

This User Instruction describes the operation of the PSS® Merlin® Repeater Units when used in conjunction with PSS® Merlin® Data Radio Unit and the PSS® Merlin® Telemetry System. It is important that the instruction be read in conjunction with the User Instructions for the following products:

1. Sentinel
2. PSS® Merlin® Telemetry System and,
3. Associated self contained respiratory protection apparatus (SCBA).

## For Your Safety

- ◆ Refer to and take note of the 'For Your Safety' statements in the Instructions for Use supplied with the selected SCBA.
- ◆ Use the equipment only for the purpose as specified in this Instruction for Use.
- ◆ Only trained competent personnel should carry out the requirements of this instruction.
- ◆ Use the equipment and any approved ancillary units only in the combination as outlined in this instruction.
- ◆ There is a duty and responsibility on employers to ensure that a safe system of work is in place for entry into and working within a hazardous environment. The owner or the operator of the equipment, described in this Instruction for Use, must ensure the safety of personnel by providing the correct and appropriate personal protection equipment to personnel allocated to use and position the equipment when entering and working in an environment identified as being hazardous.
- ◆ The PSS® Merlin® Repeater Units meet the FCC requirements regarding exposure of human beings to radio frequency radiation. Occupational/Controlled limits apply when persons are exposed to radio frequency radiation as a consequence of their employment provided these persons are fully aware of and exercise control over their exposure. Awareness of exposure can be accomplished by use of warning labels or by specific training or education through appropriate means, such as an RF safety program in a work environment.

## Liability Statement

Responsibility for reliable function of this equipment and any approved ancillary units, transfers to the owner or the operator when the equipment is serviced or repaired by untrained personnel, (not employed or authorised by Dräger) or when used in a manner not conforming to its intended use.

## Description and Intended Use

Scenarios may occur at an incident where the PSS® Merlin® entry control board (ECB) experiences a loss of radio contact with one or more of the 'Logged On' radio modules (PU's) associated with the wearer's of the SCBA.

When strategically positioned at an incident the PSS® Merlin® Telemetry Repeater Units will extend and enhance the effective transmission coverage between the ECB and the 'Logged On' PU(s). The repeater is able to receive data transmissions from any ECB or PU(s) within range and then re-transmit the data to any ECB or PU(s) within range.

The Repeater System can consist of up to two repeater units identified as Repeater No. 1 and Repeater No. 2.

The sequence for the 'In Use' positioning of the repeaters is as follows:

1. Repeater No. 1 must be in range of the ECB.
2. Repeater No. 2 must be in range of Repeater No. 1 (Chain Configuration) or in range of the ECB (Star Configuration).

*Note: For an explanation of Chain and Star Configurations refer to the chapter on Propagation in the Instruction for Use for PSS® Merlin® Telemetry.*

Contained inside a weatherproof carry case with detachable carrying strap, each repeater incorporates an integral digital radio transmitter/receiver powered from a single rechargeable battery. Also included are associated antenna and accessories. Details are as follows:

- 1 Repeater Radio/Transmitter c/w Control Box (Repeater No. 1 or No. 2).  
Frequency: 450 - 470 MHz
- 1 Rechargeable Battery.  
(Not charged or fitted)
- 1 Release Key (Battery)
- 1 Antenna Support Tube
- 1 Antenna (2m cable) c/w BNC Plug
- 1 Leaky Feeder Connection Cable
- 1 BNC "T" Adaptor (1 Plug and 2 Jacks)

It is recommended that the chapter on Propagation in the Instruction for Use for PSS® Merlin® Telemetry is studied and understood in relation to positioning of antenna, repeaters, leaky feeders etc. and the affect of obstructions to the radio signal.

## Technical Data

Frequency  
450 - 470 MHz

Dimensions  
45(cm) x 18(cm) x 10(cm)  
45(cm) x 18(cm) x 55(cm) (antenna fitted)

Weight  
2Kg (incl. battery)

Operating Temperature  
-30°C to +75°C

Battery Details  
6.5V NiMH (nickel metal hydride)  
battery - rechargeable.

Weight 0.2Kg  
Battery Life 8 hours continuous operation.  
Charge temperature range 41°F to +104°F

### Caution - Worn-out Battery

- Do Not incinerate – risk of explosion.
- Do Not puncture the battery casing – risk of explosion.
- Special waste disposal of battery - according to local waste disposal regulations. Information on this subject should be available from the local environmental and regulatory agencies and waste disposal companies.

## Charging the Battery

The battery is not charged, or fitted, to the repeater when supplied and must therefore be charged before initial use. Refer to the Order List – Accessories for details of charging units and accessories.

