02

SATELLITE NAVIGATOR

skipper

467031

CE

Software rel. 1.2X

INSTALLATION

LEGEND SYMBOLS

	= **Generic danger**
	= **Warning**

Illustrations, images and photographs given in this manual have been supplied merely as indications and are not in any way binding; ARAG reserves the right to modify the specifications and instructions regarding the product at any time and without prior notice.

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1 PRODUCT DESCRIPTION

Skipper is a satellite navigator which can be used for agricultural purposes thanks to its GPS receiver.

1.1 Intended use

This device is designed to work on agricultural machinery for crop spraying applications.

The device is designed and manufactured to comply with the requirements of directive 89/336/EEC, dated 03/05/1989 and subsequent modifications, and of the EN ISO 14982 standard.

SKIPPER is not a road navigator and should only be used for field mapping.

2 PRECAUTIONS

- **Do not expose the device to jets of water.**
- **Do not use solvents or benzene for cleaning the exterior of the housing.**
- **Do not use direct jets of water for cleaning the device.**
- **Make sure the power voltage meets the device's rated power requirement (12 Vdc).**
- **If doing arc-welding, disconnect the three connectors from the back of the SKIPPER device and disconnect its power cable.**
- **Only use original ARAG accessories and spare parts.**

3 CONTENTS OF THE PACKAGE

The following table lists the components contained in the SKIPPER package:

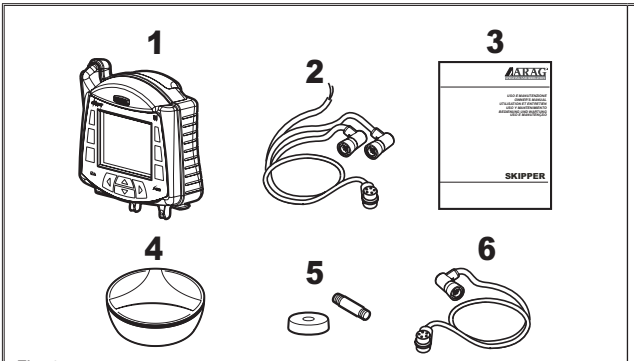


Fig. 1

Legend:

1 SKIPPER satellite navigator
2 Connection cable SKIPPER - BRAVO 300S - Power supply
3 Instruction manual
4 GPS receiver
5 Receiver support
6 Receiver cable

4 INSTALLATION

4.1 Introduction

Installation of the SKIPPER system does not require specialist knowledge.
We recommend however that this be done by a qualified technician in as much as the installation also requires electrical connections to be made.

ARAG IS NOT LIABLE FOR ANY DAMAGE CONSEQUENT ON INSTALLATION BY UNQUALIFIED PERSONS.
IF CASE OF DAMAGE TO THE SYSTEM CAUSED BY INCORRECT INSTALLATION OR CONNECTIONS, THE WARRANTY IS AUTOMATICALLY VOIDED.

CAUTION! THE CONNECTION OF RECEIVERS OTHER THAN THE SPECIFIED ONE IS NOT ALLOWED (art. no. 520100.602).
ARAG IS NOT LIABLE FOR DAMAGE TO THE PRODUCT, FAULTS OR RISKS OF ANY NATURE CONSEQUENT ON CONNECTING THE MODULE TO NON-ORIGINAL RECEIVERS OR THOSE NOT SUPPLIED BY ARAG.

4.2 System configuration

System with SKIPPER and BRAVO 300S

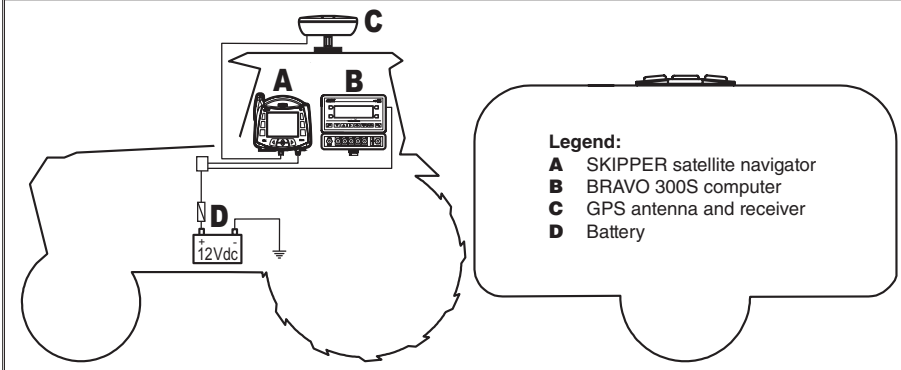


Fig. 2

• Positioning the SKIPPER device in the cab:
- DO NOT place the navigator in areas subject to excessive vibrations and shocks or close to moving parts which might cause damages;
- Mount the remote control unit in a visible position, without obstructing the operator's view, and within easy reach by hand;
- Take care to position the device away from moving parts to avoid accidental operation of its keys.

