



Bryan Neumeister

IEEE, IVP, ABRE, ASCAP, PATC, APA, AES, BMI, NATAS

Court Certified: Military, Federal, State, Civil US District Court, Department of Justice,

US Grand Jury, State, Civil & Aviation Audio, Video & Photographic Forensic Expert

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38 Years Professional Experience

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Basic DVR Video Extraction Procedure:

On arrival: Photograph the DVR's display time with a cell phone. Getting a correct time stamp with metadata is critical for court use. Cell phone photos provide Date, Time and GEO Data. Very often the time on a DVR can be off if it is not synced to an internet UTC source. **EX1**

Omitting this procedure defeats the chain of custody as there is no way to technically and accurately prove the time of a recording. In staying compliant with Daubert standards: Rules of Evidence 902 (13), metadata must accompany any submitted electronic evidence.

```

EXIF IFD0 @ Absolute 0x00000026
Dir Length = 0x0008
[Make] = "Apple"
[Model] = "iPhone7,1"
[XResolution] = 72/1
[YResolution] = 72/1
[ResolutionUnit] = Inch
[Software] = "11.4.1"
[DateTime] = "2018:08:05 08:03:45"
[ExifOffset] = @ 0x00D2
[GPSOffset] = @ 0x06B6
Offset to Next IFD = 0x00000000

EXIF SubIFD @ Absolute 0x000000F0
Dir Length = 0x001F
[ExposureTime] = 1/6 s
[FNumber] = F1.8
[ExposureProgram] = Normal program
[ISOSpeedRatings] = 100
[ExifVersion] = 02.21
[DateTimeOriginal] = "2018:08:05 08:03:45"
[DateTimeDigitized] = "2018:08:05 08:03:45"
[ComponentsConfiguration] = [Y,Cb,Cr,-]
[ShutterSpeedValue] = 79494/30259
[ApertureValue] = 2159/1273
[BrightnessValue] = -3781/3303
[ExposureBiasValue] = 0.00 eV
[MeteringMode] = Spot
[Flash] = Flash did not fire
[FocalLength] = 4 mm
[SubjectLocation] = 1371, 1711, 753, 756
[MakeNote] = @ 0x02B4
[SubSecTimeOriginal] = "658"
[SubSecTimeDigitized] = "658"
[FlashPixVersion] = 01.00
[ExifImageWidth] = 0x[00000BD0] / 3024
[ExifImageHeight] = 0x[00000BD0] / 3024
[SensingMethod] = One-chip color area sensor
[SceneType] = A directly photographed image
[ExposureMode] = Auto exposure
[WhiteBalance] = Auto white balance
[FocalLengthIn35mmFilm] = 38
[SceneCaptureType] = Standard

```

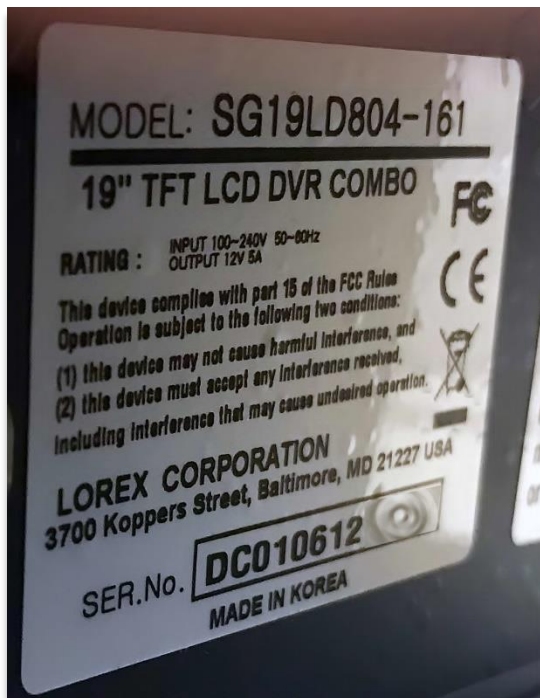
EX1

Photograph the Make, Model & Serial number of the DVR. **EX2**

This is critical as the Format and Codec of each DVR can vary.

ALWAYS work with the original format.

This requires a simple write-blocked raw “dd” image of the DVR drive or a DME extraction. **EX3**



EX2



EX3

Video outputted to USB goes through the very inexpensive Digital to Analog converter on a DVR board, giving very poor resolution. Video that has gone through DVR circuitry will have reduced resolution and artifacts introduced into the video by inexpensive circuitry. See **EX4**

Using an “Omnivore Extraction” is not a good idea in that the full DVR Log File is not exported. The Omnivore often uses a screen capture mode, which is not the original codec.

The Log File notes any errors, such as power outages, attempted erasures, long term technical issues and similar.



Entrance

IN 4K THE VIDEO IS DAY AND NIGHT.



Entrance



EX4: Top Output by USB - Bottom Raw Codec- Notice the clarity of timecode stamps as an example

The Log File gives you the Video Bandwidth each Camera is allocated. This often explains why certain camera channels will have what appear to be “missing frames”.

Camera Priority: In many cases only the Entrance Camera and Cash Register camera will have priority bandwidth and even higher resolution. External cameras are often set with reduced bandwidth, depending on the type of business or property. **EX5**

