

White light Mean Daily Frequencies, 2001 September

Observer	AA				R		Q	
	North	South	Total	Days	Total	Days	Total	Days
R. Dryden	4.6	4.8	9.4	8	188.1	8	-	-
A. Gabriël	5.1	4.6	9.7	25	188.4	25	-	-
H. Hill	4.2	4.5	8.7	19	-	-	-	-
G. Johnstone	4.1	5.8	9.9	10	-	-	-	-
P. Meadows	4.6	5.0	9.6	13	158.1	13	31.0	13
K. Medway	3.7	4.1	7.7	23	-	-	-	-
G. North	3.8	4.0	7.8	6	155.0	6	-	-
E. Richardson	5.9	5.7	11.6	21	184.7	21	28.3	15
J. Shanklin	4.5	5.5	10.0	20	162.0	20	-	-
L. Smith	5.2	4.0	9.2	5	133.8	5	23.0	5
D. Storey	6.0	3.8	9.8	6	-	-	-	-
E. Strach	5.0	4.3	9.3	19	136.8	15	29.1	19
MEANS	4.7	4.8	9.5	175	168.5	113	28.8	52

AA = active areas, R = sunspot number, Q = mean quality estimate (JBAA 98,6,pp282-286)

White light activity, 2001 September

Strach comments that high sunspot activity occurred during the month with his AA MDF only been exceeded in 2001 June and 2000 July. He added that it seems that a second peak of the maximum phase of the present cycle has been reached. TA AA MDFs show a similar trend while the TA R value is the second highest this solar cycle (the highest being 187.2 in 2000 July).

Meadows reports that the two nearby groups at N17N/221 and N12/219 seen at the end of August continued to be prominent at the start of the month. The appearance of the northern most of these groups changed little as the group progressed towards the central meridian, although the number of spots within the group did reduce. When it was on the meridian, on the 3rd, it was of type Dki with an area of 170 millionths. The southern group did change appearance; the main spot began to grow and more penumbral spots were seen. On the 3rd it was of type Ekc with an area of 260 millionths. On the next two days, the leading spot was seen to grow as did other spots within the group such that on the 6th, the total area was 640 millionths. This group was next seen on the 9th close to the western limb.

On the 5th, Meadows saw an Hsx spot near the eastern limb. By the 8th, Strach saw this SE quadrant group extend from S14/135 to S32/107, thus spanning 28° in longitude and 18° in latitude. Meadows next saw this group on the 9th as a Fkc group spread over more than 30° of longitude and it had an area of 1010 millionths. The largest spot was in the following half of the group while there were many other smaller penumbral spots spread throughout the group. Strach reports that the largest spot of this group (S29/107) was about to cross the central meridian on the 11th. When seen by Meadows on the 14th, most of the leading spots had reduced in size as had the main spot such that the total area was 640 millionths. This decay continued, as on the following day the area was 440 millionths. This group was last seen on the 17th. During the period this group was seen, Meadows observed that southern hemisphere activity dominated in terms of both the number of group and their size.

On the 20th Strach reports that another group of similar importance had rotated onto the disk. Meadows determined that this was the return of a group last seen on the 3rd (it was of type Dac on the 1st with an area of 440 millionths). This group was now of type Fkc at S17/295 which had an elongated irregular spot with several umbrae within it together with surrounding penumbral spots towards the leading part of the group. Also seen by Meadows on the 20th was an Hkx spot at similar latitude but closer to the eastern limb (at S18/276). On the 21st, the western most group has an area of 750 millionths with the main elongated spot being 15° in longitude; the main umbra within it was towards the following part of the spot. When this group was next seen on the 28th, the main spot had split leaving a much more symmetrical following spot and a collection of leading small penumbral spots. The eastern most group from the 20th was seen as two penumbral spots with the larger spot being towards the south on the 21st. On the 28th, just one penumbral spot was seen with a total area of 680 millionths; this spot was asymmetric with it being larger in latitude (7°) than in longitude (4°). Also on the 28th, Johnstone reports seeing 2 naked eye spots.

