

Amateur Extra – The Right Answers

Chapter Ten – Topics in Radio Propagation

E3C02. What is indicated by a rising A or K index?

Increasing disruption of the geomagnetic field

E3C04. What does the value of Bz (B sub Z) represent?

Direction and strength of the interplanetary magnetic field

E3C05. What orientation of Bz (B sub z) increases the likelihood that incoming particles from the Sun will cause disturbed conditions?

Southward

E3C07. Which of the following descriptors indicates the greatest solar flare intensity?

Class X

E3C08. What does the space weather term G5 mean?

An extreme geomagnetic storm

E3C09. How does the intensity of an X3 flare compare to that of an X2 flare?

Twice as great

E3C10. What does the 304A solar parameter measure?

The UV emission at 304 angstroms, correlated to solar flux index

E3B04. What is meant by the terms 'extraordinary' and 'ordinary' waves?

Independent waves created in the ionosphere that are elliptically polarized

E3B05. Which amateur bands typically support long-path propagation?

160 to 10 meters

E3B06. Which of the following amateur bands most frequently provides long-path propagation?

20 meters

E3B07. Which of the following could account for hearing an echo on the received signal of a distant station?

Receipt of a signal by more than one path

E3B08. What type of HF propagation is probably occurring if radio signals travel along the terminator between daylight and darkness?

Gray-line

E3B10. What is the cause of gray-line propagation?

At twilight and sunrise, D-layer absorption is low while E-layer and F-layer propagation remains high

E3B12. What is the primary characteristic of chordal hop propagation?

Successive ionospheric reflections without an intermediate reflection from the ground

E3B13. Why is chordal hop propagation desirable?

The signal experiences less loss along the path than normal skip propagation

E3B14. What happens to linearly polarized radio waves that split into ordinary and extraordinary waves in the ionosphere?

They become elliptically polarized

E3C01. What does the term ray tracing describe in regard to radio communications?

Modeling a radio wave's path through the ionosphere

E3C03. Which of the following signal paths is most likely to experience high levels of absorption when the A index or K index is elevated?

Polar paths

E3C11. What does VOACAP software model?

HF propagation

E3C12. How does the maximum distance of ground-wave propagation change when the signal frequency is increased?

It decreases

E3C13. What type of polarization is best for ground-wave propagation?

Vertical

E3C15. What might a sudden rise in radio background noise indicate?

A solar flare has occurred

E2D02. Which of the following is a good technique for making meteor-scatter contacts?

**15 second timed transmission sequences with stations alternating based on location
Use of high speed CW or digital modes
Short transmission with rapidly repeated call signs and signal reports**

E2D06. Which of the following describes a method of establishing EME contacts?

Time synchronous transmissions alternately from each station

E3A01. What is the approximate maximum separation measured along the surface of the Earth between two stations communicating by moonbounce?

12,000 miles, if the Moon is visible by both stations

E3A02. What characterizes libration fading of an EME signal?

A fluttery irregular fading

E3A03. When scheduling EME contacts, which of these conditions will generally result in the least path loss?

When the Moon is at perigee

E3A04. What do Hepburn maps predict?

Probability of tropospheric propagation

E3A05. Tropospheric propagation of microwave signals often occurs along what weather related structure?

Warm and cold fronts

E3A06. Which of the following is required for microwave propagation via rain scatter?

The rain must be within radio range of both stations

E3A07. Atmospheric ducts capable of propagating microwave signals often form over what geographic feature?

Bodies of water

E3A08. When a meteor strikes the Earth's atmosphere, a cylindrical region of free electrons is formed at what layer of the ionosphere?

The E layer

E3A09. Which of the following frequency ranges is most suited for meteor-scatter communications?

28 - 148 MHz

E3A10. Which type of atmospheric structure can create a path for microwave propagation?

Temperature inversion

E3A11. What is a typical range for tropospheric propagation of microwave signals?

100 miles to 300 miles

E3A12. What is the cause of auroral activity?

The interaction in the E layer of charged particles from the Sun with the Earth's magnetic field

E3A13. Which emission mode is best for aurora propagation?

CW

E3A14. From the contiguous 48 states, in which approximate direction should an antenna be pointed to take maximum advantage of aurora propagation?

North

E3B01. What is transequatorial propagation?

Propagation between two mid-latitude points at approximately the same distance north and south of the magnetic equator

E3B02. What is the approximate maximum range for signals using transequatorial propagation?

5000 miles

E3B03. What is the best time of day for transequatorial propagation?

Afternoon or early evening

E3B09. At what time of year is Sporadic E propagation most likely to occur?

Around the solstices, especially the summer solstice

E3B11. At what time of day is Sporadic E propagation most likely to occur?

Any time

E3C06. By how much does the VHF/UHF radio horizon distance exceed the geometric horizon?

By approximately 15 percent of the distance

E3C14. Why does the radio-path horizon distance exceed the geometric horizon?

Downward bending due to density variations in the atmosphere