• Inserting the connectors:
- Fit supplied O-rings into connectors and then connect paying special attention to the notch. Press gently and then tighten the ring nut.

CAUTION: do not use tools to tighten down the connector locking collars.

- Do not force the connectors by pushing too hard or bending them: the contacts can be damaged and monitor operation compromised.

• Securing the cables:
Note the various connections required for the SKIPPER system to operate, the necessary length of the cables, and ensure that there is sufficient space for the cable runs and connectors:
- Route the cables in such a way that twisting and machine movements cannot damage or break them.
- If, due to limited space, the cabling has to run around a corner, make sure that the bend is not too sharp as this may cause the cable to break.

• Use ONLY the cables and accessories listed in the catalogue; these have the correct specifications for their intended application.

4.4 Overall dimensions

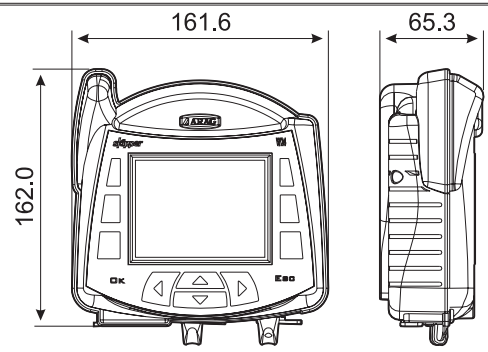
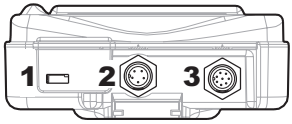


Fig. 3



Legend:

1 USB HOST port (pendrive, etc.)
2 GPS Receiver
3 BRAVO 300S - Power supply Enable current treatment

4.5 SKIPPER navigator position

Carefully read all instructions as described in par. 4.3 - General precautions for correct SKIPPER and cable positioning before positioning the satellite navigator.

Position SKIPPER centrally into the cab so that it does not impair driving visibility while allowing data check during treatment.

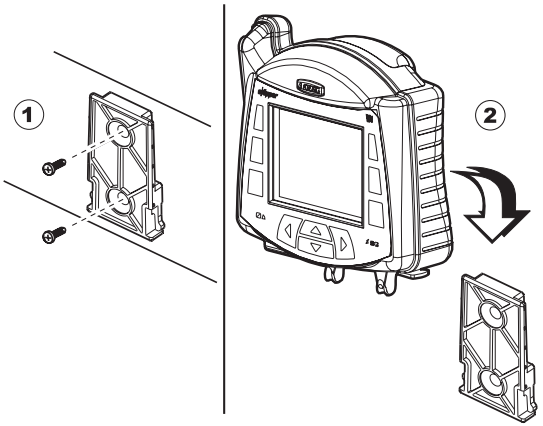


Fig. 4

1) Install the mount slide in the cab with the provided bolts, in a location which is within easy reach and visible to the operator, and away from moving parts.
2) Fit the satellite navigator by pushing it onto the mount slide and pushing down until it locks in place.

4.6 Locating the antenna

• Installing the antenna

Installation of the antenna on agricultural equipment must observe certain basic requirements:

• it must be installed on the highest point of the machine (including trailer): the skywards reception angle must be as unobstructed as possible.

