaker reaches the right ear, and vice versa. Lexicon's booklet that accompanies the MC-1 explains crosstalk cancellation: "Imagine there is a sound coming from the left channel only. This sound will travel to the left ear of the listener, then diffract around the listener's head and be heard by the right ear. If we take the left-channel sound, delay it just the right amount, invert it in phase and feed it to the right speaker, it will arrive at the right ear just in time to cancel the crosstalk from the left speaker."

Although crosstalk cancellation has been used in other products (where it has been called a variety of trade names), the MC-1's implementation is considerably more sophisticated. The simple technique described above can introduce colorations because the cancellation signal becomes audible. Lexicon uses a multi-order cancellation technique in which the cancellation signal is itself canceled by a second signal, and that signal canceled by a third, and so on. Reducing this "inter-aural crosstalk" by adding cancellation signals can make the sonic presentation appear wider.

These are just a few of the processes, used individually or in combination, by which the MC-1 creates multi-channel surround playback from two-channel sources. Other equally interesting techniques are also employed that space restrictions prevent me from describing.

Listening to Movies

For starters, the MC-1 in straight decoding mode (Dolby Pro Logic, Dolby Digital, and DTS), or those formats with THX processing, was superb sounding. The MC-1 had outstanding dialog clarity and intelligibility, even with the center-channel level perfectly matched to the other channels. With lesser products, I find myself increasing the center-channel level a couple of decibels to make the dialog easier to hear. The MC-1's good resolving power and image solidity seemed to anchor the dialog right on the screen (it helps to have a superlative center-channel speaker like the Revel Voice). This impression of tight center-channel focus and clarity was particularly impressive with matrixed Dolby Surround sources, which often lack the image specificity and clarity of discrete multi-channel sources. The MC-1's Pro Logic decoding made matrixed sources sound more like discrete soundtracks, with greater apparent channel separation, smoother pans, and increased clarity compared with other Pro Logic decoders.

Even without any additional processing, the impression of envelopment from the surround channels was exceptional. The MC-1 seemed to create a spaciousness behind me, along with a smooth transition between the front and rear speakers. More-

over, detail resolution in the surround channels was excellent.

Moving next to Logic 7, Lexicon's process for deriving 7 channels from 2-channel or 5.1-channel sources, I found the effect worked remarkably well on film soundtracks. (Logic 7 enhancements can be combined with some THX processing on discrete 5.1-channel sources such as Dolby Digital and DTS.) The addition of rear speakers driven with Logic 7 produced a more vivid feeling of sound effects moving behind me rather than simply stopping near the listening position. I had a greater impression of the wall behind the listening seat disappearing. This effect was enhanced by Logic 7's other salient attribute, the perception that the soundstage was continuous from front to rear. That is, pans were seamless along the room's side walls, rather than presented as a discrete jump from the front channels to the rear channels. In addition, Logic 7 processing widened the soundstage and created a more expansive feeling. Try the chase scene in *Toy Story* (chapters 28 and 29 on the DTS laserdisc) in which the toy car speeds through traffic; the "real" cars whiz by as pans from front to rear, an effect vastly more effective with Logic 7 than either straight DTS or DTS/THX decoding. In addition to these benefits, seven loudspeakers are, I believe, fundamentally better than five for film-sound reproduction.

An interesting way to judge Logic 7's effectiveness is to compare a full 5.1-channel discrete source with that source downmixed to two channels, then played back with Logic 7. Here's how you do it: Record a section of a film soundtrack on a VHS machine (or cassette deck) using the MC-1's "AC-3 2-Channel" mode. This mode downmixes the discrete 5.1-channel soundtrack into two channels for recording on a two-channel medium. Then play back the two channels with Logic 7 decoding and compare it to the discrete 5.1-channel source. I did this with the scene in *Dragonheart* in which the dragon flies 360 degrees around Dennis Quaid. The sound of its wings beating, accompanied by Sean Connery's voice, moves from speaker to speaker around the room several times, making it an ideal test of Logic 7 decoding.

If someone hadn't heard the discrete version, they'd never think that they were hearing a matrixed format. Logic 7 is that effective in creating the impression of wide channel separation. Indeed, I found it hard to believe I was listening to two channels decoded into seven. The channel separation in the DTS original was better, generating a stronger illusion of movement, but it was a much closer call than I would have thought possible.

Overall, Logic 7 provided an impressive enhancement to film soundtracks. The processing did, however, seem to make the soundtrack less intimate, as though I were sitting farther away from the action. The upside of this impression is that my 14.5 by 21 by 9-foot listening room seemed larger.

I evaluated the MC-1's DAC quality by feeding it a digital signal from a Mark Levinson No.31.5 CD transport, then connected the MC-1's main outputs to an Audio Research Reference One preamp. The No.31.5 also drove a Mark Levinson No.360S digital-to-analog converter, which also fed the ARC preamp. (Power amplifiers were Audio Research Reference 600s.) I could thus switch inputs on the Reference One and compare the No.360S to the MC-1. Granted, a \$5,995 multi-channel processor should be no match for a \$7,995 two-channel DAC, but the comparison put the MC-1's performance into perspective.

The MC-1's sound quality in this evaluation was only fair. The MC-1 overlaid the music with a grainy texture, with a darkening of the upper midrange that resulted in a less palpable rendering. The MC-1's treble was a bit hashy, and the soundstage was somewhat flat and closed-in. These characteristics became apparent when listening critically to two-channel music sources through a reference-quality playback system; when listening to film soundtracks, the MC-1's sonic shortcomings didn't intrude on the experience. I would rank the MC-1's DAC stage as on the level of a \$500 CD player. (That's not bad considering the \$5,995 MC-1 has eight DACs and analog line stages, plus everything else that goes into a sophisticated multi-channel controller.)

The \$6,500 Classé SSP-50 controller provides an interesting contrast with the MC-1. The Classé was significantly better sounding when reproducing music. If the MC-1's DACs were comparable to those in a \$500 CD player, the SSP-50 sounded more like a \$2,000 outboard converter. The Classé benefits from an audiophile-quality signal path and a superb multi-bit DAC stage. That superior two-channel performance is, however, offset by the MC-1's more sophisticated surround processing, 7.1-channel capability, THX processing, vastly better remote and user interface, and proprietary Lexicon film-soundtrack enhancements. But that's the beauty of diverse design goals: You can choose the product that best matches your priorities.

If you are uncompromising on both film and music reproduction, you can still enjoy the MC-1's terrific surround performance without shortchanging High End music playback: run the MC-1's left and right outputs through a two-channel analog preamp on the way to the left and right power amplifiers. (The Krell KPS-25S has a "Theater Throughput" mode just for this purpose. Theater Throughput sets the preamp's gain at a set level so you maintain your individual channel-level calibration when switching back to multi-channel.) Analog source signals that you will listen to in two-channel feed the analog preamp and never go through the MC-1's A/D and D/A stages. Note that adding an analog preamp works only if you have full-range left and right speakers that don't require the MC-1's front-channel crossover.

Listening To Music Surround

My experience with surround-sound modes on A/V receivers has left me contemptuous of the concept. The modes sound gimmicky, often destroy the musicality of the front signals, and their presence is purely marketing driven. That is, the receiver must sport a huge list of surround modes for it to be competitive on the sales floor, whether or not those surround modes are well thought out or even musically appropriate.

But after living with the MC-1 and reading the superb booklet explaining the theory behind the MC-1's surround modes, I've taken a somewhat different view. The MC-1's modes, designed by Dr. David Griesinger, are all based on solid research that relates the physical properties of concert-hall acoustics with our perception of sound. The MC-1's effects are far from marketing gimmicks.

The MC-1 is without question the most sophisticated music processor available today. But do two-channel recordings benefit from this processing, or is a pure, unadulterated signal path more musically engaging? Before tackling that question, I

should mention that my loudspeaker array is less than ideal for assessing Lexicon's surround modes. The side loudspeakers are bi-polar (the Revel Embrace set to bi-pole for music surround, di-pole for films), and the rear speakers were the point-source Mirage Reference Monitors. Lexicon recommends seven timbre-matched loudspeakers in an acoustically absorbent room. Nonetheless, I got a good impression of what each surround mode was doing. (I've also heard these modes in Lexicon's listening room.)

The subtlest of the music processing modes is called Music Surround, which sends the left and right signals to the left and right loudspeakers unaltered. The MC-1 in this mode creates a low-level center-channel signal, along with side and rear signals (with seven-channel playback). The side and rear speakers receive ambient information extracted from the recording. Delay and steering are used on the side and rear channels. Music Surround produces a gentle expansion of the soundstage that takes the presentation out of the front speakers. In Music Surround, I was never consciously aware of sound arriving from the sides or rear. Instead, my listening room walls seemed to disappear aurally, replaced by a larger acoustic. Switching back to two-channel mode caused the soundstage to collapse into the front loudspeakers. About 30 percent of the music I tried in Music Surround benefited from the processing.

Smaller, more intimate music was best reproduced without any processing. The classic Bill Evans recording *Sunday at the Village Vanguard* (a superb transfer on JVC XRCD) was more immediate and direct in two-channel mode, even though the "Nightclub" surround mode created an amazingly realistic impression of a club acoustic. In surround, I felt a sonic and emotional distance from Evans' introspective expression.

One of the most spectacular examples of two-channel playback conveying a sense of the recorded acoustic is Keith Johnson's stunning recording of Rutter's *Requiem* on the Reference Recordings label. When played back with HDCD decoding on a superlative two-channel system, *Requiem* is transcendent. Could this maximally optimized recording be improved upon with surround processing?

Requiem didn't benefit from any of the MC-1's processing, in my view. The processing did expand the acoustic, but at the expense of reduced image specificity. Just for fun, I ran *Requiem* through the decidedly unsubtle Cathedral ambiance-generation mode. Although this was a gross distortion of the recording, the feeling of being transported to a large acoustic was stunning. Twenty minutes in the listening chair with the lights off and I was awestruck at how convincing the illusion was.

I also evaluated the ambiance-generation modes by playing the *Denon Anechoic Orchestral Music Recording CD* [Denon PG-6006], an orchestral recording made in an anechoic chamber (a reflection-free room). This recording doesn't just seem dry; the sound is totally distorted in a way we never hear in real life. The complete absence of reverberation allowed me to add effects with the MC-1 and hear exactly the effect's contribution to this unique recording. The MC-1's reverberation generation was exceptionally clean and smooth, producing an almost convincing impression the recording was made in a real hall.


Overall, the MC-1's music surround modes were more successful on some types of music than on others. Most of the time I preferred two-channel reproduction. Nonetheless, I found some music discs more involving and engaging in sur-

round sound. That's a big step for a confirmed two-channel purist – and a testament to the careful thought that went into the MC-1's music-surround processing.

Conclusion

The Lexicon MC-1's unparalleled array of sophisticated signal-processing modes represent the state-of-the-art in consumer multi-channel controllers. For those who listen primarily to film soundtracks or surround-sound music, the MC-1 provides exceptional surround performance, unique signal processing, and a terrific remote and user interface. The thought that went into the music surround modes and the effectiveness of Logic 7 were particularly impressive.

If you're a two-channel music purist looking for a home-theater controller, the MC-1 may not be for you. The lack of a two-channel bypass mode that circumvents the MC-1's A/D and D/A converters limits the musical performance possible from your system. It does little good to own a High End digital processor or turntable if its analog output is digitized by the MC-1. This shortcoming was exacerbated by the only fair sound quality of the MC-1's D/A stage.

If you want the ultimate performance from both film and music sources, you can always add an analog preamplifier. It's a bit of a hassle and adds to the system cost, but the MC-1's outstanding film-soundtrack and multi-channel music performance make it worth the effort. 

Manufacturer Information

LEXICON, INC.

3 Oak Park

Bedford, Massachusetts 01730-1441

Phone: (781) 280-0300; fax: (781) 280-0490

Web: www.lexicon.com

Source: Manufacturer loan

Price: \$5,995

Associated Equipment

See text.

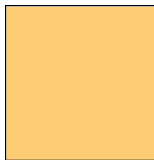
Manufacturer's Response

We would like to thank *The Perfect Vision* and Robert Harley for the comprehensive review of the MC-1. One of our primary goals in the MC-1 and DC-2 was to improve upon the earlier DC-1's audio performance. We procured samples of the latest Digital to Analog and Analog to Digital converters from our vendors and began a series of objective and subjective tests. During this process we came across a prototype DAC from AKM. The performance of the AKM exceeded that of every other DAC we tested, and handily exceeded the performance of the DC-1's DACs, which Mr. Harley noted in his review.

We used several analog and digital sources to compare the ADC/DACs to ensure that even the purists would be satisfied with the results. It was no contest. The AKM converters easily won the subjective listening tests with comments like: "completely neutral," "dead quiet," and "extremely dynamic."

We stand by our decision and feel that the MC-1 and DC-2 shatter the myth that digital audio products are "grainy" compared to analog designs. The performance of digital audio products has reached the point where the ceiling is now being dictated by the limitations of analog.

THE CONSUMER PRODUCTTEAM
LEXICON, INC.



Controllers



No product better exemplifies the fundamental shift in home-entertainment technology than the controller. Also known as a surround-sound processor or audio-video preamplifier, the controller is an entirely new product category that combines many diverse functions in a single chassis. To understand what a controller is and does is to understand the technologies that are transforming the way we reproduce sound in our homes.

A modern controller replaces as many as four separate components in your music and home-theater system: the source-switching functions of a preamplifier, a surround-sound decoder, six (or eight) channels of digital-to-analog conversion, and an electronic crossover to split up the frequency spectrum. Moreover, the rapidly increasing computer horsepower in today's controllers points to a future in which they will incorporate even more functions and capabilities, such as digital signal processing for loudspeaker and room correction. While power amplifiers and loudspeakers change relatively little over time, the controller represents a radical new path to the future.

Despite the power and sophistication of some of today's controllers, they are remarkably inexpensive and relatively easy to use. While none of us would call a \$5,000 audio product cheap, the price of a High End controller is reasonable considering all the functions it performs. In addition, it seamlessly merges a diverse array of sophisticated processing and controls to provide nearly transparent inter-operability to the user. Still, designers need to focus on improving the user interface so that anyone can operate even the most sophisticated system.

As controllers replace two-channel analog preamplifiers, many of us music purists are concerned that two-channel music reproduction may be compromised in the rush to add features. Some controllers are designed with an emphasis on multi-channel film-soundtrack reproduction, with little regard for the two-channel

musical experience. Other controllers can be considered true High End preamplifiers that also offer surround-sound decoding and video switching. This diversity of products on the market lets you choose a controller that parallels your priorities. The movie buff will have very different requirements from the music listener who wants a little surround sound when he occasionally watches a movie.



Inputs, Outputs, and Source Switching

Let's start with the controller's most basic function, selecting the source you listen to or watch. The controller accepts audio or A/V (audio and video) signals from all your source components and lets you select which source signal is sent to the power amplifiers and video monitor. A basic controller will offer two analog-audio inputs

(for a tuner and CD player, for example) and perhaps four audio-video (A/V) inputs. In addition to the main outputs that drive your TV and power amplifiers, two record outputs are often provided to drive two VCRs or a VCR and an analog tape recorder.

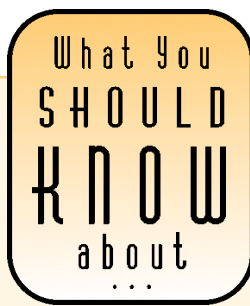
When choosing a controller, make sure its array of inputs matches or exceeds the number of source components in your system. Your system is likely to expand in the future, so look for a controller with at least two more inputs than you need right now.

A modern controller replaces as many as four components in your music and home-theater system: the source-switching functions of a preamplifier, a surround-sound decoder, six (or eight) channels of digital-to-analog conversion, and an electronic crossover to split up the frequency spectrum.

All controllers have inputs for digital audio signals as well as for analog. These inputs receive the digital-audio output of a DVD player, laserdisc machine, DSS receiver, or CD transport. The signals carried on these digital connections include Dolby Digital, DTS, Dolby Surround, and two-channel PCM (Pulse Code Modulation) signals, such as from a CD transport.

If you're an old hand at home theater, you probably own a laserdisc player with Dolby Digital output. Further, you know that to get Dolby Digital (once called AC-3) onto a laserdisc, the sig-

ROBERT HARLEY



nal had to be encoded as a radio frequency (RF). If you don't want to immediately replace your cherished laserdisc collection with DVDs, you'll probably need a controller that can decode those RF-encoded Dolby Digital discs. If your controller doesn't have an RF digital input (typically labeled "AC-3 RF"), you'll need an external RF demodulator box. This device converts RF Dolby Digital to bitstream Dolby Digital, which can then be fed to one of the controller's standard digital inputs.

Don't forget the controller's responsibility for handling the video signal. Look for S-Video input jacks on all A/V inputs and outputs. Most controllers offer both composite video (on RCA connectors) and S-Video jacks. Controllers can degrade video quality and some have better quality video processing than others.

Two-Channel Bypass Mode

For the music lover shopping for a controller that will also serve as a two-channel preamplifier for his system, one of the most significant considerations is its performance with two-channel analog sources (especially if you have an extensive vinyl collection). In that case, you'll want a controller that has analog bypass. Without a bypass mode, the analog signal will be converted to digital and back as it passes through the controller. Digital conversion is far from transparent, so the sound will suffer.

There are two catches to look out for regarding the bypass mode. First, the controller must have an analog volume control such as that used in the Proceed AVP. Most modern controllers adjust the volume digitally in their DSP chips (which don't sound as good as an old-fashioned potentiometer). Second, whenever you engage bass management, even a controller with a bypass mode will convert the analog signal to digital because bass management is performed by the DSP chips. If you have a subwoofer with satellite speakers and use the controller's crossover to divide the frequency spectrum, the bypass mode won't remove the A/D and D/A conversions from the signal path. This is a serious limitation for music lovers who demand the ultimate in sound quality.

Surround Decoding and Digital Signal Processing (DSP)

The availability of powerful Digital Signal Processing (DSP) chips has revolutionized controllers in the past few years. DSP chips are the heart and brain of the controller, performing surround-sound decoding, signal processing (equalization, crossovers), and THX post-processing (if the controller is THX certified). Today's advanced controllers boast the computing power of a late 1980s mainframe computer.

The first job of the DSP chip is decoding; that is, converting a stream of digital data into separate digital signals that can be converted to analog audio. Virtually all controllers today decode the three major surround-sound formats: Dolby Digital, Digital Theater Systems (DTS), and Dolby Surround. Dolby Digital is by far the most common format on DVD and laserdisc, and has been chosen as the

surround-sound format for HDTV.

Even inexpensive A/V receivers sport DSP chips, although they have vastly less computing power than those in High End controllers. Consequently, High End controllers offer better implementations of surround-sound decoding, more flexible features, and higher sound quality (more powerful DSP chips allow greater precision in the mathematical computations performed on the audio signal).

A DSP chip is a number cruncher that operates on specific instructions (the software) controlling it. When decoding a Dolby Digital source, for example, the software tells the DSP how to decode Dolby Digital. When decoding DTS, the same DSP operates under the instructions for decoding the DTS bitstream. A DSP chip is only as good as the software it is running. That's why some High End companies write all their own software in-house rather than rely on stock software that performs a given task. As DSP chips grow increasingly more powerful and less expensive, controller capabilities increase proportionately.

Beyond decoding digital data signals, DSP chips are used to perform advanced signal processing that creates the artificial acoustic environments such as "stadium" or "concert hall." Those artificial environments are the parlor tricks of DSP. Much more importantly, DSP can be used to perform equalization and room correction. That is, DSP at the highest level can be used to alter the signal so that it compensates for the intrinsic sound of your room, smoothing out the room's resonant characteristics and allowing you to better hear the music and the sound of the recording venue.

On a practical level, DSP makes it possible to execute the crossover for the subwoofer in the digital domain. Someday, DSP chips may be the standard method for providing crossovers in speakers.

If the trend toward more powerful, less expensive DSP continues – and it will – controllers will incorporate more and more sophisticated signal processing. Digital crossovers for the subwoofer will become more flexible (see, for example, the Theta Casanova crossover options). Surround decoding will be executed with greater precision. The potential for DSP in audio is only now starting to be realized. Much more is yet to come.

DSP and the Future-Proof Controller

Because of this software control, some controllers can be updated simply by downloading new software into the machine. As new technologies arrive, or refinements in existing systems are discovered, you simply install new instructions for the DSP chips. Such "software-based" controllers can be thought of as general-purpose DSP devices that happen to be running the software for Dolby Digital, DTS, and Dolby Surround decoding.

The Proceed AVP is a good example of a software-updatable controller. The unit has an RJ-11 port (a telephone jack) on the rear panel that connects to a computer's RS-232 port. A Proceed dealer can download the latest software from the Internet, connect his computer to your AVP (either in your home or his shop), and update the AVP's flash memory. The

process takes about eight minutes, can be performed with the AVP installed in your system, and doesn't erase your set-up and configuration settings.

New software can add capabilities such as DTS or MPEG decoding (by changing the DSP code), refine the user interface (by updating the operating system), or configure the unit to accept formats not available when the product was designed (by changing the input-receiver software). The AVP's Proceed input receiver (the chip that receives, identifies, and decodes the incoming bitstream) is custom made, which allows the AVP to work with future formats whose interface protocols have not yet been established. Updating software in this way reduces the likelihood of needing expensive hardware changes.

Another method of heading off controller obsoles-



cence is "modular" construction. A modular controller is built like a PC, with a motherboard and smaller circuitboards that fit into slots on the motherboard. If a new technology comes along or better digital-to-analog converters become available, as examples, you simply swap out a circuitboard to bring your controller up to date. Some controllers combine the ability to update software with modular construction for the ultimate in upgrade flexibility.

Bass Management

An important controller function performed by the DSP chips is *bass management*, the subsystem that lets you selectively direct bass information in the soundtrack to the main loudspeakers or to the subwoofer. Bass management allows a controller to work correctly with a wide variety of

THX-Certified Controllers

Some controllers are "THX Certified," meaning they incorporate Lucasfilm signal processing – a technology that Lucasfilm believes better translates film soundtracks created for theater playback into the home. THX-certified controllers must also meet a set of technical performance criteria established by Lucasfilm. If the product correctly implements the THX technologies and meets the performance criteria, the unit can be branded "THX Certified." The manufacturer then pays a license fee to Lucasfilm on every unit sold.

The goal of Home THX is to re-create as closely as possible in a home-theater system the sound that the mixing engineers heard on the film-dubbing stage. THX-certified controllers employ four processes that Lucasfilm has found to improve the home-theater experience: surround decorrelation, timbre matching, re-equalization, and the subwoofer crossover. Let's look at each of these.

Surround decorrelation makes the monaural surround signal slightly different in the left and right surround channels by varying the time and/or phase of those signals. This technique prevents the "in the head" localization of surround signals, and "smears" the surround signal so that we feel a greater sense of envelopment in the film soundtrack. With the advent of 5.1-channel formats with separate left and right surround channels, THX surround decorrelation has taken a new twist, called "adaptive de-correlation." Adaptive de-correlation turns off the de-correlation circuit when the two surround channels carry different information, but smoothly turns it on when the surround channels are identical. Most 5.1 soundtracks still have mono surrounds most of the time, so this is a useful feature. (See the side-

bar to the Denon AVR-5700 review in Issue 25 for more on surround decorrelation.)

Timbre matching makes it possible for sounds arriving from the sides to have the same perceived timbre as sounds arriving from the front. This makes pans (movements of sounds) from front to rear more realistic, because the perceived timbre doesn't change with movement.

You can easily demonstrate for yourself how perceived timbre changes with direction: Snap your fingers in front of your face, and again to the side of your head. The sound is "sharper" to the side. THX timbre matching compensates for this difference with signal processing in the controller.

Re-equalization is a treble cut applied on playback to make soundtracks mixed for movie theaters sound natural when played in the home. Mixers intentionally make soundtracks bright for several reasons. Theaters are usually full of absorbent seats, drapes, and people, all of which roll off high frequencies to a greater degree than midrange and bass frequencies. In addition, the long distance between the audience and loudspeakers tends to selectively attenuate treble. Consequently, the soundtrack has a natural tonal balance in the theater, but excessive brightness on a home-theater system. The answer is to equalize the soundtrack during playback so it sounds correct in the home.

But how much treble cut is correct? And what should the equalization curve look like? To find out the correct THX re-equalization curve, THX's inventor, Tomlinson Holman (THX stands for Tom Holman's eXperiment), asked a series of top-level film-sound mixers to listen to their films on a home-theater system. The mixer had an equalizer in front of him, and was asked to adjust the equalizer until the

soundtrack sounded "right" on the home-theater system. Holman averaged the equalization curves created by the mixing engineers (which were remarkably close) to generate the patented THX re-equalization curve.

To save money, some budget controllers license only the re-equalization part of THX processing, not the entire signal-processing suite. Other controllers not licensed by Lucasfilm may employ a selectable treble cut, often carrying a name such as "Cinema EQ."

Finally, the THX *subwoofer crossover* standardizes the crossover characteristics (cut-off frequency and slopes) that split the frequency spectrum into bass for the subwoofer and midrange/treble frequencies for the main speakers. The THX crossover frequency is 80 Hz, with fourth-order low-pass and second-order high-pass slopes. The subwoofer-out jack on a THX-certified controller thus carries a precisely defined signal. When decoding 5.1-channel Dolby Digital or DTS (so-called THX 5.1 mode), the subwoofer output carries the Low Frequency Effects (LFE) channel, plus the bass from any number of the other five channels. When decoding Dolby Surround, the THX subwoofer output is a mix of the front three channels' bass below 80 Hz, assuming that the front speakers are small satellite types.

You may have recently seen the designations "THX Select" and THX Ultra" replace plain old THX. THX Select products have relaxed performance standards, and are designed to allow products suitable for smaller rooms to benefit from THX processing. The more rigorous Ultra performance level corresponds to what used to be simply called "THX" and is built on the assumption that the room involved may be 3,000 cubic feet or larger. **RH**

What You
SHOULD
KNOW
about

speaker systems. For example, if you have five small loudspeakers and a subwoofer, you tell the controller to filter bass from each of the five channels, and to direct it, in sum, to the subwoofer. When watching a Dolby Digital or DTS movie, the bass from the LCR and surround channels is mixed with the Low Frequency Effects channel to drive the subwoofer. The bass management in most controllers lets you direct the full frequency range to the left and right channels (including the LFE channel), but filter bass from the center and surround channels.

A feature in the most advanced controllers is the ability to specify the crossover frequency and slopes between the subwoofer and main speakers. The crossover is implemented in the digital domain with DSP. Splitting the frequency spectrum into bass and treble in the controller is a vastly better approach than subjecting the analog audio signal to the capacitors, resistors, and inductors found in the crossovers built into subwoofers. Other controllers let you specify the crossover frequency (40 Hz, 80 Hz, 120 Hz, for example), but not the slope or phase characteristics. The greater the flexibility in this function, the greater the likelihood that you can achieve the best results with your speakers and room.

**...the controller represents
a radical new path to
the future...**

Keeping low bass out of smaller loudspeakers confers large advantages in the speaker's power handling, dynamic range, midrange clarity, and sense of ease. When the woofer doesn't have to move back and forth a long distance trying to reproduce low bass, the midrange sounds cleaner and the speaker can reproduce louder peaks without distortion.

High-Resolution Digital Audio Decoding

Many controllers today feature the ability to accept digital input signals with a sampling frequency of 96 kHz and word lengths of up to 24 bits. This allows them to decode high-resolution digital audio output from a DVD player that can deliver 24/96 digital signals (the Pioneer DV-09 is an example). The selection of 24/96 discs is slim, and until a digital interface with a copy-protection system is in place, don't expect many DVD players to provide access to the 24/96 bitstream.

A more useful feature for taking advantage of the high-resolution multi-channel formats about to come on the market (DVD-Audio and Super Audio CD – SACD) is a six-channel *analog* input on the controller. Until the digital-interface issue is resolved (which may take a long time because it is inextricably linked to the

What You SHOULD KNOW about

copy-protection problem), DVD-Audio and SACD players will have six analog outputs for reproducing multi-channel music discs. Unless your controller has a discrete six-channel analog input, you won't be able to play high-resolution multi-channel music through your system until the copy-protection dust has settled. The six-channel analog input approach has its drawbacks: You're paying for six DACs in the DVD-A or SACD player and for six DACs in the controller. It would obviously be better and more cost effective if multi-channel DVD-A or SACD was provided to the controller in a single digital data stream. Until then, the most important thing to look for is that the analog bypass is available for the DVD-A and SACD signals. Adding extra layers of conversion will only degrade the sound. The issue becomes more complicated when you add bass management to the mix, since bass management is done in the digital domain.

After DSP - Digital to Analog Conversion

Every 5.1-channel controller has six digital-to-analog converters (DACs) and six analog output stages built into it. The DACs convert the digital data for each channel into analog signals. The quality of these DACs and the subsequent analog output stage (which drives the power amplifier through interconnects) is crucial to realizing good sound quality. DACs vary greatly in their sound, and a poor-sounding DAC (or a poor implementation of a good one) can ruin an otherwise excellent controller. More expensive controllers use higher quality parts and design techniques, including metal-film resistors, polystyrene capacitors, four-layer circuitboards, and exotic circuit board material. Also look for analog stages made from discrete transistors instead of inexpensive operational-amplifier chips. Some High End companies now have considerable expertise in designing cutting-edge digital converters, expertise they can apply to building multi-channel digital controllers.

Don't be swayed by marketing hype that touts the DACs as "24-bit." Although the DAC may have 24 resistor "rungs" on its "ladder," that doesn't mean it has 24-bit resolution. The last four bits often contain just noise, not real information. Because real-world DAC technology is limited to 20-bits, those last four bits are known in the industry as "marketing bits."


The best minds working today in digital conversion cite

the historical "two bits per decade" rule of converter advancement. Assuming this rate continues, consider this: 24-bit digital audio has a theoretical noise floor of -144 dBV, but the thermal noise produced by a single 1,000 ohm resistor (generated by random movement of electrons) at room temperature is -125 dBV, a noise floor 19 dB higher than a 24-bit converter's theoretical limit. I doubt that converter technology will advance beyond 21 bits without a fundamental breakthrough employing new DAC architectures.

(Inter)Facing the User

Most of this article has been concerned with the path of a signal from input to output and the wide variety of turns between. But how the user operates a controller with all these features is just as important as the raw technology that makes the magic. A controller can be easy to set up initially and a joy to use on a daily basis. Or it can be a confusing nightmare that makes you feel lucky to get any sound at all from your speakers - never mind fine-tuning the controller for the best performance. Which of these scenarios comes to pass is determined by the controller's user interface, a term that encompasses the front-panel controls and display, the remote control, and the on-screen display. Some products are easy and intuitive to use; others are frustrating and complex.

Before buying a controller, ask the salesman to run through the system set-up; if he has a hard time, watch out. Second, play with the unit yourself in the store; you'll not only get a feel for how it works, you can ask questions before you take the controller home. Third, take a close look at the remote; if it is covered by a sea of identically sized, shaped, and colored buttons, it doesn't bode well for the rest of the user interface. The buttons should be color coded, grouped by function, and feature different sizes according to their frequency of use or function. And it's all to the better if they light up in the dark.

Do not underestimate the importance of a well-designed user interface. It could make the difference between loving and hating the component that is the heart and brain of your multi-channel system. 

For more information about controllers and other home theater topics, check out Robert Harley's book Home Theater for Everyone. For information, or to order a copy, call 800-848-5099. Website: www.hifibooks.com

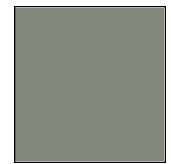
Component-Video Switching

One feature lacking on even some High End controllers is component video input and output jacks. Component video, carried on three separate cables, offers vastly improved picture quality over composite video, and is even better than S-Video. As more and more products with composite-video connections become available (DVD players, HDTV set-top boxes, video monitors), component-video switching becomes an increasingly important feature. Most con-

trollers with component-video switching, however, have no on-screen display from the component-video output.

If you have a single component-video source (a DVD player, for example) and a video monitor with component-video input, you can simply run the component-video cables directly from the DVD player to your video monitor, bypassing the controller's video-switching function. This technique requires that you switch inputs on your video monitor to watch a DVD.

Even if your controller has component-video switching, however, none available today offer cross-format conversion (i.e., S-Video input to component-video output), meaning you still must switch inputs on your video monitor when watching a component-video source. Although component-video switching will become increasingly common, multiple RCA jacks take up valuable rear-panel real estate. Some products just don't have the room. **RH**



Revel Ultima Speakers – From 2 to 7.1 Channels Episode One: The Ancient Enemy

It is a conflict as old as good vs. evil. It is the war that came before wars between peoples. It is the battle between humankind and its environment and it is being fought to this day in your house.

While not so noble as a life and death struggle between a Jack London hero and the elements, your battle to extract good sound from the room in which you listen to music and watch movies is as challenging. Your victory is not to be measured by survival, but satisfaction. And when the tools of war cost many thousands of dollars, satisfaction *is* survival.

Know thine enemy: *The Room*. Do not think of it as a helpful collaborator or even an innocent bystander. It, more than anything else, will determine the overall quality of sound you extract from your system. A bad room will put a foot on the throat of your speakers, choking off their musical life.

From hard experience I have learned these lessons. I built a room – from scratch. And I vowed it would be a great room, unlike any other. In my *hubris*, I thought this was truly possible and that I would do it. Now my comfort comes from knowing that humility brings education and, with education, satisfaction is, indeed, possible.

This article and the ones that follow trace my experiences installing the Revel Ultima speakers and Proceed electronics multi-channel system into this enemy mine. We begin here with the Revel Salon loudspeaker and the Revel Sub-15/LE-1 subwoofer system. Future episodes will include the Revel Voice, Embrace, and Gem models. Other players in this first episode include the RPG Room Optimizer software and, briefly, the Cambridge Signal Technologies T1100 Room Correction System. Each of these companies has faced the enemy with their products, offering hope that victory can be had.

Meet My Enemy

Now that you have a blank sheet of paper, what's next? Choosing the dimensions. Start

with the realization that no set of dimensions is perfect. The perfect room does not exist. Revisit Robert Greene's "What You Should Know About Bass" in Issue 24. Every room has modes that arise from its dimensions. The most obvious – and the most significant – are the axial modes. These are the fundamental acoustic resonant modes (and their harmonics) that are created between two opposing surfaces, such as front wall and back wall, side to side and floor to ceiling. In addition to axial modes there are tangential and oblique modes. Tangential modes arise from four surfaces (e.g., the side, front, and back walls) and oblique modes arise



The Revel Ultima Salon loudspeaker and Sub-15/LE-1 subwoofer system face an implacable enemy of sound, with some help from the RPG Room Optimizer software and, at the last moment, the SigTech T1100 Room Correction System.

from all six surfaces. Your room's modes will create audible gaps within (nulls) and boosting of (nodes) the sound at different frequencies, destroying the tonal uniformity that is necessary for uncolored music reproduction. The best you can hope for is to avoid modes piling up on top of one another, since that will greatly exacerbate the non-uniformity of the sound.

Programs now exist into which you can input the dimensions of your room and calculate the room's modal characteristics. A "simple" Excel spreadsheet, properly configured, will do the trick. It's nothing more than math. But don't let that deceive you into thinking it's simple. Such programs assume accurate dimensions that form a uniform lossless rectangle – that is a perfectly rigid room. But building a rigid, uniform room doesn't solve your problems; it only helps make them more predictable. There is even some thought that a rigid room isn't preferable because it actually intensifies the low-frequency modes because none of the bass can be attenuated by leakage through walls that flex.

TOM MILLER

Now that your head is swimming, choose your dimensions. The actual dimensions you select based on a ratio such as those listed below will determine the exact frequencies at which the modes will develop. Jim Thiel, the engineering brain behind Thiel speakers, calculated the following set of ratios:

2.5 by 1.6 by 1 *2.18 by 1.6 by 1*
1.39 by 1.14 by 1 *1.54 by 1.14 by 1*
2.33 by 1.6 by 1 *1.9 by 1.4 by 1*
1.9 by 1.3 by 1 *2.1 by 1.6 by 1*
2.5 by 1.5 by 1 *1.59 by 1.26 by 1*

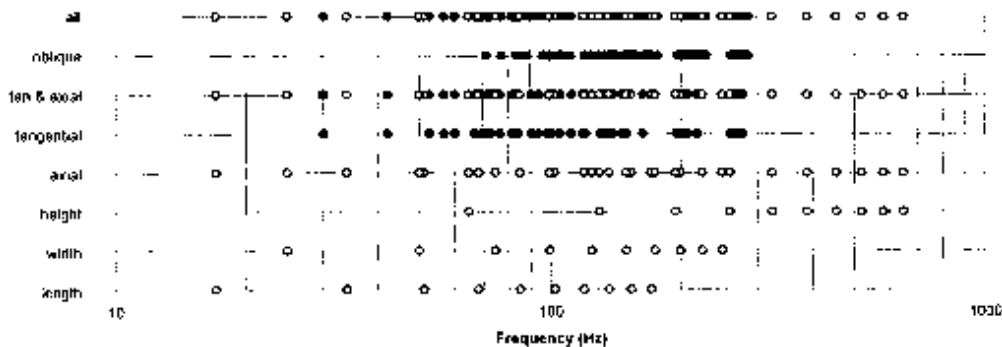
I chose to build a room that measured 33'3" long by 22'9" wide by 8'9" high. That's *3.8 by 2.6 by 1*. At the time, I thought it was permissible to double any of the numbers (it isn't). I

place the speakers. Perhaps the best known is the Rule of Thirds (put the speakers at the one-third points away from the side walls and back wall). The Rule of Thirds is derived from a superficial understanding of modal room characteristics. This approach, which seems to work with dipole loudspeakers, is less than optimal for dynamic coil designs.

There is no predictable location that works optimally for all speakers and all rooms; the variables are too numerous. Indeed, finding the absolute best location for a certain speaker in a certain room is extraordinarily difficult (unlikely, but not impossible). Now, though, there is a useful tool to credibly attack the location issue: Room Optimizer software (\$99 a copy) from RPG Diffuser Systems, Inc. You quickly learn, when using Room Optimizer, that what is optimal depends on where you sit, on the geometry of the speakers, and their location. Fortunately, Room Optimizer will consider all those variables for you.

Diagram 1: Room Mode Calculator
by Allan Devantier

dimensions	length	width	height	Cubic Volume	
meters	10.13	6.93	2.67	Cubic	Cubic
feet	33	22	8	meters	feet
inches	3	5	9	187.41	6618.44



doubled two of them in the *1.9 by 1.3 by 1* ratio. Plug these numbers into our Excel spreadsheet and the resulting plot of modes looks something like Diagram 1.

Despite my mistake, the room ended up with a good spread of modes (save for a pile-up at 50 Hz). Being somewhat skewed myself, I chose not to build a perfectly rectangular room (see Diagram 3, page 46) although I built it fairly rigidly with studs that were on 12-inch centers and two layers of dry-wall (the floor is concrete). I wanted an equipment room I could walk into to change components and cables, and I wanted an opening from that room into the media room. I also decided not to wall off the entrance to my office at the end of the media room, leaving a floor-to-ceiling opening. Finally, I have always suspected that rooms with bay windows or similar broken angles behind the speakers sound better. So I framed in three-foot facets where the side walls meet the front wall. If I ever get the chance to do it again, I would do it a little differently – but that's another story.

Deploying the Troops – RPG Room Optimizer Software

Nothing is more important to good sound than where you choose to place your speakers. Over the years there have been numerous attempts at simple empirical formulae to help you

Room Optimizer, in simple terms, does the math for you. It combines a modal analysis with a Speaker Boundary Interference Response (SBIR) analysis based on the legendary work of Roy Allison. It is the combination of these two approaches that makes Room Optimizer unique and useful. Balancing the modal and SBIR analysis, Room Optimizer searches out locations within your room for your speakers and your listening location that will meet a certain threshold frequency uniformity. See Diagram Two for a graphic representation of a solution that Room Optimizer found for the Salons in my room.

I will eschew a detailed technical explanation of how Room Optimizer works and concentrate more on how well it works and its limitations. Know this about it: It will “do the math” on many thousands of locations, relentlessly honing in on the optimal location within parameters set by the user. Room Optimizer randomly selects a starting spot within user-defined boundaries. This random starting point influences Room Optimizer's search for the optimal location. Once it has a starting spot, it works around that location gradually refining the search. Different starting locations lead to different final solutions. For this reason, it can and usually does come up with different solutions when fed identical parameters. Thus, it is worthwhile to spend some time at the computer,

letting Room Optimizer search out different solutions (just hit "start" and go get a beer, or two).

Room Optimizer is concerned only with the low-frequency characteristics of your room. Its search is based upon the frequencies from 20 Hz to 300 Hz. It is possible to set the high and low points within that 20-300 Hz range. Thus, you may seek an optimal location for a full-range speaker or a main speaker that will be crossed over to a subwoofer. Similarly, you can set the upper limit so that search is concerned only with the frequencies that will be covered by a subwoofer (e.g., 20-80 Hz). It is not possible to set the upper limit below 80 Hz, if, for example, you wanted to cross over your subwoofer at 40 Hz (the crossover point I prefer when using full range main speakers).

Another limitation of Room Optimizer is that it assumes a fairly rigid symmetrical room. Its formula includes an absorption coefficient for the surfaces that is comparable to the amount of flex in the walls of my room. According to RPG's president Peter D'Antonio, at low frequencies most rooms are essentially rectangular, so the assumption of a rectangular room might not be as limiting as it first seems. If you don't take Room Optimizer's results as gospel – how can you when the same problem usually yields different results? – it can be remarkably useful in finding a good (and close) starting spot for placing full-range speakers.

I used Room Optimizer to find initial locations for the Thiel MCS-1, Thiel CS 7.2, and Revel Salon loudspeakers in two-channel configurations. In each instance, Room Optimizer got me within several inches on each axis of an excellent location. From the suggested location, I used a variety of program material as I moved the speakers to and fro, listening to the extension and smoothness of the bass as well as its blend with higher frequencies. As I will discuss later in this series,

matching the performance of the two channels as closely as possible is instrumental in attaining outstanding soundstaging performance. Thus, symmetrical location within the room is highly desirable. Room Optimizer automatically sets the speakers up in symmetrical locations.

When Room Optimizer generates a solution, it also identifies suggested locations on your walls and ceiling for diffusive and absorptive materials. These are materials that RPG will be more than happy to sell you, and the suggested locations are rational and not just a clever cross-promotion for RPG products.

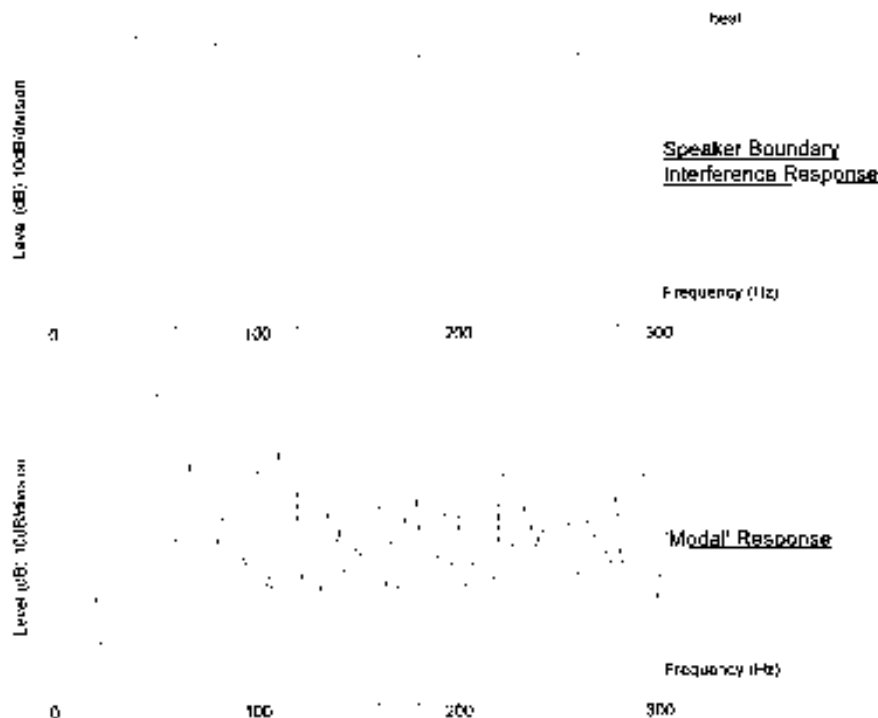
Here we set Room Optimizer aside, but do not leave it behind. It will return in our discussions of subwoofer set-up and, more importantly, surround speaker set-up. Beware: You cannot use the software as a means of totally avoiding empirical experimentation in your speaker set-up. But if used to substantially narrow your empirical search, Room Optimizer is remarkably useful.

