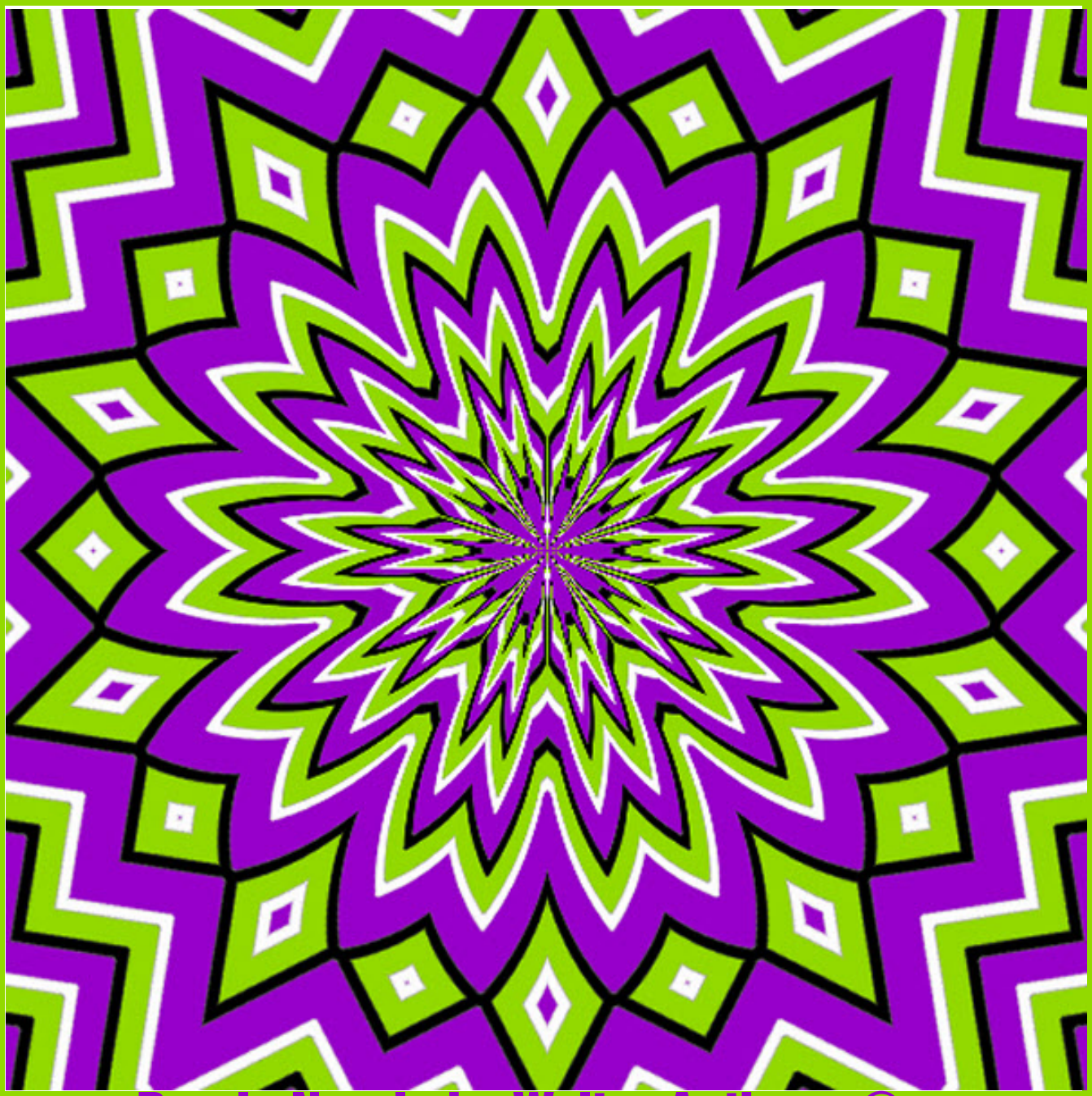
VOL. 44 No. 1. Jan. 2010

PANORAMA

OF AMATEUR FILM & VIDEO

SUR LE FILM ET VIDEO

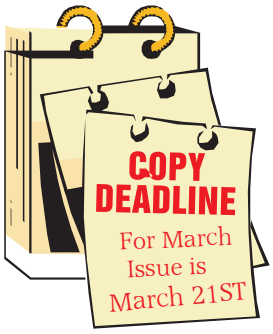


Purple Nurple by Walter Anthony ©

The Publication of the SOCIETY of CANADIAN CINE AMATEURS / SOCIETE DES CINE AMATEURS

CONTENTS

Front Cover Illusion:
Purple Nurple
By Walter Anthony



Editorial Board

Fred Briggs

Layout, Design
Fred Briggs

Distribution
Jim Town

2004 ISSN 1187-28207

NOTE

VACANCIES!

ANY VOLUNTEERS?

Executive Panel

Honorary President
Christopher Chapman, C.M.

President
Fred Briggs, FSCCA
3 Wardrope Ave. S.
Stoney Creek, Ontario L8G 1R9
(905) 662-4406
Pres@sccaonline.ca

Past President,

CIAFF Festival Director
Jon Soyka, Hon. SCCA
P.O. Box 60554
Mountain Plaza Outlet
Hamilton, Ontario L9C 7N7
(905) 388-5840 Fax (905) 388-5840
Director@ciaff.info

Eastern Vice President
Ben Andrews, Hon. SCCA
Box 10 Main Station
Barrie, Ontario L4M 5E1
(705) 737-2729
EasternVP@sccaonline.ca

Western Vice-President
David Fuller
5328 Arbour Lane
Nanaimo, British Columbia V9T 6E5
(250) 751-0142
WesternVP@sccaonline.ca

Secretary
Thom Speechley, FSCCA
#19 - 295 Wilkins St.
London, Ontario N6C 5C1
(519) 685-6197
Secrty@sccaonline.ca

Treasurer
Carolyn Briggs FSCCA
3 Wardrope Ave. S.
Stoney Creek, Ontario L8G 1R9
(905) 662-4406
Treas@sccaonline.ca

Contest Chairman
Keith Gloster, ASCCA
10 Seneca Cres.
Brantford, Ontario N3R 1K2
(519) 752-5745)
ContestChair@sccaonline.ca

Membership Chairman
Jim Town
540 Ingersoll Avenue.
Woodstock, Ontario N4S 4Y2
(519) 537-2014
Membership@sccaonline.ca

Publicity Officer
Fred Briggs FSCCA
3 Wardrope Ave. S.
Stoney Creek, Ontario L8G 1R9
(905) 662-4406
Pres@sccaonline.ca

Film & Music Library
Fred Briggs FSCCA
3 Wardrope Ave. S.
Stoney Creek, Ontario L8G 1R9
(905) 662-4406
Pres@sccaonline.ca

Honours Chairman
Thom Speechley, FSCCA
#19 - 295 Wilkins St.
London, Ontario N6C 5C1
(519) 685-6197
HonoursChair@sccaonline.ca

PANORAMA Editor
Joan Bochsler, ASCCA
475 Caithness St. E.
Caledonia, Ontario N3W 1E3
(905) 765-5408
PANORAMA@sccaonline.ca

Video Librarian

VACANT

PATRONS

T.V. Adams*
Ben Andrews
Jan Bekooy §
Joan & Joe Bochsler
Carolyn & Fred Briggs
Ron Chappell §
Frances Crutcher *
Rose Dabbs*
Elke Englicht §
Lois* & Gordon Fowler §
Keith Gloster
Agnes & Adam Houston
Stella Magic §
Lilian McKibbin*
Robert Moutrie §
Betty Peterson*
Bill Ripley §
Jack Ruddell*
Linda Smith*
A. Somerville §
Thom Speechley
Grace & Neil* Upshall

Corporate
BC Hydro
Noranda Mines Ltd.

* Deceased
§ No Longer Members

PRESIDENTS MESSAGE

Photo by Joseph Bochsler Jr.

Fred Briggs, FSCCA

I'm pleased to announce that the SCCA Executive has appointed Jim Town, an SCCA member since the mid '90's, as Membership Chairman. Jim has been working with Thom Speechley lately, who has been showing him the ropes, and Jim will be distributing this issue to our members by email. Jim's contact information is shown on Page 2, and you can reach him at Membership@sccaonline.ca. Thom will continue acting as Secretary and Honours Chairman, and he can still be reached at Secrty@sccaonline.ca and HonoursChair@sccaonline.ca.

We had hoped to have a new SCCA Roster in the email to our members by this time, but there are still a few Memberships that have not yet been renewed, though their fees were promised in the mail (they should still be sent to our Treasurer, Carolyn). You may have noticed that we no longer use a Membership Application/Renewal Form as we try to streamline the operations of the SCCA.

With no other pressing items of SCCA business to report, I thought I'd use this space to talk about this issue of PANORAMA. We were short of material, and then things turned around and the only shortage became time. In the past couple of weeks I have had a major brawl with a virus on the computer I call HQ, this one, the one on which I get my email, keep the books, write articles for PANORAMA, etc. I finally won that one and got started on PANORAMA layout on the Graphics computer. The next morning it crashed (I suspect power supply) and as I write this, it's in the shop. When I get it back sometime next week, I should be all ready to roll out the January Issue!

Inside you will find TWO very useful Reports by new SCCA Member, John Cook. John lives in Tottenham, Ontario, and attends the meetings of the Hamilton Video/Film Makers (about 125 km each way) and the Workshops in Kitchener (about 150 km each way)!

I had promised to follow up the Introduction of C.G.I. in the November Issue with an article about *Poser*, another important part of the foundation of the computer animation industry as it applies to us. I also had a few ideas about the direction I should go next with the *Get The Shot* series, but recent developments have pushed all that onto the back shelf for now.

I've always had a passion for 3D movie making, and that partly explains the number of announcements about the pending 3D Revolution that have appeared in recent issues of PANORAMA. Now they're coming so fast we can't keep up. Clubs are beginning to switch to HD/BlueRay projection, so that means the game is about to change again! (Early adopters have a lot of fun, and a head start on experience, but it's expensive!)

