SES E.S.L.

Electronic Shelf Tagging

Installation Manual
Radio System Installation

Manuel Installateurs

Installation radio

FOREWORD

This manual is reserved for installation specialists who should use it for reference purposes.

Installing an electronic tagging system requires complying with the recommendations set out by the technical department at SES-ESL.

Any system that is installed without complying with the procedures, recommendations and tips provided in this document will be considered as being under the sole responsibility of the installer who cannot in any event seek to hold SES-ESL liable.

SES-ESL reserves the right to make changes at any time and without prior notice to the products and the information described in this document. The latter cannot be considered as a contractually binding document.

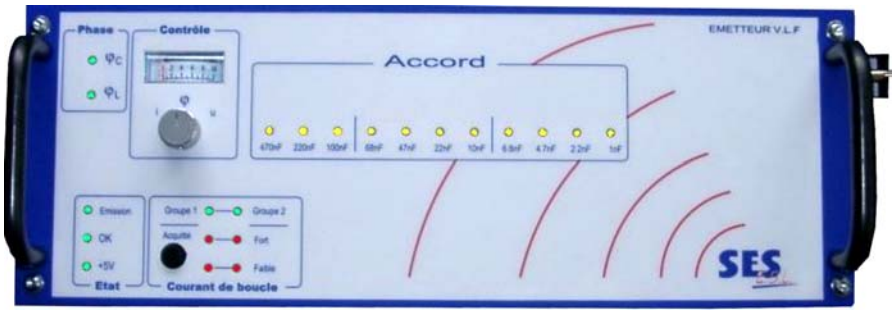
As the exclusive property of SES-ESL, this document and its content must not be made public, loaned out or copied without the prior written agreement of SES-ESL.

This documentation cannot be used in any way, directly or indirectly, against SES-ESL.

CALIBRATION

1 - TRANSMITTER

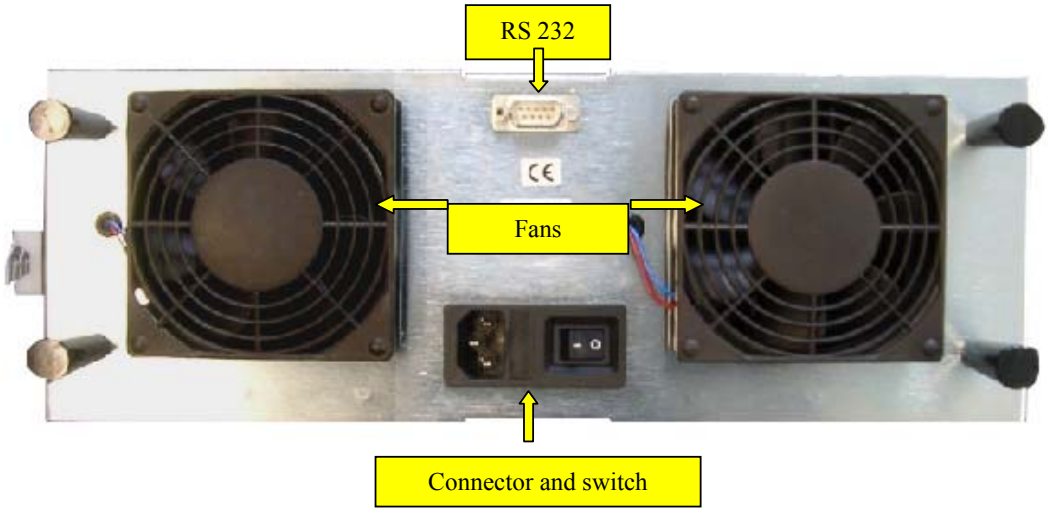
a) FRONT PANEL PRESENTATION:



The transmitter front panel comprises:

1) A three-position switch in the "Control" section: "I", "φ" and "U" positions.
2) Two green LEDs marked "φ C" and "φ L" indicating the phase, in the "Phase" section.
3) Eleven yellow LEDs displaying the tuning level in the "Tuning" section.
4) Three green LEDs indicating: "Transmission", "OK", "+5v" in the "Status" section.
5) Two green LEDs indicating the group: "Group 1", "Group 2".
6) Four red LEDs indicating "High" and "Low" fault conditions in the "Loop current" section.
7) An "Acknowledgment" push button in the "Loop current" section.

b) BACK PANEL PRESENTATION



CALIBRATION

2 - GENERAL

Before going into the details of this operation, its role must be understood.

