

10/20 System Positioning

MANUAL

Trans Cranial Technologies

NOTICE

THE FOLLOWING MATERIAL IN THIS MANUAL IS EXCLUSIVELY FOR INFORMATIONAL PURPOSES. THE CONTENT AND THE PRODUCT IT DESCRIBES ARE SUBJECT TO CHANGE WITHOUT NOTICE. IN NO EVENT WILL TRANS CRANIAL TECHNOLOGIES LTD, BE LIABLE FOR THE DAMAGES ARISING FROM OR RELATED TO THE USE OF THIS MANUAL OR THE PRODUCT IT DESCRIBES.

IMPORTANT

The information you read in this manual cannot replace the relationship that you have with your health care professional. None of the the information in this manual should be considered medical advice. You should always talk to your health care professional for diagnosis and treatment.

COPYRIGHT

No part of this manual may be reproduced, transmitted, in any form or by any means, electronic, mechanical, photocopying, microfilming, recording, or otherwise, without written permission from Trans Cranial Technologies ltd.

© 2012 *Trans Cranial Technologies ltd.*

2410 Fortis Tower

77-79 Gloucester Road

Wanchai

Hong Kong

Table of Contents

1	<i>Introduction</i>	<i>1</i>
	General introduction	1
	10 / 20 System electrode distances	2

2	<i>Electrode Placement Procedure</i>	<i>3</i>
	Step 1	3
	Step 2, step 3	4
	Step 4, step 5	5
	Step 6, step 7	6
	Step 8, step 9	7
	Step 10, step 11	8
	Step 12, step 13	9
	Step 14, step 15	10
	Step 16, step 17	11
	Step 18, step 19	12
	Step 20, step 21	13

3	<i>Addendum</i>	<i>14</i>
	10 / 20 system positions	14
	10 / 10 system positions	15

1 Introduction

General Introduction

The 10/20 system or International 10/20 system is an internationally recognized method to describe the location of scalp electrodes.

The system is based on the relationship between the location of an electrode and the underlying area of cerebral cortex. The numbers '10' and '20' refer to the fact that the distances between adjacent electrodes are either 10% or 20% of the total front-back or right-left distance of the skull.

Each site has a letter to identify the lobe and a number to identify the hemisphere location.

Electrode	Lobe
F	Frontal
T	Temporal
C	Central *
P	Parietal
O	Occipital

No central lobe exists, the 'C' letter is used for identification purposes only.

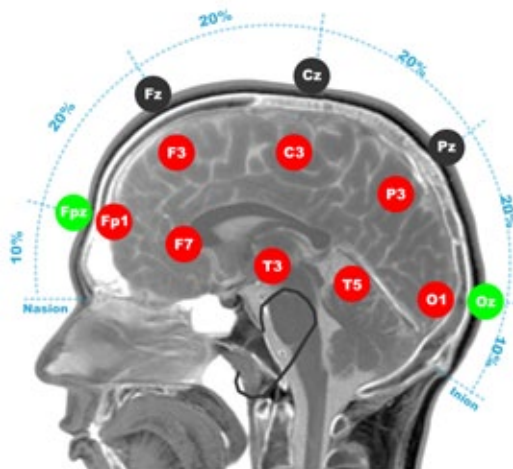
The 'z' (zero) refers to an electrode placed on the mid line.

Even numbers (2,4,6,8) refer to electrode positions on the right hemisphere.

Odd numbers (1,3,5,7) refer to electrode positions on the left hemisphere.

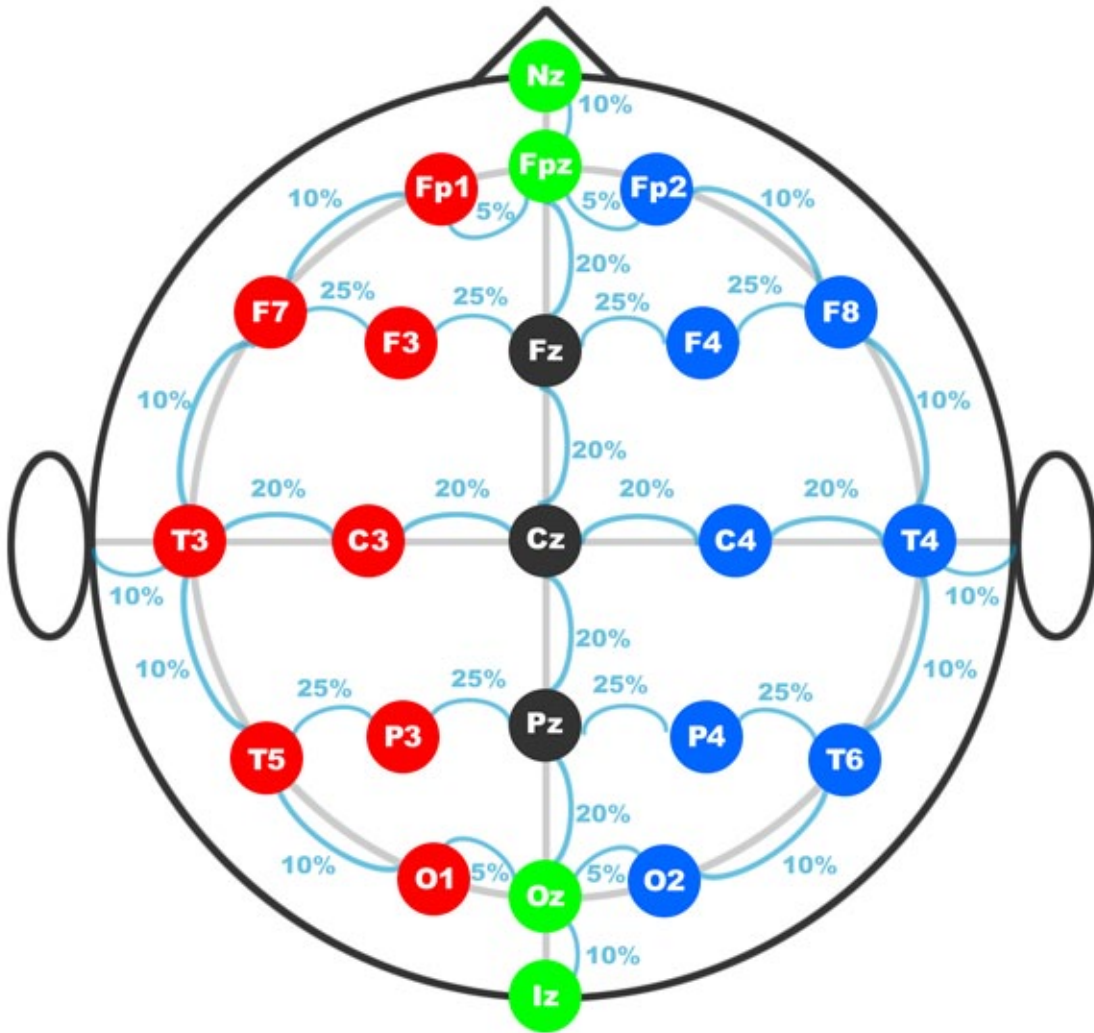
Four anatomical landmarks are used for the essential positioning of the electrodes: first, the nasion which is the point between the forehead and the nose; second, the inion which is the lowest point of the skull from the back of the head and is normally indicated by a prominent bump; the pre auricular points anterior to the ear.

