

Hobby Broadcasting

\$3.50 Summer
U.S. 1999

Canned Radio ?

WHOT/RFNY

Tom Mix

1970s German pirates

Carrier-Current: The legal low-power solution?



Newsstand: Please keep on shelves until 8/31/99

WiNRADiO

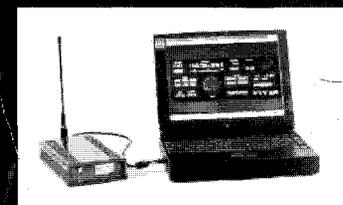
Tune in to the action packed world of radio communications

- Scan for exotic stations from faraway places
- Eavesdrop on aircraft and maritime communications
- Intercept clandestine stations
- Monitor emergency services
- Receive satellite and Space Shuttle signals
- Witness combat transmissions making history

The award-winning WiNRADiO WR1000i is the world's first commercially available PC-controlled wide-band scanning receiver. We also have a full range of internal and external PC-controlled receivers, including a range of software and hardware options.



Internal Model (WR-1500i)



*External Model (WR-1500e)
(computer not included)*



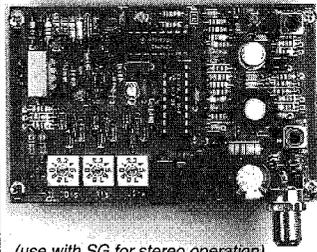
The WiNRADiO Control Panel

Check out our website for more details
www.winradio.com

PROGRESSIVE BROADCAST EQUIPMENT CONCEPTS

— SINCE 1990 —

HIGH QUALITY FM

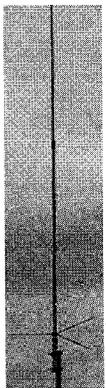


THE PANAXIS FMX
A programmable, Microprocessor Controlled Phase Locked Loop, FM transmitter. Output power is adjustable from 20 to 400 milliwatts. Applications include: Lab oscillator, cable modulator, Low Power FM Transmitter. Use in offices, churches, stores, & drive-ins.
- Kit Price \$119

(use with SG for stereo operation)

CFM-95SL 5/8 WAVE FM ANTENNA

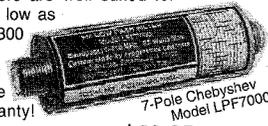
You've been asking for it, and now it's here! Finally a quality FM antenna at a reasonable cost. The Comet 5/8 wave antenna is a professional quality, commercial grade antenna that offers **3.4 dB gain!** This **doubles your Effective Radiated Power!** Designed with the needs of the low power broadcaster in mind, the model CFM-95SL provides exceptional quality and performance with an unbeatable price. This antenna comes with our exclusive 30 day money-back guarantee and full one year warranty. Special Offer: mention this ad and the price is only **\$105.95** plus shipping. (Normally \$109.95 plus shipping)



PROGRESSIVE'S 7000 SERIES LOW PASS FILTERS

Most FM transmitters produce harmonics. If your harmonics fall on or near a TV channel or Maritime frequency you could cause severe interference to that channel. Use of a Low Pass Filter is the best method of eliminating this kind of interference. These filters are well suited for use on power levels as low as 100 milliwatts on up to 300 watts. All three units include our 30-day money-back guarantee and a full 2 year warranty!

Model LPF7000 (0-25 watts, -43dB) **\$69.95** (shown)
Model LPF7002 (0-125 watts, -75dB) \$89.95
Model LPF7003 (25-300 watts, -75dB) \$189.95



NEW 1 WATT STEREO RACK MOUNT FM EXCITER

The BW-1S is a part 73 verified single space 19" rack mountable Stereo FM exciter which includes a front panel LCD frequency



display with frequency "locked" indicator. The frequency can be set easily using the front panel frequency "UP" and "DOWN" buttons. Withholds RF output until the PLL has achieved lock. Holds last used frequency in memory. Also includes built in audio compressor which keeps your modulation as close to 100% as possible. Visual indication of audio "peaks" is provided by two front panel LEDs. Includes built in low pass filter for exceptionally clean spectral output. Comes with manufacturers one year warranty. - Only \$595 plus shipping.

