Low Power Broadcasting

You Don't Need A License. Many Stations Are Already On the Air!

BY TOM KNEITEL, K2AES, EDITOR • • •

Kris, proprietor and chief operator at WQNR.

Two of the WQNR tape decks.

Radio station WQNR, 640 kHz in Selden, New York, operates every day of the week from morning until sunset. It has an audience that may be as large as 7,000. Its signal area covers about 20 square miles. WQNR broadcasts today's latest rock and roll sounds; it also sends out programming from the Westwood One Radio Network as well as the Radio International "Rock Over London" program. WQNR is also a reporting station to C.M.J.'s (College Music Journal) New Music Report, and is also listed in Sparrow Records' news updates.

The station is on the promotional mailing lists of most major record companies and frequently offers its listeners free tickets to rock concerts.

While the station presently runs 20 watts, it has plans to increase its power soon. WQNR is also getting set to erect a dish antenna on its roof in order to receive additional programming from networks with which it has made arrangements. Yet, while WQNR has no FCC license, its operator bristles at any suggestion that WQNR is a pirate station. WQNR's operator, Kris Holtegaard, refers to the station as a "community broadcaster" and points out that the FCC has seen his station and given it a "clean bill of health."

WQNR and other similar limited area broadcasters have learned that there are legal ways to commence broadcasting without having to take out a broadcasting license; this by means of the provisions of FCC Rules Part 15. WQNR's approach is by the section of Part 15 which allows broadcasting by carrier current methods—sending the signals out via power lines. There are other approaches that can be taken, according to Part 15, and there is a rapidly growing industry supplying hardware and services to low power and limited area broadcasters. And yet, it's practically a well kept secret. Most folks have scarcely heard of any of these goings-on!

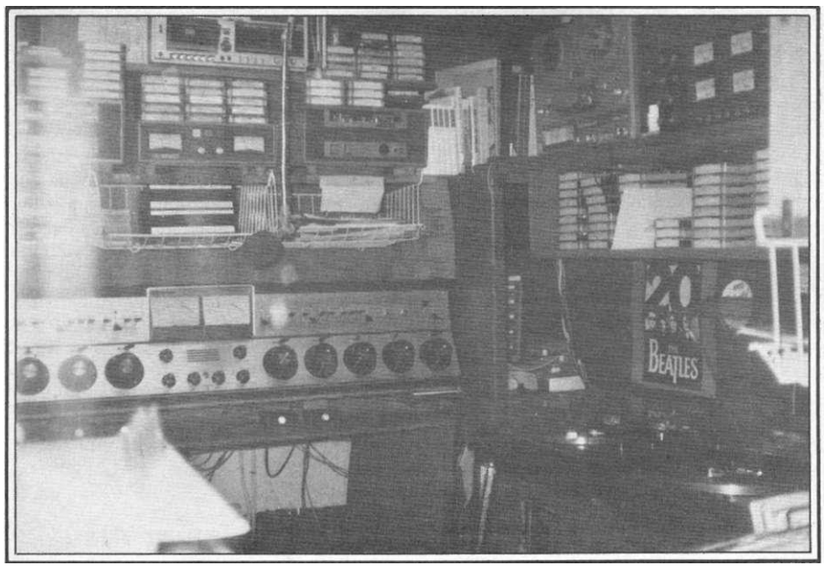
Part 15

Under Part 15 of the FCC Rules (these are the same regulations which permit hands-free FM transceivers and CB walkie-talkies), a person can establish a low-powered radio station anywhere between 510 and 1600 kHz. However, for practical purposes, it wouldn't make much sense to consider frequencies below 530 kHz since broadcast receivers don't tune below 535 kHz.

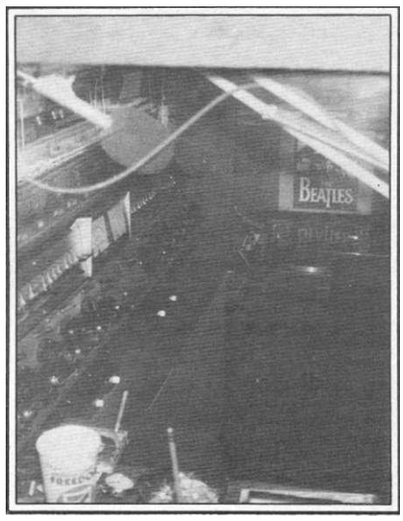
On the conditions that the station not cause interference to licensed broadcasters, a Part 15 sanctioned transmitter can be established within the FCC's technical guidelines within this band. Carrier current (as used by WQNR) is one way of doing it. Another way of doing it is by sending the signal out through a conventional antenna system.

