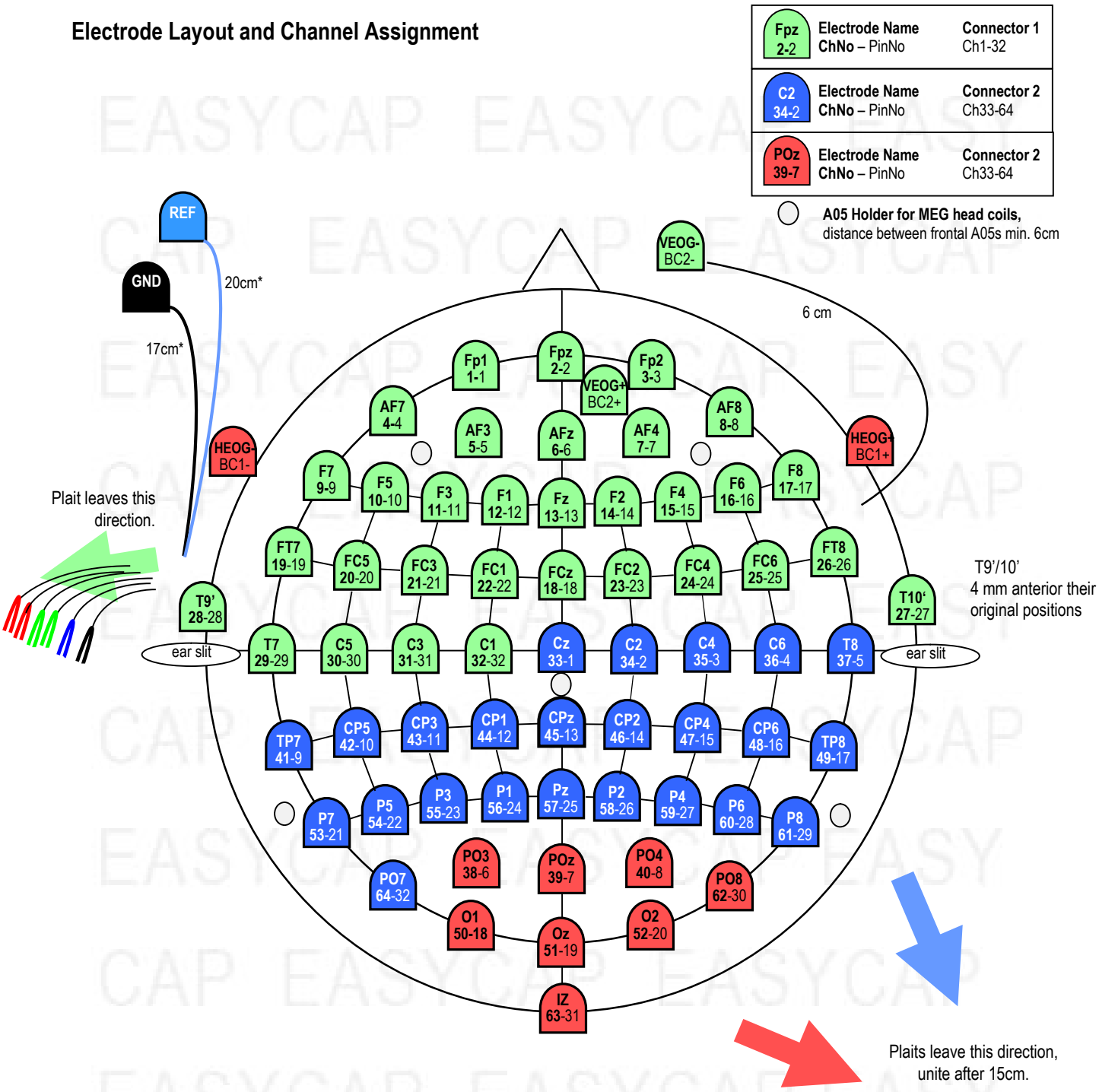
EASYCAP
EEG Recording Caps and Related Products