Extra positions can be added by utilizing the spaces in between the existing 10/20 system.



The next pages are a step by step guide for measuring positions of the 10/20 system.

10 / 20 System Electrode Distances

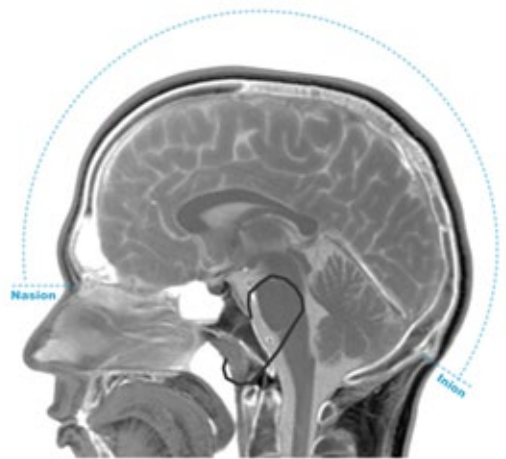
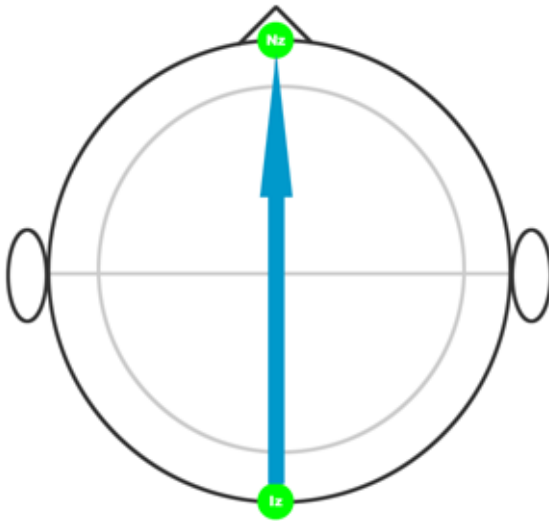


2 Electrode Placement Procedure

Step 1

Take a measuring tape and use the centimeter side. Measure over the center line of the scalp, from the Nasion (bridge of the nose) to the Inion (occipital protuberance). Note the total length.

For our example, the total length is 36 cm.

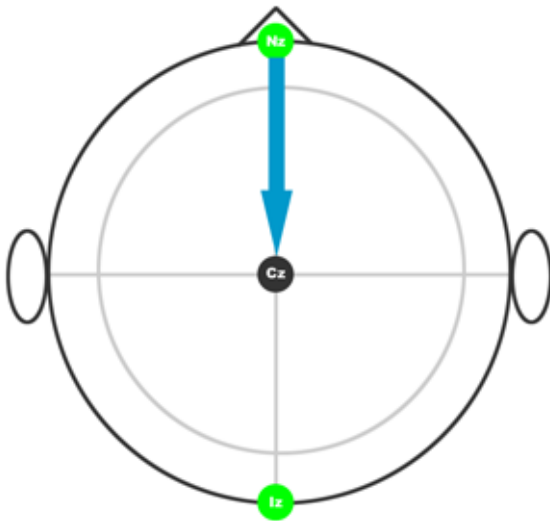


Finding the Inion: if you run your finger up the back of the neck, you will encounter a depression with the ridge of the protruding inion just above it.

Step 2

Measure and mark 50% of your total.
This is your preliminary Cz mark.

In our example $36 \text{ cm} / 2 = 18 \text{ cm}$

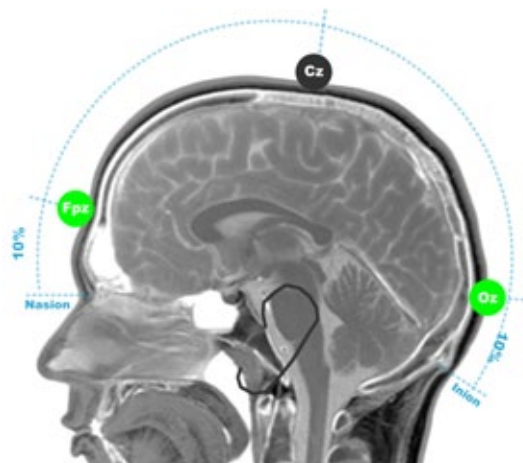
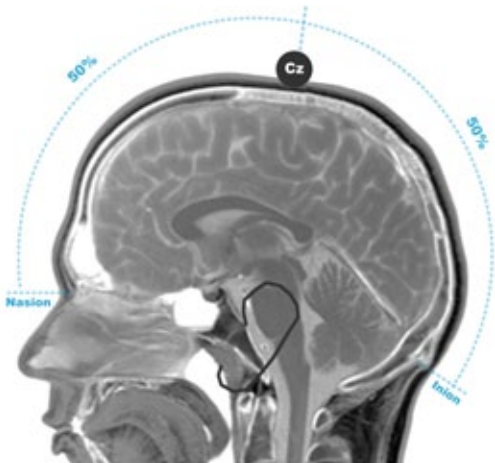
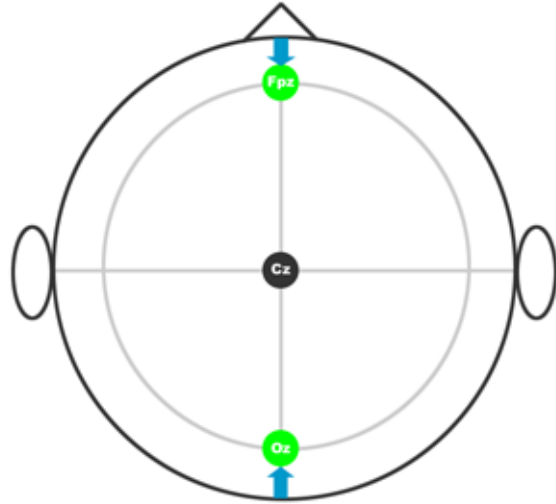


