TECHNOFROLICS™
integrating art & science

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FrameGlide™ video explorer with Spin Browser™ dial

(abbreviated FG|SB below)

Content Aesthetics

(Last Updated 2012-10-19)

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Brief Overview

1. Video content comes in all qualities, ranging from grainy, shaky, home movie level, to 3-axis gyro-stabilized IMAX quality.
2. Prices are commensurate - i.e., from free, to millions of dollars per hour.
3. Content may be procured through custom filming, royalty free stock footage, licensed-managed footage, public domain footage, or content donations.
4. TechnoFrolics' stock FG|SB library includes video of varying dimensions, ranging from 1080p HD (1920 x 1080) to standard def (640x480). Frame rates vary from timelapse to high speed to 30/60 fps. Video selections range in duration from seconds to years, and from a few tens of megabytes to 500+ gigabytes.
5. Whoever performs the content acquisition, be it though stock footage licensing or custom filming, it is recommended that TechnoFrolics be involved at a minimum as an adviser. This is because presentation of content on the FG|SB system requires a substantially different sensibility than when presenting with conventional technologies.

What kinds of video (or still) content works particularly well or badly with the FG|SB System?

Works well

1. Fixed camera imagery of processes with intrinsically high levels of complexity. Examples include:
    a. The motions of groups of fish within a large school as they change directions.
    b. The chewing motions of an infant.
    c. The robotic assembly of an automobile.
    d. The facial expressions of a person being told a joke.
    e. Fluid flow.
2. Fixed camera imagery of processes with high levels of entropy change. Examples include:

a. A forest fire.
b. The dispersal of ink in a glass of water.
c. A building being constructed or explosively demolished. (A science museum filmed their building going up over a 3-year period and put the footage on a FG|SB system within their newly constructed building as an exhibit.)
d. A sandcastle being eroded by the tide.

3. Fixed camera time-lapse imagery of interesting phenomena. Examples include:
    a. Grass growing, flowers blooming.
    b. Crystals forming as a liquid freezes.
    c. A cocoon opening to release a butterfly.

4. Fixed camera high frame rate imagery of interesting phenomena. Examples include:
    a. A bird in flight.
    b. A dart piercing a balloon.
    c. A bullet going through a wine glass.
    d. High speed machinery.
    e. Vehicle collisions and crash tests.

5. Moving camera imagery of journeys of all kinds. Examples include:
    a. A flyby through a city.
    b. A walk through a forest.
    c. A shot out a submarine of the ocean floor and coral reef.
    d. Endoscopic footage of human veins, intestines, etc.
    e. A truck ride through an African wildlife refuge.
    f. A tour of a museum.
    g. Footage from a spacecraft.

6. Note that stills can also work wonderfully on the FG|SB system. While at first glance it might seem that stills are ill-suited to the technology, in fact that is not the case. Creative, artistic editing, combined with the enormously high resolution of most photos, can turn collections of still images into unique, fluidly-perusable journeys. Please contact us to discuss past stills-based projects, produced by TechnoFrolics and

others, with content including architectural views, shots of university campuses, botanical images, microbe photos, and more. Compared to the alternative of conventional touch screen graphic-button-based access, the FG|SB experience is dramatically more sensual, rugged, and engaging. Why make the process of locating images be a chore, when instead it can be a magical journey?

Works badly

1. Sections with many short cuts. For example, a music video.

2. Sections with relatively low complexity of imagery. For example, an animated Saturday morning cartoon.

3. "Talking Heads" - e.g., a news broadcast. (Unless the FG|SB technology is primarily being used as a content-locating tool, rather than an education medium in and of itself, in which case this limitation does not apply.)

4. Sections filmed with a camera in a position that is neither fixed, nor moving point-of-view, but rather, intermittently wanders from one to the other.

Additional notes, particularly relevant for the exhibit producer, professional camera-person, post production editor, or anyone generally interested in more information.