media_type	stream_index	key_frame	pkt_pts	pkt_pts_time	pkt_dts	pkt_dts_time	best_effort_timestamp	best_effort_timestamp_time	pkt_duration	pkt_duration_time	pkt_size	pkt_size_time	width	height	pkts	sum
2	video	0	1	0	0	0	0	0	0.033333	0.033333	9928	120725	960	720	vvv420p	1:1
3	audio	1	1	0	0	0	0	0	0.072	0.072	130654	72	960	720	vvv420p	1:1
4	audio	1	1	0.072	1	0.072	1	0.072	0.072	130734	72	960	720	vvv420p	1:1	
5	audio	1	1	0.144	2	0.144	2	0.144	0.072	130814	72	960	720	vvv420p	1:1	
6	video	0	6	0.2	6	0.2	6	0.2	0.033333	130934	1616	960	720	vvv420p	1:1	
7	audio	1	1	0.216	3	0.216	3	0.216	0.072	132558	72	960	720	vvv420p	1:1	
8	video	0	7	0.233333	7	0.233333	7	0.233333	0.033333	132638	813	960	720	vvv420p	1:1	
9	video	0	8	0.266667	8	0.266667	8	0.266667	0.033333	133460	11548	960	720	vvv420p	1:1	
10	audio	1	1	0.288	4	0.288	4	0.288	0.072	145016	72	960	720	vvv420p	1:1	
11	video	0	9	0.3	9	0.3	9	0.3	0.033333	145096	1290	960	720	vvv420p	1:1	
12	video	0	10	0.333333	10	0.333333	10	0.333333	0.033333	146394	1071	960	720	vvv420p	1:1	
13	audio	1	1	0.36	5	0.36	5	0.36	0.072	147474	72	960	720	vvv420p	1:1	
14	video	0	11	0.366667	11	0.366667	11	0.366667	0.033333	147554	760	960	720	vvv420p	1:1	
15	video	0	12	0.4	12	0.4	12	0.4	0.033333	148322	632	960	720	vvv420p	1:1	
16	audio	1	1	0.432	6	0.432	6	0.432	0.072	148962	72	960	720	vvv420p	1:1	
17	video	0	13	0.433333	13	0.433333	13	0.433333	0.033333	149042	560	960	720	vvv420p	1:1	
18	video	0	14	0.466667	14	0.466667	14	0.466667	0.033333	149610	497	960	720	vvv420p	1:1	
19	video	0	15	0.5	15	0.5	15	0.5	0.033333	150116	492	960	720	vvv420p	1:1	
20	audio	1	1	0.504	7	0.504	7	0.504	0.072	150816	72	960	720	vvv420p	1:1	
21	video	0	16	0.533333	16	0.533333	16	0.533333	0.033333	150696	473	960	720	vvv420p	1:1	
22	video	0	17	0.566667	17	0.566667	17	0.566667	0.033333	151178	470	960	720	vvv420p	1:1	
23	audio	1	1	0.576	8	0.576	8	0.576	0.072	151656	72	960	720	vvv420p	1:1	
24	video	0	18	0.6	18	0.6	18	0.6	0.033333	151736	466	960	720	vvv420p	1:1	
25	video	0	19	0.633333	19	0.633333	19	0.633333	0.033333	152210	464	960	720	vvv420p	1:1	
26	audio	1	1	0.648	9	0.648	9	0.648	0.072	152682	72	960	720	vvv420p	1:1	
27	video	0	20	0.666667	20	0.666667	20	0.666667	0.033333	152762	459	960	720	vvv420p	1:1	
28	video	0	21	0.7	21	0.7	21	0.7	0.033333	153300	460	960	720	vvv420p	1:1	
29	audio	1	1	0.72	10	0.72	10	0.72	0.072	153698	72	960	720	vvv420p	1:1	
30	video	0	22	0.733333	22	0.733333	22	0.733333	0.033333	153778	457	960	720	vvv420p	1:1	
31	video	0	23	0.766667	23	0.766667	23	0.766667	0.033333	154244	456	960	720	vvv420p	1:1	
32	audio	1	1	0.792	11	0.792	11	0.792	0.072	154708	72	960	720	vvv420p	1:1	
33	video	0	24	0.8	24	0.8	24	0.8	0.033333	154788	454	960	720	vvv420p	1:1	
34	video	0	25	0.833333	25	0.833333	25	0.833333	0.033333	155252	456	960	720	vvv420p	1:1	
35	audio	1	1	0.864	12	0.864	12	0.864	0.072	155716	72	960	720	vvv420p	1:1	
36	video	0	26	0.866667	26	0.866667	26	0.866667	0.033333	155796	456	960	720	vvv420p	1:1	
37	video	0	27	0.9	27	0.9	27	0.9	0.033333	156260	455	960	720	vvv420p	1:1	
38	video	0	28	0.933333	28	0.933333	28	0.933333	0.033333	156724	455	960	720	vvv420p	1:1	
39	audio	1	1	0.936	13	0.936	13	0.936	0.072	157188	72	960	720	vvv420p	1:1	
40	video	0	29	0.966667	29	0.966667	29	0.966667	0.033333	157268	453	960	720	vvv420p	1:1	
41	video	0	30	1	30	1	30	1	0.033333	157730	453	960	720	vvv420p	1:1	
42	audio	1	1	1.008	14	1.008	14	1.008	0.072	158192	72	960	720	vvv420p	1:1	
43	video	0	31	1.023333	31	1.023333	31	1.023333	0.033333	158272	453	960	720	vvv420p	1:1	
44	video	0	32	1.066667	32	1.066667	32	1.066667	0.033333	158734	453	960	720	vvv420p	1:1	
45	audio	1	1	1.08	15	1.08	15	1.08	0.072	159196	72	960	720	vvv420p	1:1	
46	video	0	33	1.1	33	1.1	33	1.1	0.033333	159276	453	960	720	vvv420p	1:1	
47	video	0	34	1.133333	34	1.133333	34	1.133333	0.033333	159738	453	960	720	vvv420p	1:1	
48	audio	1	1	1.152	16	1.152	16	1.152	0.072	160200	72	960	720	vvv420p	1:1	
49	video	0	35	1.166667	35	1.166667	35	1.166667	0.033333	160280	454	960	720	vvv420p	1:1	
50	video	0	36	1.2	36	1.2	36	1.2	0.033333	160742	452	960	720	vvv420p	1:1	
51	audio	1	1	1.224	17	1.224	17	1.224	0.072	161202	72	960	720	vvv420p	1:1	
52	video	0	37	1.233333	37	1.233333	37	1.233333	0.033333	161282	451	960	720	vvv420p	1:1	
53	video	0	38	1.266667	38	1.266667	38	1.266667	0.033333	161742	451	960	720	vvv420p	1:1	
54	audio	1	1	1.296	18	1.296	18	1.296	0.072	162202	72	960	720	vvv420p	1:1	
55	video	0	39	1.3	39	1.3	39	1.3	0.033333	162282	451	960	720	vvv420p	1:1	
56	video	0	40	1.333333	40	1.333333	40	1.333333	0.033333	162742	451	960	720	vvv420p	1:1	
57	video	0	41	1.366667	41	1.366667	41	1.366667	0.033333	163202	451	960	720	vvv420p	1:1	
58	audio	1	1	1.368	19	1.368	19	1.368	0.072	163662	72	960	720	vvv420p	1:1	
59	video	0	42	1.4	42	1.4	42	1.4	0.033333	163742	451	960	720	vvv420p	1:1	