Step 3

Measure and mark 10% up from the Nasion and
10% up from the Inion.

These are your preliminary mark of Fpz and Oz.

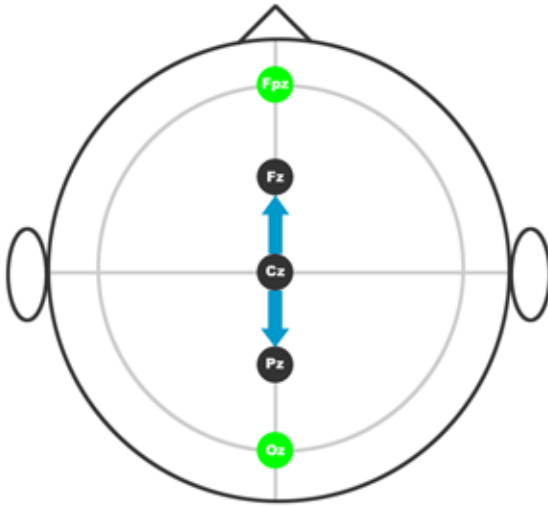
In our example 10% of 36 cm is 3.6 cm



Step 4

Mark 20% from either the first mark of Fpz or Cz. These will be your preliminary marks of Fz and Pz.

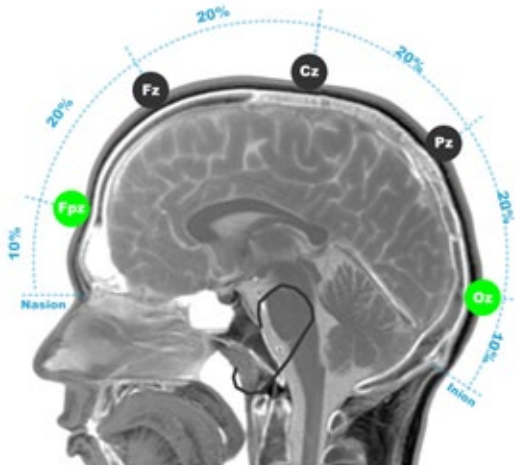
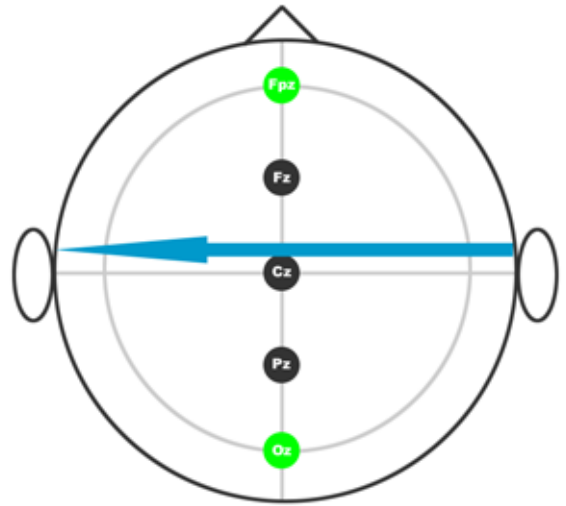
In our example 20% of 36 cm is 7.2 cm



Step 5

Measure from preauricular point to preauricular point. Lightly run your finger up and down just anterior to the ear; the indentation above the zygomatic notch is easily identified. Opening the mouth slightly makes it easier to find the exact location. Note the total length.

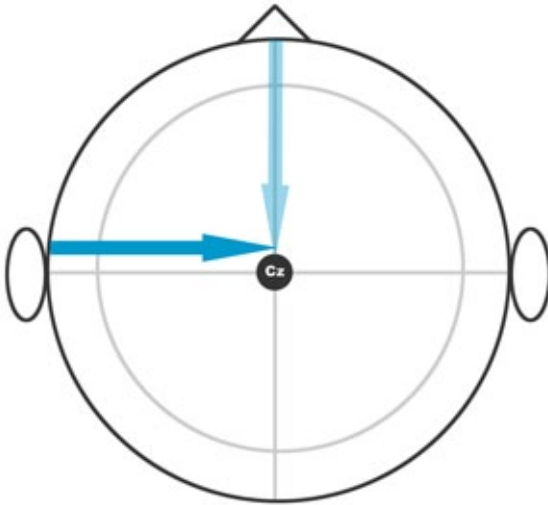
For our example it is 38 cm



Step 6

Measure and mark 50% of your total.
At the intersection with your previous 50% mark from the Nasion to the Inion is your **true Cz** mark.