1. Length of content:
    a. What matters for FG|SB exhibits is total number of frames in the content; do not think of time - rather, think of number of frames. Thus, 300 time-lapse frames of (say) a building construction, shot 1 frame per day for about a year, is substantially "equivalent", in terms of the user experience, to 10 seconds of "normal" video at 30fps[1] showing (say) a crab feeding, which in turn is equivalent to 3000fps shot for 1/10 of second of (say) a glass breaking.
    b. Visitor dwell time[2] is substantially unrelated to the amount of perusable content on the FG|SB system. There exist public FG|SB installations with 24 hours of content, and those with less than 2 minutes.[3] In both cases, visitor dwell time could range from just 10 seconds, to 15 minutes or more. It is important to remember that a visitor may review a particular 30 second clip at great length, or zip through 8 hours of content in less than 2 seconds.

2. If performing custom filming:

[1] 30 fps = frames per second, the standard rate for North American video.
[2] Assuming kiosk, not lecture, application.
[3] By "10 hours" of content, what is meant is 10 hours if played at the normal rate of 30 frames per second. The same goes for the "2 minute" phrase.

a. Limit Pans and Zooms
Typically, best results are achieved by either fixing the camera (limited/no pans, zooms[4], etc., and ideally on a tripod if circumstances permit), or attaching the camera securely to a moving vehicle (car, plane, boat, etc.) at a fixed viewing angle (i.e., again limited/no pans, zooms, etc., and ideally, if budget allows, mounted on a 3 axis gyro stabilizer).
In other words, what is *not* good is 5 seconds of the camera fixed on the subject, then a 3 second zoom into the subject, then a 2 second pan, then a walk-around with the camera, etc. Users of FG|SB exhibits will in such circumstances become frustrated (just as they think they understand what they are controlling with the dial, the context shifts), and will become physically queasy as well.

b. Shoot *Long* Clips
Take much longer clip shots than you would shooting for a documentary or the like. In a documentary, it is rare in the final production to find a single camera angle held for more than, at most, 15 seconds. With the FG|SB system, in contrast, there are installations with fixed camera shots ranging from 10 minutes (for clouds passing overhead), to 12 hours compressed to 1 hour running time (tides), to 3 years compressed to 1 hour "running" time (building construction), to 40 minutes shot out a helicopter following the Mississippi river through multiple states, to 24 hours at 30fp of a starfish tank.

c. Short Exposure Time
Even if you don't have access to a high speed (high frame rate) video camera, if you are shooting moving objects, or shooting from a moving point-of-view, be sure to drop the exposure time down such that each frame is clear and without blur. Otherwise, visitors who pause at a particular point in the video will see a blurred image. For many applications, changing the exposure from 1/60 second to between 1/1000 and 1/10,000 second should suffice. (Most video cameras, from "prosumer" to professional grade, will readily allow this.)

d. Time Lapse
TechnoFrolics has developed a software tool that allows "Cluster Capture™", a filming technique resulting in dramatically better FG|SB-based timelapse presentations than the norm.
Historically, timelapse has been shot by taking 1 frame every periodic interval of time - once per minute, once per day, etc. For subjects in which there is no fast motion - such as a flower blooming - this is fine. However, there are many scenes where interesting evolution is occurring on multiple time scales. Examples include tides in the ocean over 12 hours (where the motion of waves, sea birds, and the like, is occurring relatively quickly), building construction over years (where the pounding in of pipes, motions of cranes and backhoes, and the like, are similarly occurring relatively quickly), the maturation of a young chick over weeks, etc. In all these multi-timescale cases, conventional timelapse loses dramatic amounts of real-time information and is frustrating because of this, as well as being annoyingly jerky. And of course it is not practical to simply film the sequence continuously over weeks or years at 30fps, both because it would take untold numbers of videotapes or hard drives, and because no one would watch it (at least not running in real-time).