EX5 iNput-Ace examination of a camera channel

All cameras are greatly impacted by the types of light illuminating an area. Fluorescent, Quartz, Halogen, Tungsten, Argon, Sodium Vapor, Black-lights in clubs etc. An accurate Color chip-chart should be recorded by the system. EX6

Simply drop a chip-chart into the area of interest and record at the same time of day/night a recording of interest was made onto the DVR before performing a forensic image of the DVR drive. Lighting greatly impacts the way a subject looks to the system. EX6

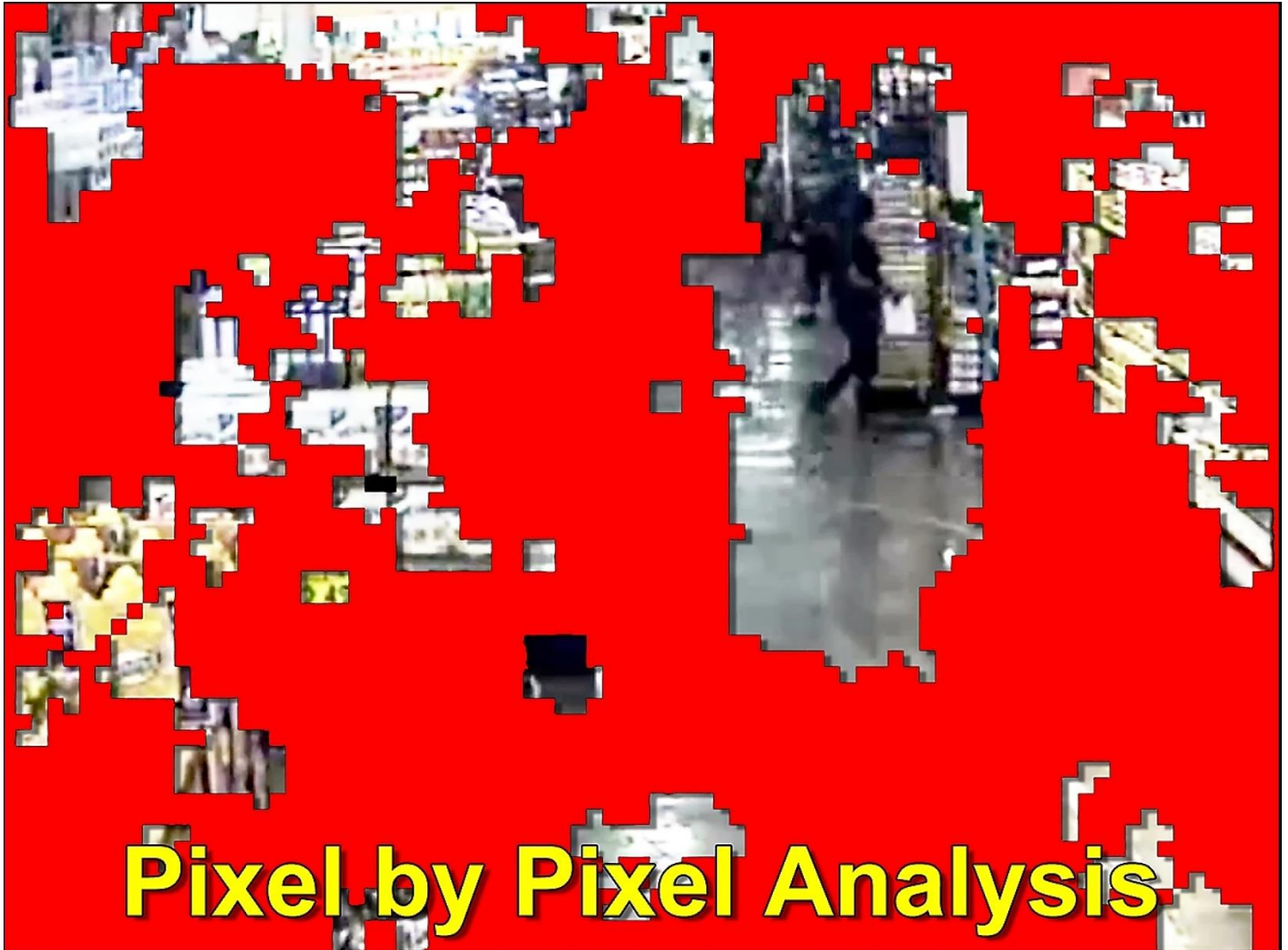
Degrees Kelvin	Type of Light Source	Indoor (3200K) Color Balance	Outdoor (5500K) Color Balance
1700-1800K	Match Flame		
1850-1900K	Candle Flame		
2000-3000K	Sun: At Sunrise or Sunset		
2500-2900K	Household Tungsten Bulbs		
3000K	Tungsten lamp 500W-1k		
3200-3600K	Quartz Lights		
3200-7500K	Fluorescent Lights		
3275K	Tungsten Lamp 2k		
3300K	Tungsten Lamp 5k, 10k		
5000-5400K	Sun: Direct at Noon		
6500-6600K	Daylight (Sun + Sky)		
6500-6600K	Sun: through clouds/haze		
6000-7500K	Sky: Overcast		
6500K	RGB Monitor (White Pt.)		
7000-8000K	Outdoor Shade Areas		
8000-10000K	Sky: Partly Cloudy		

EX6

DVR systems record Video differently than standard home video handi-cameras for example. Pixel blocks that show no immediate movement are stored in a “frame-buffer”. Below those stored pixel blocks are marked in red EX7.

On many systems, at least 15 percent of the pixels in a camera’s field of view must show movement for the system to record that camera. This is done to preserve hard drive space. Continuous recording is not the default on most surveillance systems. Motion detection is the default.