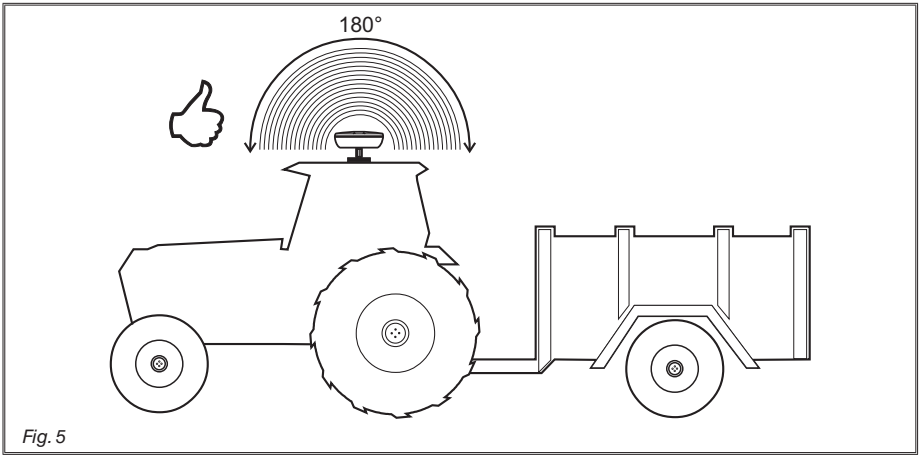


Fig. 5

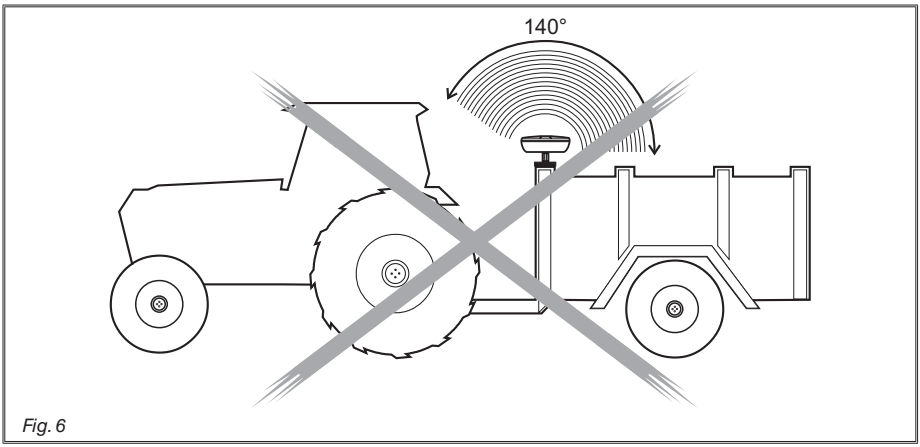


Fig. 6

• The antenna must be installed on the lengthwise axis of the machine.

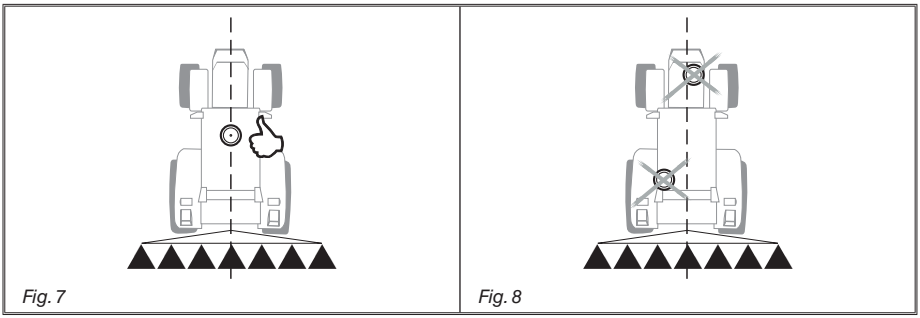


Fig. 7

Fig. 8

• Securing the antenna:
If the surface to which the antenna is to be mounted is metal or steel, use the provided magnetic plate: the magnet is equipped with a threaded shaft to which the antenna can be installed by screwing it fully down (Fig. 9).

⚠ **Make sure that the antenna is mounted to a perfectly flat metal surface, free of any surface treatment capable of reducing the strength of the magnet itself.**

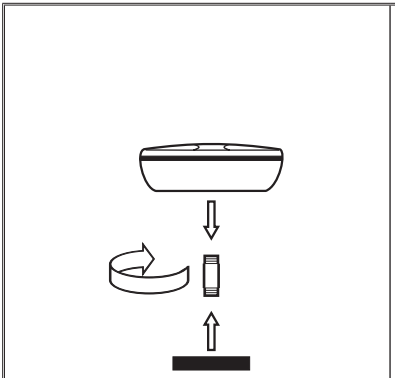


Fig. 9

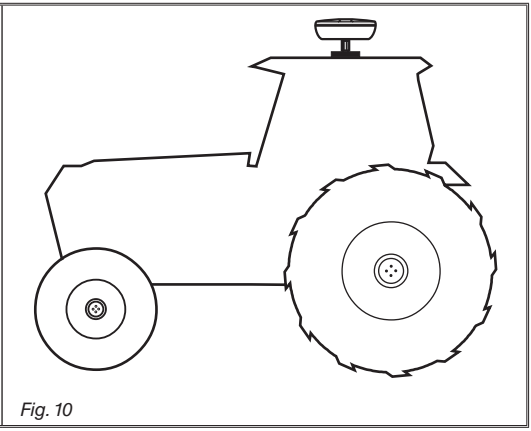


Fig. 10

If the magnetic mount is not secure enough, screw the mounting shaft directly onto the chassis of the machine as shown in Fig. 11; drill a hole in the chassis and mount the shaft with an M10 nut.

