CLAIMS:

1. A wireless flight recordation system for collecting black-box data of an *aerial platform* comprising one or more sensors, a black box for collecting black-box data comprising one or more flight recorders, and one or more black-box cables which provide data feed to the one or more flight recorders from the one or more sensors, the wireless flight recordation system comprising:

one or more *black-box data collectors* comprising one or more black-box data sniffers adapted to interface with said one or more black-box cable to sense signals which are communicated through said one or more black-box cables to provide said data feed to the flight recorder, from outside said one or more black-box cables, thereby indirectly receiving said black-box data from the one or more sensors, without interfering with the cable or the signals communicated therethrough ~~for collecting *black-box data*, being data suitable for recordation by one or more *flight recorders* of an aerial platform~~; and

at least one *data transmission interface* connectable to the *black-box data collectors* for receiving said *black-box data* and configured and operable for:

establishing a wireless communication link with a wireless data communication network capable of providing data communication services to said aerial platform during flight, and

transmitting said *black-box data* or at least a parts thereof, via said wireless data communication network to a receiver remote from the aerial platform.

2. The system of claim 1 wherein said *black-box data* collected by the one or more *black-box data collectors* includes at least one of cockpit voice recording (CVR) data and flight data recording (FDR); said one or more *black-box data collectors* are configured and operable according to at least one of the following:

the one or more *black-box data collectors* are connectable directly or indirectly to at least one or more flight sensors of the aerial platform for retrieving data therefrom and adapted to process said data to obtain at least a portion of said FDR data in real time; and

the one or more *black-box data collectors* are connectable directly or indirectly to one or more cockpit sensors of the aerial platform for retrieving data therefrom and are adapted to process said data to obtain at least a portion of said CVR data in real time.

3. The system of claim 2, wherein said *data transmission interface* is adapted to receive in real time one or both of the portions of the FDR and/or CVR data obtained by the *black-box data collectors* and pack and transmit said one or both of the portions of the FDR and/or CVR data in real time to said receiver.

~~4. The system of any one of claims 1 to 3 wherein the aerial platform comprises one or more *flight recorders*; and wherein the *black-box data collectors* are adapted to interface with one or more black-box cables, which provide data feed to said one or more *flight recorders*, thereby indirectly receiving said black-box data from sensors of the aerial platform, being one or more of flight sensors and cockpit sensors.~~

4~~5~~. The system of any one of claims 1-~~4~~3 wherein said *black-box data collectors* comprise one or more signal splitters/duplicators adapted to implement said interface with one or more black-box cables; each signal splitter/duplicator is connected to a *black-box data collector* of said *black-box data collectors* and is connectable to a black-box cable of said cables, which is connected to a *flight recorder* of said *flight recorders*, and is adapted for duplicating/splitting digital or analog signals, which provide said data feed to the *flight recorder*, such that a duplicate of signals is communicated to the respective *flight recorder*, and another duplicate of at least a part of said signals is communicated to the *black-box data collector*.

5~~6~~. The system of any one of claims 1-~~4 or 4~~5~~, wherein said *black-box data collectors* comprise one or more *black-box data sniffers* adapted to implement said interface with one or more black-box cables;~~ wherein each of said one or more *black-box data sniffers* is associated with a respective black-box cable of said one or more black-box cables of a *flight recorder* of said one or more *flight recorders*~~ and is adapted to sense signals, which are communicated through said cable to provide said data feed to the *flight recorder*, from~~

~~outside said cable and without interfering with the cable or the signals communicated therethrough~~.

6~~7~~. The system of claim 5~~6~~ wherein said *black-box data sniffers* comprise:

at least one ~~*non-disruptive*~~*passive signal sniffer* to be placed in proximity to a cable carrying data for input for recording by the respective flight recorder of the aerial platform for measuring electromagnetic signals of one or more frequency ranges in the vicinity of said cable, and obtaining measured data indicative thereof; said measured data being indicative of at least part of the data communicated through said cable for recording by said at least one black-box, whereby obtaining said measured data does not disrupt the data signals carried by said cable;

at least one *noise filtration processor* in communication with said ~~*non-disruptive*~~*passive signal sniffer* for obtaining said measured data therefrom, and configured and operable to apply noise filtering to said measured data and obtain noise filtered signals indicative of said at least part of the data communicated through said cable for recording by said flight recorder; and

said at least one *transmission interface* is connected to said one or more *black-box data sniffers* and to at least one *transmitter*, and is configured and operable for:

processing the noise filtered signals obtained from the one or more black-box data sniffers to generate transmission signals including data indicative of said at least part of the black-box data; and

providing said transmission signals to the transmitter for transmission to the remote receiver.