Most electronic devices whose role is to amplify a signal, in most cases work with a fixed load or at least one that is relatively constant.

A hi-fi amplifier produces its signal using an 8-Ohm load represented by the speaker. This load is an identical one regardless of the make and power level of the speakers.

On the other hand, a CB transmitter works with antennas which may be different, and an adjustment will be required for the complete system to work correctly.

In our transmission system, the same applies and **this action is called calibration**.

Its importance is significant as our transmitters operate in stores with different sale areas and therefore unequal antennas settings.
Furthermore, all of the metal masses are located close to our antennas which are very long and spread throughout the entire store, have a very significant inductive and capacitive influence on the antenna values.

It is therefore necessary to adjust the amplifier to adapt to these differences.

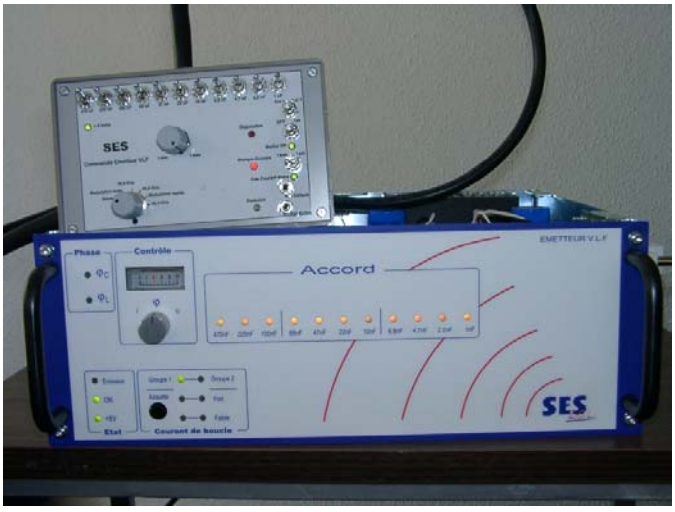
If the transmitter is powered up and a data transmission order sent, no output current will be obtained.

This is the proof of the importance of this operation.

Transmission quality is dependent on this step!

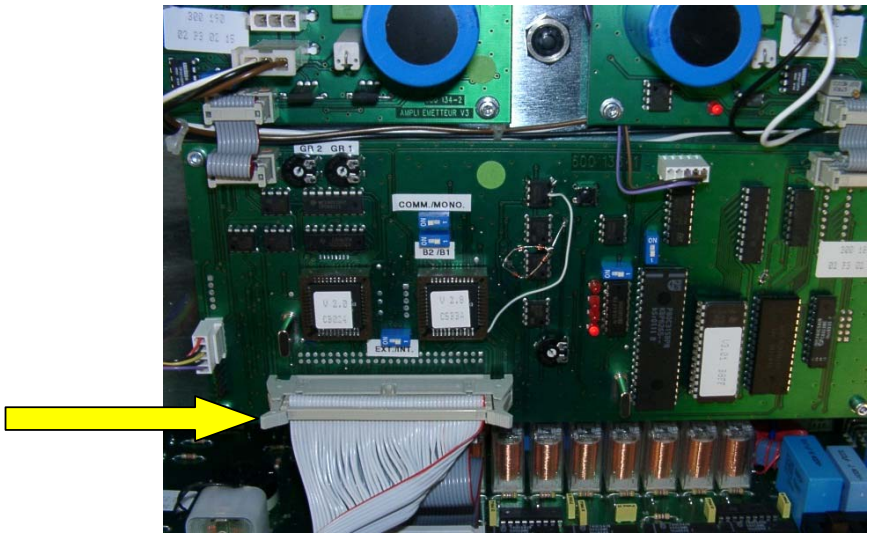
Calibration is performed by adding capacitance into the tuning circuit. This operation is performed using a calibration unit, the purpose of which is to select and validate the capacitance values that correspond to correct operation.