The amount of motion needed to initiate a recording is 15-18% by default on most systems, but can be set by the user.



Pixel by Pixel Analysis

EX 7

Directional movement of Pixel Blocks for motion analysis **EX 8** is best done on original footage. Artifacts or noise introduced when converting to another format may influence detailed findings.



EX 8

Always Photograph the Camera recording the scene of interest. The type of camera make, and model should be in the Log File however the type of lens and aperture has a dramatic impact on the way a person looks and can result in unacceptable inaccuracies if not properly accounted for. **EX9**



EX 9: Same person, same day, different focal lengths and apertures

File Information

File Name	000081 Surveillance Video Part 1 IMG_2718
File Size	5.03 MB
File Hash	d238f85993957ce0a4b6a635f79f12b

Audio Stream (0)

Audio Codec	aac
Number of Channels	1
Audio Bit Rate	62889

Video Stream (1)

Video Codec	h264
Pixel Format	yuv420p
Pixel Dimension	568/320 (1.775:1)
Frame Rate	29.9732fps
Frame Count	1620

File Information

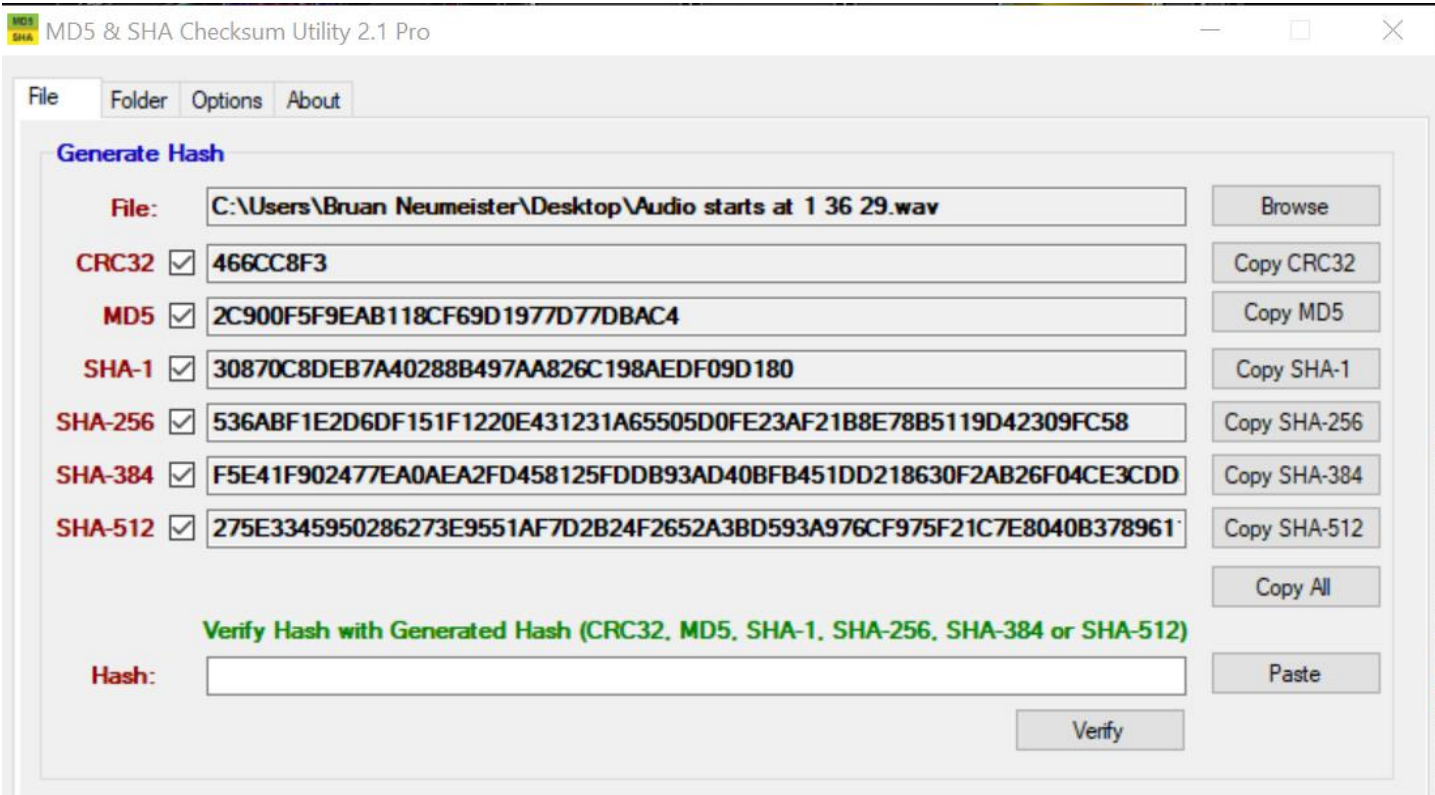
File Name	Phoenix PD MDCN 06-15-17 1050-1112 all cams 17-1043678_MDCN-CAM1-004_15Jun201
File Size	21.9 MB
File Hash	87c52bd57e98d43ee03ed1d9781cf581

Video Stream # 1

Video Codec	mpeg4
Pixel Format	yuv420p
Pixel Dimension	352/240 (1.467:1)
Frame Count	14043

EX 10

HEX Values of video, Codecs, Pixel Format, Frame Rates and Pixel Dimensions can be determined by various programs such as iNput-Ace if needed. Any exports should be Hashed if they are to be submitted as evidence. **EX 11**



EX 11

Hash example: MD5 and SHA-256 are most common. MD 5 & SHA-1 can be currently be modified and is no longer considered as reliable as SHA-512.