So I expect (but not promise) to discontinue the *Breaking News* column in the light of some recent announcements indicating that 3D is just around the corner for us.

Samsung Signs RealD to Provide 3-D TV Technology

3-D TV: Guide to the Shifting Landscape

TV Makers Firm on Real-Time 2-D/3-D Conversion

but most importantly

Small Camcorder Company Announces 3D Video Camcorder Solution

First 3D Game That Does Not Require 3D Glasses, Debut At The Olympics

After searching for several years, I finally found (while looking for something else I lost, as usual) a paper I had written for my final course (Sensation and Perception) for my B.Sc. that I earned at McMaster University in 1976!

I had done quite poorly on my penultimate course because neither the Prof nor her marker found my papers understandable. Apparently they found them confusing and difficult to follow because of poor organization, and even though I had recently been on the Dean's Honours List, and was the Extension Student's Representative on the President's Task Force for Security on Campus for three years, I lost my confidence! (Can you believe that?)

For the paper for my final course, I had to get approval for my topic in advance from the Professor, and when I told him that I had chosen *The Perception of 3D*, he said it was far too big a subject , would be too difficult to organize, and advised me to "pick one small part of the problem". Well, I tried, but you know me by now. I couldn't choose one part without worrying about the parts that I was skipping over, so I went ahead on the whole subject, in spite of the lack of his necessary advance approval.

In the end he gave me 90% and the notation "Comprehensive and interestingly written". I was very pleased with the result, and that was the only paper I wrote in 8 years of night school and summer school that I kept. The problem was that I didn't know where I kept it! On several occasions I conducted extensive searches, without any success. Then a few weeks ago I noticed a folder marked *3D* at the back of the bottom drawer in one of 5 filing cabinets, and there it was!

Why am I telling you all this? I assure you, not to brag. After all, that was 34 years ago! But I've decided to print the article in this PANORAMA, and the title, *Everything You Always Wanted to Know About Depth Perception (And Wish You Hadn't Asked)* makes it sound like it's written for a general readership, and it isn't: it was written for one Professor teaching a course on Experimental Psychology, and it's pretty tough going for a general reader. So I'd like to recommend a reading technique I developed in university: read it once quickly, without stopping to reread anything, pushing on even if you don't understand what you're reading, just to get a broad overview of what's covered. On the second reading, read one paragraph at a time, and stick with that paragraph until you're sure you have it before going to the next. Finally, some time later, read it right through in one quick pass (I used to do this just before an exam to bring everything to the front of my memory, but you might decide to do this a day or two after the intensive reading). You'll be surprised to see how well this works, and after all, this may be tough, but it's only a few pages and not a thick book!

I've included the References and I've tried to provide links so you can access them on the internet, without much success. Most of those I did find can only be reached with a subscription to a service, so I looked for some diagrams to make it a little easier. Not many of those, either!

However, I did find the picture *Purple Nurple*, which is on the front cover with the kind permission of its creator, Walter Anthony. It doesn't really demonstrate any of the phenomena discussed in the paper (actually the illusion is an example of *Peripheral Drift*), but the illusion of moving through the 3rd dimension is so strong, I just couldn't resist it for the cover!

There are fewer articles in this issue than usual, but they are full of useful and stimulating material so I hope you enjoy them. And I just got another article from John Cook for the next issue, and it's as good as his others!

■

CLUB NEWS

By Thom Speechley FSCCA

Now that the Christmas and holiday rush is over, most clubs seem to be getting back to the usual business. There are some interesting projects planned. They range from taking a fresh look at local history to revisiting the often-overlooked use of the 'story board'.

BRANT VIDEO MAKERS

Brant Camcorder News editor, Dan Kennaley

The November meeting featured productions by Joan Jacquemain and Joe Blake. Joan had just returned from an extended trip to South America and had great footage from Machu Picchu and the Galapagos Islands. She made a visit to a museum on the islands, which traces the efforts of Charles Darwin. Joe's video is a study of a stubborn raccoon up a tree near the river. He hopes to use the footage to create a story. A short video from the London club was also shown.

Dan Kennaley opened the subject of preserving memories of friends, families and pets. He told the group that Randy Hincks dog, which Randy had included in footage he shot for the WNED project, had died and Randy had expressed great satisfaction that he had had the foresight to keep his memory of the dog alive. Dan mentioned that Don Bradley's former daughter-in-law is copying his photos to put together a Creative Memory book for her children.

Dan then gave a tutorial on the use of "Powerpoint", using stills taken during the 'Pie-in-the-face' feature with Frank Birch. A "Powerpoint" presentation prepared by Iain Calder was also shown.

Keith Gloster reminded members of the 2010 SCCA contest, which prompted someone to ask if a "Powerpoint" production qualifies as a 'video' for purposes of entering the contest. The question was left unresolved. Keith also took the opportunity to talk about a planned bus tour of the Niagara Escarpment this spring. He will be providing further details at a later meeting.

On November 30, the club and other participants got a sneak preview of the completed project, "Our Town – Brantford". Everyone waited anxiously for the broadcast from Buffalo on the 12th of December. Unfortunately, after all the fanfare, viewers on the Rogers Cable system were terribly disappointed. The entire first half, which featured the work of the Brantford Club, was ruined by some kind of failure in the digital transmission of the program. Viewers on other systems watched, and probably copied the complete production with no problems. Eventually everyone got to see the video through the efforts of the 'guerilla network'.

BUFFALO VIDEO-MOVIE MAKERS

"Camerama" editor Chris Scioli

The December 13th meeting opened with the showing of a "10 Minute Film School" by filmmaker Robert Rodriguez, which uses clips from the director's films to illustrate filming techniques which do not require large financial investment. This was one of a series and others will be shown at later meetings. Contest Chairman Sam Terranova revealed that the winner of this year's Shorty Contest is Alex Szatmary for "The Promise". The runner-up, is Emil J. Novak for "Leftovers." For discussion regarding the technique of director frank Capra, Terry Kimmel showed a scene from the popular 1936 Hollywood production, "Mr. Deeds Goes To Town", starring Gary Cooper. The January issue of "Camerama" lists entry requirements for this year's Annual Contest, entries for which must be submitted no later than the March club meeting.

HAMILTON VIDEO/FILM MAKERS

"Reel News", editor Dave Stewart

The Christmas meeting attracted 26 members and guests. That's a smaller than usual number but considering the weather, MC Jon Soyka felt that was a respectable turnout. Notably absent was 56-year member Ralph Trouten, who has never before missed a Christmas event. Members' videos shown that night were a 3-minute feature of a lock in the Welland Canal, by Harold Cosgrove, a 20-minute production of a cruise of the New Zealand Islands by Ken and Iris Davy, a short Rick Doelle production showing the underwater feeding of sharks near Belize. It was amusingly titled "Rock-a–by-Baby". Keith Gloster, also of the Brant Club took the opportunity to advise members of the December 12th broadcast of the WNED Buffalo production, in which several Brant members participated.

A discussion was opened regarding the Hamilton Club's possible purchase of equipment for the showing of Hi-Def member's productions. Presently, anyone shooting in Hi-Def can only submit their work for viewing in SD (Standard Definition DVD). The executive will prepare a report for presentation of a proposal at the March meeting. Meanwhile, five Hamilton members attended the London Videography Club December meeting in order to evaluate the Hi-Def equipment now used by that club.

LONDON VIDEOGRAPHY CLUB

From the club's website

December was the annual Christmas meeting which included a number of spouses and five visitors from the Hamilton Video-Film Makers. President Kim Brown showed his video of a summer visit to Greece and Paul Herbert, during the 'still photo' half of the program, showed a "ProShow" Gold presentation of his summer visit to Turkey. After a pause for holiday refreshments, Paul Armstrong showed a 'multi-media' (slide and video) production of his African Safari trip. Paul also offered useful advice regarding the planning for such a trip, including considerations of batteries and additional memory. Those warnings apply equally to still or video photography.

The January meeting was devoted to the annual "Bag Shoot". Three groups were each assigned to create and shoot a story that night, using all the contents of a mysterious garbage bag. Two groups worked in video format and the third, in still image format. After editing, the results will be shown at a later meeting.

Hamilton Club members at the London December meeting:
L to R - Manfred Ernst, Jon Soyka, Andrea Bakai, JR, Keith Gloster

SACRAMENTO AMATEUR MOVIE MAKERS

From the club's website

Club members have just discovered that a film, made by the club in 1960, is being shown and used as a "pledge" gift by the local PBS station KVIE. A copy of the DVD has been obtained and will be shown at some future club meting.

The film, "Save the American River", can be viewed on Blip TV

Investigating the availability of this DVD also revealed some local history that might be researched with the idea of making a club production of the event. The subject of interest is the apparent sighting of a "UFO" over the Capitol building in 1896. Other films by this club can be accessed by going to their website.

WINNIPEG AMATEUR MOVIE AND VIDEO CLUB

Bulletin editors, Wallace and Jeanette Robertson

The November meeting featured a tribute by Don Rogers, to Kapyong Barracks, longtime home of Winnipeg's famous Princess Patricia Canadian Light Infantry. The regiment has been relocated and the video contained interviews with members of the regimental museum and a review of the museum's contents and historical artifacts.

A record of the final formal "march past" and reviews by the Commanding Officer was also featured in the video.

The December meeting was dedicated to celebrating the Christmas season and included a very remarkable record of Louis Villa's family visit to Australia. Excellent scenics were enhanced by beautiful footage form a rented helicopter. The January "Bulletin" reported the community contribution made by member Lorne Strick, who volunteers to record, on video, presentations given at meetings of the Winnipeg Prostate Cancer Support Group. The videos are available for a nominal charge. It should be mentioned that while all this activity was going on, co-editor of the Bulletin, Wallace Robertson was out of commission due to a serious leg fracture suffered while cycling. We hope that Wally is quickly recovering. This also serves as a cautionary note: things can go horribly wrong even when you are doing that what you know is exactly the right thing to do. Exercising while sparing the environment. Good luck Wally.

