



9th Annual ASA
Equipment Valuation Conference
Tuesday, June 2, 2020 | 11:00am – 5:30pm ET | Virtual Online

Drone Technology and its impact on the profession

By Matt Kaufman

Spearhead Valuation Group

Standing on the shoulders of giants



Paniolo Solutions?

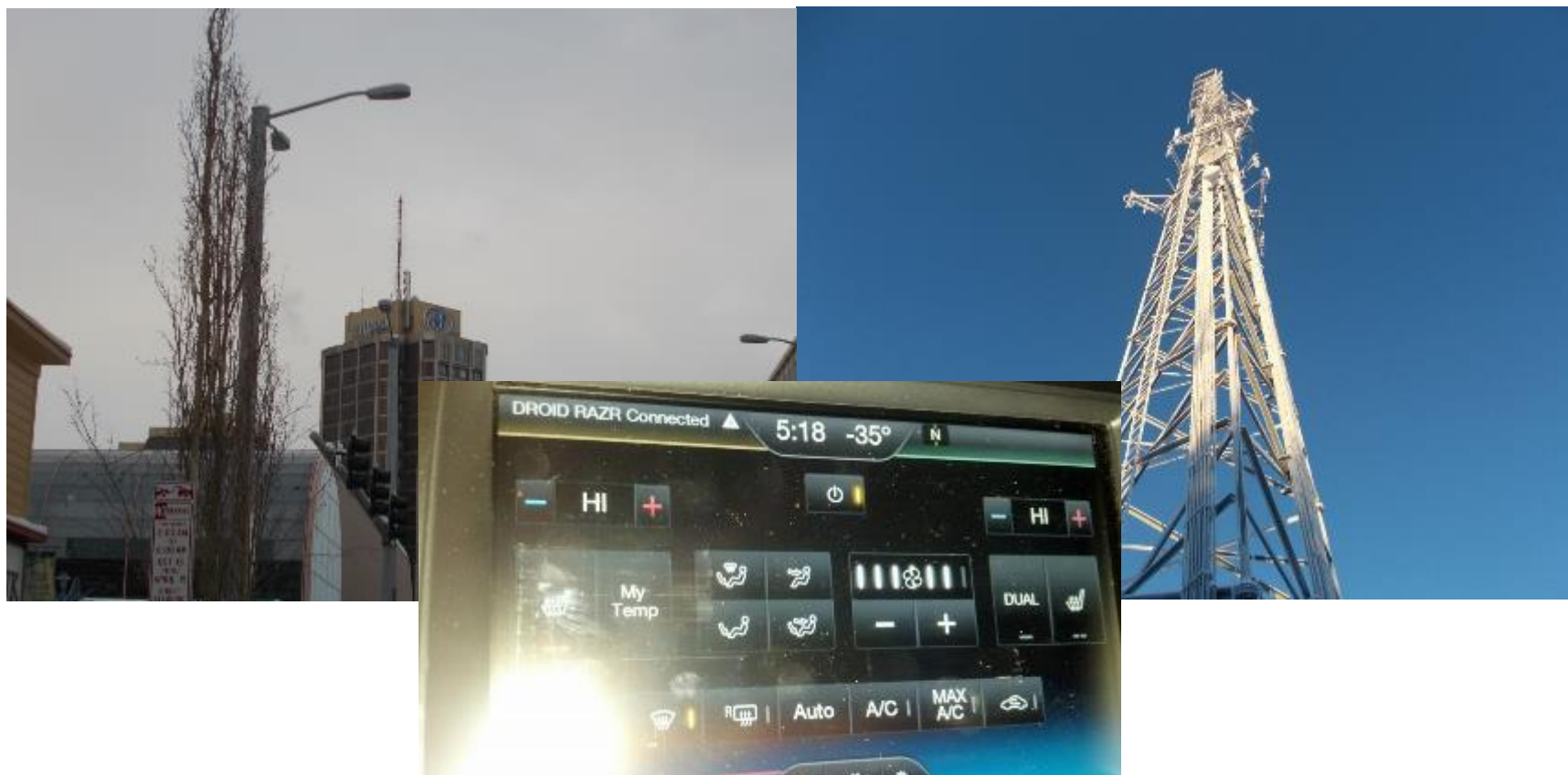


SPEARHEAD
VALUATION GROUP

The Twelfth – Northern Ireland July 12th, 2015



ABC Alaska -35 Degrees in the picture on the left



You Never Know Where You'll Go.