[4] Comments about limited/no pans/zooms assume such are performed in the "standard" manner. If the whole *point* of the clip is a pan or a zoom, and the action is very very steady (ideally computer controlled), such as a complete 360 of a scene, or a zoom onto a human hand over several orders of magnitude from complete limb to cell level (like the Powers-of-Ten-video), that of course could be very cool. (Note however that because of human perception issues, pans are particularly difficult to have function smoothly, whether such pans were created at filming time, or done during post-production from high-res stills. Standard frame rates of 30fps are typically insufficient for the appearance of smoothness in pan situations. Please contact TechnoFrolics for more information should this issue be relevant to your application.)

Cluster Captured content, presented on the FG|SB system, dramatically improves this entire situation. With this technique, footage is captured at real-time at 30fps for X minutes (say 1/2 minute), then capture pauses for Y minutes (say 30 minutes), and then the cycle repeats. In this way, with the exception of the occasional periodic "jerks" at Y+X minutes, the user experiences smooth, full frame rate control when turning the dial slowly and thus can readily explore the relatively quicker motions. However, when turning the dial fast, the experience is just like with conventional timelapse. You have the best of both worlds!

Content Pricing Overview

Background:

1) Regarding stock footage:
   a) Many commercial suppliers of stock video have pricing structures based upon "conventional" uses such as within TV advertisements, Hollywood movies, and other similar contexts. In these contexts it is frequent that just 5-10 seconds of stock content is used, and for the production to be seen by millions of viewers. Because of this, it is not unusual to see licensed-managed commercial stock video in the range of $65/second = $234,000/hour, and licensed-managed non-profit stock video in the range of $30/second = $108,000/hour. Obviously, while for a few seconds in a TV ad such pricing is fine, for the thirty minutes to several hours typical in FG|SB system use, such prices are both exorbitant and inappropriate.
   b) Prices for royalty-free stock video can be significantly less, depending on the supplier. The ease of finding content specific to your needs, content suitable for FG|SB system presentation, and license agreements that allow FG|SB system use, all may vary.
   c) Typical prices for firms that specialize in locating and compiling public domain footage (from NASA, NOAA, etc.) can be around $1000/hour-of-content + editing costs, with an affordable effective total cost of around $6000/hour-of-content. However, finding content of sufficiently high quality, and suitable for FG|SB system use, within public domain footage, can (depending on the subject matter) be quite difficult.

2) Regarding custom filming:
   a) Prices per minute for custom filming will almost always be significantly higher than for stock footage, at a given quality level and subject matter. However, because the FG|SB system typically benefits from clips dramatically longer and less edited than the norm, up front filming costs can often be offset by *significantly* lower post-production costs.

TechnoFrolics cost-effective content offerings:

1) Regarding stock footage:

a) TechnoFrolics has spent significant effort accumulating stock footage both affordable and particularly appropriate for FG|SB system use. License fees for both TechnoFrolics-filmed and specially-negotiated third party footage, are typically in the range of $4000-$8000 for 30 *minutes, less than 10% of typical license-managed rates*.[5]

b) In addition, TechnoFrolics has a special FG|SB system licensing arrangement with the excellent stock house www.artbeats.com. Artbeat's site is well set up to allow perusal of all their offerings, and those we have already acquired are listed below.

c) For exact pricing, please contact David Durlach at TechnoFrolics to discuss your specific application and needs.

2) Regarding custom filming:

a) For filming of content whose subject matter is readily available (e.g., an ice cream cone melting, as opposed to a shot 2000 feet underwater), and where the "production values" are mid-range as is typical of museum interactives, TechnoFrolics in-house equipment and level of expertise is well suited to the task, and you will find our prices very competitive. For high-end productions (and thus very expensive, i.e., in the $100,000 to millions range) of the National Geographic/Madison Avenue/IMAX level, third parties should be contracted.

b) TechnoFrolics sells and rents timelapse Cluster Capture software (as described above) for a modest fee. Please contact us with details of your application.