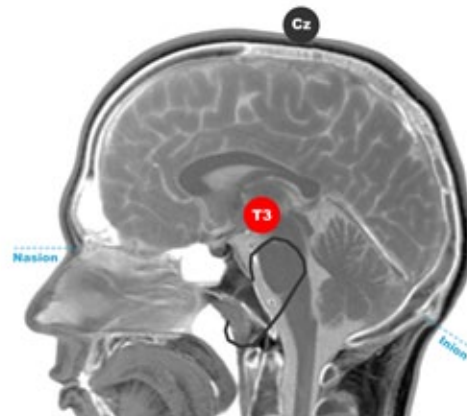
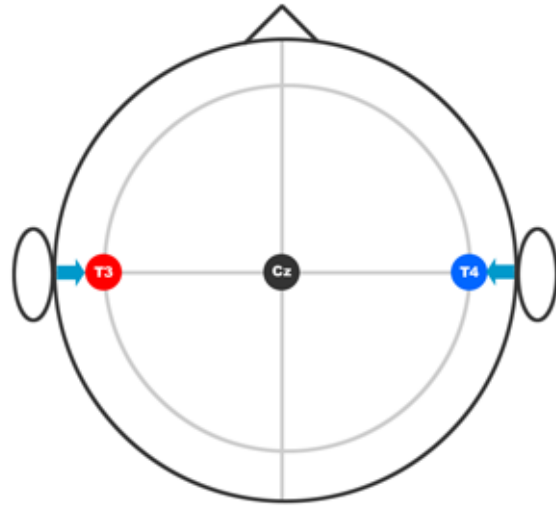
In our example $38 \text{ cm} / 2 = 19 \text{ cm}$



Step 7

Measure and mark 10% up from the pre auricular points. These are your preliminary marks of T3 and T4.

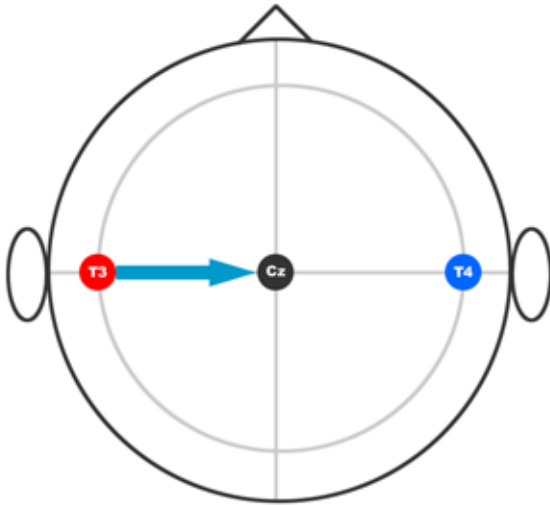
In our example 10% of 38 cm is 3.8 cm



Step 8

Measure from your first mark of T3 to Cz.
 Note the total length.
 Measure from your first mark of T4 to Cz.
 Note the total length.

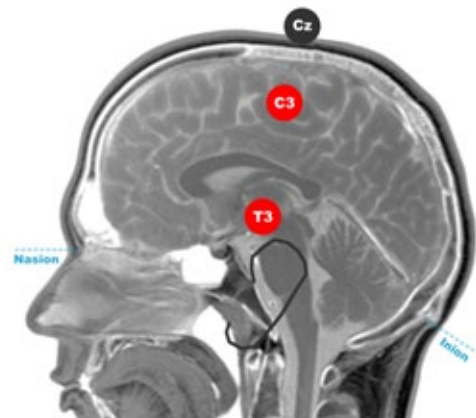
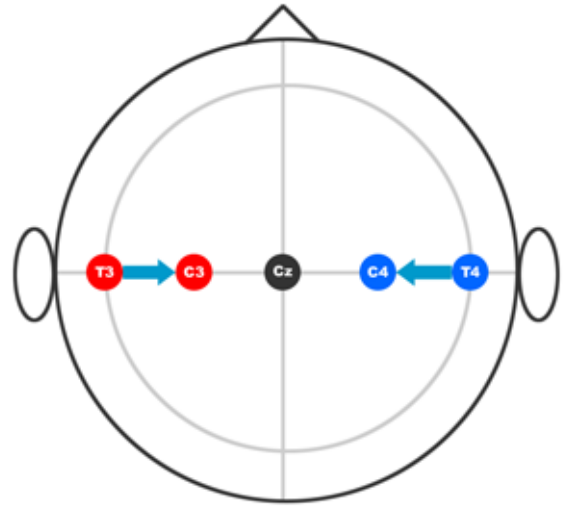
For our example 15 cm



Step 9

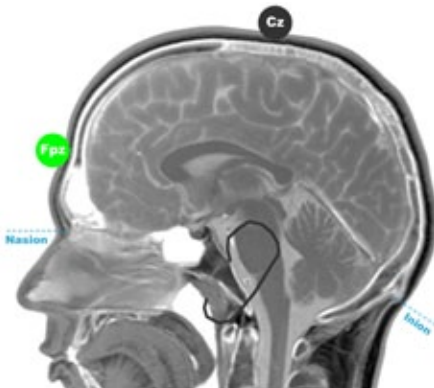
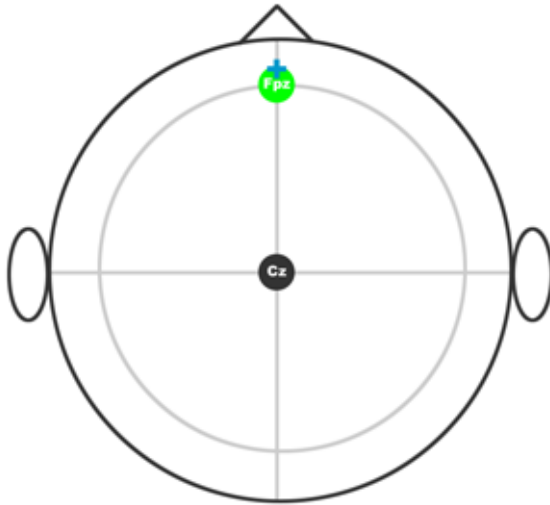
Measure and mark 50% of the totals in the previous step. These are your preliminary marks of C3 and C4.

In our example $15 \text{ cm} / 2 = 7.5 \text{ cm}$



Step 10

Draw a cross section mark on Fpz.
This is your **true** Fpz mark.

