include both fix-wing aircraft, better at distance flying, and rotor aircraft that can hover. These systems are generally limited in range to anything from line of sight to a few kilometers, and to flight times under an hour. Operating these systems is much simpler, with little training required. Professional-grade systems can carry sophisticated cameras and GPS equipment and increasingly have the capacity for autonomous flight, object avoidance and other safety features. Costs can range from $5,000 to several hundred thousand dollars, including analytical software and support [3].

The most common use of in humanitarian response today is data-collection and observation.

Here is presented one more UAVs civil using for detecting roof's leakage. Designed device must include some detectors that can determine leakages and other defects of the roofs, by non-destructive control method. The main idea is to use infrared thermography and observation by camera.

This article sets the direction for further researches. The project is at an early stage and a lot of things will be modified. There are great prospects of development in this direction in instrument making industry. In consideration of the work is analyzed the relevance of the chosen theme.

Such invention will help to analyze the condition of the roof of any height and will help to keep the human-operator in the safety.

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Unmanned Aerial Vehicles on the World Market

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Unmanned Aircraft Systems (UAS) is an emerging technology with a tremendous potential to revolutionize warfare and to enable new civilian applications. It is integral part of future urban civil and military applications. It technologically matures enough to be integrated into civil society. In recent years, the term UAV (Unmanned Aerial Vehicle) has been replaced with the term UA which stands for Unmanned Aircraft. To emphasize that a UA is a part of a complete system including ground operator stations, launching mechanisms and so forth, the term Unmanned Aircraft System (UAS) has been introduced . That system whose components includes the necessary equipment, network, and personnel to control an unmanned aircraft also called UAS [1].

An unmanned aircraft system is a system comprised of three main features: the aircraft, the Ground Control Station (GCS or C3) and the operator.

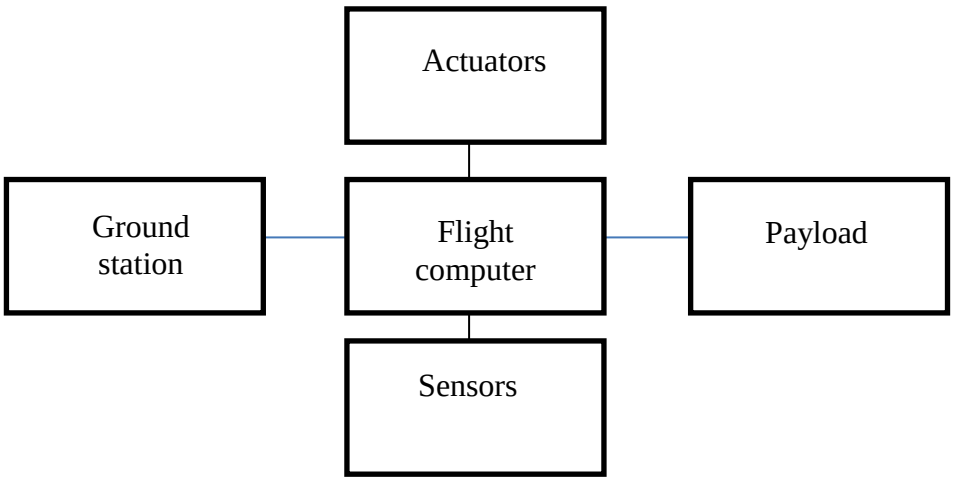

Figure 1 - Basic UAV Avionics Architecture

At the moment there are many different types of UAV that have a lot of variations of types of designs, possibilities, dimensions, materials. The following table 1 gives a brief overview of the advantages and disadvantages of different build types.

Table 1 - UAV build types [2]

	Advantage	**Disadvantage**	**Visual**
Fixed-Wing	• Long range • Endurance	• Horizontal take-off, requiring substantial space (or support, e.g., catapult) • Inferior maneuverability compared to VTOL (Vertical Take-Off and Landing)	
Tilt-Wing	• Combination of fixed-wing and VTOL advantages	• Technologically complex • Expensive	
Unmanned Helicopter	• VTOL • Maneuverability • High payloads possible	• Expensive • Comparably high maintenance requirements	
Multicopter	• Inexpensive • Easy to launch • Low weight	Limited payloads • Susceptible to wind due to low weight	

Except this short classification of the advantages and disadvantages of drones there are global classification of UAV.

Table 2 - Classification of UAV [3]

Category	Weight of UAV	Normal Operating Altitude	Radius of Mission	Endurance	Altitude	Normal Employment	Typical Use
MICRO	< 2 kg	Up to 200ft AGL	5 km (LOS)	A few hours	Very Low Altitude	Tactical Platoon(Single operator)	Reconnaissance, inspection, surveillance
MINI	2-20 kg	Up to 3000ft AGL	25 km (LOS)	Up to 2 days	Low Altitude	Tactical Sub-Unit(manual launch)	Surveillance, data gathering
SMALL	20 -150 kg	Up to 5000ft AGL	50 km (LOS)	Up to 2 days	Low Altitude	Tactical Unit(employs launch system)	Surveillance, data gathering
TACTICAL	150-600 kg	Up to 10,000ft AGL	200 km (LOS)	Up to 2 days	Low Altitude	Tactical Formation	Surveillance, data gathering
MALE	> 600 kg	Up to 45,000ft AGL	Unlimited (BLOS)	Days/weeks	Medium Altitude	Operational/ Theatre	Surveillance, cargo transportation
HALE	> 600 kg	Up to 65,000ft AGL	Unlimited (BLOS)	Days/weeks	High Altitude	Strategic/ National	Surveillance, data gathering, signal relay
STRIKE/ COMBAT	> 600 kg	Up to 65,000ft AGL	Unlimited (BLOS)	Days/weeks	High Altitude	Strategic/ National	Surveillance, data gathering, signal relay

On the world market, there are several manufacturers of similar products. Such countries are: USA, Ukraine, Germany, Canada, Israel, United Kingdom.

While unmanned aircraft systems (UAS) have been used for decades, they are increasing in number and effectiveness as aircraft, sensor and automation technologies mature. Consequently, the potential benefits of these systems are now projected to extend well beyond military use – to a variety of domestic applications that will improve the safety of our communities, strengthen public services and achieve countless additional benefits to a wide variety of commercial and government organizations [4].

There is a practice using of unmanned aerial vehicles for peaceful purposes. Dron is a universal device capable of change and to adapt to any conditions, so it is used in three trichomes: in water, on land, in air. Potential civil applications of UAVs are Inspection of terrain, pipelines, utilities, buildings, coast guards, border patrol organizations, rescue teams, police, etc.

Table 3 – Civil applications of UAVs

Policing duties	Sports events film coverage	Border patrol	Agriculture and forestry.	Research by university laboratories
Traffic spotting	Agricultural operations	Surveillance of coastal borders, road traffic, etc.	Fire fighting.	Communications relay.
Fisheries protection	Aerial photography	Disaster and crisis management search and rescue.	Communications relay and remote sensing.	Law enforcement
Pipeline survey	Power line survey	Environmental monitoring.	Aerial mapping and meteorology.	Meteorology missions

Since devices of this kind are becoming more accessible to ordinary person connection with the appearance choices, there is only a problem on the legalization of commercial services. This question remains a open in many countries, because there is no legal basis for this. Despite the fact that the International Civil Aviation Organization (ICAO) is adopted a resolution that the drone is an aircraft, in addition, commercial organization must have the certificate of airworthiness and approval of government restriction. For example, in the USA such an organization is Federal Aviation Administration (FAA). Technically, the FAA doesn't forbid the commercial use of UAVs, they just require FAA approval. Only two UAS aircraft models have been approved for commercial use and only for deployment in the Arctic. These are the kind of operations the FAA initially had in mind when they drafted the law. Today's commercial quadcopters are clearly not what they were thinking of when the law was passed [5].

In this survey paper, UAV (Unmanned Aerial Vehicle) which is an emerging technology with a tremendous potential to revolutionize equipment and enable new civilian applications were reviewed. UAV (Unmanned Aerial Vehicle) today play an increasing role in many public missions such as border surveillance, wildlife surveys, military training, weather monitoring, and local law enforcement. As a result, the UAV (Unmanned Aerial Vehicle) required more exploration and revision.

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