VICTORIA VIDEO CLUB

***The Bulletin,* editor James Hatch**

(This is taken from the club's website)

Club member's Margaret Chamberlain and David Fuller were delighted to hear that entries that they had submitted to AMMA had received awards. Margaret had submitted "*From Rails to Sails*" and David had submitted "*Dave's Dawgs*". Both videos took honours in the **North American Movie Maker Awards**' (NAMMA) "The Ten Best 2009," a contest that selected the ten best movies from all the submissions made for the annual contest. Movies are not ranked, but rather they are considered equal, among the "Ten Best." You can read an interesting summary of the making of "Dave's Dawgs" at this link

You are also invited to visit the club website and watch their SCCA 2009 winning best club entry: "Gin and Tonic". Other productions are also available for viewing.

The club enjoyed a Christmas buffet lunch on December 5th, before many members departed for warm, exotic places.

Victoria Video Club Christmas luncheon, December 2009

■

AUDIO POST PRODUCTION

JOHN COOK REPORTS ON THE FEBRUARY 13, 2010 WORKSHOP OF THE MULTICULTURAL CINEMA CLUB OF KITCHENER

This workshop, by Earl McCluskie, was a follow-up to his workshop, *Recording Good Sound for Film and Video* of Nov. 14/09, reported in the November PANORAMA.

SPEAKER

Earl McCluskie is a recording producer and engineer based in the Waterloo region. In addition to CD recording and concert production, he has worked in audio post-production with the CBC for the Nature of Things, Fifth Estate and drama, as well as numerous independent video productions. He is currently producing a video documentary for the *Wellington Winds*, and as recording producer and engineer on an independent film project with Helmut Lipsky and Stefan Pleszczynski (CBC's *Da Vinci's Inquest*, *Intelligence*) in Montreal.

EXECUTIVE SUMMARY

How professionals rescue bad audio situations encountered in on-site video recording.

1. Earle demonstrated how to use the audio tools of editing suites to make speech more intelligible and background noise less objectionable.
2. Earle described the very time arduous task of ADR (Automated Dialogue Replacement).
3. Sound effects are added using sound effect clips and live recording of sound effects (Foley recording)
4. Music is very powerful when used to augment the emotional impact rather than used simply as background.
5. Everything is brought together in mixing.
6. Getting good audio on set is a lot easier than trying to doctor bad audio.

VALUE OF GOOD AUDIO

While in the past, the best audio was the hallmark of a few select TV programs and a few high budget Hollywood movies, the existence of over 40 million home theatre audio systems has raised the bar in the ears of a significant portion of the public. These 40 million audio systems, that default to Dolby 5.1 surround sound, are raising audio quality expectations just as HD is raising video quality expectations. All the US TV networks, as well as CTV and CBC are gunning for high quality Dolby 5.1 surround sound, as opposed to its introductory use of isolated jet over-flights and explosions.

Now more than ever, poor audio screams AMATEUR! Where dialogue is key, poor audio quality degrades the enjoyment of a video more than poor video quality. One cannot "get into" a video if one is straining to follow the dialogue and even totally missing key speech.

DIFFICULTIES OF ON SET AUDIO RECORDING

It is very rare indeed for the ideal microphone position to be the same as the desired camera position. The optimum camera position wins every time. So by definition, an on camera microphone is at a decided disadvantage.

Because the microphone is typically too far from the subject, ambient noise will make itself very obvious, as a microphone does not have the abilities of the human ear/brain system to concentrate on the desired sound, while blocking out the background noise, as we regularly do in "cocktail conversation".

Most movie and TV sets are not the resonating boxes of the typical room in a house. They rarely have any ceiling and typically have only a couple of short walls. This means that they are not plagued by the sound muddying reverb of a small room, exacerbated by distant miking.

Despite all the advantages that TV and Hollywood sets have, the majority of their on set audio recording still does not meet high standards and they very often revert to very expensive and time consuming post production audio track replacement.

DIFFICULTIES OF ON SITE AUDIO RECORDING

Most amateur recoding is not done anywhere that could be described as a movie set or sound recording studio.

We often shoot outside, where we are plagued by wind noise. Wind socks muffle the sound, reducing intelligibility. We try to use directional shotgun microphones to get the dialogue above the surrounding noise. Unfortunately, the more directional the microphone, the more it colours the sound, with its internal resonating pipes.

If we shoot in a room, wall reflections and room resonances reduce intelligibility. Furnace noise, traffic noise, refrigerator noise, PC fan noise, even a neighbour's TV or sound system vie for attention on our sound track. Thank God, iPods have replaced most Ghetto Blasters. Our kids can now go deaf in our blessed silence.

DOCTORING SOUND IN POST PRODUCTION

Sample Clip in Car

Earle used a clip, shot in a car, to demonstrate doctoring the sound track in an editing suite. Shooting in a car with the microphone seeing the nearby hard reflective glass surfaces gives us highly coloured sound. Then we have to contend with vehicle noise, passing traffic noise, such as trucks, as well as the speaker raising her voice when noise becomes apparent. While it is desirable to use fixed audio gain settings to avoid the volume pumping of automatic audio gain in this situation, we revert to the automatic setting because of our lack of control of the actual sound levels. The volume pumping action makes post-production more difficult.

Editing Suite

Even though he is a seasoned professional, it is worth noting that Earle avoids the high cost of Final Cut Pro and MacIntosh computers and uses Sony's Vegas. It does the job, to the highest professional standards, in acceptable delivered format, for $600, without needing a herd of extra add-ons. So, you have no excuse to waste your money for meaningless status. Then there's your really cheap writer who's very happy with his $45 Magix Movie Edit Pro for HD.

Using Audio Filters

Using a high cut filter to remove high frequencies, removes significant amounts of high frequency noise. One must be careful when cutting below about 5 KHz as then one

will be removing the sibilance frequencies critical to speech intelligibility. The high cut filter will remove the high frequencies that make up high fidelity, but this is the tradeoff for reducing objectionable noise.

Using a low cut filter will remove the low frequency rumble noises. This time we risk cutting the low frequencies that give the voice warmth, trading off audio quality for reduction of objectionable noise.

Notch filters can be used if a noise is of a very specific frequency. In our sample, the main frequency of a passing truck was effectively removed. Because the notch was very narrow, the effect on the voice was unnoticeable.

Monitoring

It is important to use a good quality speaker system when doctoring your sound track. This is especially important for very low frequencies which are inaudible in a cheap speaker system, but may be overwhelming when played on a good audio system with a powerful subwoofer. Similarly, high frequency noise may be very objectionable on a good sound system, and be absent on a cheap speaker.

While doing the doctoring, the particular flaw we are trying to reduce is played in a loop while settings are adjusted. After we are satisfied with our settings, a comparison to the original should give us great satisfaction.

Another good practice is to play the clip on a cheap speaker system, to ensure that it still sounds good on this more typical sound system.

Using the Audio Timeline

There are many ways to use the timeline features of your editing program to control the audio segments. Earle reverts to the time proven technique used before computers. One assigns each short part of the clip a separate channel, as in the days of mixing boards, where the parameters are adjusted until satisfactory. When these parameters are not satisfactory for another part of the clip, another copy of the clip is put on another timeline track, and adjusted to satisfaction.

The final mix is done by cross fading among the many doctored segments or mixer channels. The segments may need to be adjusted to ensure the cross fading is seamless. More segments will be required to compensate for the pumping of the camera's automatic volume control.

Using the Noise Gate

Though frowned upon by many, the noise gate can be very effective for reducing noise. What the noise gate does is eliminate sound that is below a set threshold. One can also adjust the attack and release time of the action to minimize its side effects. Earle very effectively eliminated a buzz in a phrase, without audibly affecting the voice quality. The following phrase was badly affected by the settings, and was corrected on another timeline track.

Substituting Background Noise

If we have a noise throughout most of a clip, its sudden absence, in the middle of the clip, can stick out like a sore thumb. You should always record a segment of only background noise for each clip, to be used later to fix such a situation. It is only a matter of adding a piece of this background noise back into the segment to eliminate the interruption. One could also use the background to add a needed break in the dialogue, provided of course that you had also shot some footage of the scene where the speaker's lips were not on screen to switch the video to during the added audio "silence".

Results

I was very impressed with the improvement of the sound clip after the operation. Most of the objectionable noise was totally removed, and the voice was strikingly more intelligible. The dialogue could now be followed effortlessly.

While a clip that was originally very hard to follow was rescued, the final result certainly could not be called high quality audio.

SUBSTITUTING STUDIO SOUND

In practice well over 70% of the audio in high quality movies is generated in sound studios, rather than on set. All blue screen audio is done in post because of the risk of microphone shadows on the blue screen.

ADR (Automated Dialogue Replacement) replaces set recorded voice with voice recorded in a sound studio. Foley Recording and canned clips replaces the non-human sounds. And of course, music is written and recorded for the film.

You could say that most high quality Hollywood movie sound is artificial sound.

ADR

There's nothing automatic about Automated Dialogue Replacement, except that most studios automatically use it in their films.

The general principle is to repeat each phrase, recorded on set, in a loop. This loop is then played through the actor's headsets, while the actors repeat the dialogue in sync and with the proper accent, emphasis and feeling. When one phrase has finally been done to the satisfaction of the dialogue director, the operation moves on to the next phrase.

The voices are recorded in a sound studio. If an intimate sound is needed, the actor is in very close proximity to the microphone. If a more distant voice sound is needed, the voice is recorded at normal distance, for best quality, and the characteristic of further distance is artificially achieved by appropriate tone manipulation and reverb.

Sound Effects

Non-human sounds recorded on set rarely sound realistic. You may have noticed that even AFV augments its amateur clips with sound effects. Fireworks and gun shots recorded on set never seem to sound right. The sounds of footsteps, doors, cars, birds, insects etc. are notoriously difficult to capture properly when they are central to the action.