3) Regarding post-production and editing work:

a) Whether you are providing the raw content, we are, or a combination, TechnoFrolics staff is uniquely suited to create productions for FG|SB system use. This is because we combine talented designers, with years of experience producing content specifically tailored to our environment. These past projects provide us with an excellent sense of what “works” and what does not within our system.

b) The above said, we are nevertheless delighted to collaborate with 3rd party firms producing the content, and will happily share our expertise and experiences in an advisory capacity.

[5] With the inclusion of an unobtrusive on-screen acknowledgement as compensation to the content provider for dramatically reduced pricing over the norm.

Stock Footage Listings & Options

LAST UPDATED 2007. PLEASE CALL US FOR MORE CURRENT INFORMATION.
WE ALSO ENCOURAGE YOU TO EXPLORE OUR STOCK FOOTAGE ON OUR SITE.

(Note that this listing, because we keep adding more content to our library, is a moving target, and thus is never fully up-to-date. So if there is something you are looking for, but don't see here, please don't hesitate to contact us to see if we have recently acquired it, or know where it might be found!)

Group A: Footage TechnoFrolics can readily and immediately offer for affordable FG|SB system licensing.

Notes:

- In most cases, a (very unobtrusive) on-screen acknowledgement is required as compensation to the content provider for dramatically reduced pricing over the norm.
- Unless specifically noted otherwise, clips do not have audio.
- Unless specifically noted otherwise with an "HD" legend, all clips are Standard Definition (SD). (Stock HD footage is only now just becoming available, and negotiating FG|SB-level pricing not easy…)
- Color Coding:
  - Red == high frame rate.
  - Blue == time lapse (either Cluster Capture™ or conventional).
  - Black == the NTSC/PAL/Film standard of 30/25/24fps.

Group A-1: All Artbeats content. (www.artbeats.com has complete library online)

Currently owned clip collections (resulting in reduced cost for clips selected from these collections) include, as of 7/2/07:

- Farm Animals
- Monster waves **(HD)**
- Storm Clouds
- Timelapse Flowers 1
- Timelapse Landscapes 2
- Timelapse Plants
- Ultra Fire
- Ultra Motion
- Ultra Water
- Wild Cats

Group A-2: Footage from miscellaneous Sources, including TechnoFrolics' own filming, past client projects, etc.

CATEGORY	CLIP NAME	FRAME RATE[6] (FPS)	LENGTH (M:S)[7]	CONTENT QUALITY[8] (10=BEST, 1=WORST)	IMAGE QUALITY (10=BEST, 1=WORST)	COMMENTS
Animals						
	Alligators_JC	30	0:37	6	8	Alligators crawling.
	Anteater_JC	30	0:09	8	8	Anteater lumbering.
	Caterpillars_JC	30	0:49	8	9	Caterpillars crawling.
	Centipede_JC	30	0:17	10	10	Amazing wave motion visible in feet.
	Chameleon	High	0:20	10	9	Very cool tongue grabbing grasshopper.
	CrazyLookingSeaCreatures_SBfilms	30	5:42	7	10	All kinds of wild looking sea creatures.
	DogFaces_2004	30	1:30	6	9	All kinds of different dogs from dog show.
	DogFrisbeeStunts_2004	30	0:35	6	7	Stunt Frisbee catching dog doing flips.
	DolphinsInWaves_SBfilms	30	0:34	8	9	Dolphins playing and diving in surf.
	ElephantSeals_NOAA	30	0:22	7	9	Elephant seal "walking" out of surf.

[6] If designations such as “high” or “time lapse” are used, and no specific frame rate is given, it means the exact frame rate is unknown.
Also, "30 fps" is also meant to cover 25fps (PAL standard) or 24fps (film) standard, as the original source media, and country of filming origin, is often unknown.
"CG" means "Computer Graphics/Generated", and thus the frame rate is in general not applicable.
[7] The times given here refer to how long the clip would take to play if presented at 30fps by a conventional playback medium.
[8] These designations are of course just based on our own subjective reactions.