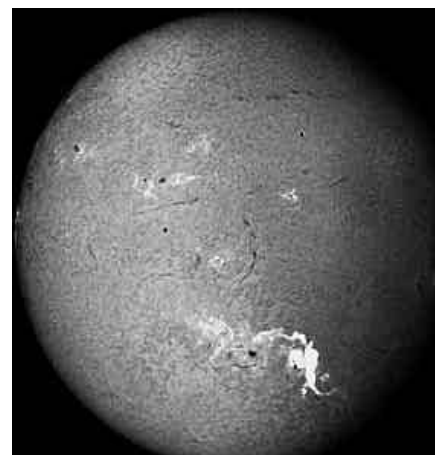
Both Hill and Strach recorded spots in the equatorial zone. Hill saw spots at N2/318 and N2/302 from the 20th onwards. Strach reports observing a gradual increase in longitude of these spots as they progressed across the disk due to differential rotation. Hill also saw a small penumbral spot positioned at N1/244 with a smaller follower on the 29th.

H α activity, 2001 September

Hill notes that an array of prominences was seen almost continuously down the W limb on the 8th from S16 to S55 but none were of great height. On the 10th Strach saw a dense, low arc prominence in the NW from N16 to N28. On the next day the arc was still present but even lower as the main body seems to have rotated onto the averted part of the solar disk. Both Strach and Hill report a spectacular prominence eruption on the 11th. Hill observed the eruption occurring at 1325, on the W limb at N25, with ejecta reaching an estimated height of 130,000 km at the maximum phase (1341). Clouds then intervened - the outburst had died down considerably by 1415. Strach reports the following events: 1325 a very bright small projection emanating from the southernmost part of the prominence; 1335 this dense projection erupted, sending three streamers outwards; 1339 - maximum eruption: the northern streamer very dense and slightly inclined northwards while the southern streamer reaches furthest from the limb and breaks up at the "tip"; 1341 - the middle streamer fragmenting; 1353 - subsiding, only one streamer left; 1404 - residual streamer very faint and 1406 - no trace of the eruption seen. Medway notes that on the 22nd the NW limb was particularly active with many mounds and large spikes seen. On this date, Hill saw an example of a completely detached prominence when a bright condensed cloud fully 160" high eventually sent down delicate streamers to the surface, breaking up dramatically as it did so. It was still very much in evidence at 1543. On the 24th, at 1045, Strach observed an eruption on the W limb at N20 with three jets veering to the north. At 1201 another eruption at S17 on the E limb was seen. The 26th Strach saw a plethora of prominences with most occurred on the W limb between S28 and N55. Also on E limb between N15 and N50 Strach also saw two interactive prominences, one at N32, the other at N44. Also on the 26th, Hill notes that some lofty pyramidal types broke the almost continuous dearth of countable prominences in recent months north of the N40 parallel from N46 to N58. The tips of the highest of these were still visible on the 29th as they rotated over on to the far side of the Sun. Hill also saw the E limb prominences, extending from N42 to N25 but only remnants were visible two days later.

Strach saw a slightly tortuous filament in the NE quadrant on 10th and 11th. It was clearly seen on the 11th around N20 at 1400, but when he searched for it at 1630 it had disappeared. On the 28th, Strach observed two dark filaments near the E limb at N32 and N42 respectively. They represent the interactive prominences which had partly rotated onto the disk. On the 29th the two filaments merged into one structure having separated from the E limb. The filaments assumed a curious structure and remained in evidence up to the time of the month.