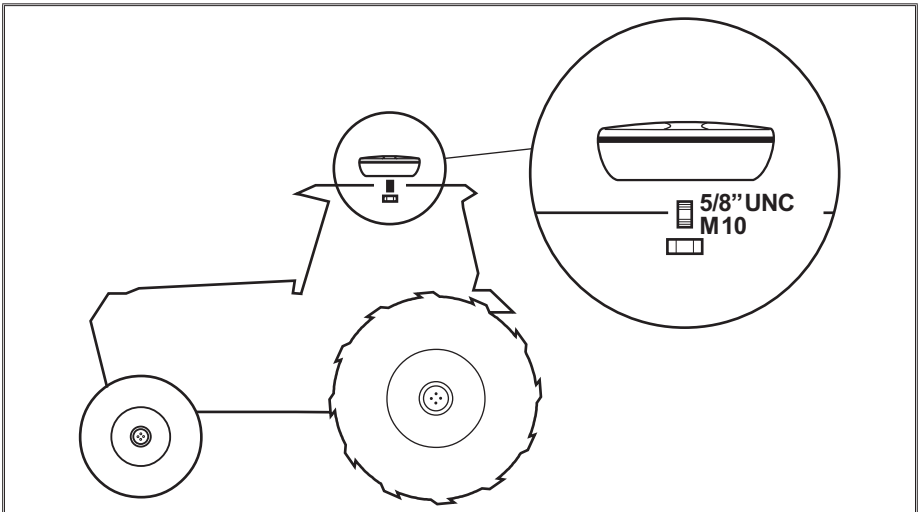
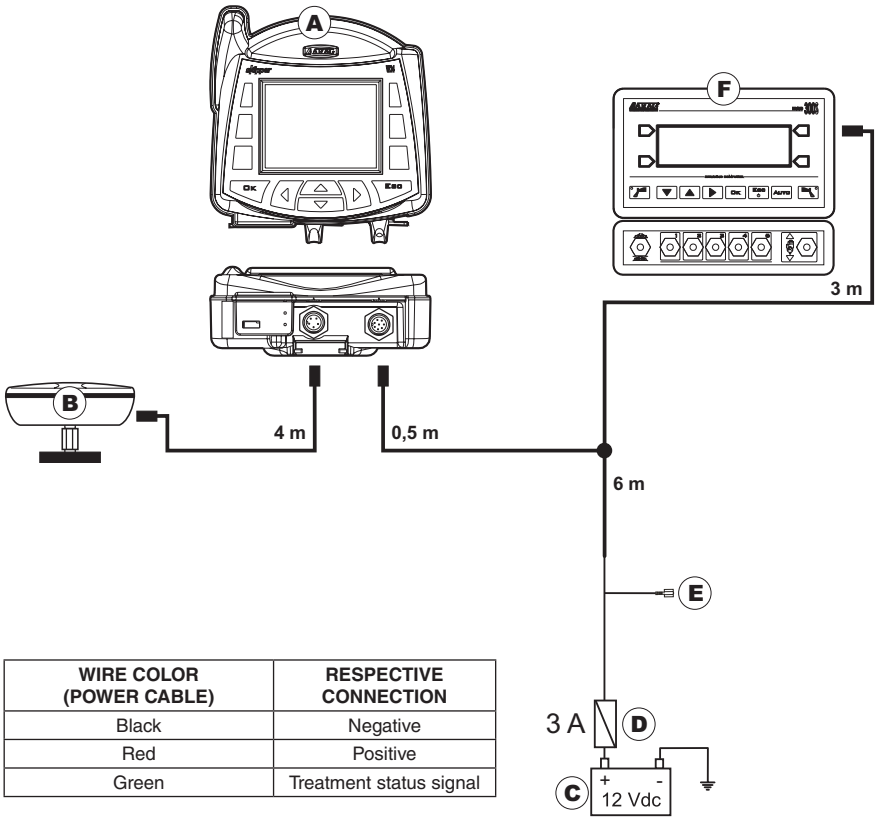


Fig. 11

⚠ **The operator is responsible for checking that the mounting system is completely secure. ARAG is not liable for damage of any nature caused by the antenna working free, independently of which mounting system is used.**

4.7 Electrical connections - general diagram



WIRE COLOR (POWER CABLE)	RESPECTIVE CONNECTION
Black	Negative
Red	Positive
Green	Treatment status signal

Fig. 12

A Satellite navigator
B GPS antenna and receiver
C Battery
D Automotive fuse - 3 A
E Treatment status signal +12 Vdc (from main control valve)
F BRAVO 300S computer

4.8 Connection to the GPS receiver

⚠ **Only use ARAG receiver especially designed for SKIPPER. ARAG is not responsible for any damages caused by the use of non-authorized receivers.**

Before making the connection, carefully read par. 4.3 - General precautions for locating the SKIPPER and cable runs.

