

SARBE G2R[®]

Personal Locator Beacon



SARBE G2R - Global Reach & Recovery



Signature Industries

SARBE G2R®

Global Reach & Recovery

World Emergency Locator and Communicator

Introduction to G2R

Innovation, quality and flexibility are built into the G2R. The most advanced product ever to bear the famous SARBE name brings a new level of performance to the Personal Locator Beacon.

Key Features

- Software defined dual role Personal Locator Beacon
- Peacetime role - Search and Rescue, SAR
- Combat role - Combat Search and Rescue, CSAR
- COSPAS-SARSAT approved
- Precise global location with GPS
- 406MHz digital data transmissions
- 121.5MHz & 243MHz SAR homing/voice frequencies
- Programmable training channels
- 3000 programmable CSAR frequencies
- Automatic or manual activation
- Encryption for secure data communication
- Mission abort function prevents unauthorised use
- One touch silence
- Automatically deployed antenna options
- Unique 90° pull-pin activation mechanism
- Infra-Red programming
- Combat rescue system with SARFIND
- Quick change "Twist Fit" battery
- 5 year battery life (unused)



CSAR LPI/LPD

In CSAR mode, a short, randomised burst data transmission, along with the ability to stop and restart data transmissions on demand ensures extremely low probability of intercept/detection (LPI/LPD).

SARBE - Saving lives for over 50 years

The SARBE range of Personal Locator Beacons is in Tri-Service use on every continent. Forces in over 40 countries rely on SARBE for their peacetime and combat PLB needs.

The SARBE range of products from SARBE 5 to SARBE 10 is proven in the field and meets the rigorous demands of combat and peacetime recovery missions. Since World War 2, when our first Locator Beacon was launched, SARBE has become the standard by which endurance and performance are measured.

The SARBE range includes the SARBE10 SPLB, Submarine Personal Locator Beacon and the BE369/406 ADELM, Aerial Deployed Emergency Locator Marker. Both of these products are available with 406MHz.

SARBE G2R - Questions & Answers

- **Why 406MHz ?**
 - Virtually instant global alerting
 - Improved location accuracy
 - True global coverage
 - Unique identity of each beacon
- **Why 121.5/243MHz ?**
 - Needed for local homing
 - Two way voice for final talkdown
- **Why GPS ?**
 - Accuracy to within 10 metres with SARFIND
 - Accuracy to 120 metres SAR role
 - Reduces rescue time, increased survivability
- **Why CSAR/SAR modes ?**
 - **Search and Rescue mode** - SAR uses the COSPAS-SARSAT satellite network during non-combat situations, allowing the rescue mission to be activated
 - **Combat Search and Rescue mode** - CSAR allows covert rescue missions to be undertaken using encrypted positional data and random burst transmissions
- **Why encryption ?**
 - Protects GPS position information, LPI/LPD, ensuring hostile forces remain unaware of position
- **Why open voice ?**
 - Allows "Friend or Foe" confirmation of survivors identity during final approach before pickup
 - Increased survivor confidence
- **Why alternative frequencies to 406MHz, 121.5MHz and 243MHz ?**
 - Allows covert operations and training on non-emergency channels
- **Why antenna options ?**
 - Allows flexibility to place beacon anywhere on body
 - Allows antenna to be placed in optimum position for range and GPS pickup



Features of 406MHz Global

- Digital message with beacon identity and optional GPS location
- Near instantaneous COSPAS-SARSAT response across the majority of the earth's surface (between 70° North and 70° South latitude)
- Less than 1 hour COSPAS-SARSAT response time in polar regions

Features of 121.5MHz, 243MHz Local

- Provides local communication to civilian and military aircraft and shipping
- Range - @ 10,000ft - swept tone >100nm
- voice >30nm
@ 1,000ft - swept tone >32nm
- voice >10nm

121.5MHz, 243MHz Local



225MHz -300MHz Private



Features of 225MHz - 300MHz Private

- Provides local communication to military aircraft and shipping carrying a SARFIND decoder
- Data signal is encrypted to ensure LPI/LPD and carries the beacon identity and GPS location
- Range - @ 10,000ft - data >50nm
- voice >30nm
@ 1,000ft - data >16nm
- voice >10nm

Automatic beacon activation and antenna deployment

SARBE Personal Locator Beacons are carried by fast jet aircrew around the world as part of their essential flight equipment.

To assist in the fast location of downed aircrew after an ejection has taken place SARBE have developed a system which automatically activates the beacon and deploys the antenna into optimum position.

By automating the activation of the beacon it ensures that even where aircrew are unconscious or injured, SAR transmissions will be initiated immediately, with no human intervention required.