On a most basic level for court use to meet Chain of Custody and Daubert standards:

- 1) ALWAYS Photograph the DVR Clock and Serial Number when arriving at the scene with a cell phone synced to UTC or cell provider offset.
- 2) Use an Accurate Color Chip Chart on the scene that can be recorded by the DVR before extraction at the point(s) of interest.
- 3) Photograph the Surveillance Camera and Lens.
- 4) Perform analysis on data extracted from a write-blocked raw "dd" image or DME image.
- 5) Hash exported files for evidentiary use

Respectfully,

Bryan Neumeister

IEEE, IVP, ABRE, ASCAP, PATC, APA, AES, BMI, NATAS

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US Grand Jury, State, Civil & Aviation Audio, Video & Photographic Forensic Expert

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United States Grand Jury: Contracted Technical Expert
US Department of Justice: Contracted Technical Expert
United States ARMY - (SAMS Forensic contract with C.I.D.)
Special Prosecutor's Office on Corruption - P.A.N.E.L. - US & Puerto Rico
Audio Engineering Society- Member & Lecturer
DARPA: Defense Advanced Research Projects Agency (classified)
Institute of Electrical and Electronics Engineers – Member
American Board of Recorded Evidence Standards
Technical work in 23 countries
Recipient of 39 EMMY AWARDS – National Association of Television Arts & Sciences for Technical Excellence
Over 70 National & International awards for technical excellence including Gold at the Cannes & Calgary film festivals for audio.

Legal & Technical:

38+ Years Professional Full-time Audio & Video Experience
Professional Audio & Video Enhancement,
Computer Drive Recovery,
Cell Phone Forensics – Tower Analysis
Federal & State Government Agencies Computer Drive Recovery
DARPA: Defense Advanced Research Projects Agency (classified)
Law Enforcement Agencies, National, State & Local
8 Years Search & Helicopter Rescue (MCSO-DPS- Arizona)
US Military – Army, Navy, Air Force, Marines & Coast Guard (SAMS contract)
Los Angeles District Attorney's Office -NELOS
Department of Defense (classified & non-classified)
Beta Tester for Various Forensic Systems Manufacturers
United States District Court system: Forensic Consultant
United States Grand Jury system: Forensic Consultant
U.S. Department of Justice: Forensic Consultant- Audio forensic work
OPDS and Office of the Public Defender: Vendor number
Work with US Army CID Prosecutors Office & Maricopa County Prosecutors Office
Phoenix PD Homicide - Mesa PD Homicide- Case Video & Audio Evidence Enhancement
Work with various Innocence Projects - Nation wide
10 Years with NBC Television - Technical Video / Audio
Federal, State, Aviation and Civil Law cases - Court Certified Technical Expert
2 State of the Art Facilities. Over 75 custom Computers & Processors
State of the Art HD Video and Audio Gear.
Gear and Software Upgraded Continuously
3D Sonographs, Spectrographs, Spectral 3D -HD Video & 192kHz - 64 bit Audio
Expert Cell Phone Analysis (Oxygen) : Towers, Transmitters, Phones & Software
Current D.O.E. Military Forensic High-Speed Video Expert
Photo Enhancement using Clear-ID, Pixel Stacking & Frame averaging etc.
Graduated Pi Sigma Alpha- California State University Northridge - 1980 (Political Science, emphasis on Journalism)
Have worked in 23 Countries as a Technical Expert
Published Nationally

Over 200+ Forensic Cases in the past 36 months:

Non-Military court cases include: Federal, US District, Grand Jury, RICO, Homicide, Murder for Hire, Fraud, Robbery, Armed Robbery, Assault with a Deadly Weapon, Arson, Kidnapping, Bank Robbery, DUI, DWI, Civil Cases...etc. Currently working over a dozen Homicide and Capital cases nationwide. For Defense, Prosecution, Civil and Insurance carriers.

Large Cases (Small Sample):

State of Arizona vs. Jodi Arias - In Trial, Audio Expert & Photographic Expert.
US Government vs. Charles Keating - In Trial, Retained as Video Expert
US Grand Jury: The Hope Steffy - Retained as Video Expert
Government of India: Sri Nithyananda Swami - Retained as Video Expert
US Government vs. Charles Keating III - In Trial, Retained as Video Expert
State of Arizona vs. Steven DeMocker - Retained as Audio & Photographic Expert
State of Arizona vs. Jeffery Martinson - Retained as Video Expert
United Kingdom (London, Barrister) V. Terone Williams - Retained as Audio Expert

State of Arizona vs. Jodi Arias – *Penalty Phase* - Computer Expert - "During the first trial in 2013 and earlier in this trial, Mesa police experts testified that there was no porn and or viruses on the computer. Martinez had used that testimony to impeach Arias' claims that there were both, and it furthered his portrayal of Arias as a liar. But defense experts subsequently found porn and the viruses associated with the device. Mesa police have since admitted it was there all along." –Gannett

Publications:

Published Nationally

The Legal Investigator Magazine- Surveillance Systems - TV vs. Reality

High Tech, High Stakes Published in Expert Ease - National Forensic Publication.

Consultant to CPU Magazine as a Forensic Audio and Video Expert on Hardware and Software.

Books:

"*Earthbound Misfit*" (Helicopter Rescue, TV Helicopters, Medivac & work with Law Enforcement agencies)

591 pages - senior contributing author & consultant.

"*The Secrets of the Blue Oyster Cult*" - Bryan Neumeister discussed as Blue Oyster Cult musician & composer on

"*Curse of the Hidden Mirror*" & "*Heaven Forbid*" Albums.

"*After You're Dead*" -Featured as Forensic expert character, "Bry", in #1 best selling series of Crime/Fiction books by author Cary Allen Stone.

"*S.E.E.S, The Journey Begins*" - Science Fiction. Character likeness and full name used in book as a scientist.

-Autor #1 bestselling Amazon author Cary Allen Stone.

