

This services is provided on a daily basis eighteen minutes after the hour, hourly. The **A** index is a daily figure for the state of the earth's magnetic field. The **A** index tells you mainly how yesterday was, but is very revealing when charted regularly, because geomagnetic disturbances nearly always recur at four-week intervals.

The **K** index (new every three hours) reflects Boulder Colorado readings on the geomagnetic field in the hours just preceding the bulletin data changes. It is the nearest thing to current data on radio propagation available. With new data every three hours, **K** index trend is important. Rising is bad news, falling is good, especially related to propagation on paths involving latitudes above 30 N. Because this is a Boulder Co., reading of geomagnetic activity, it may not correlate closely with conditions in other areas.

The **K** index is also a timely clue to aurora possibilities. Values of 3 and rising warn that conditions associated with auroras and degraded HF propagation are present in the Boulder area at the time of the bulletin preparation.

Geomagnetic Storms and the **A** index/**K** index

Quiet **A** index less than 7 No **K** index to no more than 2

Unsettled **A** index less than 7 No **K** index or no greater than 3

Active **A** index no less than 15 no more than 30 **K** index no more than 4

Minor **A** index no less than 30 no more than 50 **K** index of 4-5

Major **A** index 50 **K** index of 6 or greater

SOLAR FLUX and sunspot count are a linear measure of each other .Smoothed sunspot numbers accounts for the daily variations, usually called 12 month running average.

A solar flux of 170 to 300 indicates good HF propagation conditions (14-30 mhz.). This indicates the degree of ionization in the earth's upper atmosphere and either the **A** index or **K** index measures the activity of the earth's magnetic field. Both taken together give a relative accurate picture of the overall ionospheric propagation conditions.

These readings are measured at a frequency of 2695 mhz. At the Solar Observatory in Ottawa Ontario.

Solar Flux indicates the level of X-ray, Gamma radiation of the upper atmosphere and thus the level of ionization which provides the reflective layers for radio wave propagation.

**A** index=Solar Particle radiation by its magnetic effects. Solar particles which have mass are pulled into the earth's magnetic field and cause disturbances which in turn cause ionized layers to be unstable and cause fading and weakening of signals.

A high solar flux with very low **A** & **K** indices provides good sporadic E conditions on 6 metres (also at times on 2m, 1 1/4 m, and even up to 70 cm.

**K** index=Is also a measure of the earth's magnetic field variation and is determined every 3 hours at a given observatory

**SOLAR ACTIVITY** is classified as the following:

**Very Low:** unusually quiet regions on the solar disk and no more than five of these. Fewer than ten class C sub-flares without centimetric radio bursts or SID observed or expected.

**Low:** usually more than five but less than ten quiet regions on the solar disk, only class C sub-flares without centimetric radio bursts or SID observed or expected.

**Moderate:** Eruptive regions on the solar disk, fewer than five class M, X-ray events with centimetric radio bursts and strong SID observed or expected.

**High:** Active regions on the solar disk, several class M, X-ray events with centimetric radio bursts and strong SID and/or one to two importance- 2 chromospheric flares or class X, X-ray events observed or expected.

**Very High:** Region capable of producing protons on the sun, one or more chromospheric flares of importance - 2 or greater with outstanding centimetric radio bursts (flux of 500 units or greater). Class -X, X-ray bursts and major SID observed or expected.

### **SOLAR FLARES:**

**Class C:** any solar X-ray burst with a peak flux at 1-8 angstrom of less than 10 micro-watts per square metre.

**Class M:** a solar X-ray burst with a peak flux at 1-8 angstrom, greater than or equal to 10 micro-watts but less than 100 micro-watts per square metre.

**Class X:** a solar X-ray burst with peak flux at 1-8 angstrom greater than or equal to 100 micro-watts per square metre.

**Major Solar Flare:** a flare of optical importance greater than 2B (bright) with a centimetric radio burst of 500 flux units or more: or an X-ray event of class X intensity of a duration greater than 180 minutes regardless of optical flare importance.

**Proton Flare:** Protons by satellite detectors, (or polar cap absorption by riometer) have been observed in time associated with high intensity flares

**Satellite Level Proton Event:** a proton enhancement detected by earth orbiting satellites which measure particle flux .

**Polar Cap Absorption:** proton induced absorption greater than 2dB as measured by a 30 mhz riometer located within the polar cap.

**Stratwarm:** reports of stratospheric warmings in high latitude regions of winter hemisphere of the earth associated with the gross distortions of the normal circulation associated with the winter season.

**Note:** One Angstrom is equivalent to  $10^{-8}$  m. It is a unit of measure of the wavelength of light and other radiation (one ten thousandth of a micron, where a micron is one millionth of a metre). For example, blue light is 4700 A. and yellow light is 5800 A. and red light is 6500 A.