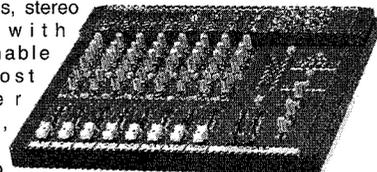


Now you're talking with Protech's new illuminated "ON AIR" sign. Beautifully crafted from fine Oak wood, this 5.2" x 9" x 2.5" station accessory adds the finishing touch to any broadcast studio. Highly visible, this annunciator comes alive with brilliant red colored letters set against a black background. A simple contact closure or DC voltage is all that's needed to activate the unit. Includes fully opto-isolated 12 volt circuitry so it will not add any noise to your audio. Normally \$179, With this add - Only **\$169**



The new **MAX1** is a high quality 3-5 watt mono FM transmitter operating in the 86 - 109 MHz range. The unit features an LCD frequency display which also provides important tuning and self diagnostics information. Simply press the "UP" or "DOWN" buttons to set frequency. This unit may be operated in stereo by adding any of our stereo encoders. Operates on 12 volts DC @ 2 Amps. Includes built in harmonic filter for super clean spectral output. Complete Kit - **\$159.95** + S&H.

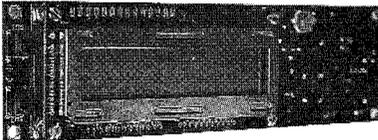
The **MX1602A** mini-mixer by Behringer is the perfect mixer for small or Low Power FM stations. In fact, any Broadcast studio or field operation can benefit from this multifaceted little marvel. Features 12 channels (4 mono & 4 stereo) with individual pre/post auxiliary switches, peak LEDs on mic channels, stereo solo with switchable pre/post fader modes, individual solo LEDs, and two band EQ on all channels. Up to 60 dB of input gain control! You'll have no problems with noise or hum because of the totally professional balanced inputs and outputs. Includes 2 aux sends, 2 stereo aux returns, and low noise external power supply. Includes our exclusive 30 day money back guarantee and full one year warranty. - Only **\$299**



These Dummy Loads simulate an accurate 50 ohm antenna load which enables you to tune and test your transmitter or RF amp without radiating a signal on the air. Comes with SO-239 input connector. (N type available at an additional cost) The **DL300** handles short term power up to 300 watts. (100 watts for 1 minute) Includes our exclusive 30 day money back guarantee and one year warranty. Only **\$35**

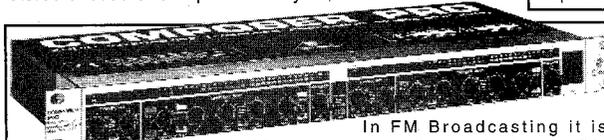
MODEL 220, 2-15 WATT RF POWER AMPLIFIER

The model 220 is an 88 - 110 MHz RF amplifier that connects to mono or stereo FM transmitters and produces a powerful 2-15 watt signal which could broadcast up to 5 miles or more! Requires 50-150 mW drive. Step by step plans complete with part source and antenna information. . .



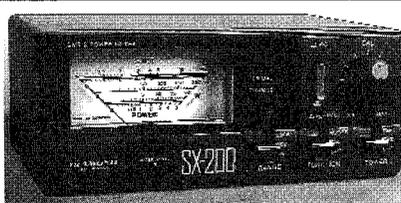
The **1W-LCD** is a 1 watt FM transmitter which has a built in LCD frequency display & selector. Just dial in your frequency using the UP/DOWN push buttons on the front panel and your ready to go! Withholds RF output until the PLL has achieved lock. A front panel pot lets you adjust audio level easily. Stereo operation can be obtained using any of our stereo encoders. Complete kit only - **\$169**

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In FM Broadcasting it is important to keep your audio signal as loud as possible without exceeding 100% modulation. A loud sounding signal is perceived by the listener to be a strong FM signal. A strong FM signal sounds better and therefore attracts more listeners. The **MDX2200 COMPOSER PRO** is a two channel (stereo) compressor/limiter with a separate peak limiter circuit. Includes fully balanced inputs and outputs. Comes with our 30 day money back guarantee and full 5 year warranty. On sale now.

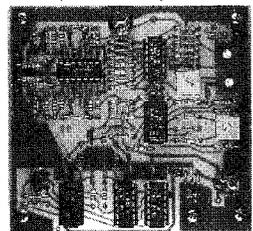
ONLY \$14 PLUS \$2 S&H - **\$269.95** Plus S&H



Model SX200
This is a must have item for proper tuning and peaking of FM transmitters, RF Amplifiers, and antennas. The Diamond Antenna model SX200 Meter covers the 1.6 - 200 MHz range in three full scale readings: 5 watts, 20 watts, and 200 watts. The large easy to read meter scale is calibrated for forward and reverse power, and SWR. The meter has 50 ohm SO-239 input and output connectors and includes a full one year warranty. - Only **\$119**

PANAXIS "SG" STEREO GENERATOR Careful PC Board layout, precision IC amplifiers, and a double balanced mixer make this an exceptionally clean composite stereo generator. Includes on board controls for precise L+R and L-R mixing, sub-carrier null, 19 KHz pilot level, and audio output level. High stability pilot and sub-carrier frequencies are crystal derived.

Uses standard 75uS or 50uS pre-emphasis. Although the SG was designed specifically as a companion for the FMX exciters, it is also compatible with any exciter that has an MPX input. - Kit Price **\$109.95**
Assembled & Tested PC Board - **\$169.95**



Progressive Concepts
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(630)736-9822 FAX: (630)736-0353
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Our ad rates are up 20%

BUT OUR CIRCULATION IS UP 400%

And it's climbing. Do the math! Even though our ad rates have increased, an advertisement in **Hobby Broadcasting** is even more of a bargain now than ever. Just take a look – everything is increasing: page count, number of advertisers, and circulation. If you sign up for a year of advertising now, you can expect that the circulation will continue to increase...and your ad will be seen by even more people.

What's the bottom line? Simply that these low ad rates add up to a wise investment for your advertising budget!

Why should you advertise in *HB*? If there's hobby broadcasting, **Hobby Broadcasting** is there.

Rate for 1 issue

Back page \$220
Inside cover \$180
Page 3 \$180
Full page \$145
2/3 page \$120
1/2 page \$85
1/3 page \$60
1/4 page \$50
1/6 page \$35

Rate for 4 issues

\$180 x 4 = \$720
\$150 x 4 = \$600
\$150 x 4 = \$600
\$120 x 4 = \$480
\$100 x 4 = \$400
\$72.5 x 4 = \$290
\$44.5 x 4 = \$178
\$39.5 x 4 = \$158
\$30 x 4 = \$120

Send check or money order payable to:

Cabinet Communications
P.O. Box 642
Mont Alto, PA 17237
ayoder@cvn.net

Write or e-mail to be sure that space is available.

Hobby Broadcasting

Andrew Yoder, editor
Yvonne Yoder, business manager

Hobby Broadcasting is a quarterly publication of Cabinet Communications, Mont Alto, Pennsylvania. *Hobby Broadcasting* is dedicated to the coverage of all sorts of hobby broadcasting: Internet radio ("Netcasting"), microbroadcasting, public-access radio and TV, pirate radio and TV, shortwave radio, college and high school radio and TV, and much more! If you would like to send articles, photos, or any other information for possible use in *Hobby Broadcasting*, please send it via our mailing or e-mail addresses.

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Hobby Broadcasting
P.O. Box 642
Mont Alto, PA 17237
USA

ayoder@cvn.net
<http://www.frn.net/rfi>

Subscription rates

\$12 for one year in the U.S.; \$24 for Canada via airmail, or \$43 foreign air elsewhere in the world.

Distribution information

If you would like to distribute *Hobby Broadcasting* magazine (via mailorder, at hamfests, bookstores, electronics shops, at NAB conventions, etc.), please contact us for our special bulk rates.

