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LPB Transmitter: AM for LPFMers

Many prospective broadcasters have filled out their LPFM applications and have already scouted out frequencies and antenna locations in their respective markets. All are ready to hit the ground running.

But technical issues, the lack of spectrum in some markets, conflicting positions between the NAB and the FCC and a proposal in Congress to rescind the establishment of LPFM have ground the intended service to a slow crawl.

It may be hard to tell which way the winds of LPFM will blow. Until then, community-minded micro-broadcasters anxious to hit the air need not sit on their hands. Many can go on the air now, albeit on a different band.

LPB Inc., the new owner of Fidelipac and the company that put low-power college radio on the map, offers the AM-2000, a nifty little mast-mounted transmitter and antenna combo that presents the bored micro-broadcaster with an alternative to thumb-twiddling: legal, license-free broadcasting *on the AM dial.*

A look-see

The AM-2000 is an FCC-certified, self-contained, 100 mW frequency agile AM transmitter and antenna combination that comes under Part 15 regulations as an "unlicensed secondary device." Solid-state guts and a frequency synthesizer assure the AM-2000 sounds good and stays on the mark.

The downside is that 100 milliwatts does not go far. By design, the signal of the AM-2000 fades between 1,000 and 2,600 feet. With efficient grounding, a wide radius might be possible while still remaining legal.

LPB positions the AM-2000 as a limited-range device to be "used for auto racing, guest and tourist information," according to the company Web site. I see a further use: to help get prospective LPFM operators established in their communities by getting them up and running legally on the AM band first while LPFM details are hammered out in Washington.

Granted, there is a condition in the LPFM application process stating that applicants may have no other broadcast interests. Whether or not license-free AM communication falls under that condition remains to be seen (much as the rest of the LPFM regulations).

However, if that indeed were the case, an applicant could conceivably be rejected for owning and operating a CB base station. The interpretation of the law could be that broad, so check with your lawyer.

The LPB AM-2000 transmitter is 6 by 8 by 4-1/2 inches in size and weighs about four pounds, most of the weight coming from the lockable and gasketed weathertight steel enclosure. A separate power transformer box remains indoors where it's dry, feeding juice and program audio to the transmitter via an audio/power snake cable.

LPB engineers designed the AM-2000 to function with a stock Radio Shack 102-inch whip CB antenna. No expensive or esoteric components here. If an antenna gets bent in the wind, fifteen bucks puts you back on the air.

Even though the eventual goal of micro-broadcasters is to be on the FM dial, much can be gained by spending some time on the AM dial first.

For one thing, it establishes credibility right in the neighborhood that a prospective licensee intends to serve — a foothold that may pay off when LPFM grants are handed out.

For another, it is a low-risk, low-cost way to ascertain whether such a service is viable in the community. After all, if what you offer is any good, listeners will latch onto you whether you are on FM or not. Best of all, it is almost foolproof.

The interior of the LPB AM-2000 transmitter: Tune it up and get on the air

One big red button puts the AM-2000 on the air with no readings to take.

Furthermore, a license-free station need not be EAS compliant, although it is good practice to leave the air during a legitimate emergency and let the big rigs take over. And unlike non-commercial LPFM, you can probably bring in an advertiser or two to offset the electric bill.

What if there are no available FM frequencies in a market? Except for the largest metropolitan areas, there is frequently room on the AM dial in most markets to shoehorn in a Part 15 station.

AM radio is still a viable and vibrant band. As said in these pages before, if AM truly were dead, manufacturers wouldn't build receivers anymore.

On the air anywhere

The interior of the AM-2000 reveals the same solid, socked-down PC board construction seen in other LPB transmitters. That smiley "robot face" seen inside the case holds a milliammeter, selector switch and a pair of tuning slugs.

Altering the positions of 10 DIP switches on the PC board sets the operating frequency (530 to 1700 kHz). The frequency seemingly can be set "between the cracks" at dial settings such as 855 kHz.

Once set to an available frequency, the transmitter is peaked with the use of a non-inductive alignment tool on one of the two tuning slugs. When the meter shows 0.6 milliamperes, the AM-2000 is at its legal limit of 100 mW.

The eventual goal of micro-broadcasters is to be on FM, but much can be gained by spending time on AM first.

Obviously the meter can be set higher, which translates to slightly more power output. But that is risking a hefty fine and equipment seizure by your friendly neighborhood FCC man. If you're going on the air, play by the rules.

