NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB 14391-2026

Replacing GB 14391-2021

Technical specifications for 406 MHz distress beacons

406 MHz遇险示位标技术规范

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1.Scope This document specifies the general requirements for the 406MHz distress beacon of the International Search and Rescue Satellite System, and the first and second generation distress beacons. Technical requirements and certification and testing requirements. This document applies to three types of distress beacons. 406MHz emergency radio beacons, personal location beacons, and emergency locator transmitters. The design, research and development, production, use and management of [the product/service].

1 Scope

GB 14391-2026 replaces the performance standard for satellite EPIRBs with a technical specification built around the 406 MHz distress beacon, and its structure shows why: it carries separate requirement sets for first-generation and second-generation beacons, the latter being the higher-data-rate design Cospas-Sarsat is migrating to. It covers the general requirements, the technical requirements for each generation, the certification and testing, and adds normative annexes on the protocol coding options, the emergency codes describing the nature of the distress and the functional requirements for the return link service that confirms to the survivor that the alert was received. Issued on 25 May 2026, in force from 1 December 2026, replacing GB 14391-2021. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the edition it replaces are taken from there. The clause text, the tables and the numeric limits are not reproduced on this page - they are in the document itself, which is delivered in full in English translation.

5.1.3.6 Data Encoding Data encoding should use biphase L encoding, as shown in Figure

2.The value of a particular bit should be determined by the change in level within half a bit cycle of that bit length. The transition is represented by rising/falling to indicate a binary "1" and a binary "0". Figure

2 Schematic diagram of biphase L-coding and modulation

5.1.3.7 Modulation 5.1.3.7.1 The transmitted signal shall be phase-modulated to a peak value of ±

0.1 rad, as shown in Figure 2. 5.1.3.7.2 The rise (tauR) and fall (tauF) times of the position indicator modulation waveform should be 150μs ± 100μs. The rise (tauR) and fall (tauF) times of the ELT(DT) modulation waveform should also be 150μs ± 100μs. The rise (tauR) and fall (tauF) times should be 50μs~150μs, as shown in Figure 3. 5.1.3.7.3 The symmetry of the modulated signal is an index describing the symmetry of the modulated signal before and after a phase transition in the middle of a data symbol. The definition of symmetry is shown in Figure

4.The index should meet the requirements of formula (1).

5.1.3.8 Voltage Standing Wave Ratio When the VSWR is any value between

1.1 and 3.1, the modulator and the 406MHz transmitter shall meet the requirements in addition to those specified in 5.1.3.3. All requirements must be met, and the load should not be compromised by open or short circuits.

5.1.3.9 Maximum Continuous Launch The design of the position beacon should limit any accidental continuous 406MHz frequency transmission to within 45 seconds.

4 General Requirements

4.1 Classification of Position Markers The 406MHz distress beacon (hereinafter referred to as "distress beacon") is divided into FGB and SGB according to technological evolution, and further divided according to usage scenarios. The three categories are EPIRB, ELT, and PLB.

4.2 Emergency Radio Position Beacon EPIRB is applicable to distress scenarios involving ships and offshore facilities and should be equipped with.

a) Free-floating release and activation device;

b) AIS transmitter;

c) GNSS receiver.

4.3 Personal Positioning Beacon PLB is suitable for personal distress scenarios and should support manual activation. It is available in the following types.

a) Water-based type. Suitable for scenarios involving accidents on water or in the air followed by falling into the water, possessing buoyancy;

b) Land-based. Suitable for non-water-based scenarios after an emergency on land or in the air (such as parachuting or mountain rescue), and does not require buoyancy.

4.4 Emergency Positioning Transmitter ELT is suitable for aircraft distress scenarios and should be equipped with a 121.5MHz homing signal. It is divided into the following types.

a) ELT(AF). Permanently fixed to the aircraft, automatically activated after reaching a trigger threshold, used to locate the distressed location of the aircraft.

b) ELT (AP). Fixed inside the aircraft, automatically activated upon reaching a trigger threshold; can be removed after a crash and disposed of by survivors or life rafts. Carry it to locate the position of aircraft or survivors in distress.

c) ELT(AD). Fixed inside the aircraft, automatically activated after the sensor confirms a crash, and works normally when floating in water.

d) ELT(DT). Divided into stand-alone ELT(DT), impact ELT(DT), and combined ELT(DT). Supports automatic flight control. Alternatively, it can be manually activated and features a built-in GNSS receiver for real-time tracking of aircraft distress locations.

e) ELT(S). This device can be removed after an aircraft crash, supports manual activation or automatic activation upon deployment of life-saving equipment, and is divided into water-floating and other types. Type 1 (suitable for water-based scenarios) and Type 2 (suitable for land-based scenarios).

5.1 System Requirements

5.1.1 Essential Functional Components A position indicator should have at least the following functional components.

a) Digital information generator;

b) Modulator and 406MHz transmitter.

5.1.2 Digital Information Generator

5.1.2.1 Basic Requirements The digital information generator, used in the keying modulator and 406MHz transmitter, should transmit the digital information content defined in 5.2.

5.1.2.2 Repetition Period 5.1.2.2.1 Except for ELT(DT), the repetition period of other position indicator signals is not fixed and should be randomly distributed between 47.5s and 52.5s, with an average interval of It lasts for 50 seconds. 5.1.2.2.2 For stand-alone ELT(DT) in PDF-2 that does not contain 3LD, the repetition period shall meet the following requirements.

a) Phase 1 (0s~120s). 24 signals are transmitted, with a time interval of 5s±0.2s between adjacent signals; the first signal is emitted from the position indicator. Transmission will begin within 5 seconds of activation.

b) Phase 2 (120s~300s), a total of 18 signals are transmitted, with a time interval of 10s±0.2s between adjacent signals.

c) In stage 3 (after 300s), the time intervals between adjacent signals are evenly distributed between 27s and 30s, and the values are random. 5.1.2.2.3 For stand-alone ELT(DT) containing 3LD in PDF-2, the repetition period should meet the following requirements.

a) Phase 1 (0s~120s). 24 signals are transmitted, with a time interval of 5s±0.2s between adjacent signals. The first signal is transmitted via the position indicator. Transmission begins within 5 seconds, and starting from the second signal, 3LD is transmitted once every 4 signals.

b) Phase 2 (120s~300s). 18 signals are transmitted, with a time interval of 10s±0.2s between adjacent signals; the 25th signal is emitted. After 5s ± 0.5s, the first signal containing 3LD is transmitted, and thereafter a signal containing 3LD is transmitted every 6 times, plus... The 3LD signal was transmitted a total of 21 times.

c) Phase 3 (300s later). The 46th signal is transmitted once every 28.5s on average after the start of the 45th signal, with the time interval between adjacent signals... The values are uniformly distributed between 27.0s and 30.0s, and are randomly selected; after the 61st signal ends and every 30 subsequent signals, the values are determined by the previous signal. Within 15s ± 0.5s after the signal begins, a signal containing 3LD is sent once. 5.1.2.2.4 The repetition cycle of the impact-type ELT (DT) should meet the following requirements.

a) If the ELT(DT) has a crash detection function, and it is activated or reactivated within 5 seconds after a crash, then the ELT(DT) is considered to be activated. It is active and will continue to transmit signals at least 95 times (approximately 30 minutes).

b) The average signal transmission time interval (TR) after the 95th transmission is 120s, and it is evenly distributed between 115s and 125s.