SPECIFICATIONS OF THE 121.5 MHZ TRANSMITTER

1. Principles:

The transmitter broadcasts a signal for 0.75 seconds every 2.25 seconds on 121.5MHz, amplitude modulated.
The power to the antenna is equal or more than 30mW for 24 hours in an ambient temperature of 20°C.
Withdrawing the antenna starts the continuous transmission.

The transmitter consists of :

- quartz oscillator,
- power stage,
- clock and modulator,
- power supply,
- antenna.

2. Reliability :

2.1 *Life*

The device is expected to remain functional for at least 50,000 hours at 30°C.

2.2 *Quality control*

Compliance with the industrial-process DQA 00038 specification, published by quality service of *Dassault Automatismes et Télécommunications.*

3. Environmental constraints :

3.1 Climate

3.1.1 Operating conditions

Conditions in which the transmitter functions indefinitely at constant performance. The equipment is designed to keep within its operating specifications under the following conditions :

- Temperature : -10°C to +85°C (*)
- Humidity : RH ≤ 95%
- Water resistance : Non-resistant material

(*) The specified duration of transmission is guaranteed at 20°C.

3.2.2 Storage conditions

- Temperature : -40°C to +100°C
- Humidity : RH ≤ 95%

3.3 Electromagnetic environment

The equipment is not designed to function close to a powerful transmitter.

4. Power Specifications :

4.1 Electrical specifications

- Mean transmitting frequency : 121.5MHz ± 3.5kHz
- Phased signal rejection 2 : > 15dB
- Phased signals rejection >2 : ≥ 25dB outside modulation spectrum
- Peak modulated power to antenna : ≥ 30mW
- Modulation type : AM

- modulation rate from 85% to 100%,
- signal modulation by decreasing sweep on a minimum frequency range of 700Hz in the 1600Hz to 300Hz band. Sweep frequency from 2Hz to 4Hz,
- utilization rate of modulation signals to the carrier wave: 33% to 55%.

- Antenna 43 cm tuned.

- The transmitter is powered by extracting the antenna. During transmission, a CMOS signal generates a visual display on the watch.

- Power supply is from two 3V lithium batteries, which will maintain transmitting power from 24 to 48 hours at a minimum temperature of 20°C.

5. Dimensions :

- Module diameter : ≤ 32mm
- Height of electronic components : ≤ 4mm
- Height of batteries and housing : ≤ 6mm

1. INTRODUCTION

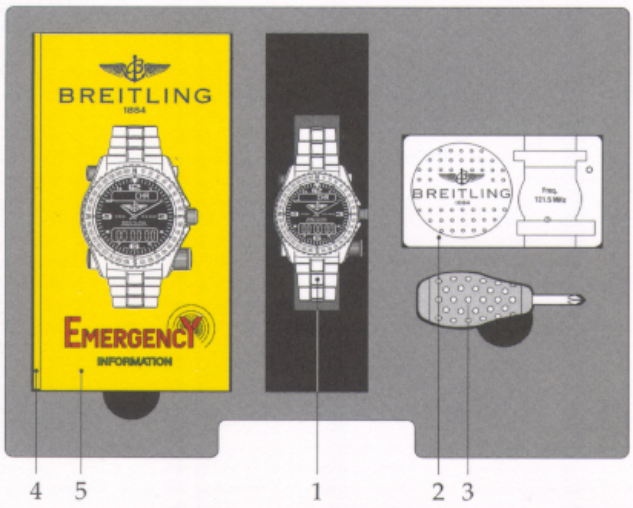
The BREITLING EMERGENCY is a back-up survival instrument for pilots. It consists of a multi-function watch equipped with a miniature transmitter to locate people in distress. The miniature radio transmitter broadcasts a signal on the international aviation distress frequency of 121.5MHz, used by all rescue services. The EMERGENCY complements the 121.5MHz distress beacons in aircraft. Designed to be worn on the wrist, it is not intended as a primary distress beacon.

Warning: The transmitter may only be activated in the case of distress in aviation. Unwarranted operation of the transmitter is subject to a fine and may entail additional costs for search and rescue activities launched in response to a signal on the distress frequency. The owner is exclusively liable for any consequences (including prosecution) of misuse by any party. Neither the manufacturer of the transmitter nor its distributor can be held responsible for any improper use.

2. CONTENTS OF THE EMERGENCY CASE

The BREITLING EMERGENCY watch is delivered in a case containing the following:

1. EMERGENCY transmitter-watch
2. Test receiver with separate batteries
3. Cross-head screw-driver
4. Presentation video (VHS)
5. Instruction manual



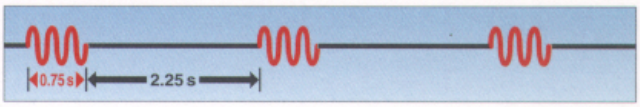
3. DESCRIPTION

3.1 The 121.5MHz frequency

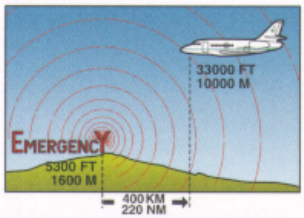
The 121.5MHz radio frequency is reserved internationally for aeronautical distress transmissions.
All aircraft operating under international civil-aviation rules carry a radio beacon set to 121.5MHz and 243 or 406.025 MHz. In the event of a crash, this beacon automatically broadcasts signals to alert and guide rescue services. The EMERGENCY personal transmitter-watch complements the aircraft's distress beacon and increases the chance of being found.

3.2 Transmission and range

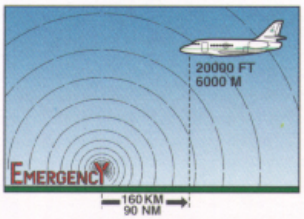
The transmitter-watch broadcasts an amplitude-modulated signal on 121.5MHz for 0.75 seconds every 2.25 seconds. In addition, the EMERGENCY identifies its signal by transmitting the Morse letter B (–···) every 60 seconds.
The transmitter will broadcast for 24 to 48 hours according to the state of the battery and the temperature. Its power is rated at a peak of 30mW.



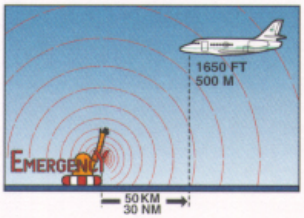
The range of the signal transmitted by the BREITLING EMERGENCY varies according to the terrain, the location of the transmitter and the height of the search aircraft above the transmitter.



In ideal conditions, transmitting from a mountain peak, for example, the distress signal can be picked up 400km (220nm) away by an aircraft flying at 10,000m (33,000ft).



From flat land, the range depends on the height of the aircraft. The signal carries 36km (20nm) to an aircraft at 900m (3000ft) and 160km (90nm) to an aircraft at 6000m (12,000ft).



The range from a boat at sea is the same as that from a flat area (see above). Signals from a survivor floating in a lifebelt in calm sea can be received an estimated 50km (30nm) away by an aircraft at 500m (1650ft).

In deep valleys or broken terrain, the range of the transmitter is largely determined by its location.