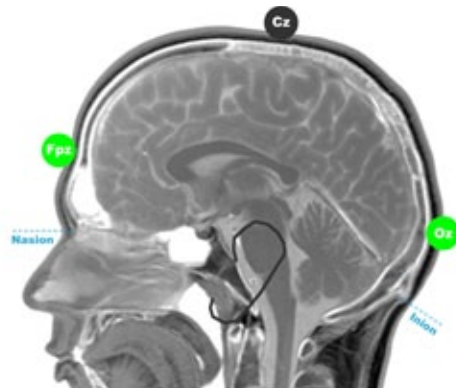
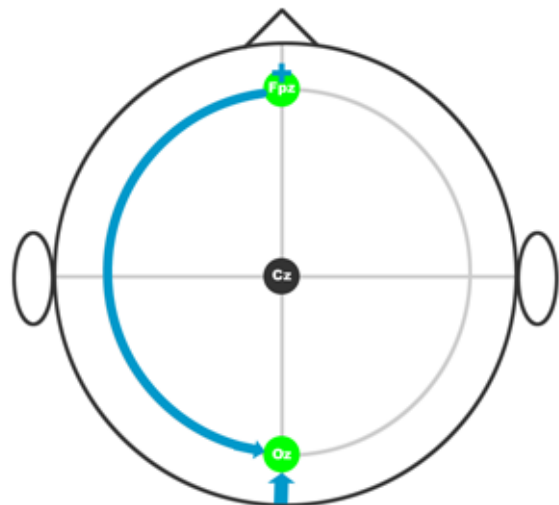


Step 11

Encircle the measuring tape across your 10% Fpz mark and the 10% Oz mark at the back of the head.
Note the total circumference of the head.

Measure 50% of the total circumference from Fpz to the back of the head. At the cross section with your preliminary Oz mark is your **true** Oz mark.

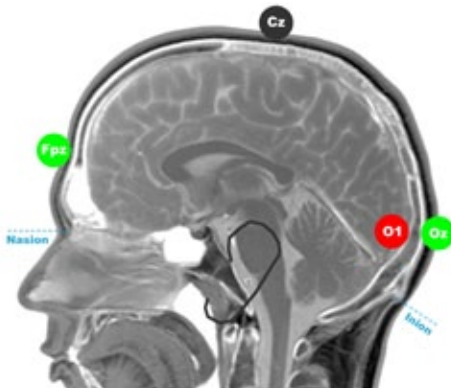
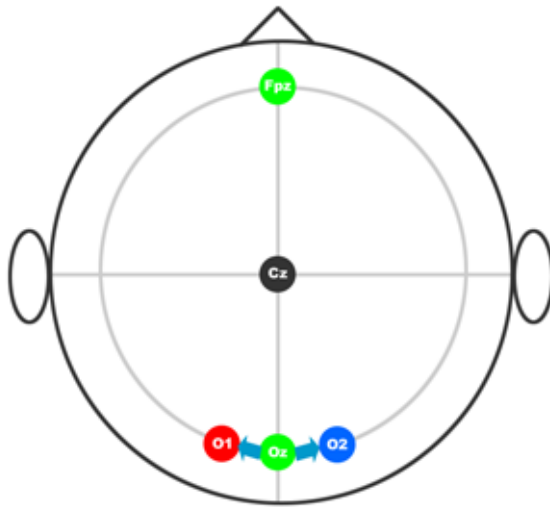
For our example $56 \text{ cm} / 2 = 28 \text{ cm}$



Step 12

Measure and mark 5% of total circumference to the left and right of Oz. These will be your **true** marks of O1 and O2.

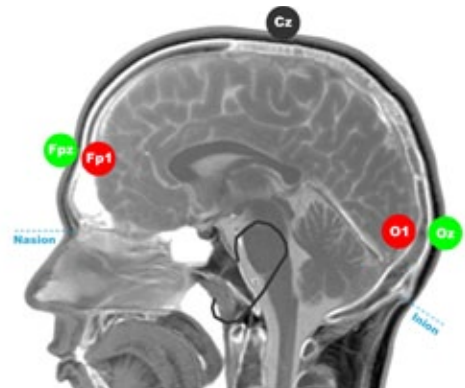
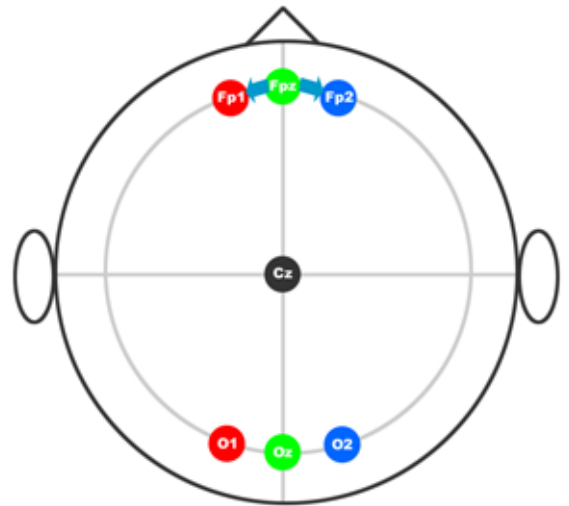
In our example 5% of 56 cm = 2.8 cm



Step 13

Measure and mark 5% of total circumference to the left and right of Fpz. These will be your **true** Fp1 and Fp2 marks.

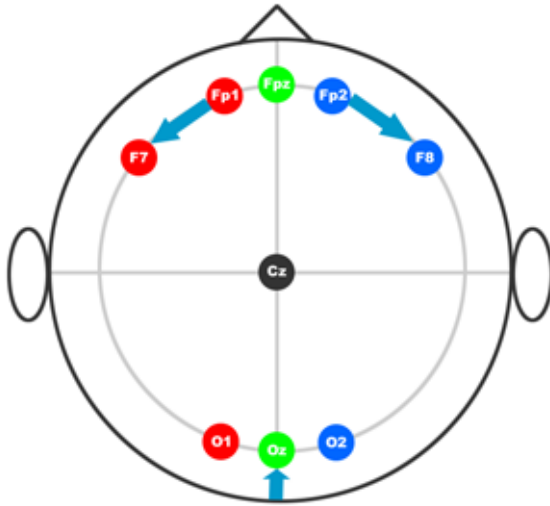
In our example 5% of 56 cm = 2.8 cm



Step 14

Measure and mark 10% down from Fp1 and Fp2. These are your marks for F7 and F8.