**Safety Note: The charging units are not approved to the same intrinsic safety standard as is applied to the repeater. Do Not attempt to charge the battery underground or in an area designated as, or subject to explosion hazard. Charge the battery in a safe area.**

Refer to the label attached to the Universal Power Supply (AC) to check that the electrical main supply voltage corresponds to the specified voltage requirement as indicated on the label.

**Important Note: The temperature of the battery is measured by a thermistor inside the battery cell. To protect the battery, the charging process will stop if the temperature of the battery is below 41°F (5°C) or exceeds +104°F (+40°C).**

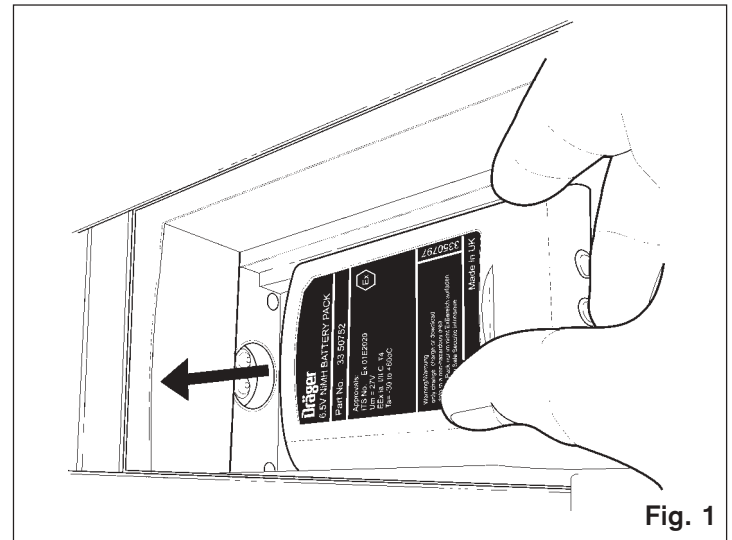


Fig. 1

1980

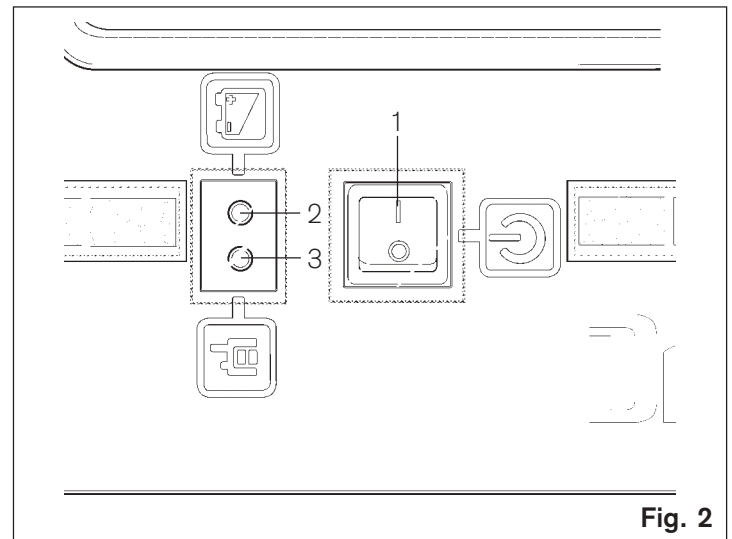


Fig. 2

1981

## Fitting the Battery

*Note: Before fitting the charged battery, check that the O ring seal of the locating boss is in position and not damaged and that the dovetail guide of the battery and the radio module are clean and not damaged.*

Refer to Figure 1.

- ◆ Partially open the lid of the carrying case, enough to access the lid of the radio module/battery compartment. Lift and fold back flat the lid to access the radio module.
- ◆ Locate the battery to the dovetail guide of the radio module then slide the battery along the guide until a positive audible 'click' is heard. Correct retention is indicated when the 'Red' indicators are visible in the two release key holes in the base of the radio module. To further ensure positive retention, grip the battery and attempt to remove - there must be no movement.

Refer to Figure 2.

- ◆ Press the toggle switch (1) Fig. 2 to the 'On' position - the 'Red' LED. (2) should begin 'flashing' confirming a satisfactory charge condition of the battery. Switch 'Off'.
- ◆ Fold back the lid of the radio module/battery compartment to close then close the main lid of the carrying case. Ensure the Velcro fastening is secure.
- ◆ The repeater is now ready for operational use.

