



8. PROPAGATION – AI6JB

Chapter 8 Propagation

ARRL General Class Sections 8.3 – Scatter Modes





Section 8.3

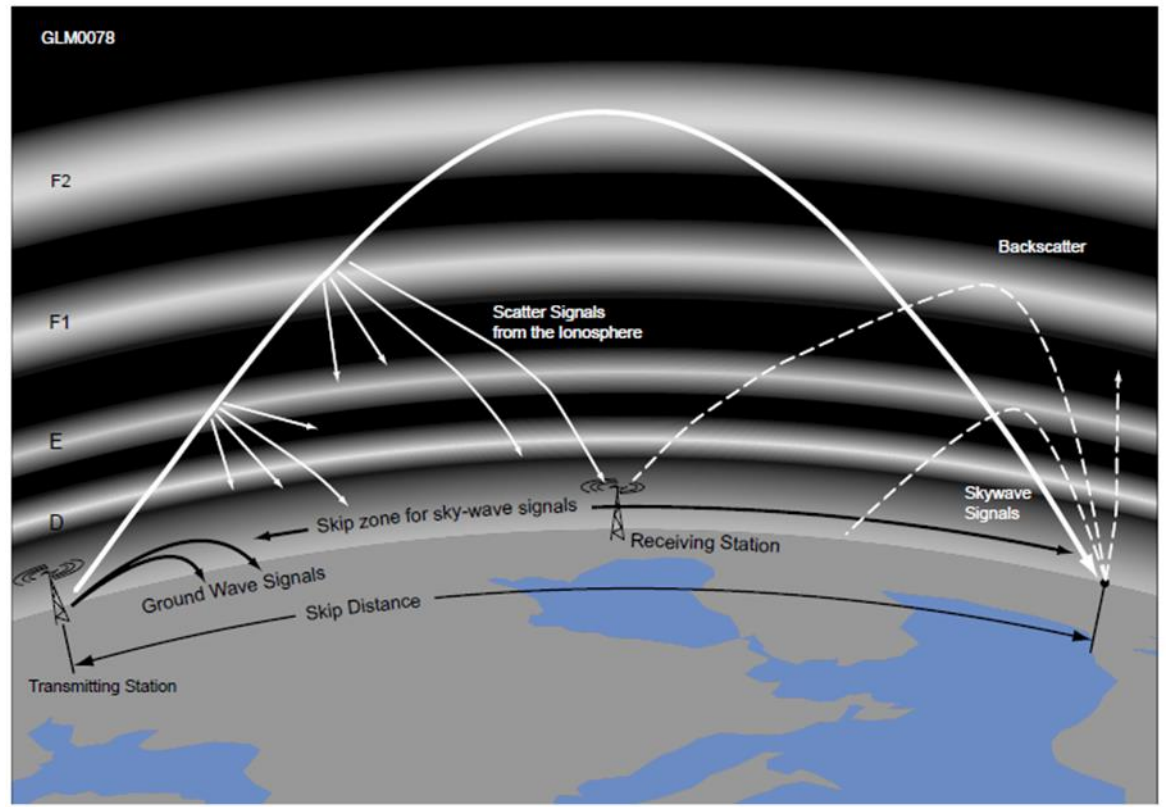


Scatter Modes

Scatter Characteristics

Backscatter: Reflections from features on Earth's surface

Waves can also be scattered from within the ionosphere, allowing signals to be heard from stations too distant to be heard by ground wave and on frequencies too high for short hop sky-wave propagation



