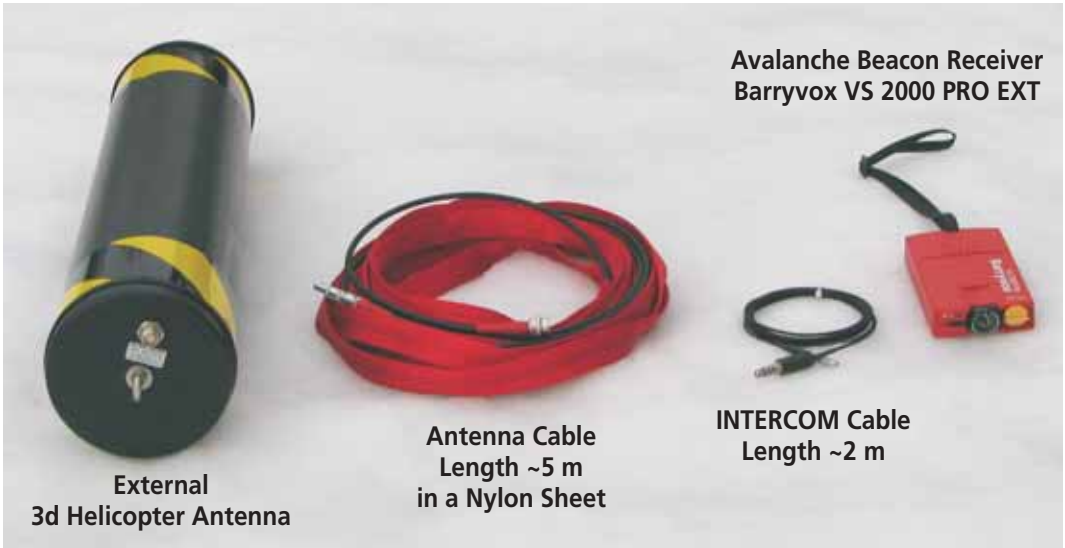
Technical Information for Setup and Use

1. SYSTEM COMPONENTS



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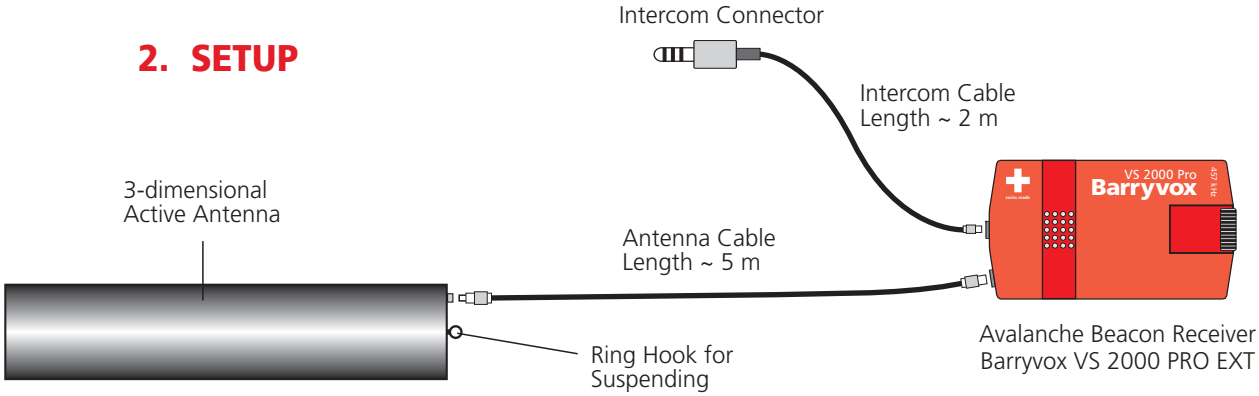
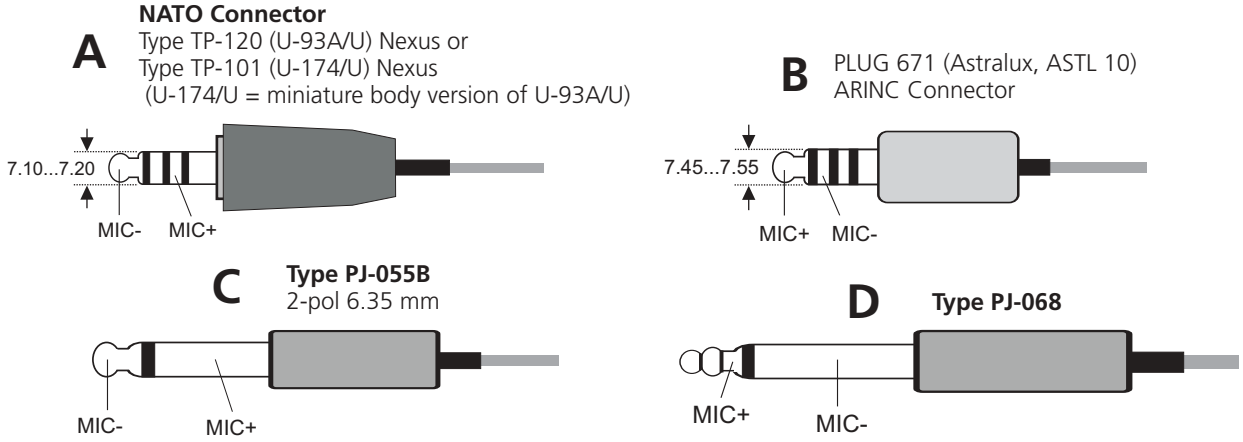
2. SETUP