EASYCAP GmbH
Steingrabenstrasse 14
DE-82211 Herrsching
Germany

Tel +49 (0) 8153 88702-00
Fax +49 (0) 8153 88702-10
www.easycap.de
info@easycap.de
Delivery Address: Am Anger 5, DE-82237 Woerthsee-Etterschlag

64Ch BrainCap-MEG for Triux, customized for Birmingham 2019

Electrode Layout and Channel Assignment



*average drop-down length in adult size 58, slight deviations in other cap sizes

Details for Users

Ordering Information

For ordering please give **Article Number, Cap Cut, Cap Fabric, and Size**
(e.g. *BC-MEG-64-X10, Caucasian, High Precision, 56*):

- Article Number: *BC-MEG-64-X10*
- Cap Cut: *Caucasian* or *Asian*
- Size (given in cm head circumference):
  Adult caps: *54*, *56*, *58*, *60*, *62*, *64* (average male: 58, average female: 56)
  Children caps: *50* (5 years), *52* (7 years), *54* (11 years).

The catalogue-number comprises the cap as described, serial number, and this document; all packed in a labelled cardboard box. For a first order additional single, loose electrodes may be useful (see below: "Extra Electrodes"). For further information about accessories or consumables please visit our website or contact our local distributor.

Cap Fabric & Cap Style

Standard: White Subtemporal Cap with integrated chin belt, high precision cap fabric.
Options: Caucasian or Asian, Cap Fabric, Size

Cap Electrodes

All electrodes are MEG-suited Multitrodes with sintered Ag/AgCl sensors. They are buttoned directly into the cap (total height 3,5 mm) or can be attached to the skin with washers (= double-sided adhesive rings).

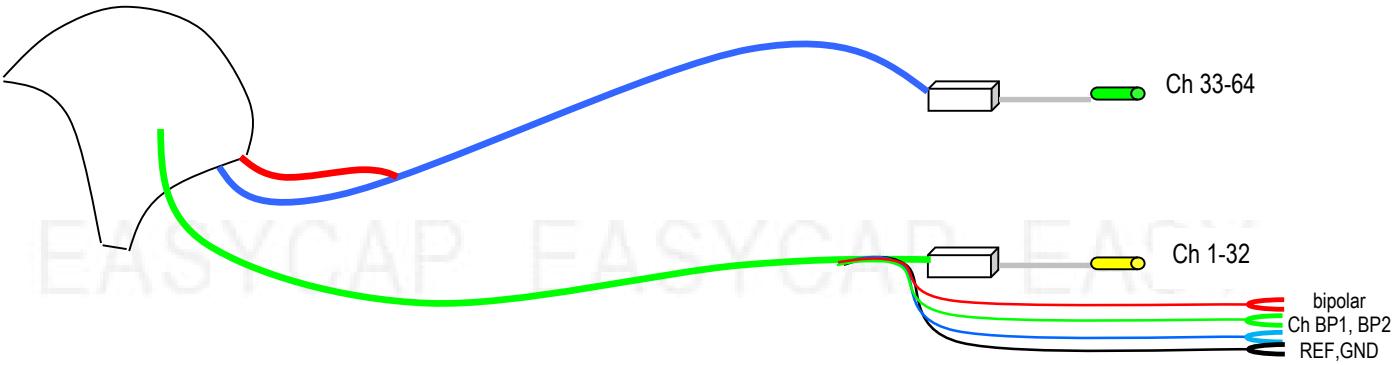
All cap-electrodes are labelled with name (Fp1, …) AND channel number (1 thru 75) at the sensor end. The cable colours correspond to the above figure. The cables are attached to the cap with nylon threads. Three cable trees leave the cap at the indicated positions, the blue and red cable tree unite approx.. 15cm after the cap rim to one cable tree. Each of those cable tree ends into a connector. The length of cable trees is approx. 160 cm.