You Never Know Where You'll Stay.



Matt Kaufman ASA, ARM-MTS

- About Me
- Current projects are: Refineries, Sawmills and Equipment Dealerships
- Recent projects: Right of Way assignments, Soccer Stadium, STP, Water Treatment Facility, Machine Shop, Marine, and Telephone, Fixed and Wireless Internet Provider, Sawmills, and aerospace.
- Appraised The Corona Brewery in Mexico
- I do testify as an expert witness and have testified in Tax Courts and in divorces as well.
- MTS Committee
- ARM Committee
- Board of Examiners

Personally

- Married, Just celebrated 25 years, Kristi is a recovering attorney selling real estate
- Just turned 50
- Two kids and a dog.
- Enjoys outdoor sports, boating, model trains, music, and precision paper punching.
- Received ASA in 2013
- Received MTS-ARM designation in 2019

We've gone from:



To:



We've gone from:



To:



We've gone from:



To:



To This?



Topics

- Drones
- BOSCH GLM 400C
- Nikon Coolpix W300
- GoPros

We've gone from:



To This:



To This:



To This:



Drones – Providence Park, Portland, Oregon



Nyrstar Mine BC, Canada



Nyrstar Mine BC, Canada



Nyrstar Mine BC, Canada



Umpqua Dairy Roseburg, Oregon



Umpqua Dairy Roseburg, Oregon



Privacy Infringement



Privacy Rights

- **What are drones impact on privacy rights?**
- **This concern is being addressed by all levels of government around the world.**
- **In the United States, the federal government is allowing states and municipalities to pass laws to protect privacy rights.**
- **The general consensus is that the lower courts will apply laws that will eventually make their way all the way to the Supreme Court.**
- **Hopefully, by the time it is all complete, we will have laws that are fair and reasonable.**

Security Concerns





Drone Definition

A drone is an unmanned vehicle. They can be used in the water, on land, in the air and in space. We will be discussing Unmanned AERIAL Vehicles. Also known as small Unmanned Aircraft Systems, Unmanned Aerial Vehicles, et.

They are flown by:

- 1. either remote control**
- 2. or on-board computer.**

Argument for Drones

Drones are preferred for dangerous jobs where applicable.

Commercial, Residential, Industrial and large acreage inspections all benefit from drone technology.