Sound editors can spend a long time finding suitable sound effect clips to doctor until they sound right for the action on screen. I've listened to whole CDs worth of sound effects and found only one or two that I've found of marginally acceptable sound quality. There are a lot of sub-par sound effects available out there. The good ones, that are up to Hollywood standards, are rather expensive. Unfortunately, Hollywood quality is what we're used to and expect.

Foley Recording

The introduction of radio and the talkies also introduced us to the sound effects man. He's the guy who supplies all the non-human sounds using an array of devices to simulate creaky doors, footsteps on any surface, breaking glass, thunder, rain ... the works. The technique is named after Jack Foley, one of the original Hollywood sound effects men.

The best sound effects men can do a whole scene, in sync, on one take. Anyone remember Air Farce on CBC radio? The good sound effect man's hardware and microphone placement has been proven to sound right. The good sound man is far

more efficient than trying to find a suitable pre-recorded sound, and doctoring it to sound right and then synching it with the action.

Recording Your Own Sound Effects

Going out in the world to record a suitable sound can be a trying challenge. Look at all the lousy ones out there.

George Lucas spent a long time finding the sound he wanted for the Star Wars light sabre. The classic sound of the light sabre is a recording of an impact on a set of old copper railway telegraph wires in their typical location on the tee bars of telegraph poles, struck under very specific high humidity conditions. You can hear the waves bouncing back and forth between the poles.

Getting suitable sound effects for surround sound Dolby 5.1 is another major hurdle for today's quality directors. The Holophone family of surround sound microphones are widely used for ambient surround sound at sports events. The Holophone PortaMic 5.1 is intended for serious amateur use, with its price of well under $1,000 and its ability to code Dolby 5.1 sound onto the standard stereo microphone inputs of camcorders.

Music

Unless the film is about musicians playing, music is always added in post. Most amateur films use music simply as a background. In a good production, the music sets the mood and follows the emotions of the film. If you have a big budget, you hire a good composer to write the music for the film, and hire a good orchestra to record the score.

There are a few tricks that are used on lower budget productions. The first is to avoid classical music, as it's very difficult to edit without making the cut points apparent, because of long reverb times and continuously overlapping instruments. Pop music is much easier to edit, especially with the myriad of music programs out there, like Band in a Box and Garage Band. Many of these programs will actually compose for you, so you don't have to worry about copyright.

Synching

Synchronizing all the audio and film clips was quite the challenge in the days of film and audio tape recorders, whose speed was not very consistent. SMPTE had a code that was generated in a sync generator and recorded on every device - from tape recorders, to film cameras to video recorders. All this equipment then had the ability to lock on to the sync generator during playback so that everything stayed synchronized. Some studios still use this system. It makes for very complex setup on site, as all the equipment has to be plugged into the sync generator and working properly before you can record anything. In the latest systems, every setting of every device is logged. For example, the camera location, orientation, lighting etc. are required when the scene is being mixed with computer generated animation.

These days, with the accurate crystal clocks of digital recording technology, each recorder and playback device is locked on to its own very stable crystal and will automatically play at the correct speed to eliminate any drifting out of sync. We amateurs can easily sync our individual camcorders and digital audio recorders in our edit suites. Synching on set is still required for real time TV.

MIXING

In a Hollywood production, the final mixing is a big deal indeed. This is where the movie director, the dialogue director, the music director, the sound effects director and all the other directors fight it out and the professional mixer actually make the final product. Film duration limits can wreak havoc with an edit. It is not uncommon for Toronto's mixer professional to earn $300,000 or more a year.

Having 96 tracks can be useful here.

Because audio is often dealt with as an afterthought, with the picture quality the main concern of the director, it is common that audio is not up to the highest standards because of the time and budget crunch.

BENCHMARK MOVIES OF HIGH AUDIO QUALITY

Movies with top notch audio quality are not all that common. It is a good idea to view the few good ones to inspire one and see just what can be done. Listen carefully to the products of producers that are on the cutting edge, like George Lucas and James Cameron. Academy Awards for best sound are always an indication of the latest in sound quality. In addition, some stars, like Tom Cruise seem to demand good sound for all his movies.

■

SPACE FILLING UPDATE ON DAZ STUDIO MENTIONED IN THE NOVEMBER PANORAMA

Well, we've ended up with one column to fill and nothing small enough to fit!

I didn't expect to have any room for this 3D Animation stuff, but here we are!

In the November Issue (under C. G. I.) I recommended DAZ Studio as a good place to start, and suggested that you take advantage of their FREE OFFER and download the software and the FREE Characters they include with it, illustrating some of them on page 13 and 14.

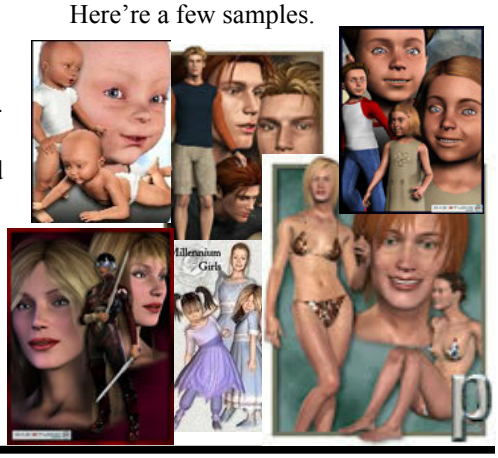
Recently DAZ upped the offer. When you accept the latest version of the Program (now DAZ Studio 3) they give you the latest versions of their main characters. They're always better that the last issue, but the older models are still useful, especially if you have invested in clothing that fits only that model, etc. To get an old version you had to buy it, and I bought several because there was some clothing available for them that don't work with the new improved models.

Now DAZ has decided to make ALL the old characters, and even those they have never given away Free, available as Free downloads to anybody and everybody.

Just go to their web site Click on 3D MODELS along the top line, and then look at t he list on the left. The fourth listed is Free 3D Models. Click that and then start downloading. You'll find nearly 60 Free Models: men, women, boys, girls, and a few "others". Also included are some animation tools, buildings and backgrounds, props, instructional videos, etc. I got them all, including some low resolution models I didn't even know were available, but are just the thing for crowd scenes, etc.

Just download each one and save each setup file to a folder on your hard drive. Once you have installed DAZ Studio 3 you can install the ones you want, as you want.

Here're a few samples.



EVERYTHING YOU ALWAYS WANTED TO KNOW ABOUT DEPTH PERCEPTION (AND WISH YOU HADN'T ASKED)

The paradox of visual depth is not immediately apparent to the general population. Everyone knows how and why we perceive the third dimension, but there is little unanimity in the immediate explanations. When it is noted, however, that light transmitted information about the three dimensional world is reduced to a two dimensional image projected on the retina, the problems begin to reveal themselves. The process is generally understood as one of decoding information concerning the third dimension from the two dimensional images on one or both retinas. This implies that the required information was somehow encoded in these images, and perhaps in other components of the visual system as well. Hence the search for depth "cues", or "clues", which are usually categorized as monocular, or one-eyed, and binocular, or two-eyed cues. We will attempt here to examine each of these cues in turn, though the difficulty of considering each in isolation will soon become evident.

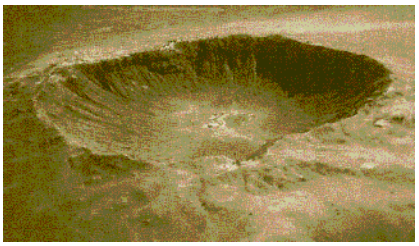
The monocular cues consist of pictorial, or "artists' cues" present in a single static image, and motion cues, contained in a changing image or a series of successive images. Listed as pictorial cues we find terms such as "interposition" or "overlap" or "blocking", "geometric" or "linear perspective", "foreshortening", "familiarity with size", "elevation", "shadowing", "shading", "texture gradients", and "aerial perspective" or "haziness". Some terms include others and some are very closely related to still others.

Interposition, overlap or blocking is basic and scarcely requires explanation. That object which occludes full view of another object is nearer to the observer than is the object which is occluded. This principle is utilized by the photographer who contrives to "frame" a distant mountain range with a foreground object such as a tree, thus providing some apparent depth to the photograph. Interposition alone identifies only relative position along a directional axis leading away from the observer. It provides no clues as to the distance between the objects, or the distance of any object from the observer. Neither does it provide any information about objects in laterally disparate regions of the visual field. Nevertheless, the invariance of the principle is so absolute that the cue (unless falsified) is totally devoid of ambiguity, as we shall see below.

Aerial perspective, or atmospheric haze, on the other hand, is of use mainly to the landscape painter. It is a phenomenon occurring out-of-doors over generally large distances. The atmosphere between the observer and a distant point absorbs red and yellow light more than blue light (rendering the image of the distant point bluer than near points) and degrades the image, reducing both sharpness and contrast. This effect is negligible over short distances and is variable over great distances, dependent as it is on atmospheric conditions. Thus its use as a distance estimation clue is limited, serving more as a weak confirming or contradicting factor, existing as it does in the presence of more powerful depth cues to be considered below. However, since aerial perspective does influence depth perception to some degree, we might examine some possible mechanisms. The cue might depend on the user's knowledge of "the real clarity" and color of the object" as G. Hugh Begbie[1] observes. "[otherwise] A fuzzy blue ball might look farther away than a smooth red one at the same distance." Van Tuyl's experiments with lights, in fact, have indicated an opposite effect: a sharply focused light appears farther away than does a light which is less well resolved.[2] This result may be peculiar to lights as it corresponds well with visual experience: distant light points lack the "glow" that often blurs near lights. With regard to the colour aspect, most subjects, but not all, in chromostereopsis experiments report that red objects appear nearer than do blue objects when both are actually equidistant from the eye. This effect is known to be produced by differential refraction of the crystalline lens and an eccentric pupil, and as the relative position of the lens and pupil varies with individuals, so does the amount of chromostereopsis, even to the extent of producing an opposite effect with some people.[3] It is therefore likely that the aerial perspective clue acquires its limited usefulness through the viewer's experience of its coincidence with more powerful cues.