Revel Ultima Salon – Noble Warrior

At first blush, it isn't apparent why any loudspeaker could be thought of as a warrior in the battle against The Room. Rather, it may seem more like a casualty of war. And yet the \$14,200 Revel Ultima Salon is not only equipped to do battle, it is well suited to the task.

The Salon is, in every sense of the word, a full-range loudspeaker. It can plumb the lower depths (way below 30 Hz) with ease and reach dizzying heights of amplitude without strain. Revel rates the Salon's "in room response" (their measurement) as plus or minus 1 dB from 25 Hz to 18 kHz. I realize that response seems limited in the treble, but it is well

Diagram 2: Room Optimizer Frequency Responses



established now that dead flat 20 kHz treble response in your room is an unpleasant experience. I'm not sure if that's because 20 kHz flat is just too much treble or too much distorted treble. I find that treble distortions are the

most pernicious throughout the entire chain from recordings to speakers. The Salon's treble seems well balanced as a part of the musical whole. I do, though, hear slight treble limitations within the highest harmonic structures of instruments.

But I wouldn't want more treble extension if it meant that I had to sacrifice even one other positive characteristic of the Salon. The Salon seems almost uniquely well crafted to reproduce musical timbres. It has the best balance of tonality and character of any speaker I have ever used. In this regard, it is our noble warrior against the ancient enemy.

The Salon is a four-way design with crossover points at 125 Hz, 450 Hz, and 2.2 kHz. All crossovers are fourth order Linkwitz-Riley. Three 8-inch mica/carbon-filled polymer dome woofers handle the range below 125 Hz. These woofers are said to extend the Salon's bass response to a minus 10dB point at 17 Hz. The midbass driver, which actually handles the upper bass through lower midrange, is a 6.5-inch driver of the same composition as the woofers. The midrange driver is a 4-inch titanium dome. The Salon has two tweeters. One, which is more robustly built of an aluminum alloy, fires forward while the other fires back, to provide ambient fill in the higher frequencies. Except for the tweeters, the Salon drivers are designed and made within the Harman International house (likewise for the 15-inch woofer in the Sub-15).

The design brief for the drivers included the ability to handle high peak amplitudes without compression. This was necessary to achieve the Revel design team's (led by Kevin Voecks) objectives, since they wanted a speaker that would not change tonal character on dynamic peaks.

Nearly every aspect of the Salon's design and performance can be related to Revel's primary objective - to produce a speaker as timbrally accurate in the listening room as it is in the lab. To that end, Revel embarked on an extensive research effort to quantify in-room speaker behavior and incorporate its findings in its speaker designs. The typical listening room undermines many speaker designs, which boast nonpareil frequency response when measured anechoically. Typically, the upper bass and lower midrange are suppressed, exaggerating the upper midrange and lower treble content. To combat this, Revel developed a model of what a typical listening room does to a loudspeaker's frequency response.

It is ironic how so many of the virtues we prize in sound - midrange openness, soundstage depth, and detail resolution - are exaggerated by the colorations created by the room-loudspeaker interface. Many might regard these characteristics as indicators of "transparency," since they artificially open up the soundstage and highlight the transient details of images.

In this context, the Salon can come as a bit of a shock. It sounds fuller than many other loudspeakers. Further, its sound is more up front spatially (not timbrally) and it doesn't seem, at first listen, to resolve as much information. It doesn't take long, though, to realize that the Salon is telling a higher truth. In contrast with most other speakers, it is capable of rendering timbres that are more fully saturated. That is, instrumental timbres sound more authoritative and more complex. There is a legitimate weight to the sound of instruments through the Salon that is natural sounding and intoxicating.

Consider, for example, the ride cymbal front and center at the start of the *Conspiracy Theory* soundtrack [TVT 8130-2]. Through the Salons, it is possible to hear the sustained fundamental in the instrument's metal while the sizzle rides cleanly in the overtones. There is richness here that is often missing, and yet the textural aspect of the instrument's timbre is not lost (as it would be with another rich sounding type of component - the single-ended triode amplifier). I suspect that the Revel's ability to project power into the room in the lower midrange through upper bass is directly related to its wonderful way with timbres. Don't forget that this is the region where most fundamentals reside. Reduce the strength of the fundamentals and lower harmonics in a note and the result will be washed out timbre.

There are a number of loudspeakers based on the legacy of Allison's work in room acoustics that reproduce timbre much like the Revel. While I haven't heard all of these, my impression is that the Revel distinguishes itself by maintaining its tonal balance more evenly at all loudness levels. During major dynamic peaks, the Salons don't compress nearly as much as most speakers I have heard. Thus, their tonality doesn't change. Moreover, the treble distortion is truly minimal during such peaks - movie lovers will drop to their knees to thank Revel.

Actually, mentioning the single-ended triode amplifier makes me wonder - did music lovers turn to that flawed device in an effort to restore the timbral richness that was lost in their rooms by many loudspeakers? If so, the solid-state amplifier is going to experience a perception makeover when paired with the Salon, because listeners will be able to enjoy solid-state control with timbral accuracy. I have, with a wide variety of solid-state amps (the BEL 1001 Mk IV, the Proceed HPA 3, and the Conrad-Johnson Design MF-5600). You will want to use a sizable solid-state amp with the Salon. Its sensitivity is moderate at 86 dB with 2.83 volts input and its minimum impedance is 3 ohms (nominal: 6 ohms). This isn't a hideous load, but a robustly designed solid-state amplifier with low output impedance will pay dividends. Do not assume, though, that the Salon is imposing a pleasant-sounding distortion through the lower midrange that makes these different amplifiers all sound alike - the Salon can differentiate the sound of amplifiers and source components quite easily. In this respect it is a reviewer's dream - revealing sound that is also a delight to hear.

When optimally set up, the Salons easily reached into the 20 Hz region, producing clean bass information that I could feel in my chest. It clearly delineated the plethora of big instruments on *Conspiracy Theory*. The Salon sports a bass control that allows the listener to reduce or boost the bass in the region around 50 Hz. This proved helpful in my room, as I was able to reduce the effect of the 50 Hz node (take *that!* cursed Room).

Although the Salon's balance through the lower and middle frequencies seems to bring images forward, it still produces a remarkable soundstage with stunning resolution in the field of depth. This soundstaging performance is unique among the direct-radiating dynamic-coil designs I have experienced. Many direct radiators produce pinpoint images within a smaller, sharply defined soundstage. In contrast, the presentation of dipole radiators is more open. Dipole images, depending on the design, can range from well-focused (though typically not as tightly focused as a

direct radiator) to bloated. The Salon's soundstage combines the best attributes of both types. It has better image specificity than most dipoles, though it doesn't render pinpoint images. There is a natural sense of size and weight to images generated by the Salon. The soundstage itself seems huge and encompassing on material such as that recorded by Keith Johnson for Reference Recordings.

While the Salon doesn't produce that phony see-into-it transparency, you can easily distinguish between instruments in space – if you want to. But the separation isn't tossed in your face. Indeed, this is true of all aspects of this speaker. It's all there and you can listen to it, if you want to. But you'll probably be too busy listening to the music.

What more could I want from the Salon? For now, it doesn't resolve the *pulsation* you hear from live instruments. I say for now because I haven't yet had an opportunity to apply basic acoustic treatments to the first-reflection points in the room. The sensation I am discussing is subtle and could easily be lost within the ambient wash of an overly live room. Because of room issues not yet addressed, I suspect that I have only heard a fraction of this speaker's potential. Nevertheless, it is already obvious that the Revel Salon is the finest speaker I have ever used and one of the best available at any price.

Revel Ultima Sub-15/LE-1 Subwoofer System – Bringing in Reinforcements

If the Salon is so wonderful all alone, why add the Sub-15 subwoofer (much less four of them)? How 'bout: *size matters*. I used to despise subwoofers, but home theater has infused the old beasts with new vitality. More research has been devoted to subwoofer design in the last few decades. As a High End kind of guy, I wouldn't much care about all this subwoofer research if digital signal processing in controllers hadn't made subwoofer crossovers so much less audible and so much more flexible.

So, why add subwoofers to a state-of-the-art full-range speaker? Removing the bottom octave from the Salon's duties frees up a good deal of power from the main amplifier. Deep bass sucks up more power than anything else does. By shifting the bass load to the LE-1 power amplifier, the main power amplifier can perform at a higher level. Likewise for the Salon woofers. It all adds up to more dynamic range without compression that distorts the sound. Finally, it is possible to place subwoofers in other locations that will smooth out the bass response of the whole system. With four subwoofers, it should be possible to do an even better job of balancing the bass. Using multiple subs also results in lower distortion because each sub doesn't have to output as much sound as one alone would.

My description of the Salon might lead you to think that the bass in my room was seamless and free of resonance. I

wish. Using a wide variety of recordings, I can draw a map of the disaster area called the bottom three octaves. Don't forget – this is war. I mentioned the pronounced bump around 50 Hz. Listening to the bass guitar tracks on Elvis Costello and Burt Bacharach's *Painted From Memory* [Mercury 314538002-2] was like riding a roller coaster. All bumps and dips and the bumps were ugly. Similarly, trying to follow the bass synthesizer lines in Celine Dion's "My Heart Will Go On" from the *Titanic* soundtrack [Sony SK 63213], a worthwhile test disc for bass performance, was an exercise in frustration. Some notes overpowered the arrangement while others were nearly inaudible. But I know you know what I'm talking about because this condition exists in every room. I don't care how much you move your speakers around; the modes will get you every time. Over time, you will probably accept all but the most pronounced perturbations in tonal uniformity.

I worked well nigh a month trying to find the best location for those four subs. I started by using the Room Optimizer and quickly discovered that its value dropped with the frequency. The charts reflected the problems I kept bouncing into, but the program didn't offer me any real solutions (possibly a user limitation – I need more time to work with the program). The main problem was that I could get deep bass and midbass bloat, or a good midbass blend and no low bass. Ultimately the four subwoofers ended up flanking



e to each side of h. This provided the smoothest blend with the best extension, but the response below 30 Hz was weak. Alert: This was solely a room blem.

is worth working to get the bass right, lower octaves are otherwise clouded

by the bass resonances and perception of the highest treble is warped. It can actually sound as if the treble is reduced in level, though that is not the case. Changing the perceived tonal balance of a system this severely has a direct correlation with the accuracy of timbre. Timbre for each instrument is created by a finely balanced group of unique frequencies and is easily disturbed by the gross irregularities arising from poor bass reproduction, whether it is the fault of the speaker or the room.

Bass has a profound effect on our perception of the temporal aspects of music. I will acknowledge that a hi-fi cannot change the beat of the music. But I just as steadfastly maintain that a system can alter our *perception* of the music's rhythms. Precision down through the bottom octave is essential to accurately define the beginning of a note. Smear that moment and our perception of the moment and when it occurs can change. Worse, if bass resonances get in the way of the proper bloom and decay of a note, the transition from one note to the next is smudged. Again, the points of reference in the music's time are less clearly defined. Finally, musi-

cians often use emphasis in the intensity of notes to build rhythmic structures within the measures of the music – it’s one of the things that separates artists from technicians. Bass that won’t get out of the way (and other distortions) mars the fine artistic emphasis applied by the musician, denying us access to the performance’s inner architecture.

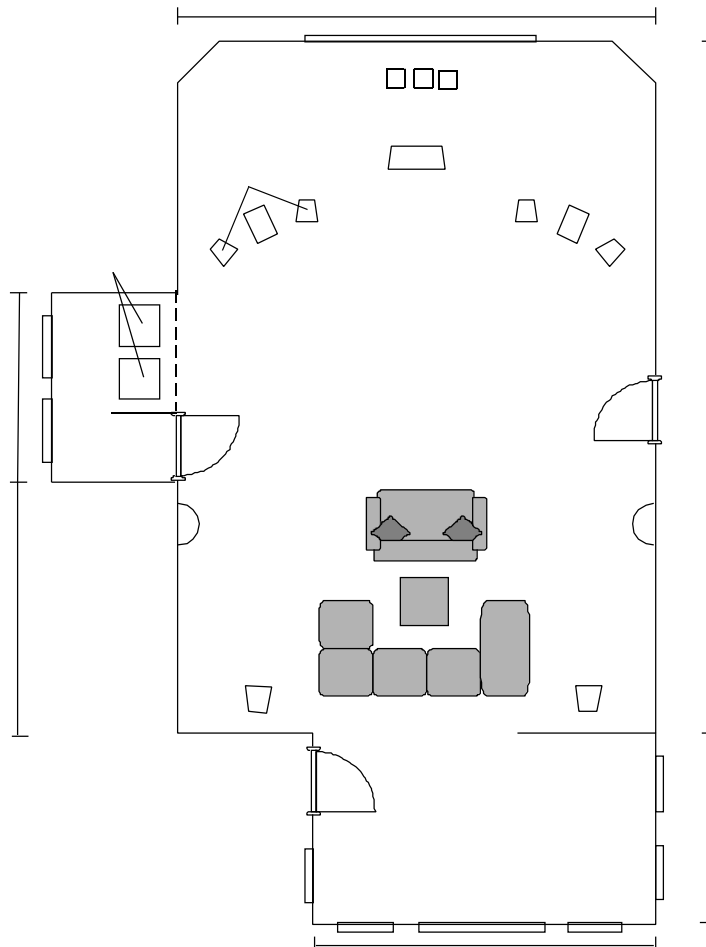
Finally, the presence of deep bass, accurately reproduced, informs our perception of the music’s physical presence. It not only adds weight, but it defines the environment of the performance. Orchestral music, for example, is performed in large venues that have observable modal characteristics only at very low frequencies. These low modes allow us to hear the size and volume of the space. It is an essential part of trying to generate a realistic illusion of a live performance.

The \$2,500 Revel Ultima Sub-15 is a stupendous subwoofer, when it is well integrated with your main speakers. Each Sub-15 features a robust 15-inch driver in a compact cabinet that blends into your room easily. It offers very low distortion, with no audible doubling. If it is barnstorming in the

basement, it does so cleanly. Ultimately, I could play “The Vikings” from *Pomp and Pipes* [Reference Recordings RR-58CD] at lifelike volumes (94 dB peaks) without a hint of strain in the Sub-15s. And the Sub-15 is clean enough to blend seamlessly with the Salons, which means it should blend just as well with any other speaker you choose, unless their characters are radically different.

Driving the Sub-15 was Revel’s \$6,000 LE-1 amplifier/crossover. Used with one Sub-15, the LE-1 will pump out 700 watts; with two Sub-15s the LE-1 will deliver 1,200 watts total. I used two LE-1s with the four Sub-15s. But I didn’t use their internal analog crossovers, having previously played with the crossover and having not cared much for its effect on the high-pass signal. Instead, I relied on the digital crossovers in the Proceed AVP and Theta Casanova controllers. While I was playing with subwoofer placement, the LE-1’s phase adjustment feature was invaluable. The blend with the Salons was more transparent when the phase was adjusted *just so* and the perception of the music’s timing improved. Both phase and level can be adjusted by remote control from the comfort of your chair.

Diagram 3: Tom Miiller’s All-Media Room



I have one minor sonic criticism of the Sub-15. Until the volume is advanced to higher levels, it doesn't resolve the sensation of air moving in the recording venue. This is a sensation that exists in the concert hall and I have heard it reproduced by the Audio Artistry dipole subwoofers. The Sub-15 gets the pitch, timbre, and timing of the music right, but the environment in which the music takes place is a shade to the dry side. Consequently, it is more difficult to perceive the acoustic volume of the recording site. It will be interesting to explore how room acoustic treatments effect this characteristic.

Battle Summary – Stand-off

I don't pretend that all the work described above resulted in a convincing victory over The Room. At this point, though, I was close to a draw. The spectral balance of the room was delightful, even though I had minimal damping material on the walls (just a 12 by 9-foot cotton canvas sheet over the area for the video screen and a little more propped up in the rear corners). Despite the great overall spectral balance, an excessive amount of ambient splash remained in the room, limiting the loudness levels that could be cleanly attained and smearing images and information in the soundstage. The bass was better, especially when listening to classical program material. But popular music, especially *Painted From Memory*, wouldn't let me forget that the fight for the lowlands was far from over.

I have two major offenses planned: acoustic treatment of the first reflection points on the sidewalls and ceiling and the use of advanced technology to address room-induced distortions. The former is to come first from Acoustic Innovations and, later, from RPG. The latter arrived from Cambridge Signal Technologies just in time for a sneak peak.

The SigTech T1100 is one of the most important audio products to reproduced sound since the introduction of electricity. The T1100 is a dedicated computer whose sole task is to analyze the sound of your room in three domains (frequency, phase, and time). It then develops adaptive filters that modify the signal and applies those filters to pre-correct the signal to counteract room distortions. This is an extraordinarily advanced and sophisticated use of digital technology that promises to mitigate room problems that were previously intractable.

As much as I had hoped for from the T1100, I was unprepared for the fundamental way it reshaped my aural experiences. First, using the T1100, the subwoofers blended seamlessly with the Salons *and* reached 20 Hz flat. The performance I extracted from the Salons and Sub-15, which is described above, was fully attainable *only* with the SigTech. Not that I would change a word about the Revels. The SigTech confirmed the excellence of the Revels.

You will have to wait until Episode Two for a full report on the T1100, but I will share this now: The changes it wrought improved not just the tonality of the music, but the dynamics and space as well. If you want to know more right now, dig out your old copies of *The Absolute Sound* (Issues 113 and 109) and read Robert E. Greene's comments on the SigTech.

Episode Two – A War On Two Fronts

With the arrival of the SigTech T1100, The Room was thrown back on its heels. There was reason to hope for a convincing victory. Before the day could be won, though, the war expanded to another front – the center (Revel Voice) and rear channels (Revel Embrace) – giving The Room more opportunities

to prevail. How would the design prowess of Revel fare outside the traditional realm of two-channels and could the SigTech triumph over a fully activated room?

To Be Continued



Heartfelt appreciation to Robert E. Greene for his technical contributions to this article. He is a gentleman and a scholar, as generous with his knowledge as he is passionate about the science of audio.

Manufacturer Information

REVEL

8500 Balboa Boulevard
Northridge, California 91329
Phone: (818) 830-8777
Source: Manufacturer loan
Price: Salon – \$14,200 (\$15,500 as tested with high gloss finish and rosewood panels); Sub-15 – \$2,500;
LE-1 – \$6,000

RPG DIFFUSER SYSTEMS, INC.

651-C Commerce Drive
Upper Malboro, Maryland 20774
Fax: (301) 249-3912
e-mail: info@rpginc.com
Price: Room Optimizer software program – \$99

CAMBRIDGE SIGNAL TECHNOLOGIES, INC.

95 Fulkerson Street
Cambridge, Massachusetts 02141
Phone: (617) 491-8890

Manufacturer's Response

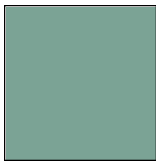
We thank Tom for his tremendous effort and vigilance in working to create a listening room that allows more meaningful critical listening. We are pleased that he found Room Optimizer and our approach to its utilization to be useful. Through its use, it becomes evident how inadequate simplistic dimensional ratios are in the quest for optimum room design.

A couple of clarifications of points Tom made in the review might be useful to the reader:

Dynamic compression does much more than rob the music of dynamics during high-level peaks. We have found that many High End speakers change in sound quality at perfectly normal loudness levels. The problem is greatly exacerbated by the use of first-order filter networks, smallish voice coils, or less than optimum crossover points. We believe that our efforts to combat dynamic compression pay off in improved neutrality and realism. The lack of dynamic compression is an essential factor in achieving the even tonal balance to which Tom refers.

Tom's listening room currently has bare, untreated walls. A normally furnished or acoustically treated room yields very different sound at high frequencies. Since Tom is planning to treat his room, we look forward to his further comments after he has installed room treatment in the next episode of his saga.

KEVIN VOECKS
REVEL



LINN-AV5103 AKTIV Multi-Channel System In Search of the Mythical Beast: I

he gleaming white livery of the Fed-X truck splintered the morning calm with a fusillade of gravel against the stone griffins sternly guarding the massive oak front door. Upon the FedEx man's announcement: "Two items," the door opened to reveal a man who might well be a stone Griffin himself, his face bearing a stern and raptor-like stare.

"What do they weigh?"

Looking down at his clipboard, the Fed-X man replied: "800 pounds."

"But that's a third of a *ton!*"

The next morning saw the arrival of the Bull, who swiftly moved the boxes to the music room.

Then on the third day came the Alchemist from Linn Products to spread layers of thick black cables, cardboard boxes, black metal boxes, and wooden speaker boxes. This formed an ultimate hi-fi horizon layer two feet deep over the entire 25' by 18' floor, but the tide had again receded by sunset that evening. The first level of alchemy left the room pristine and newly decorated with a four-foot tall rack of black metal boxes and a perimeter of cherry veneered cabinets. The Linn AV speakers were arranged variously on black metal stands (the four principal channels served by the AKTIV Tukan), on a television monitor (the Aktiv AV5120 center channel), and on the floor (the AV5150 sub).

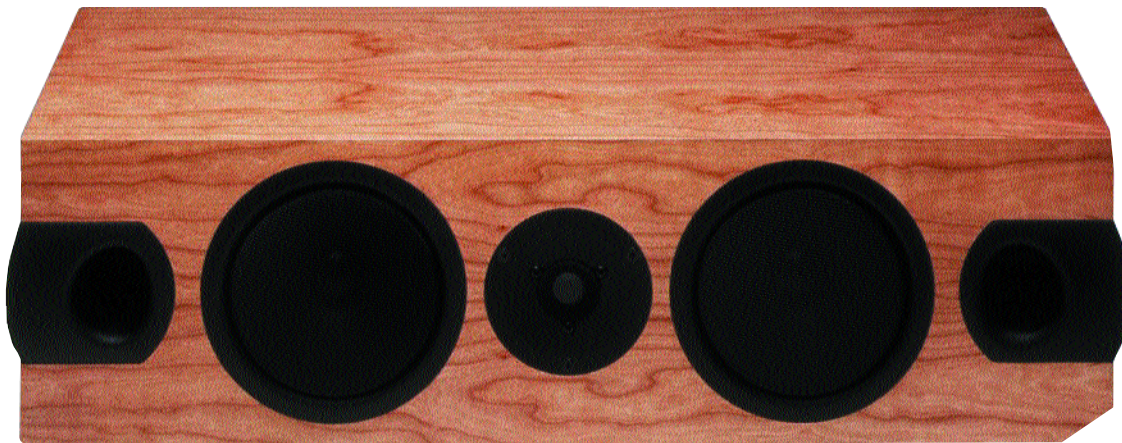
The cabinets of the Tukan speakers are a foot tall, a little more than half as wide and deep. They sit upon open black metal stands that raise the top of the loudspeakers to a height

high, 9.5 inches deep). The AV5150 subwoofer (26 inches high, 18.5 inches wide and deep), sits between the television and one of the Tukan. A Quadraspire rack contains the five AV5105 power amplifiers, the AV5103 system controller, and on the top two shelves, the Linn Karik CD player and Numerik digital-to-analog converter. The shelves are finished in cherry veneer to match the loudspeaker cabinets.

The price of systems based around the 5103 controller starts at \$18,815; the system I am testing costs \$27,170. This reflects the 11 channels of amplification provided to separately power each driver or pair of drivers, in the case of the center speaker and subwoofer. With the addition of better Linn components, it is possible to drive the system cost to \$145,680.

The fourth day was set aside for musical refinement. The Alchemist was pushing buttons on a remote control, watching as messages appeared on the control unit and simultaneously on the monitor. He listened to the hiss (pink noise) emitted by each loudspeaker in turn, measuring the distance between each loudspeaker and the listening position, adjusting the loudspeaker stands, moving them a half inch at a time. At one point, he added a cellular telephone to his juggling, speaking rapidly into the mouthpiece as he set white words to flash across the screens and listened to the loudspeakers hiss as he moved them to and fro.

In the middle of the fourth day, music appeared whole and viscerally present, as first the Alchemist then I sat on a chair placed at the focus of the equipment. The cherry cabinets with



of three feet. At the front of the room, a television monitor is centrally placed between the two loudspeakers on stands, and it is surmounted by the Aktiv AV5120 center loudspeaker (2 feet wide, 7 inches

their eyes one above the other gazed upon us as frantic messages in computeiform script scrolled over the blank displays.

A new cycle began. After much searching and deep consideration, a disc

BARRY RAWLINSON

was withdrawn from its shell and consigned to its whirring drawer mechanism. Messages darted again over the screens, followed by music that materialized throughout the room, a large gentle beast trembling the wooden floor, stalking along the walls, palpating the window panes.

In the Company of the Beast

I am listening as I write this to the latest release on the Water Lily Acoustics label, entitled *Fascinoma*, a virtuoso vehicle for trumpeter Jon Hassell in collaboration with Ry Cooder, Ronu Majumdar on flute, and Jacky Terrasson on piano. A point of special interest is that before developing his Fourth World style, Hassell worked with Stockhausen and thereby acquired the technique and aesthetics of electro-acoustic composition. He now routinely incorporates loops and samples into his music as an accompanying ground bass.

On track 3, the entry of the synthesized percussion loops explodes into the room with the intensity of a seismic tremor over which Hassell floats the gossamer threads of his muted trumpet tone like an impressionistic Milky Way serenely arching over a landscape in turmoil. The bass energy in this recording is remarkable, but it demands a great deal of the system to faithfully reproduce this together with the accompanying delicate and discrete strands of musical information.

If the system can cope, the assembled illuminati weave a tapestry of surpassing richness within the ample acoustic of the stone chapel in Santa Barbara, California, in which Kavi Alexander has made so many remarkable recordings. So wide is the dynamic range of this recording that the demand for the system not to sound strained at climaxes becomes paramount.

The recording chain used by this label is unsurpassed in rendering instrumental timbres naturally, and this will require commensurate performance from the reproduction chain. If there is any tonal imbalance in the system, this recording will quickly expose it. With the Linn system, there was no such problem, and the cavernous acoustic was rendered with tactile presence while the music was woven in its supportive embrace. But this degree of performance did not materialize overnight, and before we achieved this resolution we were to undertake the voyage of discovery that I have set down here.

Because there are so many aspects to the installation of such a comprehensive surround-sound system, this review will extend into the next issue, wherein we shall evaluate the performance in other respects, most notably film sound.

The Quest Begins

Characterizing Linn's advance man as the Alchemist is more than just a writer's device. Linn is an atypical audio company that will purposely *not* regale you with design parameters and specifications. Their typical response when asked about any aspect of their products' performance is "enough." They will perform the magic that brings the mythical beast of entertainment to your home. That is not your concern. The Linn dealer will play the role of Alchemist for every purchaser of a Linn system. You need only sit back and be awed.

In keeping with that company philosophy, the Linn AV5103/Tukan system delivered to me came without manuals that would disclose its innermost workings. Linn did not feel that I needed to know how this particular trick was performed or how that rabbit got in the hat. But magazine writers (and editors) are compelled to pull back the curtain of magic and witness the act itself. For this article, we will sit

back and watch the show. In the next issue, though, we want to work the controls.

The sound of the Linn system has mutated through three distinct phases to date: When first set up, the sound was, in my room, a blizzard of razor blades – a room problem, for my walls are plastered. There is very little diffusion, and a handclap produces a ring at the top of the room, near the ceiling. This has not prevented the room from working well with most speakers, especially the Quad 63s with their tightly focussed treble radiation patterns. The Linn tweeters are, I suspect, more generous in the breadth of their polar dispersion patterns.

Purists of sound arcana always begin by aligning sound radiators to achieve a solid mono image within the room, and so did we. This process was aided in great part by "party mode" – a multiple mono mode invoked by the surround options button. Switching then into stereo mode revealed a surprisingly deep stage. The bass frequencies, though, were too much of a good thing, even when the controller crossover sending the main signal to the Tukans was configured as "small," resulting in a low-frequency roll off beginning at 60 Hz. This bass heaviness had a rubbery quality, a looseness or slight slowness of response that added a dragging beat to the music.

I suspect that this first set-up had located the drivers within existing room modes. The AV5103 controller, for its high price, has a limited bass-management system, but it may be possible for Linn to add more options for tailoring this range within the installer menus, which are normally invisible to the user. It appears that the only bass management provided is the turnover point for the main speakers, a selection between "small" and "large." This is not a major limitation in a closed system such as the Linn. Bear in mind also that the system had at this point been working for only one day, and all the speaker suspensions were unused!

Our next step was to tilt the cabinets slightly backward. Now transients acquired substance as the midrange frequencies aligned better with the treble. Next the speakers were turned out to fire parallel along the long axis of the room, then toed in toward the center just enough to attenuate the side-wall reflections. In this position, the room ceased to negatively dominate the treble presentation, and now it was possible to relax into the sound. The predominant characteristic of the sound at this second stage was clarity, reflecting correct time alignment of the principal stereo pair within the room acoustic.

Integration of the subwoofer was impeded by the heavy bass response, which may at this stage have resulted from a low-frequency mode of the room. Whatever the cause, the sub had to be integrated with this anomaly, resulting in a dragging bass with a slow decay.

At this point the Alchemist felt the results were more than acceptable for running in the system before his second visit a month later. There's more to this saga, but that must wait until the third phase, set-up for film sound, which brought about a new level of performance with both music and film recordings.

For now, the sound had acquired a clear and muscular characteristic. Everything was imbued with a dynamic sound; orchestras filled the room with massive wavefronts, while Massive Attack turned the room into a massive vibrator at low frequencies. Piano benefited especially, reminding me yet

again that this instrument was the first attempt at a full-range home music center, a range rarely captured or replicated by electronic devices today.

All systems are biased in some way, and the three principal biases are toward time coherence, phase coherence, or tonal production. It is not possible to have all three unless you also factor in the room, which acts as a filter affecting all three. This Tukan-configured system seems to me biased toward temporal alignment, as a result of which its dynamic capabilities are enhanced. I would like to hear more of the subtler textures of the tonal range, and so would you, if you'd spent 15 years listening to Quads and BBC monitors. For voice intelligibility, this dynamic bias has much to recommend it; I was able to follow unfamiliar Sullivan (*The Rose of Persia*) with surgical precision.

Controlling the dynamic qualities of this system requires discretion, but this is encouraged by the system's ability to disentangle and relax the sound sources across the full width of the stage when so adjusted. The soundfield projected is also surprisingly stable when heard at some distance from the focal point of the loudspeaker array, a very refreshing change for those who dislike being confined to the sweet spot.

Working the Environment

It seems to me that the THX concept is good for the rooms in which we listen to films, for it mandates an observational frequency response at the listening position. In other words, the response of the system at the listening position is measured and guaranteed to meet specifications laid down and used for mixing guidelines on sound stages, ensuring that the mix heard in the cinema or your room will bear some resemblance to what the mix engineer intended! This is something that no supplier of music reproduction equipment has dared to offer in the past. This, however, merely addresses tonality. To arrive at the best solution, we must also have control of time and phase.

These factors are routinely addressed in live, amplified concerts, following pioneering efforts spurred by the giant concerts of the Seventies, which necessitated time alignment of their public-address towers to achieve a single pulse response over the full audience area. That technology is now used to improve the acoustic performance of sound stages and recording studios, where at least a smooth response is a prerequisite.

Now it's time to take that mature technology and apply it to the domestic environment. Our controllers already include digital-signal processing to achieve stadium effects; the next ingredient is the processing algorithm that optimizes the response from the loudspeaker-room interface. The hot contender here is SigTech T1100, which, to date, is the only device that corrects for non-uniformity in tonality, time, and phase (see the Revel review, this issue). In a perfect world, its proprietary algorithms would become a de facto system licensed to other manufacturers. Regardless of who does it first, all controller brands will be galvanized into action by the first one to use a microphone to optimize the signal for any room.

The Linn AV5103 controller incorporates a PC port on the rear panel, and I assume this will be used to update the host software. The larger point is that the system uses a separate channel of amplification for each driver, and its dynamic capabilities reflect that. It is implicit in such a system that there is a crossover filter upstream of each amplifier. For

now, the crossover functions (except for the bass management) are performed in plug-in modules that are installed in the AV5105 amplifiers. It would be much better to move the crossovers even further upstream, to the DSP engine where it can be performed elegantly in the digital domain.

This system cries out for a finer control of the tonal qualities of the room response. Absent DSP correction, we will see how these qualities can be further optimized by moving the acoustic sources within the room in the next article, wherein we devote ourselves to extracting maximum temporal synchronization from the system.

The Remote Interface

I'll look at two levels of the interface, the customer's and the installer's. First, the customer interface is kept simple by linking video and audio bus switching to the source controls, so all the customer has to remember is to switch the system on from standby, and then hit a source button if the system is addressed to the wrong source.

The remote control itself is built upon a cast metal chassis resembling a footprint in plan, a rather weighty slab that tapers from three inches in width to two and a quarter inches to provide a hand grip. The area of the control pad is divided into four zones, one at front left for controlling the Linn 5103, another at front right for the source transport controls invoked by the source selector zone keys, which occupy the center of the remote. There is also a number pad zone on the heel of the remote. Altogether a very good piece of industrial design modeling after the Brancusi school, though perhaps not the best choice for those with small or arthritic hands. One quirk the user must get used to is the slight delay built into the response of the 5103 processor before visual feedback confirms receipt of the signal. Perhaps this is where some more instant feedback might be given, even something as simple as a repeater LED within the display area. This would also encourage use of the system without video monitoring for those of such disposition. The manual makes a good case for this delay; it enables a short-press option for controlling sources other than those currently selected without disturbing the video and audio images you are currently following. In other words, if you tap the relevant keys quickly, you can cue up a CD and route it to a CDR and make a recording without having to stop following the currently selected program. But *sans* audible or visual feedback, I was more likely to start repeatedly pressing the source key until the confirming caption appeared.

Switching on the system from standby compounds this problem. Unless your video display is on, you know that the system has received the command only via a rearrangement of the typography of the Linn 5103 caption, from one line of type to two, on the display, which is rather dimly lit to start with. If you have been successful in switching the system on, you can confirm this by pressing a source key, but there's a slight delay.

The remote worked well as a universal remote, soaking up all the functions of the other remotes with the notable exception of the one that operates the cable television box – surely one of the most commonly found remote-control systems in America?

The interface itself needs a little more memory to allow tagging of soundfield settings to sources. This happens with AC3 decoding, as confirmed by the caption "As mix" that

appears on the displays when the "surround" button is pressed while playing an AC3-encoded source. Also useful would be a last-source-selected memory. Now if you play a disc and adjust one of the speaker level controls, then hit "Play" to start the track again, you will discover you have to press the relevant source button before regaining use of the transport controls.

Summing Up

The Linn system offers advantages insofar as it is a turnkey system, and anybody who buys one will be able to leave to the dealer all the tedious installation details of running cable, positioning loudspeakers, finding a home for the components, and initializing the system controller to accept the source components and direct their signals through the appropriate processing functions to the related amplifiers and thence to the speakers.


Linn also is known to have built its reputation on playing the tune. This refers to its superimposition of one cardinal rule upon all the flashing lights that surround audio: The music comes first, and it don't mean a thing if it don't play the tune. If your toes ain't tapping and your hands ain't clapping, if your head ain't bobbing and your guitar ain't throbbing – well, what's the point?

This strikes at a schism between tonal quality and imaging that divided the field of home music reproduction following the advent of stereo. When you put two loudspeakers into a room, you set up comb-filter effects that add and subtract from the recorded sound in unpredictable ways. When you put, as in this case, six sound sources into a room, you are far better placed to control the room modes that render most stereo a weak sister to mono – provided you are given the tools for the job!

I hope Linn acquires a digital equalizer interface to refine the tonal consequences of all that power (1,200 watts total),

power that should be even more nimbly applied using the new generation of Linn amplifiers as these incorporate switching power supplies.

I asked Linn to supply a system of minimal bulk, as I suspect this will be the choice of most people contemplating the addition of such a system to a room of modest dimensions that will probably have to serve multiple uses. As a consequence, the smallest loudspeakers in the range, the Tukans, were supplied. They did not betray any power handling problems despite the use of live piano recital levels.

In the next installment, we'll experience the full power of the Linn illusion, applied to music and movies. And we'll take a much closer look at how it all works. 

Manufacturer Information

LINN INCORPORATED

4540 Southside Boulevard, Suite 402

Jacksonville, Florida 32216

Tel: (904) 645-5242

Source: Manufacturer loan

Prices:

5103 System Controller: \$8,495

5150 Bass Reinforcement Loudspeaker:

\$4,195 (\$4,395 in cherry)

5105 amplifier for front left and right: \$3,590 each

5105 amplifier for center: \$3,590

5105 amplifier for rear left and right: \$3,590 each

Aktiv 5120 Tukan loudspeaker: \$2,490 each;

\$2,590 each in cherry

Aktiv 5120: \$1,220 (\$1,440 in cherry)

Karik CD Player: \$3,595

Numerik D-A Converter: \$2,595

NAD T770 Audio-Video Receiver Just the Basics, Done Well

In 1976 the NAD 3020 integrated amplifier hit the North American shores and changed performance expectations for less expensive audio forever. While competitors stretched the limits of inanity with bells and whistles, NAD (New Acoustic Dimension) concentrated on the basics of clean sound: short signal paths; bulletproof power supplies and conservative power ratings. NAD succeeded by appealing to what audiophiles like most – less. Though nearly 25 years have passed since that first NAD arrived, the new \$1,700 T770 Audio-Video Receiver hasn't turned its back on its roots.

If you are looking for adrenaline-pumped features like Cinema EQ or compression levels or 1,001 surround modes from the Sistine Chapel to Abbey Road Studios, then you'll be missing the point of the T770. NAD's philosophy is to give you what you need to listen to music or watch movies by providing the best engineering and components at the price point. Features that they

believe will not contribute to this experience or might subtract from performance are canned. Like the High End audio market, NAD is taking the purist approach. Here's an example: Many AVRs automatically take a stereo analog signal and process it through an inferior analog-to-digital converter and back out through a D-to-A. NAD leaves the signal undisturbed in the analog domain. The simpler and purer path.

The Model T770 is a five-channel, 70 watts per channel into 8 ohms surround sound receiver that incorporates an integrated Dolby Digital decoder. It provides a 5.1 input for the addition of an external decoder, allowing the user to expand to another surround sound format such as DTS. For two-channel listening with surround enhancements, the T770 provides EARS (Enhanced Ambient Recovery System).¹ Three digital inputs are provided, including RCA coaxial, TosLink optical and an input with an integrated RF demodulator for laserdisc players

NEIL GADER

that are DD compatible. There are preamp outs for all five channels. Build quality in general seems up to NAD's usual fine standards. Also included are the NAD Link jacks, which allow other NAD components (with NAD Link)

that are not remote controlled to be driven via the T770's controller. Very clever if one intends to stay within the NAD family. But since the remote is not of the learning variety, the user is penalized if he chooses to consider a competitor's offerings.

Once I managed to hook up the Sound Dynamics RTS-3 Surround Speaker system and my Pioneer 414 DVD player, making friends with the T770's remote control was the next important step. It is well organized and allows thicker fingers some room to negotiate the keypad. And the infrared end is angled slightly so users know how to orient the remote when they grasp it in the dark. (A lighted keypad would have been better.) The OSD has the requisite multiple layers. Its graphics are concise and the critical surround set-up mode is easy to access. The T770 circuitry will adjust the delay characteristics of the surround system based upon the distances of the five speakers. Then with an SPL meter (not included), it's easy to calibrate 5.1 speaker levels via the T770's test tone.

For apartment dwellers, the "Late Night" feature is especially welcome for those soundtracks with lease-busting explosive effects. Since it's a compressor, it limits the dynamic range of the audio portion. That is, the extremes of loudness will be drawn closer together. Explosions will not be as loud, while soft dialog will not be as quiet. This allows the user to turn the overall volume down and still not miss important moments – a boon for some elderly videophiles as well.

Bass management is downright basic. With a Dolby Digital source, the LFE (Low Frequency Effects) option in the OSD's (On Screen Display) level calibration menu permits an attenuation of 10 dB; take it or leave it. Using this in conjunction with the Late Night feature, you can listen at reasonable overall levels. Still, it does not have the flexibility of a THX crossover, which allows you the option of mixing sub-80 Hz bass information with the LFE and redirecting it to the sub-woofer – an effective way to reduce the work load and open up dynamics on smaller speakers.

The Sound

At 70 watts into five channels, the T770 is not a real stump puller and speaker matching should be carefully evaluated for sensitivity and impedance. But that said, running the T770 as a two-channel integrated amplifier into either the Joseph Audio RM-22 or the slightly larger Meadowlark Shearwater loudspeakers² reveals a pleasing, smooth sonic character. The T770 understands the all-important midrange. It's not aggressive in the highs and that area in the upper mids between 2-3 kHz is full. In my book, the midrange is the sweet spot and the NAD really connects. Vocals, male and female, are rich and continuous. Soundstaging is wide and fairly deep, but imaging is not as precise as some dedicated two-channel rigs I've heard. The image specificity on tracks like Roy Gaines' "Stormy Monday" [*I've Got the T-Bone Walker Blues*; Groove Note, GRV-2002-2] is a little swimmy. It

just doesn't have the snappy focus that this cut can have. Pitted against the 150wpc Plinius 8150, my reference integrated amplifier, the T770 sounds slightly dry. Bass is not quite as rich and extended. But neither is it muddy or ill-defined. It's just a little rolled off.

The heart of the T770 is its competence in decoding Dolby Digital soundtracks. Intelligibility of dialog is paramount not only to understanding but to conveying nuance and atmosphere. One of the easiest ways to test for this is to find soundtracks where narration occurs. The Tennessee Mountain narration of actor Jeff Jeffcoat in the charming and overlooked film *The Education of Little Tree* [Richard Friedenberg, director; Paramount Home Video LV336143] is a prime example of how a few well-chosen words can whisk the movie-goer into a different time and place. The warm, non-aggressive midrange character of this voice sounded remarkably similar to the theatrical presentation I attended at the state of the art Academy Theater in Los Angeles. And when you listen to the West Virginia drawl of Levon Helm from *The Right Stuff* [Philip Kaufman, director; Warner Bros. 20027] through the T770, you not only catch every inflection with clarity and smoothness, you can almost smell that stick of Beemans gum he just started chewing.


The sound design of the film *Elizabeth* gave the NAD's decoder a thorough workout in retrieving ambience via – of all things – footsteps! The movie's interiors are set primarily in medieval castles and churches. These large vaulted expanses have huge reverberant fields with delay characteristics bordering on echo chamber. Throughout the movie, characters are shown in medium and long shots walking through these cavernous spaces, sometimes from above, other times at eye level. The NAD demonstrated exemplary steering combined with fast transient attack by not only localizing approaching and departing footfalls from LCRs into the surrounds then back again, but by taking those footfalls and their accompanying reverberations and shifting them spatially to another combination of speakers as the camera set-up shifted. Each camera position yields a similar but distinctive spatial perspective. A thunderstorm sequence during chapter eight reveals the T770's ability to place powerful cues deep in the background, an auditory illusion that appeared to be occurring well behind the LCR speakers.