	ExtremeDogs_VHS	30	0:35	8	5	Stunt dogs jumping twice their own height.
	Geese_AtCharlesRiver2003	30	1:00	7	10	Geese by Boston river edge cleaning themselves.
	Jellyfish_DMN	30	0:24	7	5	Jelly swimming.
	LeafCuttingAnts_JC	30	0:40	9	9	Leaf cutting ants marching through forest.
	MonarchBirth_JC	Timelapse	0:33	8	10	Monarch butterfly emerging from transparent cocoon.
	MonsterClam_SBfilms	30	1:03	7	10	Huge clam, spawning? eating?
	MothBirth_JC	Timelapse	0:21	8	10	Brown moth emerging from cocoon.
	(17 year Cicada birth)	Timelapse	0:23	9	9	Cicada emerges from cocoon.
	Ray_SBfilms	30	0:39	8	9	Large black rays swimming.
	SchoolingFish_NOAA	30	0:11	8	7	Schools of silver fish twisting and turning.
	SchoolingFish_SBfilms	30	0:37	8	9	Schools of black fish turning and "kneading" themselves in layers.
	SeaTurtles_DMN	30	0:16	7	7	Sea turtle swimming in aquarium tank, with camera in fixed location.
	SeaTurtles_SBfilms	30	0:20	8	9	Point-of-view moving camera shot following sea turtle swimming.
	WormCrawling	30	1:22	6	7	Worm crawling a few inches along grass/dirt.
Animations, Simulations, & Computer Graphics						
	CGchain_DMN	CG	0:14	5	7	Flat copper link chain moving through space.
	CGclock_DMN	CG	0:19	7	7	Analog timepiece spinning through 12 hour period.
	CGgears_DMN	CG	0:20	7	8	Large polished-surface reflective linked copper gears turning.

	(Animation clips from renowned artist Karen Aqua)	Hand drawn cell animation	Many clips/stories.	8	8	See http://home.att.net/~aquak/ for more information.
People, Culture, Food, Art, & Humor						
	BabyCrawlingNatalie	30	0:18	8	6	A baby maneuvering across the floor in a very unusual, funny manner.
	(~8 hours of analog clock turning and candles burning down.)	Time Lapse	0:52	8	8	White & black clock and two red candles on fireplace mantle against white wall.
	CookiesBaking	Time Lapse (Cluster Capture)	3:05	8	8	Cookies baking in a commercial bakery oven. (Good example of Cluster Capture™.)
	FerroFluid	30	1:12	7	7	Magnetic liquid transforming and flowing under computer control.
	Fireworks_Bennington	30	0:12	7	6	4th of July fireworks in Bennington VT.
	FunnyFacesFatherAndDaughter	30	2:41	7	7	Father alone, and father and daughter together, making expressive funny faces.
	FunnyFacesYoungGirlMiriam	30	0:17	7	7	Little girl making funny faces.
	KineticArtworkGansonArtichoke	30	1:39	8	10	Kinetic artwork wherein a complex set of mechanical parts, and large flywheel, combine to make an artichoke leaf “walk” in a very whimsical manner.
	KineticArtworkMatisseKalliroscope	30	2:55	8	8	Kinetic artwork and educational exhibit allowing visualization of complex flow patterns in a liquid.
	KineticArtworkTFironDust	30	0:45	8	9	Microscopic-sized iron particles transforming and flowing under computer control.

	MuffinsBaking	Time Lapse (Cluster Capture)	4:48	8	9	Cookies baking in a commercial bakery oven.
	Newsreel1960	30	5:26	8	6	Clips of 1960s Newsreel footage showing President Kennedy and more. Has audio.
	NuclearExplosions	30?	1:37	10	8	Atmospheric and ground nuclear tests. Clips include destruction of house, where first light flash ignites, and then airborne shockwave turns house to kindling.
	ShoesBeingTied	30	0:52	7	9	Woman tying her shoes and then playfully, briefly, making shoes "dance".
	VietnamBombing_PD	30	3:16	8	6	Shots from plane during Vietnam war of our napalming and firebombing the countryside.
Point Of View						
	Amtrak_2003	30	8:23	7	8	Shots out train window going from Boston to New York City.
	BostonExpressway	30	0:52	7	7	Shots out car window driving down the Boston Southeast Expressway before the "Big Dig" construction project.
	HangGliding_SD	30	6:43	8	6	Shots from a hang glider-mounted camera, continuous from takeoff to landing.
	HersheyParkCoaster	30	0:20	9	9	Shots out the front of a roller coaster in Hershey Park, PA.
	NevadaParkDriveLoop	30	10:56	8	8	Shots out the front of a car driving through a beautiful state park in Nevada located outside of Las Vegas. Includes mountains, desert, and shadows.

	WildRide-FlyByWire	30	0:30	8	9	Shots out the front of a wild New Zealand-based amusement park ride called Fly By Wire. A member of the public gets into a "plane" she can herself steer, where the plane is tethered to a wire suspended between two mountain tops.
	(Cessna)		9:10	8	7.5	Point of view shot out a small plane (Cessna?) on nice sunny day, including takeoff and landing.
	(Bennington Vermont)		> 60 minutes	7	7.5	Point of view shot out a car driving through the Bennington Vermont area during foliage season.
Science, Engineering, & Processes						
	CarCrashTests_HW	High	0:44	8	7	High frame rate video of crash test dummies in automobiles, as they impact windshields with and without air bags.
	ChampagneCorkRelease	High	0:46	10	10	Beautiful high frame rate shots of champagne cork being released from bottle, and fluid plume following it upwards.
	ChladniVibratingSandPatterns	(See note to right.)	16:37	10	10	Stunning self-organizing sand patterns on a vibrating plate. (While exported in “mild” timelapse to save disk space, the “timelapse” element is essentially irrelevant and the experience is the same as if at 30fps.)
	(Small prefab white house being constructed over most of a day.)	Timelapse	0:40	7	8.5	
	DiggingFoundation_84P	30 & mild timelapse	1:50	7	9	Shots of backhoes in operation, excavating dirt for the foundation of a new building.

	ExplosiveBldDemolition_EW	30?	0:31	10	10	Fantastic clips showing buildings being explosively demolished to prepare for new construction.
	GalleryOfFluidMotion-SandSpout	High	0:22	9	9	Fantastic clip of a metal disk being dropped into a bucket of sand, and the resulting sand spout.
	NASA-0G-basketballHotdog	30	0:27	8	7	Astronaut performing hot dog basketball dunk in 0 G.
	NASA-0G-gymnastics	30	0:48	8	7	Astronauts performing gymnastics in 0 G.
	NASA-0G-magneticMarbles	30	1:43	8	7	Astronaut playing with magnetic marbles in 0 G.
	NASA-0G-toysPhysicsNotMarbles	30	3:06	8	5	Billiard ball collisions, darts with floating dartboard, and more all in 0 G.
	NASA-0G-toysWindup	30	0:45	6	5	Astronauts playing with windup toys in 0 G.
	NasaLaunch	30	0:17	8	8	Rocket launching with cool steam/smoke clouds.
	ShrinkyDink-GIGAlogo	30	1:03	7	8	GIGA corporate logo implemented in plastic called "Shrinky Dink" that rapidly contracts upon heating.
	TacomaBridgeResonance_PD	30	1:58	8	5	Old Newsreel film of bridge destruction resulting from design error that caused winds to excite natural resonances of the structure.
	WaterAndFoodColoring-GIGAlogo	30	4:57	7	8	GIGA corporate logo set in context of food coloring being added to and mixed in fish tank full of water.
	WaterBalloonPopping_Ph	High	0:39	10	10	Stunning high frame rate shot of water balloon being punctured by an Exacto knife.
	WaxMelting-GIGAlogo	Time Lapse	0:29	6	8	GIGA corporate logo made out of different color wax being melted into a single large pool.