Subscription labels

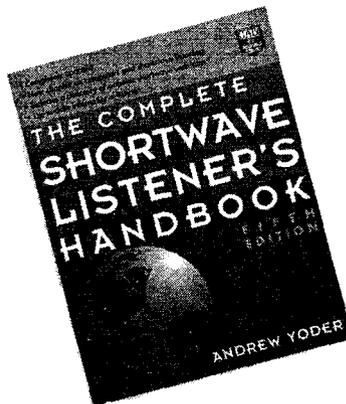
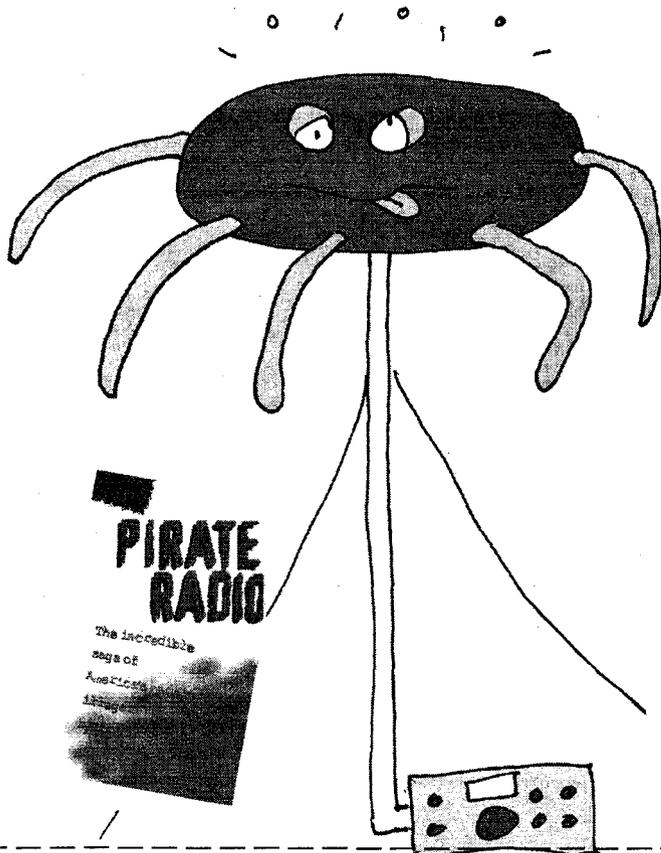
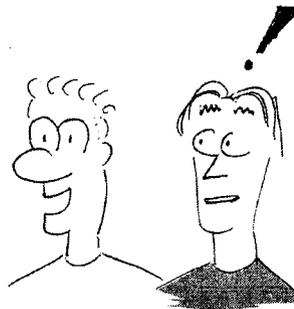
The label indicates the volume and issue number that marks the expiration of your subscription.

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Legal stuff

Although *Hobby Broadcasting* makes an effort to ensure that the information published within is accurate, it cannot be held liable for the contents. The reader assumes any risk for broadcasting or operating any radio/audio/video equipment. Opinions or conclusions expressed are not necessarily those of Cabinet Communications. Check local ordinances and contact the Federal Communications Commission for information concerning broadcasting regulations.

"He's a giant spider, but I think he makes a great discone!"



Cabinet Communications Book Order Form

- \$29 *The Complete Shortwave Listener's Handbook (5th Edition)*
- \$13 *Build Your Own Shortwave Antennas (2nd Edition)*
- \$25 *Pirate Radio: The Incredible Saga...*
- \$18 *Pirate Radio Operations*
- \$18 *Access to the Airwaves*
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- \$19 *Jamming the Media*

New!
Free "pirate radio" bumper sticker with every order!