For spatial resolution I use the "Raindrops Keep Falling on my Head" Test. In this case directly overhead. The DVD of *Das Boot, The Director's Cut* [Wolfgang Peterson, director; Columbia-Tristar 22219] has some of the finest, most immersive sound effects I've experienced in a movie soundtrack – the metallic clatter of the diesel engines in the background, the occasional groan of the boat's hull as it descends deeper than it was ever engineered to go. The sound designers implanted a living, breathing soul within the vessel and her fate is very nearly as poignant as that of the submariners she carries. You can close your eyes and almost smell the mildew hanging in the stale air. And feel the panic as claustrophobia takes hold. The "Raindrops" test occurs late in the film, with the U-boat crippled on the sea floor near the Straits of Gibraltar. Pipes have burst from the pressure on the bulkheads and the sounds of discrete leaks are plopping in all channels. These sounds were clean and startlingly lifelike. But there is one specific leak that consistently dropped right *down my back*, courtesy of the NAD T770 system. And it appeared to be coming from my ceiling! This immediacy was not accom-

¹ NAD points out that EARS is left-minus-right channel ambient processing, incorporating no reverb.

² 86 dB & 88 dB sensitive respectively.

plished with gain biasing to the surround channels, either. I set up the speakers fair and square. But clearly, the T770's steering in DD mode is precise and smooth.

Finally users are going to have to decide for themselves which features they can and can't live without. At its suggested list price, the T770 faces some stiff competition from AVRs with higher stated power ratings and prodigious features. Now I'm not a big bells and whistles fan. If I want to drive fast, give me direct input of a gated manual five speed from *any* era Ferrari, not the "fly by wire" computer electronics of a clutchless Tiptronic. The same goes for audio and video. I want to see and hear the unadulterated material reproduced as intended. A great many poseurs impress with their sizzle. But as single-chassis designs go, the NAD T770 is all steak. 

Manufacturer Information

NAD ELECTRONICS OF AMERICA

6 Merchant St.

Sharon, Massachusetts 02067

Tel: (781) 784-8586; fax: (781) 784-8386

Website: www.nadelectronics.com

Source: Manufacturer loan

Price: \$1,699

Manufacturer's Response

NAD would like to thank Neil Gader for his thoughtful review of the T770 receiver.

One point I would like to elaborate on is his assertion that speaker sensitivity and impedance should be carefully evaluated for compatibility with the T770's 70-watt x 5 power rating. While he is correct in the absolute sense, the T770 incorporates an exclusive NAD amplifier design, impedance-sensing circuitry, which endows the NAD with the ability to properly drive 4-ohm speakers by maintaining the correct relationship between voltage and current irrespective of the loudspeaker being driven. This is accomplished automatically, requiring no adjustments from the listener. The T770 is stable even at 2 ohms!

As Neil mentions in his opening paragraph, we rate our power for A-V products the same way we rate our stereo amplifiers, that is, all channels driven simultaneously, 10 Hz – 20 kHz, at 0.08 percent THD. Most manufacturers would have rated the T770 at 100 x 2, 20 Hz – 20 kHz at 0.08 percent THD and 100 x 5 at 1 kHz. We believe our conservative approach is more in keeping with our "music first" approach to A-V products.

GREG STIDSEN

DIRECTOR OF SALES AND MARKETING

NAD ELECTRONICS OF AMERICA

Manufacturer's Corner

We are grateful to manufacturers for correcting any errors of fact in our reviews. When we can, we also include the manufacturer's comments following a review. But sometimes space does not allow us to do that and this section gives us the opportunity to include a cogent comment while the subject is ripe, rather than holding it over for inclusion in another issue.

RPG Diffuser Systems, Inc., Room Optimizer

I'd like to commend Tom Miiller for tackling a very challenging task ("Revel Ultima Speaker System Episode One: The Ancient Enemy," this issue). Episode One is a wonderful attempt to raise the awareness of our community to the acoustical distortions a room can introduce. RPG has been conducting room acoustics research for 16 years, sharing our results with the acoustical and entertainment industries through peer review publications, seminars at CEDIA, NSCA, the Audio Engineering Society, and the Acoustical Society of America. Over time, it became apparent that despite the progress we have made in room-acoustic design, sound diffusion, and absorption technology, recording studios and residential hi-fi and home-theater communities were still at the mercy of the location of the loudspeakers and the listener. In researching existing programs to assist in these two areas, we

found that the solution lay in a new approach that simultaneously addressed modal coupling and speaker-boundary interference response (SBIR), the two causes of low-frequency acoustic distortion. A technical description of this new algorithm was presented at the AES and a copy can be downloaded from our website (www.rpginc.com). One can address this problem using wave acoustics, called the frequency-overlap method, or by geometrical acoustics, using the image model. Both approaches are difficult to apply. The rectangular room offers a unique case in which both resolve into simple and identical solutions. The image model, however, is the default solution, since it is time-based and can be windowed to provide the SBIR and modal responses. The issues are how to deal with the SBIR and modal coupling simultaneously and how to search the millions of possible solutions for the best one. Simultaneous treatment of SBIR and modal coupling was easily addressed by using the weighted smoothness (standard deviation) of both responses, and an intelligent search engine (downhill simplex, in this version) was used to search through error space for the best answer. One thing to keep in mind is that this type of problem requires optimization of many variables at one time. This type of problem contains the possibility of false solutions. The goal is to find the global minimum.

The starting point always affects the solutions, so the program allows for the evaluation of many random starting points. Each solution is valid and users should choose the solution that has the smallest error and the best ergonomic placement. Once loudspeaker and listener positions are established, the program indicates optimum positions on walls and ceiling for absorptive and diffusive materials to control the mid-high frequency portion of spectrum. It is important, though, to remember that the objective is envelopment in the A-V experience, and this cannot be accomplished by sound absorption alone. The acoustical palette consists of absorption, reflection, and diffusion. The best room can be achieved by an appropriate combination of these. Deader is not better!

While users are generally astonished at the difference proper placement can provide, some tweak the positions the program generates. The program will find the locations that generate the best room response within its stated assumptions. While a flat room response may be mathematically preferable, listeners have different hearing acuity, musical tastes, and musical training. So let the Room Optimizer get you close, then tweak to taste. We are committed to expanding and improving the Room Optimizer, and users' comments are welcome.

PETER D'ANTONIO, PRESIDENT
RPG DIFFUSOR SYSTEMS, INC.



I Want My DVD!

Major Labels' Plans for Classical Music on DVD

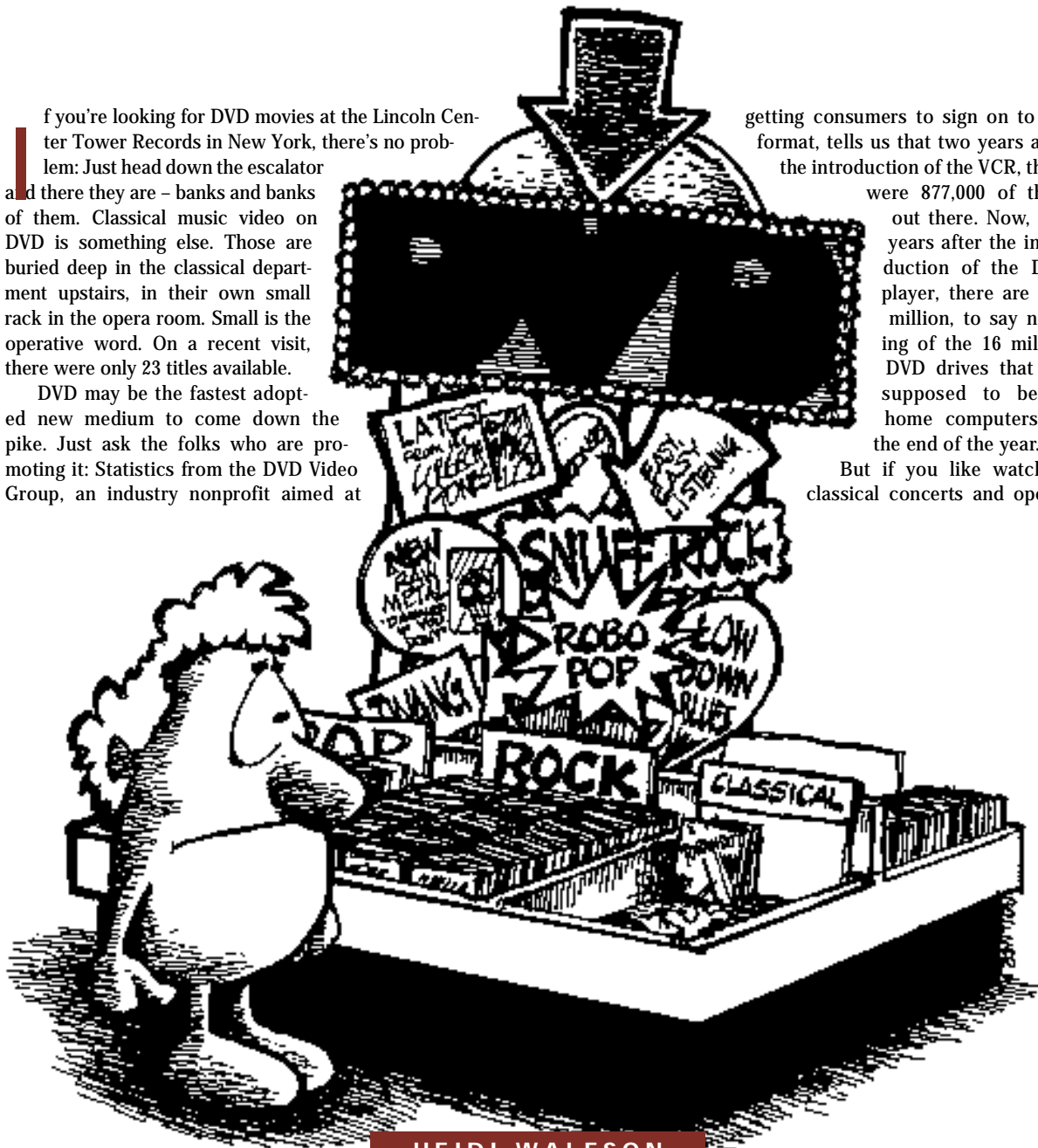


If you're looking for DVD movies at the Lincoln Center Tower Records in New York, there's no problem: Just head down the escalator and there they are – banks and banks of them. Classical music video on DVD is something else. Those are buried deep in the classical department upstairs, in their own small rack in the opera room. Small is the operative word. On a recent visit, there were only 23 titles available.

DVD may be the fastest adopted new medium to come down the pike. Just ask the folks who are promoting it: Statistics from the DVD Video Group, an industry nonprofit aimed at

getting consumers to sign on to the format, tells us that two years after the introduction of the VCR, there were 877,000 of them out there. Now, two years after the introduction of the DVD player, there are two million, to say nothing of the 16 million DVD drives that are supposed to be in home computers by the end of the year.

But if you like watching classical concerts and operas



HEIDI WALESON



in a home theater, don't toss that VCR or laserdisc player just yet. Ken Crane's, a DVD consumer sales website address, a subsidiary of Image Entertainment, and one of the medium's distributors and licensees, lists 3,759 titles (everything from pornography to operas from Milan's La Scala opera house) and climbing. Of the 325 music titles, 41 are classical music, 21 more are opera. DVD Express, another dedicated internet site, offers 55 titles under "Classical Music"; some of the titles listed on both sites are not yet available (though scheduled to be released in the next few months). Nominally (read: dubiously) classical events such as "The Three Tenors" and performances by Andrea Bocelli were, naturally, the first to appear. But what about the opportunity to have some fabulous opera productions with DVD's high definition image? Pickings are still slim. "Opera tends to be a year behind - that's how it was for VHS," says Paul Gruber, author of *The Metropolitan Opera Guide to Opera on Video* and executive director for program development at the Metropolitan Opera Guild, which sells such products through the Met By Mail.

No one disputes the usefulness of the format for classical programs - the ability to choose tracks without the constant rewinding and fast-forwarding of video is only one of the more practical advantages. Still, most of the major classical labels are hedging their bets. Universal Classics, the company formerly known as Polygram, comprising the classical labels London (Decca), Philips, and Deutsche Grammophon, has nothing yet to say about how much or how little of their vast back catalog of opera and concert video will make it into DVD in the US. (Polygram Japan, however, has released a 25-opera set on DVD - subtitled in Japanese and the original language, so probably not destined for the US market.) EMI Classics has nothing to say yet either.

Pioneer, which put out laserdisc versions of a number of the Metropolitan Opera productions, did leap into the fray with two DVDs of popular operas from the Met - a 1982 *La Bohème* and a 1985 *Tosca* plus the 1983 Centennial Gala. The Met, however, found some flaws, and all three titles have been recalled for audio remixing. Over at Lincoln Center, caution now prevails. One other Met opera, a little-known work by Zandonai, *Francesca da Rimini*, a particularly lavish production, is out on Pioneer in DVD, and two more are in the pipeline. Choices available so far from other houses are not exactly greatest hits: for example, Verdi's early work *Attila* (see review) from La Scala; Janàček's *The Cunning Little Vixen* from Chatelet.

Some major labels do admit to be grappling with the question. Sony Classical has brought out six titles; five more, including one new program, a teenage wundersinger from England, *Charlotte Church: Voice of an Angel in Concert*, are in the plans. Most of the Sony titles are old Herbert von Karajan performances - the Great Stone Face conductor (see review) up close and personal. Only one, planned for next spring, is an opera - Karajan conducting a 1987 Vienna performance of Mozart's *Don Giovanni* with Samuel Ramey.

Leslie C. Cohen, vice president, business development at Sony Music, is decidedly bullish on the potential of DVD and is jubilant at the demise of Circuit City's DIVX competitor. "Sony Music supports DVD. Each of our labels [Columbia, Epic, etc.] has had it from the beginning, and there are now 34

music titles out," she says. "With three to five titles a year, Sony Classical has done slightly less than some of the other labels, but is keeping pace proportionately with the number of releases. We're also working toward simultaneous release of VHS and DVD programs."

There are two million DVD players in our homes today. But if you like watching classical concerts and operas on home theater, don't toss your VCR and laserdisc players just yet.

It's not surprising that Sony, with its hardware division, supports the new format. Cohen also cites its wider entertainment potential. "There's an entire market of DVD-ROM players to be satisfied," she says. "There are only a handful of titles available. People are traveling with their computers, and the DVD gives them flexibility. We can also do web links with DVD - with a new title from an artist, we could add a link to their web site, so that fans can keep current." (It would also naturally give the company the opportunity to sell fans its other recordings by that artist.) All new Sony projects are being evaluated as to their VHS and DVD potential. Will the day come when DVD replaces VHS? "Not in the immediate future," says Cohen. "But DVD has been adopted more quickly than either VHS or CD. If it keeps going, the whole market may change."

An added feature of the Sony DVDs with Karajan is the addition of surround sound, familiar to moviegoers - that airplane taking off from the back of the theater and flying over your head - but new to classical video. According to David Kawakami, a director in Sony Corporate strategy and a developer of DVD, the medium can support surround sound in the compressed audio formats of Dolby AC-3 (Dolby Digital), as well as newer formats, DTS (Digital Theater Sound) and SDDS (Sony Dynamic Digital Sound). "They all allow 5.1 channels of audio, compressed so they can fit on the disc with the video," Kawakami says. "The quality is good, though below the quality of CD. Psychoacoustically, we are able to elicit perceptually good quality, though if you turn off the picture and concentrate on the sound, people have commented that the audio falls short of what we're used to hearing."

Richard King, engineer on the Karajan discs, agrees. "No one is super-happy with the audio on the DVD. When you compress it, you don't get everything back." He says that Sony is working on the new Super-Audio CD technology, which, when combined with compressed video, should give a better result. There is room to combine uncompressed stereo with DVD, but the 5.1 channels for surround sound take up too much space.

By adding surround sound in a music program, the producer's goal is "to recreate the ambiance of the actual hall,"

Kawakami says. "The greater number of channels is useful in directing that enveloping ambient sound." Kawakami says that producers are more conservative with the surround sound on classical than they are with pop. "Few orchestras or classical producers want to take liberties – they're not going to have the instruments coming from behind you. They're trying to recreate the feeling of sitting in the hall, in the best possible seat, with a wide and deep soundstage, with the instruments placed accurately. Coming from behind would be reflections of sound, and sounds from the audience, so it feels like a hall."

Steven Epstein, who produced the DVD Karajan recordings, went back to the original multi-track recordings. "The 1987 New Year's Concert had pick-up mikes hanging in the audience," he says. "We fed that information to the rear channels, added a little reverb to glue the perspective from front to rear, and added a slight delay to get more of a sense of distance from the front to the rear, which enabled us to achieve a realistic surround sound. The Beethoven *Ninth* was recorded without ambient mikes, so we used information from the main mikes as well as the spot mikes in the orchestra. First we remixed the stereo, and brought it into a more present-day natural sound. Then we took information from the two main mikes and brought it to the rear ones, but we had to process it, to recreate the sense of depth. We used delay, some additional reverb, and equalized the sound to get a believable result." (See review of three Karajan DVDs, this issue.) Producers working on popular concerts sometimes get fancier. "You can put a guitar solo or a drum solo front and center, tailoring the audio to feature what's on the video at that moment," Cohen says.

Back to the numbers, however. Classical has its own peculiarities, particularly within major labels. When sales of 5,000 have been considered typical – indeed, good – for a single audio title, labels have to think carefully before com-

On a recent visit to Manhattan's major Tower store, there were just 23 classical DVDs available.

mitting resources to a project. After the industry downturn in the 1990s, which saw a major reduction in the number and kinds of classical audio releases put onto the market, it is not surprising that these companies are taking a relatively conservative approach to the new format, which adds big bucks to the production costs. Classical video isn't exactly a mass-market seller anyway. Paul Gruber points out that many of the classical VHS titles are going out of print. "The audience just isn't big enough for the big companies now," he says.

The one major label to come out ahead of the pack with new product is BMG Classics, which several months ago released its DVD version of Puccini's *Turandot*, as lavishly performed last September in the Forbidden City of Beijing. Why this one? David Kuehn, VP marketing and A&R director



Upscale Pop

DVD is having a profound impact on how pop record companies look at music videos for the home market. "It's almost reinvented the business, now that we have a system that delivers a high-quality picture and high-quality audio," says John Beug, senior VP, film/video production and marketing for Warner Bros. Records. "Not to cast aspersions on VHS, but the audio quality stinks and the picture quality depends on who is duplicating it."

Music video programs on DVD are now released routinely by pop labels and are available from scores of acts, from the Allman Brothers to Yes. But record companies still are selective in choosing acts for DVD treatment, given additional production costs of \$10,000 to \$30,000 per title. "It certainly appears as though the slightly older, slightly upper-demographic artists are selling better," says Beug.

A recent ranking by Amazon.com of its best-selling music video releases on DVD included titles from Eric Clapton, B.B. King, Neil Diamond, Earth Wind & Fire, and Sarah McLachlan. But also in the Top Ten were Michael Jackson and Madonna, acts with a younger appeal.

"DVD was originally skewing toward older fans and classic releases," agrees Leslie Cohen, VP of business development for Sony Music. "But now with DVDs from groups like Oasis and Savage Garden and Pearl Jam, we're obviously reaching out to younger listeners, and also trying to capitalize on the existence of a fairly large CD-ROM population, which is completely underserved." The thinking here, says Cohen, is customers won't watch DVD films on small computer screens but they will play music programs on their PCs.

Pop music fans, like their classical counterparts, are drawn to the consistently high sound quality of DVD titles, whether provided through Dolby AC-3 [Dolby Digital], Dolby 5.1, PCM Digital Stereo, or the Digital Theater Systems (DTS) alternative, which requires a decoder-equipped DVD player.

While the quality of DVD audio and video is relatively consistent, interactive content is not. Pop record companies differ in their approach to DVD programming. Pop music DVDs may include biographies, discographies, song lyrics, interviews, and more. *James Taylor Live at the Beacon*, a made-for-DVD release with several interactive elements, has outsold its VHS counterpart 2-to-1, says Cohen at Sony Music, which is exploring web-links and gaming elements in future music DVD titles. Metallica's *Cunning Stunts* concert DVD offers multiple camera angles, interviews, and a photo gallery of nearly 2,000 shots. (See review, TPV 25.)

"I appreciate all those bells and whistles but I tend to be pretty traditional and I'm really focused on the audio and picture quality," says John Beug at Warner Bros., which has released straightforward music programs on DVD from Clapton, R.E.M., Prince, Frank Sinatra, Fleetwood Mac, Alanis Morissette, and others.

As classical and pop fans embrace DVD, record company executives now wonder if the format will work in other genres. "How much more will the business 'sectionalize' itself?" asks Beug. "We know the classical stuff works. Will this work for country?"

How about a Garth Brooks concert on DVD with an interactive choice of hats?

THOM DUFFY

Thom Duffy is International Deputy Editor of *Billboard* magazine.



for classical music at BMG, explains, "We decided to do it because the format had become standard, and projected volume of hardware for last Fall was so high. This was an elaborate joint venture between various Bertelsmann companies. We were shooting it in high definition, with multiple cameras, and a documentary was going to be made. It was an opportunity to put a product on the market that we felt would have the highest level-capability of features for the format." *Turandot* has all available bells and whistles, including a behind-the-scenes documentary, camera angle changes, separate audio track, multiple languages for titles, to say nothing of the standard indexing programs. "It really shows the capability of DVD, and what everyone should be thinking about when making decisions about doing it in future," Kuehn says. (See review, this issue.)

So far, BMG reports that the title is selling well – several thousand copies – though it is moving more through internet sales than conventional retail. Also helpful was the June PBS broadcast, after which sales made a 40 percent jump. Kuehn doesn't think it's necessarily selling to the people who plan to play it on their computers, however. "My guess is this is more of a dedicated DVD player audience. It's a big, colorful spectacle. Still, the market is going in the direction that will see computer and TV combined."

BMG Classics will be doing more DVDs. "Eventually," says Kuehn. "It more than doubles the production budget from video, because the authoring costs are high. If we took videos from the catalog and reissued them, we would have to give them something special, such as interviews, documentary footage, opera libretti in three languages. The labor that goes into that is expensive. We've earmarked some items as good candidates. We could just take the four or five best-selling operas or videos, do a master transfer, and rush them out to take advantage of the fall buying season. But if we want to be able to market them properly, we have to give the consumer something different. Just the higher definition is not enough – and most of them have been on laserdisc."

For new programs, Kuehn says, "our strategy is to reserve DVD to those projects with the biggest commercial potential, say, an event with a TV broadcast. We're also doing more new recordings now with future DVD audio in mind as well. Since the format standard isn't completely agreed upon, it's a little risky to release it now. Then in ten years, if we want to come back and exploit the catalog, we won't have to go back and remaster."

The Atlantic Warner classical labels – Teldec, Erato, and Nonesuch – are also going slowly, according to Arthur Moorhead, VP, Associated labels. The company is planning two or possibly three titles for the fall. One will definitely be the exotic Matthew Bourne *Swan Lake* – that's the one with male swans. Two documentaries *Richter: The Enigma* (about Sviatoslav Richter, the late Soviet pianist; review, *The Absolute Sound*, Issue 115, page 144) and *The Art of Singing* (in which households names in opera talk about vocal technique and performance) are also under consideration. "We're still conquering technology issues," Moorhead says. "Most of our repertoire is from Europe, and it's expensive to remaster it to

the US/Japanese standard. If these do well, we'll do more. We have a great video catalog."

It doesn't look as though Atlantic is going to be rushing to market with classical concert videos, however. "It's the age-old conflict. Things intended for the stage, like theater, ballet, and opera, are immediately interesting from a marketing standpoint. Videos of people performing sonatas – that's for a special kind of consumer. It's a struggle we had with VHS and laserdisc, and it won't change."

Small, independent video labels are being careful, too. VAI (Video Artists International) which has a large library of historical classical video, is not even entering the market yet. "The compressing and authoring costs to create a DVD are not justifiable for our type of product," says Ed Cardona, the company's general manager. "As with CD, the pricing will have to come down to where it becomes reasonable, and we can generate a profit after conversion. But now, with the number of units we typically move on a historical classical release, which can be a few thousand to perhaps 10,000 to 15,000 over the life of the program, it's too high a number. We didn't do laserdisc for the same reason, and now we're glad we didn't spend the money on it. It's better to allow the majors and mass-market merchandisers to set the format definitively. Once it's being done on a mass-market basis to a high degree, that usually drives prices down low enough so that it becomes reasonable to invest."

Kultur, a New Jersey-based producer of opera and other classical videos with 1,200 performing arts titles now on the market, thinks differently. Dennis Hedlund, chairman of the company, reports, "We've been watching for two years, and we've decided to go ahead this fall with 20 DVD titles," he says. Initial titles will focus on star names, such as Baryshnikov, Nureyev, Callas, Domingo, Pavarotti, and Leonard Bernstein. "The profit margins have eroded even before we got started, with some companies putting out product at \$14.95 and \$19.95," he says. "Our minimum price will have to be \$24.95 or \$34.95, depending on if it's one disc or two. But we survived Beta and laserdisc. And because of the compatibility with the computer, DVD is the future of the world. I see Best Buy going to 50 percent DVD, 50 percent VHS – the handwriting is on the wall. And since some customers already have our whole collection, we're honor bound to make the product different, with additional footage, bios, possibly adding an additional language. Some titles we're now acquiring might go straight to DVD – perhaps some of our visual art titles, which have more application for the search-and-find capability. We'll see what happens to the first titles between now and the end of the year." By that time, some of the fence-sitters may have decided that the whole medium is too much fun to miss. For starters, how about the outrageous Peter Sellars productions of Mozart operas (in unlikely modern settings) with the addition of commentary from the director, as has been done for films? Maybe then we'll know what he was really thinking.

Heidi Waleson writes about opera for The Wall Street Journal, and used to be a classical music columnist for Billboard.



Made for DVD

Puccini: *Turandot* (at the Forbidden City of Beijing). RCA Victor Red Seal 74321-60917-2.

I'm inclined to be kind to the lavish RCA *Turandot*, and not just because – as I sample a smorgasbord of available big-name classical DVDs, in this and a succeeding review – it's the only one seriously crafted for the medium. In fact, let's give it full credit. It's the first major-label classical video planned from the start as a DVD release, which means it's full of DVD candy: angles, audio, and subtitles in six languages, plus a "making of" movie. No surround sound, but that, if you ask me, means that RCA is being honest. There wasn't surround sound in the original, so they're not going to fake it for DVD.

Still, none of this guarantees a worthwhile product. Somebody, after all, had to be the first to release a serious classical DVD, and now that it's here, the most important question has to be, "How good is it?" And here, I admit, I was skeptical. *Turandot* is one of those operas for huge voices, like Verdi's *Aida*, that don't fare well in the current operatic climate. What we handle easily these days are ensemble operas, operas that require intelligent, educated singers who contribute small fragments to a mosaic. But we struggle with works that fail unless the cast (educated, thoughtful or not, who cares?) floors its collective accelerator, vocally speaking, and sings with the force of a top-of-the-line Corvette in heat. I wrote about a cast like that in Verdi's *La Forza del Destino* in the first issue of this restored magazine. But that performance

The first release of a serious classical DVD, and the most important question has to be: "How good is it?"

was filmed in 1957. Now it's 1999, and the Beijing *Turandot* doesn't even feature the modern world's most famous opera stars. God, was I skeptical.

And my first look at the thing only fueled my doubts. I gave myself a taste of the beginning, letting the opera play for 15 minutes or so. It's a beautiful, distinctive, unusually artistic production (no surprise, considering it's directed by Zhang Yimou, China's leading film director, auteur of *The Story of Qiu Ju*, *To Live*, and *Shanghai Triad*), but what was clear from the start was that the most telling artistry comes from the staging, along with costumes and Chinese dancers, all of which make a compelling, even thoughtful frame for the opera, but don't deliver the heart of the performance. The singers seemed blah; careful, reasonably sonorous,

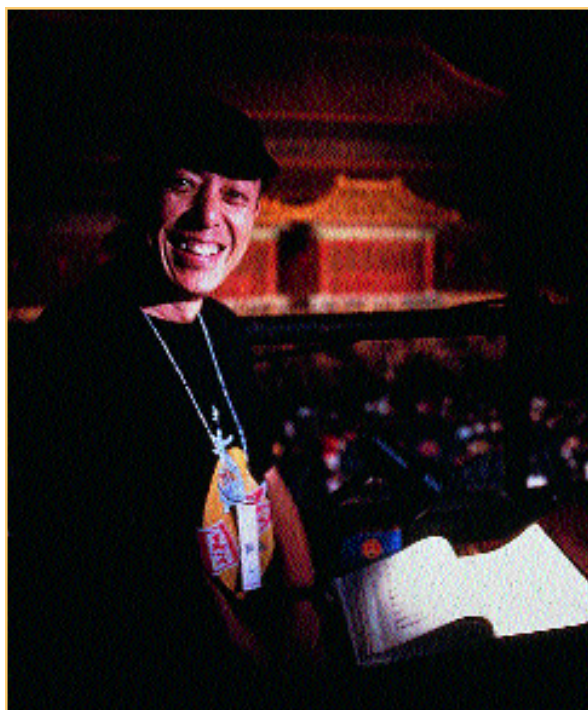


Photo: Sven Armstein

Zhang Yimou

but not possessed. At times I wouldn't have sworn that they even cared much about their work.

The hero of the opera, Calaf, an impetuous wandering prince (with, ideally, a heroic tenor voice), has just encountered his blind exiled father, Timur, on a crowded street in the Forbidden City of Beijing (*Turandot*, of course, is an Italian setting of a Chinese story, and the *shtick* of this production is that it's staged more or less exactly where the story is supposed to take place). Timur, blind and helpless, has been rescued and all but adopted by Liú, one of those old-fashioned opera characters with a personality profile that can make a modern person shiver with dismay; she's a slave girl of unbounded, abject loyalty. Upon hearing all this, Calaf, the prince, is seized with gratitude, and tells Liú she's blessed. But on screen, unfortunately, we see not a real prince, or even a reasonable simulacrum, but instead a boyish Russian tenor named Sergej (on the DVD box) or Sergeij (on the DVD itself) Larin, and none of his fairytale get-up (not even his long black barbarian's ponytail) could stop me from noticing that he sang his line with all the enthusiasm of a man saying, "Yes, thanks for helping my dad, but now I've got to watch the stock market report."

Taking advantage of DVD technology, I paged quickly forward to the opera's most

GREG SANDOW

dramatic confrontation, in the second scene of Act Two. Princess Turandot of China suffers from an icy heart, and she jones toward men. Any male of royal blood may woo her, but must answer three riddles. If his answers are correct, she marries him; if they're wrong, you guessed it: He dies. Every prince who's tried up to now has contributed his severed head to Turandot's collection; the Chinese nation, ruled by an ancient, weary emperor, is caught up in the drama, with people either turning cynical, or lusting for more blood.

Calaf, it won't surprise any reader to learn, is the prince who answers the riddles and melts Turandot's heart. But first she must defy him, explaining with frigid passion that the whole scheme is designed to avenge a female ancestor who'd been horribly violated, and then flinging a threat at the prince, the kind of utterance that only makes sense in the unreal world of fantasy (or opera): "The riddles are three, but death is one!"

She sings this, of course, in a phrase that rises to a high note. "The riddles are three," replies our game hero, taking the musical arc even higher, "but *life* is one!" And then both of

of Act Three. His worst are those that absolutely demand interaction, like his blessing of poor Liú (will anyone, by the way, be surprised to learn that, in the end, she sacrifices her life to save Calaf?), and his defiance of Turandot. So when the moment for the highest high note comes, here's what we see. Both singers take a careful breath; then, with equal care, they sing their lines. No drama, no music, no athleticism; just abstract performance, as if the two had been bred in a tank of nutrients and trained to accomplish this task, with no idea that anything raw and human was involved.

The Liú, soprano Barbara Frittoli, was miles better, a singer fully equal to the human, vocal, and musical challenge of her role, the one member of this cast who wouldn't have been out of place in the long-gone golden age (though, to be honest, those years were only golden when the good singers sang; there were more bad ones than there are now, and when *they* got on stage, you'd want to run for the hills). But in the first act, at least, Frittoli seemed to *publish* her music, rather than sing it.



Photos: Sven Arntsen

them hurl their lines at each other, both singing at once, taking the music to the highest note yet. I would have thought nobody, not even Richard Nixon, could have sung that music without shameless excitement, if only because the high notes won't come out without some physical oomph behind them, and because exuberance would be anyone's natural reaction after surging through them successfully. Like many other great operatic moments, this one isn't just music and drama, but also an athletic feat.

So what happened in the Forbidden City? The Turandot, soprano Giovanna Casolla, has a voice a size or two too small for her forbidding role, so she has to work a bit too noticeably to project her formidable music. I've already noted Mr. Larin's lack of conviction, though I later found that I'd been unfair to him. He *can* sing passionately, but he doesn't get involved with anyone else on stage. His best moments are those that are his alone, especially his famous aria, "Nessun dorma," at the start

It seemed far too premeditated. "Yes, this is how I sing Liú," she might have advertised. "I always do it just like this." Perhaps she wasn't helped by the traditional Beijing Opera poses director Zhang Yimou prescribed for her, a tricky hurdle for opera singers, and maybe Zhang's only miscalculation; she executed them well enough, but not with any spontaneity.

When I sat down to watch the whole thing through, then, I wasn't surprised that the first two acts were a chore, vocally. Casolla has a notable wobble in her voice, and, maybe worst of all, looks matronly. Here, of course, we're on tricky territory, because this is opera. If you're casting the role of a drop-dead gorgeous princess in a movie, you start by eliminating everyone who doesn't look right. In an opera, you eliminate everyone who doesn't sound right, which means the looks are secondary.¹ Still, a matronly Turandot is a big problem, at least in close-ups. Why, after all, does Calaf take up her challenge, risking his life and allowing the sacrifice of hapless Liú? This really is a question we shouldn't ask too strongly, because the odds are that Puccini himself didn't know. The way I've spun the story – China, a kingdom in distress, itself needing liberation from Turandot – is only hinted at in the opera, carelessly, so we can't really say that Calaf wants to free the Chinese people. Instead, he seems besotted by Turan-

¹ In fact, to digress briefly, it's even worse than that. For some very difficult roles, the bottom line is to find someone who doesn't sound absolutely horrible; the parts are so hard to cast, in other words, that sounding good might not even be a requirement. For what's arguably the hardest opera role of all, Siegfried in Wagner's *Ring*, opera companies will even settle for the lowest standard of all – someone who can hack his way through the music without breaking down, even if he sounds raw and ugly.



dot's looks. Maybe, on a deeper level, he senses her own need to shed her obsession, but all we hear from him is that she's beautiful. Maybe in the 1920s, when Puccini composed the piece, a preoccupation like that made more sense, but now it sounds silly. "Jeez, Cal! I know you like bimbos, but stay away from this one!" Still, this is all we have to go on, and when the singer in the title role is dowdy, without even the star-power that can override mere looks, *Turandot* as drama falls apart.

What did grip me, though, was the production. I would have said, up to now, that there's nothing really Chinese about *Turandot*. And why would there be? Yes, Puccini conscientiously used Chinese folk songs in his score, but what did he really know about China? What did any Westerner, besides a few scholars and unusually open-minded travelers, really know? China, in this opera, serves (or so I used to think) merely as an exotic locale for a pre-Hollywood spectacular, much as Egypt serves in Verdi's *Aida*, or, reaching heights of grand absurdity, the American frontier, complete with Indians, did in an earlier Puccini work, *La fanciulla del west* ("The Girl of the Golden West").

But now I'm not so sure. This production, first of all, is grand enough to suit the opera, whose music – a direct ancestor, I'd think, of Hollywood scores for epic films – proclaims its size, and gilded (if not precisely golden) glitter. Conductor Zubin Mehta even jokes, in the "making of," that the opera tucks into a tiny corner of the staging. Hordes of Chinese extras come on stage, along with dancers, and the Western singers in the leading roles are costumed with unheard-of sumptuousness. Even Liú, who has crossed deserts and begged for coins in the street, is wearing clothes lavish enough to bankrupt a small city; her nails flash with manicured splendor. Somehow, instead of making the work seem silly, all this helps it make sense. "It's only a fable," the production seems to tell us, with surprising gentleness, considering its size. Some of the Chinese effects are brilliant, even touching. In the first scene, there's a chorus about the rising moon; onstage we see a corps of Chinese dancers, wearing long white sculpted robes that shiver in the midnight wind. Touches like these even give the opera depth it wouldn't normally have, perhaps because the visual imagery takes the grand suggestions in the music to a higher and more truthful plane. Whether Puccini's vision was surprisingly Chinese, or whether Zhang Yimou picked Chinese imagery that would complement the music, I don't know. (And don't look to the "making of" for him to tell us; nothing there goes even half an inch below the surface.) But the whole thing adds up to much more than I would have expected.


And in the third act, even the operatic performance starts to be good. I'm not quite sure what makes that happen. Zubin Mehta gets some credit. He's a conductor somewhat reviled these days by critics, ever since his hollow tenure in the Eighties with the New York Philharmonic. But there's no way to fault him here. His *Turandot* (he conducts the Maggio Musicale Fiorentino orchestra from Italy) is spacious, lyrical, and suitably grand. And Barbara Frittoli helps to bring the act to life. She's the one principal, remember, who can really sing her part, and here, given her biggest scene (her sacrifice), she loses all her caution, and wakes the drama up.

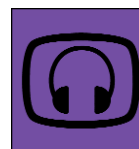
But Sergeij Larin gets a medal, too, for his "Nessun dorma." He doesn't interact much, I've said, but here he does

not have to; the aria is sung alone on stage, for what seems to be his favorite dramatic partner, himself. And his voice rings out. I have to admit that I'm suspicious of that ringing sound, because the entire sound of the performance is artificial. It had to be; the event took place outdoors, in a huge open space. Obviously, the singers are miked, and the "making of" shows us exactly how, as well as revealing, for those who catch a fleeting moment when Larin tests a mike, that his singing is beefed up with some reverb. "Beefing up" might not be the intention; the idea might simply be to give the sound some ambience. But there's nothing like reverb to make a rough voice a little smoother, and a small voice a little bigger. Larin doesn't have the trumpet sound a Calaf really needs; worse, when we hear him in a practice studio in the "making of," he's rougher than he sounds in the performance. Give him the benefit of every doubt; grant that he's just rehearsing, that he could have been hoarse, or just generally having a bad day. But still I think that amplification helped him. Maybe, knowing it was there, he sang more lightly than he would have, not pushing his voice, but letting it blossom naturally. If then he's not loud enough, there's a simple solution: Turn up the volume, which would have been simplicity itself to do. In the "making of," we see a giant mixing console, with separate channels, clearly marked, for every singer.

And yet in the end, I was moved (even though Puccini died before finishing the opera, and someone else had to write the final scene, someone who couldn't find the right, convincing sound for *Turandot*'s crucial transformation). And so, I find I recommend this DVD – though if you've never heard the opera, you might supplement it with either of two classic audio-only recordings, the RCA with Jussi Björling as Calaf, or the EMI with Franco Corelli; both have Birgit Nilsson, spectacularly the right kind of voice, as *Turandot*. (Avoid the set with Pavarotti and Joan Sutherland, spectacularly the wrong sort of voices. Pavarotti sings "Nessun dorma" nicely, but he's far too light and lyrical for this heroic role; don't be fooled.)

About the goodies: I've already said the "making of" won't tell you anything deep; I trust you're not surprised. The synopsis, read out loud against snapshots from the performance, is pompous in English, much more friendly in the other languages; it's adequate, and not a word too long. There's a PCM audio-only track, again with snapshots, if you want that. What the package badly needs, but doesn't have, is a complete libretto of the opera, on screen or in a booklet, so listeners can prep themselves and then watch without subtitles. The whole package needed much more careful editing. I've mentioned the two spellings of the tenor's name, but there are odd, no doubt accidental omissions. We're correctly told, for instance, that Zhang Yimou is a distinguished film director, but we don't learn the names of any of his films.

The box contains a booklet, with the kind of random scholarly essay on the opera's origins that might be found with any new recording. We didn't need that; we needed what I said was missing from the "making of," some comment from Zhang or from a Chinese scholar on how Chinese the opera seems, how it feels to be a Chinese person working with it. The musical performance, with its strengths and obvious weaknesses, is what it is. But if someone had worked one-fourth as carefully on the DVD package as Zhang (and his choreographer and costumer) worked on the staging, this first big-time classical DVD – welcome as it is in many ways – could have been better. 



A (Classical) DVD Sampler

.....

Verdi: *Attila* (La Scala production), Image Entertainment ID4360PUDVD.

Cilea: *Adriana Lecouvreur* (La Scala production), Image Entertainment ID4362PUDVD.

Dvořák: *Symphony No. 9, "From the New World"* (Herbert von Karajan conducting), Sony Classical SVD 48421.

Vivaldi: *The Four Seasons* (Herbert von Karajan conducting), Sony Classical SVD 46380.

New Year's Concert, Vienna 1987 (Herbert von Karajan conducting), Sony Classical SVD 45985.

erewith the rest of my classical DVD smorgasbord – the appetizers, if you like, the desserts, the smaller items (compared to the oversized Beijing *Turandot*), all involving big classical-music names, but chosen with no attempt to be complete or comprehensive. Consider them a sampler, a taste of what's available.

I'll examine them under two headings – as DVDs (looking at the DVD-ness of the products, how well they use the DVD format, its resources, and its interface) and as performances.

DVD-ness:

How well do these items use the DVD format? The overall answer: Not very well. Neither the Karajan nor the Scala series offers a 16.9 image, for instance. (Both series include more releases, the Scala many more.) The Scala DVDs offer nothing but an opera performance; no commentary, no plot synopsis (well, there's one on the box the disc comes in), nothing. There's no libretto, either, as there isn't for the BMG *Turandot*, so you can't take your time to prep yourself, and then watch the opera without subtitles. But wait – you can't turn the subtitles off, so that isn't an option anyway. Nor can you get them in any language but English.

The chapter menu shows itself with a touch of operatic cuteness; a red curtain parts, to the sound of applause. How quickly will you get sick of that? At least the selection bar, which shows you which scene you'll chose by hitting "select," is elegant, an image of one line of a musical manuscript. But now we come to something really weird. For Verdi's *Attila*

(yes, Verdi really wrote an opera about the rampaging Hun; more on that below), the chapters don't correspond with the start of scenes. Just imagine a CD that worked this way. The soprano (a warrior woman Attila admires) finishes her aria, and goes offstage. Now the baritone arrives; he's an ambassador from imperial Rome, and he's here for formal colloquies with Attila, the bass.

But the new CD track wouldn't begin with his entrance. No, it starts only when the baritone and bass begin the melodic part of their duet! If you want to hear their recitative, or in other words if you want to start the scene from the baritone's entrance, its natural beginning, you're out of luck. Nobody would accept that on CD, but that's how this DVD is planned. The chapters take you from one musical highlight to another; they don't let you page through the opera scene by scene. If you want the baritone's entrance, you have to find the soprano's aria and fast forward, or find the Attila/ambassador duet, and hit rewind. This frustrated me to no end; there are parts of the opera that are quite literally inaccessible, unless you scan forward or back from one of the official landmarks.

Adriana Lecouvreur works better, but has yet another oddity. Each act begins with the white-haired conductor, Gianandrea Gavazzeni, whom the audience adores, entering the orchestra pit. If you don't want to see that, you're in luck, because the chapter on the DVD begins a moment later, when the music starts. But we hear the music too abruptly; the chapter all but coincides with the first note, which, no matter how many times I tried to get used to it, came as an uneasy shock. I make my own CDs at home, and I've learned to leave a breath between the start of each new track and the beginning of the music. For exactly the same reasons, I wished that I could start each act with Gavazzeni, but I couldn't.