EOG electrodes BC1+, BC1-, BC2+, BC2- are labeled at the sensor end with electrode names. Electrode BC2+ is behind position Fp2/Fpz in the cap; electrodes BC1+, BC1-, BC2- are drop-down electrodes, extending beyond the cap rim by the length given in the figure. All 4 electrodes plus REF and GND are included in the cable tree of connector 1, but not terminated into the LEMO-connector. Instead, they leave the cable-tree before the small converter box and extend beyond the LEMO connector for another 10 cm. Then each electrode is terminated individually into silver-plated 1.5mm-touchproof safety sockets, labeled with the channel number.

Additional 5 A05 holders are inserted at the indicated positions (little gray circles) for MEG head coils, at approximate positions AFF5h/AFF6h (possibly slightly lateral so distance is minimum 6cm apart), and TPP9h/TPP10h (slightly posterior), and CCPz.

Termination

Channels 1-32 and 33-64 are converted onto round cables inside a small box and then terminated into three push-pull-32Ch-connectors to match the Triux-Inputs according to the pin-assignment given in the figure.



Hints for Handling MEG-compatible Electrodes

It is important to understand that although MEG-compatible electrodes are and stay non-magnetic if handled correctly; they still contain soft metals which will become magnetic if exposed to a magnetic field.
Therefore, please never take them close to sources of electromagnetic fields, e.g. into a MR-scanner. Even closeness to neon-bulbs, wall outlets etc. should be avoided.

Further, cleanliness is important not only for hygienic but also for technical reasons: it is astonishing how many ferro-magnetic particles are contained in ordinary household dust. Thus not only the cap but also the storage room should be kept clean.

As tap water may contain metallic particles, the whole cleaning process should be performed with purified water (pharmacy-available). If this is not possible, then at least the last step of each cleaning should be to rinse the electrodes with purified water.

In case electrodes become (slightly) magnetized, in most cases they can be made MEG-compatible again either by simple cleaning or else by de-magnetizing the electrodes with e.g. a hand-held degausser (among others available from us).

Extra Electrodes (can be ordered separately)

For further bipolar channels, separate single electrodes are required, here an example of a set of 2 electrodes:

2 B18-MEG-HS-200 MEG-compatible Multitrode made with transparent housing, 200 cm heavy duty leadwire, labels „EX20" and "EX21" on both ends, silver-plated 1.5mm touchproof safety socket
cable colours eg. Red and green (alternativ colors are blue or black)

Table of Coordinates

Channel-number	Name	Theta	Phi
1	Fp1	-90	-72
2	Fpz	90	90
3	Fp2	90	72
4	AF7	-90	-54
5	AF3	-74	-68
6	Afz	67	90
7	AF4	74	68
8	AF8	90	54
9	F7	-90	-36
10	F5	-74	-41
11	F3	-60	-51
12	F1	-49	-68
13	Fz	45	90
14	F2	49	68
15	F4	60	51
16	F6	74	41
17	F8	90	36
18	FCz	23	90
19	FT7	-90	-18
20	FC5	-69	-21
21	FC3	-49	-29
22	FC1	-31	-46
23	FC2	31	46
24	FC4	49	29
25	FC6	69	21
26	FT8	90	18
27	T10'	113	3
28	T9'	-113	3
29	T7	-90	0
30	C5	-68	0
31	C3	-45	0
32	C1	-23	0
33	Cz	0	0
34	C2	23	0
35	C4	45	0
36	C6	68	0
37	T8	90	0
38	PO3	-74	68
39	POz	67	-90
40	PO4	74	-68
41	TP7	-90	18
42	CP5	-69	21
43	CP3	-49	29
44	CP1	-31	46
45	CPz	22	-90
46	CP2	31	-46
47	CP4	49	-29
48	CP6	69	-21
49	TP8	90	-18
50	O1	-90	72
51	Oz	90	-90
52	O2	90	-72
53	P7	-90	36
54	P5	-74	41
55	P3	-60	51
56	P1	-49	68
57	Pz	45	-90
58	P2	49	-68
59	P4	60	-51
60	P6	74	-41
61	P8	90	-36
62	PO8	90	-54
63	Iz	112	-90
64	PO7	-90	54
REF		-	-
GND		-	-

These values are standardized to a Theta of 90° for the plane through Fpz, T7, T8, Oz.

The signs follow this convention: