*Low*fing on 1750 Meters

It isn't an Amateur Radio band, but you'll find plenty of hams in residence. If you're one of those hardy souls with a taste for adventurous operating, 1750 meters may be for you!

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If 1750 meters is not an Amateur Radio band, what is it? It's a low-frequency (LF) band used by utilities, the military and by a number of dedicated explorers. You don't need much equipment to operate on 1750 meters and you don't need a license from the FCC. In many ways, 1750 meters is like the wild-west frontier—lightly settled and very challenging.

1750 meters sounds almost too good to be true, doesn't it? If the requirements are so simple, you'd think this band would be flooded with signals. Why is it so empty? There *must* be a catch, right?

The Catch

Actually, there are two catches waiting for you on 1750 meters.

The first is legal. Although, you don't need a license to operate on this band, the FCC lays down some strict rules concerning your equipment and your signal.

❑ The power *input* to the final amplifier stage of your transmitter must not exceed 1 watt.

❑ The entire length of your transmitting antenna, *including your transmission line*, must not exceed 15 meters (about 50 feet).

If a 50-foot transmitting antenna seems reasonable, get your calculator and figure out the length of a ½-wave dipole at 175 kHz. Take 468 and divide it by 0.175. The answer is a startling 2674 feet—over half a mile! (There are no limitations on your *receive* antenna, however.)

Well, you've heard of hams working DX with a watt or less and antennas much smaller than 50 feet. What's the big deal? Here comes the second catch.

If you don't know where the 1750-meter band is located, consider your AM broadcast receiver. The AM broadcast band begins around 530 kHz on your dial. Turn on your radio and listen around that frequency. Do you hear buzzing, hissing and static crashes? This is typical for the lower frequencies. Generally speaking, the lower the frequency, the more natural and man-

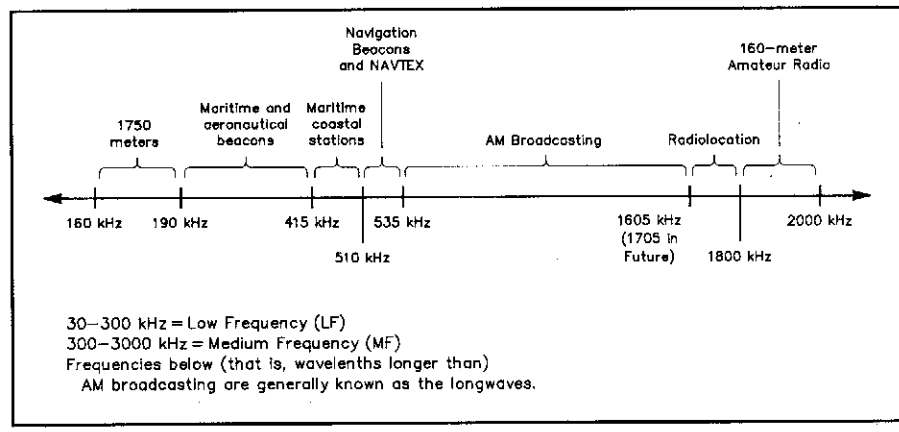

Fig 1—The location of the 1750-meter band compared to various military/utility services, the AM broadcast band and the Amateur Radio 160-meter band.

Table 1
1750-meter CW Beacons

Note: This is a partial list only. Contact the Longwave Club of America for more information. Beacons are listed by state.