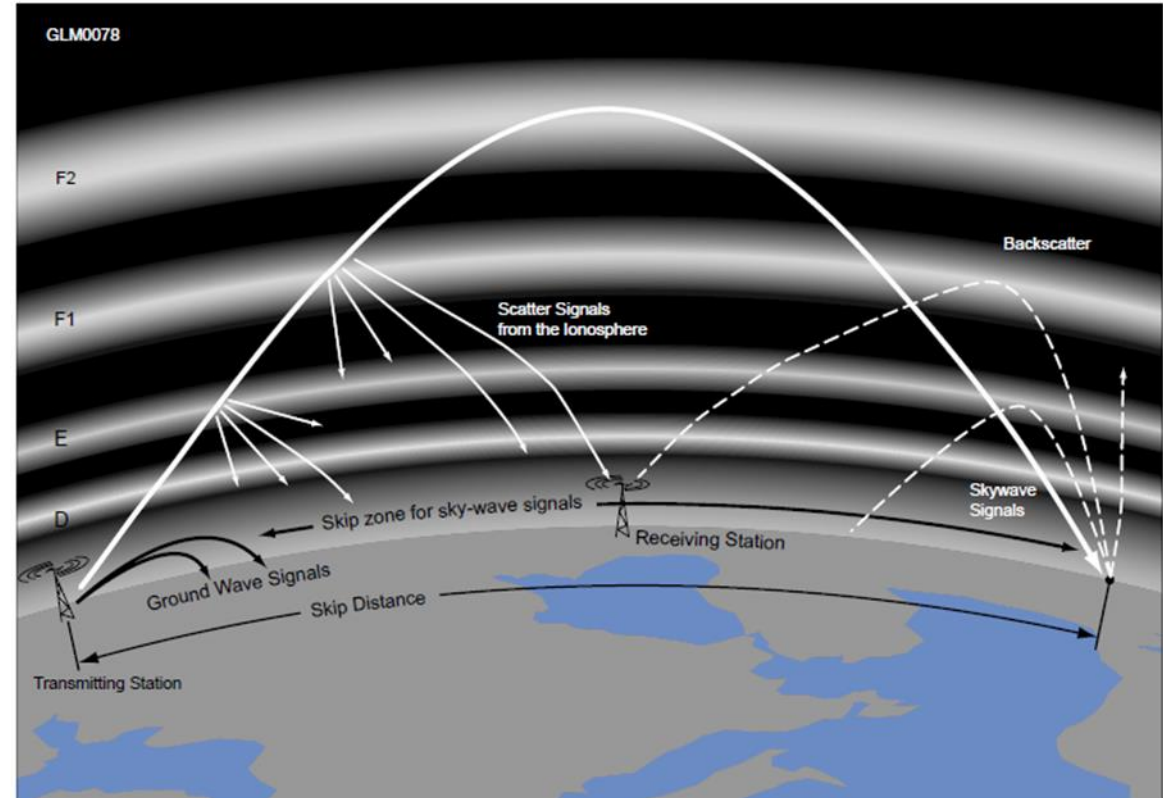


Scatter Modes

Scatter Characteristics

Scatter and backscatter help fill in the skip zone where signals would otherwise not be heard

Signals received via HF scatter are usually weaker than those received by normal skywave propagation (reflection is not very efficient and tends to spread out the signal); such signals sound distorted, resulting in fluttering or wavering