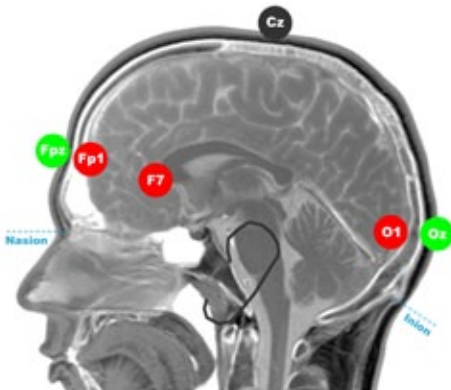
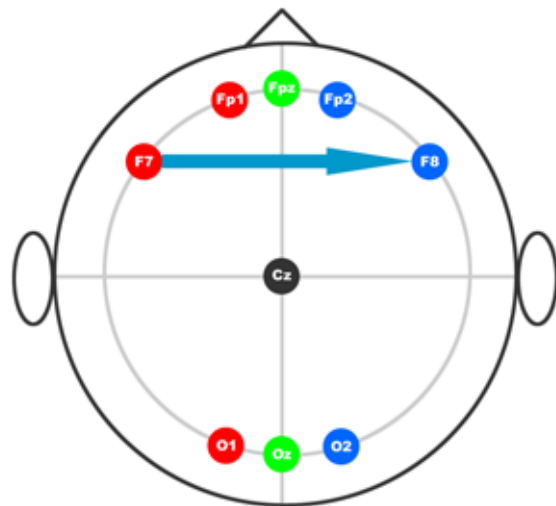
In our example 10% of 56 cm = 5.6 cm



Step 15

Measure from F7 to F8 and note your distance.

For our example 32 cm

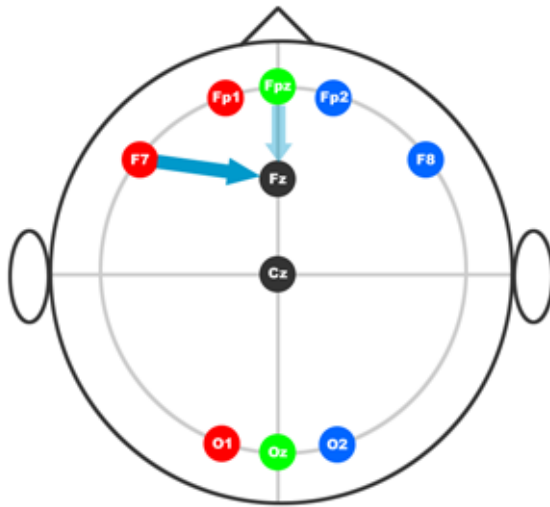


Positioning for T5 and T6 is analogous to step 14 for determining F7 and F8

Step 16

Measure and mark half of the distance between F7 and F8. At the intersection with your preliminary Fz mark is the **true** mark for Fz.

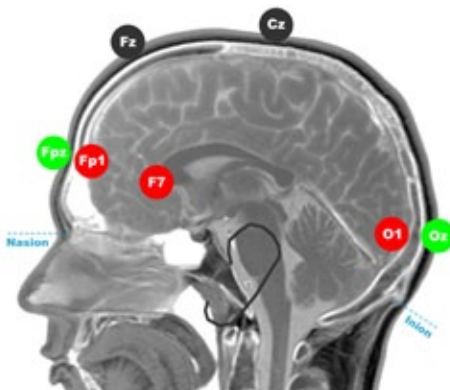
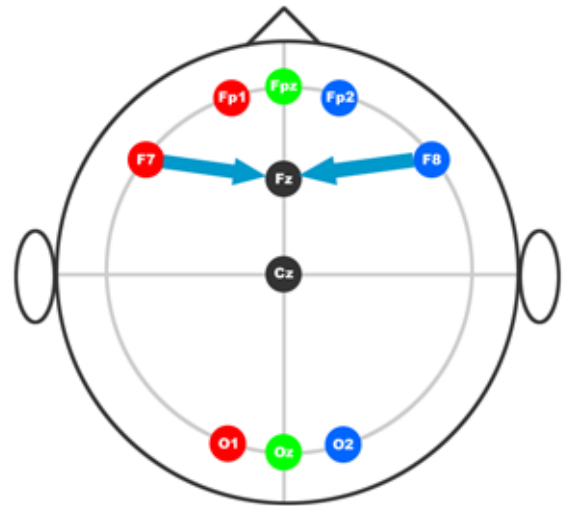
In our example $32 \text{ cm} / 2 = 16 \text{ cm}$



Step 17

Measure from F7 to Fz, note the distance.
Measure from F8 to Fz, note the distance.

For our example 16 cm and 16 cm

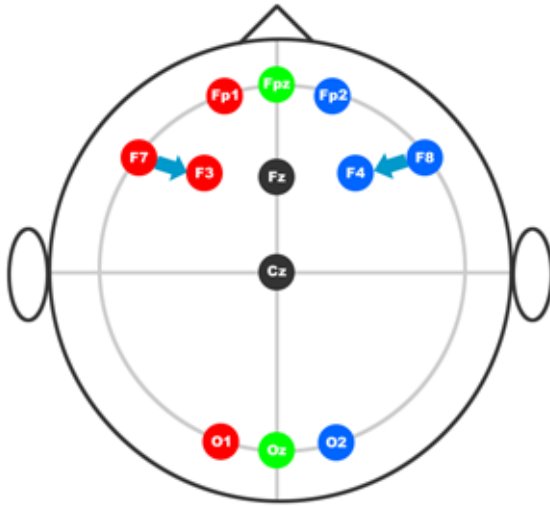


Positioning for Pz is analogous to steps 15 and 16 for determining Fz

Step 18

Measure and mark half of the distance between F7-Fz and F8-Fz. These are your preliminary marks for F3 and F4.