Stations have already been established under Part 15 on college campuses, military bases, in hospitals, nursing homes, sports stadiums, Indian reservations, churches and synagogues (to assist the hard-of-hearing), schools, convention halls, drive-in churches and theatres, at airports, along highways and at construction areas and entrances to parks, and for community broadcasting. Of course, not all of the radio facilities at such places are unlicensed and operating under Part 15, but many are legally unlicensed and operated within the provisions of that section of the FCC regulations.

Part 15 is quite liberal as to what one might do with such a radio station and there are no restrictions against setting up a broadcasting station, even as a hobby effort.



The entire studio portion of WQNR fits into a room the size of a walk-in closet.



A bird's eye view of WQNR.

Low Power—How Low?

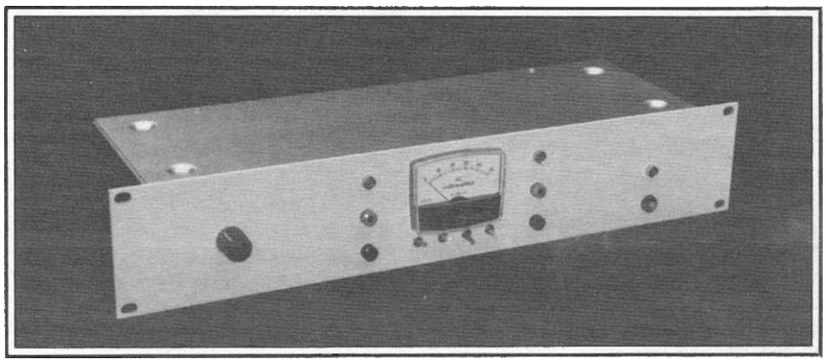
FCC Regulation 15.111 specifies that the broadcast band (535 to 1600 kHz) is okay to use for such operations as long as the signals are within certain limits.

One way of staying within the limits is by making certain that the power input to the final stage of the transmitter doesn't exceed 100 milliwatts and (simultaneously) the total length of the transmission line, plus the antenna and any ground lead doesn't exceed 3 meters (about 10 feet) in length, regardless of the station's operating frequency in the authorized frequency band. Any emissions outside of the authorized band must be suppressed 20 dB or more below the unmodulated carrier. And (FCC Part 15.113 states that) any RF radiated back into the power lines must be 200 uV or less. As a general rule of thumb, the FCC says that if the broadcasts can be received more than 300 feet away from the antenna, then the station is probably putting out more power than they permit under Part 15.

Carrier Current

The FCC's carrier current regulations permit the radio signals to piggyback along the power lines and therefore the signals can be received by all AM broadcast receivers powered from the same line, and all battery operated portables being operated near the power lines. Such broadcasts are limited by FCC regulations, which restrict the amount of signal which might leak off the power lines; also the signals will generally not go past any power company sub-stations. The rules spelling all of this out are expressed in FCC Regulation 15.7.

While carrier current has its advantages, hobbyists must also keep in mind that attempting to feed a signal into a power line could turn out to be dangerous, if not altogether fatal, for persons working with insufficient knowledge of the art, or with unsafe equipment. In addition, some power utility companies may have restrictions regarding the use of their lines for such purposes and it would probably be wise to check in advance of the commencement of broadcasting operations via their lines.



Front view of the Macromod compressor offered by *Panaxis. It has front panel controls for input/output levels, limiting level, AM or FM mode, limiter in/out, bypass, stereo/ mono mode. (Photo* by *Jim Brown)*

General Operations

The FCC isn't especially concerned with the type of programming that goes out over a Part 15 station as long as the station itself doesn't cause interference to licensed stations. There is, of course, a general FCC prohibition against the use of what the agency defines as "obscene, indecent or profane language." The interpretation of which words or phrases might fit into those categories is left to the broadcaster, however there are penalties for those who figure out how to overstep the boundaries of good taste and who get caught as a result. Typical programming might include general entertainment consisting of live or recorded music, commentary, local news, public service announcements, possibly even commercials from area merchants.

A station can make up its own callsign providing it won't be confused with the callsign of a licensed station.

