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ADVISORY CIRCULAR



DEPARTMENT OF TRANSPORTATION
Federal Aviation Administration
Washington, D.C.

Subject: USE OF PYROTECHNIC VISUAL DISTRESS SIGNALING DEVICES IN AVIATION

1. **PURPOSE.** This advisory circular suggests standards and procedures for the acquisition, use, and storage of pyrotechnic visual distress signaling devices that are intended for use in aircraft emergencies.

2. **BACKGROUND.** Although a variety of safe and effective pyrotechnic signaling devices have been available to the aviation community for many years, it has come to the attention of the Federal Aviation Administration (FAA) that many pilots and operators of aircraft are utilizing distress signaling devices that are inherently dangerous, as well as being ineffectual when used in an actual emergency. Typical of the problem is the use of "railroad flares," which produce an excessive amount of highly flammable slag, usually burn the user when hand held, and are easily extinguished when used in open bodies of water. Also, the incendiary nature of these and other unsafe pyrotechnics presents a problem for their safe and proper storage in the aircraft environment.

a. In addition, Parts 91, 121, 125, and 135 of the Federal Aviation Regulations (FAR) require the carriage of at least one pyrotechnic signaling device for extended overwater operations.

b. Predicated on the foregoing, this advisory circular was propounded to guide the pilot/operator in the acquisition and proper use of these devices. It will also provide suggested criteria to meet the requirements of the regulations.

3. **DEFINITION.** For the purpose of this advisory circular, reference to "Coast Guard Approved" implies the minimum standards suggested by the FAA for the acquisition and use of pyrotechnic visual distress signaling devices. Our reliance on the Coast Guard expertise in the area of pyrotechnic signal device performance criteria is predicated on their historical involvement with the entire spectrum of search and rescue techniques, many of which they have originated and successfully implemented.

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4. TYPES OF VISUAL DISTRESS SIGNALS. There is a wide variety of signaling devices and no single device is ideal under all conditions and for all purposes. The most popular, because of cost, are the smaller pyrotechnic devices. Pyrotechnics make excellent distress signals, and are universally recognized as such, but have the drawback that they can be used only once. Consideration may be given to carrying several types. For example, an aerial flare can be seen over a long distance on a clear night, but for closer work, a hand-held flare may be more useful.

a. Coast Guard approved visual distress signaling devices are divided into three general categories:

- (1) Daylight signaling devices.
- (2) Night signaling devices.
- (3) Signaling devices acceptable for both day and night.

b. The following table lists the current "Coast Guard Approved" devices:

Number Marked On Device	Device Description	Accepted For Use
160.021	Hand-held red flare distress signals. (These signals must have a manufacture date of October 1, 1980, or later, to be acceptable.)	Day & Night
160.022	Floating orange smoke distress signals. (5 Min.)	Day Only
160.024 160.028	Pistol-projected parachute red flare distress signals. (These signals require use in combination with a suitable approved launching device.)	Day & Night
160.036	Self-contained rocket-propelled parachute red flare distress signals.	Day & Night
160.037	Hand-held orange smoke distress signals.	Day Only
160.057	Floating orange smoke distress signals. (15 min.)	Day Only
160.066	Red aerial pyrotechnic flare distress signals. (These devices may be either meteor or parachute type and may need an approved, suitable launching device.)	Day & Night

5. WHEN AND HOW TO USE THEM. Visual distress signaling devices are part of your aircraft's safety equipment. Check to see that they are onboard before departure so that they may serve their intended purpose and summon help, should the need arise. Visual distress signals can only be effective when someone is in a position to see them. Therefore, when employing pyrotechnic devices, do so only when you see or hear a boat or aircraft, or you are reasonably sure that someone is in a position to see your signal and take action. Good judgment is an essential part of the successful use of visual distress signals.

a. Red hand-held flares can be used by day, but are most effective at night or in restricted visibility, such as fog or haze. Hand-held pyrotechnic devices, such as flares and smoke signals, may expel ash and slag as they burn. Even though these particles cool quickly, they can cause painful burns or ignite materials that burn easily. The flare itself is very hot and can start a fire if it is dropped. Therefore, when burning, these devices should be held in such a way that hot slag cannot drip on the hand or arm.

b. The hand-held and the floating orange smoke signaling devices are good day signals, especially on clear days. Both signals are most effective with light or moderate winds. Higher winds tend to keep the smoke close to the water and disperse it, which makes it hard to see.

c. Red parachute flares, either pistol launched or hand-held rocket propelled, are good distress signals for both day and night because of their altitude, slow descent, and brilliant intensity. Their slow descent, however, makes them drift with the wind, which can lead a would-be rescuer away from the rescue site.

d. Pistol-launched or self-contained rocket-propelled red meteors can be used by day, but are most effective at night. Because of their rapid descent they are less affected by wind than are slower descending signals. However, the burning time is also shorter and, therefore, they are not as readily observed as the slower descending signals. Whenever a pistol or hand-held rocket-propelled distress signal is used, the wind must always be taken into account. When firing the device in calm winds keep your arm at approximately 60° above the horizon, with the wind at your back. As the wind increases, increase the angle of the arm up to, but no more than, 80° to 85°. No pyrotechnic device should be fired straight up in calm wind so as to preclude the device falling back on the individual.

6. HANDLING AND STORAGE.

a. If young children are frequently aboard your aircraft, careful selection and proper stowage of visual distress signals become especially important. Projected devices, such as pistol-launched and hand-held parachute flares and meteors, have many of the characteristics of a firearm and must be handled with the same caution and respect. If you elect to carry pyrotechnic devices, to preclude an accident in the event these devices fall into the hands of children, you should select those devices that are not easily ignited and are packaged in durable containers.

b. Pyrotechnic devices should be stored in a cool, dry location and must be readily accessible in case of an emergency. Care should be taken to prevent puncturing or damaging of their coverings. A watertight container such as a

surplus ammunition box painted red or orange and prominently marked "DISTRESS SIGNALS" is recommended.

c. Coast Guard approved pyrotechnic devices carry a service life expiration date. Currently, this date may not exceed 42 months from the date of manufacture.



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