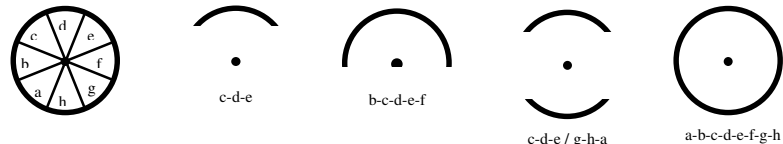


appendix 3: special group

The full halo circle is cut into 8 segments as shown in the figure below. Segments in which the halo or parts of it appear are to be added at the end of the report (see examples). This special group is only to be applied for the 22°, 46° and circumscribed halos.



Further comments to the halo key and the computation of monthly reports:

Since all observations are stored with the HALO program it is very important to use only the uniform report format.

- please send in your monthly reports only in the halo key format
- report the group **8HHHH** only for Sun pillars
- the special group (appendix 3) should only be applied for the 22°, 46° and circumscribed halo
- group **MMTTg**, element **g**: Please report changes in your secondary observing site immediately to the data centre
- If you report **g = 1**, please specify the observing location under **remarks**
- group **ZZZZd**: report only Central European Time (CET = UTC + 1 h)
- group **EEHFV**, element **V**: Please distinguish between complete and incomplete halos only. More detailed descriptions of the completeness of 22°, 46° and circumscribed halos can be reported in the **special group**, for the parhelic circle and the circumzenithal arc in the appended **remarks**.
- group **fz:GG**, elements **f** and **zz**: The precipitation and the weather phenomenon should be related to the halo event. If you cannot determine these elements for sure, leave them out. If you observed no precipitation in connection with the halo, please report “/”.
- **remarks**: Please use the given abbreviations only. Remarks should not be longer than 60 characters.
- if possible, split **EE 04** into **EE 02** and **03**
- please emphasize lunar halos in the **KKOJJ** group
- **multiple halo phenomena** are marked with an asterisk “*” in the **remarks**. Please mark all visible halos on the extra phenomenon report form and send them in together with your monthly report.

Please send in all reports by the 10th of the following month to the data centre.

SHB Halo Key

key structure: **KKOJJ MMTTg ZZZZd DDNCc EEHFV fz:GG 8HHHH special group / remarks**

group	key	explanation/remark
KKOJJ	KK	identification number of the observer, which will be assigned by the data centre. is registered as KK
	O	which object caused the halo: 1 Sun 2 Moon 3 a planet 4 a bright star 5 an earthbound light source (e.g. a street lamp)
	JJ	year of observation (for example 1999 = 99)
MMTTg	MM	months of observation from 01 - 12 (for example March = 03)
	TT	date of observation from 01 - 31
	g	definition of the observing place: 0 observation at the primary observing site (home) or not farther away than 5 km 1 observation at neither primary nor secondary observing site 2 observation at the secondary observing site (work place) or not farther away than 5 km. The secondary observing site location also has to be reported to the data centre.
ZZZZd	ZZZZ	time the halo was first seen, given in Central European Time (CET = UTC + 1 h). For simple halos, round to nearest 5 min, for <i>multiple halo phenomena</i> , accurate to 1 min.
	d	Halo source: 0 very thin to thin cirrus (almost invisible to just visible) 1 normal cirrus (usual cirrus cloud development, Sun has not yet faded, still strong shadows) 2 thick to very thick cirrus (Sun has started to fade, only weak shadows, but halos still visible) 4 white frost 5 snow cover 6 ice nebulae / polar snow 7 virga / not observed No. 4 to 7 together with N = 0 and C = 0 - see below
DDNCc	DD	duration of the halo, rounded to nearest 10 min (for example 157 min = 16). Duration shorter than 5 min = 00.
	N	cirrus sky coverage (in eighths): 1 1/8 of the sky covered with cirrus clouds . . . 8 8/8 of the sky covered with cirrus clouds 9 could not be observed due to lower clouds 0 no cirrus clouds, halo was caused by ice nebulae or ice needles (together with d = 4...7 and C = 0)
	C	type of cirrus: 1 Cirrus (Ci) 5 Ci + Cs 2 Cirrocumulus (Cc) 6 Cc + Cs 3 Cirrostratus (Cs) 7 Ci + Cc + Cs 4 Ci + Cc 0 no cirrus clouds (together with N = 0 and d = 4...7)
	c	type of middle-high and low clouds: 1 Stratus (St) 6 Cumulonimbus 2 Stratocumulus (Sc) 7 Altostratus (As) 3 St + Sc 8 Altocumulus (Ac) 4 Nimbostratus (middle/upper St) 9 Ac + As 5 Cumulus 0 no middle-high and low clouds