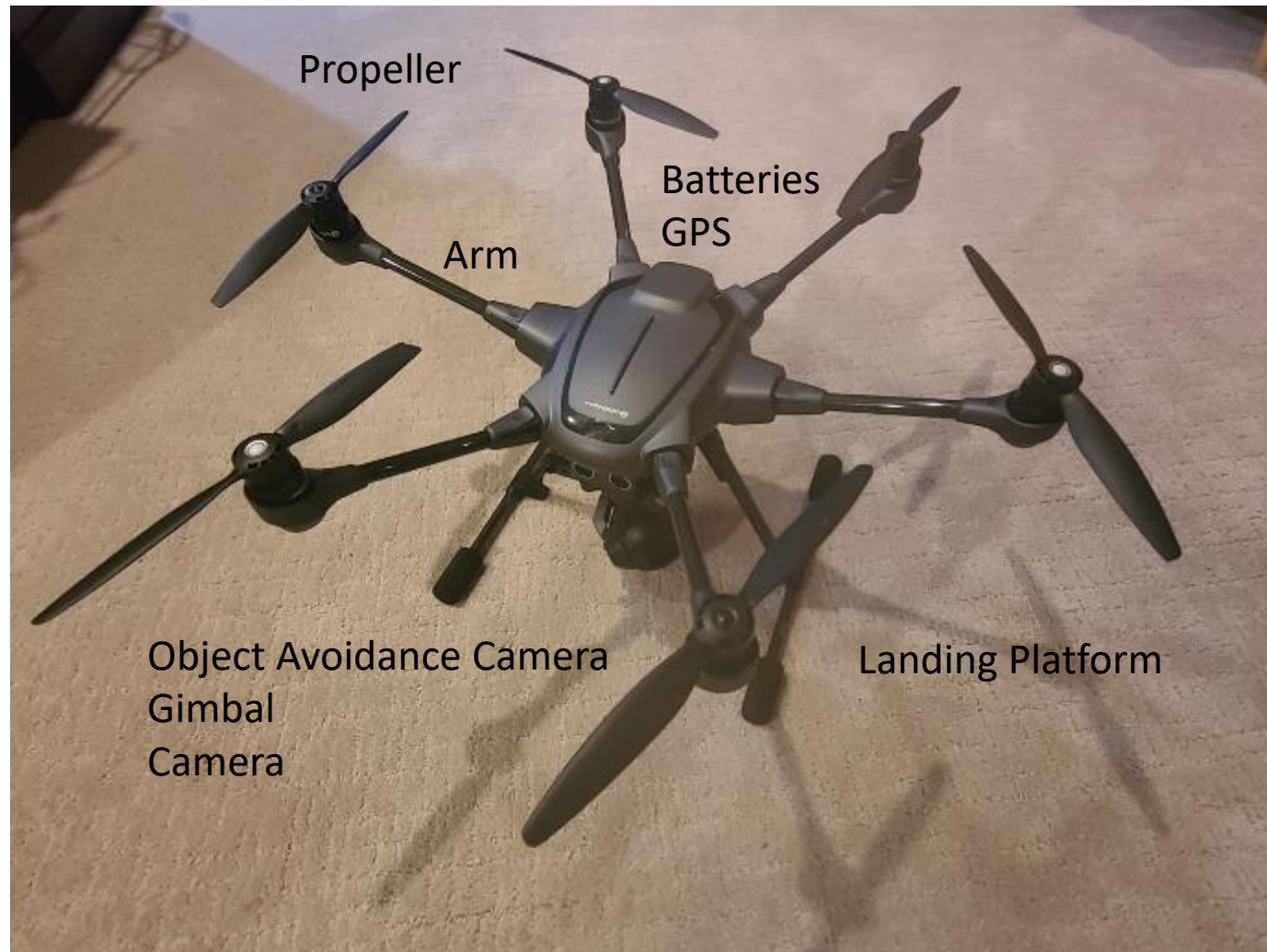
Because

Drones drastically reduce risk.

Drones are tools for Appraisers

- Not appropriate for every single assignment
- Weather
- Lighting
- Location not useful in restricted facilities and airspaces
- For targeted research, being able to raise the camera off the ground gives a different perspective of the subject property

How do drones fly?



How Drones Work



Types of Drones

Types of Drones on the market

1. Fixed Wing
2. Multi-rotor

What does it have to be able to do?

1. Has to be practical and reliable.
2. Has to fly a long time on a single battery.
3. It must be easy to deploy.
4. It must be rugged to stand up to multiple flights.

Fixed Wing - Advantages

1. Can cover a larger amount of space.
2. Can stay in the air longer.
3. Can be retrofitted with a number of different types of sensors.





Fixed Wing - Disadvantages

- Larger footprint needed for take off and landings
- Reaction times are increased for emergency situations
- Steeper learning curve.
- Take-offs and landings can be difficult

Multi-Rotor Advantages

1. Easier to Fly.
2. Can take-off and land onto small spaces.
3. Can carry a variety of sensors.
4. Better suited for in-town flying.
5. Can focus on features of construction.
6. GPS can bring it back to original location.

Multi-Rotor Disadvantages

1. Shorter time in the air.
2. Reduced airtime analysis.
3. Because typically flying in urban areas the chance for a crash is increased.
4. Other aircraft can be in the air.

The Appraisal Foundation

September 13, 2016 -

2016-17 USPAP Q&A Issue Date: September 13, 2016 2016-11: APPRAISAL DEVELOPMENT - SCOPE OF WORK ISSUES

Inspection Using a Drone

Unmanned aerial vehicles, or drones are a tool, not unlike binoculars.

USPAP does not require that you inspect the property being appraised.

The SCOPE OF WORK RULE requires that you disclose the extent to which you inspected the property.

Appraisal Applications

Practical Applications drones have towards Appraisals.

1. They give access to hard to reach places.
2. They can point out problems while they are still small.
3. They cover larger amounts of properties in a shorter time period.
4. They are relatively inexpensive to use.
5. They can contribute to a safe working environment.

