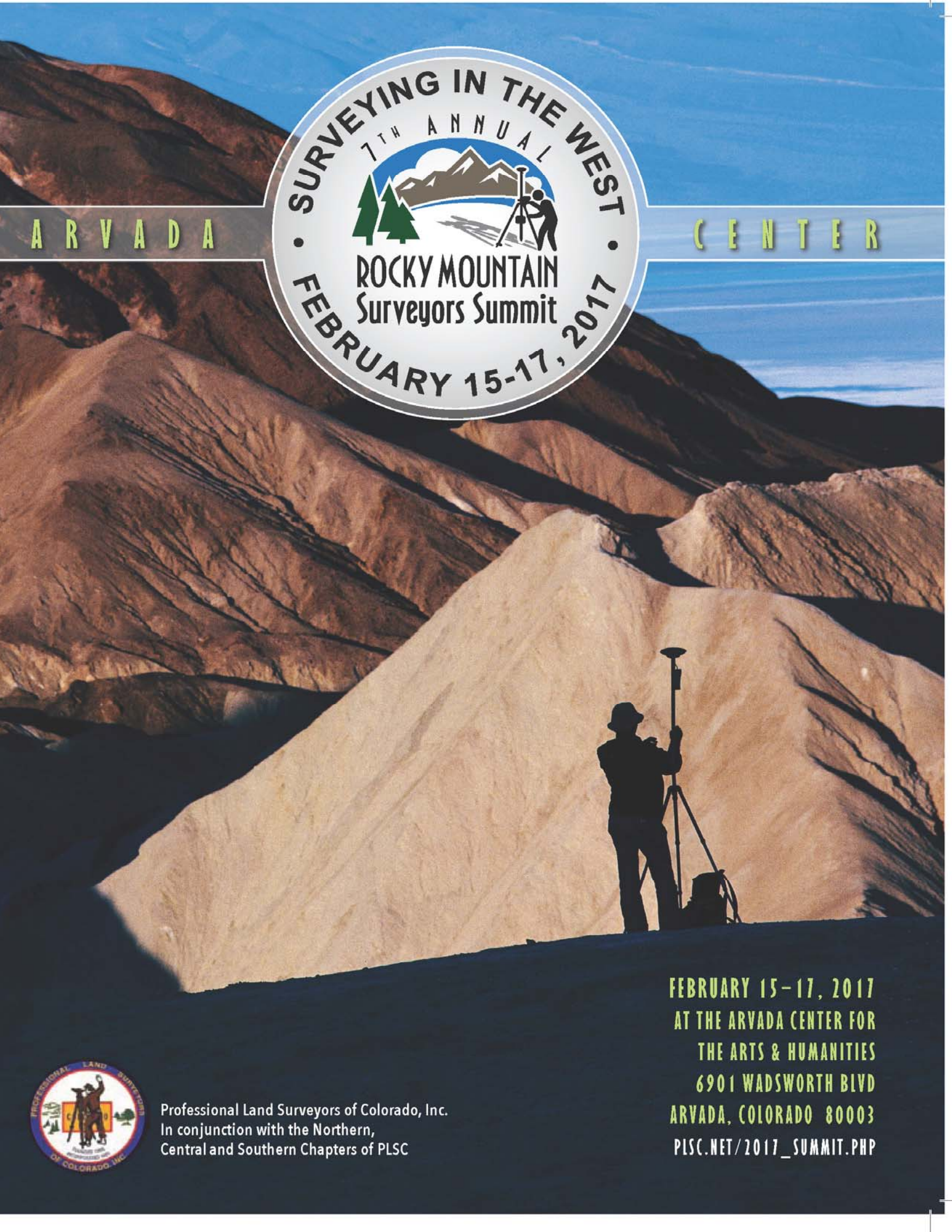
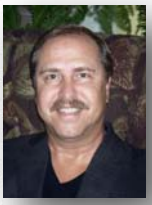

SURVEYING IN THE WEST
7TH ANNUAL
ROCKY MOUNTAIN
Surveyors Summit
FEBRUARY 15-17, 2017
ARVADA CENTER
FEBRUARY 15-17, 2017
AT THE ARVADA CENTER FOR
THE ARTS & HUMANITIES
6901 WADSWORTH BLVD
ARVADA, COLORADO 80003
PLSC.NET/2017_SUMMIT.PHP
Professional Land Surveyors of Colorado, Inc.
In conjunction with the Northern,
Central and Southern Chapters of PLSC

7th Annual Rocky Mountain Surveyors Summit
Speaker Biographies and Abstracts
Technical Track