G2R can be configured to operate with any ejection seat mechanism and the unique 90° activation pull-pin ensures total flexibility when positioning the beacon on the aircrew. The antennas can be tailored and supplied ready for mounting on to most life preservers.

SARBE's team of engineers have a wealth of experience in resolving complex issues relating to antenna deployment and performance. Our problem solving skills in this area are unparalleled within the field of Search and Rescue Beacons.





Technical & Mechanical Specification

RF Specification for SAR, CSAR and Trainer modes

- SAR mode**
- **Primary frequencies:**
 - 406MHz - COSPAS-SARSAT data (identity and GPS location)
 - 121.5MHz, 243MHz - swept tone, voice, SARFIND data (identity, GPS location, time of fix, no. of satellites tracked)
 - 282.8MHz - SARFIND data (identity, GPS location, time of fix, no. of satellites tracked)
 - **Power output:**
 - 406MHz - 5 watts
 - 121.5MHz - 200mw
 - 243MHz - 400mw
 - 282.8MHz - 500mw
- CSAR mode**
- **Additional combat frequencies:** 3000 between 225MHz & 300MHz, voice, SARFIND data (identity, GPS location, time of fix, no of satellites tracked)
 - **Power output:** @ 282.8MHz - 500mw
 - **Data burst:** 300 millisecond, randomised
 - **Encryption:** 256 bit as standard
- Trainer mode**
- **Offset frequencies:**
 - between 119MHz & 124MHz - voice and swept tone
 - between 238MHz & 248 MHz - voice and swept tone
 - **Power output:**
 - 119MHz - 124MHz 200mw
 - 238MHz - 248MHz 400mw

RF specifications common to all modes

- **TX/RX Audio response:** 300Hz - 2500Hz
- **TX/RX Distortion:** Typically 10% @ 85% modulation
- **RX Sensitivity:** 4 microvolts - VHF + UHF
- **RX Audio output:** 25mw
- **RX IF selectivity:** 6dB down, at +/- 15KHz
- **TX Modulation:** 85% AM voice + swept tone
- **TX Harmonics:** -40dB below carrier
- **TX Range:**
 - @ 10,000ft - swept tone >100nm
 - data >50nm
 - voice >30nm
 - @ 1,000ft - swept tone >32nm
 - data >16nm
 - voice >10nm

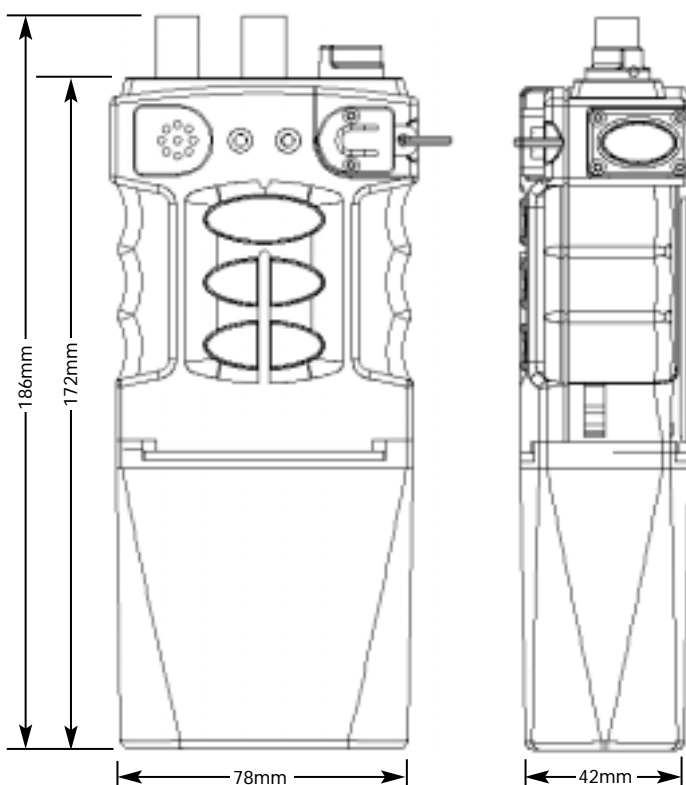
Mechanical Specification

- **Weight:** 780gms
- **Dimensions:** H186mm x W78mm x D42mm
- **Waterproof:** To depth greater than 10m
- **Operational temp:** -40°C to +55°C
- **Battery type:** 6v LiMNO2 - 2 'D' cells
- **Battery life:** 5 Years (unused)
- **Endurance:** 18 - 36 hours depending on role

GPS Specification

- **Type:** 12 channel parallel LI/CA code
- **Transmission frequency:** Transmits GPS co-ordinates on VHF, UHF and 406MHz
- **Co-ordinate systems:** Geodetic lat /long WGS84
- **Global accuracy:** 10m with SARFIND, 120m SAR role

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SARFIND

SARBE DECODER

SARFIND, the SARBE GPS decoder, provides the user with a position and identity readout of up to 64 individually tracked beacons. SARFIND may be programmed to decode either standard SAR transmissions or Combat mode transmissions.