*Note: With the toggle switch (1) Fig. 2 in the 'Off' position no power is used from the battery.*

## In Use

**Safety Warning: Refer to 'For Your Safety' regarding the duty and responsibility on employers.**

**Important Note: Before operational use of the repeater(s) ensure that a fully charged battery is fitted. Switch 'On' the repeater - an intermittent short 'flash' 'Off' of the 'Red' LED signals a low charge condition of the battery - recharge the battery. Fit a fully charged battery.**

### Operation - Single Repeater

The following procedure applies to the use of either Repeater No. 1 or Repeater No. 2 when used as individual units (Star Configuration) in range of and communicating with the operative ECB and with the associated 'Logged On' PU(s).

- ◆ Open the lid of the carrying case and remove the antenna and antenna support tube from its holder in the lid. Open the inner pouch to access the antenna cable. Connect the BNC plug of the antenna cable to the BNC jack on the control box - Fig. 3.

Refer to Figures 4 and 5.

- ◆ Insert the end of the antenna support tube (Fig. 4) into the location hole in the case. Insert the antenna (1) Fig. 5 into the support tube.
- ◆ Fold the excess cable neatly and place in the pouch then close the lid of the carrying case.

*Note: If it is required to site the antenna some distance from the repeater then an optional antenna with a 30 metre cable length may be fitted instead. See Order List.*

◆ Proceed to the selected location for the positioning of the repeater. When in position, press the toggle switch (1) Fig. 2 to the 'On' position and wait for the 'Green' LED (3) to begin flashing as this will confirm a successful radio link with the ECB. See Important Note. The flashing 'Red' LED confirms a satisfactory charge condition of the battery.

**Important Note:** The ECB emits a signal at least every 20 seconds. Following switching on of the repeater, the 'Green' LED may not immediately illuminate. Wait at least 25 seconds to establish whether a successful radio link has been made with the ECB.

Should the 'Green' LED not illuminate after this time then switch the repeater 'Off' - proceed to an alternative location - repeat the procedure until the 'Green' LED begins to flash confirming a successful radio link with the ECB.

Refer to the Instructions for Use supplied with the PSS® Merlin® Telemetry System Entry Control Board for complete operational instructions and procedures.

### Operation - Two Repeaters

The following procedure applies to the use of Repeater No. 1 and Repeater No. 2 when positioned in line (Chain Configuration) i.e. Repeater No. 1 in range and communicating with the operative ECB, and Repeater No. 2 in range and communicating with Repeater No. 1 and with associated 'Logged On' PU(s).

- ◆ Repeater No. 1 – prepare and position for operational use as described in the previous section, i.e. Operation - Single Repeater. The 'Green' LED (3) Fig. 2 flashing.
- ◆ Repeater No. 2 – select a location for positioning of the repeater and prepare for operational use as described in the previous section, i.e. Operation - Single Repeater. Refer to the Important Note regarding timing of the signal from the ECB.

Refer to the Instructions for Use supplied with the PSS® Merlin® Telemetry System Entry Control Board for complete operational instructions and procedures.

### After Use

**Safety Warning:** Refer to For Your Safety regarding duty and responsibility on employers.

- ◆ Retrieve the repeater(s) from the selected location(s) and switch 'Off' by pressing the toggle switch (1) Fig. 2 to the 'Off' position. The 'Red' and the 'Green' LED will extinguish.
- ◆ Pack the antenna, the antenna support and cable etc. and close the lid of the carrying case.

**Note:** Do Not drop or throw down the repeater(s) as damage could occur.

- ◆ Pass the repeater(s) to the Service Department.

### Care and Maintenance

Other than the after use requirement for a general visual inspection of the unit, and associated accessories, for damage, contamination etc., and ensuring that the battery is 'charged' before future operational use, the repeater does not require any routine attention by the user.

### Cleaning

When considered necessary by the user, remove dirt and contaminants by carefully cleaning the carrying case etc. using a clean lint free cloth dampened in a mild soap solution, then thoroughly dry. Apply a proprietary antistatic cleaning agent to a clean lint free cloth and clean the surfaces of the unit. **Do Not** immerse the repeater unit in cleaning fluid.

**Safety Note:** Do Not use organic solvents, such as Acetone, Alcohol, White Spirit, Trichloroethylene or similar or any abrasive cleaning agents.

### Removing the Battery

**Important Note:** An intermittent short 'flash' Off of the 'Red' LED indicates a low charge condition of the battery - recharge. Fit a fully charged battery.

### Tools Required

Release Key 3351827

- ◆ Partially open the lid of the carrying case enough to access the lid of the radio module/battery compartment. Lift and fold back flat the lid of the radio module/battery compartment to access the radio module.
- ◆ To remove the battery - insert the pins of the release key into the two holes in the base of the radio module. Press the key into the module until the locking mechanism is released and the battery retracts (approx. 5mm). Remove the key and then slide and remove the battery.
- ◆ Charge the battery as described in the section – Charging the Battery.
- ◆ Fit a charged battery as described in the section – Fitting the Battery.