3. INTERCOM CONNECTOR TYPE

Helicopter INTERCOM Systems may have any of the following connector types :



The **standard version** of the Barryvox VS 2000 PRO EXT comes with a type **U-174/U ('NATO connector')**. Other connector types are available upon request.

4. INTERCOM ADAPTATION

Electromagnetic interference from the helicopter on-board electronics may reduce the receiver sensitivity and thus the range for any kind of avalanche beacon search by helicopter. The Barryvox VS 2000 PRO EXT provides the following features for mitigating the problem:

- **External Antenna**

  The external 3d-antenna is suspended about 3 to 4 m below the helicopter. It is therefore far away from any source of interference.

- **Galvanic Separation between Beacon Receiver and On-Board Electronics**

  The electrical signal path between the beacon receiver and the on-board electronics is separated galvanically. These circuits are built into the VS 2000 PRO EXT.

- **Level Adjustment**

  The signal from the beacon is fed into the intercom system via the MIC input. It must be connected using proper impedance and signal levels. The signal level can be adjusted over a wide range by means of a dial built into the Barryvox VS 2000 PRO EXT.

  Please Note:

  For the MIC input used by the beacon, the voice control (VOX) must be disabled. All other sources (helmet microphones of the crew etc.) should have the VOX switching enabled. This will minimize background noise that may be coupled into the intercom system via the helmet microphones, thus maximizing the range. This applies in particular to the person operating the antenna and the beacon at the open door (see picture on page 1).

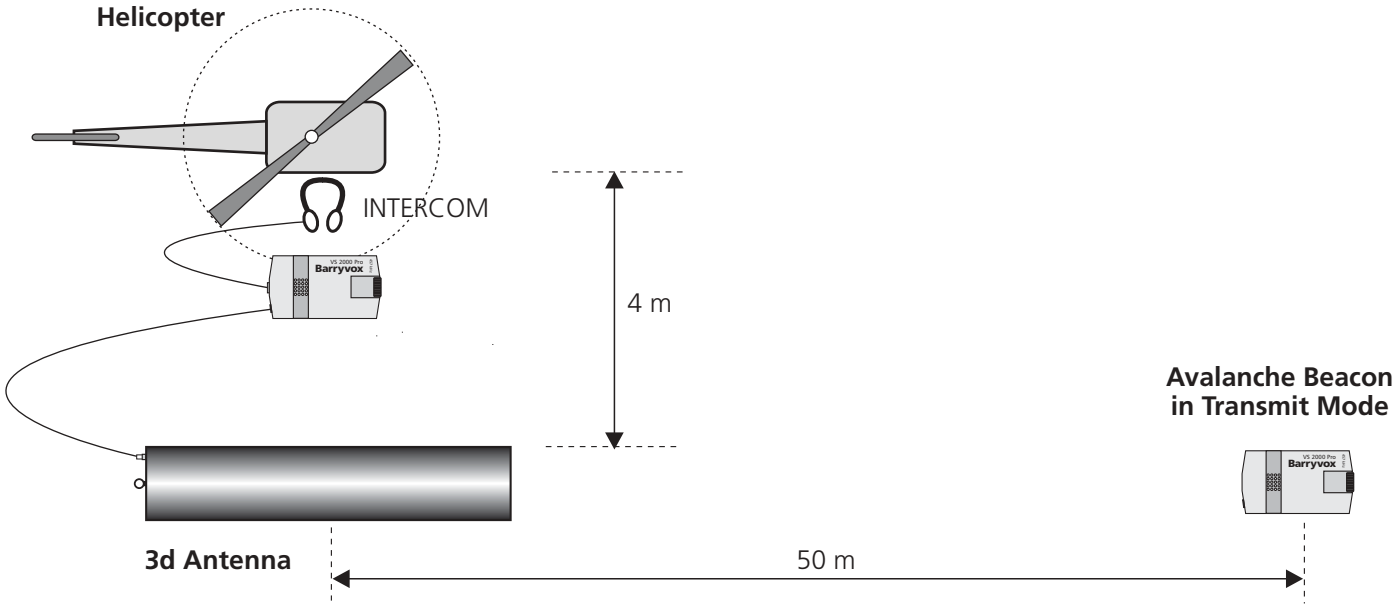
If you can not disable the VOX switching on the input from the VS 2000 PRO EXT:

Adjust the VOX threshold for this input to the lowest possible value, so the relatively low signals from the beacon are received continuously. If this also affects the setting for the helmet micorphone of the beacon operator, muffle this microphone by means of some rubber foam to avoid picking up environment noise which may override the signal from the beacon. It may make sense to additionally cover the microphone with the operator's hand while doing a coarse search in order to allow for the weak signal from the beacon to dominate.

