Ham Radio Solar Indices Cheatsheet

1. Solar Flux Index (SFI)

- Measures solar energy at 10.7 cm (2800 MHz).
- Higher SFI raises the Maximum Usable Frequency (MUF).
- 60–80: Low activity. 10m closed. 20m dependable.
- 90–120: Moderate. 15m improves. 10m may open midday.
- 130–180: Strong. 10m and 12m open regularly.
- 200+: Excellent high-band conditions when K is low.

2. K-Index

- Measures geomagnetic disturbance. Updates every 3 hours.
- Scale 0–9. Lower is better for HF stability.
- 0–1: Quiet. Excellent DX conditions.
- 2–3: Minor impact. Most bands stable.
- 4–5: Storm levels. High bands degrade first.
- 6–9: Major storm. HF unstable. Polar paths collapse.

3. Sunspot Number (SSN)

- Counts visible sunspots and groups.
- Tracks long-term solar cycle strength.
- 0–20: Solar minimum. 10m mostly closed.
- 30–70: Improving. 15m stronger.
- 80–150: Strong cycle. 10m opens often.
- 150+: High activity. Excellent high-band potential when K is low.HF Propagation Tools and Limits

4. MUF – Maximum Usable Frequency

- Highest frequency that will refract back to Earth over a given path.
- If you operate above MUF, the signal passes into space.
- Higher SFI and SSN raise MUF.
- Example: MUF 28 MHz means 10m may support that path.
- MUF varies by distance, time of day, and solar conditions.

5. LUF – Lowest Usable Frequency

- Lowest frequency that can overcome absorption and noise.
- Below LUF, signals are absorbed in the D-layer.
- LUF rises during daylight and geomagnetic storms.
- Example: LUF 5 MHz means 80m may be weak or unusable.
- Nighttime lowers LUF, improving 40m and 80m.

6. VOACAP

- Voice of America Coverage Analysis Program.
- Propagation prediction model using SFI, SSN, K, location, and time.
- Estimates probability of successful communication between two points.
- Shows MUF, best band, takeoff angle, and reliability percentage.
- Useful for planning DX, portable ops, and contest strategy.

Best HF Scenario for High Bands (10m, 12m, 15m)

- SFI above 130
- SSN above 80
- K-Index 2 or lower
- MUF above 21–28 MHz for your path• LUF below your operating band