7~~8~~. The system of claim 6~~7~~ wherein said ~~non-disruptive~~passive sniffer is furnished at a circumference of a continuous section (un-cut section) of said cable for sensing said electromagnetic signals, which are indicative of at least part of said data signals communicated through said continuous section of the cable, thereby not disrupting said data signals.

~~9. The system of claim 8 wherein said non-disruptive sniffer is a passive sniffer configured and operable not to generate interfering signals disrupting said data signals in the cable.~~

8~~10~~. The system of ~~any one of~~ claim~~s 7 to~~ 7~~9~~ wherein said ~~non-disruptive~~passive sniffer comprises one or more of:

an inductive sniffing module comprising one or more induction loops furnished to surround said circumference of the continuous section~~;~~. and

~~11. The system of any one of claims 7 to 10 wherein said non disruptive sniffer comprises~~

a capacitive sniffing module comprising one or more electrodes arranged near said continuous section.

~~12. The system of claim 11 wherein said non-disruptive sniffer comprises a combination of said inductive and capacitive sniffing modules.~~

9~~13~~. The system of any one of claims 6~~7~~ to 8~~12~~ wherein said at least one *black-box data sniffer* associated with the respective flight recorder comprises a plurality of the ~~*non-disruptive*~~*passive signal sniffers* in proximity to the cable carrying data for the respective flight recorder;

wherein the plurality of the ~~*non-disruptive*~~*passive signal sniffers* are arranged along said cable at respectively different spatially spaced apart regions thereof for measuring electromagnetic signals of one or more frequency ranges in the vicinity of said cable at said respectively different spatially spaced apart regions thereof;

wherein the measured data obtained by each ~~*non-disruptive*~~*passive signal sniffer* of said plurality of the ~~*non-disruptive*~~*passive signal sniffer*s, which is arranged along a respective spaced apart region of said cable, includes a *signal of interest* part, which is indicative of said at least part of the data communicated through said cable, as well as a noise/clutter part associated with electromagnetic signals of one or more

frequency ranges sensed in the vicinity of said respective spaced apart region of said cable, and not originating from the data communicated through said cable; and wherein the *signal of interest* parts of the measured data, obtained by said plurality of the ~~*non-disruptive*~~*passive signal sniffer*s, originate from said at least part of the data communicated through said cable, and are therefore respectively highly correlated with one another in the measured data obtained by said plurality of the ~~*non-disruptive*~~*passive signal sniffers*; and the *noise/clutter parts* of the measured data obtained by said plurality of the ~~*non-disruptive*~~*passive signal sniffer*s are different in the different respective spaced apart regions of the cable, and are therefore associated with substantially lower correlation between them; and

wherein the *noise filtration processor* is in communication with said plurality of the ~~*non-disruptive*~~*passive signal sniffer*s for obtaining said measured data therefrom, and is configured and operable to apply noise filtering by carrying out at least a correlation processing between the said measured data obtained from the plurality of the ~~*non- disruptive*~~*passive signal sniffers* to extract said noise filtered signals, or data indicative thereof, as being said highly correlated part of the measured data obtained from the said plurality of ~~*non-disruptive*~~*passive signal sniffers*.

10~~4~~. The system of claim 9~~13~~ wherein said *noise filtration processor* comprises a correlation analyzer adapted to determine the cross-correlation between the measured data obtained from different ~~*non-disruptive*~~*passive signal sniffers* of said plurality of the ~~*non-disruptive*~~ *passive signal sniffers*; and extract said noise filtered signals, or said data indicative thereof, as the part of said measured data for which the cross-correlation is above a certain predetermined cross-correlation threshold.

11~~5~~. The system of any one of claims 6~~7~~ to 10~~4~~ wherein said one or more frequency ranges comprise at least one predetermined data frequency range indicative of frequencies by which said data is communicated through said cable; said ~~non-disruptive~~passive sniffer comprises a frequency filter adapted to extract said predetermined data frequency range

from the electromagnetic signals being measured, to thereby obtain the measured data indicative of the data signals.

162. The system of any one of claims 67 to 115 wherein said *black-box data sniffer* is configured and operable for measuring data indicative of power supply provided to the flight recorder;

the black-box data sniffer further comprises a power state processor adapted to process the data indicative of power supply to determine a power state of said flight recorder; and

said at least one transmission interface is configured and operable for obtaining and processing the power supply data to include data indicative thereof in said transmission signals that are to be transmitted to the remote receiver.