National News Media: Forensic Analyst:

FOX Business Network: Featured Forensic Expert 2018

The Science Channel Six 1-hour Episodes on Video & Audio Forensics 2018

Universal Studios/BBC & MSNBC: Video Forensic Expert 2017: *Real, Fake or Unknown* TV series

Six 1-hour specials on analyzing viral videos

Fox Business Network: Featured Forensic Expert 2017

CNN: Jodi Arias: Audio & Photographic Forensic Expert (in Trial testimony)

FOX News: Boston Bombings: Forensic Surveillance Expert (analyst)

CNN: Trayvon Martin / Zimmerman: Audio Forensic Expert (analyst)

NBC: Forensic Surveillance Expert

Lectures:

2018 CLA Conference:

Digital Forensics (Facility) Cell phones, Towers, Metadata, Photos, Computers Audio & Video Forensic

2018 AACJ Annual Attorney Winter Conference (Facility)

Digital forensics: Audio, Video, Social Media, Cell Phones, Towers, Computers & Photography

2107 Audio Engineering Society:

Cellphone forensic audio re metadata, chain of custody, forensic acquisition of audio

2016 Federal Habeas Conference

Cellphone and Tower forensics

2016 Audio Engineering Society:

Topics: Multi-Pathing of Transmitted RF Signals, Forensic audio

2015 Inns of Court:

Topics: Cell Phone metadata, Audio & Video Forensics

2015 Audio Engineering Society:

Topics: Pareidolia, Dithering, Forensic Audio & NyQuist Theorem

2014 Audio Engineering Society & Conservatory of Recording Arts

Topics: NyQuist Theorem, Sample Dithering & Forensic Audio

Opening of the 2013 APDA (Arizona Public Defenders Conference)

Topics : Audio, Video, Photographic & Surveillance Forensics: 1.5 hour lecture

APDA Faculty Member - 1,550+ Attorneys attended conference (June 26-28, 2013)

Television: National & International Broadcast:

Recipient of **39 EMMY AWARDS** from The National Association of Television Arts and Sciences for Technical Excellence
40+ additional National & International Awards.

Winner CANNES Film Festival (Gold) (Technical Audio Excellence)

Winner CALGARY Film Festival (Gold) (Technical Audio Excellence)

Worked for NPR & NBC Television News stations for 12+ Years.

Phi Sigma Alpha - National Political Science Honor Society – Lifetime Member.

Member: NAB, BMI, ASCAP, AES, ERA, NATAS

Winner: Film Advisory Board Gold Medal, Parents Choice Award

Film & Television Clients:

NBC - ABC - CBS - PBS - BBC - FOX - DREAMWORKS - SCREEN GEMS FILMS - TOUCHSTONE FILMS - LUCASFILMS LTD. - LEVIS - COCA COLA - AMBLIN ENTERTAINMENT - PEPSI - VOLKSWAGEN - TOYOTA - CHEVROLET - NISSAN - AMERICAN EXPRESS - UNIVERSAL PICTURES - LORIMAR - TRIMARK FILMS - TRIMARK ENTERTAINMENT - GANNETT - A&E - DISCOVERY CHANNEL - FOX - DIAL SOAP - COORS BEER - BUDWEISER - MTV - PIZZA HUT - MOTOROLA - UNION CARBIDE - DISNEY - INTEL - MICROSOFT - VISA - MASTERCARD - ARMY - NAVY - AIR FORCE - MARINES - UNITED AIRLINES - CONTINENTAL AIRLINES - PARTNERS FILMS CANADA - PRTV - NATIONAL MEDIA - MOMENTUM FILMS – DFXTV - LOTTO/LOTTERY - GREYSTONE PICTURES - HISTORY CHANNEL – DISCOVERY CHANNEL - WARNER BROTHERS - DAIRY QUEEN - AT&T – MLB - NBA - NFL - SUPER BOWL XXX - ESPN - MAJOR LEAGUE BASEBALL – McDonald's - MCI - HARLEY DAVIDSON - STOUFFER'S- CARQUEST - MD HELICOPTERS - BOEING – “FUTUREWEAPONS”, “MYTHBUSTERS” {THE LUXOR - FLAMINGO - STRATOSPHERE - CESAR'S PALACE - MGM GRAND - NYNY - The HARD ROCK...CASINOS all in LAS VEGAS} - NUMEROUS ADVERTISING AGENCIES...

Certified Cell Phone Forensics:

Latest Cellebrite Ultimate 4PC, Secure-View Forensics, Oxygen Detective & Analyst, APEX Laboratory and Field systems
SV Striker box, PassWare Forensic, EnCase, etc.

D.A.R.T Tower Tracking and signal software- latest versions.

Official Beta-Tester for Oxygen Detective Phone & Tower forensic programs

Certified Oxygen Forensic Analyst & Detective cell phone analyst 14,000+ phones (PATC)

PassWare Complete Forensic Decryption of 280+ encryption methods using 16 core liquid cooled systems

Recovery of deleted apps and data from over 14,000 cell phones.

All cell phone communications Apps, iCloud, iOS9, Android Lollipop, Windows OS etc. Password decryption & recovery.

DCode, Plist, SQLite Browser, Opanda, Kies, EnCase Extractor, EnCase readers, FTK Reader Stellar Phoenix Professional data recovery

Six fly-pack MSI 8/ 12 Core multi SSD Field-Units for extraction at any location

CELL TOWERS & CDR:

D.A.R.T & 2018 Oxygen Detective Plotting

2016- Call Data Records & Towers (Lucent, Samsung, Nortel) PATC certification

AT&T, Verizon, Sprint, T-Mobile, Cricket, US Cellular, Tracfone, MetroPCS and subsidiaries...

Call Records Analysis – Switching analysis. *Cloud, SMS, MMS E-Mail.*

TOWER Dumps: Lucent, Samsung, Motorola, Ericsson etc. PATC 2016

GPS, NELOS, WiFi and Blue tooth tracking and E911-FCC mandated data location logs.

D.A.R.T. advanced and HTCI Mapping to verify if a call did hit a specific Tower Switcher.

Paperwork for legal requests for all of the above available on www.USAForensic.com .

Forensic Video & Surveillance Video Recovery/ Analysis

DME Forensics DVR Examiner, iINPUT-ACE, Omnivor, D-plex Pro Forensic, D-Tective, ClearID Forensics and numerous forensic systems with over 200 clarification plug-ins

Latest computer and cell phone programs *such as FTK, Autopsy, Cellebrite, Apex, Secure-view, Oxygen, EnCase...*

Beta tester of Software & Hardware for leading Forensic Companies (Clear-ID, iZotope, DC8 Forensics etc)

Hard drive recovery for US Military (SAMs vendor) - Forensic drive analysis.

Recover damaged files, Deleted files, Changes in Registry & Meta-Data, Hash values, SHA2 etc

All Surveillance Systems as well as Computer Drives

Validate video pixel by pixel with iINPUT-ACE

Tampering or Keying detected.