Transmitter and its calibration unit



CALIBRATION

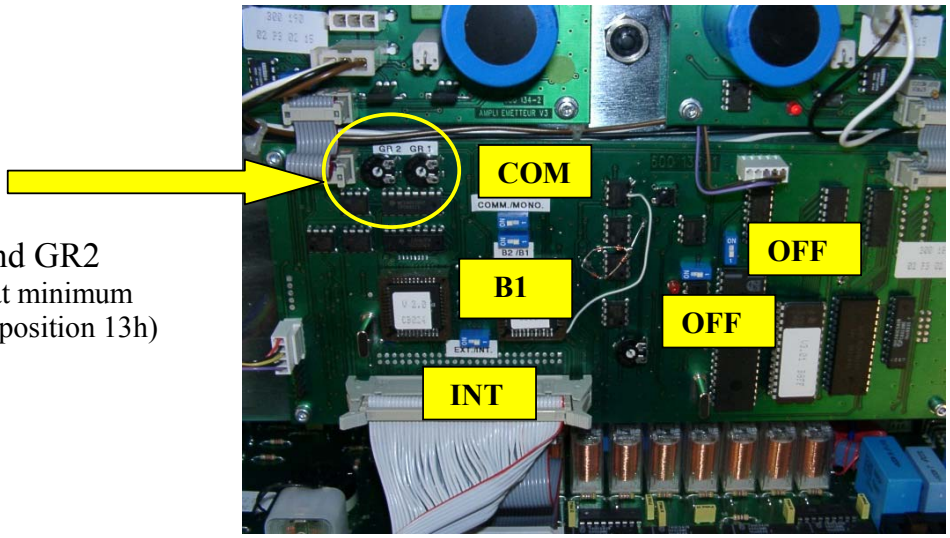
3 - PRELIMINARIES



Connect the calibration unit to the transmitter (foolproof connector).

Advantage is taken of this operation to check whether the configuration switches are correctly set.

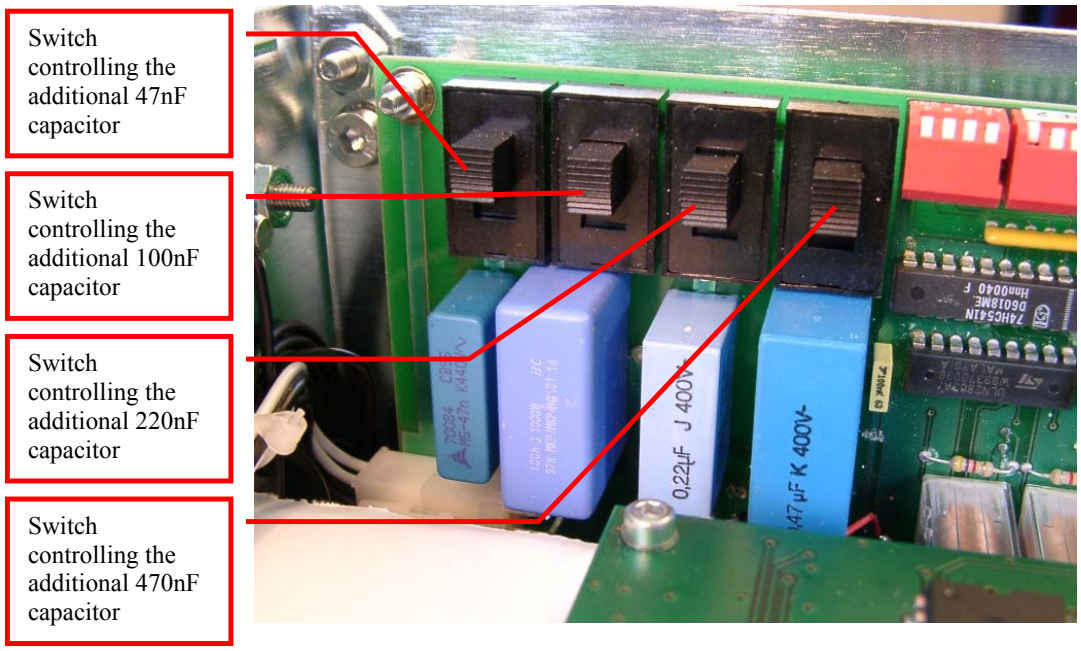
GR1 and GR2
at minimum
(position 13h)



CALIBRATION

3 - PRELIMINARIES

First of all, ensure that the additional capacitor switches are indeed in the up position.