Connect the GPS receiver to the guidance monitor with cable **6** in Fig. 1 (chapter 3 - Contents of the package).
The connection points are given in par. 4.7 - Electrical connections - general diagram.

4.9 Treatment status signal

• If the machine is equipped with a treatment control, such as a switch on the control valve, the SKIPPER can be connected to a corresponding treatment status signal, so that it receives a +12 Vdc signal directly from the control itself when treatment starts.
We recommend that the control be connected to the main control valve positive pole.
Since the current in question is very low, the cable connection to the control need not be of any special cross-section.

⚠ **CAUTION: the connection to the treatment control must be done by a qualified technician.**
ARAG is not liable for damage to the system, persons, animals, property or crops due to incorrect connection of the above control or modifications to the system, cabling, connectors or any other components required to make the connection.

• If the treatment control connection is not made, the operational status of the equipment must be entered into the SKIPPER manually with the key  on the remote control unit.

• If SKIPPER is connected to BRAVO 300S, there is NO need to make any connections to enable treatment start command.

4.10 Connections to BRAVO 300S

Before making the connection, carefully read par. 4.3 - General precautions for locating the SKIPPER and cable runs.

Connect devices to SKIPPER with cable **2** as shown in figure 1 (Section 3 - Items included in the supply).
Connection points are specified at par. 4.7 - Electrical Connections - main diagram.

4.11 Connection to the power source

CAUTION!
To avoid short circuits, do not connect the power cable connector before the installation is completed.
Before powering up the guidance monitor and remote control unit, make sure the engine battery voltage rating is correct (12 Vdc).

SKIPPER is powered directly by the vehicle battery (12 Vdc): SKIPPER should ALWAYS be switched on from the satellite navigator, whereas it should be switched off by means of the appropriate button on the control panel.

The vehicle battery may go flat if SKIPPER stays on for a long time when the engine is not running: in case of long stops - with engine OFF - disconnect SKIPPER from the battery.

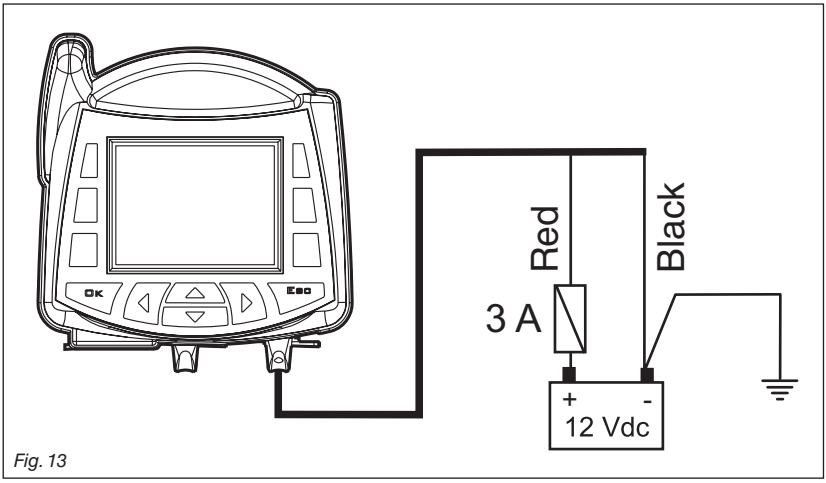


Fig. 13

CAUTION:
• The power circuit must ALWAYS be fitted with a 3 Amp automotive fuse.
• All battery connections must be made with cables with a minimum cross section of 1 mm².
• Use cables with suitable terminals to ensure correct connection of each individual wire.

5 CONTROL PANEL

5.1 Keys

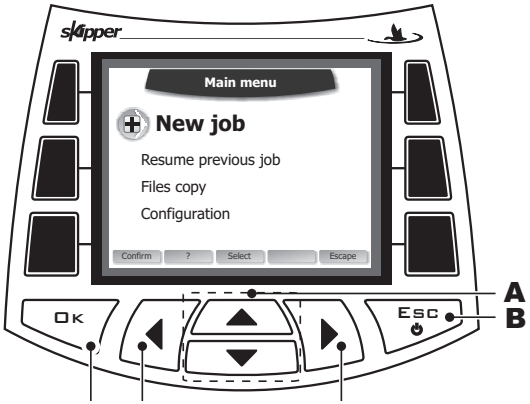


Fig. 14

MENU

A Scroll menu items or data
B ON/OFF; stop data editing
C Confirm
D Edit data (decrease or -)
E Edit data (increase or +)

