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OF THE FISHERIES ON LAKE
TANGANYIKA

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OPERATION MANUAL FOR STD-12 PLUS

by

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PREFACE

The Research for the Management of the Fisheries on Lake Tanganyika project (LTR) became fully operational in January 1992. It is executed by the Food and Agriculture Organization of the United Nations (FAO) and funded by the Finnish International Development Agency (FINNIDA).

LTR's objective is the determination of the biological basis for fish production on Lake Tanganyika, in order to permit the formulation of a coherent lake-wide fisheries management policy for the four riparian States (Burundi, Tanzania, Zaïre and Zambia)

Particular attention is given to the reinforcement of the skills and physical facilities of the fisheries research units in all four beneficiary countries as well as to the buildup of effective coordination mechanisms to ensure full collaboration between the Governments concerned.

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GCP/RAF/271/FIN PUBLICATIONS

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For both series, reference is further made to the document number (**01**), and the language in which the document is issued: English (**En**) and/or French (**Fr**).

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1. INTRODUCTION

The STD-12 plus is a multiparameter, self contained, intelligent CTD, designed for the measurement of conductivity, temperature, and pressure.

During LTR's second scientific sampling programme assessment meeting, it was decided that the STD-12 plus probe with the portable computer will be circulated among the stations.

Because of the numerous rewritten and improved STD-12 plus manuals (in LTR's headquarter there are nine different manuals of the STD plus probe), it was decided to write a short and practical manual to operate the STD-12 plus probe.

2. GETTING STARTED

2.1 Unpacking and inspecting the instrument

When unpacking the instrument be aware that this instrument has been shipped with the following standard equipment:

- One STD-12 plus with 128K battery backed-up RAM;
- One Users manual;
- One Total System Software manual;
- One Preliminary user manual;
- Two spare oil bladders for pressure sensor;
- One bottle of mineral oil for pressure sensor;
- Two spare O-rings;
- Three hexagon key wrenches;
- Two red shorting plugs (On/Off switch);
- Two black dummy plugs;
- One communication cable ("D" connector 25 pin, male! 9 pin. female);
- One communication cable ("D" connector 25 pin, female! AWL5M-MP connector);
- One COMPAQ portable computer;.

Before unpacking the STD probe it is necessary to read **thoroughly** the three manuals named: (1) TOTAL SYSTEM SOFTWARE, (2) PRELIMINARY USER MANUAL and (3) MODEL STD-12 PLUS.

These manuals are the latest versions about our probe. The older, somewhat different, manual versions have been published earlier in the project's field manual (Kotilainen(ed.),1993). Because of a different approach and especially the presentations and drawings of the apparatus in the maintenance section of these outdated STD manuals, attention should also be paid to these manuals.

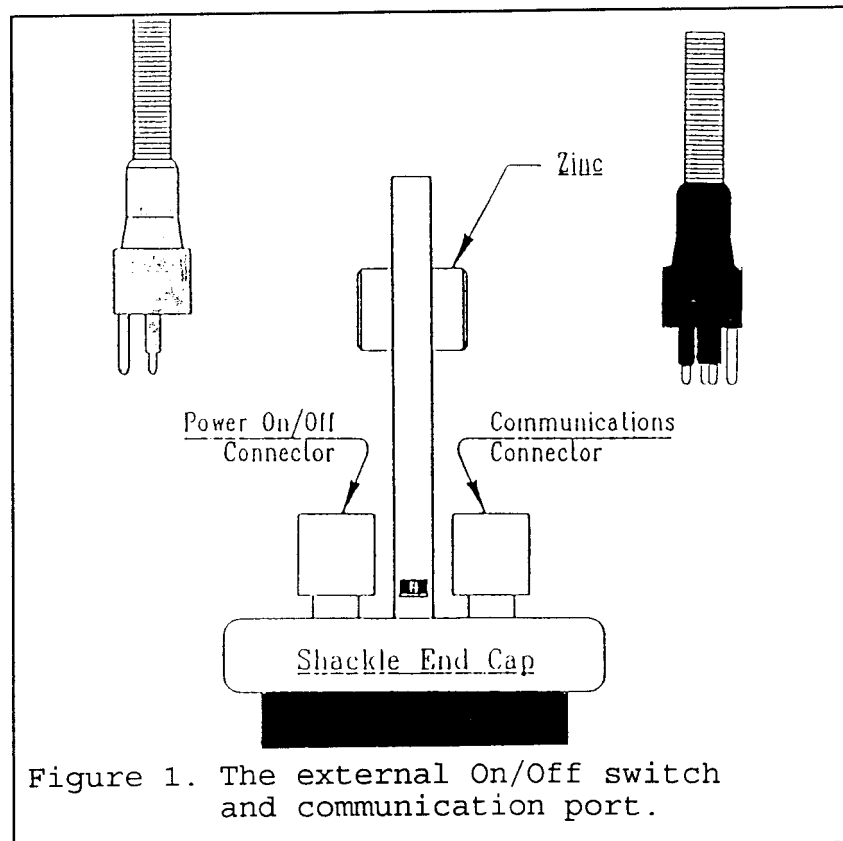
An inspection of the STD-12 plus before use will assist in spotting problems that could lead to inaccurate data readings or possible system failure:

- a- Examine the outside of the shipping case for evidence of heavy impacts during transport;
- b- Remove the instrument to a suitable location for close examination;
- c- Inspect the top end cap of the instrument for signs of damage;
- d- Check that the communications and power connectors are not

loose and that there is no grit or dirt on the surfaces or in the holes;
e- Check the condition of the cables and plugs;
f- In case of any damage, contact LTR's headquarters.

2.2 Switching the STD-12 plus On/Off

The instrument has an external On/Off switch and a communication port (see Fig. 1)



a- The communications port, is used to program the instrument as well as to recover the recorded data, it has a six hole connector (the black plug to insert has five golden pins and one silverish guide pin)

b- The external On/Off switch consists of a shorting plug and a three hole connector (the red plug to insert here has two golden pins and one silverish guide pin) . To switch the instrument on, insert this greased shorting plug in the hole. By removing this plug the instrument can be switched off.

When you unpack the labeled plugs and cables from the kit with the spare parts, you should find the following items:

- Cable labeled N°I = communication cable ("D" connector 25 pin, male! 9 pin, female)
- Cable labeled N°II = communication cable ("D" connector 25 pin. female/AWL-5M-MP connector)
- Plug labeled N° III = Shorting plug **red**;
- Plug labeled N°IV = Dummy plug **black** (with screwing cap);

- Plug labeled N° V = Small shorting plug **black**;
- Hexagon key wrenches, for installing the STD-12 plus in its frame;
- Extra rubber 0-rings, for sealing the STD-12 plus off;
- Extra oil bladder, an important part of the pressure meter;
- Extra mineral oil, to be used when you replace the oil bladder;
- Extra spareparts.