WEDNESDAY MASS SESSION PRESENTER: TBD

Speaker Biography:



John B. Stahl, PLS, is a registered professional land surveyor in the states of Utah and Montana, currently owning and operating Cornerstone Professional Land Surveys, Inc., and Cornerstone Land Consulting, Inc., in Salt Lake City. Mr. Stahl specializes in surveying land boundaries, resolving boundary conflicts, performing title and historical research, land boundary consultation services, mediation and dispute resolution. He has been qualified as an expert witness in numerous boundary, access, and negligence cases. He has furthered his mediation education by participating in a state-qualified training program. He has also completed a training program to earn the recognition as a Certified Federal Surveyor. Mr. Stahl has served his profession as state chairman of the Utah Council of Land Surveyors and a Utah delegate to the Western Federation of Professional Surveyors. He is an adjunct instructor for the Salt Lake Community College and the Utah Valley University, where he teaches an extensive course in land boundary law. Mr. Stahl has authored numerous articles and publications covering topics on boundary laws, research, and resolving conflicts of evidence.

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TOPIC TITLE: *THE GEOID SLOPE VALIDATION SURVEY 2017, WALSENBURG—DURANGO, CO: THE BASIS TO EVALUATE THE NEW VERTICAL DATUM IN MOUNTAINOUS TERRAIN*

Speaker Biography:

Pamela Fromhertz has been the NOAA National Geodetic Survey Colorado State Geodetic Advisor and transitioned to the Rocky Mountain Regional Advisor January 1, 2016. As a geodetic advisor, she interacts with the geospatial community at the local, state and federal levels, as well as with private industry, to educate and advise on the benefits of the National Spatial Reference System (NSRS) and how its datums, models, and tools may be utilized for user's programs and projects. Pam organizes numerous workshops and training opportunities, including training in Continuously Operating Reference Stations (CORS), NGS' Online Positioning User Service (OPUS), DS-World, precision digital leveling and Height Modernization (HT MOD). She has her M.S. in geodesy, photogrammetry, and GIS from the Ohio State University and a B.S. in geology with a math minor from Long Island. She has worked for the federal government for over 30 years.

Derek van Westrum joined NGS in 2014, and is based at the Skaggs facility in Boulder. He has a PhD in physics from the University of Colorado, and prior to his time at NGS, spent 15 years working for Micro-g LaCoste in Lafayette. There he worked extensively on the development and operation of absolute and relative gravity meters. He is currently focused on the acquisition and analysis of terrestrial gravity data in support of the GRAV-D project.

Abstract:

NGS is conducting the third of three extensive field campaigns called Geoid Slope Validation Surveys. Two have already been completed and the last one is being conducted here in Colorado from Walsenburg to Durango in 2017. Marks have already been set every mile along US 160. GPS, gravity, 1st order leveling and Deflection of the Vertical data will be collected all along this route.

NGS is planning on new datums to be implemented around 2022. Both horizontal and vertical will differ by nearly a meter here in Colorado. The new vertical datum will be based on a gravity survey, GRAV-D. The GSVS will validate the method of the new vertical datum. Here in the mountains it will be interesting to see how well things fit. In this talk we will discuss the new datums and the GSVS campaigns.

TOPIC TITLE: *DATUM TRANSFORMATIONS*

Speaker Biography:

Dave Doyle joined the National Geodetic Survey in 1972, and held the position of chief geodetic surveyor at his retirement in January, 2013. He was responsible for the development, technical design and management of plans and programs that enhance the United States National Spatial Reference System. He has provided technical assistance in geodesy to international, federal, state and local surveying, mapping and GIS agencies. Mr. Doyle began his career as a geodetic surveyor in the U.S. Army in 1967, and served on numerous survey campaigns until completion of his military service in 1970. From 1970 until 1972, he worked for a private surveying company near Washington D.C. where he was responsible for completing boundary, topographic and engineering surveys while he pursued undergraduate studies in geodesy, cartography and mathematics at the George Washington University. During his time at NGS his experiences included all phases of geodetic triangulation, astronomic positioning, leveling, GPS data collection, data analysis, datum transformations, network adjustments, and data publication. Mr. Doyle's activities have included extensive efforts on the development and implementation of the North American Datum of 1983, the North American Vertical Datum of 1988, the Puerto Rico Vertical Datum of 2002 and the Virgin Islands Vertical Datum of 2009. He has also provided technical support to various countries for the modernization of national and regional geodetic reference systems in Caribbean and Central America, Africa, and the Pacific. Mr. Doyle's activities include 35 articles on geodesy and geodetic surveying in national and local surveying publications and he has conducted more than 400 workshops and seminars detailing the various aspects of geodesy and the