GENERAL DESCRIPTION

SARFIND is a 'Carry On - Carry Off' unit that incorporates a rechargeable power source providing not less than 18 hours endurance with complete independence from the aircraft power system. Using SARFIND simply involves connecting the integral headset lead to the aircraft communications system.

During operation, the SARFIND front panel display provides the following information about the detected SARBE:

- a) Beacon Identity.
- b) Beacon position in Latitude and Longitude.
- c) Time elapsed since reception of last beacon transmission.
- d) Time of GPS acquisition by beacon.

An audible alert tone is provided, which sounds when a successful position decode is established. This function may be disabled at any time by operation of the 'ALARM INHIBIT' switch.

The front panel display is optically filtered to give best viewing under adverse conditions. The display is NVG compatible.

PROGRAMMING

The SARFIND may be programmed to operate in either SAR or Combat mode. In SAR mode, SARFIND will respond to any SAR coded SARBE transmission. It will not detect or respond to a SARBE operating in the Combat mode.

In Combat mode, the following parameters may be programmed into SARFIND:

- a) Mission operating code.
- b) SARBE call signs for up to 64 beacons.
- c) Single beacon detection (SARFIND will respond to a specific user identity provided the correct mission code is also received).
- d) Group beacon detection (SARFIND will respond to a specific group of user identities provided the correct mission code is also received).



Technical Specification

Operating Frequency

Audio from standard aircraft receiver

Input Level

Input level from radio system: 0.5Vpp to 10Vpp

Input Impedance

Greater than 50KΩ

Receiver Sensitivity

For successful decode the minimum receiver signal to Noise Ratio is 10dB

Mission Endurance

Not less than 18 hours

Built-in test

Comprehensive self test facilities are included

Weight

3.5 kilo including battery

Size

232mm x 210mm x 91mm



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SARBE G2R - Standard models - Options and Customisation

Dual role SAR/CSAR	• G2R	A fully featured emergency beacon and survival radio with CSAR and SAR capability
SAR role	• G2R-64	Emergency beacon for peacetime SAR operations
SAR GPS role	• G2R-64G	Emergency beacon for peacetime SAR operations with GPS
Training	• G2R-T	Training beacon transmitting on offset frequencies

Summary of features	G2R	G2R-64	G2R-64G	G2R-T	Custom
406MHz data transmission	✓	✓	✓		○
GPS GNSS	✓		✓		○
121.5MHz swept tone transmission	✓	✓	✓		○
243MHz swept tone transmission	✓	✓	✓		○
282.8MHz voice/data transmission	✓	○	○		○
Offset frequency: 119MHz-124MHz	✓			✓	○
Offset frequency: 238MHz-247MHz	✓			✓	○
CSAR 3000 channels: 225MHz-300MHz	✓				○
Two way simplex voice	✓	✓	✓	✓	○
One touch silence	✓				○
256 bit encryption	✓				○

✓ = Standard equipment ○ = Optional

Standard Features

- IR programming port
- Built-in test
- LEDs show operating mode
- One hand operation
- Quick change "Twist Fit" battery
- Integrates with SARFIND decoder
- Manual or Automatic activation
- 5 Year battery life (unused)
- Wrist Strap
- Rubberised side grip
- Waterproof 10 metres

User Specified Features

- SAR frequencies 121.5MHz, 243MHz, 406MHz
- CSAR frequencies between 225MHz - 300MHz
- Swept Tone (SAR mode only)
- GPS - Auto / Manual update
- 3000 programmable channels
- 256 bit encryption
- Spare RAM for customer-specified encryption
- "One Touch" silence button
- Mic & speaker combined
- Volume High / Low
- Seawater activation
- G-Switch activation
- Pull-pin activation with 90° option
- Pull-pin activation force selectable
- Colours, Olive Drab/Yellow/Black/Sand or custom
- Alternative length wrist strap & pull-pin lanyards
- Language required on label



SARBE G2R, derivatives and SARFIND are designed and manufactured to meet the relevant environmental standards and conditions of STANAG 7007 edition 2 and DEF STAN 00-35 issue 2. COSPAS-SARSAT approval # 706 NSN 5825-99-148-4277

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