2.3 Connection to the Compaq portable computer (see Fig.2)

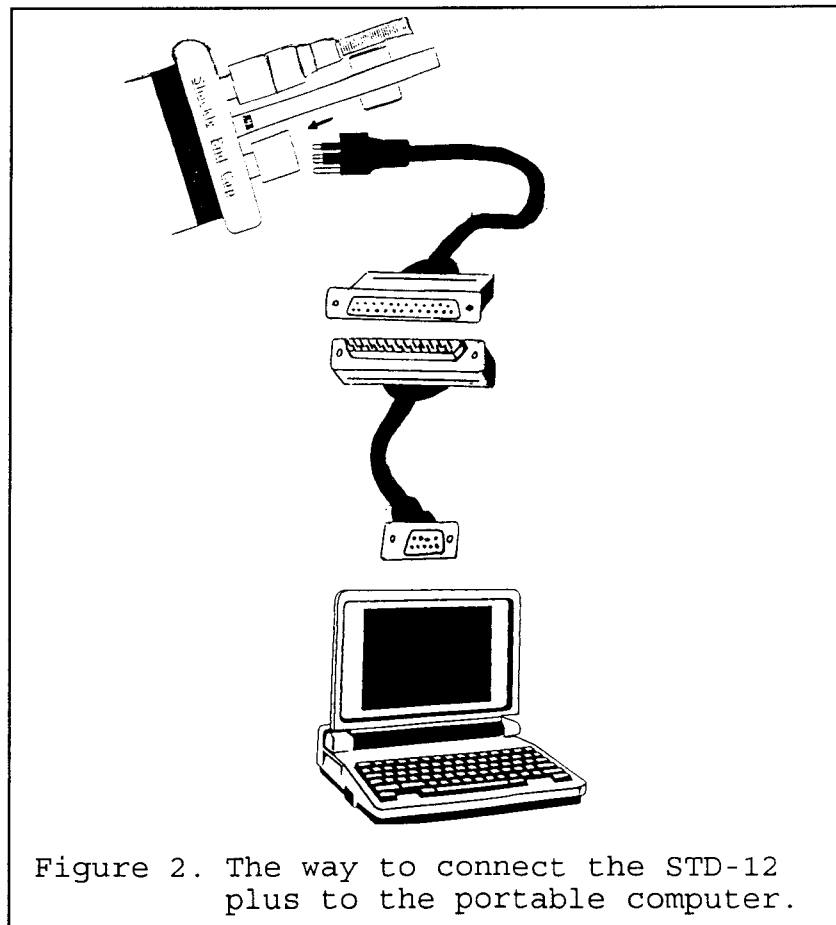


Figure 2. The way to connect the STD-12 plus to the portable computer.

In order to connect the STD-12 plus with the computer follow the next steps:

- a- Connect cable number I with cable number II;
- b- Insert the six pin plug of cable number II into the communications port of the STD-12 plus;
- c- Insert the other end of cable number I in to the serial port of the portable computer.

When these connections are made and when the red shorting plug has been inserted in the instrument, the instrument is ready to communicate with the computer.

3. COMMUNICATING WITH THE STD-12 PLUS

3.1 STD-12 plus and its software

The appropriate setups and installations of the computer programs have been carried out earlier.

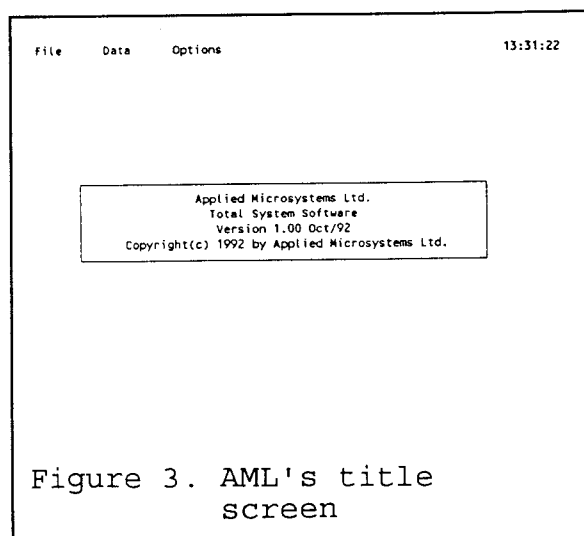
The STD-12 plus can be operated with the two programs PROCOMM and AML, who regulate the performance of the instrument. We will use the easier program AML.

To use the AML software enter the following commands:

```
C:CD PROCOMM
PRO COMM
ALT X
RETURN TO DOS TYPE "YES"
CD..
CD AML
AML
```

This will display a screen as shown in Figure 3 .

To get familiar with the options of this program I strongly suggest to study thoroughly pages 9 to 22 of the manual "TOTAL SYSTEM SOFTWARE". These pages describe how to setup the program AML, according to your own wishes.



IF YOU DECIDE TO CHANGE SOME SETTINGS IN THE SN622.CFG CONFIGURATION FILE OF THE STD-12 plus, DO NOT EVER CHANGE OR DELETE THE CALIBRATION DATA OF THE FACTORY. IF THIS WOULD HAPPEN BY ACCIDENT, CONTACT THE PROJECT'S HEADQUARTER FOR FURTHER INSTRUCTIONS.

3.2 Procomm or AML

As mentioned in section 2.1 you first have to open PROCOMM before you can open AML. Also, setting the correct date and time for AML has to be done in PROCOMM.

Therefore, go with ALT F10 into the PROCOMM menu overview and type ALT 0 (host communication). First type DATE followed by the correct date. The format is: DATE MM-DD-YY.

To set the correct time, go to host communication and type TIME followed by the correct time. The format is TIME 5:37:00, 14:32:00 OR 2:32:00P.

Now you will see the correct date and time when you quit PROCOMM and open AML with real view and connected the instrument.