National Spatial Reference System. Mr. Doyle continues to support education in geodesy for surveyors and others interested in high accuracy geospatial data as a faculty member of GeoLearn and providing seminars at surveying and GIS conferences. Mr. Doyle is a past president of the American Association for Geodetic Surveying, a Fellow member of the American Congress on Surveying and Mapping and a charter member of the Geographic and Land Information Society. He has also served on the U.S. delegation to the International Federation of Surveyors. Mr. Doyle is also an active member of the American Association for Geodetic Surveying, the District of Columbia, Maryland, and Virginia professional surveyors associations.

Abstract:
This presentation covers the relationship of and transformations between the several horizontal/geometric and vertical geodetic datums most commonly used in the United States. These include: The North American Datum of 1927 (NAD 27), the North American Datum of 1983 (NAD 83), the International Terrestrial Reference Frame (ITRF), the World Geodetic System of 1984 (WGS 84), the National Geodetic Vertical Datum of 1929 (NGVD 29) and the North American Vertical Datum of 1988 (NAVD 88). The presentation specifically demonstrates and examines the gridded utilities NADCON, GEOCON, GEOCON11 and VERTCON developed by the National Geodetic Survey (NGS), the commonly used 3-parameter abridged Molodensky transformations computed by the U.S. Defense Mapping Agency (DMA), and the more rigorous 14-parameter Helmert transformations supported by the NGS utility HTDP (Horizontal Time Dependent Positioning).

TOPIC TITLE: *SURVEYING PROFESSION*

Speaker Biography:
Richard Serby founded GeoSearch in 1988 in response to the need for Geographic Information Systems (GIS) Technicians, Photogrammetrists, Aerial Photographers, Remote Sensing Specialists, Surveyors, and related mapping and engineering occupations. Mr. Serby continues to dedicate personnel recruitment and contract staffing services to the geospatial sciences.

Abstract:
The surveying profession is about to undergo major change. The average age of a professional land surveyor is 59 and many 'baby boomers' will be leaving the profession over the next 5-7 years. As a result there will be a shortage of surveyors, especially those who hold a PLS license. There will need to be significant efforts to recruit young people into the profession and a need to re-visit surveying degree and training programs. To begin the discussion we will cover the following topics:

- Overview of the job market
- The state of the surveying profession
- List of surveying programs, and
- Audience participation – What can we do now?

TOPIC TITLE: *MODERNIZATION OF NSRS*

Speaker Biography:
Dave Doyle—see biography above.

Abstract:
During the next several years enhancements and additions to the network of Global Navigation Satellite Systems (GNSS) including: the U.S. NAVSTAR Global Positioning System, Russian GLONASS, European Union GALILEO and China's BeiDou will significantly improve the use of space-based positioning systems for surveying, mapping, charting, navigation and innumerable other applications. In order to meet the anticipated demands for an improved geospatial framework that these developments will require, the National Geodetic Survey (NGS) is implementing a plan for the modernization of the National Spatial Reference System (NSRS). Among the various topics outlined in this plan is the adoption of an entirely new geodetic reference frame with updated geometric (horizontal) and gravimetric (vertical) realizations that will replace the North

American Datum of 1983 (NAD 83), the North American Vertical Datum of 1988 (NAVD 88) and the several island vertical datums. The new framework will be designed such that the geometric component (latitude, longitude, ellipsoid height) will be virtually identical to and aligned with the International Terrestrial Reference Frame (ITRF), while orthometric heights will be based exclusively on a nation-wide high accuracy (1-2 cm) gravimetric geoid model. This presentation highlights the rational for these changes; the various elements that currently define the NSRS and the activities NGS is engaged in to improve the capacity of and access to the NSRS in support of this transition including tools such as OPUS and DSWorld.

TOPIC TITLE: *USING ASCE 38-02 TO REDUCE SURVEYOR'S LIABILITY WHILE PROVIDING BETTER UTILITY DATA*

Speaker Biography:

Andrew Sylvest oversees Cardno's Utility Engineering and Surveying operations provided throughout the Rocky Mountain Region. Prior to relocating to Colorado, Andrew managed operations in the Gulf Coast. In addition to experience in the transportation and water/wastewater sectors, he has an extensive background in providing professional services in the petrochemical industry as well as experience overseeing military base renovations for the Australian and Congolese militaries in Africa and Afghanistan. Andrew has a BS in Construction Management from the LSU College of Engineering and is currently completing his MBA from LSU.

Abstract:

When properly applied to projects, Subsurface Utility Engineering mitigates the risk of change orders and project delays and transfers utility related liability to the Subsurface Utility Engineering firm. Unlike utility locating or potholing, the Subsurface Utility Engineering firm issues signed and sealed drawings backed by professional liability insurance covering errors and omissions for utilities. Information for inclusion in contract language will be available free of charge either electronically or by hard copy. Subsurface utility engineering's technical aspects and FHWA case study findings of documented savings will be presented. The four quality levels of subsurface utility engineering data as defined by CI/ASCE 38-02 will be discussed.

TOPIC TITLE: *POINT CLOUDS WITH AUTODESK PRODUCTS AND GIS FOR THE SURVEYOR*

Speaker Biography:

Ken Martinez started his career working in various aspects of Surveying and Civil Engineering in 1983. He began as a draftsman, hand drafting transmission lines and substation layouts with ink and mylar at Generation and Transmission Utility. Ken has been utilizing the benefits of Autodesk software since the first versions came out to solve his drafting needs, especially making changes and simplifying repetitive tasks. In the early nineties, Ken moved into Surveying. In working with an environmental firm with topography maps and boundary surveys, he was able to do both field and office work. This gave him experience and a better understanding of both surveying and civil engineering. In the mid-nineties, Ken moved into Land Development where he gained the majority of his experience in Autodesk® Land Development Desktop, and then worked his way into Civil 3D. Ken has a wealth of experience and knowledge in surveying and civil design in the utility and construction industries. He brings his vast knowledge of over 22 years experience in Land Development and Civil 3D products to attendees.

Abstract:

In this class we will cover a couple of topics. The first one will be Importing Point Clouds with Autodesk Products. Since this technology seems to be changing daily we will explore how to Geo-Reference, import, Edit ad create Surfaces with Point Cloud data in Re-Cap and Civil 3D. The Second topic on the agenda is GIS for the Surveyor. In the Past CAD data and GIS data was always separated. Why, when they can be used together? An Example of this is a FEMA Floodplain. I still see people digitizing these types of things. My observations of working with Surveyors for the last seven years is that they are not taking advantage of the wealth of information that is out there, and better yet you have the software to do it! This class is intended to start you thinking about the possibilities of enhancing your deliverables.

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TOPIC TITLE: *ARE UNMANNED AERIAL SYSTEMS IN THE FUTURE OF YOUR SURVEYING COMPANY?*

Speaker Biography:

Don Hulsey, PLS, obtained his PLS license in Colorado in 2011 and has worked in the surveying/engineering field for 24 years. Don is currently serving as President for the Southern Chapter Professional Land Surveyors, and has served on the board in many capacities for 6 years. Don has worked for Lawrence Construction Company for the past 5 years, and recently started the UAS department in early 2016. Most of his spare time is spent enjoying the outdoors with his Wife and Sons and enjoying many fishing/camping trips around the beautiful state of Colorado and planning the next Big Game hunting trip.

Abstract:

Topics will range from the many changes in FAA regulations over the past year. Obtaining a Private Pilot's license to an online safety exam. Do I start a UAS department or hire an outside firm? The accuracy you can expect from the data, and how long it takes to complete a project from the signed contract to a deliverable. The types of software needed to view the models, orthomosaic photos, and digital elevation models? The role the weather plays in everyday scheduling? The different systems available to keep all the batteries fully charged and balanced? The privacy act also has a role in the UAS operations? In the end, it's just another tool in your toolbox of surveying equipment.

TOPIC TITLE: *UAS SURVEYING AND MAPPING*

Speaker Biography:

Robert Rubino:

- 40 years' experience as a Colorado Professional Land Surveyor
- 30 years' experience as a commercial pilot
- 15 years' experience as a commercial architectural photographer
- 5 years' experience as a drone videographer

The above qualifications / experience has put me in the unique position of using my professional Land Surveying experience together with my passion for flying and photography enabling me to be one of the first land surveyors to use this new drone technology to produce extremely accurate and precise topographic surveys. We have been using drones for surveying and mapping for almost two years with excellent results on every drone project.

Abstract:

- Large format prints showing typical / example projects
- Multiple drones and associated equipment on display
- Discussion of pros / cons of surveying with drones
- Discussion of typical workflow and software applications
- Video presentation of a typical drone survey project
- Brief drone flight for demonstration purposes
- Question and answer session
- Close up inspection of drone equipment