The Karajan discs are a little more elaborate. They offer program notes and bios. But what the point is, I'm not quite sure, because these are simple, undecorated texts, which to me at least would be much easier to read in a booklet than on my TV screen. (The program note for *The Four Seasons*, I might add, amounts to little more than just another biography of Karajan, with almost nothing about the work or the soloist. But that's a separate complaint.) Each time you want to read them, by the way, you have to choose your language, English, Deutsch, or Français. This gets annoying, and while it's a separate software issue (there isn't any DVD standard for choos-



GREG SANDOW



ing the language of written text), it seems to violate the spirit of the DVD interface to provide no way to pick a language once, and stick with it.

The Karajan discs also let you choose surround or standard audio. But I'm not impressed with the sound either way, or with the sound of the Scala discs, which also offer 5.1 surround, but (and this applies to Karajan, as well), not convincingly. Yes, it surrounded me, and provided a momentary high. ("Look, ma! More sound!") But the effect wasn't in the least realistic. We know that it was faked, not to mince words, in the Karajan releases (see Heidi Waleson's piece, in this issue, for Sony Music's acknowledgement of that), and when I listened, I found I'd choose the merely "stereo" option to get something even vaguely like the real spatial layout of an orchestra. The Scala discs – like the Karajan, transfers from VHS – also have an engineered surround effect, and with no way to turn it off, I had to mute the rear speakers before I could hear where the singers were on stage. The surround sound, on both series, was richer, more full of pomp and circumstance, but much less lifelike.

The Performances:

Not, though, that we're talking about sound that's all that lifelike in the first place. The two Scala discs, especially *Adriana* (which has refreshing clarity), aren't all that bad, but the Karajans are awful. Or let me qualify that. The Karajans, I'm sure, sound just the way the great conductor wanted them to. At this late stage of his career, he favored a rich, undifferentiated, beefy orchestral sound, and clearly reveled in every artificial way to make it even more that way on his recordings. There's certainly something impressive about the result, but

not in any way that reminds me of real music. There are wonderful, pop-production sonic moments, one involving a bass drum on the Vienna disc that made me feel that I'd descended to the roots of all the earth. But a bass drum would never sound that shivery and intimate in a live concert. If you have any taste for live orchestral music, the sound of these DVDs will be, at best, severely puzzling.

I might say as much for Karajan's performances. By one standard, they're wonderful. On the Vivaldi disc, he leads the Berlin Philharmonic; on the others, it's the Vienna orchestra. Both orchestras reach the highest levels of achievement, or at least they do if all you care about is pure technique; their sound, in a detached, not quite human way, is ravishing. The performances, for that matter, do everything performances of these pieces are supposed to do, except maybe touch the heart. There's something contrived, almost undifferentiated about them, as if Karajan looked at all music as some kind of abstract challenge, and even if he didn't sacrifice the most basic musical values, worked to make them sound like him, not like Dvořák or Vivaldi.

In one way, the Dvořák is the best of the three, because the music ends up speaking for itself, once you get used to Karajan's trademark sheen. There aren't issues of Baroque style (which might stop a purist from enjoying the Vivaldi), or Viennese frivolity. But then, from another point of view, the *New Year's Concert* is the best, because it raises no deep musical issues, and the sheer virtuosity of the orchestral playing can stand on its own. I'd rank it lowest, though, because this virtuosity seems almost unhinged, torn away from any real contact with human life.

www.theperfectvision.com

Our Member Site is now open! Try it for free!

- Weekly news updates
- First looks at new equipment
- Access past articles from *The Perfect Vision*
- Cutting edge reviews
- Editor's Choice listings
- Subscribe on-line
- Buy and sell equipment
- Manufacturer links

VISIT US TODAY!

Paging through the chapters is an eerie experience. At the start of each one, there's Karajan on screen, his face inscrutable, a mask of – what? He projects, at best, a statue-like institutional persona, "Herr Music Director of All Europe," as he used to be sarcastically called, in charge not of music, necessarily, but of musical institutions. Flip from one chapter to the next, and he looks the same. No New Year's froth for him; whatever's at stake here, it seems deadly serious, and I'm not the only one to find this unsettling. Two friends, both seasoned musical professionals, found it strange, as well, and one of them even told me that Karajan – his unmoving, not quite human face – disturbed her children.

The operas are happier experiences. Verdi's *Attila* is far from his greatest work; it was the product of a rushed time when he was building his career, a period he later called his "years in the galleys." There are moments when you know his heart isn't quite in the music that he's writing, maybe because at times he was too rushed to write music that he really liked. When I've seen it on stage, the work comes off like an animated poster, broad and bold but never subtle, though it has wonderful moments, like most of the last act, where there's a tenor aria that ranks with Verdi's best, and a trio that's simply ravishing.

This performance is broad and bold, but never quite involving. For a start, I'd blame Samuel Ramey, the *Attila*, and the reason for many of the opera's more recent revivals; not many works provide such a juicy title role for a bass, and Ramey's huge and oaken voice is perfect for it. (So is his bare chest, as almost any woman who saw him in the part will tell you.) His problem is that he doesn't give us any notion of the person behind the music. *Attila*, as a dramatic character, doesn't go very deep, but he's more than a cartoon, depicted, in fact, as the only honest human being on stage, the only one who isn't plotting against anybody, the only one who rejects cowardice and rewards courage, whether shown by friend or enemy. Ramey can't show us any of that, and plays the role mostly as a force of nature, powerful but blank.


Cheryl Studer, as the Italian warrior woman *Attila* falls heavily for (and who ultimately kills him) is another strong-voiced blank, completely unable to convey either her character's strength, her anger, her conflict, or her swirling, lost love for the tenor, to say nothing of all of these together. The tenor, Kaludi Kaludov, is far better, a manly persona with a ringing sound (it helps, too, that he gets much of Verdi's best music); his only problem, as video so mercilessly shows us, is that he looks Slavic, hardly his fault, since he's Bulgarian. But he's supposed to be Italian, and, unfortunately for him and us, this matters here, because the most convincing of the principals, baritone Giorgio Zancanaro, looks, with his fine, chiseled Italian face, exactly like what he's supposed to be, an ambassador from Rome. "Bring the Roman envoy to me," Ramey sings to a servant, and when Zancanaro comes on stage, reality, for one brief moment, settles into place, because a Roman is precisely what Zancanaro looks like. Nor is his solid baritone voice a disappointment. This is the one moment of dramatic truth in this performance; everything else, even Riccardo Muti's conducting – strong but blank, like his two leading singers – falls short by comparison.

Adriana is another kind of stew. Cilea was a minor composer of Puccini's era, the early Twentieth Century, with a gift

for heart-stopping moments. There are a few of these in this opera, most of them familiar excerpts, like the soprano's two arias, "Io son l'umile ancella" and "Poveri fiori," or the tenor's two. Everything else is empty boilerplate, and one principal character, the vengeful mezzo-soprano princess, has no real musical existence at all. The plot of the opera positively creaks, and should have been turned into a French farce. The Princess, at one crucial point, is hidden in a back room, not knowing that everybody knows she's there; it's meanwhile essential that everyone onstage should have a different notion of who she is. One intelligent question from anybody, and the whole tired house of cards would collapse.

So why perform this nonsense? Because it gives a soprano diva a commanding role, and this rendition features two divas at once, Mirelli Freni in the title part, and Fiorenza Cossotto as the Princess. And they're not just divas; they're aging divas, whose combined experience and charisma gives the performance a kind of stature, much loved in opera, that lies halfway between star appeal and utter camp. There are some problems, though. One of them is Cossotto's character, an older woman who, if she can't have the younger man she loves, would launch nuclear missiles, if only they'd been invented, to destroy the

world. This all is so absurd that, as I watched Cossotto, I almost had to look at the calendar to make sure it wasn't Halloween. Another problem is Freni's voice, originally a lyric soprano, and too light for this role, even though it's been strengthened by age and artifice; it still negotiates (rather than simply conquering) music that's too low for it. And the final problem, I'm afraid, is Freni's age. I can enjoy a battle of the matron-divas, but the whole point of the confrontation in this story is that Freni's character is young and beautiful, and therefore gets the guy Cossotto can't keep. We even hear about her age right near the start, when a devoted older man falls in love with her. Worse yet, Freni's one moment of real dramatic truth is only bearable if she's young. Her character is supposed to be a famous actress, and when she first comes on stage, she's worried about a passage in a role she's about to play. "I'm just a humble handmaiden of art," she tells us, and those sentiments from the lips of an older woman would be disastrously self-involved, too disingenuous to take seriously, even for a moment. From a woman of about 22, they'll pass, but Freni has not seen 22 for quite a while.

Beyond this, there's not much to say. The tenor, Peter Dvorsky, playing a character whose irresistible manly charms provoke everything, sensible or silly, in the story, sings in a manly fashion, while looking like a stable, proper bourgeois. The many minor characters are fine, except the scheming little Abbott, tenor Ernesto Gavazzi, who has a sharp, clear voice, but mugs relentlessly, underlining every utterance with a simper or a pose. I wanted to swat him like a fly. I can't finish, though, without a cheer for Maestro Gavazenni, whose alert, rapt, and passionate conducting deserves every drop of the audience's adulation. Gavazenni was music director of La Scala in a bygone era; Riccardo Muti, who conducts the *Attila*, is music director now. The difference between them – one man's art has character, the other is a flashy empty suit – tells a sad story about what's become of opera in our modern age. 

DVD-ness:
How well do these items use the DVD format?
Performances:
A question of another hue.



Surrounded!

Roger Reynolds: *Watershed* (Mode 70, DVD)

.....



Jargon

ere we have a first that needs attention – “the first music DVD [the package says] designed to totally utilize the medium’s full 5-channel capability.”

I just wish it were better, and less pretentious. The composer, Roger Reynolds, is (as he probably won’t forgive me for saying) one of the earnest, gray modernists of a past generation, a specialist in electronic music who teaches at the University of California in San Diego. One problem with modernist composers is (I’m tempted to say “was,” but they’re still with us, even if their influence has waned) that they over-intellectualize. They tend to over-value things in music that can objectively be analyzed, and then they turn around and insist that

everything in music can or should be analyzable. One mistake they make is to think that music is a language – not metaphorically (as when someone tells us “music is the universal language”), but literally. They think musical sounds are or should be connected by grammatical rules, like words in a sentence. That’s an academic preoccupation, if anything is.

On this DVD are extensive conversations with Reynolds, with Steven Schick, a percussionist who plays the longest piece on the disc, and with Peter Otto, a computer sound specialist who’s responsible for (jargon alert) the “spatialization” of sounds in one of Reynolds’ works. Now, we could argue over whether there’s too much conversation, and whether it ought to be sandwiched around the actual compositions, as it is on the DVD, or placed in its separate section, for

GREG SANDOW

Experiment in a New Medium

Because I’ve been exposed to far too much featureless modernistic music, and might be jaded coming anywhere near what looked to be new example of it, I thought I’d ask Barry Rawlinson to listen to this, too. A non-professional ear’s reaction would be worthwhile, I thought, especially since music like this shouldn’t just appeal to specialists. Maybe Barry would hear something in it that I didn’t. We heard and watched the DVD together, both of us for the first time. We didn’t discuss our reactions. Here are his, refreshingly more evocative than mine. GS

first played *Watershed IV*, in which the listener is placed at the center of a circle of percussion instruments. I found the “Raindrops” section a particularly engrossing piece as the surrounding forest of percussion is chaotically stimulated to reveal an imaginary landscape radiating outward into far darkness. I soon discovered that a mild elevation of rear-channel levels centered this sonic landscape in my room, at which point I ignored

BARRY RAWLINSON

the visual image in favor of the hemisphere of sound projected far beyond the walls, stretching into the distance all around –

The performance you experience will be defined by which sounds you choose to listen to, and your choice can vary from moment to moment, implying that you can never experience the same performance twice...

full immersion. The larger drums seem to ripple the floor as percussive wave fronts pass, smaller sources hang in space around you,

attention only if you care to give it some. I admit I'm skeptical about the need for so much commentary. Shouldn't the music speak for itself? But then maybe the techniques really are so new that we all need orientation.

Still, I knew we were in trouble when Reynolds tells us, with all the emotion of a librarian reading the phone book, that "meaning" will "arise" in his music from his "syntactical" use of space. There it is, that old fallacy of music as a language, with not just grammar, but syntax (a collection of rules that can turn languages into well-developed logical systems). Reynolds' statement – I'm not going to be shy here – is utter, total bilge. For one thing, notice that we don't talk about painting as a language. We don't look for "syntactical" relations between green and orange splotches in Jackson Pollock, or between the breasts of dancing women in Matisse.

In music, talk like this arises only because (and forgive me for getting technical) harmony – chords and chord progressions – can be talked about as if it followed rules. From a music theorist's point of view, what I've just written is a laughably simplistic statement, but these theorists, if they have even the lightest mist of compassion in their blood, will forgive me for sparing you the full complexities of their theories. What readers should understand, though, is that Reynolds is way too impressed with the mathematical explorations of music common among academic modernists, and has forgotten something very basic. Yes, theorists can find all sorts of relationships among chords, but any attempt to find something similar in other areas of music – rhythm, loudness, and tone color, for instance – has essentially been laughed away with the academic equivalent of a Bronx cheer.

So when Reynolds says he can create "syntactical" relationships from the spatial placement of sound, he's whistling in the dark. All he means is that he can create patterns of a

reasonably elementary sort – you know, like saying, "Hey, wow, Kenny dies in every *South Park* episode." Anyone can understand that this might give the show some continuity; nobody claims it's any kind of *South Park* syntax.

To me, the comments by Reynolds and his colleagues are badly sunk in jargon. "Instantiation" (meaning the way a sound begins), and "sense modalities" (meaning ways that we perceive things) are two examples. When Schick, the sober, well-meaning (and certainly skilled and sensitive) percussionist referred to his "practicing," I was ready to throw the DVD out the window. "In the course of my practicing," he said, "I've found..." (or words to that effect). What he means is not much more than "When I play my percussion gigs," or, to stretch things as far as possible in his favor, maybe "When I play a wide variety of percussion gigs." The benefit of all this jargon is all too clear. It serves, consciously or not, to inflate the importance of Reynolds' music. And by distancing the conversation from everyday life (and, in

fact, from any kind of human emotion), it enables all concerned to sidestep what seems quite plain to me, the unremarkable mediocrity of Reynolds' work.

There are four works on this DVD. The first, *Eclipse*, a 1980 piece for computer-generated sound, originally "spatialized" on seven channels, is a collaboration with video artist Ed Emshwiller, and it's his contribution that makes the time spent watching it worthwhile. Reynolds, ever the conscientious modernist, evades direct comprehension of his meaning by swirling shards of poetry around us in surround-sound space. His processing of human voices leads to wonderful moments, especially when the voices blend together in an unexpected chord. But these are only moments. To me, at least, the whole thing feels old-fashioned, stiff, and, to use the word again, too conscientious. Emshwiller, meanwhile, unfolds images that range from

The first music DVD with full 5-channel capability: The composer is a specialist in electronic music. A pairing made in a virtual heaven, or...?

gongs and cymbals shimmer from the depths beyond.

Within the piece *Eclipse* is a poem comprised of multiple

Female voice :

On the night of the quiet moon
He would be awakened
By the fleeting train music
Of thunder dawns
That brought on ruinous floods
And left a desolation of tattered gowns
Of dead brides
On the branches of the almond trees
Of the quiet moon
(repeats)
(repeats)
At the former Dutch lunatic asylum!

Male voice : The admonition of her craters,
her arid Seas, her silence
silence
silence
Silence!

voices that move in time and space to form shifting patterns of comprehension:

Male voice:

Her luminary reflection
Her constancy under all her phases
Rising and setting by her appointed times
Waxing and waning
Her power to enamour
To mortify
To invest with beauty
To render insane
The tranquillity
Of her visage
Her omens of tempest
And of calm

wandering, questing wiggles to a pulsing, stylized sun, all choreographed to the music, but far more gripping. (Imagine a dance with choreography more interesting than the musical score.)

The largest, longest work we're given is a 1996 composition with the name *Watershed IV*, and it's a tour de force for Schick's percussion. He stands in the middle of a circle of percussion gear, some familiar, some not, and at first I hoped the surround sound would simply let us hear what he hears, which would have been especially appropriate since the conversation about the lengthy piece stressed its structural use of percussion sounds, drum sounds in one place, maybe, succeeded by metallic effects.

What we get, however, is Peter Otto's "spatialization," or in other words his processing of the sound to shift it around in space, and sometimes in time as well, to make the spatial effects more noticeable. To put it differently, he's now applying his own kind of choreography, in this case a useful metaphor, because he makes the sounds move around in what might be some faint reminiscence of what dancers do. The only problem is that the piece itself is unremarkable and in fact close to stultifying.


One obvious difficulty is its lack of any real rhythm, astonishing in a work for percussion alone, and even more so in a work this long. Why there's no rhythm is suggested by an excerpt from Reynolds' written score, reprinted in the DVD's long, detailed (too detailed?) booklet. In what we're shown there, the percussionist is asked to play freely within given spans of time, sometimes faster, sometimes slower, but in rhythms he himself creates. In practice, these, to judge from what we hear, tend to be remarkably uneventful, essentially patterns of even notes. That creates a lulling effect, not conducive to sustained listening. I could also say that, while Otto is allegedly creating syntax by moving sound in space, the most elementary kinds of rhythmic syntax are completely missing. Odd. I couldn't stay with *Watershed* at all. (Those with computer DVD-ROM drives can check my theory; one added feature of this DVD is that they

Shouldn't the music speak for itself?

can print out large sections of the *Watershed* score.)

The other items aren't as striking, and to judge from the blurbs on the back of the DVD package, which don't mention them, are essentially there to fill out the disc. First we get an excerpt from *The Red Act Arias*, commissioned by the BBC and premiered in 1997. The piece was originally for live performers and 8-channel tape; we get just a little of the tape segment, mixed down to five channels. I liked it, maybe because it was short enough to be enjoyable just as sound, without wearing out its welcome or making unjustified artistic claims.

And then came the best item on the DVD, a surprise not mentioned on the box, in the booklet, or in the spoken commentary. This is called *An Odd Dream*, and is a two-minute excerpt from *Watershed*, with the visuals slowed down and the sound processed to sound vague and distant. The track is set to repeat infinitely, and creates a universe of its own. I kept waiting for it to end; I imagined changes that weren't really there, like the sound getting more and more vague. That's how the piece played with my expectations. I myself became a participant, and I think any listener would. Here, for once, we had something that lived up to the high artistic claims made for *Eclipse* and *Watershed*, something that really did change my perceptions.

This, in a word, was art. The rest of the DVD is academic timidity, though I'll grant that the spatial journeys of the sounds were interesting, and that 5.1 surround has sonic potential that, outside of the obvious movie effects, has only begun to be tapped. Reynolds, in the end, did me one favor. He made me want to hear more music that uses the full 360-degree rotation of real life – as long as we understand that the spatial placement is just another kind of color, another kind of narrative effect, similar to orchestration (playing music first on a violin, then on a clarinet), or to the imaginative stereo mixes we already get on some pop recordings. It's *not* a new development in musical language. 

I have transcribed this; it will give you a better idea of the experience of listening to this piece. Both poems exist independently, but taken together they convey a third.

Of course, the performance you experience will be defined by which sounds you choose to listen to, and of course your choice can vary from moment to moment, implying that you subjectively can never experience the same performance twice – a point that Roger Reynolds later pursues more blatantly in "An Odd Dream," which by repeating the same two-minute performance creates a mantra that becomes a meditation and then the ever-changing concentric reflections within a mandala.

Mr. Reynolds is playing games, as he tells us in the accompanying interviews, and these are games played with our perceptions of reality as distorted by time and space and the other tricks in his sorcerer's cabinet.


As his percussionist Steven Schick tells us, at some point, this stops being music and becomes ritual.

But we know the effect of endless repetition from centuries of experience of ritual, so while the point is valid and

proven by this hidden bonus track, it is hardly novel. What is novel is the use of new technology to "spatialize" the image, and here Reynolds is in danger of becoming intoxicated by the technology.

I think the composer has realized that one of the principal advantages of this format lies in the improved control of the room acoustic and he has used this to create a compellingly robust sonic hologram.

This gives rise to a heightened realism that can be both graphic and unnatural, and is carefully crafted by Reynolds. I found the subtler, more "realistic" sounds beguiled my ear more than those deliberately distorted by "spatialization," and by manipulations of the dynamic envelope. I should like to hear this solidity of image achieved with no engineering, other than the highest quality recording.

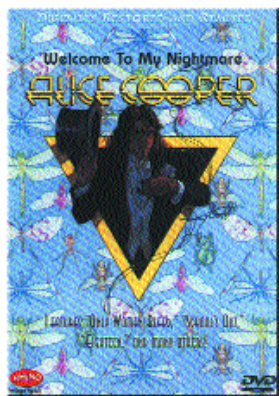
However, I think this a worthy experiment in a new medium with some worthwhile results. And I did particularly savor the utter tangibility of the imaging, even if each voice pops out of the background like the illuminated red nose of a clown... 



Pop With a Twist

.....

Alice Cooper: *Welcome to My Nightmare*.
Rhino 74469. \$19.99 (DVD).



alvador Dali saw his paintings come alive in it. Groucho Marx said it was great vaudeville and the last chance that burlesque had of surviving. Disney designed its costumes. It combined elements of *A Clockwork Orange*, *What Ever Happened to Baby Jane*, *Dracula*, James Bond, and Zorro. When it closed, the likes of Elton John, Michael Jackson, Kiss, and David Bowie borrowed its concepts.

No, it is not *Cats*. It is 1975's *Welcome to My Nightmare*, rock's very first full-scale theatrical tour, complete with dancing, illusions, movies, melodrama, and monsters.

Conceived by Alice Cooper and record producer Bob Ezrin, *Nightmare* was a huge gamble, costing over \$600,000 to design and hundreds of thousands more to compensate the tour's cast and crew. Such amounts may seem small in comparison to the mammoth pop productions we've witnessed since then (U2's four-story high TV screen on their 1997-98 *Popmart* Tour springs to mind), but conditions were considerably different in 1975. Remind yourself that no rock artist had ever staged a theatrical tour before. Cooper and Ezrin paid for the entire venture with money from their own pockets. *Nightmare* was so bizarre that it had two strikes against it from the start. There was an enormous risk of failure; if the tour bombed, Cooper's career might have been over. Some of the same uncertainties still exist now, but today *Nightmare* would at least be underwritten by corporate sponsors and Cooper's record label. And don't forget that the biggest gamble of all is removed – theatrical rock tours have existed now for 24 years, a parade that began with Cooper's original vision.

The performance we see on DVD begins with a film (another rock concert first) that depicts Cooper waking up and rising from his bed in a cemetery. Dressed in pajamas, he plays the role of a little boy who realizes he is interactively immersed in an unshakable nightmare. From the moment the concert begins, we experience the dream's dementia and its humor via Cooper's lyrics and encounters, all of which are scored to music, combining Cooper songs specifically written for the staged presentation, and older, classic Cooper hits.

To fully appreciate how intense the film is, consider that all its characters

and creatures – a legion of them – are played by an extremely talented ensemble of only six people. With no pauses or intermissions, the cast is forced to change costumes quickly, costumes that range from a one-eyed Cyclops ensemble to silver lamé space suits. The 18-year old woman who dances as a Day-Glo skeleton, crawls as a Black Widow spider, and awakens as the necrotic lover “Cold Ethyl,” to name but a few of her roles, met Cooper during the *Nightmare* tryouts, dated him during the tour, and is Cooper's wife to this day.

Does *Nightmare* still work now? If we ask whether or not it is fun to watch, the answer is resoundingly yes. Some of the props and effects are outdated, but that adds to the charm. What is most striking, though, is that two of Cooper's stage innovations seem as fresh today as they did in 1975: a movie screen that erupts from the floor, and a giant spider web,



which also rises from the floor and spans the width of the set. The way Cooper uses the movie screen has never been duplicated. A performance of the song “Escape” begins, and we see what is presumably a celluloid Cooper in a cemetery on the screen. Four alien

BOB GENDRON



creatures surround him, place him in a wooden coffin, but suddenly, to our surprise, he bursts out, runs through the screen, and lands on stage, while the dancing spacemen remain in the film. Soon, the aliens locate Cooper, and one by one they smoothly jump from their places on film to the stage. Before "Escape" concludes, Cooper and his pursuing predators jump back into the film and onto the stage once more, and the spacemen seize Cooper on stage. They carry him off into the screen, where, on film, we see him taken over the horizon, probably to his death. It is a scene that demands perfect timing and careful choreography.

The performance on the *Welcome to My Nightmare* DVD was filmed at London's Wembley Arena in 1975. Sadly, even though the original film was restored and its sound remixed, the DVD still looks and sounds like a grainy B movie. It lacks resolution, sharpness, and even cohesive audio. The sound fades in and out, obnoxiously, as does the loudness of particular instruments. That Cooper was an alcoholic, and drunk at Wembley (as he himself has said), doesn't help either. He sporadically undershoots high notes and garbles lyrics, turning in a below-average vocal performance.

If the quality of DVD is poor, why bother with it? Well, it's just too much fun to pass up. And despite its flaws, it comes with an exclusive and highly informative 25-minute interview in which Cooper explains his musical influences, superstitions, and film heroes (Bette Davis, James Bond), as well as the reasons why a male rock singer would invent a character named Alice Cooper, and play that role onstage. There is also an alternate version of *Nightmare* with a running commentary by Cooper himself; as we watch, it seems as though Cooper sits beside us while he describes the film. He even mocks himself at times, saying that if he could do *Nightmare* today, alcohol free, his vocals would be better. Besides, *Nightmare* is a starting point for those interested in the development of exotic fantasy at rock concerts. And, I confess, the crude look of the film gives *Nightmare* a certain cult-like feel. To put the options on this DVD in context, I'd watch them in the following order: The Cooper interview, *Nightmare* by itself, and finally the version with Cooper's commentary.

I can't resist mentioning *The Life and Crimes of Alice Cooper* [75680], Rhino's new four-CD box set, which makes a wonderful supplement to the *Nightmare* DVD. The CDs arrange Cooper's 32 years of music in chronological order. If we listen in sequential fashion, we trace Cooper's rise, pinnacle, fall, and slight rebound. Discs one and two, which span a period of 11 years (from 1966 to 1976), are essential, and document Cooper's most creative work.

From 1976 to 1985, Cooper battled drinking, spent time in treatment, and recorded several forgettable concept albums with which only he seemed to relate. Having lost most of his original band to solo careers, Cooper chose to work with session players rather than assemble a new group. In what may have been an effort to lure the public, whose tastes lay with disco at the time, Cooper embraced a disco-like sound, and layers of excessive keyboards supersede his usual shrill, edge-slicing guitars. He also drops his familiar diabolical snarl in favor of a warm purr, a transformation that strips his music of its adventurous edge. The team who assembled the box set seem to recognize this; they included just 12 songs from the six albums (all of them out of print in the US) that Cooper

released during these years.

After alienating many of his fans, Cooper enjoyed a comeback with 1989's slick, hook-heavy *Trash* (which profited from the last stages of the late Eighties hard-rock boom), before sinking to an all-time low with 1991's moronic *Hey Stoopid*. Once fantastically original, Cooper's lyrics and music now became pathetic clichés. Several tracks on his later albums, including songs from *Trash* and 1994's *The Last Temptation*, remarkably reveal Cooper to be a proficient mainstream pop writer, a facet that, thankfully for his hardcore fans, didn't surface in his earlier works. The main reason you'd buy this box is for the first two CDs and the comprehensive booklet inside.

I'm compelled to close with a wonderful quote from an affectionate essay, specifically written for the box set by none other than John Lydon (a.k.a. Johnny Rotten of Sex Pistols fame): "There's originality and then there's always ten cheap versions, and it's a shame that it's those versions people pay attention to. They don't want to find out the history of how things emerged, and that's too bad, because without any historical perspective, nothing can make any sense...I love originality, and there's nothing like Alice Cooper...before or since, really. Alice Cooper...whatta man." Indeed.

Radiohead: *Meeting People Is Easy*. Grant Gee (director). Capitol. \$19.99 (DVD; VHS).



The title is a sarcastic jab at music journalists, hangers-on, and overzealous fans. The film, subtitled "A Movie About Radiohead," is a chronological documentary that traces the group's 1997-98 tour from its beginning to its conclusion. *Meeting* does not glorify Radiohead's live performances (as R.E.M.'s *Roadshow* does) or rock star lifestyles (like Marilyn Manson's *Dead to the World*). Nope, this is exactly the opposite – if there ever was any true-to-life film made about the emptiness of

being a successful rock band, this is it.

Meeting is made from what seems to be a callous and uninviting point of view. After watching it, we sense that Radiohead was uncomfortable with its new fame after releasing *OK Computer*, an album that not only won a Best Alternative Record Grammy in 1997, but also received critical acclaim all over the world, landing on nearly every critic's top ten list. The film gives us a first-hand look at life through the band's eyes. We are placed in hotel rooms where our privacy is invaded, swept onstage where no matter what we do, the audience still wants more, and dumped in the band's car/bus/train/Lear jet (the film's point seems to be that, it's all the same after a while), where everything is uncontrollably moving around us. All these frantic experiences, and more, constantly accompany Radiohead on their tour.

Personally, I find it difficult to empathize with rock stars, but *Meeting* confronts my beliefs that famous rock celebrities are luckier than everyday people. I lost count of the critics hounding the band, the profusion of printed record

reviews scrolling across the screen, and the many images of endless pavement, tunnels, and indistinct automobile headlights vaguely glowing from neon-lit gridlock. Much rock journalism might as well be printed in a tabloid, because of its sensational pursuit of rumor and hype. This film exposes the soap-opera mentality of writing like that, with segments in which sound check footage drowns out interviews (the music audibly suffocates the press to symbolize the insignificance of the media) and with a revealing scene where lead singer Thom Yorke's reluctant, wiry body contorts under the onslaught of merciless flashing cameras. By the end of the film, you will ask yourself, "Why?," the same question Radiohead probably ponders as well.

Several scenes demonstrate the group's occasional lassitude (an expected side-effect of touring), but none more so than the bored look on Yorke's face when he's performing "Creep" in Philadelphia. As the audience chants the song's verse, Yorke apathetically stands like a cardboard cutout, holding his mic towards the crowd. He finally turns it inward with apparent disgust, as if he imagines it to be a painkilling dagger, and tellingly slurs the tune's climactic line, "What the hell am I doing here?" We can barely hear Yorke against the din of the band; all we clearly make out are cries from the audience, "We love you, Thom!" Still, compared to the exasperating journalists Radiohead encounters in every town (and who, among other offenses, ceaselessly fire redundant questions and arrive at interviews unprepared), the fans and their blind lust for the band seem easy to cope with.

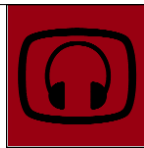
Meeting is Capitol Records' first venture into the DVD market, and strangely, the Radiohead DVD's cover art is obtuse, to the point where you almost can't see the band's name. The DVD has no chapters, which may annoy those accustomed to selecting particular slices of the movie for repeated viewing. But the constant alternation of black and white with color footage, and slightly grainy film with more vibrant stock, combines with multi-perspective angles (many shot with a minicam) in creating a stimulating A/V presentation that DVD, with its digitally clear resolution

and seamless flow, best allows. Sonically, the DVD has 5.1-channel and AC-3 surround sound that serves us well. Since *Meeting* does not focus on concert footage, but is instead a collage of events and experiences, it's appropriate that the sound wraps us in a cocoon, and lathers us with ambient electronic pulses, squealing fans, and the echoes of interviews. In scenes where we're surrounded by the crowd, the band, and the acoustic ricochet of a concert hall, and simultaneously see strobe lights dance off the band members onstage, the DVD delivers a menacing, and almost claustrophobic, feeling.

Whether or not you like or know Radiohead's music is beside the point. Tour documentaries have existed for years, but *Meeting* assails your senses and then dares you to *think*. You'll come away feeling as if you've been through the grind yourself, and it's that realism, however unnerving, that makes the film worth owning. Consider it an introduction to media studies: *Meeting* demonstrates how the media manipulates and harasses rock stars in an effort to glamorize rock stardom for all it's (\$) worth.

Fugazi: *Instrument*. Jem Cohen (director). Dischord 80. \$18.00 (VHS only).

Fugazi is difficult to describe - the band escapes classification. Even when I state that Fugazi *is* a band, I fail to provide the whole picture, because Fugazi is more than a band; it's an ideal, a political concept, a paradox. I've had an easier time explaining The Grateful Dead's 30-minute "space jams," full of guitar feedback, to people who wanted to understand what that group was attempting (if wasn't just pure obfuscation, which sometimes it was). In Fugazi we have a band that distributes its own records, books its own shows, has never taped a music video, works exclusively with independent promoters, hawks no merchandise (not even T-shirts), and charges only \$5 for a concert ticket. Think about it. Today, \$5 wouldn't even buy you a Rolling Stones bumper sticker. Does all this sound like what some artists are doing on the Internet? Yes, indeed, but Fugazi was





practicing its independent philosophy before “Internet” was even part of our vocabulary.

By remaining true to its standards, Fugazi is, without question, in a league by itself. Champions of free speech, free thought, the homeless, minorities, AIDS research, and the elderly, the group rejects violence, racism, homophobia, war, alcohol, drugs, and slam dancing. Not only does it charge a mere \$5 for its cathartic live performances, many of which are benefit shows, it managed to price its albums at only \$8 until 1997, when for *End Hits* it raised the price to \$10.

How is all of this possible? It helps that Fugazi’s founder and leader, Ian MacKaye, also co-founded Dischord Records, the now legendary Washington, D.C., punk label. MacKaye is one of the last active members of the original D.C. “strait-edge” (read: no drugs or alcohol) hardcore scene of the early Eighties. By setting up networks of fans, print rags, and home-grown record labels across the country, the D.C. scene thrived without the help of the record industry. Among the D.C. bands that took things into their own hands were MacKaye’s Teen Idles and Minor Threat, both of which expressed their rage and frustration at the Reagan era through one-minute punk blasts. In 1987, MacKaye formed Fugazi with cohorts Guy Picciotto on guitar and vocals, Joe Lally on bass, and Brendan Canty on drums and bells; MacKaye named the band Fugazi after coming across the word in a dictionary that defined it as a messed-up situation in Vietnam. Fugazi has released six full-length albums, and a few EPs, and now the group has made its first ever home video, *Instrument*, which started out as a private documentary and evolved, 12 years later, into a visual history for the public.

The spirit of the film is pure Fugazi. Most of *Instrument* was shot using Super 8 and 16mm film (the director’s preference), with more recent footage captured on video. Videophiles may turn their noses up at the hardly high-tech formats, but expensive professional filming would be out of

place for a band like this; the director notes that the two-hour *Instrument* cost less to make than most three-minute videos on MTV. And just like recent engrossing, low-budget independent films (*Gods and Monsters*, *Cookie’s Fortune*) that oppose the omnipresent cross-corporate digital monstrosities (*Godzilla*, *Armageddon*), *Instrument* is better than the majority of the “here today, gone tomorrow” videos flooding the market. *Instrument* is about a band, its fans, music, and mission; there’s no place for premeditated hype and sensationalism.

With scenes shown in non-chronological order, *Instrument* gives us a seething mix of images. MacKaye erupts into the microphone like a shark expanding its jaws before it devours its prey; Picciotto plows his right hand into the guitar’s scuffed body as if he were punching a hole through a plaster wall; Lally plugs his bass as he staunchly stands like a marine waiting for his superior officer to inspect him; and Canty whacks the old-fashioned school bell that shares space with the cymbals on his drum set, as if he were speaking to the band in Morse code. A haze of distorted melody fills the stage, drum beats resonate, and the resulting sound is perfect – so natural that it seems to be unamplified. Meanwhile, as we watch the video, we are up on stage with the band, close enough to see that MacKaye’s worn black canvas loafers are indeed without a brand name.

With interviews, recording sessions, and performance footage, *Instrument* proves that like The Grateful Dead, Fugazi functions as a “group mind,” able to improvise and to stretch songs into long, cohesive jams without a predetermined scheme. Other artists, such as Elvis, performed without a set list, but they called out the names of songs they were about to sing, to cue their bands. Nobody in Fugazi does this. Rather, in order to segue from one song to another, Fugazi relies on instrumental cues, hand signals, tempo shifts, glances, and nonverbal follow-the-leader communication (the leader being whoever first initiates the beginning of the next song). To triumphantly pull this jazz-like feat off, the band relinquishes any selfishness in the name of a one-for-all mentality. Fugazi has stated that music will become powerless if it isn’t unsettling, and a force for political change. The record industry and all serious new artists of today should take heed – Fugazi is in it for life and wants long-term change. Its work isn’t finished just because it plays one benefit show; it seems to recognize that social change doesn’t happen so simply. This band may never change the world, but what matters is that it will never give up.

Of course, in order for a group to thrive in such an alternative universe, it needs a two-way relationship with its fans, one that is based partly on trust, but more on respect. Fugazi has a cardinal rule of thumb when it plays live: It wants an audience of whole human beings, not simple idlers or consumers. That’s why it plays with such unnerving energy. While it’s true that such an audience does not always exist, Fugazi’s anti-marketing stance, low prices, word-of-mouth promotion, and broad-minded concert rules all help eliminate the coattail riders and drunks commonly found at the average



rock show. Furthermore, Fugazi's principled way of being a rock band doesn't tend to appeal to the kind of people (i.e. frat boys, wanna-be's, rednecks) who attend rock concerts in order to get high or smashed or both.

One thing *Instrument* does not provide is a sense of Fugazi's musical evolution. And so I urge you to listen to the band, sans video accompaniment. The quartet's first two records, *13 Songs* and *Repeater*, have brisk, abrasive melodies and bracing stop-start rhythms; they are a perfect hybrid of punk and straight-ahead rock. Straightforward, driven by an intense urgency readily identifiable in MacKaye's voice and Canty's thwacking percussion, these records besiege a listener, challenging our concept of what rock should communicate. These are two of the most solid independent albums ever released.

With 1991's *In on the Kill - taker*, Fugazi branches out. Galvanized distortion merges with extended guitar hooks, and tension and suspense swell during moments of complete silence. Despite its occasional surrender to generic racket, *Killtaker* manages to add complex rhythms to the combustion and cavalry-charge energy of Fugazi's earlier work. 1995's *Red Medicine* fuses delicate piano and brass motifs that crudely coexist with uptempo punk. Certain songs are surgically precise while others, with sounds of distracting laughter and talking, are coarse and broken. Unfortunately, Fugazi attempts too many rhythmic variations and seems unfocused. The group's usual thick and jagged approach gives way to a soft, unrehearsed performance, and for the first time, the music doesn't flow or breathe.

1997's *End Hits* is less fragmented, but even though it sounds milder, Fugazi's social criticism still gives the music bite, revealing the band to be more comfortable with its new approach. 1999's *Instrument* is a soundtrack to the film bearing the same title, and a set of acute songs and instrumental demos from 1989 to 1997. On all these records you will hear the kind of striking depth and dogged precision you would normally associate with the most scrupulous classical ensembles. Although *Red* and *End* aren't as good as they might be, they only seem below average in comparison to Fugazi's best work, because the band sets such extremely high standards. Which raises a question: If Fugazi's later albums aren't as good as its first three, is that because the group failed to live up to its principles, or weakened them? I firmly believe that the band's comparative decline was a by-product of evolving, and experimenting with new sounds. Every great artist makes at least one mediocre record. Most bands would consider *End* a masterpiece, while for Fugazi, the album is a sign that the group is back on track, even if the music is still a tad below the almost unachievable standards Fugazi set earlier.

I'll end by describing some unforgettable scenes from *Instrument*. Cohen films people in line for tickets. Some are young, some old, some white, some black, some brown -

most are dressed down, some gussied up in business suits. And when you look at their scarred faces, dim eyes, spiked hair, and pierced lips, you may be quick to label them as punks, delinquents, or losers, because they fit these stereotypes. But really, this audience embodies diversity. It's a slice of ragged Americana, an assortment of folk not imaginable at most rock (or classical or jazz) concerts, which automatically exclude poorer, younger fans because ticket prices are so absurdly high.

At one performance, we see the front row of an audience being crushed into a guardrail by the push of hundreds of swarming bodies. Seeing the crowd veering out of control, Fugazi abruptly stops playing. MacKaye announces that someone's head has split open and that the vicious elbowing needs to cease. Video scans of the crowd reveal six angry, drunk, insensitive teenagers near the front row. After issuing his warning, MacKaye leads the band back into the music. Moments later, the band's misgiving comes true. Something flies onto the stage and hits MacKaye, who immediately signals the band to halt. MacKaye, aided by two enormous security assistants, struggles to pull a young guy out of the swaying audience. Finally successful, MacKaye grabs the teen, holds him in a headlock, drags him to the microphone, and demands a public apology; the kid, apparently, had spit at him. MacKaye asks the fan to make amends twice more, but the guy cannot manage to utter anything discernible. MacKaye then picks the offender up, informs the audience the youth is getting removed, and carries him to security personnel backstage. The crowd erupts in applause. Wow - of the hundreds of rock concerts I've attended, never have I seen an artist give any offender even one chance, let alone three, to redeem himself and remain in the audience. Fugazi's patience must be unwavering. As the band walks off stage after playing its encore, the same kids spit at them again.

When I was jolted by the seemingly frightening faces in shots of the people in line to buy tickets, I became troubled, even though I have been at concerts with people of the same sort. Wanting to know why, I searched my soul and thought of Fugazi's fans as an antidote to inner fears and prejudiced mindsets. We cannot allow our minds to vegetate so much that we openly embrace narrow-minded views. If the only thing *Instrument* does is rattle our preconceptions about youth or punk, I believe it's done enough, and perhaps we'll be happier and more tolerant because of it.

This film and all Fugazi albums can be ordered, postage-paid, directly from Dischord Records, 3819 Beecher Street NW, Washington, D.C. 20007. Phone: 703-351-7491. Website: www.dischord.com. Most titles are also available at reputable record stores and on the Internet, but at slightly higher prices.



With scenes shown in non-chronological order, *Instrument* gives us a seething mix of images. MacKaye erupts into the microphone like a shark expanding its jaws before it devours its prey; Picciotto plows his right hand into the guitar's scuffed body as if he were punching a hole through a plaster wall.



A Close Encounter

Voices of Light/The Passion of Joan of Arc

.....



rom the moment of its rebirth two issues ago, *The Perfect Vision* has addressed itself squarely to the difficult concept of “multimedia.” Essays from Greg Sandow and HP in Issue 24 sought to define what multimedia is and is not, and to imagine its possibilities. Sandow, in a piece that touched on unfolding technical developments, offered the computer game *Myst* as a “domesticated case of true multimedia.” A *bona fide* specimen, perhaps, but not one that aims very high. HP noted the limitations of currently available software that present the marriage of music and images. He considered DVDs of an opera “gala,” a classical concert video, a Sondheim musical, a pop music video – and found them all to have shortcomings. He also described two potential multimedia experiences he had in the concert hall, both involving music by minimalist Philip Glass: the opera *Einstein on the Beach* and Glass’ score for the film *Koyaanisqatsi*. These were, I’m sure,

intensely sensuous experiences. Still, for many listeners, the repetitive nature of much of Glass’ cleverly constructed music doesn’t demand attention on a moment-to-moment basis and can induce a nearly physiologic contemplative state that, I think, allows a listener to focus more keenly on whatever else is before him, on the stage or screen. If this seems hard on Glass, I don’t mean to be. It would just help if our early models for multimedia transcended issues of musical and narrative style.

A useful prototype could be what visual artists call “mixed media” – an oil painting with collage elements like fabric, paper, or “found objects” incorporated into the canvas, for example. The different materials have their own textures, requirements for manipulation, and associations with both artistic tradition and the real world. The challenge is to maintain their individual characteristics and, at the same time, integrate them.

ANDREW QUINT



Is this achievable with multimedia involving music? Can the whole be greater than the sum of its parts?

On a Monday evening in May, I attended a production that was certainly a close approach, one that suggests interesting prospects for multimedia's future. The occasion was a performance of Richard Einhorn's *Voices of Light*, along with a screening of the silent film masterpiece *The Passion of Joan of Arc* at Avery Fisher Hall in Lincoln Center. Details concerning the musical work and an interview with the composer can be found in an article I wrote for *The Absolute Sound* (Issue 115), but the background can be laid out briefly. Einhorn is a New York-based musician who, a decade ago, discovered the 1928 film, directed for a French studio by Carl Dreyer. Cinema authorities routinely cite *The Passion of Joan of Arc* as one of the most perfectly realized and influential movies ever made. The unusual camera angles, frame-filling close-ups, naturalistic acting, and the manner in which the film is edited will impress even a casual viewer as remarkably "modern." The work derives much of its power from Dreyer's casting of Maria Falconetti, a stage actor recruited from the Comédie Française, in the title role. So truthful is her portrayal of Joan's ordeal that the performance can become almost difficult to watch. The actress reportedly suffered a psychological collapse during the shooting.

Richard Einhorn used Dreyer's film as the inspiration for an oratorio on the subject of Joan of Arc's final days – her imprisonment, trial, and fiery death. The piece is written in an accessible, but distinctive, musical language, largely tonal, with dissonances applied sparingly. There are elements of

minimalism, but these are subtle components of the musical texture, and the work has a fairly conventional dramatic shape with a strong sense of forward impetus. Einhorn captures well the relentlessly claustrophobic quality of the movie (all but the very end is filmed indoors), Joan's vulnerability and spiritual core, and the viciousness of her inquisitors.

Voices of Light has had an excellent Sony recording [SK 62006]. That CD features, as the voice of Joan, the four women of Anonymous 4, a quartet that specializes in Medieval polyphony and has achieved, by classical music standards, something like star status. The work has also been successful in concert, with dozens of public renderings since its premiere in 1994. The composer invited HP, my wife, and me to a special presentation of *Voices of Light/The Passion of Joan of Arc* celebrating the 15th season of Marin Alsop's Concordia Orchestra. Alsop, who is also music director of the Colorado Symphony and who has recently been named principal guest conductor for several European orchestras, is known as a tireless advocate for American music. She knows the Einhorn piece well, and the participation of Anonymous 4 promised a definitive performance. The auditorium was full and the atmosphere expectant as the lights dimmed.

Technically and musically, the evening went splendidly. The Dreyer film was projected on a large screen suspended over the musicians, and the quality of the image was excellent. Orchestral and choral execution were unassailable. But although I knew Einhorn's work very well from the CD and I'd watched the movie on video several times, I was not prepared for the emotional impact of the event. Somehow, I'd expected the film and oratorio to be presented sequentially. Richard

Einhorn has emphasized that *Voices of Light* is not a film score for *The Passion of Joan of Arc*, and he feels that any attempt to compose one would be folly. As he told me a few weeks after the Avery Fisher performance, "There have been some 30 scores written for the film. This figure comes from an article I've read; I've been able to document about 17. All of them, according to my informants, are awful. The reason is obvious. The movie is about as complete as it can be. The rhythms of the film contradict any typical film score approach – trying to Mickey Mouse the action, underscore the emotion, etc." But to present the two works back to back would make for a very long evening and would also be, the composer noted, "a bit didactic, like having everyone gather to read Nietzsche after a performance of [Richard Strauss'] *Also sprach Zarathustra*." So, the hall went dark and, with Anonymous 4 singing the Old Testament passage that opens *Voices of Light*, the film rolled.

The movie and the music finished virtually simultaneously, and along the way were many striking correspondences. For example, a section in the oratorio called "The Jailers" began just as Joan, on screen, is being abused by leering guards. The texts at this point are drawn from Thirteenth Century misogynist verse ("When it comes to women, men, hold your tongue! On the outside she's religious, on the inside keen and venomous..."). This, and many other instances, were not merely happy coincidences, nor was the music meant to "accompany" the action. Rather, they quite naturally fell out of Einhorn's effort to follow the *structure* of Dreyer's film in devising his own work. The result is that *The Passion of Joan of Arc* and *Voices of Light* illuminate each other. Seen together, they seemed inseparable; yet I knew from experience that each was entirely self-contained.


This is new territory, and I found that some of my own personal rules didn't necessarily hold anymore. Walking into Avery Fisher, I was disconcerted to see a large mixing console halfway back in the hall. Every singer was miked, along with the chorus and orchestra. But once the concert began, it was apparent that this decision did not deserve the scorn earned by much of the "sound reinforcement" heard in Broadway musicals these days. True, I missed the nuanced delicacy of Anonymous 4's singing, as I've heard it in a Philadelphia church. But the four vocalists, singing softly for most of Joan's music, would never have been heard in the large auditorium. In addition, Einhorn likes the aural sensation that electronic enhancement engenders. "The sound of amplified instruments is different from non-amplified. Not worse: simply different. If, say, a violin has a pickup attached and is amplified so that it is far larger than life, it has an amazing sound for me. It's the aural analogy to the 'magic realism' of South American writers like Gabriel Garcia Marquez." Although the composer doesn't insist upon amplification for all performances of *Voices of Light*, it was certainly his original intention. "It gave the music a hallucinatory quality that I

thought was entirely appropriate for a representation of Joan of Arc. It was also a sounding analog to the visual displacements that are a hallmark of the visual style of Dreyer's film." So, the nature of one medium informed the technical realization of another.¹

Was anything lost at the performance that night? One possible casualty, it occurred to me, were the words Einhorn had chosen to set to music in *Voices of Light*. The texts are a rich composite drawn from biblical sources, medieval female mystics, and Joan of Arc's own letters. They are sung in the original languages: Latin, Italian, and Old and Middle French. Needless to say, translations are necessary and they were provided in the program at the concert, as they are with the Sony recording. But in the darkened hall, it wasn't possible to follow along. Would Einhorn consider projection of the texts in some fashion – as supertitles, or on something like the LED screens that are installed on the backs of seats at the Metropolitan Opera House? "We have not tried this yet and I would like to," said the composer. "It would change the piece dramatically, but not necessarily for the worse. By projecting my texts, the balance of image, music, and word would be shifted to the word and to the tension

between the linear narrative of Joan's trial in the film and the non-linear organization of the music texts. I would love to find out what that feels like!"

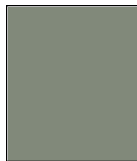
In fact, Einhorn was far less worried than I was about the audience missing something. "The notion that the experience of a piece of music begins and ends when the music begins and ends is an odd one to me. If we are moved, we carry that emotional experience with us for quite a while. In the case of *Voices of Light*, I quite consciously wanted to provide an audience with more information than they could apprehend at one performance. Why? Because that's what makes art fun and different from simply entertainment. You come back to it, to experience something that you haven't grasped before."

The feeling, then, that there *was* more going on in the hall that night than I could take in – this despite familiarity beforehand with the component parts – may have been the best indication that I was in the presence of something different, something we might truly call "multimedia." I have a growing understanding that it can be exceptionally demanding, can mean abandoning some old ideas about how we should perceive art, and that it can be very, very wonderful. 

Andrew Quint has written on musical subjects and reviewed classical recordings for The Absolute Sound. He lives in Philadelphia.

¹ Einhorn reports that reverb was added to the amplified signal. He's not certain if there was any compression or equalization, but said he wouldn't be surprised if there were; it's a common practice with amplified music.





VIDEO INSIGHTS

GREG ROGERS

.....

An Introduction to Digital Video

Part 2: Video Color Concepts

Color is critical to the performance of any home theater. Most of us instantly recognize the problem with our neighbor's TV, orange faces that look painted for Halloween or dull washed-out colors in a parade. We may not have problems like that in our equipment, but even subtle errors in color accuracy will produce unnatural flesh-tones or destroy the carefully painted vision of a master cinematographer. So I want to discuss some basics of color that apply to video – the factors that are required for a display to achieve accurate color and how we measure and present color accuracy to you.

1. The Physics of Color

The subject of color science could easily fill this book. But all we need to know is that color is a characteristic of light defined by its spectral content, i.e., the distribution of energy at different wavelengths. The visible wavelengths of light are roughly from about 380 nm (nanometers) to 780 nm. An example of one color of light is shown in Figure 1.

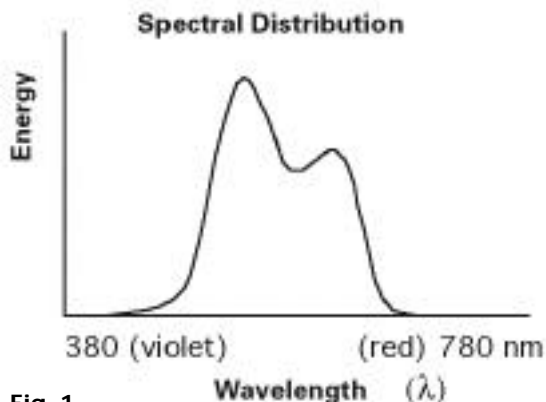


Fig. 1

2. Human Color Perception

In the human eye, light enters through the pupil and forms an image on the retina, which has photoreceptors that convert light into signals that are processed by the eye's neural circuits, which then transmit information to the brain.

Two conditions are necessary to achieve perfect display color accuracy. The grayscale must maintain a perfect D65 color temperature across the entire brightness range of the display, and the CRT phosphors must match the SMPTE C standards...For this reason, the blue-filter method [of calibration] must be considered an approximation for consumer monitors.

Vision in normal lighting depends on photoreceptors called *cones*. (Our vision at night depends on photoreceptors called *rods* that have no color-discrimination capability, so we are all colorblind in dim light.)

There are three types of cones with different spectral responses that are sensitive to long, medium, and short wavelengths of light. They roughly match the spectral distributions of the colors red, green, and blue. Their responses are shown in Figure 2. These response plots have been

normalized in the diagram. We are actually about 20 percent more sensitive to the green curve than the red, and about 40 times less sensitive to the blue curve.

As the wavelength of light varies, the probability that a cone will absorb that light depends on its spectral response, but all light absorbed by the same cone contributes equally to its response regardless of wavelength. The relative amounts of light collected by the three cone types, our tristimulus response, determines how we perceive a particular

Spectral Response of Retina Cones

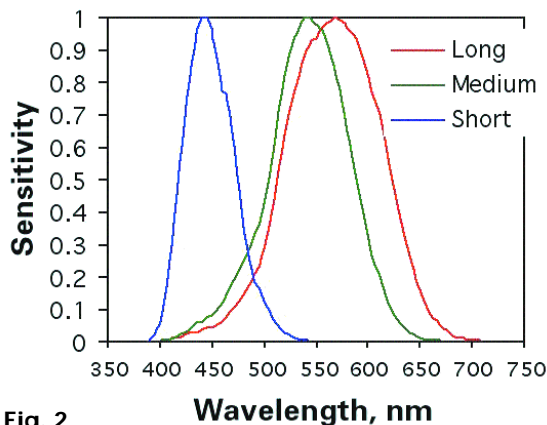


Fig. 2

color. This makes human color perception trichromatic (three-color). The sum of the three responses determines our perception of brightness, while the ratio between the three responses determines our perception of hue and saturation, the chromatic properties of light.

Interestingly, different spectral distributions can be perceived as the same color if they provide the same tristimulus response. Also notice that there are areas at the extremes of the visible range where only a single type of cone has any response. That means colors in those areas will be perceived the same, since there is a response from only one type of cone.

Colorblindness

About 0.003 percent of people can't see color at all. About 8 percent of males and 0.5 percent of females are color blind, which means they don't see color the way most of us do. About 2.5 percent of males see reds and greens as the same color. The other 5.5 percent of colorblind males match colors differently than the rest of us and differentiate small color differences less well. This hasn't much to do with video, but it was too interesting to leave out.

3. Color Concepts for Video

Additive Color

All video display systems create colors by adding together three primary colors of light, which is equivalent to adding together their spectral distributions. Red, green, and blue are used by video systems as primary colors because they

can create a wide gamut of visible colors.

To be a primary color, it is only necessary that no primary can be created by a combination of other primaries. It is also important to our video system that adding the three primaries in some portions will create a reference white color.

In video projectors, the three light sources are mixed by overlaying them on the projection screen. In direct-view monitors, phosphor dots or stripes of the primary colors are arranged so closely together that the eye perceives the light coming from a single location. The eye's visual acuity (ability to see detail) to color is related to the separation of the cones on the retina.

Luminance

Luminance is a measure of our sensation of brightness. It depends on the spectral sensitivity of human vision. Colors closer to the center of the visible wavelength range (yellow-green at 550 nm) are perceived as brighter, and therefore have higher luminance than other colors with the same energy.

Hue and Saturation

Hue is what we commonly refer to as red, green, yellow, greenish-yellow, and so forth. It is related to the dominant wavelength of a color.

Saturation is the purity of the color, what might be described as its vividness or depth of color. The more pale the color, as a pastel, the less saturated it is. A color can be desaturated by adding white. If a color is formed by adding portions of three primaries, some portion of white that consumes one primary can also be formed. That portion of white can be thought of as desaturating the color formed by the remaining portions of the other two primaries.

The Color of White

It may seem that the color of white is unique, a black and white matter. But of course there are many colors of white. Compare the pages of this book, writing paper, or anything else you normally define as white. They all have a distinctive hue. In video systems, the color of a reference white is crucial to generating all other colors. So it is critical to have a precise method to specify the color of white required. The physicist Max Planck determined that carbon heated to extreme temperatures emitted light with broad spectral distributions (i.e., shades of white) determined by their temperature. In physics these are called blackbody radiators. Standard illuminants are defined by the temperature of a blackbody radiator that most closely matches their color. This is called the correlated color temperature, which is measured in absolute degrees Kelvin (K). So the color of white can be specified by a temperature. All of our current video systems use a standard illuminant called D65, at a correlated color temperature of 6500 K.

4. The CIE Color System

It is far too complex in practical applications like video to specify colors by their spectral distributions. The CIE (Commission Internationale de L'éclairage - International

VIDEO

Commission on Lighting) was created in 1927, and in 1931 established a colorimetry system to describe colors using a simple system of numerical coordinates. I won't delve into the details behind that system other than to say it is based on the tristimulus response principles discussed earlier and experiments that were done with human observers. A result of their work was the creation of a two-dimensional (x,y) chart called the CIE Chromaticity Diagram. (Figure 3)

CIE (x,y) Chromaticity Diagram

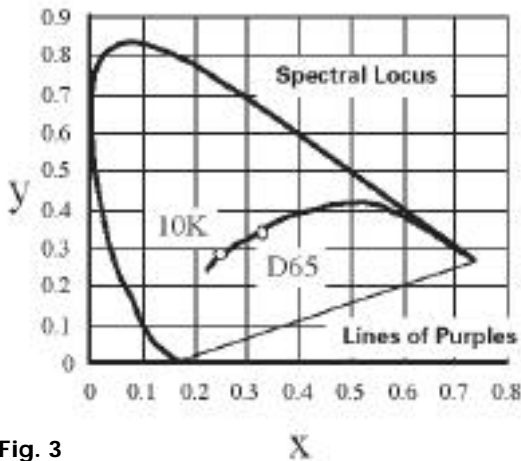


Fig. 3

The CIE Chromaticity Diagram

The horseshoe-shaped curve in the diagram is called the Spectral Locus, and consists of all colors with only a single wavelength. The lowest wavelength color, ultraviolet at 380 nm, is located at the bottom left of the horseshoe, and the wavelengths increase moving around the Spectral Locus to infra-red, at 780 nm, on the far right. The Line of Purples connecting the ends of the locus represents colors that cannot be created with any single wavelength.

The line shown in the middle is called the Plankton Locus, or blackbody radiation curve. The color temperature is infinite at the left end and drops to several thousand degrees as the Plankton Locus converges with Spectral Locus in the reds. The important D65 white reference, at a correlated color temperature of 6500K, is at (0.3127, 0.329) expressed as CIE (x,y) coordinates. It is a "correlated" color temperature because it lies just off the Plankton Locus.

Brightness is not shown on the diagram, only saturation and hue. The hue of totally pure colors is determined by their position on the Spectral Locus, or Line of Purples. The saturation is determined by how far the color lies from the reference white point near the center of the diagram. The pastel colors lie close to the center and the pure, fully saturated colors lie on the horseshoe.

5. Display Color Accuracy

RGB Primaries - The Color Triangle

One of the properties of the CIE diagram is that any color

created by mixing two other colors will lie on a straight line connecting them.

The distance along the line where the new color appears is inversely related to the proportions of the two colors. Since all single-wavelength visible colors lie on the Spectral Locus, all visible colors must be inside the locus. Furthermore, it follows that all colors made from a combination of three primary colors must lie inside a triangle formed by the three colors. Colors outside the triangle cannot be reproduced because that would require negative amounts of light from one or two primaries.

The red, green, and blue primaries of video systems are chosen to enclose a reasonably large triangle that determines the entire gamut of colors that can be displayed. If two displays have slightly different sets of red, green, and blue primaries, the overlapping color triangles demonstrate that the two displays cannot produce exactly the same gamut of colors. (Figure 4)

CIE (x,y) Chromaticity Diagram

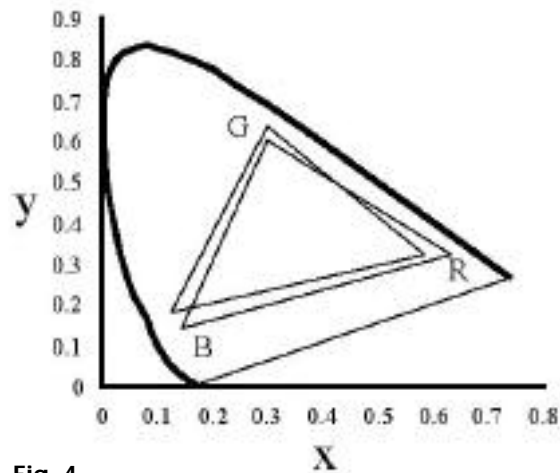


Fig. 4

Equally important, since the primaries are at different locations, mixing the primaries with the same proportions of light will generate different colors. Hence we see that to reproduce the colors specified by video signals, it is critical that the primaries be matched to the video system standards.

The NTSC primaries were specified in 1953 based on phosphors available at that time. But over the years, TV display manufacturers continually used newer phosphors that provided higher light output than the original NTSC phosphors. This created serious color errors. Finally, in 1971 a new set of primary phosphors, called the SMPTE "C" phosphors were selected. (The SMPTE C phosphor specification has been revised since then with very slight changes.) These are the phosphors used in all professional broadcast monitors. Unfortunately, consumer CRTs are still using slightly different phosphors, and different phosphors from one product to another. (The SMPTE C phosphor values are given in Table 1.)

The obvious result of not using the standard phosphors

VIDEO

Table 1 SMPTE C Color Bars

	White	Yellow	Cyan	Green	Magenta	Red	Blue
x	0.3127	0.421	0.231	0.310	0.314	0.630	0.155
y	0.3290	0.507	0.326	0.595	0.161	0.340	0.070

is that colors created by following the video signal's "recipe" for mixing light from the red, green, and blue primaries will result in wrong colors. Hence, the colors from consumer monitors must be wrong! How wrong is a function of their deviation from the standard, and I'll look at how to measure it below. But that isn't the only error that plagues color accuracy for consumer monitors and projectors. Another error is usually much larger when consumer TVs are purchased.

White Reference Color Temperature

It is necessary, but not sufficient, that the chromaticity coordinates of the primaries match the SMPTE C standard to accurately reproduce color. It is also necessary that the relative brightness of light from the three primaries be calibrated to produce the standard D65 white reference color, otherwise the contribution of light from each primary will not be correct when creating any other colors. White is defined to be the color represented by equal red, green, and blue values of an RGB signal. The color produced by any other combination of signal values depends on the initial calibration of the relative primary light outputs for the white signal values. But what brightness of white should be used when calibrating the color temperature?

Grayscale Color Temperature

The answer is that all brightness levels of white should produce the same standard D65 color temperature. That means the relative light outputs from the three primaries must track together as the total brightness changes. As a result, any color generated by another mix of the primaries will also stay at the same CIE (x,y) location regardless of the brightness of the color. Grayscale is the term used to describe the color temperature of the reference white over the range from dark gray to peak white. The closer the grayscale color temperature can be held to D65, the more accurate the colors will be at all brightness levels within the picture. For instance, if the color temperature increases to the more blue-white of 7500K in the middle of the brightness range, then colors will be seen with a bluer hue than desired when they appear at that brightness level.

So we have seen that two conditions are necessary to achieve perfect display color accuracy. The grayscale must maintain a perfect D65 color temperature across the entire brightness range of the display, and the CRT phosphors must match the SMPTE C standards. It's just that simple. Unfortunately, we can't seem to get any consumer products that exactly match the SMPTE phosphor chromaticity stan-

dards, and no one has ever built a display that can be calibrated for perfect grayscale tracking. It is interesting to note that direct-view CRT monitors can usually be calibrated for significantly better grayscale tracking than CRT projectors, but CRT projectors can have primary colors that more closely match the standard because each primary color is generated by a separate CRT. This allows more specialization of phosphor selection and possible color filtering of the light output from the CRTs.

Now that we know that no consumer display will be perfect, let's discuss what sort of technique we can use to measure color accuracy.

6. Color Measurement

Color Bars

It is helpful to have some standard video test signals that can be used to calibrate a display, or to measure the accuracy of the display's color performance. The easiest signals to generate are the common color bars that almost everyone has seen at one point or another. (Figure 5)



Fig. 5

Color bar signals are generated by creating all possible combinations of the three primary colors with each of the RGB signals set to the same value. The resulting colors are red, green, and blue, their complementary colors, cyan (blue + green), yellow (green + red) and magenta (red + blue), and white, which is always defined as equal RGB signal levels. The most common color bars are those that use 75 percent of the maximum signal value. We rather obviously refer to those as 75 percent bars, but 100 percent bars

VIDEO

are used in some circumstances. Remember that although the signal levels are the same, the actual brightness of light from each primary is not the same, that is determined by calibrating the reference white color to D65.

Changing the signal levels of all primary colors together does not change the CIE (x,y) chromaticity of a color. Color bars with 50 percent signal amplitudes would have the same (x,y) coordinates as color bars with 75 percent signal amplitudes. The difference is that the brightness of the color bars will change with amplitude, but brightness information is not included in the CIE Chromaticity Diagram.

Notice that a complementary color lies on the extension of a line connecting its missing primary and the reference white point. This follows from the fact that adding equal signal levels of a primary and its complementary color must create the reference white, and the rule that any color lies on a line between the two colors creating it. That latter rule also means that the complementary color lies on the line connecting its two primary components. Hence the intersection of these two lines geometrically locates the (x,y) position of the complementary colors. (See Figure 6)

The (x,y) coordinates can also be calculated using a mathematical analysis based on the coordinates of the phosphors and white point. The (x,y) coordinates for each color in the color bars based on the SMPTE C phosphors and the D65 white point is shown in Table 1.

We can measure the (x,y) coordinates for each color in

the test pattern directly from a display using a sophisticated electro-optical instrument known as a color analyzer (or a spectroradiometer) and plot the results along with the SMPTE C standard colors to display the errors.

CIE x,y Chromaticity Chart

SMPTE C Phosphors – D65 White Point

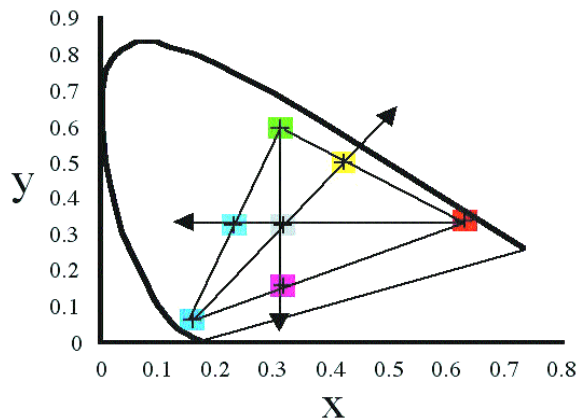
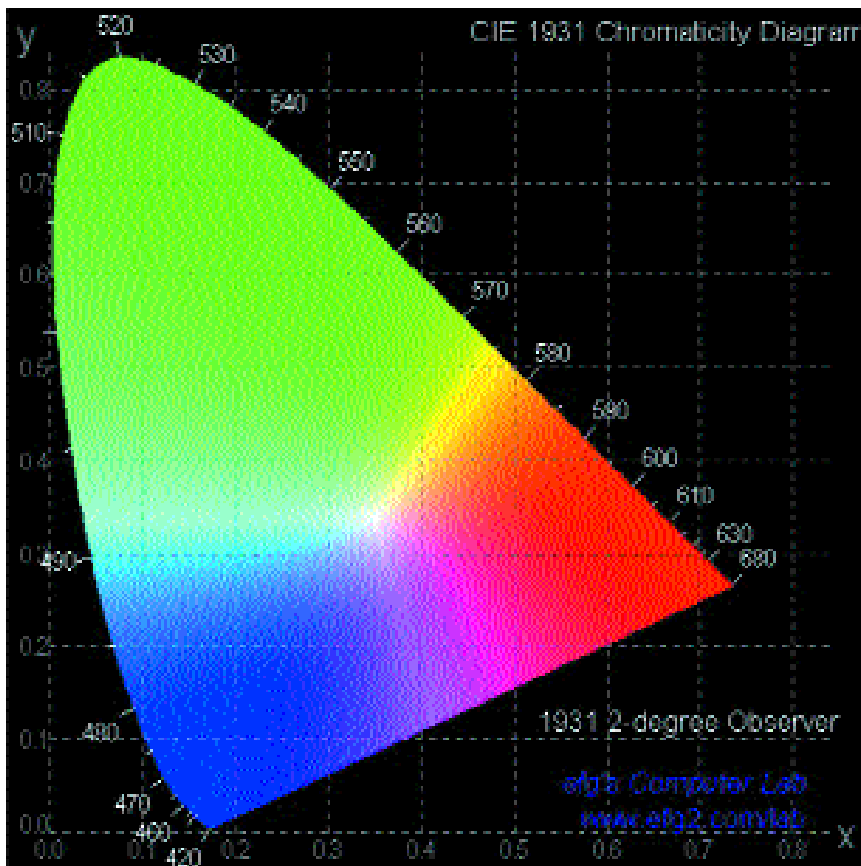


Fig. 6

At this point you might realize that the color accuracy for a display being driven by RGB signals is pretty cut and dry. Once the primary colors are determined and the white

point set, the color accuracy is determined. The variable for any display is its variation in grayscale temperature, which means the white point's (x,y) coordinates change with brightness level. If the white point moves around, we can see from the simple geometric analysis that the complementary colors will move on the edges of the display's RGB triangle. Of course, the (x,y) point for other color signals will also move around proportionally inside the color triangle creating errors.

Some of you may wonder if it isn't possible to convert the RGB video signals from the SMPTE standard to match a non-standard set of display primaries, thereby avoiding color errors. The answer is yes, within the limits of the display's color gamut, but it is more complex than one might expect because the RGB signals are non-linear. Why they are non-



linear will be discussed at another time, but with the availability of digital signal processing, such transformations are practical, but expensive. Some approximate corrections can be made more simply on consumer displays.

7. Color and Hue Adjustments


I have shown that color accuracy is a function of grayscale and phosphor accuracy when a monitor is driven by RGB signals. However, no video sources produce RGB signals directly. Instead we have composite, S-Video, or YPbPr component video from our sources. These signal formats must always be converted to RGB signals to drive the display device, either in a TV monitor or perhaps externally in a line doubler, or other upconverter, to drive a projector. This introduces another source of color errors. Hue and Color controls are usually provided to calibrate the conversion from the source signal format to the RGB signals.

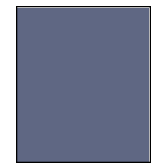
Color bars are used to adjust Color and Hue because we know that the three RGB signal values should be the same everywhere they are used in the color-bar pattern. Therefore, with proper calibration, the same brightness of blue light should come from each color that contains blue (blue, white, cyan, and magenta). The same is true for red or green. Remember that the brightness of red, blue, or green is different and that was set by adjusting the white color temperature. But the brightness of any one primary should be the same everywhere it is used in the pattern, including white.

Using this principle, calibration DVDs like *Video Essentials* and the *AVIA Guide to Home Theater* provide filters (blue in *Video Essentials* and red, blue, and green in *AVIA*) so that the light from only one primary can be viewed at a time. Most CRT projectors provide a means to turn on one primary at a time (or you can cover the lenses), so filters are unnecessary. The Color saturation control adjusts the signal levels of

the primaries without changing their levels for the white color. It is adjusted until the signal levels of each primary alone matches its signal level, and therefore brightness, in white. The Hue control varies the relative signal levels of the primaries to each other, except in white, so that the brightness of any one primary is the same in two complementary colors. For instance, the brightness of green should be the same in yellow as it is in cyan. When the signal format conversion to RGB is correctly calibrated, the brightness of any one primary will appear the same everywhere it is used in the color bars.

On many consumer monitors, it is not possible to adjust the Color and Hue controls for the proper results. This means that the conversion circuits are not capable of being accurately calibrated to generate the correct RGB signals. This can be an intentional decision by the manufacturer who believes that the resulting colors, although inaccurate, are more likely to attract purchasers. Conversely, Sony now includes additional service level adjustments in its top-end products to improve the conversion and color accuracy.

However, it should now be apparent that even if the color decoding is adjusted correctly, the colors will still not be accurate unless the grayscale is properly adjusted and the phosphors match the SMPTE standards. The blue-filter method works perfectly for professional broadcast monitors because the latter condition is satisfied. In consumer monitors, this method will produce colors only as accurate as the phosphors and conversion circuits allow. A highly knowledgeable calibrator, who understands all the concepts we've discussed, can use a color analyzer to adjust all parameters and achieve better color accuracy. For this reason, the blue filter method must be considered an approximation for consumer monitors. The *AVIA* DVD provides an additional test pattern that can aid in fine tuning the Hue and Color adjustments, but that is the best a user can do without expensive instrumentation. 



Sony VPH-G90U Multiscan Projector

The ultimate in home-theater display devices are the 9" CRT projectors. Size matters in CRT projectors because it enables higher resolution and brighter images. Sony's new VPH-G90U has entered this elite market at an attractive \$35,000 price to do battle with existing products from home-theater specialists Runco and Vidikron, priced as much as 50 percent higher. The new Sony may not be everyone's Sony, but home-theater enthusiasts who dream of 9" CRTs may have come a little closer to reality.

Physical

The G90 has a huge physical presence, not unlike other 9" CRT projectors. At over 240 pounds, it is one of the heaviest projectors I've encountered. It was delivered in a Styrofoam-padded cardboard box screwed to a wooden pallet. It is also several handfulls, at nearly 30 inches wide and 42 inches long. Fortunately it is only a bit more than 15 inches high, which improves handling somewhat. It is actually easier to carry and maneuver than many lighter projectors because Sony has cleverly designed eight convenient and sturdy handles into the perimeter of its case, each pair looking a bit like bicycle handlebars. They pull outward from each side of the projector and lock in place for use, then retract back into the case, out of the way, when not needed. This made it easy for four men to carry the projector up a flight of stairs, and for two men to lift it into place on a sturdy table.

Although its case isn't aerodynamically designed and painted a bright racing color, it is sculptured to look quite handsome in two-tone gray for ceiling or "tabletop" mounting. For this review, I mounted it on a table below a ceiling-mounted Runco IDP-980 Ultra. So I can't relate to you the experience of lifting and attaching it to a ceiling, but I'm certain those handles would have played a critical role.

Description

The front panel of the projector contains only an IR remote control sensor. Above that

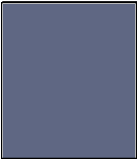


the huge 9-inch lens assemblies protrude several inches in front of the angled bezel, proudly proclaiming that this is one serious projector. Just behind the lenses, the top panel swings open to allow an installer to make mechanical focus and one-time aiming adjustments of the CRT-lens assemblies. This is particularly nice since the main cover of the case remains closed, protecting the electronics. The user should never need to access or repeat any of the mechanical adjustments. All of the inputs, power receptacles, switches, and status indicators are located on the rear panel. There are also two slots in the rear panel for optional video input/output boards.

The top cover has a sliding door that conceals a complete duplicate of the external remote control, only fixed permanently in place and running off the projector's power. This makes it convenient, especially in a tabletop installation, to use this panel for set-up. It also ensures that the user will have complete access to all projector controls should you temporarily misplace the remote.

The external remote is an almost square panel, about six inches on a side, but quite thin for easy holding. A button on the top edge turns on backlighting for all of the panel labels. All of the controls are nicely grouped and logically laid out. Two rows of calibration keys at the bottom can be covered by a sliding plastic panel. They are also disabled unless unlocked by a sequence of key pushes so that curious fingers can't accidentally disturb their settings. On-screen displays provide numeric feedback for all the variable settings and status messages. What I like most about this remote is that all calibration and normal usage functions have dedicated keys. On-screen menus are provided for functions that are seldom used, such as setting up the sync signal selections, or for obtaining status displays of incoming signals. We so often criticize remote controls that I want to acknowledge when one is done this well.

GREG ROGERS



The G90 comes with two manuals. One is an operator's manual that describes the basic user controls and the other an installation manual. The manuals are reasonably good but they could have done a bit better job explaining the basic memory system concepts. The service manual

also left out a key point, failing to note that the status mode must be on before a specified series of keystrokes will enable the service mode. I began setting the G90 up on a Saturday and was stymied by this omission. Fortunately, a quick query to an Internet newsgroup brought several correct solutions. Many thanks to those who responded.

I/O Connections

The G90 includes the usual composite, S-Video, and RGB inputs. It also includes YPbPr component video inputs for standard-definition and high-definition sources with both bi-level and tri-level sync capabilities. This means it will be compatible with virtually any video source existing or announced. There are also two slots on the rear panel for additional I/O modules, so it can be upgraded for any digital video interfaces in the future.

The rear panel has an RS-232/422 interface. I put this to use during my evaluation. The projector I was sent arrived with version 1.02 firmware, which was missing a grayscale calibration feature. I received the latest firmware version (1.11) by email from Sony and downloaded it to the G90 in less than 30 minutes.

Scan Rates

The G90 is compatible with just about any video format that exists, including the most advanced scalers and upconverters. The horizontal scan frequency range is 15-150 kHz, and the vertical scan range is 38-150 Hz. This also accommodates a wide range of computer graphic resolutions. The RGB bandwidth is 135 MHz for displaying the highest resolution graphics.

Installation and Set-up

I always recommend that ceiling mounting and initial projector set-up be done by professional installers and calibrators. There are serious safety issues when mounting heavy objects overhead on ceilings, and **lethal voltages** are found inside projectors and remain stored there **even after they have been unplugged for long periods.**

So never open a projector case for any reason.

In addition to safety reasons, projectors should be professionally installed because positioning distances and angles are critical to getting the best performance, indeed even proper functioning. In ceiling-mounted installations, it really pays to get it right the first time. It is also essential that the grayscale color temperature be correctly adjusted. It's ludicrous to spend a large sum on a projector and then try to save a few hundred dollars by avoiding this critical calibration step. It is pure fantasy to do this adjustment without a sophisticated color analyzer, so be sure your installer or calibrator has the proper electronic test equipment.

Your installer will be able to make many mechanical and electronic calibration adjustments to optimize the picture. Beyond the standard CRT-Lens alignment and focus adjustments, Scheimpflug adjustments are included for each CRT.

These mechanical adjustments alter the horizontal and vertical tilt of the CRTs to alter the focal plane with respect to the lens assemblies. This provides optimum focus at all edges of the picture. After all of the mechanical focusing is complete, an extensive array of electronic magnetic-focus adjustments are made from the remote control for nine separate screen areas. Sony's new hexapole focus adjustments produce the small spot size and round shape that are so crucial to the ultra high-resolution performance of the G90.

A complete professional calibration should be done at the time of installation. That way you know that everything involved in the installation process has been done correctly and you are getting the best picture possible from your projector. Most current projectors provide picture geometry and convergence adjustments using a remote control. It will reward owners to learn how to make those remote control adjustments to keep the picture in optimum shape, since some drift is inevitable over time, particularly during the first year of any projector's life.

Some High End projectors are available with small cameras that provide automatic adjustments, but manual controls must generally be used to fine-tune the results. The Sony G90 has no automatic adjustment capability, but its geometry and convergence controls are among the easiest to use and provide a versatile array of capabilities to get near-perfect results. All the necessary test patterns are built in, and skew, bow, size, linearity, pincushion, and keystone adjustments are available for each color and for different areas of the screen. Then each color can be fine-tweaked for horizontal and vertical registration at 25 different locations on the display using the Zone adjustment. The variety of controls, their effectiveness, and ease of use are exemplary.

Operating Functions

The memory model for accessing different sources and display formats on the G90 can be a bit confusing at first glance. The projector has 150 *input memories*, each storing identification and calibration information for a particular type of input signal. An input signal memory is selected based on the signal scan-rate, signal type (S-Video, RGB, YPbPr, etc.) and the input signal port. All signals from a line quadrupler use one input memory, S-Video signals another, and so forth. Separate geometry, convergence, and grayscale information is stored for each input signal type. Then 10 *video memories* store specific aspect ratio and picture control information (brightness, contrast, color, etc). When a signal is input to the projector, the appropriate input memory is selected automatically. The user then selects one of the 10 video memories for the aspect ratio desired. The 10 video memories are selected with numbered keys on the remote, but can be named for on-screen identification with up to 18 characters each. Memories can then be selected by name using the on-screen menu.

I set up a variety of input memories, including standard NTSC through the S-Video input, and line-doubled and HDTV signals through RGB and YPbPr inputs. I created video memories for 4:3, 4:3 letterboxed, and 16:9 enhanced aspect ratio formats.

Other features include a picture-orbiting function to help prevent CRT burns, which can be disabled if desired. The user can also select between a 3-line-adaptive comb fil-

ter or a motion-adaptive 3-D comb filter when using the composite input.

Performance

My overwhelming first impression of the Sony G90 was its razor-sharp image clarity. The 9-inch CRT technology reveals the resolution limits of projectors with smaller CRTs. I suppose it was even more impressive that the first things I looked at were HDTV pictures. But the differences in detail between the Sony G90 and the excellent but smaller CRTs of the Runco IDP-980 Ultra, were also noticeable on DVD. Edges were a tad sharper and areas of fine structure appeared to have additional depth and contrast.

The G90 has an outstanding ability to differentiate subtle levels of dark gray just above black. Plus there is virtually no shift in black level with changes in average picture level (APL). I confirmed this using the various PLUGE test patterns provided by the *Video Essentials* DVD in title 17, chapters 2, 3, 5, and 7. The Video Montage sequence from this same DVD showed how effectively the G90 held black levels constant to increase contrast-ratio and reveal shadow details.

I was able to adjust the grayscale color temperature to exceptional accuracy, 6500K +300/-50K at 7.75 ft-L measured at the plane of my 1.3 gain screen, which equates to about 10 ft-L for on-axis viewing. The G90 provides a gamma adjustment for individual CRTs that is found on few other projectors. It enables better tracking of the three CRTs and a flatter grayscale response. I believe I could have improved the grayscale even further had I had more time. Without even recalibrating, I cranked up the light output at the screen plane to over 14 ft-L and the color temperature only dropped to 6100K. So the projector is capable of much higher light output than I used for comparison tests.

Despite the excellent grayscale results, I was less pleased with the color accuracy. The primary reason (pun intended) was the chromaticity of the green phosphor. It is somewhat more yellow than the SMPTE C standard green. (See measurements.) This eliminated the deepest green hues from the color gamut, slightly desaturated the blue-greens (cyan), and shifted the purple hues (magenta) toward blue. The yellower-green can be seen in landscapes and fields where greener pastures are expected. Skin-tones appeared slightly pale or colder than normal. If the color temperature is calibrated slightly more red than normal, the skin-tones will be corrected and magenta much improved. I found that a more pleasing picture.

The green phosphor may have been a deliberate choice to maximize the light output of the projector. The G90 is rated at 1300 peak lumens and 350 ANSI lumens, impressive specs for a CRT projector. In my testing, the G90 luminance dropped only 2 percent when going from a small white window to a full screen of peak white. That is amazing performance and reflects its superior full-white rating of 500 lumens. The picture simply won't dim on the brightest scenes. The white field uniformity was also exceptional with very little variance in brightness or color over the screen.


Fan noise on the G90 wasn't nearly as loud as might be expected from a projector drawing 1050 watts. I measured 51 dB "C" weighted, at three feet from the unit. The fan noise is not high-pitched, but has a rushing-air sound that is often masked by the music and dialog in a movie. It may be acceptable in a ceiling-mount application without additional attenu-

ation, but I wasn't able to experience that.

The Sony G90 includes a built-in video upconverter that converts NTSC formats from 480i (active lines) to 960i interlaced video. Sony calls its process Digital Reality Creation, or DRC. It uses pattern matching in look-up tables to do the conversion. Conventional line doublers or quadruplers use entirely different processes to create 480p and 960p progressive video. I used the DRC to watch live basketball games and DVD movies. Video-camera sources, like the basketball game, will create some artifacts on any type of upconverter. I found the artifacts on Sony's unique DRC system to look more artificial, dare I say digital, than other techniques. Artifacts sometimes have a pixellated appearance. It comes down to matter of preference, but I'm more accustomed and comfortable with the twitter artifacts of conventional line-doublers and quadruplers. On movies the DRC did a better job but couldn't match the complete absence of deinterlacing artifacts from upconverters that use inverse-telecine processing. But the DRC feature is included standard with the G90 and a high-quality quadrupler will approach \$20,000.

I used PBS broadcasts to evaluate HDTV on the G90. This was where it really excelled. Projectors without 9-inch CRTs simply don't have enough resolution to fully display the horizontal and static vertical resolution of 1080i signals. The G90 has what it takes. HDTV on 7- and 8-inch CRT projectors like the Runco DTV-930 can look wonderful, but on the G90 the picture achieves an astonishing clarity. PBS has many airborne sequences flying across agricultural and urban landscapes that are so clear that you will feel like you are actually skimming the tree tops and peering into office building windows. A ride in a raft down the mighty Colorado river may convince you that it might be better to watch on the G90 than to actual participate. After sitting glued to my chair watching this HDTV demo material several times for more than hour, I can sing praises about the HDTV format and the incredible resolution and 3-dimensionality of the G90 picture. It rivals the best film presentations that I have seen at a well-maintained cinema. Sadly, few people will actually get to enjoy this experience.

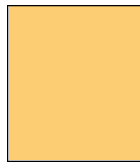
Summary

The Sony VPH-G90U will produce stunning picture resolution, surpassing the definition, contrast, and image depth of 8" or smaller CRT projectors. It is one of the very few CRT projectors, or display devices of any kind, capable of producing HDTV's available resolution. Audition it when you are selecting from among the ultimate home-theater projectors. 

Manufacturer Information

SONY VPH-G90U MULTISCAN PROJECTOR

Sony Electronics Inc
1 Sony Drive
Park Ridge, New Jersey 07656
Phone: (201) 930-1000
www.sony.com
Source: Manufacturer Loan
S/N: 2000039
Price: \$35,000



Runco DTV-930 Multiscan Projector



One of the more exciting announcements at the last Consumer Electronics Show was the introduction of the Runco DTV-930, which significantly altered the price-performance curve for CRT projectors. The DTV-930 was cloned from one of Runco's most successful products, the widely acclaimed IDP-980 Ultra. Conservatively built and highly reliable, the IDP-980 Ultra has been a favorite in premium home-theaters for its excellent picture quality and easy to use features. A year ago, it was priced at \$23,000. The DTV-930 with point convergence option is now \$16,195. To sweeten the deal even further, Runco offers a DTV-933 package that adds an external line-tripler for another four large. I haven't evaluated the tripler yet, but I'll review it separately in a future issue.

You are probably asking what you give up, other than cash, for nearly a 30 percent reduction in price. The answer is very little for home-theater applications.

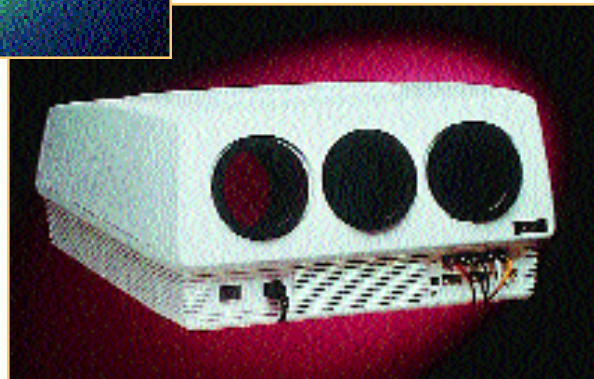
Specifications

The DTV-930 was created by limiting the maximum horizontal scan-rate of the IDP-980 Ultra from 100 kHz to 50 kHz. This positions the DTV-930 to handle nearly all video applications, but leaves a little room at the top-end for Runco's higher priced CRT projectors. The DTV-930 is fully compatible with line doublers, triplers, and any of the ATSC HDTV standards including 1080i or 720p. Its 50 kHz scan rate will accept a maximum computer display resolution of 1024x768 at 60 Hz.

The DTV-930 has a bandwidth of 80 MHz, while the IDP-980 Ultra bandwidth was specified as 100 MHz, but this difference was only significant

for the higher resolution computer graphic display capabilities of the IDP-980 Ultra. It doesn't affect video performance, where the highest bandwidth requirement is a flat response to 30 MHz for HDTV. The only other change from the IDP-980 Ultra is the deletion of a scan-line dithering board, a feature I never used anyway.

Curiously, the DTV-930 is listed as an 8-inch CRT projector, which Runco quickly volunteers really uses liquid-cooled, 7-inch electromagnetic focus (EMF) CRTs. The decision to list it as an 8-inch CRT projector dates back to the introduction of the IDP-980, apparently as a way to differentiate it from inferior



projectors that used 7-inch electrostatic focus (ESF) CRTs. Runco says they intend to revise their specifications in the future. Electromagnetic focus CRTs mean smaller spot size and higher resolution, so they hope this distinction will be understood by buyers comparing projectors by CRT size alone.

The DTV-930 uses the same (USPL HD-144) color-corrected, air-coupled lens assemblies that have been used for several years on the IDP-980 Ultra. (Runco's webpage is outdated on this point.) Light output is specified as 1100 Lumens peak and 225 ANSI Lumens. The former spec is more descriptive of video performance, which has relatively low average luminance levels, while the latter better describes computer graphic display capabilities.

Description

The DTV-930 is available in black or white, 24 inches wide and 30 inches long, weighing about 124 pounds. The case is about 12 inches high at the front

GREG ROGERS

to accommodate the three lens assemblies and input connectors, and then slopes gently downward toward the rear. There are no handles or other means for lifting the projector so it can be quite awkward when lifting to a ceiling mount position.

The three lens assemblies are recessed into the case with just their rims exposed on the front bezel. The entire top cover is hinged at the rear and swings open to mechanically aim and focus the CRT-lens assemblies. All input connectors, the power switch and line-cord receptacle reside on the front panel, slightly recessed from the lens bezel. When the projector is ceiling mounted all of the connectors are above the lenses, which keeps cables out of the way. A remote control jack is provided that can be used with one of two supplied cords (13' and 52') to save batteries during long calibration sessions.

Two IR remotes are provided, one for installation and another for user operation. The installation remote contains dedicated keys for almost all calibration functions to avoid going through the on-screen menus. The remote is backlit for working in the dark. The smaller user remote runs only on batteries and is not backlit.

The rear panel contains status lights, a two-digit diagnostic display, and a small collection of keys for navigating the on-screen menus. The latter need never be used since set-up and operation is more easily done from the remote control.

Inputs/Outputs

BNC connectors are provided for RGB and sync inputs. Composite or separate H and V sync, as well as sync-on-green can be used. Composite and S-Video inputs are provided using an unusual 15-pin D-connector. A short breakout cable is included to provide a standard mini-DIN jack for the S-Video and a BNC jack for composite video. These inputs are compatible with NTSC, PAL, and SECAM. Curtain control switching is provided via DC voltages on another D-connector.

There are no YPbPr component video inputs. Line doublers and other video upconverters provide RGB outputs. But some HDTV set-top boxes provide only YPbPr outputs (Panasonic, Pioneer), while others provide RGB outputs (Sony, RCA) or both. This is a common limitation of a large installed base of projectors, so hopefully future set-top boxes will be designed with both RGB and YPbPr outputs to maximize their market opportunities.

Installation and Set-up

A professional installer should always be used for mounting projectors on ceilings. Projectors are heavy, and proper mounting is a safety and performance issue. Furthermore, **a professional calibrator must be used to do the initial set-up.** This requires mechanical adjustments inside the projector where there are **lethal voltages that remain present even when the projector is unplugged**, which again is both a safety and performance issue.

The projector used for this review was mounted on the ceiling and an 89-inch wide, 1.85:1 Stewart Filmscreen was used for display. As with all CRT projectors, the correct distance and height relative to the screen must be set correctly. The distance from the screen to the lens for the DTV-930 must be 1.33 times the screen width when using multi-aspect-ratio widescreens. Runco has superb technical phone support and should be consulted to find out the exact height and distance dimensions you would need for any screen size and one of their projectors. A professional installer should mount the

projector and do the mechanical adjustments, which consist of setting two knobs on each lens assembly for the correct projection angle and screen size, aiming the CRT-lens assemblies to converge at center screen, and adjusting focus rings for best center and edge focus for each CRT. From that point, all other calibration is performed electronically using the remote control.

The grayscale color-temperature must always be calibrated by a professional using a color analyzer. Don't avoid this step, and make certain your calibrator has a color analyzer. The color accuracy of this projector is excellent, but it depends, like all display devices, on an accurate grayscale adjustment that can only be done using sophisticated test equipment. The professional calibrator should also ensure that all set-up adjustments are individually optimized for multiple aspect ratios and different sources. This projector is remarkably stable and touch-ups are required infrequently after an initial burn-in and calibration period of six months or so.

Built-in test patterns consist of cross-hair, focus, white-window, and multiple cross-hatch and dot patterns. When a projector has electronic remote-control adjustments for geometry, convergence and focus, as this one does, I encourage enthusiasts to learn to do these adjustments. Part of the fun of projector ownership can be tweaking the picture to optimize the image quality. But don't alter the grayscale adjustments or you will need a professional to put it right again.

An excellent array of adjustments is provided to optimize geometry and convergence. Each CRT has tilt, skew, amplitude, linearity, pin-cushion, and keystone adjustments for both vertical and horizontal axis with separate control over the top, bottom, left and right picture edges as required. Electronic focus is included for each CRT with adjustments for center, top, bottom, left and right sides. But the user should not readjust the blue focus, which will alter the color balance. In addition there are astigmatism controls with two-pole adjustments for 8 different areas of the screen. It is time consuming, but with effort you will be rewarded with a fine spot size uniformly over the entire screen.

I found all the adjustments easy to make and logically organized. There is also a contextual help button on the remote control that brings up one or more text screens describing the function and usage of the current adjustment. I think many users will be quite comfortable in tweaking these adjustments to keep the alignment in pristine condition. There is even a function that automatically guides a novice user through the calibration adjustments in order, a step at a time. Once all parameters are adjusted for best performance the point convergence option is remarkably quick and easy to use. By moving a cursor on a 16x13 grid you can adjust for virtually perfect convergence over the entire screen, which is always critical for the best picture, but crucial for HDTV. Be sure you get the point convergence option.

Operating Functions

This is one of the easiest projectors to use. There are 100 video memories that store individual picture formats including the input source and all display parameters. Each memory includes the source scan-rate, display aspect-ratio, and a complete set of calibration values for that picture format. Each memory can be individually named by the user, such as "16.9 DVD" with up to eight characters. The first 10 picture

formats can be selected directly from the remote control. The entire 100 picture formats can be selected by an on-screen menu that shows the memory number, name, video source and date created. When a memory is selected the source is switched and the display is setup with all of the individualized calibration settings for that picture. The memories can be copied, moved, deleted and renamed for selection convenience or to expedite creating new entries.

Although 100 memory set-ups may seem like overkill, 10-20 wouldn't be enough for me. You will need separate memories for 4:3, 4:3 letterboxed, and 16.9 enhanced aspect ratios, and I have special set-ups for 1.66:1 and 1.85:1 movies. Most of these are duplicated again for a doubler, tripler, quad, composite video, S-Video, and my 3Dfusion progressive-scan DVD

player that has a 72 frame-per-second output. Then add 720p and 1080i for HDTV and several set-ups for computer displays. Finally I have some special picture formats for watching 4:3 sports presentations cropped and expanded to fill the entire 1.85 screen. You may also want to keep a duplicate set of everything just in case you accidentally mess something up while tweaking.

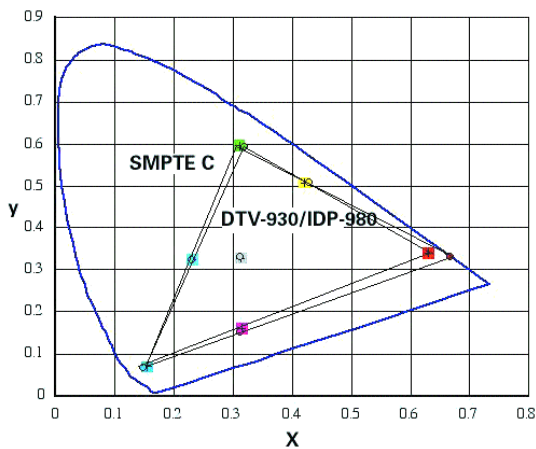
Each memory has a counter and a timer to keep track of how many times it is used and for how many hours. This is convenient for knowing how much time you've used the CRTs for watching 4:3 pictures or widescreen pictures. Two sets of timers, one that can be reset by the user, are also included for total CRT and projector hours.

Color temperature can be selected from 3200K, 5400K, 6500K, 7500K, and 9500K for special applications. Incoming

Convergence Labs Test Report Greg Rogers

Accurate color reproduction depends on how well the projector's red, green, and blue primary colors match the SMPTE C standard phosphors, combined with the accuracy of the white-point color temperature. The projector's white point has been calibrated to match the D65 standard white-point at 75 IRE. The projector's primary and complimentary (yellow, magenta, cyan) colors (circles) are compared to the SMPTE C standard colors (squares) on the CIE diagram. Changes in the grayscale color temperature will shift the position of the complimentary colors and the color accuracy.

Runco DTV-930 CIE Colorimetry



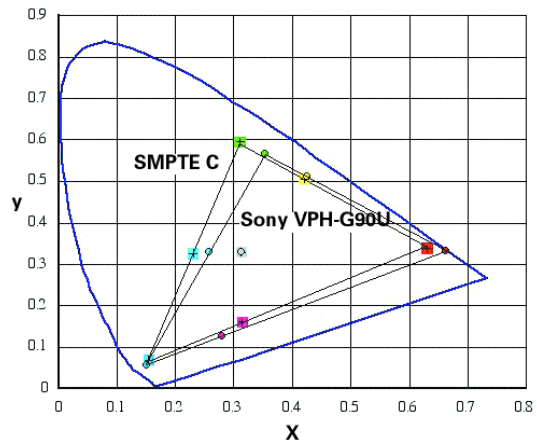
The Runco DTV-930 RGB color triangle almost completely overlaps the SMPTE triangle so nearly all colors in the video signal can be reproduced. The blue and green primary colors are close to the SMPTE standard phosphors and the red primary is shifted to the right. The resulting color accuracy is excellent.

The green primary of the Sony VPH-G90U is shifted toward yellow. This results in a gap of non-reproducible colors between its RGB color triangle and the SMPTE C triangle. The cyan color is desaturated (shifted toward white) and magenta is shifted toward blue.

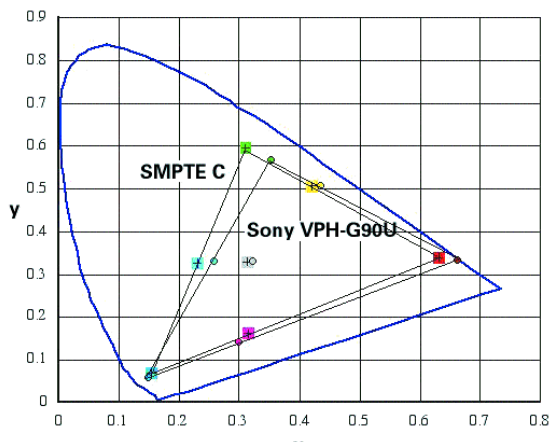
If the VPH-G90U color temperature is lowered by moving

the white point slightly toward red during calibration, the resulting color accuracy will be significantly improved with better skin-tones and more accurate purples. The eye is more sensitive to errors in blues and purples than it is to equal distance errors in yellow or cyan on the CIE diagram.

Sony VPH-G90U CIE Colorimetry



Sony VPH-G90U CIE Colorimetry Alternate White Point



horizontal and vertical scan frequencies and other source information can be displayed at any time. A phosphor saver function is provided to periodically shift the horizontal and vertical image position on screen to avoid a CRT burn. This function can be turned off if desired, although I believe it is a worthwhile function to use. If a very slight overscan is added to the picture the effect of this screen saver function will not be noticed.

Performance

I used a Runco IDP-980 Ultra for this evaluation. Its video performance is identical to the DTV-930 with the point convergence option, for everything discussed in this review.

Color accuracy is primarily dependent on two factors, grayscale accuracy and how well the red, green, and blue primary colors match the SMPTE standard. The latter is fixed for each model of projector based on its CRT phosphors and any additional filtering in the lens-CRT assemblies. The grayscale accuracy must be calibrated and will degrade if the projector is asked to supply too much light because the blue CRT phosphors will begin to saturate at high output levels. To achieve the best grayscale accuracy, and therefore good color accuracy, the screen size and image brightness must be appropriate for the projector. Generally, the larger the CRTs the more light output they can provide while operating in a linear grayscale range.

For this projector I used an 89" wide screen and set the contrast for 7.75 ft-L measured at the screen plane, which equates to about 10 ft-L on axis for the 1.3 gain screen. This combination is about the reasonable limit to achieve an acceptable grayscale and good color accuracy. If you want a larger display you can select a higher gain screen, but you will probably find hot-spotting and color variations across the screen unacceptable if you have a critical eye. The projector is also capable of much higher light output levels but the color accuracy will suffer as a result.

Using this set-up I adjusted the grayscale for the SMPTE standard color temperature of 6500K, +/- 400K over the range of 20 IRE to 100 IRE. These adjustments were made while using a Faroudja VP250 line doubler. Since the scan lines don't overlap with a doubler, a tripler would provide even flatter grayscale results since the blue CRT will provide more output before the onset of phosphor saturation. The colorimetry of the green and blue phosphors is quite close to the SMPTE standard and the red phosphor is a slightly deeper red. The result is near perfect color-bar patterns and excellent color accuracy on movies. Skin tones look exceptionally accurate while full color-saturation is maintained elsewhere in the picture. With good DVD transfers there is no need to reduce the line doubler's color control to prevent overly red faces that would desaturate (washout) other portions of the picture. (See measurements.)

Other key performance characteristics of any video display are its ability to provide a geometrically stable picture and constant black levels as picture luminance levels change. The latter can render black-levels gray and dynamically reduce the contrast ratio of the picture. These attributes are a function of good high-voltage power supplies for the CRTs. Some products, particularly RPTVs and direct-view monitors, suffer size or geometry changes as the average picture level (APL) varies. Examples include static changes when a bright object enters a dark scene, or momentary effects during


bright flashes. On this projector the high voltage system holds picture size and geometry rock solid regardless of steady state or transient changes in APL. The new Alien DVD is an excellent test of these capabilities with its dimly lit interiors that are punctuated by bright flashing strobe lights in one scene. Black level is also well maintained with APL changes.

Spot size and focus uniformity across screen is exceptional for CRTs of this size. I compared resolution and picture definition on some of the best DVDs to the performance of the Sony G90's 9-inch CRTs. *Alien* and *The Fifth Element* are two movies that have some of the best detail. The G90 provides a modest increase in the sharpness of fine details in direct A/B comparisons. Both projectors are capable of performance beyond the resolution limits of the DVD format.

A line doubler will work well with this projector when viewing 16:9 enhanced and 4:3 DVDs on a widescreen from about 4 PH (picture heights), but scan-line structure will be visible on 4:3 letterboxed DVDs. If you are sensitive to scan-line visibility, then a line tripler would be better for non-16.9 enhanced letterboxed sources and it will allow you to move up to the "ideal" 3.3 PH if you desire a wider field-of-view.

It's well established that 9" CRT projectors are required to reproduce the full resolution of 1080i HDTV. But does that mean HDTV looks blurry or unimpressive on this projector? Definitely not! HDTV broadcasts look breathtaking and clearly distance themselves from the best DVDs. I used PBS broadcasts as my HDTV source. It was no contest with any of the rear projection HDTVs on which I've viewed the same material. Picture clarity and definition on the Runco is far superior. The gap between the Runco and the Sony G90 is not as wide, but the G90 really does capture that sense of looking through an open window. Perhaps the Runco is more like looking through a double-pane window. The G90's detail and sense of depth is significantly better in direct comparisons, but unless you've already acquired a trained eye for HDTV on a 9" CRT projector you'd better sit down, because the Runco DTV-930 will knock you off your feet.

Summary

If there is anything in home theater priced a few DVDs over \$16,000 that can be considered a bargain, it is the Runco DTV-930 with Ultra option. If you are in the market for anything less than a 9" CRT projector, you owe it to yourself to see this projector optimally set-up and calibrated. But you'd better hurry. The chassis used for the DTV-930 was a last time buy for Runco, and when they are gone, they are gone for good. 

Manufacturer Information

RUNCO INTERNATIONAL

2463 Tripaldi Way

Hayward, California 94545

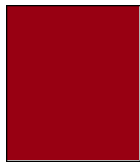
Phone: (510) 293-9154

www.runco.com

Source: Reviewer purchase

Price: DTV-930 \$14,995;

DTV-930 w/point convergence \$16,195



IEV Turboscan 1500 Line Doubler

Any home theater that uses a CRT front projector capable of graphics- or data-grade resolution needs a way to reduce the visibility of scan lines and remove interlace artifacts, which become painfully unpleasant on a big screen. Until recently the devices (line doublers) for doing this with credible quality have cost over \$7,500. For my own modest home theater, with a 7-inch CRT front projector and 6-foot wide screen, this price was beyond budget. My first priority was to find a way to convert the YPbPr component video outputs of my DVD player to work with the RGB inputs of my projector. I also needed input switching for my laserdisc and VCR viewing.

The least expensive YPbPr-RGB converter, without line doubling, is about \$900 from Extron. I was about to buy one of these when I discovered the \$2,495 IEV Turboscan 1500 line doubler. This unassuming black box performs the conversion I needed, has switching functions, and does line doubling. This remarkable device also includes separate adjustment of video parameters (brightness, contrast, color, tint, and sharpness) for each input, and overall adjustment for red, green, and blue gain and offset levels. The former is important to me for matching the slightly different output levels of my laserdisc player to those of my DVD player. The latter is useful for fine control of color temperature, especially for a projector like mine that doesn't have digital controls for this function. Imagine my delight to find all of these features in a box I could afford!

Description

The back panel of the Turboscan sports an on/off switch (normally left on), a power plug input, and a large array of video input/output connectors. The composite and S-Video inputs include buffered loop-through outputs. There is also an RJ-11 connector for a remote infrared control (IEV can supply this or you can buy from a third party) and an RS-232 connector for computer control of the unit (RS-232 programming commands are in the manual).

My only complaint is that the VGA input connector should be female, not male. All the readily available connector cables, including VGA to 5-conductor BNC, or computer to VGA monitor, terminate in a male VGA connector. To use these on the Turboscan you have to use a female-to-female adapter, creating a potentially unstable connection.

For an RGB input, the Turboscan can automatically detect whether it is already progressive (as all computer VGA outputs are) or whether it is interlaced; it can also be forced into one or the other state. Thus I set up the Turboscan to accept a computer signal on the VGA input connector (which also includes my 3Dfusion progressive DVD player) and pass that through without doubling. For laserdisc, I use the S-Video input

and for cable TV (via a VCR tuner) I use the composite input.

The front panel of the Turboscan is clean, showing only a small LCD panel and a touch panel control with left-right-up-down arrows. The menu commands, displayed on the LCD panel or on a simple onscreen block, are logically linked in a circle, all accessible by the left-right arrows on the front panel or the remote.

Remote Control

The Turboscan 1500 has many features beyond its line doubling capability, most of which I have already mentioned. As supplied by IEV, it comes with the excellent Home Theater Master SL-8000 universal remote that includes the control codes for over 500 devices (audio, satellite, TV, VCR, cable, CD, DVD, and auxiliary). My Turboscan, along with my Electrohome projector, came from Hi Rez Projections, Inc., of Boston (www.hometheater1.com), which include Home Theater Master's better remote, the SL-9000 with learning capabilities. Both these units are wonderful, exceeded only by remotes costing several hundred dollars.

Line Doubling = Deinterlacing

The name "line doubler" is misleading. These devices don't increase the total number of scan lines per video frame. They deinterlace conventional NTSC video by replacing each interlaced video field, which alternately displays only the odd or even half of the frame's scan lines, with a progressive video frame containing all of the scan lines. Deinterlacing is a complex process because the fields from a video camera represent the image at different moments in time. Simply merging fields together would create double images of objects in motion, while interpolating new lines between existing lines of each field produces a softer image. Deinterlacing video sources is where most line doublers fall down, the IEV included. That is not to say that it does a bad job, though.

Film sources are converted to video by a telecine device that repeats video fields at regular intervals, to convert the 24-frame-per-second film to 60-field-per-second video. This is called 3-2 pulldown and creates an opportunity for a line doubler to detect this pattern and reverse the process to generate progressive video. For many years, only Faroudja had special patented circuits to detect film sources with 3-2 pulldown and perform an inverse-telecine process to ideally deinterlace them. (See Issue 24 for details of the inverse-telecine process.) The Turboscan does not have inverse-telecine deinterlacing and must process both video and film sources using other techniques. The question is, how well do they match up to the Faroudja standard? The IEV Turboscan 1500 performs well with

BILL CRUCE

film sources but doesn't match the quality of inverse-telecine deinterlacing.

Performance

My primary source for evaluating the IEV was a Sony DVP-S7000 DVD player, using its composite, S-Video, and component outputs to test the various Turboscan inputs. I also used a Pioneer CLD-97 laserdisc player with its composite and S-Video outputs. As a progressive video reference, I used a 3Dfusion PC video card with an Mpackt-2 processor decoding from a DVD-ROM drive to produce RGB output. The 3Dfusion creates progressive video without deinterlacing artifacts when playing film source DVDs, equivalent to the result of Faroudja's inverse-telecine processing. It is not nearly as effective at deinterlacing DVD video sources, nor does it accept any sources other than DVD. (See Issue 24 for a review of the 3Dfusion and a discussion of its deinterlacing process.)

For display I used an Electrohome ECP-4100 front projector on a 6-foot wide Stewart Studiotek 130 screen (16.9 aspect ratio). For a brief time, I was able to compare the Turboscan to a Faroudja VP-250 line doubler on a Runco IDP-980 Ultra front projector. (A line doubler requires a TV with progressive video inputs and higher than normal scan-rate capabilities, but these inputs and capabilities are standard with any graphics-grade front projector.)

With real-world material, it was evident that the Turboscan was not doing 3-2 pulldown removal, as the Faroudja and 3Dfusion do (each in different ways). The Turboscan sometimes displays line twitter artifacts on moving objects, and while not nearly so objectionable as the artifacts seen with non-line doubled sources, they make the Turboscan display slightly inferior to that seen from the Faroudja or 3Dfusion. For example, in the opening scene of *The Fifth Element* (chapter 3, absolute time 03:20-23), one can see fine line twitter in the tent ropes and moving "jaggies" on camel backs at the center of the screen as the camera pans left to follow the running boy. In chapter 9 (absolute time 28:23-42), twitter artifacts appear as the camera zooms in on the curved top left edge of the chamber that LeeLoo is kicking to get out of.

The Turboscan has a "motion filter" that appears in the menu

only if you have "Input Setup" turned on. The filter slightly softens the image, but IEV recommends that this filter be turned on for video. However, there are examples where the image looks much worse with the filter on. The horizontal pan of the bridge during the video montage segment on *Video Essentials* is one. The vertical cables of the bridge break up badly as they move horizontally with the camera pan. In other cases the filter reduces, but doesn't eliminate, some residual artifacts, such as jaggies in the hair of the pink T-shirted girl with the bicycle.

I used the *Video Essentials* DVD and the Dolby Labs DVD (*DVD-TEST1*) to explore other aspects of the Turboscan performance. The tests on these discs are rigorous and repeatable, even though they are much more demanding than what you will usually notice on real-world video images.

With its sharpness control set at "0," the Turboscan had a significant high-frequency roll off above 4.2 MHz in all input modes, but at a sharpness setting of +6, it became reasonably flat to 5 MHz without outlining artifacts. This sharpness control isn't the equal of Faroudja's adaptive detail-enhancement circuit, but it is useful for reducing the nastiness of some DVDs with overdone edge enhancement; it is also handy for slightly boosting the sharpness of soft video sources, especially many laserdiscs. You can set this control individually for each of the three input sources.

The Turboscan showed minor artifacts on color-bar patterns that were not present with either the Faroudja or the 3Dfusion. For a component source, there was a faint light band along the cyan side of the vertical yellow/cyan transition and along the magenta side of the vertical green/magenta transition. S-Video and composite sources did not display the same artifact. Instead they had a black smudge along the two transition regions characteristic of the lower chroma bandwidth of these video formats. Some luma-chroma delay was evident on the red vertical stripes against a white background (title 18, chapter 4 of VE-DVD). There was a thin black line along the left edge of the white/red transition, just inside the red bar. On S-Video and composite sources, this artifact was replaced by a smeared black region on both inside edges of

Key Features: Video Upconverters

	Faroudja VP251	IEV Turboscan 1500	DVDO iScan Plus
Line Doubling	Yes	Yes	Yes
Line Quadrupling	No	No	No
Line Scaling (Other)	No	No	No
Inverse Telecine (Film Mode Deinterlacing)	Yes	No	Yes
Video Cal - Color,Tint,Brightness,Contrast	All	All	None
Detail Enhancement	Adaptive Detail	Sharpness Only	None
Noise Reduction	None	None	None
Composite Video Inputs	1	1	1
S-Video (Y/C) Inputs	1	1	2
Component Video Inputs	1 (YPbPr/RGB)	1 (YPbPr/RGB)	None
Component Video Pass-thru	Yes	Yes	None
Input Loop-thru	All Inputs	Composite/S-Video	None
Stored User Settings	4/Input	1/Input	None
Other Features	RGB Pass-through Input	RGB Gain/Offset	Film-Mode LED
Price	\$7,500	\$2,495	\$700


the red bar.

At the horizontal edge between the cyan bar and magenta patch (or the magenta bar and cyan patch) on the VE disc color bars, there were two or three dark blue scan lines; these were partially broken up into rows of jiggling dots above and below the transitions. There was also some bleeding of the left magenta block into the white block beneath its left corner. Furthermore the color bars displayed some video noise, especially in the green. The blue scan lines were evident on the 3Dfusion, but were not broken up into jiggling dots; nor was there any bleeding of magenta into white or any obvious video noise.

Fortunately, although the color bar tests can be used to discriminate between doublers, I didn't find any glaring evidence that the Turboscan's artifacts significantly affected performance on real-world film sources.

Summary

At first I used the Turboscan for viewing DVDs from the Sony DVP-7000. Later I discovered the joy of watching line-doubled laserdiscs from the Pioneer CLD-97. Laserdiscs look very good through the Turboscan, as long as you don't have an anamorphic DVD for comparison. They look softer (owing to

the lower luma bandwidth of LDs) and there is some color bleed (owing to the lower chroma bandwidth of LDs), but these are small imperfections, inherent in the laserdisc format. My current reference source is the 16.9 ("anamorphic") DVD progressive-scan output of the 3Dfusion; however the Turboscan is essential for watching my library of laserdiscs, many of which will either never make it to DVD or which aren't worth the expense of duplicating on DVD. In fact, given the bargain-basement prices for which laserdiscs can now be found, the frugal movie fanatic should give serious consideration to the viewing of line-doubled laserdiscs. 

Manufacturer Information

IEV INTERNATIONAL, INC.
3855 South 500 West, Suite O
Salt Lake City, Utah 84115
Phone: (800) 438-6161
www.iev.com
Source: Reviewer purchase
Serial number: 2134
Price: \$2,495

Pioneer Elite DVL-91 Combination CD/LD/DVD Player

There are some things in life that, no matter how well I understand them, I marvel that they actually work: airplanes for example. Every time I take a flight, I can't believe that I'm really in the air, even though I fully understand the physics. Combination CD/LD/DVD players are another example. They will play just about every home-theater optical media available, automatically adapting for the size and format and moving the laser into the appropriate position.

But why would anyone buy a combi player, given the increased complexity of the mechanical and electronic subsystems? Well, you may have a laserdisc collection or a near-

making the player mechanisms is Pioneer).¹

Last issue we looked at the upscale Theta Voyager, based on the Pioneer 919 combi player. This time we look at Pioneer's top-of-the-line Elite combi player, the DVL-91, to see what is the best available from the company that has single-handedly supported the laserdisc market for many years. This unit will play CDs and CD-Videos (an MPEG-1 video disc more popular in Asia than the US), but our primary interest is in its LD and DVD performance.

Look and Feel

The DVL-91 has that special Pioneer Elite look: high-gloss black enamel, gold trim, and polished rosewood side panels. It has the usual assortment of gold-plated outputs on its rear that you would expect from a component of its stature: two analog stereo audio, two coaxial digital audio (one PCM only, one PCM/AC-3/DTS), one optical audio (PCM/AC-3/DTS), one AC-3 RF (for LD only), two composite video, two S-Video (Y/C), one set of component video, and an in/out set of connectors for Pioneer SR control signals. You must select from the player set-up menu whether you wish DVD output to be via component or



by rental store that still carries LDs. There are also many movie titles still available only in that format (*Star Wars*, for example). If you want to buy a new laserdisc player, you have no option; the only ones available are in combi players (and the only company still

Y/C-composite; the mode not selected still outputs a luminance signal (helpful in navigating the menus to switch the type of out-

¹The Faroudja LD1000 laserdisc player mentioned in Issue 25, based on the Pioneer Elite CLD-99, is no longer available. The final unit was sold in April 1999.

BILL CRUCE

put). From the setup menus, you also select whether you want 16.9 formatted video output. This is called "wide," which might not be self-explanatory but the on-screen graphic makes the meaning clear.

You can also select whether you want the digital audio output to be 24 bit/48 kHz or 24 bit/96 kHz, the latter available only on some DVDs. Older outboard DACs and digital preamps or receivers will not accept 96 kHz bitstreams, so it is important to pay attention to this. If you select the 48 kHz output in the set-up menu, then any DVD audio track containing a 96 kHz signal will be downconverted to 48 kHz by the DVL-91 for backwards compatibility with older components. The DVL-91's internal DACs are 20 bit/96 kHz devices. The player will also pass a DTS surround signal through its digital outputs. The set-up menus allow you to configure such things as onscreen languages, menu colors, etc. One idiosyncrasy of the DVL-91, like the Pioneer-based Theta Voyager, is that the set-up menus must

be accessed with a disc inserted, but stopped. The kind of menu you get depends upon the kind of disc you put in. The onscreen display, besides having the usual chapter and time information, includes a digital bit-rate meter, with both a bar graph and numerical information. As with the Theta Voyager, it is an accurate meter, unlike that on the Sony players.

The front panel of the DVL-91 is sparsely populated with controls. These include power, play, stop, forward, reverse, side change (for LDs), display off, and the display itself. There are also separate eject buttons for CD/DVD and LD. The remote repeats all of these controls but has no separate eject buttons, instead responding to what disc is in the machine or which format was last used. The remote also contains menu navigation controls, programming and search functions, a numeric keypad, and a jog dial with shuttle ring. Unfortunately,

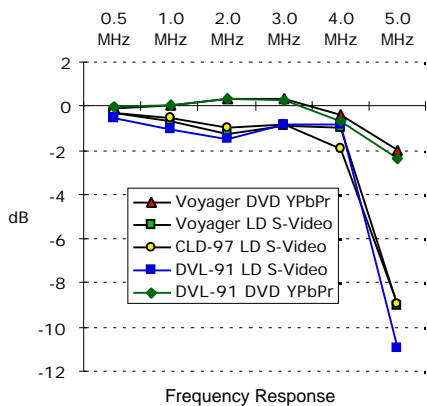
Convergence Laboratories Test Report Greg Rogers

Pioneer Elite DVL-91

The Pioneer Elite DVL-91 is compared to the Theta Voyager reviewed in TPV 25, our Pioneer Elite DV-09 DVD reference player, and the Pioneer Elite CLD-97, one of the best standalone laserdisc players from a previous generation. The DVD frequency response differences are insignificant. The DVL-91 laserdisc player's horizontal frequency response, like the Theta Voyager, is excellent to 4 MHz (320 TV lines per picture height), but then falls off rapidly at 5 MHz (400 TVL).

Frequency Response (dB, MHz)

		0.5	1.0	2.0	3.0	4.0	5.0
DVL-91 DVD	YPbPr	0	0.1	0.4	0.3	-0.6	-2.4
Voyager DVD	YPbPr	0.0	0.1	0.4	0.4	-0.3	-2.0
DV-09 DVD	YPbPr	0.0	0.1	-0.2	0.2	-0.3	-1.9
DVL-91 LD	S-Video	-0.5	-1.0	-1.4	-0.8	-0.8	-10.9
Voyager LD	S-Video	-0.3	-0.6	-1.2	-0.9	-0.9	-9.0
CLD-97 LD	S-Video	-0.3	-0.5	-1.0	-0.8	-1.9	-8.9



The DVL-91's luminance noise is excellent for a laserdisc player and will not be visible above the background noise of most discs.

Signal to Noise (dB rms)	Video			Luminance		
	Composite	S-Video (Y/C)		S-Video (Y/C)		
	DVL91	Voyager LD	CLD-97	DVL-91	Voyager LD	CLD-97
15 kHz-Full	49.2	49.7	49.8	50.1	50.8	50.1
NTC-7 wtd	54.2	55.2	55.7	54.8	55.9	55.8

Signal to Noise

(dB rms)	AM Chroma Noise			PM Chroma Noise		
	DVL-91	Voyager LD	CLD-97	DVL-91	Voyager LD	CLD-97
Composite						
100 - 500 KHz	42.0	40.2	51.0	43.1	40.7	41.0
100 Hz - 1 MHz	40.2	38.5	45.9	40.5	38.2	40.2
S-Video (Y/C)						
100 Hz - 500 KHz	51.1	50.2	54.1	45.6	40.6	47.0
100 Hz - 1 MHz	48.4	45.3	51.7	43.5	38.8	46.5

DVD component-video noise performance is excellent. S-Video noise levels are very good and shouldn't be visible on any discs. But YPbPr component video should always be used to get the best chroma bandwidth and color detail.

Signal to Noise

(dB rms)	S-Video			YPbPr		
	Y	C-AM	C-PM	Y	Pb	Pr
Unweighted						
DVL-91DVD	72.1	56.1	49.2	74.7	77.1	75.8
VoyagerDVD	74.7	69.9	48.8	74.6	80.0	77.5
DV-09	75.9	66.0	45.6	75.4	74.8	75.5

Component-video signal alignment was excellent. A 12 nS luma to color-difference signal delay is less than 1/6 pixel.

YPbPr Delay (nS)	Pb to Y	Pr to Y	Pb to Pr
DVL-91	-118	-116	-0.2
Voyager DVD	-18.2	-17.2	-1.0
DV-09	31.8	-42.9	74.7

ly, the remote of the DVL-91, like that of the Theta Voyager, has no back lighting. Given the small size of many of the buttons, it is easy to hit the wrong one in the dark.

Like all of Pioneer's recent combi players, the DVL-91 has a small drawer on the front to pick up CDs or DVDs and a larger drawer for holding LDs. Fascinated by the whooshes and whirrs of sliding trays and turning gears (reminiscent of *Dark City*), I opened up the DVL-91 and found an engineering work of art. I love watching the laser carriage move from front to back and roll over, which it seems to do whenever the disc drawers open or shut. (Pioneer should really consider releasing a special edition in a transparent case.) A good part of this machinery is Pioneer's famed Epsilon-turn mechanism, which moves the laser head from side A to side B of an LD in 10 seconds, about half the time of the CLD-97. Part of the turn mechanism is housed in a small box protruding from the back of the case.

DVD Performance

Now that DVD players have reached their "third generation" and 10-bit video DACs have become the standard, video performance looks much the same no matter the brand or model, certainly in the \$1,000-and-up range. The exception are DVD players such as the Pioneer Elite DV-09, with additional video signal processing to adjust picture parameters like color saturation, or to provide advanced adaptive detail enhancement and noise reduction. MPEG artifacts are now rarely seen – untrue of many first-generation players. The DVL-91 produces a DVD image that is largely indistinguishable from that of my reference player, the Sony DVP-S7000 or the newer Sony DVP-S7700 (on either Y/C or component outputs). On tests from the *Video Essentials* DVD [DVDI 0711], it appears to have good frequency response to at least 5 MHz; color bars are solid and without apparent noise. All of this is reflected in good performance on a variety of movies. The DVL-91 can display below-black levels from a DVD, which not all players can do. This is important for using test patterns to properly set up black levels on a video display device.

Two areas in which DVD players still differ in performance are (1) quality of downconversion from 16:9 format DVDs to 4:3 displays and (2) motion control. These are areas in which the Sony DVP-S7700 sets the standard and in which the Pioneer DVL-91, like its cousin the Theta Voyager, falls short. On a variety of 16:9 format DVDs, the DVL-91 produced

aliasing artifacts while downconverting, most prominently observable in images with closely spaced horizontal lines, particularly if those images move slowly in a vertical direction. In the opening scene of *Goldeneye* [MGM 906035], where an airplane flies low over a dam, the top of the dam has two closely-spaced horizontal lines. On the Pioneer and Theta Voyager, these lines twitter a little but are sharp; on the Sony they are stable but with a slightly softer focus. This is a common difference between downconversion algorithms: stability with softer focus or sharpness with aliasing artifacts. I prefer the non-aliasing appearance of the Sony; you may disagree. Sometimes the aliasing artifacts can be seen on suit jackets with fine patterns, as in *Contact* [Warner 15041] at the beginning of chapter 5, in Tom Skerrit's jacket, and at the beginning of chapter 9, in Jody Foster's. In both instances, the Pioneer and Theta produce a slightly sharper detail but with twittering, whereas the Sony produces a slightly softer focus but with a steady image.

While the DVL-91 is fine for playing movies, I found it quite difficult to control many of the special features of DVDs. Slow motion and still-step must be done via the jog/shuttle control and use of this is awkward, at best. (Perhaps I would enjoy it more if the player had a faster response time.) I prefer the simpler button controls of the Pioneer 919, also on the Theta Voyager, or the even better buttons on the Sony 7000 remote. Homing in on a series of still frames, such as on the *Video Essentials* test disc, is not as easy as with the Sony 7000 series. The DVL-91 does not provide smooth slow motion in reverse, but neither do most other DVD players; Sony still sets the standard here. The DVL-91 is also noticeably slower than the Sony to jump to different spots on a disc; there are long delays when jumping to different parts of feature menus. The DVL-91 also has a limited ability to function with DVD menus that have multiple layers. The main place I've encountered this is with test discs such as *Video Essentials* or *AVIA* [Ovation Software], so it may not concern those who just want to watch movies. The presence of a single "menu" button, which functions for Player Menus, Disc Root Menus, and Disc Title Menus, may contribute to this awkwardness.

LD Performance

The laserdisc performance of the DVL-91, while acceptable, like the Theta Voyager does not match Pioneer's last stand-alone laserdisc players, the CLD-97 and CLD-99. All of the

Key Features: DVD Players


	Pioneer DV-09	Theta Voyager	Pioneer DVL-91
Progressive Video Output	No	No	No
Component Video Output	YPbPr	YPbPr	YPbPr
Advanced Digital Video Processing	YNR,CNR,H-Detail,V-Detail	None	DNR
Video Calibration Adjustments	Y/C Delay S-Video Color, Black Level	None	None
Below-Black Video Output	No	Yes	Yes
96 KHz/24-bit Digital Audio Output	Yes	Yes	Yes
DTS Digital Audio Output	Yes	Yes	Yes
5.1-Channel Audio Priority	No	No	No
Other		Laserdisc Player	Laserdisc Player
Price	\$2,200	\$6,500	\$1,800

players mentioned have a similar flat-frequency response to 4 MHz with a rapid fall-off at 5 MHz (seen as a weak image in the 5 MHz band on a multiburst test pattern, e.g., on the *Video Essentials* laserdisc). There is a strange moiré or rainbow color in the 5 MHz burst on the DVL-91 that I haven't seen before. I couldn't find any examples of this in real-world images from laserdisc playback, possibly because few laserdiscs have any content at this frequency.

The DVL-91, like the Theta Voyager, has its weakest performance in chroma noise. On color bars or full-frame color displays, the noise is best described as "worms" in the image. This is most prominent in blue and cyan, but is also present in red, magenta, green, and yellow. The noise can be significantly reduced by turning the variable digital noise reduction (V-DNR) to max, but is still visible, even with that setting. Fortu-

nately this chroma noise does not often intrude on laserdisc playback. I noticed it most on older, noisy laserdiscs. Their inherent noise, added to that of the DVL-91, created a noisier image than from the CLD-97/99. The DVL-91 also has an exaggerated chroma delay: See the *Video Essentials* test pattern with two red bars on a yellow background. There is smear of the red bar to the right, into the yellow background, and it includes an irregular pattern of red dots. The awkward controls, which I mentioned above for DVD, also apply for laserdisc. Pioneer's earlier CLD-97 and CLD-99 had better controls for still step than does the DVL-91, and their jog/shuttle controls worked better.

Summary

The video performance of the Pioneer DVL-91 is essentially equivalent to that of the Theta Voyager. It is particularly impressive as a DVD player, but like the Voyager, doesn't equal previous generation state-of-the-art laserdisc players. However, for \$1,800, you get a combination LD and DVD player, which is not a bad deal, especially if you have a collection of laserdiscs and need a new LD player. There is also the convenience of having just one set of hook-ups and one remote control for all your home-theater optical disc needs. Of course, as with any stand-alone DVD or LD player, you also get a CD player in the bargain. 

Manufacturer Information

PIONEER ELITE DVL-91

Pioneer Electronics (USA) Inc.
2265 East 220th St
Long Beach, California 90810
Phone: 1-800-Pioneer
www.pioneerelectronics.com
Source: Manufacturer Loan
Price: \$1,800

Further Thoughts:

DVDO iScan Plus Line Doubler


In the last issue, we previewed a prototype of the DVDO iScan Plus line doubler, a breakthrough product at \$699. Its price and key feature, inverse-telecine processing, threatens to restructure the line-doubler market. Inverse-telecine is a process that can convert interlaced video from film sources to progressive video without creating deinterlacing artifacts. Until recently it has been protected by patents making it available only on line-doublers and video upconverters more than 10 times the price of the iScan Plus. (The inverse-telecine process is explained fully in Issue 24.)

I have now received a standard production iScan Plus and can update our earlier evaluation. The inverse-telecine processing continues to work as flawlessly as before to deinterlace DVD and laserdisc movies, as well as anything shot on film for broadcast TV. Deinterlacing material shot with video cameras, where the inverse-telecine process no longer applies, continues to be rather mediocre. That is actually a much more difficult technical challenge, so I didn't expect anything better for this price.

The complete iScan Plus feature set is implemented on the production unit, which includes one composite and two S-Video inputs, but no component video inputs. It is disappointing to give up the higher chroma bandwidth that component video inputs would have provided for DVD. You also don't get the conventional video picture adjustments for contrast, brightness, color, tint, and sharpness. The black level of the produc-

tion iScan Plus was set too low, but this can be compensated with the projector's brightness control. I believe the absence of a color control will be the feature missed the most. There is very little control over color levels on cable TV and digital satellite broadcasts, and chroma levels on laserdiscs and DVDs are sometimes variable, reflecting the judgement and taste of the telecine colorist.

The performance of the YPbPr and RGB outputs were essentially the same when connected to a Sony VPH-G90U front projector. I also didn't see any of the earlier VCR Macrovision problems using my Sony SLV-R5 S-VHS deck.

My primary concern with the prototype's performance was a significantly softer picture than its more expensive competition. Here DVDO may have overreacted. The production version's picture appears much sharper, but that has been achieved by excessively peaking the horizontal frequency response in the 2.5-3 MHz region. This creates edge-outlining artifacts, a ghostly white halo adjacent to dark vertical edges that can most easily be seen against light backgrounds. It isn't as bad as the severe edge-enhancement that I have been complaining about on some DVDs, but it is more than I wish to see. The NTSC decoder in this product has a wide range of horizontal bandwidth settings, so it would be a benefit if DVDO turned this peaking back down, or somehow provided user control. A slightly softer picture is preferable to edge-outlining. Otherwise, the iScan Plus would be the line-doubler deal of the century. 

GREG ROGERS

Celebrate Film.

Celebrate Film.



Edinburgh Intl. Film Festival
August 15 – 29, 1999
Edinburgh, Scotland

Empire State Film Fest
September 14 – October 9, 1999
Mohawk, NY

South Bronx Film Festival
September 23 – 25, 1999
Bronx, NY

Montreal World Film Festival
August 26 – September 26, 1999
Montreal, Canada

British Short Film Festival
September 16 – 23, 1999
London, England

Manhattan Short Film Festival
September 24, 1999
New York, NY

**Black Filmworks Festival
of Film and Video**
September 1 – 3, 1999
Oakland, CA

Mostra Rio
September 16 – 30, 1999
Rio de Janeiro, Brazil

New York Film Festival
September 24 – October 10, 1999
New York, NY

Telluride Film Festival
September 3 – 6, 1999
Telluride, CO

Athens International Film Festival
September 17 – September 24, 1999
Athens, Greece

Spokane Film Festival
September 25, 1999
Spokane, WA

Toronto International Film Fest
September 9 – 18, 1999
Toronto, Ontario

Independent Feature Film Market
September 17 – 24, 1999
New York, NY

Screens on the Bay
September 29 – October 1, 1999
Rome, Italy

**International Broadcasting
Convention**
September 10 – 14, 1999
London, England

Bangkok Film Festival
September 17 – 26, 1999
Bangkok, Thailand

**Saint Louis International
Film Festival (8th Annual)**
October 29 – November 7, 1999
St. Louis, MO

Le Nombre D'or
September 10 – 14, 1999
London, England

Drama Short Film Fest
September 19 – 25, 1999
Drama, Greece

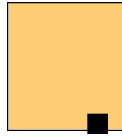
**The Rehoboth Beach Independent
Film Festival**
November 11 – 14, 1999
Rehoboth Beach, DE

Aspen Film Festival
September 22 – 26, 1999
Aspen, CO

Cairo International Film Festival
November 25 – December 8, 1999
Cairo, Egypt

A public service of The Perfect

SEE HEAR



Classic Comedy's Second Coming: Roberto Benigni

o many Americans, Roberto Benigni and his film *Life Is Beautiful* materialized out of nowhere. Who was this odd foreigner who suddenly jumped to the front of the line and garnered three Oscars: Best Foreign Language Film, Best Actor (a first for an actor in a foreign subtitled film), and Best Dramatic Score? Recently, in television interviews and in print, Benigni has been depicted largely as a crazy but charming buffoon who says he loves everybody and spews mangled English in long incoherent sentences.

actors whose memory of their field goes no further back than, say, *Monty Python* or the original *Saturday Night Live*, Roberto Benigni has been drawing from the well of the pioneering masters – particularly the silent ones: Charlie Chaplin, Buster Keaton, Harold Lloyd. There are also shades of Laurel & Hardy, the Marx Brothers, Jacques Tati, and Peter Sellers throughout his work. Fans of silent and classic comedy have been drawn to him; he appears to be the living embodiment of the traditions of slapstick and pantomime – rechanneling the magical aura of

Photo: Steve Friedman



Benigni with
Wim Wender
in 1993.

But our ignorance has been our loss, for this masterful comedian is not a Johnny-Come-Lately, and he is nobody's fool. His name is a household word in much of Europe, where he is respected and adored for his large body of work as writer, director, and actor. Benigni has been a major figure in Italian cinema for well over a decade, though making only occasional appearances in American films. He is so well loved in Italy that there was an astonishing show of public jubilation – literally, dancing in the streets – when he won his Oscars. The Pope himself requested a private viewing of *Life Is Beautiful* – apparently only the third film the Pontiff had ever seen.

Unlike many contemporary comedians and comic

these past greats and reinventing it for audiences today. While he draws inspiration from these comic geniuses, he steals nothing – for he has a unique persona and a style all his own. His appearance, stance, walk, voice, and gestures are already unmistakable and are fast becoming as well known as Chaplin's once were. What wonderful gifts this man has to offer! His warmth, charisma, his lust for life, are infectious – and a bit of fresh air in these cynical times. What makes him an even more

endearing figure is his warm public and professional relationship with his wife, actress Nicoletta Braschi (who calls him “a poet”). Benigni often includes her as his co-star and leading lady, referring to her as the “lightning” or electricity that animates his work.

ALICE ARTZT & BRUCE LAWTON

Though a number of films in which Benigni appears have not reached the US, many of his earlier efforts have been available for some time on home video in this country. As of this writing, none of his films have been released on DVD (with the exception of the just released *Seeking Asylum* – see sidebar). But while you wait for the soon-to-be released laserdisc of *Life Is Beautiful*, consider the following five films on LD and VHS:

Down by Law
1986 • 107 minutes

Writer/Director Jim Jarmusch's starkly photographed black and white film about three losers – all victims of circumstance who end up together in a New Orleans jail cell and who subsequently escape – was Benigni's first American (and English-speaking) feature. The film has a decided "watching paint dry" pace, particularly in the beginning, which shows the malaise and boredom of the surroundings – while the visuals and narrative keep things interesting. The first half hour is taken up with one day in the lives of a hot-shot pimp (John Lurie) and a down-and-out disc jockey (Tom Waits) leading up to the "set-ups" that put them behind bars. Around the 20-minute mark, Benigni makes his first appearance – with his back to the camera – appearing like a vision to the drunken Tom Waits. He says, "It's a sad and beautiful world," in a thick Italian accent, to which Waits replies, "Buzz off." Rather than taking offense, Benigni takes note of this new expression (perhaps a greeting?), practices saying it with different inflections and in differ-

ent contexts – "Hello, How are you and buzz off to you, too!" – writes it in his little black book for future reference, and disappears. Throughout the film, in an effort to improve his fractured English, he carries around this little notebook and writes down any phrase he hears, usually having no idea of its real meaning. When not spouting Italian translations of American poetry and philosophy, he innocently and happily parrots these phrases in incongruous situations.

While he's an unlikely fellow to find wandering around Louisiana (almost like a friendly alien from another planet), Roberto (who goes by his real name in this picture) nonetheless becomes the heart of the film. Not long after Lurie and Waits are jailed, Benigni joins them in their cell. His manner and demeanor upon entering his new surroundings are not unlike those of Stan Laurel. Like a child, he is cautious of – yet curious about – his new "friends." He studies them, attempts to make conversation and tries to learn better English from them. While they are at first reluctant to befriend him, Roberto manages to bring them out of their shells. In doing so, he serves as the glue that gradually brings these two surly, selfish, brooding American rebel-types together. While they benefit from his ingenuity (it is he who discovers a means of escape from the prison and keeps them from starving in the wild), they also benefit from his warm kindness and friendship. They clearly become better people just from knowing this "good egg."

Toward the end of the film, the beautiful Nicoletta Braschi (also going by her real name) appears as a lonely café owner with whom the fugitives find refuge. The highlight is a loving, sensuous dance between her and Roberto to the Irma Thomas song "It's Raining" on the jukebox. There's a feeling of blissful irony and cosmic justice that these two warm souls – Italians in a foreign land – should meet and fall in love. While the ultimate fate of all the characters is left in question, you can't help but suspect that Roberto and Nicoletta will go on to a happy life together.

The film was released years ago on VHS through the Fox label, Key Video – then disappeared. It was finally remastered and re-released on VHS in 1996 by Polygram Video (\$15), which led to its first domestic laserdisc release [ID3911PG] through Image Entertainment in the same year. The disc is now an out-of-print collectors item.

Johnny Stecchino
1991 • 102 minutes

Even before *Johnny Stecchino* ("Johnny Toothpick"), Benigni had written, directed, and starred in several Italian films (all of which have yet to be released on video in this country). However, *Stecchino* went on to become Italy's most successful box-office hit until *The Monster* and *Life Is Beautiful*, and thus received a theatrical release here, where American audiences got their first impression of what the multi-talented Benigni could really do.

Following in the grand film comedy tradition often used by Peter Sellers, Benigni plays two roles: that of Dante, a free-spirited bus driver who yearns for romance and has a propensity for stealing bananas (by sleight of hand from fruit merchants), and that of Johnny Stecchino, a macho *mafioso* forced into hiding by a feud with a rival family. While the first role is one that we've come to equate with the warm Benigni

Photo: Steve Friesdman



Benigni with Claudia Cardinale and Blake Edwards in 1993.

persona, it is the second that gives us a glimpse of his remarkable chameleonic abilities as an actor. While comical, gangster Johnny is also a menacing figure and one to be feared, even if not taken completely seriously. This basic premise is not unlike that of the little known Buster Keaton film, *The King of the Champs-Élysée*, a 1934 French comedy in which Keaton plays both a variation of his usual screen character and a ruthless gangster.

Through a chance meeting with Johnny's wife, Maria (played by Braschi), the unknowing Dante is invited to stay at the Stecchino villa – to be used as a decoy to deflect attention away from the gangster in hiding. Numerous farcical situations ensue, the most hilarious running gag being the innocent Dante's impression that he's being dogged by those around him for banana theft, when really he's being pursued by hit men and betrayed *mafiosi*. Another is his being misled into believing that cocaine is really a miracle medicine for diabetes! The film is full of such gags and yet remains a light and bittersweet piece of sublime entertainment. The jaunty evocative musical score by Evan Lurie is also a treat.

The film was released on VHS and laserdisc [ID23244LI] by New Line Home Video in 1993 and is in Italian with English subtitles. The transfer is quite nice and brings out the rich colors of the Italian locales, although several cropped shots show that it could have benefited from letterboxing. The retail price of the laserdisc was recently reduced to \$20 (down from \$40), although the disc appears to have just gone out of print. The VHS, which also retails for \$20, is still available.

Night On Earth

1991 • 128 minutes

Jim Jarmusch just couldn't keep himself from using the great Benigni in yet another of his quirky films. *Night On Earth* is a unique concept film (sporting a lurching Kurt Weillesque Tom Waits score) that proves that variety is the spice of life. The gimmick: five taxi cab rides which take place in succession in different major cities on Earth (Los Angeles, New York, Paris, Rome, Helsinki). While all five stories are interesting, the New York and Rome segments are the most piquant. Benigni, of course, is featured in the Rome episode and gives a *tour de force* of hilarity in his characterization of Gino, an eccentric, whacked-out cabby who picks up a weary priest (played with beautiful comic restraint by Paolo Bonacelli, who also appeared to great effect in *Johnny Stecchino*). Upon picking up his holy fare, Gino spews a barrage of conversation at the padre – and then gets a bright idea. Since he hasn't been to church in quite a while, he asks the priest to hear his confession. Undaunted by the priest's protestations, Gino relates with great gusto his rather odd string of sexual escapades – starting from puberty! Only an artist of Benigni's winning personality and temperament could pull off such an outrageous routine without

Roberto on the Internet

If you are internet savvy, you can check out Benigni's up-to-date filmography on the popular Internet Movie Database at: <http://uk.imdb.com/Name?Benigni,+Roberto>.

A delightful "Un-Official Roberto Benigni Fan Site" can be accessed at: <http://lavender.fortunecity.com/wildbunch/334/>.

appearing sleazy. The sequence is a comic gem, arguably the highlight of the film.

Both New Line Home Video's VHS and laserdisc [ID2246LI] releases derive from the same solid widescreen (1.85:1) transfer that really can't be faulted, considering how much of this film takes place in dark cabs at night, lit by the streetlights of the different environments. The VHS retails for \$15 while the laserdisc is one of the most sought after out-of-print titles around.

Son of the Pink Panther

1993 • 93 minutes

Let's face it – when the great Peter Sellers died, he took the key to the *Pink Panther* series with him. The five "Clouseau" films that he and comic director Blake Edwards created are classics of the genre and still constitute the most successful feature slapstick series ever created. After Sellers' death, Edwards and United Artists tried to revive the series with two companion films produced at the same time. Using many of the series regulars, he fashioned *Trail of the Pink Panther* (1982), which utilized sequences from the previous films as well as unused ones to tell the story of the "missing" Inspector Clouseau. This was followed by *Curse of the Pink Panther* (1983), which attempted to revive the series by introducing Clifton Sleigh (Ted Wass) as the second worst detective in the world. The mediocrity of these two entries appeared to bring an end to the Panther.

But then a decade later there appeared a beacon of hope. Comic sensation Roberto Benigni would be a natural to revive the series – and what better way to bring him on board than to fashion a premise where he could play Clouseau's long hidden (illegitimate) son – the product of a brief romantic tryst with Maria Gambrelli (Elke Sommer's character in *A Shot In The Dark*, now played by Claudia Cardinale, Princess Dala in the

The Only DVD...

Seeking Asylum (Chiedo Asilo)
1979 • 112 minutes

In what is, I hope, only the first of numerous home-video near-things of Benigni's past work, Image Entertainment has just released *Seeking Asylum* [ID4771SI] in Italian with English subtitles on VHS (\$20) and on DVD (\$25). (The cassette we viewed had a serious glitch for the first few minutes, which we assume was particular to our copy and not an artifact of Image's master.) The film stars Benigni as a unorthodox kindergarten teacher (named Roberto – what else?) whose anarchic manner with his pupils is not unlike the school scene in *Life Is Beautiful*. But as the film goes on, we see that he regards his charges more as experimental material than anything else. Suspicions of comic ideas and glimpses of the Benigni to come are in evidence here – not surprising since he was a co-writer on the film. However, while shot in a spontaneous and improvisational manner, the film is mired in ennui and ambiguity (and ends on a strange and unexpected mystical note) thanks to its writer/director, the late Marco Ferreri. Considering Ferreri's controversial cinematic output, this film seems to be his most conventional – which is not saying a lot! If you love Benigni, it's worth a look, but don't expect an urge for multiple viewings.

The transfer appears to be an old one, which, short of letterboxing, could have used some attention in the compositional framing department.

original *Pink Panther* film – go figure). Sad to say, though, the film just doesn't work. The dramatic plot of international intrigue (the kidnapping of the Princess of Lugash played by Debrah Farentino) is murky and uninteresting. The comic plot with which


it is intertwined – that of Commissioner Dreyfus' (the great Herbert Lom) discovery of a bumbling yet dedicated Gendarme (Benigni) who causes the return of his familiar paranoia and accompanying facial tick, is an inspired concept. Naturally, Benigni is delightful as Jacques Gambrelli-Clouseau, Jr. – and though there are a number of hilarious moments and bits of business, the direction is stale, and the poorly realized script doesn't give Benigni enough to work with. For Benigni fans, it is worth watching for those fun moments, and it includes Braschi in a cute cameo – which perhaps hints at a sequel.

MGM/UA Home Video released the film in pan-and-scan on VHS (which is out of print, but seemingly about to be reissued) and in widescreen (2.35:1) on laserdisc [ML103044], which originally retailed for \$35 but can now be had for \$10. The disc also includes the trailer, which gives the impression of a much better film. With its scope framing and chapter markers, the disc is a great way to savor Benigni's best bits. Oddly, the jacket lists both the aspect ratio and running time incorrectly.

The Monster (Il Mostro)
1994 • 111 minutes

Produced right before *Life Is Beautiful*, *The Monster* is a near perfect comedy of mistaken identity, making it an obvious

companion piece to *Johnny Stecchino*. (Like *Stecchino*, this film also sports a nifty score by Evan Lurie.) Benigni plays Loris, a clever fellow who gets by on part-time odd jobs, supplementing his resources through inventive small-time scams as he manages to stay one step ahead of his creditors (a character not unlike Chaplin's Tramp). Through a hilarious risqué incident and subsequent misunderstanding, Loris is pegged by the local law enforcement as the elusive sex-crazed serial killer they've been after. Sure that they have their man, they put the unknowing Loris under surveillance, and as they misconstrue every innocent move he makes, they become progressively more convinced that he is the murderer. Obsessed with catching Loris red-handed (and finding out what makes him tick), the police psychologist (splendid French star Michel Blanc) enlists the assistance of a policewoman named Jessica (again, the enchanting Braschi) to go undercover as "bait." Pretending to look for an apartment, she ends up rooming with the unsuspecting Loris, who is mystified at her relentless attempts to be provocative. The comic situations and developments that take place under these circumstances are nothing short of hysterical. The ending (a topper to a running gag) is exquisite and serves as a loving nod to Chaplin. The film is brimming with brilliant gags and bits of slapstick resulting in farce on a grand scale. That, combined with the vibrant characterizations of the entire cast makes this one of the most satisfying comedies of all time. This may be just the beginning of what Benigni, along with Braschi, has in store for us.

The film was released in Italian with English subtitles on VHS through Columbia TriStar Home Video in 1997 and has just recently come down in price to the \$20 range. The transfer is serviceable although it's clear throughout that the film would have greatly benefited from letterboxing. It's worth noting that the version available here omits an early four-minute sequence that, while not essential, is quite funny and sets up certain adversarial relationships that follow. 

Alice Artzt is a professional classical guitarist who has performed world-wide and recorded extensively. She writes on music for The Absolute Sound.

Bruce Lawton is a motion picture and video specialist, serving for five years as archival director of New York's Kiliam Shows, where many silent classics are stored. He has produced and edited documentaries and presentations for public and international television, and has presided over home video and laserdisc releases for Republic Pictures Home Video and the Voyager Company. He writes for Sound and Vision, and BraiPlay.com, and produces "live" film presentations (including The Silent Clowns series) in New York City.



Top

.....

Special Editions: Kubrick and The Space Monsters

he fanatics among you will know, by the time you read this, that the long-awaited Stanley Kubrick boxed set of seven films, released through Warner Home Video, is a great big disappointment.

I am, at the time of this writing, just experiencing that first wave of anger and incredulity. The DVD set was released, officially, on the very day this article had to be turned in, and I only managed by wit and ingenuity – hardy-har – to scrounge the Kubrick package a few days earlier, no thanks to Warner’s folks.

And small wonder.

The set consists of *Lolita*, *Dr. Strangelove, 2001: A Space Odyssey*, *A Clockwork Orange*, *Barry Lyndon*, *The Shining*, and *Full Metal Jacket*. MGM issued three other and

designed the package and approved its contents. In which case, double the mystery and double my doubts about certain of Kubrick’s judgments. None of the discs are “anamorphically” enhanced, which is a crying shame. And most of the transfers have been done at relatively low bit rates, which results, in too many cases, in soft pictures – even on a standard monitor.

Lolita, *Strangelove*, and *Barry Lyndon* fare best in terms of picture quality (read: definition), even though the film stock used in shooting *Lolita* (as seen in the theater) wasn’t of consistent quality: Exteriors are sometimes soft in focus, while the interiors are just jim-dandy. Exactly the same may be said for *Strangelove*, which also has more speckles than you’d ever expect from an element that ought



earlier Kubrick films separately: *Killer’s Kiss*, *The Killing*, and *Paths of Glory*. Kubrick’s director-for-hire flick, the epic *Spartacus*, evidently had been disowned by the man.

I have no idea why the three earlier films weren’t included in the “official” Stanley-approved set. Maybe, as in the case of *Spartacus*, he didn’t consider them equal to his best. What we were told, by Warner, was that Kubrick

to be in better shape. (But, then, so does *The Shining* in places.) *Lyndon* looks spectacular, better than I’ve seen it on any transfer. Note particularly the available-light scenes, shot with only candles for illumination, which are now sharply defined with much less color saturation and much more natural skin tones.

2001 is regrettably exactly the same transfer (unen-

hanced) that came from UA/MGM some months ago, with all the flaws of that release, including the image "sharpenings" that leave everyone, from man to apes, outlined by fine miniature halos. The picture is soft and the colors a bit on the pink side (on both my viewing devices). I doubt that *2001* should ever be seen on home video, no matter what the size of the screen. It was best pro-

suggests, Kubrick-approved or no, that the package – evidently originally intended to accompany *Eyes Wide Shut's* July release – was pretty much thrown together from existing transfers. We get zilch in the way of special features – save for an interview with Arthur C. Clarke on the *2001* disc and a Vivian Kubrick directed documentary about the shooting of *The Shining* on that disc. Otherwise, nada.



jected in Cinerama (the single lens variety) and shown on a deeply curved screen. Its grandeur disappears and the architectonics of its set design and special effects are reduced to the equivalent of a postcard replication of Vincent Van Gogh's "Starry Night" – that is to say, with nothing like the impact and awesomeness of the original. Once, and the first time I saw it, at the long-gone George Cinerama in Atlanta, I noted during the film's opening moments that, as the camera rose upward to reveal the alignment of the planets deep into the background, I actually had the sinking feeling that I was rising as well. Seeing it on other big screens, but not in a Cinerama installation, I did not find the sort of involvement I felt with the opening scene, nor did I have the intense rush of adrenaline during the now widely imitated "light show" that was *2001's* penultimate thrill. For that matter, the entire massive scale of the film is shriveled and with it, much of the awe *2001* could inspire is lost. Instead of the feeling of great spaciousness that Kubrick manages to work in to almost every scene, we get a tamed "instant" version of what was once really a "space" odyssey. On this DVD, we are not even treated to a picture-book replica of the original, but something, in terms of quality, that approaches the look of an upscale comic book.

Consistency is not much in evidence in the set. *Full Metal Jacket* and *The Shining* are shown in their full-frame versions, not in the 1.66:1 aspect that Kubrick evidently preferred – *2001* being Kubrick's only foray into multi-channel sound (which he used with indifference to its potential) and a very wide aspect ratio. Played back, however, on a 16.9 screen, both *The Shining* and *Full Metal Jacket* play better. In *The Shining*, for instance, such picture cropping covers the shadow of the helicopter from which the opening sequence was filmed. I can't imagine that Kubrick didn't see this as he watched the film on video, just as I am puzzled by the exterior shots of the Overlook Hotel, where no maze is to be seen – why the incongruity? And the transfer of *The Shining* appears to be identical with the full-frame version released on 12-inch laserdisc, and not materially better. It

That said, the documentary on the making of *The Shining* is tantalizing and, sad to say, all too brief a look at the director at work, fleshed out with Jack Nicholson's on-and-off-set antics and a not very flattering glimpse of some of Shelley Duval's diva-like (in the "difficult" sense of diva-like) tactics during the filming.

With the exception of *Barry Lyndon*, which I would much, much rather have seen in a widescreen "enhanced" version, these transfers are far from the state of the art. I despised the look of *2001* and found the "softness" of too many images in *A Clockwork Orange* distracting (it may look better on a direct view, small-screen monitor, but you won't want to blow the image up to front-projection size). Both *Clockwork* and *Full Metal Jacket* exhibited pinkish skin tones on both systems here.*

So what do we have? All of the releases from *Lolita* through *Barry Lyndon* at the correct aspect which, excepting *2001*, is basically 1.66:1. All, save *2001*, are monophonic Dolby, with the sound on *Barry Lyndon* overly ripe in the bottom octave (which plays havoc with the e'er-circulating Vivaldi theme) and not so good as the laserdisc issue. All appear to be taken from older transfers. There are few "goodies" for the avid moviegoer in the way of extras. And, top it, no enhancement. Bad show.

The other big news in boxed sets was the early June issue of *The Alien Legacy* from Fox.

For the four movies therein – *Alien*, *Aliens*, *Alien3*, and

* The direct view Toshiba IDTV set, a 32-incher, was set up by Joe Kane and has always exhibited a breathtaking color fidelity, especially on hard-to-capture reds. The recently installed Barco is promised a color analyzer check out of its grayscale and color temperature. I believe it could use some fine-tuning of its color balance.

**For those who care, the goodies include, on *Alien*, an interview with Ridley Scott, the movie's storyboard, the original score on its own audio track, some deleted scenes, one of which surely ought not to have been deleted, given its importance to the versions that would follow, and this is the scene where the survivors find the first victims of the alien all bundled up in their gooey cocoons. On *Aliens*, we have an interview with James Cameron, some behind-the-scenes footage, and the restored 17 minutes missing from the Dolby Digital laserdisc issued last year. On *3*, we have a "making of" feature, original trailers (but, who cares?), and so on.

Alien Resurrection – we find each at its correct aspect, 2.35:1 for all save the James Cameron-directed *Aliens*, done here at 1.85:1. All are enhanced for widescreen displays. All are in Dolby 5.1 surround, which, as we shall soon learn, is not always an unmixed blessing. And all have value-added features, ranging, at the simplest, from *Resurrection's* making-of featurette, to the chock full of goodies on the original *Alien*, now in its “20th Anniversary” edition.**

The bad news? The sound on *Alien* is stinko. In earlier laser transfers of the film, the sound is quite remarkable, especially in terms of low-frequency weight and articulation and in overall dynamics. Considering its 1979 origins, the surround sound was most effectively deployed.***

But on this DVD, there is no low bass to be heard, and little in the way of dynamics. Indeed, if you want a notion of how far off the sound is, you don't have to look up the earlier editions; all you have to do is select and play back the music track itself (one of the nice features of the disc) and see how vitiated, anemic, and jejune the sound has become. Castrated is the word that pops to mind, if not to body.

This disc should be recalled, a new attempt made to squeeze its wideband response into Dolby Digital's narrow band of bits.****

Visually, it's a hard choice. I think my Palme d'Or for visual excellence would go to *Aliens* (viewed in enhanced fashion), which is up there with the best in my experience. *****

Nearly, maybe just as good is *Alien Resurrection*, but what a mess its script is, and its director Jean-Pierre Jeunet (*Delicatessen*, *The City of Lost Children*) brings little of his outrageous visual flare to bear on the proceedings. Given its box-office reception, nearly as bad as the critical drubbings it took, I doubt there will be another in the series, although I find the implied prospect of aliens loose on a futuristic planet earth yummy (maybe they would physically morph into the sleaze-spitting Matt Drudges of the world to come). *Alien3*, which repulsed me when I saw it in the theater, actually plays better on the smaller screens of the home theater. *****

***I saw a 70mm blow-up of this film in one of Long Island's best theaters, before United Artists split it into three theaters and finally razed it to the ground. The sound design helped scare the pants off me and virtually everybody else who was there.

****I intend to undertake a lengthy analysis of the all-too-often crummy AC-3 sound on DVDs. I have tarried for DTS capability, on the thought that the DTS soundtracks that haven't been souped up to the high Andes might provide a useful comparison, provided I can find a DTS disc that has not been dicked with.

*****I am working on a comparative listing, in terms of visual excellence alone, for an upcoming Super DVD compilation. So far, for those of you who cannot wait, that list would include *Starship Troopers*, *Crash*, *Austin Powers* (but not for content - yes, I just don't get it), *Dark City*, *Ronin*, *Elizabeth*, and *Gods and Monsters*, to name but a few.

***** I saw, with Tom Miller some years ago, the opening day showing of John Carpenter's *The Thing* in a 70mm blow-up, and it left me feeling queasy with stomach over easy, much as did a reading recently of Thomas Harris' *Hannibal*, which cannot, without the dread NC-17 rating hovering overhead, be translated faithfully to the screen. Those who have read the ending will know what I mean. When I again saw *The Thing*, in the first of its two laserdisc editions, I found it fascinating and what had been repulsive was tamed almost into an *objet d'art* field day for the gifted Rob Bottin. The home-theater experience seems to favor feeling over impact, expanding our ability to identify or “read in” to the emotional context of a film, while shrinking the film's ability to overpower, transport, or disgust.

It certainly makes more sense. The look that director David Fincher (*Seven*) bestowed on it was radical in several senses and made following its convoluted goings-on, particularly where the monster was concerned, difficult on first viewing. *3* isn't as bad a movie as I first thought, though it is not in the same starry pantheon as the first two movies. Is it heresy to say that Cameron's only two good films are the original *Terminator* and *Aliens*? If so, so be it. And the restoration of the 17 minutes he had to cut to accommodate the marketing powers that he makes sound emotional sense in the deepening of Ripley's character, although I think I could have done without the prolog of what happened to the colonists. The film works better, I think, if the way the aliens connected with the people in the off-world settlement is left a mystery. I find it particularly objectionable that it is the parents of the one survivor who first got alienated, so to speak. Too pat. Being pat to the point of obviousness is one the things I object to most about Cameron's work. In *Terminator II*, he throws away suspense and the unexpected, unanticipated shock for the gratuitous special effect. If the morphing villain of *II* could change himself into anything including the floor, the suspense of where he'd pop up next ought to be killing, but Cameron doesn't once take advantage of this inherent license to scare the remaining wits (not much these days, judging from what's making money at the box office) out of the audience.

These discs are available separately, to be sure. So you might save a buck or more by cherry-picking the best of the series. I don't recommend the *Alien* disc and won't short of a remastering (unlikely, I'd think) to solve its sonic woes. *Aliens* is a must. Whether or not you go for the other two would depend entirely on your compulsiveness about these things. I think you could pass, but then I didn't, did I?

Special Editions: A Few Weird Thoughts

I seem to have developed a kind of journalistically induced schizopolis when it comes to the “added value” stuffings found in laserdisc and DVD special editions. I deplored the lack of these features in the Kubrick set and have wondered what else, beside the kitchen sink, might be found on the DVD of *What Dreams May Come*.

As a general rule, I have no use for the “making of” featurettes on DVDs since they are basically promo stuff that adds virtually nothing to my understanding of the background of what I've just seen. Exception: The all-too-short film made during the filming of *The Shining*. Proving the rule: The film accompanying the release of *Gods and Monsters* (“Worlds of Gods and Monsters: A Journey with James Whale”), which I expected to further enlighten me about the life of that director. It didn't.

Oddly, I think, given my endless fascination with film technology, I really don't want to know how every special effect has been done – some things are better left mysteries, as any practicing magician can tell you. And I find some of the blather from directors self-indulgent to the point of narcissism. I understand, from a standpoint of pure ego, the desire of directors and stars to leave behind some sort of permanent record that

goes beyond the film itself, since through video we have come to, essentially, the preservation of film history. But is, for instance, *The Last Starfighter* really all that historically significant in the pioneering of digital effects as its liner notes proclaim, as does an included documentary? Do I really care, I ask myself, hoping by the asking I can pump up some enthusiasm for the subject? Nope, not really and truly.

But then again, sometimes I do. I would have loved any commentary from Stanley Kubrick about his aesthetic sensibility and how he applied it to film. (As noted above, I watched the documentary on *The Shining* before I checked out the quality of the movie's transfer, and normally a behind-the-scenes documentary I could care less about.) I would even liked to have known how some of the Steadicam shots in that film were made, and whether the evil smile Jack Nicholson gives the camera as he throws dishes at it was on purpose. I would like to know how some of the shots in *Wolfen* were made – and how they got an obviously terrified Albert Finney to go up on the Williamsburg Bridge's topmost spans. Ditto for a director's cut of *Wolfen* and some commentary about how he, Michael Wadleigh (*Woodstock*), used sound to tie the thematic elements of the film together.*

Or what he originally had in mind before the picture was taken away from him. I wouldn't even have minded hearing from John Frankenheimer about the spectacular last car chase in *Ronin*. DeNiro looks terrified and he appears to be doing much of the driving. How did they manage the mechanics of driving two high-speed cars the wrong way on a Paris freeway (and through a tunnel that looks suspiciously like the one where Princess Diana met death)? And I'm always interested in seeing the sexy stuff they cut out, e.g., the 65 seconds of *Eyes Wide Shut*, which Kubrick fudged on to avert an NC-17 rating in America, but which will be shown as shot (private parts and all) elsewhere in the world. Postscript: Wouldn't it be an event, if not one likely in this or any other realm, to have a commentary about his work from Terence Malick?

Maybe I'm just wondering aloud if I am the only movie collector who could do without the sometimes intimidating array of bonuses that come increasingly on DVD, even for movies that are quite ordinary. Too much of what passes for "special" features on DVD is drivelt and only partially treated sludge, creating an illusion of importance and "permanence" for movies that are quite ephemeral in the sense of having lasting value, even if such features are therapy for the egos of the moviemakers, and aromatherapy, in the more odious sense, for the rest of us.

Worth a Look: (Relatively) Recent Arrivals

Gallipoli. Peter Weir, director. 1981. 5.1 discrete surround. 2.35:1 aspect ratio. Enhanced for 16.9. 111 minutes. Paramount.

As it proved with its DVD issue of *Days of Heaven*, Paramount is no slouch when it comes a startlingly good video transfer. And of late it seems that Paramount has put itself

* This movie is still available on laserdisc and is a showcase, even in matrixed form, for the use of surround sound.

solidly back in the camp of those who "enhance" their transfers for widescreen viewing on a 16.9 sized screen. (It started out with "enhanced" releases, then abandoned the practice, now "enhancement" is back on their recent releases, including, most notably *The Ten Commandments*.) I believe than fans of this early Peter Weir movie (featuring a baby-faced Mel Gibson) will be in hog heaven with this release. The movie is exquisitely beautiful in this transfer. Weir knows how to use the widescreen, and this disc could well be a demonstration for the virtues of preserving a film's original aspect ratio. Pan-and-scan, a phrase that always reminds me of the early California gold miners, hurts this film, reducing it to a buddy movie when that is only the superstructure around which Weir has built a picture of the Aussie and his sensibility, then as now.

What Dreams May Come. Vincent Ward, director. 1998. 5.1 AC-3 sound. 2.35:1 aspect. Enhanced for 16.9. 114 minutes. THX. Polygram.

Vincent Ward has made two fascinating films. One is called *The Navigator: A Medieval Odyssey*, the other is *Map of the Human Heart*.

The Navigator is a wondrous strange little film, about some medieval villagers, on a kind of crusade (looking for a cross) who stumble across time and into contemporary New Zealand. It is a film full of odd and quite gripping moments, none finer, to my way of thinking, than their confrontation with a freeway, which they must cross if they are to succeed in their venture. *Map of the Human Heart*, which is available on a laserdisc you must not buy, is a film that works best and only in its wide aspect ratio. If you see the pan/scan version, you won't have the vaguest notion why us modern-day Romantics find it such a gem of narrative storytelling. (Even the versions shown on satellite's art movie venues, usually home to widescreen issues, are pan/scan.) I don't know how to explain what happens. But somehow the heart has gotten cut out of the film.

What Dreams could have been every bit as good as the two earlier films if only Ward could have had a Tom Hanks or some latter-day Jimmy Stewart in the lead, instead of a pompous, smug, condescending Robin Williams, who, I'd guess, isn't into the material at all. Lacking that kind of High Romantic's sensibility, he would be bound to a kind of confusion about the character he is playing. We have to believe in a man who loves his wife to the point that he would give up all hope of Heaven to find and to rot beside her in Hell. So Williams slaps on a goofy, sweet grin, the one that has carried him through so many other mushy roles, and tries to look sincere. He's as out of place in this fantasy as I'd be at a militiaman's convention. And it wrecks the picture. We can't believe in him, so we don't believe in it. By a mile, it was the worst performance by a major male star last year (and he still had *Patch Adams* ahead of him).

Williams dies, in more ways than one, early on in the picture and goes to a Heaven that seems to consist of his wife's paintings, evidently meant to be her idea of heaven, though it is not quite clear why it should be his. This gives the special effects "artists" – and in this movie they are that

– opportunity to run riot with the colors and they do. *Dreams* has some of the most beautiful visuals you're going to see short of the next world and this transfer does them full, full justice. It is one of those rare instances where high-tech movie reproduction in the home is fully justified by the visual content of the film you're seeing. Which only makes me the angrier at whoever did the casting (they needed a star for box-office gross; that didn't save the investment in this case, just the opposite). It's too bad they can't digitize him out of the film and put Jimmy Stewart in. That way the elaborate structure and plotline of the movie would have had the solid foundation it needed.

Yes, you should rent. And I guess fairness requires me to say that the film is developing a cult following; some folks quite like it. I did not. I squirmed and watched the clock and picked holes in every illogical loop in the film, which I wouldn't have done had I "bought in," that is, believed in the ability of the main character to love with that degree of passion and sacrifice. (Oh yes, the ending is just as sappy as a maple in Vermont.) What a beautiful, beautiful looking DVD. Oddly, I don't remember a thing about the sound, so engrossed was I in the visual.

Barbarella. Roger Vadim, director. 1968. Dolby mono. 2.35:1. 98 minutes. Paramount.

At last, *Barbarella* done justice. The laserdisc widescreen transfer was nowhere near so good as the one here and the mono sound on that issue was shrill and horrid, like some of the music tracks on an Italian horror film. Not so here – smooth as could be and given the importance of the Bacharach-alike score to the film, a genuinely lovely surprise.

Jane Fonda has long since turned her back on sex-kitten (or even sexy) roles, and so it is easy to forget just exactly how beautiful she was when she was married to Roger Vadim. She alone is worth the price of admission and you certainly would get more than one eyeful. The film's PG rating gave me pause for thought. It would, with its acres of revealed skin and suggestive, how is it they say it – "sexual situations"? – get a sterner rating today.

I like the quality of the transfer. It is just shy of being in my top ranking (but nevertheless, some thing like an A-) and has made me try to devise sub-categories for the best DVD transfers. The differences between the best and those just below that exalted level are actually quite small. And I'm not yet sure how to quantify those most minor differences. The very best transfers have a quality of coherency, almost like the concept of "continuousness" I devised for audioland edification, about the image, maybe a smooth fluidity and consistency of resolution that makes the picture seem, especially on a big screen, almost seamless.

Noted in Passing

The Last Starfighter. 1984. 5.1 Surround. 2.35:1. Enhanced for 16.9. 101 minutes. Universal.

Fairly simple and sorta sweet story about a guy and his video game, called "The Last Starfighter." The object is to shoot

down alien spaceships. What he doesn't know is that, upon becoming the highest scorer, he will actually get a chance to do just that in fact. It's a recruiting tool.

Lotsa digital effect of the sort Disney pioneered in *Tron* (which was the film of genuine historical importance for these kinds of special effects). Nice widescreen transfer, if a little soft looking despite a high bit rate, with quite good sound in terms of bass, dynamics, though with not too much emphasis on surrounds per se.


On the other hand, the movie's fairly bland, maybe a once-a-year sort of thing to entertain undemanding friends.

Silverado. Lawrence Kasdan, director. 1985. 5.1 surround. 1.85:1. Enhanced. 135 minutes. Columbia.

The box says the movie's aspect is 2.35:1, but 'taint so. *Silverado* was originally shot in what they call Super 35, a process favored by James Cameron, one that I don't find Super visually. The idea is to shoot the movie full frame, while also composing for an aspect of 2.35:1 within the frame for theatrical release (the full-frame version thus goes to video, where there is, as some would have it, nearly twice as much picture information). It was a treat in its wider aspect; much is lost at 1.85 in terms of the film's look and architecture. And I think portions of the transfer look a bit brown and grainy. Not to my liking. *Silverado* itself, despite flaws, is a hugely entertaining western. I hope it will be done "right" one of these days. But this wasn't that day.

The Ugly. Scott Reynolds, director. 1998 (US release date). 2-channel Dolby. 1.85:1. Not enhanced. Trimark.

This sharp-looking and beautifully edited Down Under horror film from New Zealand looks like the work of a major new talent. Its first 40 minutes (or so) are as good as anything I've seen lately on the horror circuit. The sleek visuals and high-intensity color schemes add measurably to the pleasure of watching it. And the sound is surprisingly good, if entirely too heavy on the subterranean bass (*à la* the madhouse scene in *Silence of the Lambs*) and a bit light on some of the dialog (unfortunately no subtitles to help us over the rough patches). During that first 40 minutes, before we know which way the writer is going with the story, the movie is filled with real possibilities of being a minor classic in the mind-bender school of horror noir.

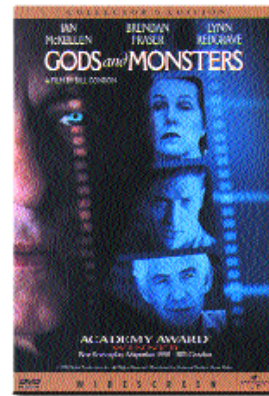
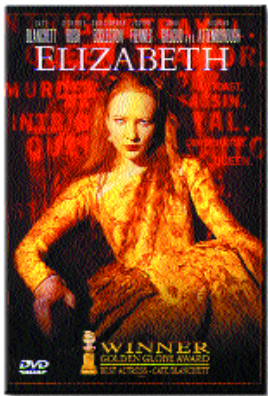
You begin to wonder if the mad patient in the asylum hasn't driven everyone crazy and what a picture it would have been had this been the way it went. Alas, despite some wonderful near-psychic touches, which the movie doesn't follow through on, things take a predictable turn toward the conventions of the genre. The use of black blood for the gore sequences actually struck me as an artful way of distancing us from the slaughter – it is far from the only imaginative touch, but all to little avail. Shown unenhanced on the big screen in Room 1, it was a terrific looking disc. Not all that different from the average "enhanced" disc. The liner notes on *The Ugly* say the movie is for "16 x 9 widescreens" which led me to believe it had been enhanced, but no, it wasn't. 



SECOND RUN



Biopics: Three British Royals



Elizabeth. Shekhar Kapur, director. With Cate Blanchett (Elizabeth), Joseph Fiennes (Leicester), Geoffrey Rush (Walsingham), Christopher Eccleston (Norfolk), Richard Attenborough (Cecil). 1.85:1 Widescreen. Dolby 5.1. Polygram Video. Enhanced for 16.9.

Mrs. Brown. John Madden, director. With Judi Dench (Queen Victoria), Billy Connolly (Brown), Antony Sher (Disraeli). 1.85:1 Widescreen. Dolby Four-Channel Surround. Miramax Classic Widescreen.

Gods and Monsters. Bill Condon, director. With Ian McKellan (James Whale), Brendan Fraser (Clayton Boone), Lynn Redgrave (Hanna), Lolita Davidovich (Betty), David Duke (David Lewis). 2.35:1 Anamorphic Widescreen. Dolby Digital 5.1. Universal. Enhanced for 16.9.

ineteen-ninety-eight was another banner year for the Virgin Queen. As acted by the great Judi Dench, Elizabeth played a small but memorable part in *Shakespeare in Love*.¹ As portrayed by giggly, gimlet-eyed Cate Blanchett, in Shekhar Kapur's gaudy Gothic meller *Elizabeth*, she got an entire "coming of age" movie of her

own. All things considered, she was considerably better off in the supporting role.

Not only does this so-called "historical drama" play fast and loose with the facts,² it does so in particularly unhappy ways.