One of these is "elevation". In the lower half of the visual field objects which are at a greater distance appear higher in the visual field than do nearer objects, and in the upper half the situation reverses so that objects imaged lower (actually higher on the retina) are farther from the observer's eye. (When two objects are in different halves, the one nearer the horizon is the more distant). This principal is consistently true only if the two objects have the same objective elevation, (or if in different halves, then the same absolute elevation above and below the midplane) and is therefore only a corollary of geometric perspective rather than a simple retina location rule defining relative spatial distance as a function of perpendicular distances from image points to a midline on the retina).

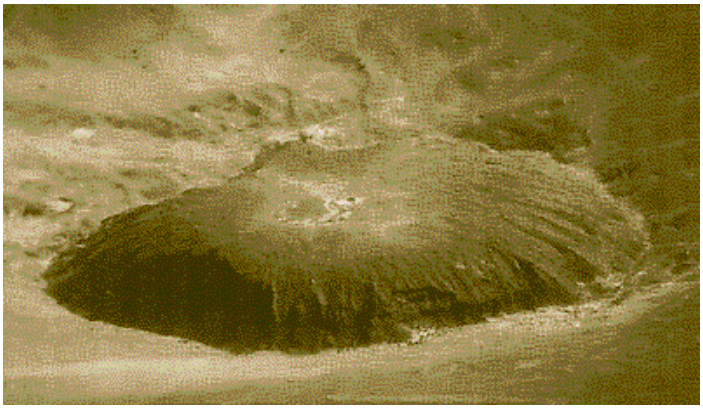
Variations in illumination can influence our perception of depth in several ways. Shadows simultaneously indicate the direction from which illumination originates and provides information about contours in planes which cross the directional axis of the light. The photographer's or artist's choice of side lighting in preference to frontal lighting to convey information regarding depth of objects is an effective illustration of the potency of this cue. However, in the absence of other depth cues, this one too may be ambiguous as the cameo-intaglio illusion demonstrates. As the percentage of people who are familiar with the meaning of "intaglio" has diminished since 1745 when Gmelin first described the illusion[4], the appellation might better, in the space age, be changed to moon crater-mountain illusion. Photographs of moon craters, oriented so that the shadows indicate illumination coming from somewhere beyond the top of the photograph, clearly indicate craters. However, if a



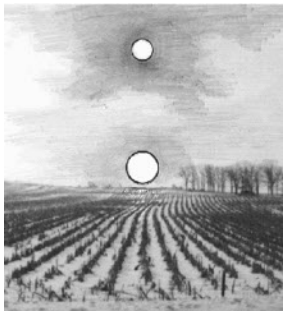
References

1. **Begbie, G. H. Seeing and the Eye. Garden City, N.Y.: Anchor Books, 1973. p 209.**
2. **Rubin, M. L., & Walls, G. L. Fundamentals of Visual Science. Springfield, Ill.: Charles C. Thomas, 1969. pp 389, 390.**
3. **Ibid. p 373.**
4. **Ibid. p 372**

picture is rotated 180° so that light appears to come from below (a rare occurrence in nature) the depth reverses so that the craters are perceived as domes.

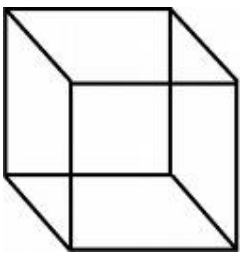


Shading can also be an indication of texture, which will not be discussed at this point. It is sometimes suggested that if an observer is familiar with the real size of an object, and the object is seen at some distance to be smaller than its known size, the distance can be perceived by the size reduction. This suggestion however neglects the phenomenon of size constancy; the observation that objects are perceived to maintain their size quite well in spite of their displacement in space. To explain many illusions, such as the moon illusion, it is necessary to combine size constancy with an assumed perception of the distance of the object. Before pursuing this further, perspective should be considered.



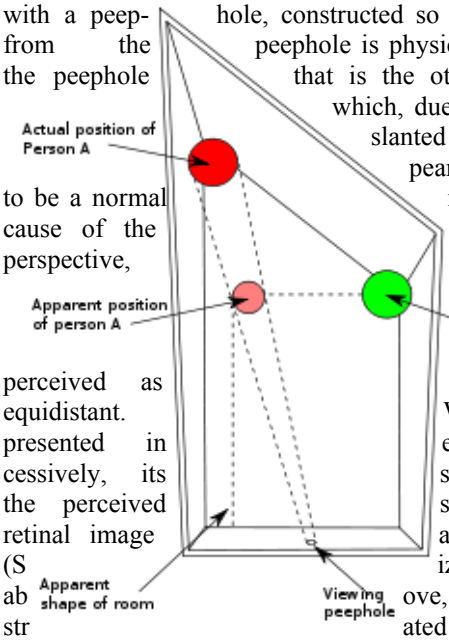
Geometric, linear, or mathematic perspective is perhaps the most powerful of the artist's depth cues. Because of its familiarity (and its complexity) a full explanation of perspective will not be undertaken here. However, a few observations should be made.

Elevation of the visual field, discussed above, and the spatial "corner" called "horizon" are one aspect of perspective, and foreshortening is another. The effects of perspective are most dramatic near the observer, and consequently perspective is more useful for judging the distance between two near points than between two far points. Similarly, foreshortening is less apparent (and hence less useful as a cue) for distant objects than for near objects. The mathematical, geometric precision of the laws of perspective as they relate all points in space to the observer is invariant.



It can therefore be a great shock to discover that when an artificial visual situation is presented, devoid of any depth cues except perspective, perspective can be so ambiguous. Most astonishing are those illusions in which a shape is well defined by perspective, but is subject to two opposing interpretations regarding its spatial orientation, or depth. The Necker cube, for example, maintains this ambivalence even when every face is differentially shaded, coloured, or "textured", and when constructed of wire, painted with phosphorescent paint, and held in the hand in the dark, it will reverse visually in spite of the tactile information.

Perspective exhibits less than perfect reliability as a depth cue, but it usually prevails over size cues to depth. This is spectacularly demonstrated by the Ames Room (See Video); a room, with a peephole, constructed so that one corner viewed from the peephole is physically much farther from the peephole that is the other visible corner, but which, due to tapered walls and a slanted ceiling and floor, appears through the peephole to be a normal rectilinear room. Because of the false cues provided by perspective, the two corners opposite the peephole are perceived as being equidistant. When a familiar object is presented in each visible corner successively, its size appears to change, the perceived size being dependent on retinal image and perceived depth. (Size constancy, invoked above, is not exactly demonstrated in this case except by inference. The logic will not be pursued as it is tangential to the subject of depth). Hence, if size perception is dependent on the perception of distance, the use of size perception as a cue to depth entails circular logic. However, in the interest of objectivity, a report must be noted of wives perceiving their husbands as of normal size and the room distorted as it really is.[6]



As mentioned above, shading indicates textures, the latter used in the sense of common parlance, the texture you can feel with your fingers as well as see. It is necessary to introduce a different concept; visual texture as conceived by J. J. Gibson. An attempt has been made above to indicate that most of the pictorial cues are inadequate for the task when existing singly, but are effective together when in combination and in agreement. Gibson's theory combines them in another way; as elements in a textural gradient. Briefly, the whole visual field is conceived as consisting of textures. Each object in the field comprises an element of the macrotexture, and the surface of each object provides the microtexture. The aspect of perspective which is most important is not the lines retreating to the vanishing point, but the surfaces of the receding planes. A surface viewed in the frontal plane has a texture, but a surface seen in perspective has a texture gradient. (As the surface is viewed obliquely, far points more obliquely than near points, texture is graded from coarse near the observer to fine at a greater distance.) The ground and the sky sloping away to the horizon constitute two large planes and the objects in the field, their retinal image size diminishing as they approach the horizon, provide the macrotexture gradient, with aerial perspective contributing to the gradient. Macrotexture is produced by edges, so interposition, by providing edges, contributes to macrotexture. Gibson therefore

References

5. Gregory, R. L. The Intelligent Eye. New York: McGraw-Hill, 1970. p 42

6. Eye and Brain: The Psychology of Seeing. New York : McGraw-Hill, World Library Ed., 1966. p 180.

views the pictorial cues not as discrete cues operating separately and in cooperation, but as artificially extracted elements of a natural whole.

The depth information contained in a good painting or in a photograph is most effective if two conditions are met. First it should be viewed with just one eye under conditions which do not allow the surface of the picture to be visible. (It can be viewed, for example, under low illumination, or projected on a smooth surface in the dark.) Secondly, no movement of the head relative to the picture should be allowed. If either condition is broken the depth illusion will be reduced as information is gained which will reveal the two dimensional reality of the picture.

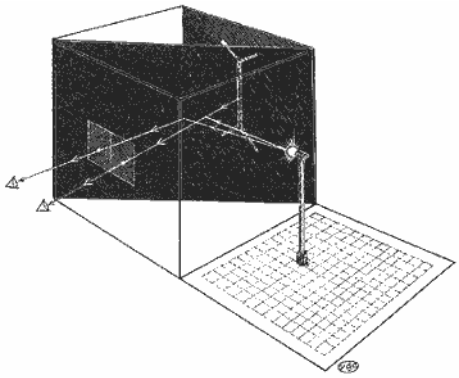
Before considering binocular cues, we should examine motion cues, which can be divided into motion of the visual field relative to the observer (and the reverse) and motion of some elements within the visual field relative to others. The former, motion parallax, in turn has two components. Movement along the visual axis, that is, movement forward or backward, changes all absolute distances and therefore the perspective of all the elements in the visual field, affecting all the same way but to different degrees. Movement lateral to the visual axis, as when looking out the side window of a moving vehicle, has a different effect. The visual field appears to rotate around the point of fixation with more distant points apparently moving in the same direction as the observer, and nearer points seeming to move in the opposite direction. The amount of movement between various points relative to each other and to the observer is inversely proportional to the distances from the observer, and thus provides a very powerful and non-ambiguous cue to distances.

The motion of objects in the visual field produces motion perspective, but an analysis of the depth cues associated with it encounters problems of great complexity which cannot be fully explored without a lengthy investigation into the perception of motion itself. Instead, only a few loosely connected points most closely involved with depth will be discussed.

