

1750m

THE EXPERIMENTERS BAND

Here's How to Dabble on 160—190 kHz



by Ken Cornell W2IMB



Tired of the 20m SSB crowd? Hate contest weekends? Have a hankering to build a simple transmitter? Want a real challenge? C'mon down to the low frequency (LF) band and join the fun, and you can leave your ham license behind!

It's a great big world out there! All hams know about Part 97 of FCC Rules and Regulations, which governs licensed amateur operations. Most have yet to discover the great fun that Part 15 allows, although some may recognize this section covers the use of nonlicensed transmitting devices.

In Subpart D, Section 15.112, they permit the operation of a radio transmitter as follows:

(a) The power input to the final radio frequency 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 below the unmodulated carrier.

(c) The total length of the transmission line and antenna does not exceed 15 meters.

Any type of transmission mode can be used with the exception of Class B (damped waves).

Let me tell you, 1750m can rejuvenate that radio experimenter's spirit so many hams find fading these days. QRP operations at 160 kHz are like no other ham experience. It's a challenge, alright, and a heck of a lot of fun.

Who Uses 1750m?

The 1750m band was a "sleeper" until the late 1960s when small groups of experimenters, mainly hams, began to operate on it. They call themselves "Lowfers," short for Low Frequency Experimental Radio Station. Lowfers make up their own calls. The rules allow use of any callsign unless it belongs to an authorized station, including those in the amateur radio service.

Initially, small groups clustered in the Northeast and on the West Coast. They ran beacons and used the 160m and 75m phone bands as back-up communications. Contacts over more than 100 mile were considered real DX! Vast improvements since then in antennas, transmitting, and especially receiving techniques, led to reception reports over 2000 miles away.

Make no mistake, 1750m presents some serious challenges for the experimenter. These require strategy to overcome, and

those with successful strategies reap the rewards of true radio pioneers. Take a look at some of the common problems of LF and how to get around them.

The high noise level in LF is the worst problem. Unfortunately, most of this noise is man-made. Appliances, light dimmers, and power lines are common sources. Some of the noise comes in on power line feeds into the home.

Assuming a good, efficient receiver, first sort out all the possible noise sources within the home. A good power mains filter will help reduce imported noise. Running the receiver on battery power is better still. Fluorescent lights are noisy and can cause serious trouble if located in the shack. Schedule appliance use as much as possible around your operating schedule.

About Antennas & Transmitter

Avoid automatically slinging up the highest and longest wire antenna possible. Depending on the location, it may be a terrific noise collector! Try, instead, to achieve the best signal-to-noise ratio (S/N) possible.

An active antenna may help for a noisy location. This is a relatively short whip mounted on a weathertight housing that contains a broadband preamplifier. Use coax to connect it to the receiver and power source through an isolating network. This type of antenna is small and easy to mount and can be moved around the average home to find the best S/N location.

Another popular antenna is the loop type. They come in various designs, but they all have the classic "figure 8" pattern. Use the nulls off the sides to attenuate a noise source.

The transmitting antenna should be vertical and located in as clear an area as possible to avoid RF-absorbing structures and trees. Use a good ground system. Lay as many radials as possible on the ground around the antenna.

Try to get an antenna configuration that fits into an imaginary cylinder 15 meters high by 15 meters in diameter, to take maximum advantage of the legal size. The transmitter should be within, or at the periphery, of the circle. Despite the low power, high RF voltage will be on the antenna, so all supports should be extremely well insulated.

Practically all Lowfers today use solid-state transmitters. Most of the popular

designs use high frequency crystals with ICs that divide the frequency to come out at the desired frequency. Most use power FETs, such as the IRF series or the VN types, as a final amplifier. When using ICs, the only coil normally required is the antenna loading/coupling coil. This coil should have a high "Q." Most Lowfers use Litz wire for the coil.

Information Sources

Palomar Engineers (Box 455, Escondido, CA 92025) market a number of receiving accessories for LF, including loop antennas and a VLF converter to receive 10–500 kHz on a standard shortwave receiver. An excellent source of transmitting and receiving hardware is LF Engineering (17 Jeffry Road, East Haven, CT 06512) founded by Sal DeFrancesco K1RGO. LF Engineering publishes a sizeable catalog of receive converters, preamplifiers, antennas, a transmitter, and miscellaneous accessories. Their catalog also provides some useful engineering information on operating in the 1750m band.

The Longwave Club of America publishes *The Lowdown*, essential reading for Lowfers. The monthly bulletin shares readers' experiences, prints projects, and covers LF propagation.

It is available for \$12 per year from LWCA, 45 Wildflower Road, Levittown, PA 19057.

On the Air is published by Brice Anderson and is a useful source for a list of active Lowfers and their operating schedules. Write to Brice at Box 14, Lancaster, PA 62855. Hal Murken (19 Hobby Lane, Oakland, NJ 07436) publishes *The Lower Letter*, an excellent forum for LF DXers. The *Western Update* lists beacons and includes construction projects and other information of interest to Lowfers. Write to Jim Ericson, 226 Charles Street, Sunnyvale, CA 94086. Send business-sized 22 cent SASEs for these publications.

There are more than 100 known Lowfers—plenty of room for more! Here's a chance to really have some fun running QRP in an area where radio started, and it doesn't even require a license! For the circuit builder, antenna experimenter, or just the serious listener, the challenge of "lowfing" could really add the spark of inspiration that's missing from a lot of hams' hobby lives. Give it a shot. See you down the log! **73**