Unobservable views

Changes the Way to think about virtual Inspections. Two photographs taken same day.

From the ground



From the Sky

Other map programs

World View or Google Earth are not always up to date with what might be onsite as of the date of inspection. Can be used after the fact for insurance purposes.

Attaching Sensors (Moisture Detection) Infrared



Measuring Heights

Starting from the ground drones start a 0 (AGL) Above Ground Level.

With the camera at horizontal you can fly to the height of a smokestack, dams, tower crane, building and get the height.

Civilian Use

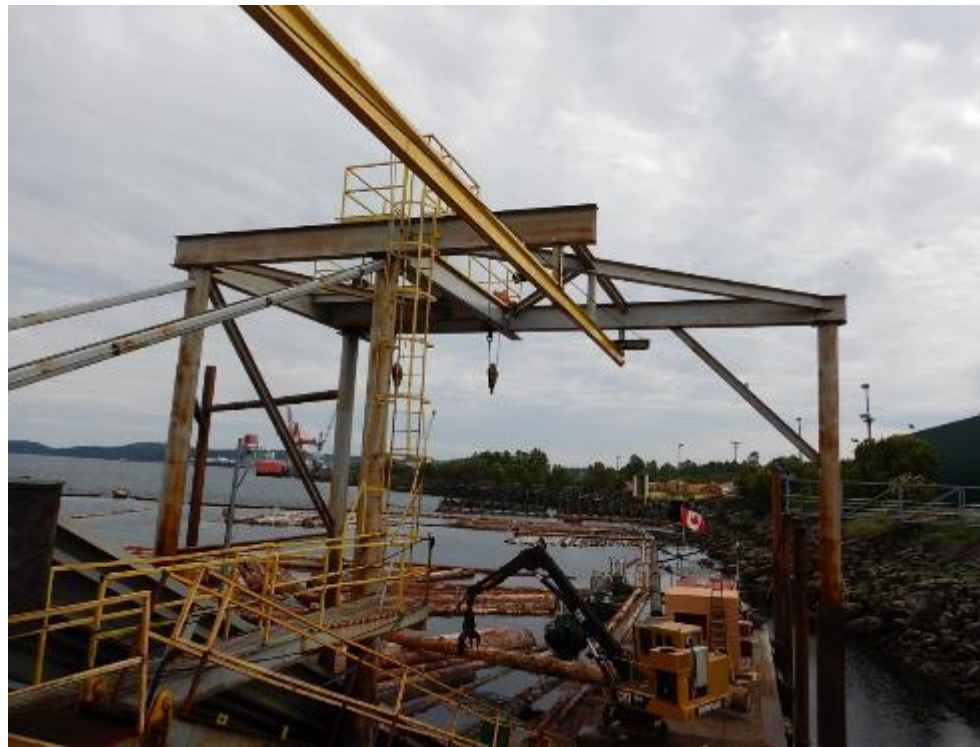
We're not quite ready for mass use of drones to deliver packages from Amazon.

Drones will need object avoidance to steer clear of bridges, overpasses, transmission lines, towers, etc.

Air traffic patterns will need to be mapped out so incoming and outgoing traffic will not interfere with one another.

Will drones give Appraisers advantages over competitors?

- Provide a better work product in your report.
- Provide a better (additional) service to your clients.
- Provide better perspective of an asset for your reports



Informational sources

- YouTube has a plethora of videos on how to which is better, etc.
- Magazines AOPA, Drone Zone, Rotor Drone, etc.
- Local Hobby Stores, Best Buy,
- Owners manual

FAA Registration

Do you need to register your drone for recreational purposes, not necessarily.

However,

- Yes if the weight requirement is .55-55 lbs
- Yes if you intend to use it for commercial purposes.

Drone Registration

You need:

1. An Email Address
2. Credit or Debit Card
3. Physical address and or a mailing address.

Registration is \$5 and good for 3 years.

www.faa.gov/uas/registration

FAA Current Rules

- FAA airworthiness certification is NOT required.
- The Drone must be in condition for “safe” operation.
- FAA is concerned with the safety of the airspace.