4. OPERATION IN THE FIELD AND IN THE WATER

4.1 Programming the STD for deployment through AML

Before lowering the STD-12 plus in the water you must everytime program the STD-12 plus through AML.

a - Carry out step 1.2 and 2.1. (Tip: in this stage use the shorting red On/Off plug with the black screwing cap instead of the shorting red plug without black screwing cap).

b - typing ALT D will result in a screen as shown in Fig. 4.

c - You can change the sample time unit, the sampling interval and the depth logging increment according to your wishes (explanations are clear and given in the Total System Software manual) . The log file is the name which you type in, for example: **SSP1**, for the future file to be saved by the STD-12 plus in his own memory.

d- After you have entered the name of the future file to be saved by the STD-12 plus, you type: ALT C. The program will notify you that the instrument is **programmed** and **ready** for measuring.

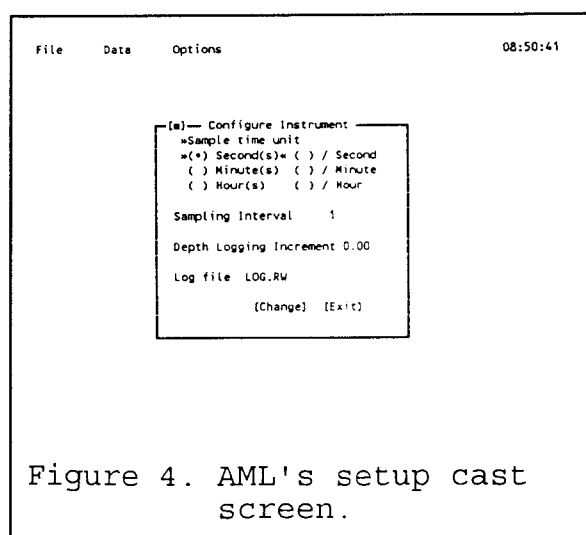


Figure 4. AML's setup cast screen.

NOTE: When the STD-12 plus is immersed in the water, it starts to measure automatically. Taking it out of the water will stop the STD-12 plus, and will directly allow it to save all the collected data with the name you gave to the LOG FILE.

4.2 Preparing the STD-12 plus for deployment

When you have finished programming the STD-plus, you must disconnect the STD-12 plus from the portable computer.

a- unplug cables N°I and II from the computer and from the instrument;

b- Insert the black dummy plug with screwing cap into the STD's Communication port and tighten the screwing cap;

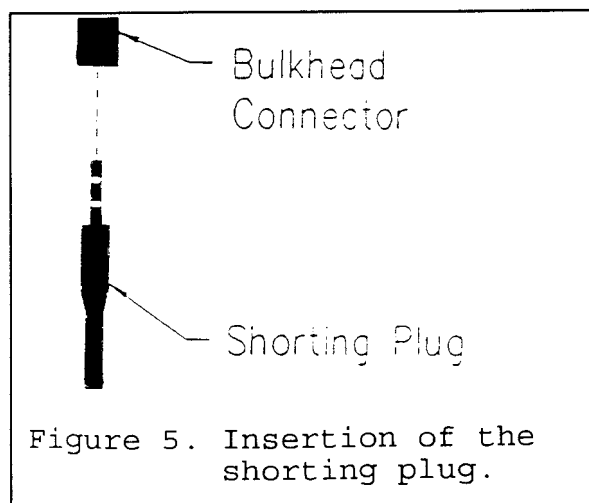
c- Make sure that the shorting red plug is inserted and tightened in the instrument's external On/Off switch.

THE STD HAS ANOTHER ONE PIN PORT TO CONNECT AN OXYGEN PROBE. WHEN USING THE STD-12 plus WITHOUT THE OXYGEN SENSOR CONNECTED PLEASE ENSURE THAT THE BLACK SMALL SHORTING PLUG HAS BEEN INSERTED INTO THE DO₂ E/O CONNECTOR (ALSO CALLED "BULKHEAD CONNECTOR" IN THE MANUALS) AT THE INSTRUMENT'S END CAP, LEFT OF THE CONDUCTIVITY METER.

A PLUG OR CABLE MUST BE INSTALLED IN ALL CONNECTORS AT ALL TIMES WHEN THE INSTRUMENT IS IMMERSSED IN THE WATER. FAILURE TO DO SO WILL CAUSE IMMEDIATE DAMAGE TO THE CONNECTORS AND A POSSIBLE FLOODING OF THE ELECTRONIC HOUSING.