Subtotal

Add \$3 of postage for the first book, \$1 for each additional in the U.S. (book rate)
 Add \$3 of postage for the first book, \$2 for each additional in Canada (surface mail)
 Add \$4 of postage for the first book, \$2 for each additional to rest of world (surface mail)

Pennsylvania residents must add 6% sales tax

Total

Please make all checks or money orders payable to Cabinet Communications,
 P.O. Box 642, Mont Alto, PA 17237



Hobby Broadcasting

#6

Summer 1999, Volume 2 Issue 2

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Behind the Mic

Aah, the growing pains are subsiding. This might be our last issue of newsprint and maybe even our last at 52 pages. This also marks our first coverage of old-time radio and Internet broadcasting.

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Feedback

Letters, letters, letters: Internet radio, the mystery station on 1710 kHz, a push for low-power FM legislation, a great plug, and more!



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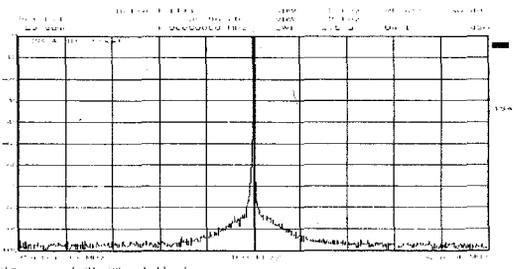
Broadcasting News

FCC Explores Creation of Low-Power FM Radio Service for Local Communities * Swatch Satellite Fails Broadcasting Mission * UK Government Stalls Fight for Independent Radio * FCC Commissioner Kennard's NAB Speech Glitched

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Interview: John Calabro

John Calabro a.k.a Hank (a.k.a. Music) Hayes is back again for the second and final round of his interview with Hobby Broadcasting. He tells more of his previously unheard story about the latter days of WHOT, their time with Radio Newyork International, and the latest chapter of the saga, Radio Free New York (RFNY)



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BCW 1-Watt LCD Transmitter Review

Marconi's back again with more charts, graphs, and tables than you can shake a spectrum analyzer at. And all of his work is paying off. He might have found the FM transmitter of your dreams, the Broadcast Warehouse 1-watt LCD FM transmitter.



24

Tom Mix Rides on the Airwaves

Tom Mix, a rough-ridin' cowboy from northern Pennsylvania, captured the imaginations of American children in the 1930s. His radio adventures kept them glued to their consoles, and their parents strapped with buying spurs and boxes of Instant Ralston.



26

WHAK Internet Radio

Is Internet radio the wave of the future or just the 1990s version of Mr. Microphone? Becky Loch and Darren Fitzgerald tell you the hows and whys of WHAK Radio getting onto the "air," broadcasting digitally to the wired world.



28

1970s German Pirate Radio

Radio Valentine, Radio Gloria International, and Radio Partisan...have you heard of any of these stations? They have dropped off into obscurity now, but they were once an exciting part of the early German pirate radio movement. Here's a fascinating look at activity from more than 20 years ago with Reiner Palma.



34

Carrier-Current AM Radio (Pt I)

OK, you don't want to break any radio laws, but you want to start broadcasting...without the threat of the FCC. Carrier-Current AM radio could be just what you're looking for. The Dude gives you half of the scoop on his Carrier-Current station (the rest of the scoop is coming in the Fall issue of *HB*).

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FM Bandscan

News from low-power FM stations around the U.S.



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Airplay

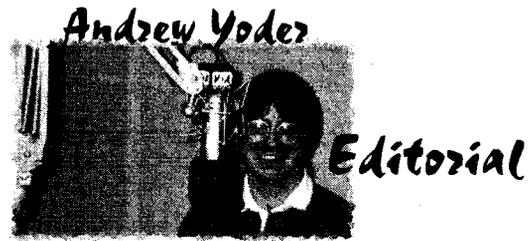
Reviews of Doc Hopper, The Candy Snatchers, OX Fanzine Comp #33, Five Iron Frenzy, Fugazi, At the Drive-In, and more.

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SW Bandscan

General shortwave news; a loglist of activity; a report of pirates from Greece, Italy, and Serbia; Radio Azteca; Radio Free America, and more.

Behind the Mic



This issue of *Hobby Broadcasting* contains a first, of sorts, for us. One of the feature articles is about Tom Mix, whose adventures were dramatized in the radio serials for decades. The exploits of his radio character entranced children across the country, but the real Tom Mix's life was significantly different.