Current Model Aircraft Operating Standards

- Recommended to fly at or below 400 feet
- Keep your drone within sight
- Never fly near other aircraft, especially near airports
- Never fly over groups of people
- Never fly over stadiums or sports events
- Never fly near emergency response efforts such as fires
- Never fly under the influence (8 hours bottle to throttle) .04 BAC
- Be aware of airspace requirements

Understand the Rules

Pleading Ignorance is not a defense.

- You need to understand the rules before you fly.
- If you have the unfortunate experience of crashing your drone, you MAY have to report it to the FAA. If you crash your drone and the only damage is to your drone or associated equipment, you don't need to report anything. However, you DO need to report the accident in the following instances:
- If the UAS causes a serious injury or any loss of consciousness.
- A serious injury is defined as a Level 3 or higher on the Abbreviated Injury Scale (AIS), which essentially means any injury that results in someone being hospitalized.
- Any loss of consciousness must be reported regardless of hospitalization.
- If the sUAS causes damage to property (NOT INCLUDING THE COST OF DAMAGE TO THE DRONE) that costs at least \$500 to either repair or replace, whichever is lower.



Inspection, Testing, and Demonstration of Compliance

- Inspecting before and after flight operations. Have a form or notebook.
- Use your owner's manual to develop your preflight checklist
- Testing set a schedule based on how often you fly your drone.
- Training Certificate
- Training flight time.

Responsibility and Authority of the Remote Pilot in Command

- The Remote PIC must be designated before the flight operation begins.
- The Remote PIC has the ultimate authority for the flight operations – to decide if the flight should be cancelled due to weather or other human factors such as fatigue or lack of fitness for flight operations.
 - The Remote PIC is responsible for making sure the sUAS will not pose an undue hazard to people, aircraft, or property in the event that there is a loss of control of the aircraft.
- The Remote PIC is responsible for maintaining compliance with all rules in part 107.
- If the Remote PIC is supervising another person who is manipulating the controls (i.e., flying the sUAS), the Remote PIC must be able to intervene immediately – either by being close by to take the controls or by having an additional set of controls that manipulate the UAV.

Regulatory Deviation and Reporting Requirements of In-flight Emergencies

Part 107.21:

- If you experience an in-flight emergency, you are allowed to deviate from the rules of Part 107 to ensure the safety of people and property.
- The regulations state that if you deviate from any of the Part 107 operating rules you MAY (upon request) have to send a written report to the FAA explaining what happened.

Hazardous Operations

Part 107.23:

The FAA does not want you operating your sUAS in a “careless or reckless” manner. Part 107 specifically says that sUAS pilots are prohibited from doing so. The rules applying to sUAS (as opposed to manned aircraft) may be interpreted more strictly since sUAS operate in unique situations – often close to property or other people.

The FAA guidance says, for example, that failing to consider unfavorable weather conditions in densely populated areas could be considered reckless operation.

Dropping anything from an sUAS that would cause a hazard to those on the ground is also prohibited. Even if the item is soft, like a t-shirt, it is usually considered to cause a hazard if dropping it from the air into a crowd of people.

Operating from a moving aircraft or moving land- or water-borne vehicle

- You can only operate from a car in a sparsely populated area.
- You cannot operate your sUAS from a moving vehicle to transport property for compensation
- You cannot operate your sUAS from another aircraft

Daylight Operations

Part 107.29

Under Part 107, UAS operations are only allowed during daylight hours. The FAA classifies “daylight hours” as morning civil twilight to evening civil twilight, which, said more simply just means daylight is 30 minutes before official sunrise to 30 minutes after official sunset.



Visual Line of Sight

Part 107 requires that Visual Line of Sight (VLOS) must be maintained (with unaided vision) by the PIC or whoever is manipulating the controls at all times during flight operations. Plainly said, you must always be able to see your UAS with your own eyes. However, the rule does say that you are allowed to periodically and briefly break VLOS for operational necessities such as looking down at your control station to check battery power, scanning the airspace, and other situations deemed necessary by the Remote PIC.

If the UAS DOES go out of sight, the Remote PIC must ensure that VLOS is reestablished as soon as practicable (a fancy way of saying, as soon as realistic/possible/feasible).