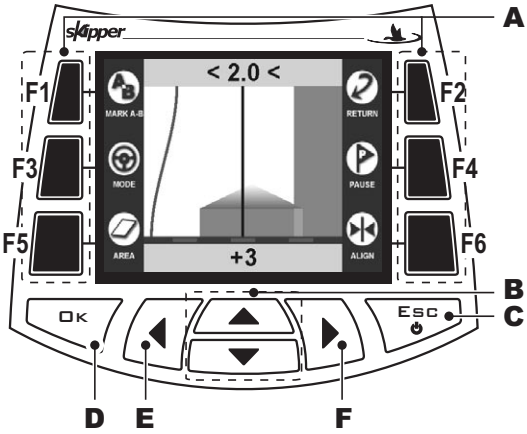


Fig. 15

NAVIGATION

A Function keys - Functions depend on menus and are shown by the accompanying icon. Key numbers - F1, F2 and so on - are mentioned for operator's convenience but are not actually printed on **SKIPPER** keys.
B Zoom
C Stop function
D Confirm
E Enable/Disable treatment (if **SKIPPER** is not connected to an external control)
F Display and scroll functions of keys F1 to F6.

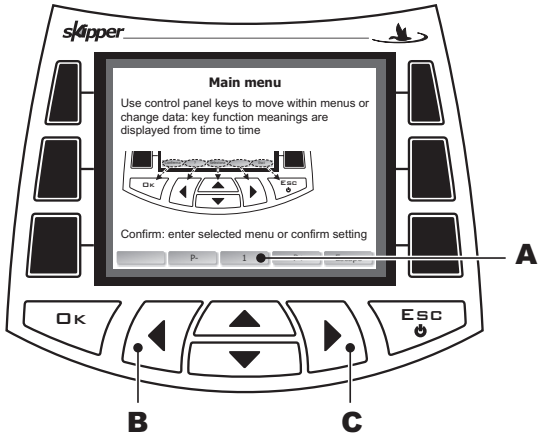


Fig. 16

ONLINE GUIDE (HELP)

A Displays current page number
B Scroll online guide pages (page back)
C Scroll online guide pages (page forward)

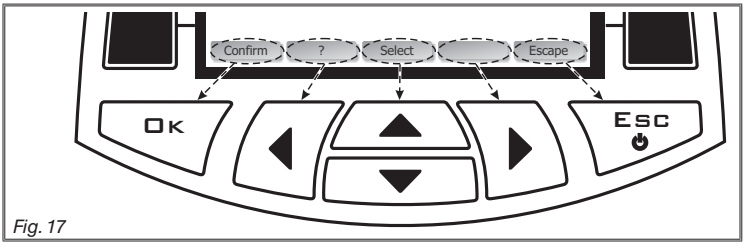


Fig. 17

Press control panel keys to move within menus or edit data: key functions depend on navigation screens (see example in Fig. 17).

- **Confirm**
  Go to selected menu or confirm setting.
- **?**
  Go to online guide.
- **New**
  Start set-up of a new machine.
- **Select**
  Scroll menu items.
- **+**
  Increase value.
- **-**
  Decrease value.
- **Delete**
  Delete selected item.
- **Escape**
  Exit menu or setting.

6 USE

SKIPPER has an online guide which can be called at any time.
Next paragraphs describe how to use the online guide, which include all instructions for a proper machine set-up and use while treating.

6.1 Switching ON

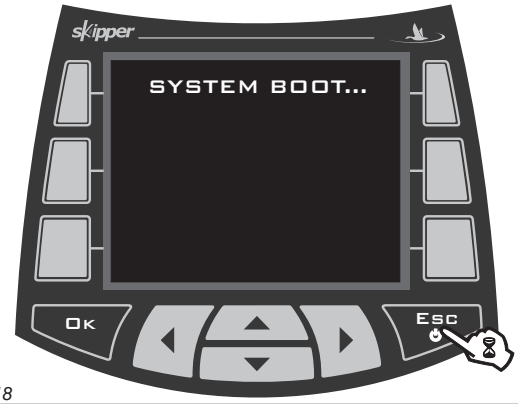


Fig. 18

Fig. 19

Hold the key pressed until SKIPPER shows the page in Fig. 18.
After that SKIPPER will automatically display **Main menu** page (Fig. 19).

6.2 Switching OFF

Fig. 20

Hold the key pressed until SKIPPER shows this page. Release the key.
After some seconds SKIPPER will switch off.