In our example $16 \text{ cm} / 2 = 8 \text{ cm}$

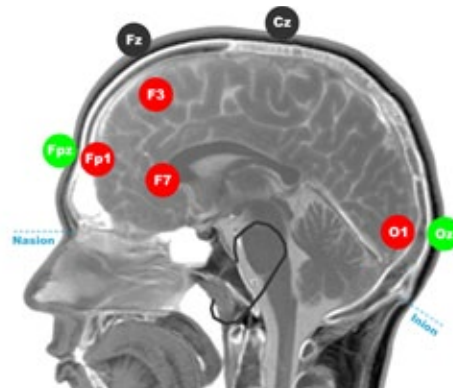
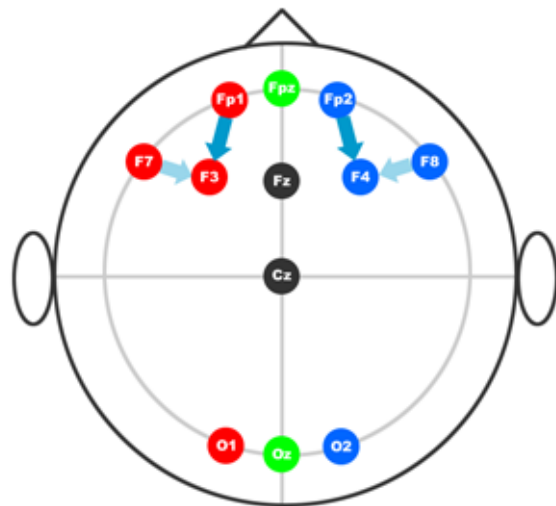


Step 19

Measure and mark 20% of the Nasion-Inion distance from FP1 to F3. At the intersection will be your **true** F3 mark.

Measure and mark 20% of the Nasion-Inion distance from FP2 to F4. At the intersection will be your **true** F4 mark.

In our example $20\% \text{ of } 36 \text{ cm} = 7 \text{ cm}$



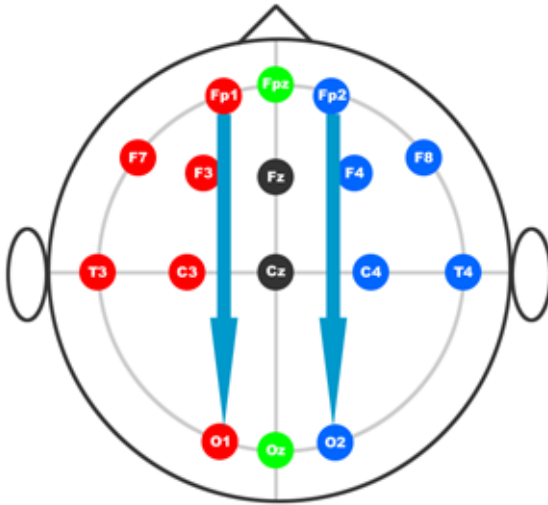
Positioning for P3 and P4 is analogous to steps 17, 18 and 19 for determining F3 and F4

Step 20

Measure from Fp1 to O1, to obtain your preliminary mark of C3.

Measure from Fp2 to O2 to obtain your preliminary mark of C3.

For our example 28 cm

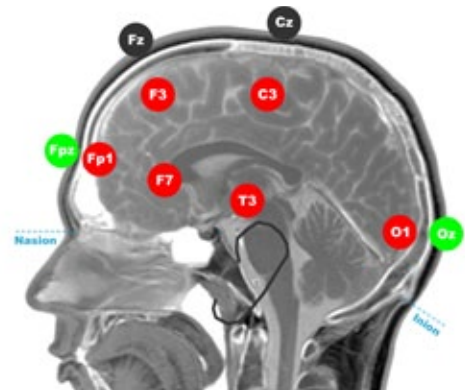
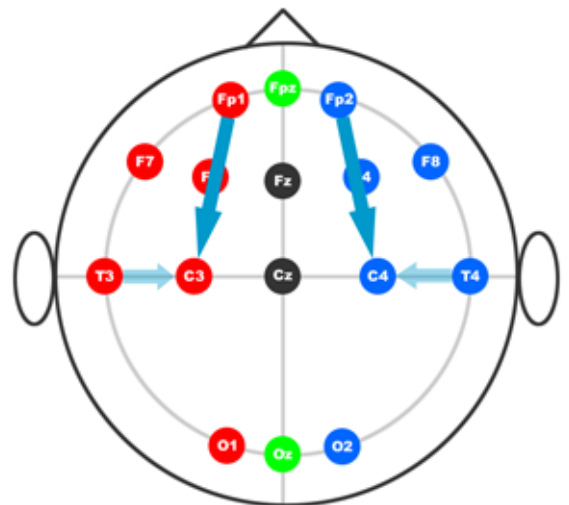