As can be seen from the table below, many flares were observed during the month. Gabriël reports that one of the best flares was seen on the 15th at S29/W51: it was very bright and grew fast until it reached 2B importance. He notes that it was remarkable to see a large quiet filament in the NW become active while the flare was on. This filament split in the middle and changed form quickly, later in the afternoon only a small part of it remained. A major flare occurred on the 24th. Gabriël had his first look at 0958 when several very bright filaments were seen in the large southern groups. At first he thought that the flare was past its best, but the filaments remained very bright and at 0922 a new double outbreak took place, just east of the large spot at S19°. These grew very fast and were extremely bright, and this event became of 3B importance in only a couple of minutes! It kept growing, while small flares occurred in several other spot groups. Around 1110, when a part of the flare became fainter, there were numerous dark filaments seen over the area. At 1335 Gabriël had another brief look, but by then most of the flare had faded, only a small part of it was still bright. Strach obtained a photograph of this flare at 1036 (see right). On the 28th Gabriël observed a large flare at about 0830; it reached maximum area at 0850 when he rated it of 2B importance. At 0910 several parts of it became dimmer, other parts were still bright at 1000. He followed this flare, but just like on the 24th



2001 September 24 1036 UT. 3B Flare. Eric Strach. 8" SC telescope with 0.6 Å H α filter, 1/90th sec on Kodak 2415.

while this large flare was going on several others occurred in other groups, at 0900, 5 of these were seen in as many different groups. At 0931 a SB flare occurred in the southern group at S19/W37, small at first, it grew steadily until it became very intricate and large, connecting the 2 southern groups with very complex detailed bright spots and filaments.

This was a very beautiful sight. It was at its best at 1010 and by 1015 it started to fade gradually. Even while fading it produced several other bright filaments in the area, one long meandering bright filament was formed at 1040 which reached a length of 25°, this started to fade at 1045. At 1130, most of the bright areas had died down and at 1240, nothing of all this was visible to Gabriël and it looked just like nothing had happened.

Major Flares, 2001 September (excluding types SF & SN)

Date	Time UT	Lat.	CMD	Type	Obs.	Date	Time UT	Lat.	CMD	Type	Obs.
9	1000	S32	E33	1N	EHS	22	0924	N13	W23	2N	AG
9	1027	S32	E32	SB	KJM	23	1334	S12	E43	SB	KJM
9	1335-1341	S31	E32	SB	KJM	24	0958	S15	E16	3N	AG
11	0759	S08	E90	1N	AG	24	1000-1155	S19	E26	3B	EHS
13	1600	S08	W13	SB	KJM	24	1022	S18	E20	3B	AG
15	0945	N11	E90	1N	AG	24	1115	S19	E77	1N	AG
15	1057	S19	W46	SB	AG	27	0925	S17	W37	1N	AG
15	1107	S29	W51	2B	AG	28	0746	S18	W24	1N	AG
15	1110-1140	S25	W49	1B	EHS	28	0835	N13	E09	2B	AG
16	1336	N17	W13	SB	KJM	28	0900-0946	N11	E18	2B	EHS
17	0840-0856	S13	E05	1N	EHS	28	0915	N21	W42	1N	AG
17	0928	N17	E67	1B	AG	28	0931	S19	W37	SB-2N	AG
20	1150	S20	E68	1N	EHS	28	0950-1128	S16	W33	2N	EHS
22	0909	N17	E03	SB	AG	29	1357	S39	W47	SB	KJM
22	0922	N25	W09	2B	AG	30	0901	N13	W11	1N	AG

AG also observed 15 SN flares, KJM 18 SF and 6 SN flares and EHS 5 SF and 1 SN flares.

Prominence Mean Daily Frequencies, 2001 September

Observer	All Latitudes				0-40°			40-90°		
	North	South	Total	Days	North	South	Total	North	South	Total
A. Gabriël	5.2	4.9	10.1	25	4.9	3.7	8.6	0.4	1.2	1.6
H. Hill	4.2	4.3	8.5	20	2.9	2.8	5.7	1.3	1.5	2.8
K. Medway	4.0	3.7	7.7	15	3.2	3.2	6.4	0.8	0.5	1.3
E. Strach	5.9	5.1	11.0	13	4.1	2.9	7.0	1.8	2.2	4.0