Sky, Clouds, Stars, Oceans, & Floods						
	CloudsA_Ms	Time Lapse	0:25	7	9	Wispy white clouds.
	CloudsB_2001Ms	Time Lapse	0:09	9	8	Puffy cumulous clouds. (Amount of cloud motion per frame too large to be ideal, but otherwise very nice.)
	CloudsSunset_Ms	Time Lapse	3:05	9	8	Nice shot of wispy clouds at sunset.
	Flood_Fitchburg	30	0:21	7	9	Flash flood in Fitchburg MA, showing soda can swirling around in a drain-induced whirlpool.
	IslandTides	Time Lapse	12:59	9	9	Time lapse of tidal cycle. (Mild Cluster Capture™. Just what commercial camera allowed, which was around 2 seconds every 30 seconds, which is too short a period on both the filming and pausing fronts.)
	Moonrise_JC	Time Lapse	0:36	7	9	Moonrise through trees.
	[Chicago cityscape (Tribune Tower) with clouds and cast building shadows seen over large fraction of a day.]	Time Lapse	0:36	9	9	Shows aerial view of traffic too, and fades into lovely close-up of nighttime cars and busses zipping past.
	(Moving shadows from a scaffolding, cast into a parking lot, over a several hour duration.)	Time Lapse	0:22	7	8.5	
	Sunrise&SunsetCharlesRiver	Time Lapse	0:08	8	7	First half sunrise over river and trees, next half sunset shot over Charles River into Boston, so building lights can be seen coming on.

	Sunset&NightOregon	Time Lapse	0:18	8	8	Oregon sunset shot from mountain over waterway, showing a barge crossing the waterway. Immediately following, car lights on highway at night, shot from the same camera position.
Sports						
	BikeRaceFitchburg	30	0:39	8	9	Rear ends of cyclists in a peloton during a sharp turn, led by a motorcycle driven by an overweight man.
	Crew-HeadOfCharles	30	0:26	7	8	Shots of rowers at Head Of Charles race in Boston, MA.
	WindSurfing_SD	30	11	8	6	Wind surfer doing a full 360 flip while sailing.
Trees & Flowers						
	TulipBlooming	Time Lapse	0:12	9	10	Close-up of single tulip blooming. (Occurred in just one hour upon taking flower out of refrigerator and putting in front of video light!)
	WillowTreeInWind	30	1:21	8	9	Willow tree shot from below during windy day.
	Cornus Bunchberry flower dispersing pollen explosively in under 1ms!	10,000fps	0:04	9	9	Only 352z252 pixels, but really cool.
Medical						
	Head	CT Scan	0:30	9	9	
	Cochlea	CT Scan	0:30	9	9	

	Internal Carotid Artery	CT Scan	0:28	9	9	
	Torso	CT Scan	0:30	9	9	
	Virtual Colonoscopy	CT Scan	0:33	9	9	

Group B: Interesting footage of which TechnoFrolics is specifically or generically aware, but where one or more of the below situations exist:

- Licensing costs are known to be significantly higher than Group A.
- Licensing difficulty is significantly higher than in Group A - for example, individual agreements must be tediously negotiated for each intended use.
- TechnoFrolics has incomplete cost and availability information.
- TechnoFrolics is currently in licensing negotiations.

Note that often less information is provided for these clips than the ones above. In particular, a blank Clip Name entry means we do not at this time have a sample clip ready to view on our stock demo collection. Additional clip samples for review can be acquired/compiled upon request, but because of the significant work required to do this, we need to charge for our time.

CATEGORY	CLIP NAME	FRAME RATE (FPS)	LENGTH (M:S)	CONTENT QUALITY (10=BEST, 1=WORST)	IMAGE QUALITY (10=BEST, 1=WORST)	COMMENTS
Clips where acquiring license requires time-consuming (and thus expensive) negotiations for each use.						
	BostonHelicopterFlyover_TU	30	7:41	9	9	Flyover, shot out helicopter, over and between high rise buildings in downtown Boston.
	StarFields_AG	Time Lapse	4:33	7	7	Star-field motions through sky shot with a fisheye-type lens. (Somewhat complex to get re-use rights.)
Vehicles						
						Ford Motor Company's robotic assembly process.