### Storage - Ready for Use

- ◆ Store the equipment 'Ready for Use' in a cool dry environment, free from dust and dirt. Protect from direct sunlight.

**Safety Note:** When stored in a vehicle, e.g. Fire Tender, ensure the equipment is secure and easily accessible in a 'Ready for Use' condition.

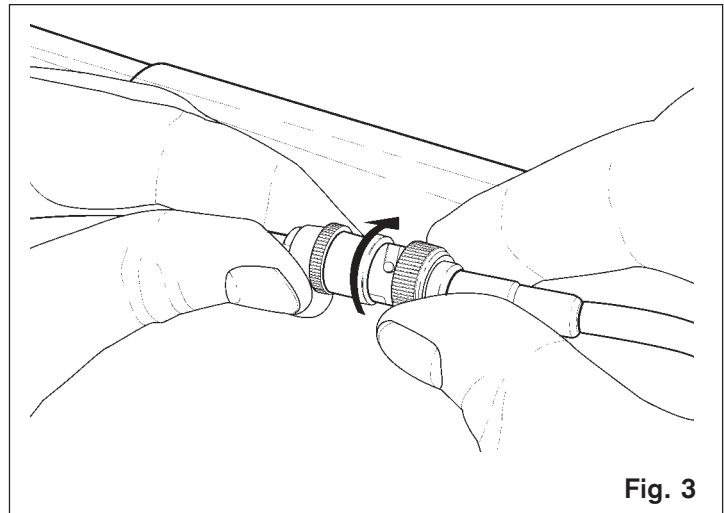


Fig. 3

1982

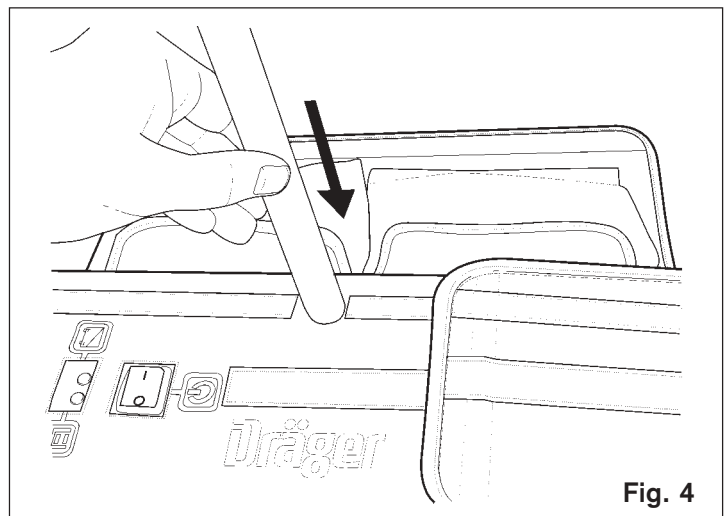


Fig. 4

1983

Order Codes	Part Number
Repeater No. 1	3354789
Repeater No. 2	3354786
<b>Accessories</b>	
Power Supply (AC)	3351815
Power Supply Cord	3351807
Clip Charging Adaptor (battery fitted to repeater)	335XXXX
Multi-Charger Module (four batteries per module)	3351815
Antenna Support Tube	335XXXX
Antenna - 6ft cable (2m)	3354788
Antenna - 100ft cable (30m) c/w Clamp	335XXXX
Leaky Feeder Connection Cable	335XXXX

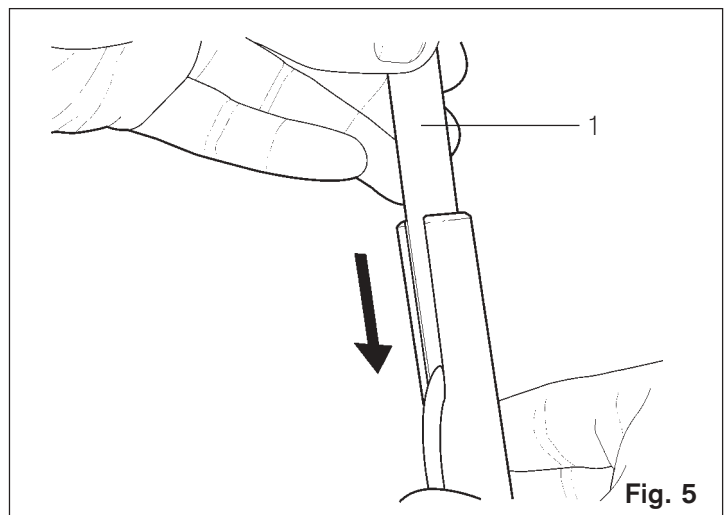


Fig. 5

1984