Restore corrupted photographic or video files.

Photo Enhancement using Clear-ID, Pixel Stacking & Frame averaging etc.

Working with computers since 1977. 3 Field Extraction teams available.

Network analysis, Tor tracing, Brute force & PassWare decryption etc.

PassWare Forensic Decryption of 280+ encryption methods using 16 core liquid cooled systems

Determining how files got onto a computer

Validating dates of files/ changes to files via Sha2 HASH values.

Computers

EnCase Ultimate, X-Ways, Autopsy, FTK and many other specialized tools:

PassWare Forensic decryption. Custom machines.

First code written in 1977 while attending Cal State University.

Recovery using Tableau write-blockers USB 3.0 T8-R2 & T35ES-R2 Tableau & DME forensic Imaging.

Beta tester of Software & Hardware for leading Forensic Companies (Clear-ID, iZotope, DC8 Forensics etc)

Hard drive recovery for US Military (SAMs vendor) - Forensic drive analysis .

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Determining how files got onto a computer

Validating dates of files/ changes to files via Sha2 HASH values.

Header Data verification

Forensic Photographic work:

Photographic clarification, metadata validation

Lux, Luminance & RGB analysis

Film, Digital, thermal imaging and infra-red cameras

Clear ID Forensics, iINPUT-ACE, Omnivore, Deplex

Vectorscope, Waveform scope, Luminance and RGB scopes in Lap

Pixel data analysis / Frame & Field level analysis

Lens and lens-aberration analytics

Lens MM relations to chip size and format

Lens wide-angle distortions correction using metadata

Deleted or Damaged Photo data memory cards recovered

Cellphone camera metadata work.

Geo data verification

Dozens of forensic photo analytical plug-ins

Stills lifted from video and clarified to 1200 dpi 8.5 x 11inch stills

All stills printed on 80 lb postcard stock for legal use

Studied from 1974-1979 with Dr Bill Wallner (co inventor of infra red photography)

Cameras from high-end Hasselblad thru Panavision down to GoPro

Ultra High-speed camerawork with Phantom-V cameras

Cineflex & Cine-Alta.

Helicopter mounts 14,500 hours aerial cinematography

Have shot professionally in 23 countries

Complete 4K 4:4:4 in lab.

Pantone charting and color correction in field and lab

Lux and Luminance lighting measurement in accident or crime scene cases.

3-axis gyro-stabilized cameras

All available camera mounts for GoPro 4K cameras for accident and test work.

DOD and DOE military testing high speed and aerial photography.

FAA licensed 4K Drone operator

Testified numerous times on photographic issues in Federal, Criminal, civil Military and aviation cases.

Photo Work published internationally

Field Cameras

For evidence gathering and accident recreation include Sony, HD & 4k, DJI Osmo, 3Axis stabilized 4k system, GoPro 4Ks all mounts and FAA Licensed 4k Drone. Fuji 3D Camera. Ultra slow-mo Phantom Cameras available. Meralli stabilization and re-speedR. Editing and all monitors are true 4k = 4086*2160. Thermal Imaging.

Thermal Video and still along with mixed format Thermal.

Emmy Award winning crews for crime scene Recreation.

Professional Sound & Music:

Over 20,000 voice tracks professionally worked with since 1980

Federal, US District Court, State, US Military, Civil and Aviation cases to TV Network television, commercials, video games and films

Sonographs, Spectrographs and 3D Audio Decibel and Frequency Mapping

iZotope RX professional, 3D Spectral Audio, DC10 Forensics, Pro Tools, Plugins from Cedar,

Waves, iZotope, Plugin-Alliance BX-Series, Bauer, SSL, NovelTech, BlueCat, SPL, FabFilters, Sony, Sequoia & Many others

Over 200 forensic plugins and programs running on 16 core liquid cooled computers

Federal and State voice comparison cases

Set Daubert standard for voice comparison in Arizona

Phonetic breakdown of spoken words on spectrograph.

Sonographs, Spectrographs and 3D Spectral audio graphs printed and embedded in forensic reports.

Human Voice separated from background noises and ambience

Tampering detection

Metadata analysis

Nyquist Theorem analysis

Edit detection

Dithering analysis

Re-sampling analysis

Audio background continuity

Sine wave detection or embedded frequency (agency)

AC power ground loop & harmonics removal.

Background noise removal.

Phase cancellation and removal of music from dialog

Voice clarification, harmonic enhancement for muffled audio

Removal of reverb (jail hallways or lecture halls etc)

Removal of mic thumps and clicks that can be misidentified as edits.

Transfer of tape to HQ digital medium: cassette, micro cassette, reel to reel

Police radios split tracked

32 bit audio running in 64 bit systems

Conversion of any audio codec to another PROPERLY with correct dithering

Time coding of audio for clients down to thousandths of a second for easy reference.

IEEE engineering standards

Written & Recorded Music with *Blue Oyster Cult*, 24,000,000 (24 Million) albums sold - Gold & Platinum records & *Credence Clear Water Revival* recording artist Tom Fogerty (Movie Score).

-Mixed & Engineered for numerous top recording acts; Jazz, Rock & Classical.

-Written music for hundreds of commercials including music cuts for Super Bowl XXX

-Written Music/SFX for 5 popular Video Games.

-Worked "Live" sound as sound mixer for concerts with crowds up to 35,000. *Challenging live mixes like: Chick Corea, Return to Forever, Ronnie Laws, Gerald Wilson's 24 piece Big Band etc.*

-Recently won another Emmy Award for best music on a Television series (Written & Performed).

I have Mixed and Mastered hundreds of National, International & Regional Television Shows.

Aerial Photography / Rescue / Surveillance :

Over 14,000+ Flight Hours of Jet Helicopter Photography – Film, HD Video, Research, Surveillance, Search & Rescue for Law Enforcement & Wildlife Rescue - Civilian Military Contractor.

Currently: Advisory Partner & Photographer - 4:4:4 Professional Film & TV Helicopter (*SaberCat HD*)

Pilot received the Harmon Flight Trophy from President Reagan at the White house. The Trophy is currently on display in the Smithsonian Air and Space Museum.