If VOX is enabled, it may be helpful to increase the VS 2000 PRO EXT level by means of the dial and reduce the VOX threshold at the same time. **It is well worth making these adjustments carefully, because they have a major influence on the performance (range) of the beacon search system.**

The best setting will always be a compromise. Also see the hints for practical use.

5. CHECKING PROCEDURES



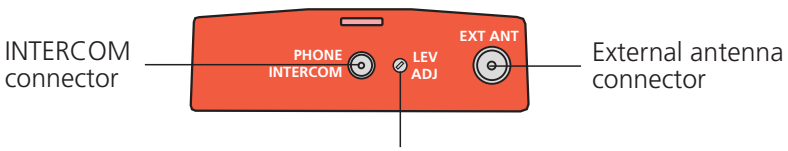
Test setup as per figure:

1. Helicopter grounded, all on-board systems off.
2. Place an avalanche beacon in transmit mode about 50 m from the helicopter (use new batteries!)
3. Connect the VS 2000 PRO EXT via the intercom cable to an intercom input of the helicopter. Make sure the VOX switch of the intercom input is disabled. If disabling is not possible or if there are other restrictions, see section 4 (intercom adaptation) for more hints.
4. Connect the 3d antenna to the VS 2000 PRO EXT and place it as shown in the figure (about 4 m from the helicopter, major axis in line with the remote transmitter, distance about 50 m).
5. Turn the VS 2000 PRO EXT on and set it for maximum sensitivity (new batteries!).
6. The beeps from the transmitting beacon must now be audible and distinct from the background noise.

7 Turn on the helicopter intercom system (but keep all other on-board systems off).

8. Adjust the dial on the VS 2000 PRO EXT by means of a small screwdriver, so that the beeps will be low volume, but clearly distinct in the headsets of the crew members (see picture).

Connections and Level Adjustment



25 turns dial for level adjustment output PHONE-INTERCOM

~ 2 mVeff ... 250 mVeff into 150 Ohms
Min. = left end position (ccw)
Max. = right end position (cw)

Both ends with slip clutch,
i.e without hard limit

Note:

Carefully adjust the PHONE-INTERCOM level by means of a small screwdriver. When done, close the dial opening with a piece of tape or a small sticker, in order to keep humidity out of the beacon.

All connections to the system **must not be used in other ways than described**.
In particular, do not feed any electrical signal (DC or AC) into the system.

Metallic objects within an area about 1 m around the antenna **may have some influence on antenna performance**. For the same reason, do not use any metal coated tape on the antenna. This also goes for reflecting material, such as Scotch-Lite etc.

9. Now successively turn on all on-board electronic systems including the turbine. If necessary, adjust the signal level by means of the VS 2000 EXT PRO dial. The signal from the transmitting beacon must remain audible despite the additional acoustical and electromagnetic interference.

Please Note:

- The environment should be **free from interference**. Use some meadow or a place where you are sure there are no underground cables or other metallic ducts.
- If the VOX on the intercom can not be disabled, the signal level dial on the VS 2000 PRO EXT may have to be set to maximum in order for the signal to be above the VOX threshold. This will have an adverse effect on the range.

6. HINTS FOR PRACTICAL USE

It makes sense to **divide the tasks between the pilot and the operator:**

- The operator installs the antenna and operates the beacon receiver (sensitivity setting).
- The pilot does the search, i.e. flying in the direction of increasing signal volume.
  He instructs the operator to adjust the sensitivity setting.

As soon as the helicopter is airborne, the operator suspends the antenna about 3...4 m below the helicopter. The antenna is attached to the helicopter be means of the Nylon sheet and descended through the open door (also see picture on page 1). Make sure there is no stress on the cable at either end. **It is not necessary to remove the protective cover (option) from the antenna for a search**.

During a **primary search**, the sensitivity dial is set to maximum (9 or longest dash), and the altitude above ground is about 20...30 m.
As soon as an audible signal is picked up, the pilot flies **in the direction of increasing volume.** Since the receive characteristic of the antenna is three-dimensional, the current orientation of the suspended antenna does not matter. Also, possible pendulum movements do not affect the receiver performance. If the volume does not increase any more, the pilot instructs the operator to reduce the receiver sensitivity.

The search can be considered terminated if the maximum volume is attained with a sensitivity setting of 6. The helicopter will be about 5 m above the buried person. By dropping a marker (e.g. a clolored cloth with an attached weight), the spot is designated.

Further procedures depend on the available resources: Either some available terrestrial personell takes over to complete the search by means of a beacon and a probe, or the operator leaves the helicopter and completes the task.

The assignment of the various tasks may be different among different organizations.
In any case, we advise to perform a thorough search practice.