137. The system of claim 126 wherein at least one of the following occurs:

said power supply is provided to the flight recorder via said cable, and said one or more frequency ranges comprise at least one predetermined power supply frequency range indicative of frequencies by which power supply is provided via said cable to the flight recorder;

said power supply is provided to the respective flight recorder via another cable, and said black-box data sniffer further comprises *a power supply sniffer* to be placed in proximity to the another cable for measuring electromagnetic signals at a predetermined power supply frequency range at which said power supply is provided to the respective flight recorder; and

said frequency filter is further adapted to extract a portion of the electromagnetic signals being measured, which is associated with said predetermined power supply frequency range.

184. The system of claims 124 or 137 wherein said power state of the flight recorder is indicative of whether the flight recorder has malfunctioned.

195. The system of any one of claims 67 to 148 wherein said noise filtration processor comprises a protocol analyzer, whereby the protocol analyzer is connected/coupled to a memory storing data indicative of a predetermined protocol by which the data is communicated to the flight recorder via said cable; and is adapted for processing the measured data according to said predetermined protocol to identify portions of the measured signals in compliance with said predetermined protocol, and filter out noise portions of the measured data not compliant with said predetermined protocol, to thereby obtain said noise filtered signals indicative of said at least part of the data recorded by said flight recorder.

2016. The system of claim 195 wherein said predetermined protocol is indicative of at least one predetermined modulation/pattern by which the data is communicated to the flight recorder; and wherein said noise filtration processor is adapted to apply processing to the measured data to identify portions thereof which are compliant with/match said modulation/pattern and include data indicative of the identified portions being compliant/matched with said modulation/pattern, in said noise filtered signals.

~~21. The system of claim 20 wherein the portions compliant with said modulation/pattern are demodulated to form demodulated portions being indicative of parts of said noise filtered signals.~~

~~22. The system of claim 20 or 21 wherein said predetermined protocol is indicative of at least one predetermined packet format characterizing a predetermined structure of transmission packets included in said data; and wherein said noise filtration processor is adapted to apply processing to the measured data, or to the demodulated portions thereof to identify part thereof which are compliant with said predetermined packet format modulation.~~

2317. The system of any one of claims 1 to 1622, further comprising an input port to be connected directly or indirectly to a GPS antenna of said aerial platform for receiving positioning signals indicative of global position of said aerial platform; said at least one

transmission interface is configured and operable for obtaining and processing said positioning signals to include data indicative thereof in said transmission signals that are being transmitted to the remote receiver.

~~24. The system of any one of claims 1 to 23 wherein the aerial platform comprises at least two flight recorders: cockpit voice recording black box (CVR) and flight data recording black box (FDR), and wherein the system comprises at least two respective black-box data sniffers, comprising non-disruptive sniffer modules to be placed in proximity to the corresponding cables carrying data signals to said at least two flight recorders.~~

18~~25~~. The system of claim 17~~24~~ wherein the two respective black-box data sniffers comprise respective noise filtration processors adapted to:

~~(a)~~ apply processing to the at least a portion of the frequency range of signal passing through said cable to identify data indicative portions thereof which are compliant with/match a specific protocol of data communicated to the respective one of the ~~at least two~~one or more flight recorders, thereby determining data recorded by the flight recorders; and

~~(b)~~ apply processing to ~~the~~ at least another portion of the frequency range to identify power consumption data of said flight recorders respectively, said power consumption data being indicative of proper operation or malfunction of the respective black-boxes.

19~~26~~. The system of any one of claims 1 to 18~~25~~ wherein at least one of said transmission interface and said transmitter, are configured and operable to encrypt said transmission signals.

~~27. The system of any one of claims 1 to 26 comprising said transmitter, and wherein said transmitter is configured to transmit said transmission signals via satellite communication to a gateway or a receiver by which said transmission signals are processed, stored, and/or further forwarded.~~

~~28. The system of claim 27 wherein said transmitter is configured and operable for broad-band satellite communication including at least one of 5G communication or *starlink*.~~

2~~9~~0. A method for remote collection of black-box data from an aerial platform comprising:

measuring electromagnetic signals of one or more frequency ranges obtained from a sensor collecting data suitable for recordation by a black-box of the aerial platform, to obtain measured data indicative thereof, where said measuring is performed from regions in the vicinity of a black-box cable, externally to said cable, such that it does not disrupt the data signals carried by said cable, which cable carrying data received directly or indirectly from said sensor to said black-box of the aerial platform for recordation by said black-box;

applying noise filtration to said measured data to thereby obtain noise filtered signals indicative of ~~said~~ at least part of the measured data sensed by said sensor and being indicative of at least part of said black-box data; and

processing the noise filtered signals obtained from the filtering of the measured data to generate transmission signals including data indicative of said at least part of the black-box data.