Lord knows, England was in a "parlous state" when Elizabeth came to the throne, to quote Richard Attenborough's weak-kneed Cecil. The wounds of the War of the Roses, only 75 years past, were not yet healed; the cultural, economic, and religious divisions that would throw all of Great Britain into Civil War a mere 40 years after Elizabeth's death were setting Englishman against Englishman. Yes, there were court intrigues. Yes, there were plots against Elizabeth's life and crown. But to present virtually every major character, from lovers to conspirators, as curly-eyed, *saaaassy* young things – all of whom look like pirates who were kidnapped by royalty when they were babies, all of whom speak a hilarious quasi-Elizabethan version of the superheated, crisis-mode dialog

¹ Despite the fact that Dench had a total of eight minutes screen time in the witty but lightweight *Shakespeare*, she was awarded the Oscar for Best Supporting Actress of 1998 – a classic example of the Academy's biennial "consolation" award, making up for the Best Actress Oscar that Dench should have won – but didn't – for her performance as Queen Victoria in *Mrs. Brown*.

² For instance (and, zounds, how many "fr-instances" there are in this film!), Sir William Cecil (Richard Attenborough) is portrayed as a doddering old buffoon, when, in fact, he was a mere 13 years older than Elizabeth and served her faithfully (and well) for better than 40 years, dying just five years before she did.

JONATHAN VALIN

you regularly hear on *ER*, all of whom act as if they were in a Tudor version of *The Godfather* – is to turn high drama into high kitsch.

Director Kapur's florid, melodramatic visual style only makes bad matters worse. Kapur dotes on short, punchy, MTV-like takes, in which he typically ratchets up the foreboding (the one effect he seems to have mastered) by shooting in very low light from lots of quick, "arty" angles. He loves setting his actors in frantic, pointless motion and then tracking them restlessly down dark, column-lined corridors. He is also far too fond of crosscutting, in hackneyed fashion, between pretty sunlit or candlelit idylls and ominous shots of horses galloping across moors or armed men striding dark castle halls. When this whole calliope of clichés is set to David Hirschfelder's dreadful, pounding, prophetic score, the saga of Elizabeth's transformation from princess to Virgin Queen is turned into Gothic camp. *The Castle of Otranto 90210*.

Although the producers of *Elizabeth* went to great extent to film in authentic locations (as if keeping faith with the past were simply a matter of keeping up appearances), their true intentions are clear from the start. The movie has been written, shot, and cut strictly for the high-adrenaline, short-attention-span Gen-X market. There are flashes of romping-through-the-fields romance and dirty dancing for the girls; dusky romps in the hay and violent revenge for the guys; and a cast that was clearly selected, coifed, and costumed with an eye to what would appeal to young viewers of each sex. Polygram ordered the old girl and her courtiers to lively up themselves – and figured they'd ordered up a hit.

A hit the movie was, although not, as you can tell, in the Valin household. Cate Blanchett, who is perhaps the only reason to sit through this kitschy claptrap, looks great and acts well in a tough part, but even she goes over-the-top on occasion. (Take a look at the scene in which she is forced by Cecil to accept the Duke of Anjou as a suitor, while simultaneously trying to deal with her jealous lover, Robert Dudley [1:9, c. 50 minutes]. Blanchett flies about, with Kapur's camera doing its usual ring-around-the-rosy, twisting her hands and screwing up her face like a bad actress in a bad silent film.)

Elizabeth is a very good-looking transfer, with a powerful Dolby Digital soundtrack and a lot of thunderous low bass – for what those things are worth, which isn't much, in my opinion.

* * *

If *Elizabeth* turned out to be a major disappointment, *Mrs. Brown*, another film about another great English monarch, turned out to be a surprising success.

Unlike Shekhar Kapur, director John Madden is a pro with a straightforward, serviceable visual style that never gets in the way of the storytelling. As a filmmaker, he has the virtues of modesty, faith in his actors, and good taste in scripts. (*Shakespeare in Love* was his next project.) All of which means that *Mrs. Brown*, which starts from a far less promising (and sexy) premise than *Elizabeth*, holds you for almost its entire length by the power of its plot-line and the pleasure of its performances.

As I said, the premise is not promising, though more accurate historically than anything in *Elizabeth*. After the death of her beloved consort, Prince Albert, Queen Victoria sank into a years-long depression. While she sat in Windsor and mourned, her country was left virtually without a monarch,

giving the crown's enemies in the House of Commons, Gladstone and the Liberals, room to maneuver and giving her son, Albert, the opportunity to promote his own regency.

In an attempt to revive her spirits and head off a constitutional crisis, some of the Queen's advisors decided to call on John Brown, a Master of Horse at Balmoral Castle in Scotland, whom Prince Albert had greatly admired and who had once saved the Queen's life after a carriage accident. The thought was that the rugged, affable Brown could entice Victoria to go riding – and that once out-of-doors, out of Windsor Castle, her depression might begin to lift and her mourning end.

What none of the Queen's counselors realized was that Brown was an extremely independent and headstrong Scot, with his own firm ideas about how to raise the Queen's spirits – and with an absolute devotion to her person. Beginning with their daily rides, he gradually won Victoria's trust – and, to everyone else's horror, her heart. Before long, he was the most powerful man in court – able to persuade Victoria to move her royal family and retinue to Balmoral, in the Highlands, able to control the Queen's daily regimen and official schedule, able to head off her son, Albert, whom he treated with utter disrespect.

The court and Commons began to gossip about Brown and "Mrs. Brown," raising the possibility of a monarchy-wrecking scandal and leading the Queen's Prime Minister Benjamin Disraeli (Antony Sher, in a marvelously arch and supple performance) to visit Balmoral and try to negotiate with Brown the return of the Queen to London – and the public eye.

Nothing sensationally dramatic occurs in the course of *Mrs. Brown* – certainly nothing like the bloody intrigues and hot liaisons of *Elizabeth*. Queen Victoria and John Brown don't even share a kiss. And yet the love that grows between them – and the way that love transforms the Queen, giving her the strength to carry on – is enough to keep us highly entertained.

Although Billy Connolly does a superior job as burly John Brown, the faithful servant, his performance grows a bit one-note as he bangs against the limits of the belligerent Scot's foursquare character. One gets a bit weary of hearing Brown/Connolly bray things like, "Woman, why y'no listen to me?" in that booming brogue. On the other hand, Judi Dench's Victoria, which is acted within an even narrower expressive compass than Connolly's Brown, is a thing to marvel at.

Given Victoria's infamous sense of propriety, Dench has to express the Queen's love for Brown primarily by indirection – rather than through words or deeds. The glint of her smile, the subtle movements of her eyes or hands become barometers of what her character is thinking and feeling. That a performer can make such gestures consistently expressive of complex and shifting emotional states – without hammering them too hard, without going over-the-top – is acting of the highest order.

In its modesty and restraint, *Mrs. Brown* may well be the ultimate Victorian love story, but that does not keep it from being a moving one – or keep Dench from giving the best performance of 1997.

* * *

For the best performance of 1998, you'll have to turn to another type of British royal – expatriate film director James Whale, whose life and death are the subjects of Bill Condon's deeply affecting biopic, *Gods and Monsters*.

Whale made his reputation in Thirties Hollywood, direct-

ing a number of successful mainstream films such as *Waterloo Bridge* (1930), *Showboat* (1936), and *The Man in the Iron Mask* (1939). But it is his wildly popular horror films – *Frankenstein* (1931), *The Old Dark House* (1932), *The Invisible Man* (1933), and *The Bride of Frankenstein* (1935) – for which he is chiefly (and rightly) remembered. (The title of *Gods and Monsters* is taken from a scene in *Bride*, in which Frankenstein's assistant, Dr. Praetorius, toasts Frankenstein's brave new world of god-like scientists and their creations.)

In the early Forties, Whale fell out of favor with the studios and the public. Whether because of his sex life (he was openly gay at a time when gay Hollywood was deeply closeted), or, more likely, a series of failures at the box office, he retired from filmmaking into genteel disgrace – living a life of dilettantism and dalliance that ended when a series of strokes incapacitated him in 1956. In the following year, Whale drowned himself in his backyard swimming pool, leaving a note for his ex-lover, the film producer David Lewis (*Arch of Triumph*, *Raintree County*): “The future is just old age and illness and pain... I must have peace and this is the only way.”

Director Bill Condon, himself a dabbler in horror films (*Strange Invaders*), has taken this cautionary tale of Hollywood excess and managed to fashion it into something a good deal closer to *Death in Venice* than *Death in Brentwood*. Indeed, the film is a triumph of style, producing, at its wordless denouement (and in a final wordless scene following its denouement), an ache of genuine sadness the likes of which I haven't experienced from a film in many a year.

How Condon has done this is chiefly a matter of four notable successes: a hauntingly beautiful score commissioned from composer/arranger Carter Burwell; an unusually intelligent and inventive script (that Condon himself wrote, based upon Christopher Bram's novel, *Father of Frankenstein*); a visual style that perfectly matches the intelligence and invention of the script; and, finally, what was and will remain – so beyond doubt, question, or debate that the voting contingent of AMPAS ought to have its collective membership revoked – the finest performance of the year by an actor in a leading role. Sir Ian McKellen, who is himself openly gay (the first openly gay Britisher to be knighted), brings this sad, witty, complex man to the most vivid life imaginable. It is the role of a lifetime and a career-crowning achievement.

Like *Mrs. Brown*, *Gods and Monsters* is about the mysteries of love and friendship, but it is also very much about the ways art and life grow knotted together, like vines in bark. Indeed, as in the novel it is based on, the film attempts to understand Whale's life and death as variations on the very story that Whale himself made famous on film – *Frankenstein*.

At times, the parallels to the novel (and Whale's version of it) makes this extremely well-crafted film seem somewhat overwrought, as if Condon were intent on having every shot of every scene answer to some aspect of the myth. For example, in his excellent commentary track on the DVD, Condon talks about how he deliberately photographed Brendan Fraser in bits and pieces through the opening credit sequence – his feet, his face, his torso, never his whole body. The point being that Fraser's character, Clay, is like the monster – inchoate, just parts – until he meets his “creator” in James Whale, who “reassembles” him into a “whole” person.

While this sort of thing is tough to see on the screen (even when you know it's coming), it says something about the wit

and subtlety with which the film was made. And without doubt, that wit and subtlety – and, yes, Condon's overriding metaphor – pay off emotionally. I have rarely seen a film in recent years that is so intricately crafted to such powerful effect.

Gods and Monsters begins in 1957, after a series of mild strokes has already begun to take a heavy toll on Whale physically and mentally. Haunted by bad memories and the nearness of death, Whale attempts to maintain his spirits and his sanity by doing what he's always done – flirting, drawing, trying to preserve the illusion that his life is as orderly and urbane as it once was. It is through flirting that he meets Clay, a tall hunk of a gardener, fresh out of the Marine corps, with a handsome, square-jawed, high-browed face and huge physique that reminds Whale (and us, a little) of Frankenstein's monster.

Whale pretends that he wants to use Clay as a model for his sketching (although, as we find out late in the film, Whale's mind is so disordered that he can no longer sketch). Once he discovers that Whale is the director of the *Frankenstein* films – “Just the first two,” Whale notes, with characteristic asperity. “The others were done by hacks.” – Clay agrees to pose.

The exceptionally naïve and very straight Clay truly believes that Whale is interested in him as a subject – as a person – and is flattered by the attention. To Clay, Whale represents a life, a level of culture, that he's seen only in movies. (His own life is an aimless ruin.) Even after he learns that Whale is gay, he continues to sit for him, although the thought that Whale may be seeing him as a sex object (which Whale innocently denies) clearly upsets him. It's as if Whale were a god, and Clay his grateful, adoring creature – eager to learn, eager for friendship. The parallel with the Frankenstein story is patent.

Whale, who has only been pretending to sketch the boy in order to get him to take off his shirt and have some fun ogling him, begins, almost against his will, to talk to him candidly. Whale explains this sudden candor by saying that there is “something about your face that brings out the truth,” only it is not Clay's face but his trust that makes Whale so helplessly sentimental. That trust reminds Whale of another boy who trusted him absolutely – a secret from the past which is not told until late in the film.

Whale as Frankenstein and Clay as his Creature are scarcely the only parallels this film draws between life and art. Condon is intelligent enough to see that Whale was both Frankenstein and the Creature – both a creator of mythic films about monsters and himself a charming monster, born of wishful con-fabulation and sheer will power.

Whale's miserable youth, which he spent a lifetime repressing, is presented in flashback memories during his talks with Clay. Born of a poor family in northern England, he was, as he later confesses, like a “giraffe given to a family of farmers. What could they do but hook the giraffe up to a plow?” Rejected by his father, who despised his effete manner and artistic ambitions, he was forced out of school and set to work in a factory while still a boy.

Whale's experiences in the First World War, also presented as flashback memories, made him – and destroyed him. As an officer in the trenches, he adopted the manner of the upper crust and discovered his talent to direct men. He also had a homosexual affair with a handsome young adjutant, who adored him and whose horrible death (and the terrible imprint it left on Whale) is the guilty secret at the heart of the film.

In Hollywood, Whale the director managed to reinvent his past, as so many in Hollywood have done. Like Frankenstein

and the Monster in one, he killed off the poor, undereducated outcast he was born and – using pieces of other lives real or imagined – reconstituted himself as the sophisticate he always wanted to be. The only vestiges of the old “Jimmy Whale” are found in his films, which, like the patchwork monsters they’re about, turn the bits of horror, loneliness, and alienation that Whale repressed from his past into an art that was quintessentially about death, loneliness, and the pain of not belonging.

What makes this movie so deeply moving is the way these long-suppressed truths come to light. It is the film’s conceit that Whale’s stroke, while not completely debilitating, leaves him defenseless against images and scenes from his youth and young manhood; they flood in on him in hallucinations that are heartbreakingly sad. It is Clay – the least likely (or perhaps, as a stranger and straight one at that, the most likely) of confidantes – who gives Whale the chance to bring these disowned memories back into focus – a last chance to confess to another, and to himself, the unvarnished truth.

Empowered by Whale’s friendship and candor, Clay also finds his way to telling the truth about his own past of grinding poverty, alienation, and rootlessness. These two men, so completely different in culture, achievement, and sexuality, somehow discover what they share, and that they *do* share these things, in spite of the vast gulf between them, is what makes their unlikely friendship so affecting.

Having used the Frankenstein myth as a metaphor for Whale’s life and art, Condon goes the final step at the film’s climax, where art becomes life.

Unable to bear the sadness of the past or his growing helplessness in the present, Whale tries to use the bond of affection that has grown between him and Clay to put an end to his suffering. In a terrible act of desperation, Whale accosts Clay sexually – deliberately turning the younger man’s love into something ugly in the hope that Clay will react with violence and kill him, as Frankenstein is killed by his monster. Although we understand the despair that motivates him, Whale’s cruelty has a devastating effect on Clay, who, as he tearfully says, is not a monster. It isn’t hard to know at this point in the film who the real monster is – and Whale, to his credit, realizes this. His apology to Clay – and Clay’s acceptance of it – is a thing of great grace and pathos.

That night Whale commits suicide. We do not see the act. Instead, Condon gives us the most remarkable sequence in the film – a wordless dream-like fantasy, in which Clay (dressed as the Creature) leads Whale to his rest, to sleep beside his long-dead lover in the death-filled trenches of Passchendaele. It is, the movie suggests, the place in time that Whale never really got beyond – and it is one of the saddest scenes I’ve seen on film.

There is yet another sequence at the film’s close, long after Whale’s suicide, that has almost as touching an effect. I will not spoil it for you, save to say that it caps off this great movie – and I truly believe that *Gods and Monsters* is a great movie (high among the very best of last year, or any year) – perfectly.


I am happy to report that Universal’s DVD transfer is sensationally good, visually and aurally. It and the movie get my highest recommendation.

HP Comments:

I think His Nitpickingness is being grumpy and hypercritical. Misappropriating a line from *Apocalypse Now*, complaining about inaccuracies in a historical film (or any of today’s “true” stories) is like handing out speeding tickets at the Indy 500.

What makes *Elizabeth* work, despite the necessary time compression and factual revisionisms (several of which are more serious than the example he cited), is the way it suggests the constant danger she faced in the early days of her rule, and how she persevered through enormous force of will, an inner toughness she used to reshape herself from sweet young thing into iron maiden. And her performance captures every nuance of the changes she underwent, from the aflutteredness of a young woman onward. The mafioso-like plottings of even her inner circle justifies the *Godfather* borrowings and help give the movie an irresistible pulse. (If Valin wants to see real MTV-style editing, he ought to check out *Run, Lola, Run*.)

The visual quality of *Elizabeth* is among the best. But, I wonder, what is it about British films and pinkish skin tones? Can’t figure it. The sound is big, bold and dramatic, with considerable bass energy, a definite improvement over that in the theatre where the dialog was drowned out consistently. *Mrs. Brown* is a pretty good transfer, even though it isn’t enhanced - why can’t Miramax cut against the Disney corporate grain, which has decreed, for now, no enhancements, and do its transfers the honor that many so deserve?

Gods and Monsters has the best color rendition of any DVD I can think of, beautiful 2.35:1 framing – it looks better on this disc, in terms of color fidelity and saturation, than it did in the theater. The sound, even though two-channel, is superb, but I wonder why Universal didn’t go the extra mile, and use the original four discrete tracks instead of their matrixed version? 

Current Attractions

Kubrick's *Eyes Wide Shut*

.....

yes Wide Shut is one of those films that has the mainstream movie reviewers (I don't dare use the word critic in this context) in cloud cuckoo land, with their assessments reading more like Rorschachs than having much to do with Stanley Kubrick's last film. If you've seen the picture, reading the reviews can be a bucket of fun, especially if you have an idea of what's really going on in the film.

First of all, *Eyes* is a horror movie, and has more in common with *The Shining* than with any other Kubrick opus. *The Shining* failed, finally, because Kubrick never successfully connected the ghost story with his hero's descent into madness. He is far too literal a director to hurl himself with abandon into the conventions of a ghost story. And so you get two-thirds of a great movie that, for all practical purposes, ends when the "ghosts" let Jack Torrance out of the food-storage room.

What *The Shining* is really about is the fragility of the family and its susceptibility to attack. It fails because Kubrick cannot correlate Jack Torrance's inner demons with those that exist independently of him or are functions of his own subconscious projections. The Overlook Hotel represents the ghosts of the past, and the ghost in Torrance's past is the bottle, which, of course, the ghosts are quick to provide (in the form of Jack Daniel's). The drinks, we may assume, are not real, but the alcoholism – or its root cause – is, since it unleashes his inner demons.

In *Eyes*, the family is once again under attack. And the trigger is, once again, an external one – the wife (Kidman), whose confession of a passing crush unleashes her foursquare (doctor, played by Cruise) husband's demons of sexual jealousy and sends him on an Odyssey through New York's sexual underworld – a demimonde depicted in cool, stylized, and, at its core, highly ritualized fashion. His predatory curiosities, once evoked, threaten both him and his family. Kubrick once again fails, and by a wider margin than he did in *The Shining*, to correlate his mythic hero's journey into the underworld of the subconscious with the externals of his life as we are shown them.


Making the connection with *The Shining* explicit, Kubrick films a party sequence near the opening in much the same fashion (and exactly the same colors) as he did the haunted Ballroom sequences of the Overlook; he even plays some of the same music. The party's host is Sidney Pollack, playing a corrupt Manhattan patient of Cruise; Pollack's avuncular manner notwithstanding, he serves the function of Charon in Cruise's journey to the far shores of Hades. And it is he who, toward the film's end, will try to explain away much of what has threatened Cruise as a "charade."

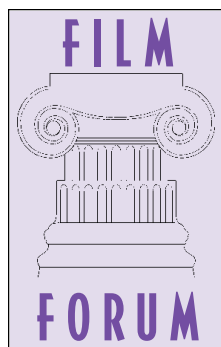
The film's central tableaux is a ceremonial sexual rite

(set in a mansion in Glen Cove, Long Island, which drew huge laughs at the local theater) and it is more frightening than anything in *The Shining* – with the possible exception of the baseball bat sequence. All of the guests – Cruise being the party crasher who is about to be exposed – are dressed in cloaks and masks and resemble nothing less than an army of *commendatori* from *Amadeus*. The music, the chanting, the sepulchral spaces, and the mechanical, stylized sexual couplings all suggest sexuality run rampant, that is, sexuality without feeling. (One has to look no further than the S&M community for insight on how the trappings of sex become a substitute for love.) And sexuality without love, that is, outside the family, Kubrick views with p.c. heterosexual suspicion.

This sequence surely wasn't meant to be pornographic or sexy; it strips bare the intellectual threadbareness of the MPAA and its consummate white-bread (and childish) fear of sex. What Kubrick suggests, I would argue, is that this form of sex is a form of death and that is why it was without animation – there was no need to cover up the soft-core behavior of the mannequins. What the scene reveals is both the character's and the director's fear of death, as represented by the death of love. Indeed, what could be more explicit than the offer of a young woman to stand in Cruise's place once he is discovered and about to be sentenced to death? She saves him, and the next day he learns that she is really dead. Cruise, of course, is way out of his depth here. He is surrounded by vampires and he's incapable, *Top Gun*-style, of showing the slightest bit of fear (the horror of a big shot looking weak!). Nor can he suggest layers of depth within the repressed doctor, much less the presence of lusty subconscious urges; he flirts more with a gay hotel clerk – a wonderful bit by Alan Cumming of *Cabaret* – than with anyone else in the film, probably because he can be playful in this scene, freed from the darker depths Kubrick may have wanted him to explore.

The ending is particularly unsatisfying. In a long, badly played, clumsily staged scene, the Pollack character tries to explain away the happenings of the evening before and the threats on Cruise's life as part of the stylized goings-on. Instead of being ambiguously disturbing, it is just a mess, leaving the audience to wonder. (Certain disturbing things are left unaccounted for, including an explanation of how the mask Cruise wore to the ball turns up on the pillow next to his sleeping wife.) Whether the goings-on were real or a dream – and they are played straight – the final word of the film, uttered by Kidman, suggests the solution for the couple is to go home and "fuck."

TP 



From Art to Cult



The Seventh Seal. Ingmar Bergman, director. 1957. B&W; 96 minutes; 1.33:1; Dolby Digital Monaural. Criterion DVD.

The Seventh Seal was the film that made Ingmar Bergman internationally famous. After *The Seventh Seal* (and *Wild Strawberries*, which appeared later that same year, 1957), Bergman the brooding Swede was an international *succès d'estime*, instantly elevated to the top tier of the art-house pantheon alongside Fellini, Antonioni, Kurosawa, Truffaut, Ray, and Buñuel. Marxists, existentialists, avant-gardists, humanists of every sect claimed him as their own. And the truth is that there are aspects of *The Seventh Seal* that justify all of these claims. And yet, 42 years along, with the post-war Age of Anxiety behind us (or fitfully so), the consensus seems to be that *The Seventh Seal* is not really a very good motion picture, after all.

Robin Wood, than whom none can be more prescient (or dogmatic), puts his finger squarely on the problem in his fine book on Bergman's films.¹ When we think of *The Seventh Seal* we think of individual images – chalk-faced Death spreading his cloak like a raven's wing to engulf Max Von Sydow's knight; the game of chess on the beach, so artfully lit by Bergman's cinematographer Gunnar Fischer that the contestants glow as if reflecting the fires of Apocalypse; the ghastly parade of flagellants, dragging that great cross through the dust like Christ on the road to Calvary; the burning of the witch in the dark woods, with its conscious homage to Dreyer; par excellence, Jof's vision of the final Dance of Death across that distant hillside beneath that lowering sky. Wood's point is that a series of still pictures, no matter how memorable, is no substitute for narrative movement, “not just physical movement from image to image but the inner movement of thought and feeling it embodies.”² *The Seventh Seal* lacks that narrative movement. It is a cold, showy, supremely well-crafted photo

album that coheres as a gallery of effects rather than as a narrative whole and, even at that, is never as disturbing as Bergman meant it to be. This is hard, but not altogether unfair. *The Seventh Seal* is an episodic film, built up of groupings and tableaux, like church art or tapestry. It does move us more by the power of its imagery (and often by the poetry of its language) than by the unity of its story line or our emotional engagement with its characters. Yet, in spite of this, I find myself wanting to defend it as an extraordinary work of cinematic art. While I don't see *The Seventh Seal* as a substantially different kind of film than Wood does, I do see more “inner necessity” – and less commercial exigency – in it than Wood is willing to allow. This does not make *The Seventh Seal* into the kind of wrenching character-based drama that, say, *Winter Light* is. But it does add a moving personal subtext to the film's play of “important and impressive” ideas.

It is time to come to terms with the fact that *The Seventh Seal* is an allegory of man's fate in a Godforsaken universe – and every bit as serious as that sounds. As such it reflects the personal spiritual crisis that Bergman was going through at that moment in his life. It also, quite obviously, reflects the larger public crises in post-war Europe, where the horrors of the Second World War and the new horrors of the Nuclear Age were casting dark shadows backward and forward in time.

Set in the holocaust of the Fourteenth Century, when bubonic plague was killing off that portion of Europe that had not already been killed by war or famine, *The Seventh Seal* is clearly meant to apply to our own age of holocausts – or to any time when God seems most distant from suffering mankind. Antonius Block (Max Von Sydow), a knight who has returned to Sweden from the carnage of the Crusades, is one of the film's protagonists; his squire Jöns (Gunnar Björnstrand) another. The idealistic knight still yearns for a God in

¹ Robin Wood, *Ingmar Bergman* (Praeger, 1970). [Hereafter, Wood.]

² Wood, p. 87.

JONATHAN VALIN

whose existence he can no longer quite believe; the cynical squire has learned to take life as it comes, without the prop of divinity. Together they are Everyman (and Bergman), and together they face the questions that vexed and haunted the

Fourteenth Century and our own: In a world beset by evil, in a world that God has seemingly deserted, in the face of certain annihilation, how does one live one's life with value, and, without the goodness of God, whence does that value come?

The film's opening montage thrusts us immediately – and nearly wordlessly – into the heart of the matter. A gorgeous shot of a sea eagle, floating aloof, predatory, and majestic in a storm sky; a picturesque cusp of mountainous beach; a brief voice-over quotation from the Book of Revelations about the silence in heaven following the Lamb's opening of the Seventh Seal; and then the shingle where the knight and his squire lie sleeping among the rocks, looking as if they've been tossed up, half-dead, from the sea. Their horses lap at the surf. A chess set sits on the stones by the knight's kit. The knight tries to pray, perhaps for his safe deliverance and return, but cannot complete his prayer. Getting to his feet, he awakens his squire who grousers at him mockingly, and out of nowhere there is chalk-faced Death (Bengt Ekerot) in his black cassock come to claim what is finally and always his.

As in the Church emblems that Bergman daydreamed over when he was a boy, where Death and a Knight (representing Mankind) confront each other over a chessboard, the knight seeks to delay his doom by challenging Death to a game of chess. Although the knight doesn't fear Death, he fears a death without meaning, without the judgment of a God he can't quite believe in or forsake. He plays for time – to do one last meaningful thing, and continue his search for grace. The film is ostensibly about this quest to do good – about the very possibility of good in an evil world where all but death is uncertain.

In other films that attempt allegorical effects, the symbolic values of characters and events are meanings derived from the action as it unfolds – not essences from which we start. Bergman simply presents us with Types – Death, Spirit, Reason – as if we were watching a latter-day Mystery play, and only later goes on to give them human dimensions. Even those who appreciate the film's ambitiousness may find the opening allegory rather too portentous, and wonder whether such blatant symbolism can sustain an entire movie.

Not content to present us with an allegory of the eternal contest between Death and Man, Bergman quickly tries something that is in some ways even more delicate and dangerous – and potentially just as prone to travesty. He gives us Innocence in the form of a family of itinerant players, also journeying through Sweden: a father called Jof or Joseph (Nils Poppe), a mother called Mia or Mary (Bibi Andersson), and their infant child. This grouping is clearly meant to suggest the Holy Family (or the “holiness of the human spirit,” as Bergman has it). But the literalness of the allegory begins to break down here, and something more personal to make its way in.

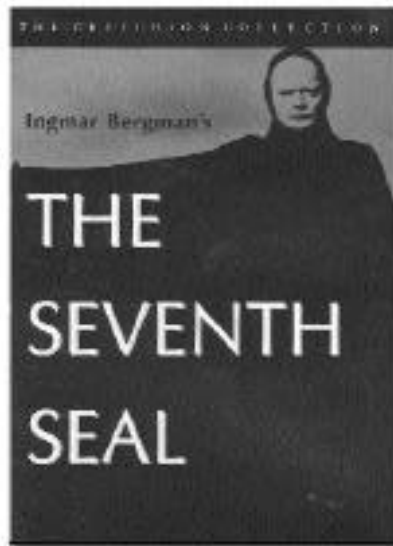
To begin with, Jof is scarcely a holy personage. He is an acrobat, a singer, a performer – albeit a bad one – a charming and persistent liar, a writer of sweet quasi-religious love songs, a bit of a thief, a childlike braggart, and a self-professed seer blessed with second sight (although no one else truly believes in his visions). In short, he is in show business. His innocence, though sweet and real enough, is not the Innocence of the Lamb of God, but the innocence of the artist, whose childlike imagination isolates him from the hurly-burly of the world of the knight and the squire – but, just as importantly and vitally, reflects the world of the knight and the squire back to them, turning its terrors and wonders into play. While the mask of Death that Skat, the “director” of the small troupe of actors, wears and then hangs from a tree limb is a symbolic reminder that death is everywhere present in the brutal world of this film, it is also a reminder that not even this fearsome mystery is beyond the ken of imagination. Indeed, the entire film is an illustration of this.

Jof and Mia reflect something else that troubled Bergman throughout his life and in this period particularly: his intellectual's isolation from other people. Of all the characters in *The Seventh Seal*, Jof and Mia are the only two who express love for one another, the only two who make a family. Everyone else is alone; after ten years' separation, even the knight and his wife, when they finally meet again, are strangers to each other. Although there is something infantile about Jof's love for Mia – closer to the love of a child for his mother than an erotic attachment – it is an attachment (or an acceptance) that Bergman explicitly says he hungered for.

Allegory has an inner movement of its own, dictated by the dialectic of its ideas. It can work itself out like a straightforward argument, as in *Pilgrim's Progress*, or it can cloak its meanings in mystery, like *The Pearl*.

The Seventh Seal is somewhere between. Bergman has clearly invested his symbolic characters with fundamental aspects of his own personality. But he has set them on a broad public highway that leads past tableaux of the downfall of civilization and culture, through a wasteland of medieval horrors that have very modern parallels. The ghastly fascistic parade of flagellants, which interrupts the players' whimsical play about death and suffering with the terrible reality of death and suffering, the senseless burning of the girl witch, who after torture can only, and rightly, see the devil right beside us, are in the film because they must be in the film – the allegory of good and evil demands it. Bergman does all he can to make these scenes memorable, including the superb lighting and photography and the marvelous set design. But there remains a formality in them that sets them off as separate episodes, like frames in a diorama, without the naturalistic probability of realistic narrative. This is not a complaint, but an observation. Allegory is the route Bergman chose, and episode is how allegory works itself out.

Robin Wood notwithstanding, there are many scenes in *The Seventh Seal* where the strength of Bergman's personal



feelings breaks through the allegory with moving power. The great set piece on the hillside, where the knight and the squire share "communion" – here a bowl of milk and a plate of strawberries – with Jof and Mia has a beauty of spirit and gorgeousness of language that are as deeply moving as Bergman intends the scene to be. In spite of a few false notes (the Plog/Lisa/Skat subplot, the knight's "confession" to Death), a good many of the tableaux are equally touching or horrifying. And Jof's final vision, and the biblical language that accompanies it, is unforgettable.


And then there is the salvation scene, which has its own special resonance. In choosing to spare Jof and Mia – and what suspense there is in the film involves their salvation – Bergman is saying two things, one overt and "public," one, I think, covert and personal. The overt and public meaning is dictated by the allegory: Innocence is magically saved. But what Bergman is not quite openly saying – or saying in a way cloaked by this other meaning – is that, for him, the answer to the riddle of death, to the quandary of faith, to the isolation of pure reason is also bound up with the childlike imagination of the artist and the bond of love. These are the meaningful things worth saving, even if they can't ultimately save the artist's life. The sentiment is so personal – and perhaps more dear for that – that it is presented half-disguised by the "Innocence" metaphor that the allegory requires. But it is there amidst the obvious symbolism, like a secret wish.

There is another artist in *The Seventh Seal*, the church painter (Gunnar Olsson) whom the squire encounters painting the very terrors that Bergman used to ponder in his youth.

By means of the painter, Bergman says:

I present my own artistic conviction. [The painter] insists he is in show business. To survive in this business, it's important to avoid making people too mad.³

To believe Bergman's witticism just a little bit is to see how he went about wrestling with his tangle of personal conflicts and violent historical realities by representing them through signs and symbols, and, finally, to see him put his faith not in the "important and impressive" ideas of God or Reason but in the play of art and the acceptance of love. No matter that these solutions would soon seem jejune to the Bergman of *Winter Light* and other films. At the time he passionately cultivated his themes to their fullest, and *The Seventh Seal* remains, in Bergman's words, "one of the few [of my own films] really close to my heart."⁴

Criterion's new digital transfer of *The Seventh Seal* is superb, far superior to their earlier excellent laser transfer or to any other print or transfer of this film I have seen. (Criterion actually gives you side-by-side examples of the laser transfer and the new digital one in a special feature included on the disc. You'll be astonished at the improvements in clarity, contrast, and noise on the DVD.) All in all, a disc well worth owning. 

³ Ingmar Bergman, *Images: My Life In Film* (Arcade, 1994), p. 238. [Hereafter, Bergman.]

⁴ Bergman, p. 235.

The Site for Sound.

Download issues and articles
(Issues 111 - 119)

Subscribe online

Buy and sell equipment

Manufacturer links

Performing arts
information



www.theabsolutesound.com



What *The Perfect Vision* Is About:

The Perfect Vision positions itself as "The Journal of Digital Audio and Video." We cover major facets of the home entertainment arena: video equipment (HDTV); audio equipment (speakers, digital power amplifiers); convergence technology (DVD drives, digital-signal processors); multimedia and music software; films (laserdiscs and DVDs); emerging technologies in audio, video, and digital processing.

Questions About Your Subscription:

If you have questions about your subscription (length before expiration, missing issues, starting issue of a new subscription), please call the subscription office at (888) 475-5991 (North America) or (973) 627-5162 (outside North America). Please do not contact our business or editorial offices. They do not have the information necessary to help you.

Change of Address:

Please send change of address cards to: *The Perfect Vision*, Box 3000, Denville, New Jersey 07834. Remember: Second Class mail is not automatically forwarded by the US Post Office. Please allow 8 weeks for a change.

Letters to the Editor:

We encourage our readers to write, since we believe in the free expression of opinion, a right guaranteed constitutionally in the US to encourage the diversity of viewpoints necessary to freedom. We do not publish unsigned letters. We will, if circumstances warrant, withhold a writer's name, but we must know his or her identity. Writers must include their mailing address. We will not print the street address, for security's sake, but we will include the name of the town. Letters must be sent to The Editor, *The Perfect Vision*, Box 235, Sea Cliff, New York 11579, or by email to hp@theperfectvision.com. If you have other business with the magazine (change of address, subscription renewal, etc.), please see the information below for the appropriate means of contacting us; and if you wish to write for the editor's perusal, then do not send a note to any of the other addresses below.

Editorial Submissions:

We welcome editorial submissions; however, we may be unable to respond to every submission and we cannot return unused manuscripts. Please send a query letter before you submit a manuscript to: The Editor, *The Perfect Vision*, Box 235, Sea Cliff, New York 11579.

New Subscriptions or Renewals:

Subscriptions to *The Perfect Vision* are \$32 for 6 issues in the US (second-class mail). In Canada, a 6-issue subscription is priced at \$36 (US funds only) for 6 issues via airmail. Foreign subscriptions are \$65 (US funds only) for 6 issues via airmail. To subscribe, you may use any of three methods: (1) call our subscription office at (888) 475-5991 in the US or (973) 627-5162 elsewhere; (2) fill out the form on the TPV website at

www.theperfectvision.com; or, (3) send your credit card information or check to: *The Perfect Vision*, Subscription Services, Box 3000, Denville, New Jersey 07834. Checks must be drawn on a US bank and should be made payable to Absolute Multimedia, Inc. For questions about your subscription see the information below.

Back Issues:

No back issues are available. Visit www.theperfectvision.com for some key articles from past issues.

Website:

You can find news, links to manufacturer and performing arts sites, our subscription and classified advertising forms, and other interesting items on our web site at www.theperfectvision.com.

***The Absolute Sound* Subscription Info:**

For new subscriber information, call (888) 732-1625 or visit www.theabsolutesound.com.

Manufacturer/Dealer Display Advertising:

Please contact Anne Hart at (512) 306-8780 ext.3 or ahart@theperfectvision.com for rate cards, demographic statistics, and circulation information.

Requests for Submission of Software for Review:

Contact Bob Gendron at (512) 306-8780 ext.4 or bgendron@theperfectvision.com.

Manufacturer Requests for Reviews of Equipment:

For video products - groggers@theperfectvision.com.
For audio products - rharley@theperfectvision.com.
For film reviews - hp@theperfectvision.com.

Manufacturer Requests to Reprint Reviews:

Not one word of editorial text from *The Perfect Vision* may be reprinted without written permission from the editor. To arrange permission and reprints, contact Mark Fisher at (512) 306-8780 ext.1 or mfisher@theperfectvision.com.

Classified Advertising:

The form at the back of the magazine will tell you everything you need to know to make out your Classified ad.

Glossary Available:

Our editors have written a glossary of terms, both familiar and esoteric, in use by reviewers and reporters in both audio and video. If you don't know the meaning of a word or phrase in one of our articles, and we have not explained it to your satisfaction in context, you can consult this glossary by visiting our website: www.theperfectvision.com.

Aerial AcousticsPage 2
www.aerialacoustics.com

Alphasound & VisionPage 76
www.alphasound.com

Audio Products InternationalPage 60
www.sound-dynamics.com

Audionut.comPage 113
www.audionut.com

BTS (Revox)Page 66
www.revoxaudio.com

CEDIAPage 80
www.cedia.org

Conrad-JohnsonPage 18
www.conradjohnson.com

Cool AudioCover II & page 1
www.coolaudio.com

FaroudjaPage 14
www.faroudja.com

GoldmundPage 40
www.goldmund.com

LaserlandPage 104

LoewePage 4 & 5
www.loewetv.com

MeridianCover IV
www.meridian-audio.com

NordostPage 54
www.nordost.com

Nuts About Hi-FiPage 78

Outlaw AudioCover III
www.outlawaudio.com

RotelPage 12
www.rotel.com

RuncoPage 26
www.runco.com

SoliloquyPage 38
www.solspeak.com

The Academy Advancing High
Performance Audio and VideoPage 73
www.avacademy.com

Thiel Audio ProductsPage 30
www.thielaudio.com

Tice AudioPage 86
www.ticeaudio.com

YamahaPage 8
www.yamaha.com

C L A S S I F I E D A D O R D E R F O R M

RATES: Private parties, \$1 per word; Commercial, \$3.15 per word, \$150 minimum (commercial only). A word is one or more characters with a space, dash, slash or other punctuation on either side. (Telephone numbers, e-mail, and web addresses count as one word.)

PAYMENT: All ads must be prepaid with order. Credit cards (Visa, MasterCard, or American Express) or checks are accepted.

SEND ADSTO: Absolute Multimedia Inc., 7035 Bee Caves Road, Suite 203, Austin, Texas 78746. Fax to 512 328-7528. (Faxed ads are credit card only.) Or place ads via our website: www.theperfectvision.com.

DEADLINES: Ads are due the first of the month preceeding each issue. (For example, ads for the July/August issue are due with payment by August 1.) Ads that reach us after the first day of the month preceeding publication date will appear in the next available issue.

NAME _____

COMPANY _____

ADDRESS _____

CITY, STATE , ZIP _____

PHONE _____ FAX _____

COPY (Please type or print; attach separate sheet if necessary): _____

Please run my ad in the following issues: 27 (Nov/Dec) 28 (Jan/Feb 2000) 27 (March/April 2000)

COST: \$ _____
(Count the words in your ad. Multiply by the number of issues, then by the rate – personal or commercial.)

Enclosed is my check, payable to Absolute Multimedia Inc. I prefer to pay by credit card

CARD NUMBER: _____ EXP DATE _____

SIGNATURE (credit card users) _____

VISION WATCH

EVENT	EXPERT A	EXPERT B	EXPERT C	SIGNIFICANCE 1 = Minor 5 = Major
First consumer Dolby EX products go on sale	Q4 1999	Q4 1999	Q4 1999	1
High-resolution, multi-channel digital audio output on DVD-A and SACD players (IEEE1394 or Universal I2S) C: Important to achieving formats' sonic potential.	Q4 2000	Q4 2000	Q1 2001	4
Electronic cinema (digital video projection in theaters) exhibited in ten cities	Q2 2003	Q2 2000	Q4 2002	2
Digital download kiosks appear in music-retail stores C: Any kiosk can download any title at any time; no more out-of-print music, no more out-of-stock stores.	Q1 2000	Q1 2000	Q3 1999	3
Hardware to receive HDTV satellite broadcasts nationally available A: Already happened with Unity Motion; what's important is when someone will start broadcasting continuous HD movies like HBO. That will also happen this year by DirecTV.	Q3 1999	Q4 1999	Q4 1999	3
Availability of 20 HDTV channels broadcasting continuously B: But will there be anything to watch?	Q4 2001	Q1 2001	Q2 2002	4
Plasma displays available below \$10,000 A: It will be important when they fall below \$3000.	Q3 2000	Q1 2000	Q1 2000	2
Multi-channel DVD-A and SACD titles available (>20 titles) B: Don't think we'll ever see multi-channel SACD; Q2 2000 for DVD-A (Expert C disagrees). C: Multi-channel editing infrastructure not yet in place; two-channel SACD set for September 1999 launch with 50 - 60 titles.	Q3 2000	Q2 2000	Q4 2000	3
Universal (DVD-V, DVD-Audio, CD, SACD) players available B: Important for the ultimate market success of high-quality multi-channel music recordings. C: Matsushita (Panasonic) will launch two Universal players this fall, probably without SACD playback.	Q4 2000	Q4 1999	Q4 1999	3
Controllers and receivers with IEEE1394 or Universal I2S input go on sale	Q4 2003	Q4 2000	Q4 2001	3
Next generation (beyond Dolby Digital) audio A: DD and DTS are available today, and that is all that is used on film. I don't expect to see SDDS or 6-channel DD on DVD ever. B: One of the most important things on the list; high fidelity for film. C: Would require a format revolution such as HD DVD.	2002	2003	2005	5
Stand-alone consumer-recordable DVD available A: Most important thing on list. This will begin the replacement of VHS tape. C: Copyright issues could delay introduction.	Q4 2000	Q4 2000	Q1 2002	5
Portable music players using removable memory-card technology available	Q3 2001	Q4 1999	Q2 2000	2
Digital HD VHS available B: Provided recordable DVD makes it to market, VHS' days are numbered.	Q4 1999	Q4 2000	Q4 2000	1
IEEE1394 connections become available for HDTV	Q3 2000	Q2 2001	Q2 2001	1
Ten million DVD players sold in North America C: The benchmark level at which a format is considered "mass-market"; a <i>fait accompli</i> .	Q1 2001	Q4 2001	Q1 2001	3

Free Manuals Download Website

<http://myh66.com>

<http://usermanuals.us>

<http://www.somanuals.com>

<http://www.4manuals.cc>

<http://www.manual-lib.com>

<http://www.404manual.com>

<http://www.luxmanual.com>

<http://aubethermostatmanual.com>

Golf course search by state

<http://golfingnear.com>

Email search by domain

<http://emailbydomain.com>

Auto manuals search

<http://auto.somanuals.com>

TV manuals search

<http://tv.somanuals.com>