Leonardo da Vinci noted "the farther away a horse is, the more slowly his galloping carries him across the field."[7] This observation implies that if an observer is familiar with the speed of an object the speed can serve as a cue to distance. In application we face the problem that few moving objects are characterized by a constant speed, but in an analysis of the fundamental cues the problem is one of precedence: the speed is generally known or perceived only as a result of the observer's perception of the distance as indicated by other depth cues. Nevertheless, once the upper and lower bounds on the possible speed of an object have been learned by the observer through experience in situations where good depth cues were available, speed cues may have some import where other cues are sparse. Thus, according to Rubin and Walls[8] "... it is movement perspective which tells us that an airplane is at great altitude once we know how fast airplanes really travel", though (without implying contradiction) the contribution of another weak cue, familiarity with known size, must also be recognized.

Motion of an object along the visual axis, produces a less dramatic change in interposition but produces an additional feature: the changing size of the retinal image of the object. The latter result is seldom perceived by the observer as a change in the physical size of the "expanding" and "contracting" object but is interpreted instead by the visual system as movement in the third dimension, simultaneously providing a depth cue and an explanation of the size constancy phenomenon. Bower's experiments indicate that this depth cue is innate in contrast to that inherent in lateral movement of an object, which apparently develops as a function of experience. Furthermore, it must be recognized that movement in nature is seldom confined to the visual axis or the frontal plane, but has components of each, so that the depth cue in the first component may, with experience, instill a depth cue in the second component.

Before proceeding further two side issues must be considered. One is the subtle distinction between depth and distance which have to this point been treated as synonyms. Without entering into a discussion of Gestalt psychology I wish to draw attention to the illusion of depth, slight as it may be, which one experiences when viewing a reversing figure-ground illusion. That portion comprising the figure "stands out" from the ground, and when the effect reverses, is "pushed back" into a different plane. Yet one would be hard put to estimate the distance comprising the depth. A similar illusion of depth without distance is created whenever a simple drawing illustrates interposition without perspective, but when perspective is added its effect on depth perception can be related to apparent distance by using a device called "Pandora's Box".[9] Distance can always be scaled, but depth sometimes cannot.



The other issue requiring examination is the validity of drawing inferences about the real world from artificial situations. The scientific approach to the study of a complex situation often is to separate the components and study each in isolation, but you cannot study the chemical behaviour of sodium chloride by studying the properties of sodium and chlorine separately. Similarly, it cannot be concluded that because a stimulus produces an illusion of depth when presented in isolation it constitutes a legitimate depth cue in a more complex situation. With this in mind we can turn to some interesting studies relating apparent depth to motion.

Wallace and O'Connell[10] demonstrated that the shadow alone of a rotating three dimensional wire form projected from behind onto a translucent screen generated a three dimensional perception of the form in the mind of an observer. In an attempt to isolate the essential components of this kinetic depth effect Mace and Shaw[11] studied the illusionary depth produced by the interaction of motion of two lattices of dots. Each lattice consisted of a set of several parallel columns of dots, and the arrangement was displayed on a

References

7. Rubin, M. L., & Walls, G. L. Fundamentals of Visual Science. P 378.
8. Rubin, M. L., & Walls, G. L. Fundamentals of Visual Science. P 393.
9. Gregory, R. L. The Intelligent Eye. Pp 92-95.
10. Wallach, H., & 0 Connell, D. N. The Kinetic Depth Effect. Journal of Experimental Psychology, 1953, 45, pp 205-217.
11. Mace, W. M., & Shaw, R. Simple Kinetic Information for Transparent Depth. Perception & Psychophysics, 1974, 15, (2), pp 201-9.

cathode ray tube. When the sets were moved through each other observers perceived relative movement of two different transparent planes or as Mace and Shaw called it, transparent depth. It is significant that subjects perceived different degrees of depth for vertical, horizontal, and diagonal displacements, with vertical movement producing the least depth and diagonal the most.

Another experiment by Börjesson and Van Hofsten[12] sought to identify the properties of motion specifying depth by studying observers' perceptions of just two moving dots. The display was also computer generated and presented on a cathode ray tube. It was found that when the two dots moved together with no relative motion between the two, observers perceived only motion in a frontoparallel plane, but when relative motion was presented, depth was sometimes perceived. More specifically if the two dots moved together or apart on the same path with no other movement in the display, or if both dots moved along the same directional axis at different rates, the presentation was ambiguous and observers could perceive either translation in the frontoparallel plane, translation in depth, rotation in depth, or translation and rotation in depth. If however, the two dots moved together or apart on the same path, and simultaneously moved together in the second dimension the display was invariably perceived as translation in depth.

Relative motion on parallel paths generally produced an illusion of rotation in depth and when a common motion was added rotation in depth was always perceived, sometimes with an additional translation in depth.

What conclusion can be drawn from these kinetic depth effect experiments? Real three dimensional motion of objects is reduced to two dimensional motion of image points on the retina, which can be identical to the two dimensional motion of image points on the retina produced by real two dimensional motion of physical objects. The image on the retina is ambiguous: it may represent motion in either two or three dimensions. In this case as in many others the mind chooses to perceive the situation as three dimensional, and if the three dimensional relationships are ambiguous the mind alternates between opposing three dimensional interpretations ignoring the two dimensional possibility. Thus a rotating weather vane in the distance, or a windmill seen in silhouette and obliquely, may appear to reverse its rotational direction.

A somewhat similar illusion of depth can present itself under some conditions of illusory motion. Two lights in different positions flashed sequentially can under certain conditions produce an illusion of only one light changing its position. These conditions will not be detailed here except to note that the apparent speed of motion of the light can be varied within narrow limits. If the flashing is alternated repeatedly the light appears to move back and forth along the same path, but if the timing is varied so that the duration of the off time is one phase of the cycle is longer than in the other phase the illusory moving light appears to follow a path curved in the third dimension during the larger interval. Kolers[13] who describes this phenomenon claims "if the object were in real movement, it would appear to change its speed rather than its distance from the observer". But as he provided no evidence for that statement, one wonders whether the situation might more accurately be described "an object oscillating back and forth at two different speeds will be perceived as moving at a constant speed along the two different pathways, the longer one three dimensional, unless there is some depth cue presenting contrary evidence".

Before entering into a discussion of motion cues to depth it was stated above that in order for a two dimensional picture to be most effective in presenting apparent depth if was necessary that it be viewed with one eye under conditions that reduced the possibility of its two dimensional surface being detected. The implication is that if one eye sees the surface, or if two eyes detect the lack of binocular depth cues, the illusion will be weakened. However, in passing, attention must be drawn to the curious case of the parallax panoramagram. By a very complicated arrangement a camera moved through a horizontal arc can produce, through a series of parallel vertical slits or cylindrical lenses, a line element panorama, which, when viewed through a similar series of vertical cylindrical lenses, will provide the viewer with a pair of horizontally disparate images from a wide variety of viewing positions or angles.[14] These images can be presented by projection on a screen provided with the necessary lenticular viewing aid, or by printing on paper which is then coated with a layer of plastic embossed with the required cylindrical lenses. When the latter arrangement is held in the hand and viewed with two eyes the apparent depth is undeniable in spite of the salient surface. The illusion is so strong that the contradictory tactile data is overpowered and the observer experiences either a numbness of his fingers or an impression that his fingers have sunken deeply into the thick object that they hold.

So finally we come to the binocular cues, generally listed as accommodation, convergence, and binocular or retinal disparity or asymmetry.

Accommodation and convergence, while most conveniently studied in the context of binocular vision for reasons which will soon be evident, should really be classed as monocular cues. Whatever information they provide the two-eyed man they also make available to the one-eyed man. Unlike pictorial cues, they come into play only when the eye alternately fixates different points in real space.

Accommodation, or change in focus, and convergence, or toe-in, are normally synkinetic, but the synchrony can be broken. A stereogram, or stereo pair of pictures, can be viewed in many ways. The simplest viewers employ an opaque divider to prevent the left eye from seeing the picture intended for the right eye and vice versa, and modifications of this system may use lenses or prisms to reduce the physical dimensions. The anaglyph system uses two complimentary coloured filters at the eyes to provide separation of the two pictures which are printed or projected in the two colours, and a refinement of that system, called the Vectograph, enables full colour pictures to be used by projecting them with crossed polarized light and using suitably oriented

References

12.Börjesson, E., & Von Hofsten, C. Spatial Determinants of Depth Perception in Two-dot Motion Patterns. Perception & Psychophisics 1972, 11, (4), pp263-268

13. Kolers, P. A. The illusion of movement. Scientific American, 1964, Oct.

14. Dewhurst, H.Introduction to 3-D: Three Dimensional Photography in Motion Pictures. London: Chapman & Hall Ltd.,1954, P 64-67

polaroid filters at the eyes to separate the views. Lastly, with a little training and practice, unaided, free stereoscopy may be attained.[15]

When viewing stereograms by any of these methods, accommodation must remain constantly at the plane at which the two pictures are drawn, printed, or projected, while convergence varies according to the distance between the two homologous, or corresponding, points upon which each eye is fixating. This restriction on accommodation does not interfere with the perception of depth. Thus accommodation may be eliminated from consideration as a depth cue.

Does this demonstrate that the varying convergence provides the depth cue? Not quite! On the evidence from stereoscopes alone it would appear that perceived distance is a function of the convergence of the eyes, but some other optical devices must be considered. The telestereoscope employs two sets of angled mirrors. The image of an object is reflected by the outer mirror to the inner mirror and they in turn reflect each image to the appropriate eye so that the eyes of the viewer are optically spread further apart without changing convergence. The result is that the viewer perceives exaggerated depth. The iconoscope reverses the effect by reversing the placement of the mirrors. The inner mirrors reflect the images to the outer mirrors, which reflect the images to the eyes. Interocular separation is effectively reduced, and so is apparent depth. The mirror pseudoscope interchanges the views normally obtained by each eye and reverses the depth of the various points of the object. All of these effects can be duplicated with a stereoscope by either increasing or decreasing the separation between the two views (when they are photographed) to produce effects corresponding to vision through the telestereoscope and iconoscope respectively, or by reversing the sterogram in the viewer to produce the pseudostereoscopic effects. We shall return to pseudostereoscopy presently.