FAA Licensed: AERIAL 4K GPS-guided VIDEO DRONE

FAA licensed 4K Video-drone, *Phantom Quadcopter*: Satellite-GPS controlled:

Owner & Operator); Mounted camera *GoPro Hero* 4K Black Edition

Thermal Imaging & Thermal Video Recording with image on image technology

Night Vision & Infra-Red

OSMO 3-axis stabilized 4k system, fully loaded.

Forensic Counter-Surveillance:

Radio Frequency Response 10MHz ~ 10GHz (20+ GHz if needed)

Analog, Digital, WiFi, Cellular GSM/GPRS/EDGE/3G/4G signals all will set off alarms.

Detection Frequencies: GSM 880-915MHz, CDMA 824-849MHz, WCDMA (1920-1980MHz), and DCS (1710-1785MHz)

Digital 'Burst' Signal Detect for all GSM/3G/4G Trackers/SMS(Text) detection

Series and Parallel transmitters

Automobile GPS transmitters

Transmitting GPS trackers (only when GPS device is transmitting signal location)

Devices on internet phone and IP phone

Detect & Prevent:

Wire telephone tapping

Laser tapping

Recordings of a voice recorder, tape, digital and parabolic reflector using white noise & sibilance generators

40HZ 100-watt sine-wave generators to eliminate laser recording from windows

Thermal Imaging & Thermal Video Recording with image on image technology

1080P Sony Night Vision Cameras & Infra-Red Lighting

Osmo 3-axis stabilized 4k system

Weapons: Classified & Non-Classified:

-Worked many homicide cases involving gunfire sound analysis, frequency, location & Triangulated acoustics.

-Worked with numerous surveillance videos to enhance shooting scenes for law enforcement and attorneys.

-Gunshots analyzed, compared & enhanced from: cell phones, land lines, surveillance equipment, 2-way communication, Police Duplex & Simplex, etc.

-Worked numerous cases requiring gunfire video enhancement from surveillance systems, cell phones and various recording devices.

-Have access to many renown civilian & military firearms experts for testimony as needed.

-Over 2-million rounds fired for high speed filming and forensic testing over 33 years. Work & have worked with -US Navy Seal Teams 1, 2 & 6, SOCOM, DEVGRU, 160th Night Stalkers. US Army Sniper teams. DOD & DOE.

-Additionally, work with many US Government retained Military contractors.

-I currently have US Military SAMS / DUNS contract.

-Worked with numerous SWAT and TOU teams in actual field operations.

-Worked with LAPD, w/ Krav Maga training.

-MSCO Helicopter Rappel Trainer (1980s Tac-Ops-Unit) - MSCO Helicopter Search & Rescue = SKY12 & DPS

-Worked with Springfield Armory testing the initial launch of the entire XD Pistol line. 9 mm, .40, .357, .45

-Work often with DillonAero on the M-134 Mini-gun project (over 20 years working together).

-Analyze Muzzle flash and sound signature of McMillan Sniper rifles for US Army Snipers (over 10 years of work together).

-Air to Ground target acquisition and aerial sniper training documentation. Thousands of hours of aerial law enforcement, search & rescue & air to ground gunship work.

-Assigned to USS CVN70 Carl Vinson and Helicopter-Carrier USS New Orleans as civilian videographer.

-Have been a "go to" guy for live Weapons Photography & Sound Recording for The Military Channel, History Channel, MythBusters, Future Weapons, Discovery Channel, National Geographic, BBC and many others.
 -Produced one of the largest selling automatic weapons DVDs ever made, "Firestorm in the Desert" &
 -Produced one of the largest selling handgun training DVDs of all time with Rob Leatham, "Shooter Ready"
 -Currently: Civilian Technical Advisor on the board of CowTown Range & Studios, which is an extremely active 88 acre Training facility for SOCOM, Swat Teams, Navy Seal Teams, DEVGRU, Homeland Security and many Special Operations teams. CowTown Range is currently under DOD and various Agency contracts for range work, tactical training and weapons development.

Weapon recording analysis for cases includes

Various rounds recorded over surveillance systems, cell phones, 4k, HD, SD and high speed Phantom video cameras.
 Diverse types of pressure, loads, powders, barrel length and calibers recorded for analysis.
 Cell phone cases include NyQuist Theorem frequencies relating to cell Phone FQ range, Sample Rate and Bit depth of recordings
 Cell phone line noise and background audio of conversations recovered from 911 calls.
 Dithering artifacts created during sample rate conversions.
 Dithering harmonics relating to audio captured by Cellebrite or Oxygen Forensics, when transferred to 44.1-16 bit for distribution.
 Cell call transmission, multi-pathing of signal, tower horn tracking v. switcher tracking, topographical anomalies of transmissions, transmission artifacts
 Phase cancellation of recordings due to microphone set ups.
 Distances of cell phone to firearm (FARO 130 system)
 Shootings captured by police wire or boomerang unit
 Sonographs and spectrographs along with 3D Spectral recording to narrow down gunshots to 1,000ths of a second.
 Shooting weapons in range shoot houses or gun ranges recorded over cell phones.
 Shots recorded over cell phones in cars, houses, open acoustic spaces
 Ambiance and acoustics graphed and measured of gunshots on surveillance and cell phone
 Certified Oxygen Cell Phone Forensics (PATC) Two Forensic Cell phone systems used 3 to 6 times a week on cases.
 Working with Cell tower experts from Verizon currently on Federal case
 Currently working with Court Certified retired US Navy Seal Team 6 and DEVGRU weapons expert, Craig Sawyer on two cases
 Currently working with Law Enforcement and Prosecutor on a Homicide investigation involving shooting on surveillance.
 Have worked with Phoenix Homicide quite often to assist with clarification of recorded audio on both homicide and cold cases.

USA FORENSIC: AUDIO & VIDEO FORENSIC LABS

USA Forensic, Ilc. (38 Years *Professional Experience*)
 Certified Audio & Video Forensic Experts: Federal, Military, State, Civil & Aviation
 United States District Courts - U.S. Grand Jury- DOJ, - DOE (Classified-Unclassified)
 IEEE, IPVM, AES, ABRE, APA, PATC, NATAS, BMI, ASCAP, PSA



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