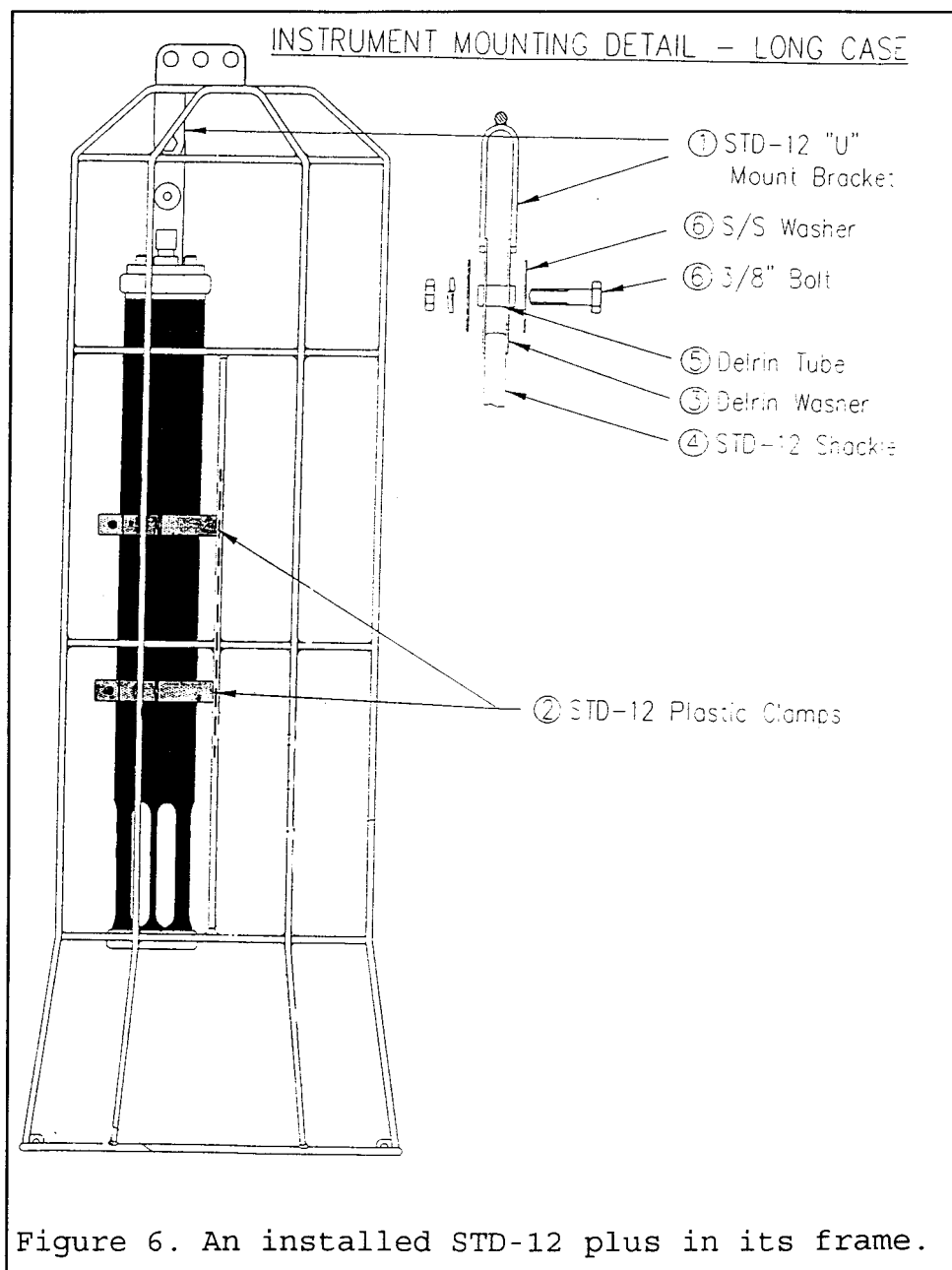
d- Thus, make sure that the small black shorting plug, which replaces the oxygen meter connector plug, is inserted in the bulkhead connector of the STD-12 plus (See Fig.5.).

IT MUST BE CLEAR THAT ALL PLUGS SHOULD BE GREASED VERY WELL BEFORE YOU INSERT THEM INTO THE STD-12 plus, TO ENSURE THAT THE INSIDE OF THE APPARATUS REMAINS DRY EVEN AT GREAT DEPTHS.



4.3 Installing the STD into its frame

The mounting of the STD-12 plus is an easy job (Fig. 6.). Flip the pages of the "USERS MANUAL" until you reach Appendix 'D', general layout. The second figure deals with the mounting of the STD-12 plus.



a- In order to mount the STD-12 plus into its frame remove completely the loose halves of the plastic clamps with the hexagon key wrenches;

b- Attach the STD-12 plus shackle with the according bolts, washers and tubes into the STD-12 plus "U" mount bracket;

c- Tighten the 3/8" bolt in a normal way (i.e., not too tight and not too loose);

d- Tighten the plastic clamps with the hexagon key wrenches in a normal way;

e- Tighten a long strong line, which can carry at least three times the weight of the STD-12 plus and cage, to the STD's cage.

FOR MULTIPLE RUNS OF THE STD-12 plus, IT IS MORE PRACTICAL TO COMPLETE FIRST SECTION 4.3 AND THEN 4.2.

4.4 Instrument stabilisation

If there exists a temperature difference of 10°C or more between the instrument and the water, the STD-12 plus should be acclimatised prior to employment. This can be achieved by immersing the instrument in the water for **10 to 20 minutes**. The instrument needs not to be powered up during this procedure but all plugs must be inserted in their corresponding connections. In case of small temperature differences between the instrument and the water, immerse the STD-12 plus for approximately **4 minutes** in the water. Instrument stabilisation procedure is required to gain optimum performance from the conductivity sensor.

5. OPERATION IN THE FIELD AND AT THE SURFACE

5.1 Retrieving the instrument

When the STD-12 plus profiling session has been completed, the instrument, and especially the instrument's sensors, should be rinsed with distilled water, otherwise dirt and other deposits will accumulate on the sensors.

5.2 Retrieving data from the STD-12 plus

To retrieve data from the STD-12 plus, the user must set the portable computer, connect it to the instrument with the communication cables, and follow the next steps:

- a- dry the top end cap of the instrument;
- b- remove the black dummy cap with screwing cap from the STD-12 plus;
- c- follow exactly the instructions given to you in paragraph 1.3:
"connection to the COMPAQ portable computer, with this difference that the shorting red plug remains in the instrument's external On/Off switch;
- d- Follow the instructions given to you in paragraph 2:
"communicating with the STD-12 plus";
- e- Once in AML, type **ALT F**;
- f- Use function COPY, in submenu FILE, to transfer the files from the instrument to your disk drive. **ALT** will display a source file selection window that will allow you to choose the drive, directory and file for transfer (see pages 9 and 10 of the manual called TOTAL SYSTEM SOFTWARE). AML will ask you to give him the name of the source file. The name of the SOURCE file is the name that you gave to your LOG file (see paragraph 3.1 section c, for example: **SSP1**). We named the memory banks of the STD-12 plus drive D;

g- Thus, in this case, enter source file, **type D:\SSP1;**

h- AML will now get this file from the instrument and will ask you the name of the destination file. Type, for example: **A:\SSP1**, for saving the file on a floppy, or **C:\AML\DATA\SSP1**, for saving it on the computer's hard disk;

i- Now erase the SSP1 file from the D: drive of the instrument. When AML asks you which file to erase, you type: **d:\SSP1.**

j- If you want to lower the STD-12 plus again, you will have to program the instrument again. Follow paragraph 3.1 point c and d. When you have arrived in the data submenu, type a new name for the next logfile to be saved by the instrument. For example type for the log file: **SSP2;**

k- The STD-12 plus is ready for measuring again.

6. COMPUTER HANDLING

6.1 Exporting files from AML

In the submenu data (ALT D), you can view/edit the files you stored in the computer. If you want to see the data from an example file like: a:\SSP3, you could get a view/edit screen like Fig. 1-5 in the Total system Software manual. You can make a graph in AML (ALT G), however this program scales the data points using the minimum and maximum values found. It's difficult to compare the results afterwards when you have figures with different scales. A method to solve this problem is to save the data in a for Excel recognizable file.

a- Activate the view/edit option in the submenu DATA;

b- Type ALT P;

c- The output may be either to a printer or a file. If you choose a file you must supply a file name with an extension **.PRN** and activate the Lotus format option **OR** type a file name with extension **.WK1**. The Lotus format option allows you to create a file for importing to **Lotus 123** or **Excel 4.0** for use with its graphing routines;

d- Give the file name an extension **.WK1** and save it to floppy drive a.