The feature uniting these manipulations is not convergence, which was constant throughout, but retinal disparity. This disparity has two components. Each eye sees a slightly different view of a rounded object with the left eye seeing more of the left side of the object than does the right eye, and vice versa. Secondly, those points which are registered on both retinas are not symmetrically positioned. Points laterally adjacent to the point of fixation are spread out along the retina, and the lateral displacement for any point is different on one retina than on the other. Here then is a source of depth information available to the visual system, but just how these disparate images are "fused" or unified is not fully understood, so in place of a discussion of the problem, we will merely examine some of the properties of binocular stereopsis.

All of the depth cues available to the one-eyed man are of course available as well to the binocular man, and in normal situations they generally agree. However, this is not always true with stereoscopy. Pseudostereoscopy in particular presents an interesting example. Line drawings of transparent figures can be presented "backwards" very successfully, but pictorial cues in scenics can override the pseudostereo. I personally am associated with a group of stereophotographers who have been meeting regularly for more than twenty years to view each other's stereograms by Vectographic projection. On one occasion the projectionist mistakenly projected all the travel pictures backwards for more than an hour. I identified the problem after a few moments, but as I had only been a member of the club for about a year, I waited for one of the "experts" to correct him. Finally, I interrupted the proceedings to ask if anyone saw anything irregular. A few admitted that something was mysteriously disturbing them, but most had noticed nothing unusual. When I asked the projectionist to reverse his transparencies, he grudgingly complied, and all agreed the pictures now had more depth.

Illumination also can have a peculiar effect on stereoscopy. Frontal lighting as we have seen reduces apparent depth, and when confounded with the rapid diminishment over distance of flash lighting, produces a "stage set" or "cardboard cutout" effect. Each object is flattened, but the empty space between objects is not reduced. Consequently, the reduction of light intensity is not uniform, appearing instead to be stepped, and objects look like photographs in different planes of depth.

Interposition can exhibit a powerful restraint on stereoscopy. Stereo images are usually presented with a frame, or "stereo window", regardless of whether they are viewed through a stereoscope or by some form of anaglyphic projection. The stereo window is a black void with a hole in it through which the scene is viewed. By suitable manipulations in the camera, in mounting or printing, or in the stereoscope or projector, the window can be made to appear in any plane the stereographer wishes; at the plane of the paper or screen, behind it, or in front of it. This window is psychologically more real than the screen and is inviolate. Objects may appear in the plane of the window, behind it, and even in front of it. However, to appear in front of the window (out in the audience) no part of the object may be "cut" by the window's edge. To illustrate, let us consider an example from stereoscopic motion pictures. Objects can be thrown through the window into the audience, and a man may even extend his arm out through the window. But he cannot walk through it! The moment he gets close enough to the window that it cuts off his legs, the mind forces him back. If the camera is lowered so that his feet are not amputated, the ground he walks on cannot extend out the window as it is cut on both sides as well as the bottom. He must fly out, or walk the plank! Here interposition is so powerful that it overcomes even pictorial convention.

In light of the above, the failure of motion parallax cues to destroy stereoscopic depth is most surprising. If one moves laterally while viewing a projected stereo scene the entire scene swings in a most unnatural way. Similarly, approaching the screen results not in a visual approach to near objects but in their retreat, and distant objects rush forward at an alarming rate. Geometric pictorial perspective holds well, but motion parallax is destroyed in a way which is most upsetting for the observer, but not for the stability of his perception of depth.

We have seen, therefore, that the interrelations of the depth cues are varied and complex. Motion parallax is undeniable, unless pitted against conflicting binocular disparity. Geometric perspective is ambiguous and ambivalent, but has the power of reversing binocular disparity. Illumination is relatively weak and unreliable, but can effect binocular disparity profoundly. Interposition is relative only, but in that it is unerring.

Behind it all is a mind which seems to seize any opportunity at all to perceive a third dimension. Perhaps we should have begun with that assumption and looked instead for definitive cues to two-dimensionality.

■

References

15. Kaiser, J. B. Make Your Own Stereo Pictures. New York: The Macmillan Company, 1955, p 14.

COMPOSING YOUR IMAGES

JOHN COOK REPORTS ON THE DECEMBER 12TH WORKSHOP OF THE MULTICULTURAL CINEMA CLUB OF KITCHENER

[*Note: Some of these tips and techniques refer to still photography, and others to video. It will be up to you to apply them accordingly. Ed.]*

This workshop was by Dragan Doric about understanding the how and why of camera operations. Dragan is an accomplished still photographer specializing in travel and wildlife work. For over 30 years his career has included portraits, commercial work, and promotional travel videos in a documentary style. He has worked with still formats from 35mm to 8x10 inch cameras and has shot and edited video in SD and HD. At this worshop he showed samples in stills and video to clarify and remove the mystery of camera operation.

Dragan explained the many rules in photography-cinematography i.e.: rule of thirds, depth of field, lead room, head room, aperture settings, shutter speeds, frames per second, aspect ratios, exposure, white balance and more.

Executive Summary

How to get incredible 100 Megapixel images with a 12 Megapixel camera
Use a tripod with an appropriate head.
Focus on your centre of attention.
Control depth of field with f stops settings.
Control motion blur with shutter speed.
Never overexpose.
Set your camera to highest resolution and normal colour, contrast sharpness etc.
Shoot nature mainly in overcast light (after a rain).
Composition, composition, composition.

VERY HIGH DEFINITION

Definition

Dragan's specialty is very high resolution still pictures (up to 100 Mega pixels) with normal (12 Mega pixel) digital still cameras. His process allows very high quality mural size enlargements. The trick is to shoot 20 - 25% overlapping images of the scene and then stitch them together in Photoshop using the feather function. The process allows for wide angle pictures without the severe distortion of wide angle lenses.

Dragan also shoots HD video and stitches together multiple shots in Pinnacle Studio.

Covering the Scene

For best results, the camera is mounted on a tripod. For accurate stitching of images, the optical centre of the lens must be located at the pivot point of the tripod head. While suitable commercial Gimbal heads are available, they are very expensive, so Dragan has fabricated his own. To align the pivot to the optical centre of the lens, sight on a foreground object and note it's relation to the background. Your pivot is at the optical centre of the lens if while swinging the camera so the object goes from edge to edge, it maintains the relationship of the foreground object to the background. If you are off, the foreground object will change position relative to the background as you pivot.

Dragan also showed many remarkable images stitched together from handheld shots. In his world travels he often shoots with a still camera in one hand and an HD camcorder in the other. He showed a number of images shot from the back of a moving camel.

Knowing Your Subjects

If you are taking 9 snaps of a scene, re-aiming the camera after each shot, your subject cannot be moving, especially in the areas where you will be stitching the shots together. While this is straightforward for still life, it can be quite challenging when photographing creatures. It is quite important to know the habits of people and animals to achieve this level of stillness. Dragan showed some incredible images of tigers. In one instance, the tiger was captivated by a peacock which he was observing as a potential meal. The tiger was perfectly still for the sequence of shots with multiple exposure settings. In another, a crane was perfectly still while observing some minnows in the pond. You don't want it windy when you're shooting. When shooting humans, they must be in a natural pose as an artificial pose inevitably results in unconscious motion. Dragan showed some remarkable portraits of "characters". Shots of "characters" are of far greater interest than shots of everyday models. In one case, he shot some children, knowing they would be very still looking at a teacher as she entered the room. His many examples included landscapes, insects and reptiles. Many were macro close-ups showing remarkable detail. This level of detail was very evident as he zoomed in on the LCD computer screen.

Dragan has remarkable patience. In the many memorable images he showed of ancient Egyptian landmarks, he had to deal with crowds of tourists swarming all over the scene through the whole day. He would patiently wait and only shoot those parts of a scene where the people were absent, until he had the whole scene covered. The final image would always show a small group of people just to get an idea of the scale. The long time taken to photograph a scene could be appreciated by the change in the shadows of different parts of the scene indicating the sun's motion during the shoot. You have to keep track of what you've taken, by viewing the digital images.

COMPOSITION

Rule of Thirds

Dragan always has his viewing screen showing the thirds grid.

Nothing shouts "amateur photographer" as much as having the centre of attention in the centre of the screen for every shot. The idea, behind the rule of thirds, is to keep the centre of attention away from the centre of the screen and near the thirds intersection points. First of course, you must determine the **centre of attention**. In creatures, the centre of attention is usually the eyes. It could, however, be the pattern of feathers, in which case the eyes

would better be out of focus to minimize their pull on the viewer's attention. Beware that anything **red** also tends to grab a viewer's attention.

Don't be too rigid applying the rule of thirds. Variety is the spice of life. The movie *Australia* is an example of the rule of thirds used in every single shot to the point where it gets annoying.

Patterns

A subject can form a simple pattern, line or geometric shape. It's best for the horizon line to be at the 1/3 or 2/3 position. An interesting object should not be in the centre but rather at one of the intersections. Fundamental lines of the object look good when composed diagonally between two of the 1/3 intersections. Strong lines of perspective should also lead to vanishing points off centre. Curved paths are more interesting than straight paths. A triangular pattern is very powerful, whether it's an image of a pyramid or a pattern of three heads or simply a head with two arms in a triangular configuration. A square is also a strong stable shape.

Subjects

A picture of a creature is more powerful when taken from the creature's level, rather than from on high - it's more close and personal.

In many cultures you cannot just shoot people without permission. Dragan always tries to shoot the natural, he doesn't direct. He never moves objects for composition, he always moves the camera only. Never mess with nature. If you must move an object, always move it back to its exact previous location after shooting.