⚠ **A long press after the closing page may cause data loss.**

Fig. 21

The following message can be displayed when switching off SKIPPER: ***if so, DO NOT press any keys, DO NOT disconnect from power supply and wait for SKIPPER to switch off.***

6.3 Language

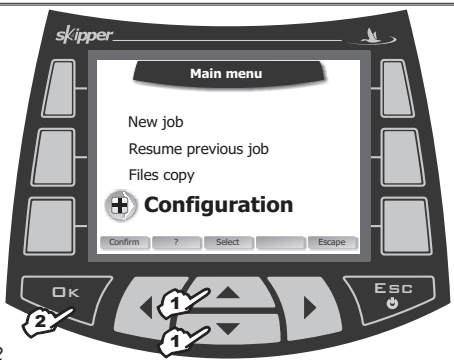


Fig. 22

1 Press keys on **Main Menu** page to select **Configuration**

2 Press key to enter the menu

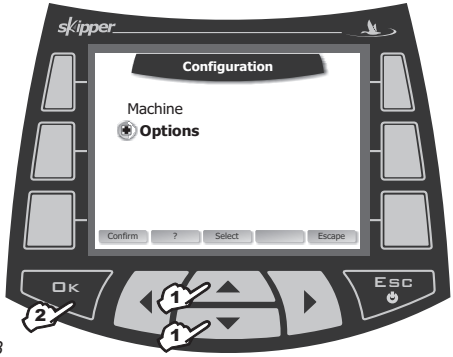


Fig. 23

1 Press keys on **Configuration** page to select **Options**

2 Press key to enter the menu

Fig. 24

1 Press keys to select the required language

2 Press key to confirm

6.4 Differential correction function DGPS (SBAS)

SBAS differential correction signal is free of charge and available only in some areas. It allows a higher accuracy while working.
In order to enable/disable the reception of DGPS signal, please refer to the **Options** menu (par. 6.3).

IMPORTANT: This function can only be used in Europe (EGNOS) and in the United States (WAAS).

7 ONLINE GUIDES

7.1 Main menu online guide

Fig. 25

1 Press key on **Main Menu** page to enter online guide

7.2 Configuration online guide

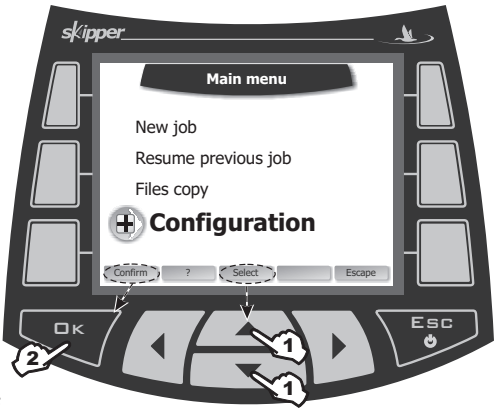


Fig. 26

1 Press keys on **Main Menu** page to select **Configuration**

2 Press key to enter the menu

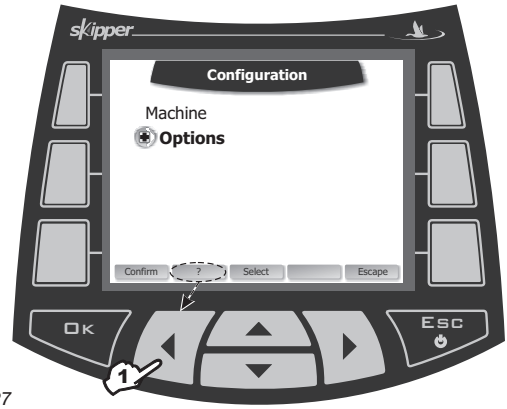


Fig. 27

1 Press key on **Configuration** page to enter the online guide

7.3 Navigation online guide

Fig. 28

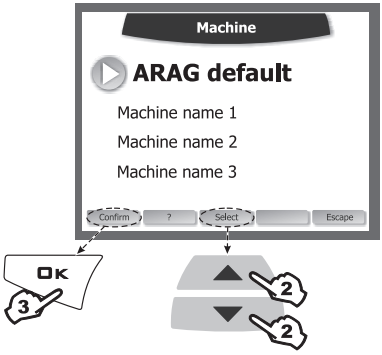


Fig. 29

1 Press key on **Main menu** page to start a **New job** (or **Resume previous job** to resume an old job)

2 Press keys to select the machine

3 Press key to start the job

4 Press key repeatedly until **HELP** is displayed

5 Press function key to enter online guide

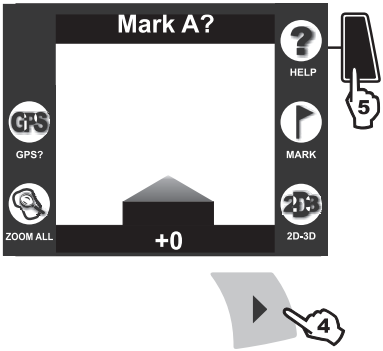


Fig. 30

8 MAINTENANCE / DIAGNOSTICS / REPAIRS

- Clean only with a soft wet cloth.
- DO NOT use detergents or aggressive products.
- DO NOT aim water jets directly at the navigator.