Frequency (kHz)	*Location*	*ID*	*Operator*
180.700	Los Banos, CA	NRE	KG6BY
181.170	San Gabriel, CA	IZJ	W6IZJ
182.000	Simi Valley, CA	ELU	WD6ELU
182.870	Descanso, CA	H2	K3YAK
183.160	Saratoga, CA	PRK	K6PRK
183.544	San Jose, CA	MEL	KB6FPW
184.020	Sunnyvale, CA	EK	KG6EK
184.480	Burbank, CA	PLI	WD4PLI
187.080	Westmoreland, CA	M	WA6SFJ
187.650	Morro Bay, CA	C	W6HDO
185.000	Wewahitchka, FL	RED	
166.667	Warm Springs, GA	SE	
184.500	Warner Robins, GA	JDH	AB4MS
175.000	Des Moines, IA	D	
188.480	Daleville, IN	9HDQ	
186.800	Scottsburg, IN	MS	
186.375	Lancaster, IL	BA	
180.030	Silver Springs, MD	FL	
185.700	Riverdale, MD	JPH	
187.335	Berlin, MD	DCH	
188,840	Frederick, MD	GSR	
178.000	North Branch, MN	OKVL	
187.747	Aitkin, MN	LEK	
189.800	Duluth, MN	RM	
189.360	Colt's Neck, NJ	TH	
178.600	Baldwinsville, NY	ZWI	
182.500	Centertown, NY	TFQ	
175.388	Chardon, OH	KRY	
184.700	Cincinnati, OH	XJ	WA8XLJ
187.260	Cincinnati, OH	CAT	
184.877	Durant, OK	1SUN	
184.900	Tarenturm, PA	XTAR	KE3AL
186.200	Verona, PA	A30	
189.200	New Eagle, PA	GIR	
188.900	Pickens, SC	WI	W3WI
189.500	Hilton Head Is, SC	ABC	
187.580	Watauga, TN	OER	
184.514	Haslet, TX	TEXAS	
186.750	Smith Mtn Lake, VA	VA	
187.500	Tacoma, WA	TAL	

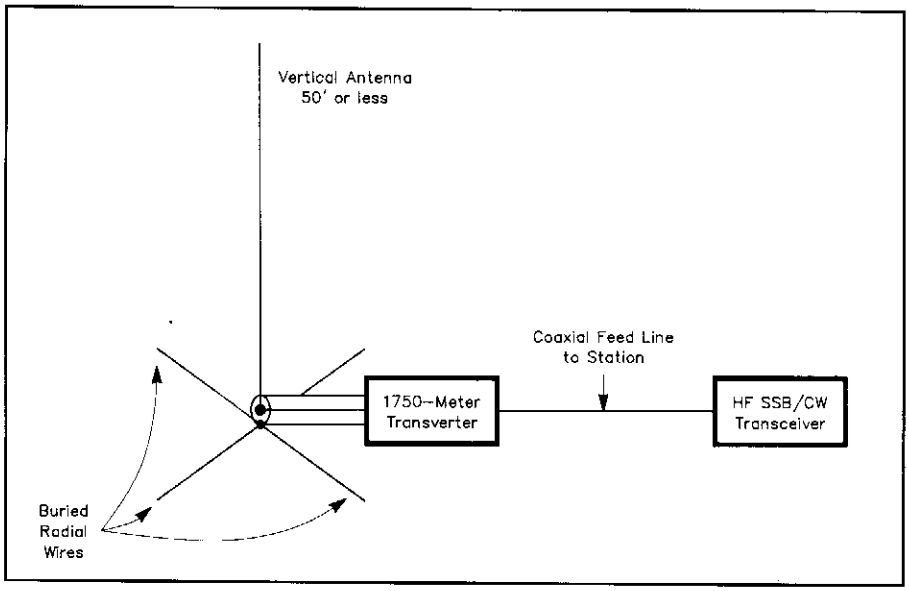

Fig 2—A typical Lowfer station design using a transverter.

made noise you encounter.

The 1750-meter band extends from 160 to 190 kHz. The *highest* available frequency on 1750 meters (190 kHz) is 345 kHz *below* the low end of the AM band (see Fig 1). We're talking about an area of the radio spectrum where Mother Nature and mankind wreak havoc with noise of every description. 1750 meters is all but useless in the daytime and the high noise levels—particularly during the summer months—make long-distance nighttime communication difficult at best.

Some say that 1750-meter operating builds character. That's probably true. You need all the best human attributes including curiosity, patience and perseverance to join the ranks of the *Lowfers*.

Who are the Lowfers?

1750 meters was essentially deserted until the late '60s, when some enterprising hams began their explorations. They called themselves Lowfers—*Low* Frequency *E*xperimental *R*adio *S*tations.

