Claims

1. An air defense system configured for anti-aircraft combat, wherein said system is comprised of:

- at least one counter countermeasures device (1) configured for generating and emitting simulated missiles (3b), with electromagnetic radiation of wavelengths that mimics real anti-aircraft missiles (21), which are detected by an anti-aircraft missile warning and detection system (11) installed on an aircraft (10) and
- at least one anti-aircraft weapon system (20) with embedded weapon electronic circuit (20a), and configured for launching at least one anti-aircraft missile (21),

wherein said counter countermeasures device (1) is implemented as a standalone device or is attached to or is integrated into the anti-aircraft weapon system (20), and wherein emitting of simulated missiles (3b) and launching of anti-aircraft missiles (21) are coordinated;

characterized in that the air defense system additionally includes a sensor subsystem (30) configured for detecting and acquiring information about the aircraft (10), and/or for detecting, analyzing, and recording or counting ejected flares (12), and/or for sensing of IR lasers emitted from directional infrared countermeasures systems on the aircraft (10);

wherein the sensor subsystem (30) is located on the counter countermeasures device (1);

wherein the sensor subsystem (30) is configured for detecting and acquiring information about the aircraft (10) before generating and emitting simulated missiles (3b).

2. The air defense system according to claim 1, wherein the counter countermeasures device (1) comprises an EM source unit (3), an electronic control circuit (4) with processing, memory, and EM source unit (3) driving capabilities, a trigger unit (5), and a power unit (6),

wherein the EM source unit (3) comprises at least one EM source (3a) and is configured for emitting simulated missiles (3b) or sequences thereof, wherein each simulated missile (3b) is defined by a profile which comprises duration, wavelength and intensity of EM radiation emitted by EM source unit (3),

wherein the trigger unit (5) is configured for selecting the profile of the simulated missile (3b) or a sequence thereof, and for activating the counter countermeasures device (1) and

wherein the electronic control circuit (4) is configured for driving the EM source unit (3), for storing the profiles of simulated missiles (3b) and sequences thereof in a memory, for receiving an input from the

trigger unit (5) and for running the counter countermeasures software module which operates the counter countermeasures device (1).

3. The air defense system according to claims 1 and 2, wherein the electronic control circuit (4) has connection means (7) for enabling cable or wireless connection between the electronic control circuit (4) and other electronic devices, such as for example an external computer for programming the electronic control circuit (4), including uploading, modifying, and updating the profiles of the simulated missiles (3b).

4. The air defense system according to claims 1 and 3, wherein the EM source unit (3) comprises multiple EM sources (3a) emitting light of the same wavelength or emitting light of different wavelengths operating simultaneously and/or with a time shifted difference, and wherein the EM sources (3a) are arranged in arrays, each individual array emitting light of the same wavelength or emitting light of different wavelengths.

5. The air defense system according to claims 1 to 4, wherein the EM source unit (3) is configured for emitting UV light in solar blind region, and/or IR light in short wave region - SWIR, or medium wave region - MWIR, and/or laser light in IR region - SWIR region, or UV light in solar blind region.

6. The air defense system according to claims 1 to 5, wherein the counter countermeasures device (1) additionally comprises a mechanical or optical sight (8) installed on top or side position of an enclosure (2) into which the counter countermeasures device (1) is installed.

7. The air defense system according to claims 1 to 6, wherein the counter countermeasures device (1) additionally comprises an attachment harness (9) for attachment of the device (1) onto the anti-aircraft weapon systems (20).

8. The air defense system according to claims 1 to 7, wherein the anti-aircraft weapon system (20) additionally comprises a weapon connection means (7a) configured for connecting the weapon electronic circuit (20a) with the electronic control circuit (4) on the counter countermeasures device (1).

9. The air defense system according to claims 1 to 8, wherein the counter countermeasures device (1) is located essentially on the same geographical location as the anti-aircraft weapon system (20), or the counter countermeasures device (1) is located on different geographical location.

10. The air defense system according to claims 1 to 9, wherein a triggering sequence of the counter countermeasures device (1) and of the anti-aircraft weapon system (20) is done manually, or when the

counter countermeasures device (1) is located on different geographical location as the anti-aircraft weapon system (20), the triggering of the counter countermeasures device (1) and of the anti-aircraft weapon system (20) is done remotely via known technologies, such as wired for example copper or fiber, or wireless link, such as WiFi, LoRa, specific military link, directional microwave link or laser based communication link.

11. The air defense system according to claims 1 to 10, wherein the triggering sequence of the counter countermeasures device (1) and of the anti-aircraft weapon system (20) is controlled by a synchronization software module, wherein said synchronization software module runs on the electronic control circuit (4) of the counter countermeasures device (1) or on an additional electronic circuit with processing, memory storage and communication possibilities, wherein the additional electronic circuit is through the connection means (7, 7a) connected to the electronic control circuit (4) and/or to the weapon electronic circuit (20a).