8.1 Troubleshooting

FAULT	CAUSE	REMEDY
The display does not switch on	No power supply	• Check power supply connection.
No signal enabling treatment to SKIPPER	Power cable improperly connected	• Check green lead connection to power cable **(par. 4.7).**
	Improper set-up	• Check set-up **(par. 7.2).**
Display shows message **The GPS receiver doesn't give valid data**	Wrong antenna cable connection	• Check connection with GPS antenna **(par. 4.7).**
	Satellite connection in progress	• Wait for connection to be established.
Display shows message **Differential correction not available**	DGPS signal not available in the work area	• Disable DGPS **(par. 6.4)**.
	DGPS connection in progress	• Wait for connection to be established.

Tab. 1

9 TECHNICAL DATA

Description	SKIPPER
Display	LCD 4", 65000 colors, 420 cd/m^2
Power supply	9 - 15 Vdc
Working temperature	0 °C ÷ 45 °C +32 °F ÷ +113 °F
Storage temperature	-20 °C ÷ 60 °C -4 °F ÷ +140 °F
Weight	600 g
1 USB 1.1 port	HOST
Treatment input	Active high (+12 Vdc)

Tab. 2

10 DISPOSAL AT THE END OF SERVICE

Dispose of the system in compliance with the established legislation in the country of use.

11 GUARANTEE TERMS

1. ARAG s.r.l. guarantees this apparatus for a period of 360 day (1 year) from the date of sale to the client user (date of the goods delivery note). The components of the apparatus, that in the unappealable opinion of ARAG are faulty due to an original defect in the material or production process, will be repaired or replaced free of charge at the nearest Assistance Centre operating at the moment the request for intervention is made.
   The following costs are excluded:
   - disassembly and reassembly of the apparatus from the original system;
   - transport of the apparatus to the Assistance Centre.
2. The following are not covered by the guarantee:
   - damage caused by transport (scratches, dints and similar);
   - damage due to incorrect installation or to faults originating from insufficient or inadequate characteristics of the electrical system, or to alterations resulting from environmental, climatic or other conditions;
   - damage due to the use of unsuitable chemical products, for spraying, watering, weedkilling or any other crop treatment, that may damage the apparatus;
   - malfunctioning caused by negligence, mishandling, lack of know how, repairs or modifications carried out by unauthorised personnel;
   - incorrect installation and regulation;
   - damage or malfunction caused by the lack of ordinary maintenance, such as cleaning of filters, nozzles, etc.;
   - anything that can be considered to be normal wear and tear.
3. Repairing the apparatus will be carried out within time limits compatible with the organisational needs of the Assistance Centre.
   No guarantee conditions will be recognised for those units or components that have not been previously washed and cleaned to remove residue of the products used;
4. Repairs carried out under guarantee are guaranteed for one year (360 days) from the replacement or repair date.
5. ARAG will not recognise any further expressed or intended guarantees, apart from those listed here.
   No representative or retailer is authorised to take on any other responsibility relative to ARAG products.
   The period of the guarantees recognised by law, including the commercial guarantees and allowances for special purposes are limited, in length of time, to the validities given here. In no case will ARAG recognise loss of profits, either direct, indirect, special or subsequent to any damage.
6. The parts replaced under guarantee remain the property of ARAG.
7. All safety information present in the sales documents regarding limits in use, performance and product characteristics must be transferred to the end user as a responsibility of the purchaser.
8. Any controversy must be presented to the Reggio Emilia Law Court.

Conformity Declaration CE

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Dichiara

che il prodotto

descrizione: **Navigatore satellitare**
modello: **Skipper**
serie: **46703x**

risponde ai requisiti di conformità contemplati nelle seguente Direttiva Europea:

89/336/CEE e successive modificazioni
(Compatibilità Elettromagnetica)

Riferimenti alle Norme Applicate:

EN ISO 14982:1998
(Macchine agricole e forestali - Compatibilità elettromagnetica
Metodi di prova e criteri di accettazione)

Rubiera, 07 Giugno 2007

Giovanni Montorsi

(Presidente)

Only use original ARAG accessories and spare parts, to maintain safety conditions foreseen by the constructor. Always refer to the ARAG spare parts catalogue.

D20165_GB-m04 02/2009

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