

Exploring the 1750-Meter Band

At Frequencies Below the Broadcast Band a Little Power goes a Long Way, and Experience Teaches You What Can or Cannot be Done... and Why

The 1750-meter band may sound "far out" to an average ham who is oriented to high-frequency operation, but I am one of many experimenters who for years have been legally exploring the use of low-power transmitters and mini-antennas on frequencies between 160 and 190 kHz!

Subpart E of Part 15 of the FCC Regulations covers low-power communication devices. Section 15.201 deals with frequencies of operation which include [sub-section 15.201 (a)]: 10-490 kHz, 510-1600 kHz, and 26.97-27.27 MHz.

Section 15.202 governs the radiation limitation below 1600 kHz and states:

"A low-power communication device which operates on any frequency between 10 and 490 kHz or between 510 and 1600 kHz shall limit the radiation so that the field strength does not exceed the value specified in the following table:

| Frequency (kHz) | Distance (feet) | Field Strength ($\mu\text{V/m}$) |
|-----------------|-----------------|------------------------------------|
| 10 to 490 | 1,000 | 2400 |
| | | F(kHz) |
| 510 to 1600 | 100 | 24000 |
| | | F(kHz) |

Section 15.203 specifies an alternative (to field-strength

measurement) requirement for operation on frequencies between 160 and 190 kHz, and states:

"(a) The power input to the final radio frequency amplifier stage (exclusive of filament or heater power) does not exceed one watt.

(b) All emissions below 160 kHz or above 190 kHz are suppressed 20 dB or more below the unmodulated carrier.

(c) The total length of the transmission line plus the antenna does not exceed 50 feet."

One watt of input power may not sound very encouraging, yet many amateurs run less power to QRP rigs and enjoy success, particularly when their "flea-power" transmitters are connected to efficient antennas of one-quarter or one-half wavelength, or to directional antennas.

The 50-foot (15.2m) antenna restriction (including the transmission line) is tough to swallow, because even a quarter-wave antenna for 160 kHz would be over one-quarter of a mile long! In spite of the 50-foot antenna handicap, many CW contacts on 1750 meters have been made over distances of 100 to 300 miles (160-480 km). Single or double sideband, suppressed-carrier, voice transmissions show promise at 30-mile (48 km)

BY KEN CORNELL, W21MB

distances and, on a-m, I would consider anything over 2 or 3 miles (3-5 km) real DX.

The receiver

The first requirement (to keep the horse before the cart) is a sensitive and selective receiver. Most of the better amateur communications receivers will meet this requirement but don't ordinarily cover the very low frequencies, so a logical next step is to use a communications receiver with a low-frequency converter. Many converters for low and very low frequencies have been described in various radio publications.¹

The antenna

Since there are no restrictions governing the length or configuration of your receiving antenna, use one that will provide the best signal-to-noise ratio. This means that you should put it as high in the air and make it as long as possible, within reason. One of the major annoyances with low-frequency reception is man-made noise, *i.e.*, radio-frequency interference produced by such things as light dimmers, electrical appliances and the like. In many instances, such noise is confined to a particular neighborhood, location, or other limited area. Improvement of the signal-to-noise ratio