						Historical footage of the invention of flight, from the Wright Brothers to modern military fighters.
Clips not available for license at typical FG|SB price level.						
Medical						
	HerniaRepair_Cinemed Audio	30	0:57	--------	8	Gaack! Has audio. (Content is available for rental on a yearly subscription basis only - it cannot be purchased.)
	Surgery2_Cinemed Audio	30	1:32	--------	9	Gaack! Has audio. (Content is available for rental on a yearly subscription basis only - it cannot be purchased.)
	Surgery3_Cinemed Audio	30	1:05	--------	9	Gaack! Has audio. (Content is available for rental on a yearly subscription basis only - it cannot be purchased.)
Animals						
						A white dove coming in to land, shot at high frame rate against a black background.
						Sharks eating and swimming.
Sports						
						Snow kayaking.
Point-Of-View						
						A complete trip across the United States, from the East to the West coast, one frame taken every 1/6th of a mile.

Other						
	CrazySproutsHeadTimelapse	Time Lapse	2:03	8	9	Wild, funny clip of a man growing hair at the same time as spouts in a garden grow around him. Shot one frame per day for around a year. (Clifford Wagner Science Interactives.)
	MississippiRiverFlyover	30	1:37	9	8	Hundreds of miles point-of-view multi-state tour down the Mississippi River shot from a helicopter. (Sample clip is only a tiny subset.)
Cool clips from past FG|SB system clients whose availability/cost is unclear: (This list is only a tiny subset of content.)						
Animals						
						An osprey diving down to catch a flounder.
						An octopus opening a mason jar.
Vehicles						
						NASCAR car races, crashes, etc.

Other						
	FacesMorphing_Farmington	30	0:43	8	8	Cool dissolves from one engaging diverse ethnic human face to another, with eyes registered in the same position in each instance.
						Elevation data from Mars, the Grand Canyon, Alaska, and other locations, turned into point-of-view flyovers of the specified terrain.
						Animated footage of dinosaurs roaming, eating, and fighting.
						Geologic time scale animations, such as of erosion.
						X-Ray video of a cyclist.
						An animation of continental drift from when the earth was formed to the present.

Group C: Stock Houses.

(Note that the list below covers but a tiny fraction of available options.)

1) Royalty-free - Generally quite affordable:
   a) Artbeats www.artbeats.com (Already discussed above, and with whom TechnoFrolics has a special relationship).
   b) Creatas - www.creatas.com.
   c) Buyout Footage - www.buyoutfootage.com.
   d) Digital Visions - www.digitalvisiononline.co.uk.
2) Rights Managed, Relatively More Expensive, Superb Specialty Content:
   a) Oxford Scientific Films - www.osf.uk.com.
   b) National Geographic - www.nationalgeographic.com.
3) Medical:
   a) Ciné-Med - www.cine-med.com. (Sales not an option - only yearly rental.)

4) Other:
   a) Discovery Communications -- www.discovery.com.

Group D: Other creative content options.

1) Find companies that have produced high quality video footage for marketing reasons, where the company does not make its living through selling the videos. Examples include a beverage bottling plant video, a machine tool manufacture showed their equipment in operation, or a government-funded fire fighting school with educational training tapes.
   In cases such as these, it is likely that you will be able to get the content donated free of charge.
2) Approach your local TV stations to donate footage as a community service.
3) Encourage local film students to create footage specifically for the FG|SB system as a for-credit project.
4) Find university researchers who produce interesting video as part of their work, and where grantors (e.g., NSF) have as a goal getting the images out to the public.

Do not hesitate to call us with any questions, comments, or requests!