EEHFV	EE	halo type (see appendix 1 and 1.1)	
	H	brightness of the halo: 0 very faint, possibly only visible with observing aids (i.e. a dark mirror or sunglasses) 1 faint, barely obvious	2 bright, obvious, even non-observers recognize it 3 very bright, dazzling, very obvious
	F	colour of the halo: 0 white instead of 1 you can give a more detailed description: 2 blue content especially obvious 3 yellow content especially obvious	1 coloured 4 red content especially obvious 5 green content especially obvious
	V	completeness of the halo: 1 incomplete	2 complete
fzGG	f	in connection with what type of weather phenomenon did the halo occur: 1 warm front 2 cold front 3 occlusion 4 trough (axle / area) 5 thunderstorm / shower	
	zz	delay in the start of precipitation (in hours) after the start of the halo event	
	If you cannot precisely determine the weather phenomenon or the start time of the precipitation, do not fill in f or zz .		
	GG	observing area (see appendix 2)	
8HHHH	8	identifier for the special group "Sun pillar heights". Report this group for Sun pillars only!	
	HH	height of the upper Sun pillar in degrees	
	HH	height of the lower Sun pillar in degrees	
	if EE 08 occurs, report 8HH / / if EE 09 occurs, report 8 / / HH if EE 10 occurs, report 8HHHH		
special group	a-b-c-d-e-f-g-h	completeness of circular halos (see appendix 3)	
remarks	kA kE	kA = start of the halo event could not be observed	kE = end of the halo event could not be observed
	UH UB	UH = break(s) in the visibility of the EE UB = observation with breaks longer than 20 minutes	
	*	EE is part of an <i>multiple halo phenomenon</i>	
If single elements of the key cannot be observed, put a slash "/" at the appropriate position (exceptions are mentioned explicitly). Observations are not worthless even if they consist mainly of slashes.			

appendix 1: EE - halo type			
EE	halo type		
01	22° halo		
02 / 03	left / right 22° parhelion		
05 / 06	upper / lower 22° tangent arc	04	both
07	circumscribed halo		
08	upper Sun pillar		
09	lower Sun pillar	10	both
11	circumzenithal arc		
12	46° halo		
13	parhelic circle		
14* / 15*	left / right Lowitz arcs	16*	both
17	antheilon		
18 / 19	left / right 120° parhelion	20	both
21*	supralateral arcs		
22*	infralateral arcs		
23	circumhorizontal arc		
24 / 25	left / right 46° parhelion	26	both
27*	Parry arcs		
28*	150-160° (Liljequist's) parhelia		
29*	150-160° (Liljequist's) subparhelia		
30	subantheilon		
31	9° halo or van Buijsen's halo		
32	18° halo or Rankin's halo		
33	20° halo or Burney's halo		
34	23° halo or Barkow's halo		
35	24° halo or Dutheil's halo		
36	35° halo or Feuillée's halo		
37*	elliptical halos		
38*	Bottlinger's halos		
39	Kern's arc		
40	subparhelic circle		
41 / 42	left / right 90° parhelion	43	both
44	subsun		
45 / 46	left / right 22° subparhelion	47	both
48 / 49	left / right subparhelic or sub-Lowitz arc	50	both
51	bright area between EE 05 and EE 27		
52	upper 46° tangent arc		
53 / 54	oblique arc to left / right 120° parhelion	55	both
56	Wegener's antheilon arc		
57	Tricker's antheilon arc		
58	Hasting's antheilon arc		
59*	Diffuse antheilon arcs		
60*	Tape's (46° Parry) arc		
61	heliac arc		
62	subhelic arcs		
63	subantheilon arcs		
64*	44° parhelia		
65*	66° parhelia		
66*	9° parroids		
67*	18° lateral arcs		
68*	20° parroids		
69*	23° parroids		
70*	24° lateral arcs		
71*	35° lateral arcs		
72*	9° tangent arcs		
73*	24° tangent arcs		
74 / 75	left / right 120° subparhelion	76	both
77	Moilanen arc		
99	unknown halo		
Halo types marked with an asterisk "*" consist of different subtypes which can be specified in the <i>remarks</i> (see appendix 1.1).			

appendix 1.1: remarks - halo subtype			
EE	halo subtype		
14 / 15	A / B upper / lower Lowitz arc C / D upper / lower circular Lowitz arc E unusual Parry arc		
21	A / B left / right supralateral arc		
22	A / B left / right infralateral arc		
27	A / B upper / lower suncave C / D upper / lower sunvex		
28	A / B left / right Liljequist parhelion		
29	A / B left / right Liljequist subparhelion		
37	n , x / y number , horizontal / vertical radii		
38	n , x / y number , horizontal / vertical radii		
59	A Greenler's antheilon arc B Tränkle's antheilon arc		
60	A / B upper / lower left Tape arc C / D upper / lower right Tape arc		
64	A / B left / right 44° parhelion		
65	A / B left / right 66° parhelion		
66	A / B upper / lower 9° parroid		
67	A / B left / right 18° lateral arc		
68	A / B upper / lower 20° parroid		
69	A / B upper / lower 23° parroid		
70	A / B upper / lower 24° lateral arc		
71	A / B upper / lower 35° lateral arc		
72	A / B left / right 9° tangent arc		
73	A / B upper / lower 24° tangent arc		
The definition of <i>multiple halo phenomenon</i> is the visibility of five or more different halo types at the same time.			

appendix 2: GG - observing area			
EE	observing area		
01	Schleswig-Holstein / Mecklenburg-West Pomerania		
02	Lower Saxony / Bremen / Hamburg		
03	Saxony-Anhalt		
04	Brandenburg / Berlin		
05	North Rhine Westphalia		
06	Hesse		
07	Thuringia		
08	Saxony		
09	Rheinland Pfalz / Saarland		
10	Baden Württemberg		
11	Bavaria		
16	Czech Republic /	29	France
17	Slovak Republic	30	Spain / Portugal
18	Austria	31	Greece
19	former Soviet Union	32	Denmark
20	Asia	33	Norway / Sweden
21	Poland	34	Finland
22	Hungary	35	United Kingdom /
23	Bulgaria		Ireland
24	Romania	36	Africa
25	Yugoslavia / Albania	37	North America /
26	Belgium / Holland /		South America
	Luxembourg	38	Australia / New
	Switzerland		Sealand / Oceania
27	Italy	39	Antarctica
28			