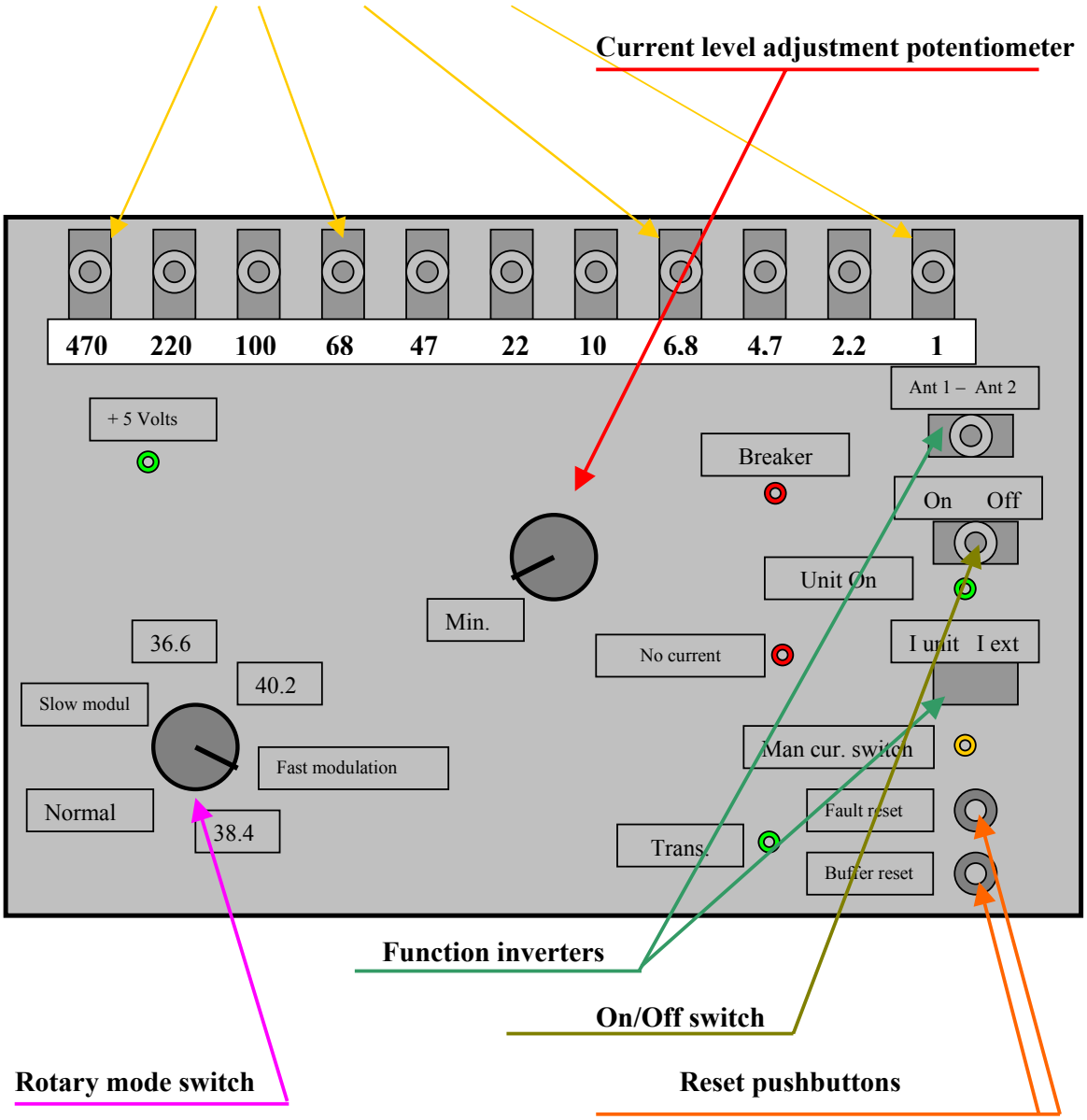
Warning: Some of the parts that are accessible within the transmitter are powered by potentially dangerous voltage level supplies.

We recommend always taking the utmost care to avoid unfortunate accidents.

CALIBRATION

4 - CALIBRATION UNIT

The eleven capacitor selection switches



LEDs:

- **+ 5 Volts presence, Transmission, Unit On**
- **Manual current command**
- **Circuit breaker, no current**

CALIBRATION

5 - PROCEDURE

After becoming familiar with the calibration unit, now is the time to start work!

a) Powering up

Use the **measurement sheet** (provided at the end of this chapter).

Call up the start configuration.

To do this, set:

1) The On/Off switch to **Off**,
2) The Antenna 1/Antenna 2 switch to **Antenna 1,**
3) The I unit/I ext switch to **I unit**,
4) The current level potentiometer to **I minimum**,
5) The Modes rotary switch to **38.4 kHz**,
6) All of the capacitor switches to **On** (out),
7) The **transmitter to power on** (back panel),
8) The "Buffer reset" switch to reset.

b) Determining the additional capacitor values required

From the transmitter front panel, in the Control section, set the switch to **φ**.
Set the On/Off switch on the calibration unit to **On**.
Now the transmission system is running.

The calibration procedure will be run using the calibration unit based on the observations taken from the Vu-meter in the "**Control**" section and on whether or not the "**Phase**" section LEDs come on.

Slowly increase the current level until the Vu-meter needle deviates slightly to the right (it must not go all the way to the right).
N.B.: Only the **φ C** LED should be lit.

Starting with the highest value **470 nF**, disable the capacitors one by one.

For each value, if the Vu-meter needle changes direction, re-enable the last capacitor switched off. Do not push too far!

When the lowest value capacitor has been tested, the procedure is completed for group 1.

Record the values in the measurement sheet table.

CALIBRATION

5 - PROCEDURE

N.B.:

- The φ C and φ L LEDs reverse when the Vu-meter needle changes direction.

- If the two φ C and φ L LEDs come on at the same time, this means that the setting is close to optimum. Never deliberately attempt to create this situation.

.

Warning, this may trigger the "breaker"

- Always ensure that the "**High**" LED on the transmitter stays off. If this LED comes on, this means that the current level is too high. At the extreme, this may indicate a circuit breaker triggering condition. The "**Breaker**" LED shows you this condition on the calibration unit. If this occurs, lower the current level a little.

- In the same way, ensure that the "**Low**" LED remains off. A "**No current**" indication on the calibration unit warns you that the current level is too low. If this occurs, raise the current level a little.

- To switch off the "**High**" or "**Low**" indicator LEDs, press the "**Reset**" button or the "**Fault reset**" button on the calibration unit.

Once the evaluation of antenna group 1 is completed, the same operation can be performed on group 2.

To do this, reset all of the capacitor level switches to the up position and repeat the previous procedure to **determine which additional capacitors** are needed.

Record the values obtained for group 2.

	470	220	100	68	47	22	10	6.8	4.7	2.2	1
G 1											
G 2											

Perform the short calculation shown on the measurement sheet.

This comprises **summing the capacitor values** retained for each group.

Take the highest value from each group.

Using the four additional capacitor values, look for the nearest sum level.

470	220	100	47

Record your choice using the switches on the transmitter by disabling the values not chosen.

The procedure for determining which additional capacitors are required is completed.

CALIBRATION

5 - PROCEDURE

c) Definitive adjustment

The previous operations are used to **evaluate the additional capacitor values** that are common to both antenna groups. Now it is time to repeat this operation knowing that this adjustment will take into account the capacitor values you have retained.

To do this:

- Return all of the capacitor switches to the up position,
- Move to the "Antenna 1" group
- Repeat the de-selection operation just like in the previous step.

The new combination will summarily tune the transmitter to a central frequency of 38.4 kHz. However the values that you have just selected do not provide any certainty that the output current level will be the same for both frequencies: 36.6 and 40.2 kHz.

To move in this direction, **current level balancing** is required.

To do this, proceed as follows:

- From the transmitter, move the rotary switch to **I**,
- From the control unit:
  a. The capacitor switches remain set,
  b. The two-way switch is set to I unit,
  c. The rotary switch is set to 36.6 kHz,
  d. Using the potentiometer bring the Vu-meter needle to **4,**
  e. Position the rotary switch to 40.2 kHz and observe the Vu-meter variation.

WARNING: During the entire adjustment procedure, when in the 36.6 kHz position, the **φ L** LED should be lit and when in the 40.2 kHz position, the **φC** LED should be lit. **If not**, repeat the capacitor selection process for operation is not correct.

Now seek out the larger of the two values. This process is performed by switching between the two frequencies a number of times.

Consequently, you now have an idea of the current imbalance between the two frequencies.

Move to the larger of the two and set the current level to **7** using the potentiometer.

Check the value for the other frequency.

Using the capacitor switches, starting with the lowest value, bring the needle up to the average current value read for each frequency.

CALIBRATION

5 - PROCEDURE

If the variation is not significant enough, move on to the next switch.

This operation is a fairly delicate one for it requires a proper understanding of what is going on. With a little experience it should be possible to complete it in 30 seconds.

It is important to switch between the two frequencies every time the capacitor switches are used in order to view the resulting action caused. This procedure is therefore performed with one hand on the rotary mode switch and the other on the capacitor switches.

If the current level is a little low for both frequencies, you can always increase the higher of the two up to a 7-8 setting.

It is also possible that the highest current at one time becomes the lowest, and vice-versa. This means that you have moved past the best value setting. This is where the capacitor combinations come in.

For example: You have just switched on the 22nF capacitor and you realize that this value is too high, switch off 22 and switch on 10, 6.8 and 4.7 to obtain 21.5 nF.
If this is not enough and 21.5 is still too high, switch off 4.7 and switch on 2.2 and 1 to obtain 20 nF and so on.

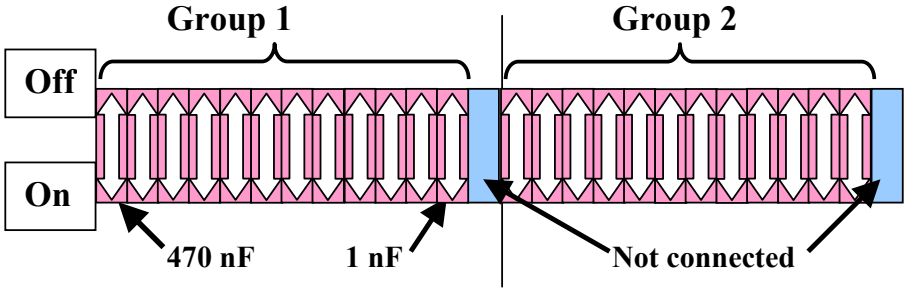
- Refine this adjustment until the difference between the two frequencies is less than one graduation,
- Then position the rotary mode switch to slow commutation and observe the needle pulse. This should be a very low level one.

To ensure that the adjustment made is the optimum one, change the position of the switches for the smallest combinations possible. If the needle no longer deviates, you are sure to have found the best adjustment.

When observing the **φ C** and **φ L** LEDs, you should see the two LEDs pulse alternately.

If the adjustment fails, repeat the current balancing procedure from the beginning.

The newly obtained values should be recorded on the measurement sheet as well as on the transmitter's Group 1 dip switches.



CALIBRATION

5 - PROCEDURE

This means that the second step has been completed: the current level is balanced on both frequencies; all that remains is to set its output level on the antennas.

This point requires special care, for the current level adjustment that is about to be made is up to the user only! Connect up the oscilloscope and the current probe.

Note that the system must comply with applicable standards. These standards imply a maximum admissible magnetic field which is reached when a 2-Amp peak-to-peak current **runs through an antenna** like the ones used here.

The adjustment will therefore be made to not exceed 2 Amps peak-to-peak.

To perform a proper adjustment, proceed as follows:

1) Place the transmitter rotary switch on **I**,
2) Set the function two-way switch to I unit,
3) Adjust the current adjustment potentiometer to set the needle on **4**,
4) Connect a current probe to the first antenna in Group1,
5) Record the current level,
6) Connect the probe to the second antenna in the same group,
7) Record the current level,
8) Choose the antenna with the highest current level,
9) Place the probe on this antenna,
10) Using the small screwdriver, check that the current level is at minimum (13h),
11) Move the two-way switch from I unit to I ext,
12) Increase the current value by slowly turning the small potentiometer counter clockwise (12h). Note that this adjustment is a sensitive one! **Set to 2 A dc**,
13) Check the current level on the other antenna, it must never exceed 2 A,
14) Record these values on the measurement sheet.

At this stage, the transmitter is correctly calibrated for Group 1. Now repeat the same procedure for the **second group** (from the definitive adjustment on).

CALIBRATION

5 - PROCEDURE

- MEASURING THE CURRENT LEVELS OF THE TWO GROUP 1 ANTENNAS

adjusting the output current level to 0.7A eff (2A peak-to-peak)

- MEASURING THE TRANSMITTER'S OVERALL OUTPUT CURRENT LEVEL