In those early days, they were pleased if they could hear each other at a distance of 10 miles. Now, with modern equipment, Lowfers have managed to communicate over much greater distances.

Almost any mode can be used on 1750 meters. Because of the high noise levels, however, CW is the mode of choice. Lowfers traditionally explore band conditions by setting up continuous CW propagation beacons (see Table 1), but you'll also hear live conversations from time to time. As long as you do not interfere with other stations, there's no reason why you and a friend couldn't chat using CW, AM, FM or SSB.

You can use any identifier you wish on 1750 meters—*except your Amateur Radio call sign or a call sign used in another service.* (You can't use the call sign of one of your local FM broacast stations, for example.) A number of hams have a passion for 1750 meters, so many of their Lowfer call signs are just contractions of their ham calls (BKE instead of N1BKE, for example). Ham Lowfers often coordinate their experiments by talking to each other on 160, 80, 40 and even 2 meters.

Lowfer Hardware

The first Lowfers built their own equipment from scratch, but this is changing. You can now purchase 1750-meter gear in kit form, or assembled and ready to go. *Transverters* offer one route to 1750-meter operating. A transverter takes a ham-band signal (often 80 meters) from an Amateur Radio transceiver and converts it to a 1750-meter signal. It also receives on 1750 meters and converts the signals to ham frequencies.

In addition, many general-coverage receivers and transceivers feature LF reception capability. If the receiver or transceiver can tune down to the 1750-meter band, it may be usable for Lowfer communications.

Remember that the length of your 1750-meter transmitting antenna includes your feed line. For this reason, many Lowfers opt to place their transmitters or transverters at the feedpoints of their antennas (see Fig 2). Vertical antennas are popular for Lowfer operating, although a good ground system with many buried radial wires is required.

There are two companies that specialize in commercial equipment for the 1750-meter band:

❑ Curry Communications, 737 N Fairview St, Burbank, CA 91505; tel 818-846-0617.

❑ LF Engineering, 17 Jeffery Rd, East Haven, CT 06513; tel 203-248-6816.

Getting the Lowdown

The Longwave Club of America was established in 1974 to promote interest in 1750-meter operating as well as other activity on the frequencies below 530 kHz. Membership in the LWCA includes a one-year subscription to the *Lowdown*, its monthly newsletter. Membership cost is $18 in the US and $19 in Canada. The address is: The Longwave Club of America, 45 Wildflower Rd, Levittown, PA 19057.

The *Longwave Beacon Guide* is available for $15 from Ken Stryker, 2856-G, West Touhy Ave, Chicago, IL 60645. The guide lists more than 7000 low- and medium-frequency beacons (Lowfer and otherwise) throughout the world.

One of the great resource books for Lowfer operating is *The Low and Medium Frequency Radio Scrapbook* by Ken Cornell, W2IMB. The 20th anniversary, 8th edition is available directly from the author: Ken Cornell, 225 Baltimore Ave, Point Pleasant Beach, NJ 08742. The cost is $17.50 (shipping included).

Digital signal processing (DSP) holds the potential for remarkable improvements in 1750-meter communications. A DSP processor converts the receive audio—noise and all—into digital data. High-speed microprocessors equipped with special software sort through the data, separating the noise from the actual signal. At the end of the process, the data is converted back into audio—minus much of the noise! Several DSP audio processor/filters are already on the market. I tested one model with a 1750-meter receiver and the noise reduction was amazing. Perhaps some clever DSP programmers will turn their attentions to the challenge of eliminating even more receiver noise on 1750.

Some Lowfers combine DSP audio filtering with highly directional receiving antennas. By turning the antenna, they are able to eliminate a particularly bothersome noise source.

The Few, the Proud

Lowfers are a rare breed at the present time (200+ active lowfers on the air), though their numbers are growing steadily. Perhaps with improved technology, the popularity of this fascinating band will increase. To learn more about 1750 meters, and low-frequency activity in general, contact the Longwave Club of America (see the sidebar, "Getting the Lowdown.") QST