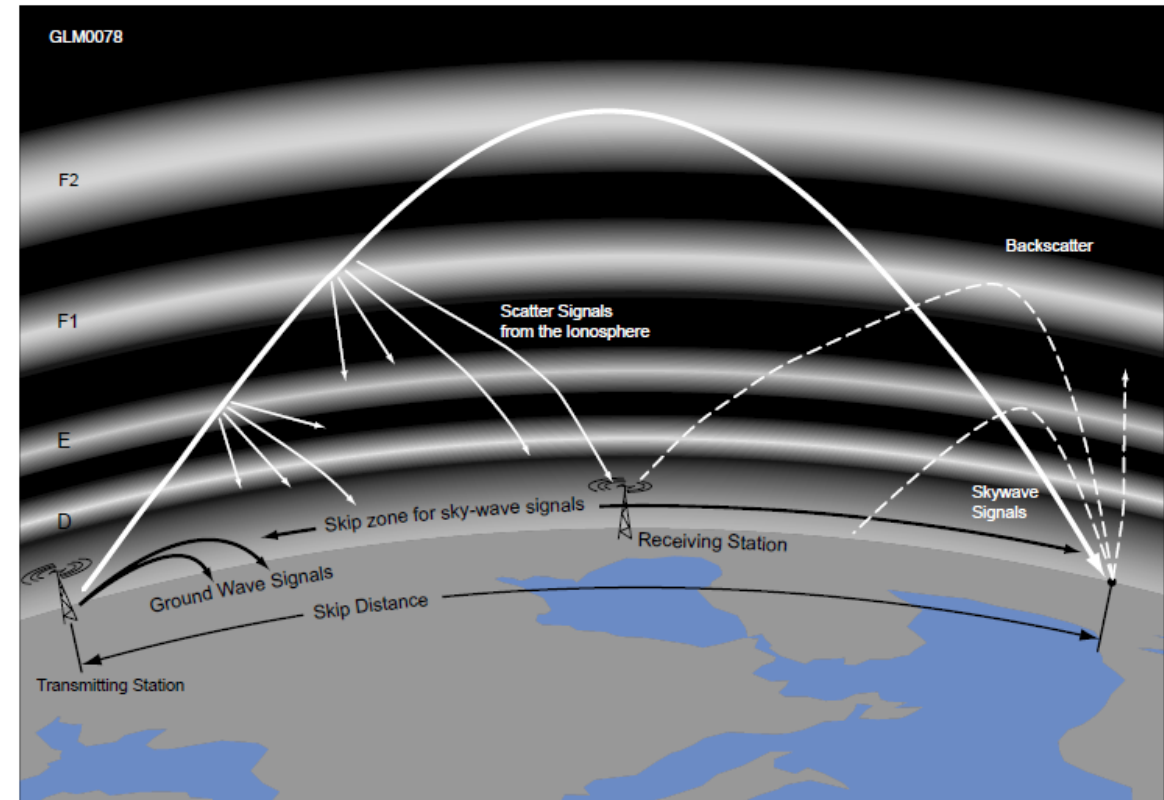


Scatter and Backscatter

On striking the ground after ionospheric reflection, radio waves may be reflected back toward the transmitting station.

Backscatter consists of signals reflected by the ground back into the skip zone.

Backscatter supports communication between stations that would otherwise be in each other's skip zone.





Near Vertical Incidence Sky-wave (NVIS)

Critical Frequency – The highest frequency, when transmitted straight up or nearly so, which will be refracted back to earth

For a signal below the critical frequency, the ionosphere reflects waves arriving at any angle — even vertical (always above 5 MHz, up to 40 meters)

NVIS Definition: For a signal below the critical frequency, when it is radiated vertically the reflection scatters the signal back to Earth throughout a region of up to 200-300 miles

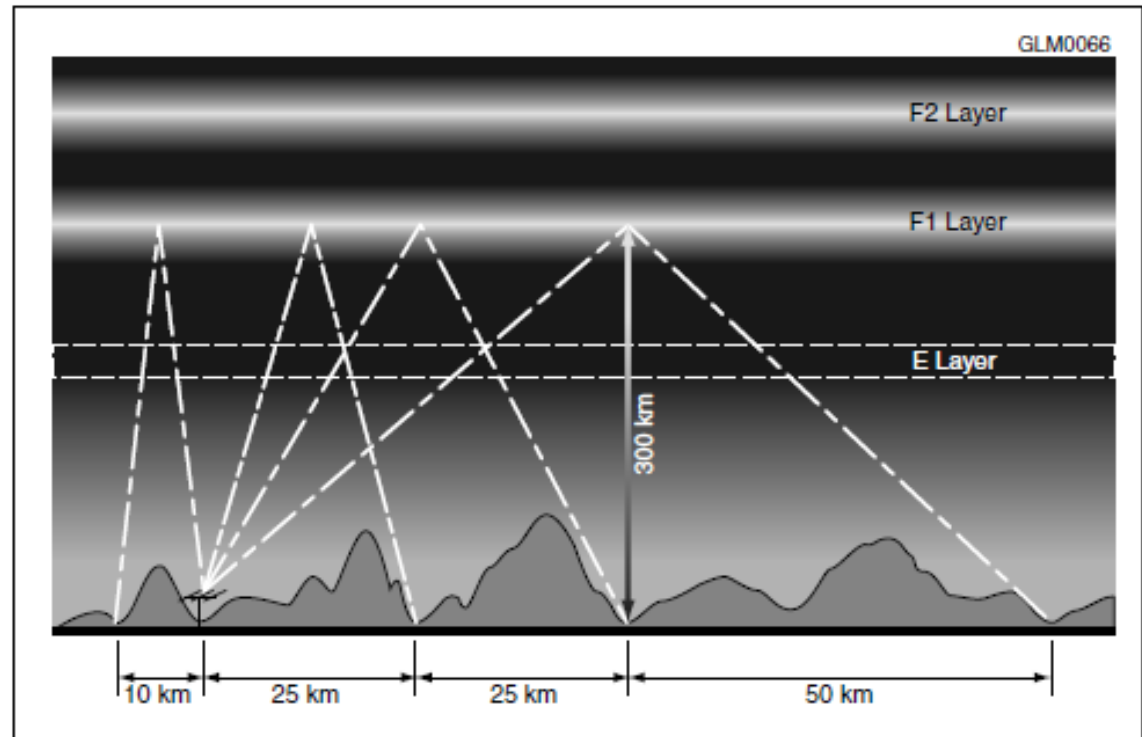
To make use of NVIS, horizontally polarized dipoles are placed low to the ground so that their radiation pattern is almost omnidirectional and concentrated at high elevation angles



NVIS Communications

Near vertical incidence sky-wave (NVIS) communications relies on signals below the critical frequency transmitted at high vertical angles.

The signals are reflected by the ionosphere back to Earth in the region around the transmitter.





QUESTIONS?

ONLINE EXAM REVIEW AND PRACTICE QUESTIONS:

<http://www.arrl.org/examreview>