~~30. The method of claim 29 wherein:~~

~~said measuring of the electromagnetic signals is performed from regions in the vicinity of a cable carrying data received directly or indirectly from said sensor to said black-box of the aerial platform for recordation by said black-box; and wherein said measuring is performed externally to said cable, and such that it does not disrupt the data signals carried by said cable; and wherein said noise filtration is applied to said measured data to thereby obtain noise filtered signals indicative of said at least part of the data communicated through said cable, and to filter out noise introduced to the measured data due to performance of the measurement externally to said cable.~~

31. The method of clam 30, wherein said one or more frequency ranges comprise at least one predetermined data frequency range indicative of frequencies by which said data is communicated through said cable; said measuring of the electromagnetic signals also includes extracting said predetermined data frequency range from the electromagnetic signals being measured, and thereby obtaining the measured data indicative of the data signals.

32. The method of claims 30 or 31, further comprising:

measuring data indicative of power supply provided to the black-box;

processing the data indicative of power supply to determine a power state of said black-box;

including said data indicative of the power state in said transmission signals to be transmitted to the remote receiver.

33. The method of clam 32, wherein at least one of the following:

said power supply is provided to the black-box via said cable, and said one or more frequency ranges comprise at least one predetermined power supply frequency range indicative of frequencies by which power supply is provided via said cable to the black-box;

said power supply is provided to the respective black-box via another cable, and said measuring of the data indicative of the power supply further comprises measuring electromagnetic signals in proximity to the another cable at a predetermined power supply frequency range at which said power supply is provided to the respective black-box; and

wherein the method comprises extracting a portion of the electromagnetic signals being measured, which is associated with said predetermined power supply frequency range.

34. The method of claim 32 or 33, wherein said power state of the black-box is indicative of whether the black-box has malfunctioned.

~~35. The method of any one of claims 29 to 34, comprising receiving positioning signals indicative of position of said aerial platform; and processing said positioning signals to include data indicative thereof in said transmission signals to the remote receiver.~~

~~36. The method of any one of claims 29 to 35, wherein the noise filtration comprises utilizing reference data indicative of a predetermined protocol by which the data is communicated to the black-box via said cable, and processing the measured data according to said reference data to identify portions of the measured signals which are in compliance with said predetermined protocol, and filtering out noise portions of the measured data which are not compliant with said predetermined protocol.~~

~~37. The method of claim 36, wherein said reference data of the predetermined protocol is indicative of at least one predetermined modulation/pattern by which the data is communicated to the black-box; and wherein said noise filtration comprises applying processing to the measured data to identify portions thereof which are compliant with/match said modulation/pattern and include the identified portions in said noise filtered signals.~~

~~38. The method of any one of claims 36 or 37, wherein the portions compliant with said modulation/pattern are demodulated to form demodulated portions being indicative of parts of said noise filtered signals.~~

~~39. The method of any one of claims 36 to 38, wherein said predetermined protocol is indicative of at least one predetermined packet format characterizing a predetermined structure of transmission packets included in said data; and wherein said noise filtration further comprises applying processing to the measured data, or to the demodulated portions thereof, to identify parts thereof which are compliant with said predetermined packet format modulation.~~

~~40. The method of any one of claims 29 to 35, wherein said measuring of the electromagnetic signals is performed from a plurality of different spaced apart regions in~~

the vicinity of said cable; said measured data thereby includes a plurality of measured data pieces associated with the measurements near the different regions of said cable; and

whereby the measured data pieces obtained from said the different spaced apart regions include:

a *signal of interest* part, which is indicative of said at least part of the data communicated through said cable, and is therefore relatively highly correlated between the measured data pieces; and

noise/clutter parts, which are sensed in the vicinity of the different spaced apart regions of said cable and which do not originate from the data communicated through said cable, and therefore have relatively lower correlation between the measured data pieces from the different spaced apart regions; and

wherein said noise filtering comprises carrying out a correlation processing to at least diminish said *noise/clutter* parts having relatively lower correlation between the measured data pieces.

41. The method of any one of claims 29 to 40 , further comprising transmitting said transmission signals to the remote receiver.