If a subject is moving there must be enough *lead room* ahead of him to go into. Otherwise it will look as if he's going into the wall of the picture frame. *Head room* above his head is also required so it doesn't look like the ceiling is coming down. Too much head room can leave the impression that there is something that's going to fall down on his head.

Lighting

When shooting nature, to achieve maximum detail, it is best to shoot when overcast, preferably after a rain when you have very good contrast and colour saturation. Clear sky can make many shots impossible. Dragan showed a winter shot of a snow covered forest, with details in the dark tree trunks as well as fine details in the snow itself. This wide latitude of detail would only be possible with an overcast sky.

The time of day also affects not only the angle of lighting but also colour temperature, being most extreme near sunrise and sunset.

Straight-on diffuse lighting is commonly used in fashion photography to minimize facial lines. For shooting "characters" lines give character, so sharper lighting is preferred. Lighting can be used dramatically to control the viewer's attention by only lighting the centre of attention and putting the rest in shadow or darkness.

Silhouette scenes can be very effective in high definition, when highly detailed objects, such as plants are in the scene.

CAMERA SETTINGS

Depth of Field

The centre of attention is always in sharp focus. We can control the amount of blur of the foreground and background by the f stop. The smaller the opening is, the greater the depth of field. As a rule of thumb, the depth of field is in a ration of 1/3 to the front and 2/3 to the rear of the plane of focus. Use depth of field to control what the viewer will concentrate on.

For shooting landscape shots, it is common to use very small apertures. f 1:64 and even f 1:128 are not uncommon for maximum depth of field. It is worth noting here that as a general rule, a lens's highest resolution will be at it's middle f stops. Therefore, you will get significantly higher resolution at the very small f stops with slow lenses rather than fast lenses. This is actually good news, as the slower lenses are much cheaper.

Shutter Speed

Shutter speed is used to control the amount of motion blur. Remember, the human eye is very limited to the motion it can sense. Below 20 fps it detects flicker. The motion picture industry has standardized on 24 fps to get above this threshold. The motion picture industry has also standardized on a 50% rotating shutter, giving an effective shutter speed of 1/48 second, which you can use as a reference for normal blur.

Exposure

It is always better to underexpose than overexpose. Overexposing will wash out the highlights which cannot then be recovered by image processing. In a nature scene under bright sunlight, you will find that different exposures will bring attention to different parts of the scene. An overcast day will even out the exposure considerably, making more of the scene's details visible. There is no hard and fast rule for exposure. Automatic exposure is rarely the most desired exposure. It's best to shoot multiple shots at different exposures and then chose when processing.

A grey card can be used for setting exposure when located at the centre of attention and perpendicular to the camera. Zoom into the card alone when locking the settings.

When shooting the moon, for colour balance, remember it is illuminated by the sun and the light then passes through the filter of the atmosphere. When the moon is high in the sky, the exposure is similar to a sunlit scene.

Sunny 16 Rule

For normal landscape shots in bright sun, set the f stop at 16 and the shutter speed at the ISO speed of the film or image sensor used. Another exposure setting that works is to set the exposure off the grass of a lawn.

Image Distortion

Image distortion is only apparent on manmade objects such as buildings, roads, fields, etc. that are straight and square. Since nature as a rule does not have exactly geometric lines, except for the horizon, image distortion in nature is never really apparent.

Aspect Ratios

Most of the standard sizes of photographic prints have different aspect ratios. For over 50 years, the TV industry has used the 4:3 aspect ratio. 16:9 is the current standard for HD TV. 2.35:1 is becoming the standard for Hollywood movies, which, unfortunately, doesn't fill HDTV screens.

In the movie industry, getting wider pictures has always been a pursuit.

The first approach, using standard cameras and projectors, was to use an anamorphic lens on the camera and projector. This type of lens was used to compress the image horizontally to fit the extra width on the film, and then again

used to spread the horizontally compressed image on film out to its normal size on a wide screen. This technology used existing cameras and projectors, and only required additional lenses and, of course, wider screens.

Another approach to wide screen was to use the same 35mm film cartridges, but to run them horizontally (35mm slide format) giving greater resolution, but using more film and requiring new cameras and projectors.

Dragan takes a lot of panorama shots, often to a full 360 degrees. Using multiple stitching of images, these can be very high resolution indeed for large murals.

In digital systems the anamorphic lens is replaced by digital processing.

Processing Equipment

Dragan uses a dedicated Windows based computer with Adobe Photoshop for his stills and Pinnacle Studio for his HD movies. All his projects are stored on external hard drives, one hard drive per project. This computer never sees the Internet. Since most Windows updates are caused by security issues, there is no need to update on the Internet. By dedicating the PC to only these applications, the seizing of computer resources by the various installed programs is minimized.

One can achieve similar results at less cost by using plug-in hard drives: one for the OS (operating system) and photo programs only and a second for the OS and the usual PC applications. Only one of these OS hard drives is plugged in at a time. It's most convenient to purchase a computer case that can accept bare SATA drives as direct plug-ins.

Prints

Dragan, being in the graphics art business, has access to wide bed printers that feed long rolls of paper. *For those of us who don't have such facilities at hand, I would highly recommend Silvano Color Labs in Toronto who have the capabilities of printing almost any size of mural from your digital files.*

CONCLUSION

I have a great deal of admiration for the superb results of Dragan's work. There is a great deal of challenge to the process. His pictures have the appearance of perfect timing to get that fleeting moment frozen in time, and then you realize that he was triggering his shutter many times over many seconds. ■

PINNACLE VIDEO TRANSFER

by Fred Briggs

Many of our SCCA Members use one version or another of Pinnacle Studio for their computer editing, but Pinnacle isn't just a software company.

Years ago I used their hardware to get my video footage into and out of my computer, but since the advent of Firewire/i.Link/Lynx/IEEE 1394 in 1995, and later, USB, and the many new computers I've had in the past 15 years, I've been moving my video in and out of my computer directly from and to my camera.

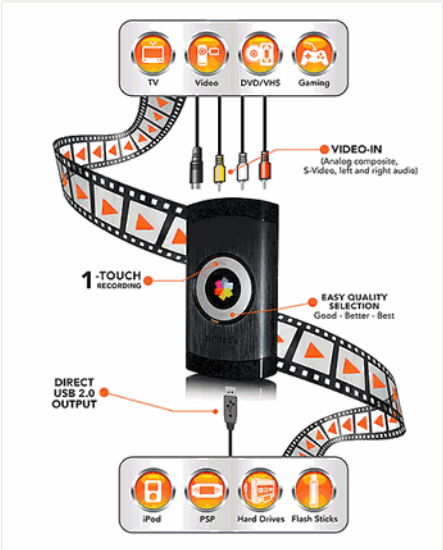
On the few occasions when I wanted to edit some old S-VHS footage, instead of digging up the old video input/output board and installing it, hopefully with drivers compatible with the current operating system, I simple copied the footage to miniDV with my camcorder, an S-VHS player, and an S-VHS cable.

Pinnacle now sells a small device that will convert the input from Composite Video or S-VHS, in real time, to H.264 MPEG-4 format and write it onto a USB 2.0 compatible storage device – like the hard drive in your computer!

A new member of the Hamilton Video/Film Makers showed us a video he had shot with an old Professional S-VHS Camera and recorded directly onto a portable hard drive instead of tape, and having such a camera, I had to get one of those Pinnacle Video Transfer Devices. I had always loved that top notch Camera, Lens and Microphone, but hated VHS tape and refused to buy into video until S-VHS came along, and didn't buy a camcorder for my personal use till Hi8 came out. Was this thing the perfect answer?

He had bought his at Tiger Direct, Factory Refurbished, for $69 plus taxes, and so did I!

It came with a 5V Power Supply, and will record to an SD Card (not supplied). I had a 16 Gig SD Card that I had bought for a digital still camera, and the system did work with this (transferring with an S-VHS cable from my camcorder) but I wasn't satisfied with the quality.



The video suffered from those digital problems we see far too often, apparently because my card couldn't keep up. I thought I might have to research the problem and buy a higher speed SD Card, but I have a USB 2.0 60 Gig portable hard drive for my laptop (and by the way, these are getting very cheap now!)

But to use it with the Pinnacle unit, the hard drive had to be reformatted as FAT16/32 and not NTFS that I use on all my computers now. (I have no idea what computers use FAT16!)

Well, at least I could plug it into any computer still running Windows XP for reformatting! Oops! FAT32 can't be used for anything larger than 30 Gigs!

So I had to partition the hard drive into a 29 Gig and a slightly smaller hard drive. I partitioned both as FAT32, and the Pinnacle unit (This thing NEEDS A NAME!) accesses only the first partition. However, my laptop can access either partition by the Drive Letter.

This works beautifully! The Hard drive gets its power from the USB Cable from the Pinnacle (I refuse to use the word :"unit" again!) I copied 38 minutes of miniDVD and it ran very smoothly on my computer in H.264. (By the way, when you buy the product you get several things with it, including a setup disk. However, you are asked to login to their web site to update the software before using it, and you are given a chance to download the H.264 CODEC (FREE) and a small editing program to go with it.

So much for transferring videos, including any VHS, to H.264 at home. The power supply has to plug into the mains, or as we call it here in Ontario, the Hydro!

To use it in the field with another camera (that Pro S-VHS, or a small spy camera on a kite, or RC helicopter, or in a watertight mason jar, or whatever, I'll need a battery supply.

However, my go-to guy for electronics is in Florida since Christmas and won't be back for a few more weeks, so I was on my own. I was afraid to put 4 1.5 Volt rechargeable batteries together, because that would give it 6 Volts. That probably wouldn't hurt, but I didn't want to take that chance, so I used 4 NiMH batteries, at 1.2 V each, they gave me a nice safe 5 Volts, and the AA size run the "PVT" (how's that for a handle?).

I haven't tried the batteries yet with the hard drive feeding off them, or with various cameras that will need their own battery supply, but when I do, I'll let you know the results.

Meanwhile, have a look at their web site, think about all the ways you could use it with your iPod, Nano, iPhone, etc., download the small Manual, and think about whether or not this is something you could use.

■