Other rules

- Only operate one sUAS at a time. However you can have an assistant operate a camera.
- No transporting “hazardous materials”
- Give right of way to all aircraft
- Do not operate over people

Airspace Authorization and Restrictions

- All unmanned aircraft are required to receive prior authorization before flying in controlled airspace (Class A, B, C, D, and E airspace – discussed later in the course). No notice or authorization is required to fly in uncontrolled airspace (Class G airspace).

Prohibited or Restricted Areas

- Prohibited and restricted areas are areas where flight operations are generally not allowed without prior consent of the agency controlling the airspace.
- For instance, military bases and other sensitive areas may be considered prohibited or restricted, and thus unmanned aircraft would not be allowed to fly there without prior permission.

Take a Class

- Drone Launch Academy
- Guaranteed to pass the 107 exam, updates, support

Take the test – Get Certified

- To be eligible for a Part 107 Remote Pilot Certificate. You must satisfy the following requirements.
- Be at least 16 years old.
- Be able to read, speak, write, and understand the English language (FAA may make exceptions for medical reasons).
- Be in a physical and mental condition that would not interfere with the safe operation of the drone.
- Fulfill training and testing requirements.

Where to get Certified

- Schedule an appointment with a Knowledge Testing Center (KTC)
- Test cost \$150
- Tests are Monday through Saturday
- 60 questions
- 2 hours to complete

The knowledge test can include:

- Applicable regulations relating to small unmanned aircraft system rating privileges, limitations, and flight operation
- Airspace classification and operating requirements, and flight restrictions affecting small unmanned aircraft operation
- Aviation weather sources and effects of weather on small unmanned aircraft performance
- Small unmanned aircraft loading and performance
- Emergency procedures
- Crew resource management
- Radio communication procedures

The knowledge test can include: (continued)

- Determining the performance of small unmanned aircraft
- Physiological effects of drugs and alcohol
- Aeronautical decision-making and judgment
- Airport operations
- Maintenance and preflight inspection procedures
- Map Reading (Hint the answers are in the test booklet)

107 process

- IACRA Integrated Airman Certification and Rating Application
- Be vetted by the TSA
- Obtain an unmanned aircraft operator certificate with a small UAS rating (NO EXPIRATION).
- Pass a recurrent aeronautical knowledge test every 24 months.
- Once you're vetted by the TSA you have access to a temporary paper certificate that you can have immediately for use.
- You will receive a hard card in the mail.

Insurance

Insurance shows that you're professional.

Protecting your liability exposure is why you should insure your drone and yourself.

- a) carry bodily injury and
- b) property damage insurance.
- c) Invasion of privacy

My clients are requiring me to have 10M in insurance that runs \$234.00 a month.

Tools

- B4UFly This free app shows flight restrictions
- Airmap – provides airspace maps to the FAA’s “Know Before You Fly” operations.

You've bought it now what?

- Read the manual. Yes.
- Read how to take off and land.
- Hover
- Fly 3 to 4 feet off the ground
- Crashes can be recoverable
- Prop wash and air flow under the rotors will not be interfered with by the ground.

Bosch GLM400C

- Laser Measuring Device
- Has a 5MP Camera for outside use
- Range of 400 ft.
- Blue Tooth Compatible to store up to 50 measurements
- Includes an app that can be used to sketch buildings

Nikon Coolpix W300

- 4K camera
- Waterproof to 100ft.
- Shockproof to 8 ft.
- Blue Tooth Compatible and syncs to an app on your phone.
- Charges with a Micro USB

GoPros

- 12MP camera
- Waterproof to 196ft.
- Blue Tooth Compatible and syncs to an app on your phone.
- Charges with a Micro USB C

Thanks

- Matt Kaufman
- (541) 788-0290
- matt@spearheadvaluation.com

- For a complete listing of ASA's upcoming educational offerings, visit www.appraisers.org.

• Let's Connect!



- [Facebook.com/ASAAppraisers](https://www.facebook.com/ASAAppraisers)



- [@ASAAppraisers](https://twitter.com/ASAAppraisers)



- [Linkedin.com/company/american-society-of-appraisers](https://www.linkedin.com/company/american-society-of-appraisers)



- [Youtube.com/ASAAppraisers](https://www.youtube.com/ASAAppraisers)



- Appraisersnewsroom.org

Thank you for joining us!