I tested an AM-2000 unit at 650, 840, 1170 and 1630 kHz in the bedroom community of Annandale, Va., a dozen or so miles from Washington, D.C. With nothing more than a Walkman-type CD player connected directly to the audio input at first, I fired up the inaugural broadcast of ATR – "Annandale Terrace Radio."

Beginning simply by clamping the AM-2000 to a front porch railing for ground, I took to the street and drove around, listening to my signal. Not good. The low height of the antenna coupled with the hilly contours of this community and the insufficient ground caused the signal to fizzle long before it should have.

Next, the AM-2000 was clamped to a chain link fence between houses. Even worse. The fence was better at absorbing my signal than providing a solid ground, so my program audio went nowhere.

Finally, I actually did what the LPB manual said to do: mount it higher than nearby rooflines and metal objects. I used 1.5-inch diameter metal wiring conduit as a mast to raise the AM-2000 over the roof.

Bingo

Bingo. I had the Doobie Brothers for three to four blocks in all directions. It got noisy very quickly after that, but for this little suburban cluster, a four-block radius was more than adequate.

Residents that heard and followed my testing suggested the usefulness of the AM-2000 as a "Neighborhood Watch" service and a truly "local" radio station for the two schools serving our immediate community.

As in a full-power station, good modulation and audio quality is assured when an audio processor is used ahead of the transmitter audio input. Very good results were obtained using a Behringer "Composer," an inexpensive compressor/limiter found in music stores. LPB engineers reported similar success using a comparable PreSonus compressor.

Efficiency and distance improve noticeably when the AM-2000 is solidly grounded.

FCC regulations state that the combined length of a Part 15 AM antenna and ground lead cannot exceed 120 inches. One might think that, because the antenna already occupies 102 of those inches, the very short ground left behind will impair performance.

Ah, but look again. The operative word is ground *lead.* You cannot run a copper grounding wire all the way up the mast to the transmitter, but nothing on earth is stopping you from hoisting an AM-2000 atop a 60-foot-high all-steel billboard and grounding directly to the structure. As long as the total combined length of the antenna and a grounding *wire* do not top 10 feet total, everything is kosher.

In my own case, the metal conduit I used as a mast was sunk about 18 inches into the soil. I might have eked out another dozen yards or so of coverage had I dug in a few copper radials, but that might have been pushing the legality of the rig, to say nothing of the rental lease on my house.

I am certain some enterprising wiseguy is going to try ways to increase the range of a low-power transmitter such as the AM-2000 — perhaps by buying two or three units and attempting a directional array (don't bother), or adding an ersatz capacity hat to the top of the antenna.

This would not increase the physical length of the antenna, but would affect the electrical length. I doubt that FCC engineers would let a capacity hat slide; it would void the type-acceptance certification of the transmitter.

Why mess with it? The AM-2000 is a capable performer the way it is. Mount it high on a metal pole, get a cheapie compressor, scrounge a retired rotary pot console from another station in town – engineers never throw that stuff away – and you are on the air, legal and license-free.

Maybe you won't get the three miles you were hoping for with an LP100 license, but it puts you on the air before everybody else. You can resolve programming issues and technical bugs early and allow your intended audience to get familiar with you before moving to the FM band.

And if you can't staff your Part 15 station around the clock, check out WebJockey, a fairly impressive $99 computer radio automation program also offered by LPB.

If I were to offer a suggestion, it would be that LPB include a page on lightning protection or suppression in the manual. Manufacturers of consumer electronics routinely do this in their manuals, and while a transmitter owner may have more smarts than the average Joe may, it cannot hurt to educate a user what to do when the clouds grow dark.

I do like the AM-2000, although the $1,800 price tag seems lopsided compared to its wattage. This limits its appeal to serious and semi-serious broadcasters, which is probably not a bad thing. The specifications and performance of the AM-2000 place it far above those crummy "hobby" transmitters one can obtain anywhere.

A parting thought: whether it's 100 mW or 100 MW, AM or FM, broadcast responsibly and within legal limits. The FCC will not grant an LPFM license to someone who acts outside the law.

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For information, visit the LPB Web site at www.lpbinc.com *or contact the company at 877-LPB-COMM*

*Alan Peterson is an **RW** technical adviser and newly-christened program director of cable/Internet radio station WEBR at Fairfax Public Access Corp., Fairfax, Va.*