Step 21

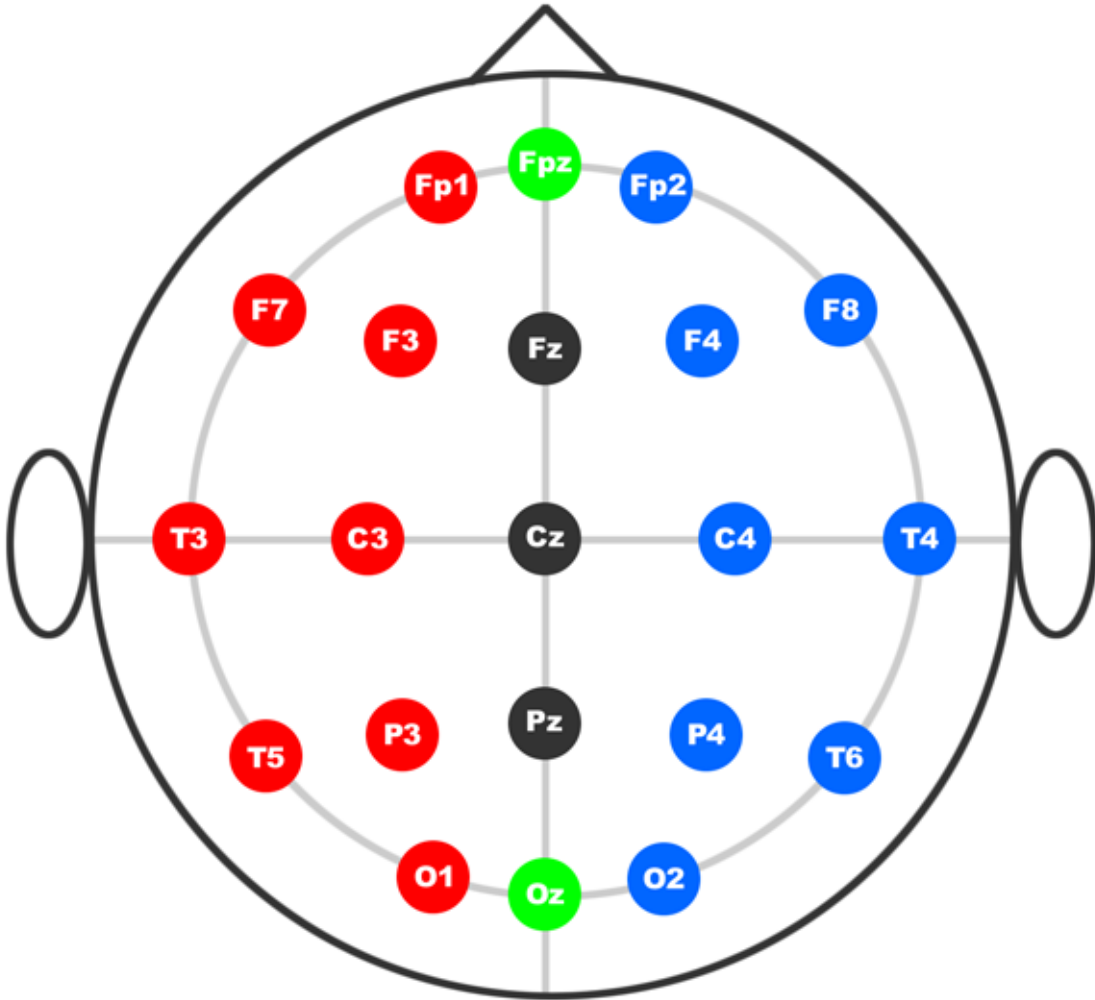
Measure and mark half of the distance Fp1-O1. Where your first and second marks intersect will be your **true** C3.

Measure and mark half of the distance Fp2-O2. Where your first and second marks intersect will be your **true** C4.

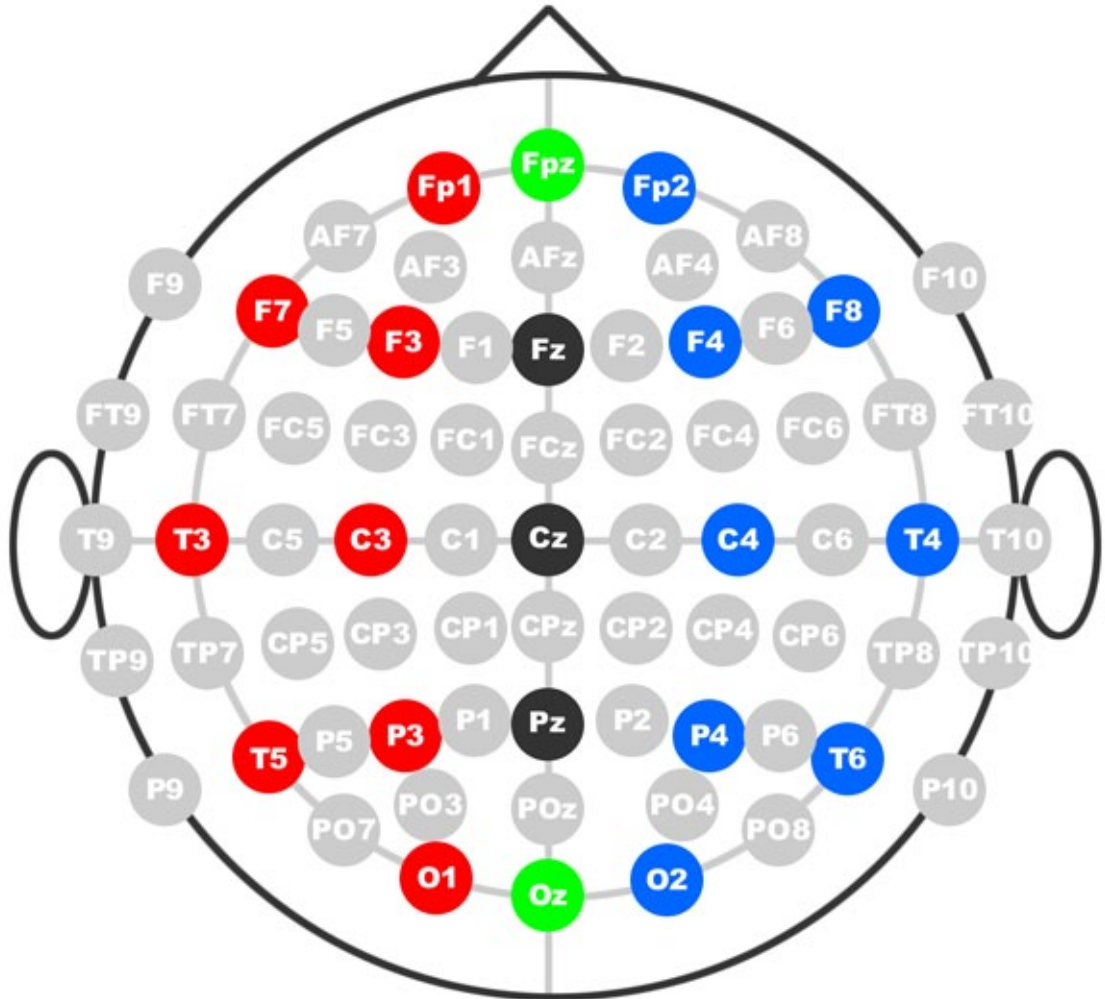
In our example $28 \text{ cm} / 2 = 14 \text{ cm}$



10 / 20 System Positions



10 / 10 System Positions



- Page intentionally left blank -