6.2 Working with STD-12 plus files in MICROSOFT EXCEL 4.0

In MICROSOFT EXCEL 4.0 you can open the STD-12 plus files with extension .WK1 without problems. However, because of its format, the data are not nicely arranged in columns. With the PARSE command in submenu DATA you can arrange all data directly into columns.

a- Open a STD-12 plus file;

b- Click the whole first row where all the headings are located. Go to the PARSE command in submenu DATA;

c- Click GUESS. Now EXCEL will try to arrange all the different headings like TEMP, SAL, COND., into their separate columns. The first time you do this, EXCEL may commit mistakes during the PARSE procedure when you didn't use brackets (H) to indicate separate column headings. So, you should change the headings TEMP, SAL, CONE, etc., into [TEMP], [SAL], [COND], [etc.], before running PARSE;

d- Now the data are ready for all the graphic and statistical routines of EXCEL 4.0.

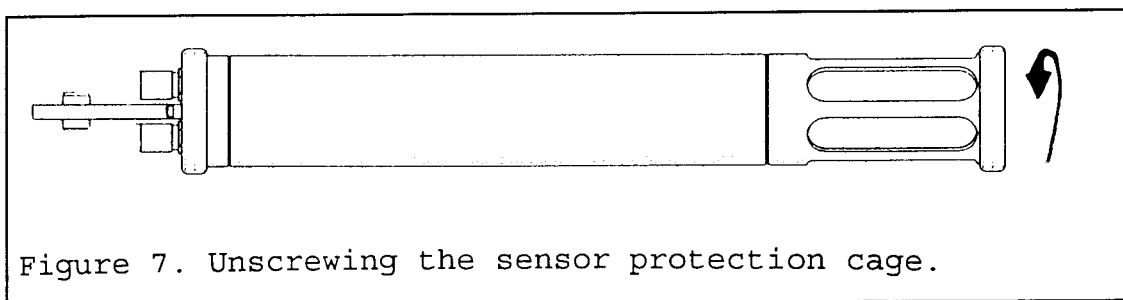
7. MAINTENANCE OF THE STD-12 plus

Read thoroughly chapter 5 of the USER'S MANUAL.

Be aware that the temperature, conductivity and pressure sensors need not to be calibrated until July 1995. Beyond July 1995, recalibration of these sensors must be carried out by the factory.

Remarks

- Before opening the STD-12 plus, for example for checking the electronics or changing the batteries, remember to dry the whole apparatus.



- It is important to lay the STD-12 plus on its side before opening it. To unscrew the sensor protection cage, it should be turned counter clockwise (see Fig. 7) . It goes faster with two persons, one holding the STD-12 plus' body and the other turning the sensor protection cage. Then follow the instructions in the USER'S MANUAL and be careful not to break or touch the sensors since they are extremely sensitive. When the sensor protection

cage is loose, you must pull out the **whole** instrumentation of the STD-12 plus, because the batteries are located just below the SHACKLE END CAP.

- When closing the STD-12 plus again make sure that all 0-rings are freshly greased and the sensor protection cage is tightened well.

8. TROUBLE SHOOTING AND FINAL REMARKS

Read thoroughly APPENDIX C of the USER'S MANUAL.

Remarks

In the submenu DATA from AML you can view and edit the data collected by the STD-12 plus. One column of the data collected contains information about the batteries. When you use the STD-12 plus, you will see how fast these non-rechargeable batteries run dry. This column gives you an indication about when to change them.

It may happen that by the time you replace the old batteries, the new ones are not what they seem to be. In Bujumbura for example, we once used batteries with reversed polarities (mistake in battery factory!) You should first check batteries by putting them (if possible one by one), into a less expensive apparatus to verify the polarity before installing them into the STD-12 plus.

IF A FLOOD OR BATTERY VENTING OCCURS, OPEN THE INSTRUMENT AS EXPLAINED TO YOU IN PARAGRAPH 7, AND REMOVE IMMEDIATELY THE BATTERIES. DISCONNECT THE WIRES RUNNING FROM THE EXTERNAL ON/OFF SWITCH AND THE COMMUNICATION CONNECTORS TO THE INTERNAL STRIP ON THE CIRCUIT BOARD. THOROUGHLY RINSE THE ELECTRONICS AND MECHANICAL HOUSING WITH DEIONIZED WATER. USE A HAIR DRIER TO DRY THE ELECTRONICS. THEN CONTACT THE PROJECT'S HEADQUARTERS FOR FURTHER INSTRUCTIONS.

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