The hours of operation, as well as the frequency used, is a matter of one's own preference. While pirate stations like to operate around 1620 kHz, stations trying to operate legally aren't going to be able to locate above 1600 kHz. This puts them right into the thick of the AM broadcasting band and forces the low-powered signal to compete with licensed stations running as much as 50 kW. It may be possible to set up shop with a Part 15 station on a frequency located between the standard 10 kHz AM broadcast channel spacing intervals, however there are drawbacks. It might be possible for a station on an adjacent frequency to cause a heterodyne whistle on your signal, even if the other station's signal is not especially strong in your area. Also, persons having digital receivers won't be able to pick up the station's 5 kHz offset frequency.

Best bet would be to try to locate a standard frequency that isn't used in your area, at least one that is quiet during daylight

hours—such as 1200 kHz, which may be suitable everywhere except in Texas. WQNR, for instance, finds 640 kHz to be perfect for their purposes until sunset. After sunset, WQNR can't compete with the signal from 50 kW station CMBB (Radio Progresso) in Guanabacoa, Cuba.

Station operators would have to make signal surveys to see the status of their signals within the listening area. Even after a good frequency is discovered, its status could change due to seasonal conditions.

On The Air

Despite the restrictions and competition with more powerful AM broadcasters, many stations are on the air—for instance, KOAG at a KOA campground in Kansas. It's operated by Roy Baum, who says, "This is leading me into an occupation that I can have fun at and that challenges me."

In Fond du Lac, Wisconsin, station WFDL has been operational since last June under the direction of Jan A. Starks. He has branched out into a mini-network of stations in several states and is forming the Direct Area Broadcasting Association (DABA) in order to promote low power broadcasting.

Like WQNR, WFDL is a most serious undertaking. It even sells commercial time to advertisers. The station has two Gates turntables, two Tapecaster decks, a Russco console, an Ampex RTR deck, plus 3,000 record albums and other miscellaneous equipment.

One low power station in Southern California was so professional sounding that it recently had two of its air personalities hired by commercial broadcasters in the area!

Equipment

In order for equipment to be sold commercially for low power broadcast use it must be FCC type accepted, although kits may be sold without type acceptance.

A major force in the manufacture and sale of professional grade low power broadcast equipment is LPB, Inc., 28 Bacton Hill Rd, Frazer, PA 19355. This company, which is headed by Richard Crompton, W3JUD, of fers everything from professional consulting services to FCC type accepted equipment which is presently in wide use. This is a company that has been in business for 25 years and whose equipment has made a fine reputation for itself. The prices for their transmitters run between $600 for the 1 to 25 watt carrier current unit to $4,995 for the 75 to 165 watt carrier current gear.

A more hobbyist-oriented line is offered by a company known as Panaxis Productions, P.O. Box 130, Paradise, CA 95969. Panaxis is run by Ernie Wilson, K6SQN, and it offers a large variety of services and products to the low power broadcasting enthusiast. The company will shortly introduce an all-new, 100-milliwatt transmitter kit for the AM broadcast band. A catalog is available showing their products, books, and other services.

Other Useful Information

In order to help those interested in low power broadcasting get as much information as possible, here is some information on sources that will be of use.

Of course, FCC Part 15 is the basis for all of the operations described here, so you'll want to have a copy on hand to get the full impact of what is and isn't permitted. Copies are available from the Supt. of Documents, Government Printing Office, Washington, DC 20402. Their catalog number for the FCC Rules Volume II (which contains Part 15) is 004-000-00411-6. The price is $5.50.

The FCC has two useful bulletins that can be obtained from the Office of Chief Scientist, Federal Communications Commission, Washington, DC 20554. One bulletin is called OCE-11 "Does My Transmitter Need A License?" and the other is OCE-12 "Operation In the Band 535-1600 kHz Without An Individual License." These are sent at no cost upon request, however a few months ago the FCC advised me that they were working on a new bulletin to replace these two older ones—so if you write to them, better ask for OCE-11 and OCE-12 or any subsequent replacement publications for them.

Panaxis Productions (address given previously) publishes an extremely useful *Experimental Broadcasters' Newsletter* for a subscription price of $18 per year. Every issue is a goldmine of information for low power broadcasters, including stories about stations (with photos). information about techniques, networks, and all sorts of other good stuff. It even has ads from persons selling used equipment, such as turntables, transmitters, tape decks, etc. Panaxis' Ernie Wilson has also written a really good book called *Carrier-Current Techniques,* which tell you how to get on the air with as little grief as possible. This 64-page book is actually part of a series of books called the *Broadcaster's Library,* available from Panaxis. Look for these in the Panaxis catalog.

LPB Inc. (address given previously) publishes their LPB Tech Note #1A entitled "Limited Area Broadcasting," which is a 33-page overview of low power operation within the broadcast band, especially its