The Tom Mix article is our first excursion into old-time radio. Old-time radio might seem like a diversion from DIY radio, considering that, even decades ago, it was overtly controlled by corporations. But I think that OTR blends well with DIY radio because the programs have been abandoned and are now generally avoided by the licensed stations (although a few stations have experimented with playing OTR programs overnights or in special time slots). Also, most of the choice OTR formats have been totally abandoned—dramas, adventures, comedies, variety shows, and cooking shows.

Not only are these programs excellent for at least occasional DIY station airplay, but they are a great inspiration for station operators. For example, you could be a budding Arthur Godfrey or Ed Sullivan and have your own variety show. Think of the possibilities of setting up regular (weekly or monthly?) talent shows to be broadcast via your station. It could be a lot of fun and a great way to do something positive for your community. This kind of experimentation is perfect for DIY radio—especially now that commercial radio is stuck in a rut of telephone talk shows and top-40 music.

So, this is the connection between old-time radio and do-it-yourself broadcasting. I think that it's a

symbiotic relationship and I hope that *Hobby Broadcasting* will provide plenty of useful information for OTR enthusiasts in future issues. Perhaps not only will our current readership be interested and inspired by OTR, but some of the long-time OTR enthusiasts might be motivated to create their own stations or outlets for programming.

Technical vs. nontechnical

I've heard comments that *Hobby Broadcasting* is too technical. These are legitimate concerns for me and I would have to say that the Spring issue was a bit more technical than I would have liked. I see broadcasting as being equally split between the technical and the nontechnical. Not only do you need to get the audio onto the air (and make it sound good), but you've got to put on interesting, well-done programming.

I think that the perfect *HB* issue should be split almost evenly between technical (transmitter reviews, projects, and how-to articles) and nontechnical (interviews, music reviews, music articles, station history articles, and station format pieces) material.

Newsprint vs. White bond paper

I tried to be prepared for the sight of newsprint when the huge boxes of the Spring *HB* were stacked up all over our side porch. I have to say that it was exactly what I expected; I'm not planning to stick with newsprint. It's too smudgy, too low in contrast, and too impermanent. If cost was no object, I'd publish every page in full color on heavy-weight acid-free paper. But cost is a problem. And I got to the point where I couldn't lose thousands more

dollars publishing *HB* while we're trying to build up a subscription/advertising base.

The cost-cutting measures have worked: our advertising is continuing to increase, as well as the number of issues sold. Chances are good that we'll break even on this issue. Fortunately, that likely means a switch back to white bond paper.

Thank you very much for your patience as *Hobby Broadcasting* continues to grow.

'Netcasting

Just as I was finishing this issue, I exchanged a few e-mails with Joey Manley, co-moderator of the new Streaming audio list and former director of the Free Speech Internet Television Website (<http://www.freespeech.org>). Joey informally agreed to write a regular 'Netcasting column for us that will cover everything from the nuts and bolts of the technology to why anyone would want to broadcast on the Internet.

In addition, I've been busy contacting others about possible articles concerning online, digital radio. There are just loads of possibilities here. With the Internet expanding at an incredible, unpredictable rate, it's difficult to determine its future importance.

Will 'Netcasting audiences eventually outshadow traditional radio and TV audiences or will it remain a niche market for dabblers and experimenters? I believe that the most important point is that the possibilities are enormous. As long as they remain so, 'Netcasting must remain a top priority, regardless of the currently small audiences for these stations.

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Feedback

Every issue, Hobby Broadcasting prints selected letters from our readers. We reserve the right to condense lengthy letters and to edit letters for style and grammar. All letters must be signed and have a valid return mailing address or e-mail address. Contact Hobby Broadcasting at P.O. Box 642, Mont Alto, PA 17237 USA or via e-mail at ayoder@cvn.net.

Tuning in to the 'Net

I just got a copy of *Hobby Broadcasting* and have been browsing. You have a lot of interesting stuff. Skimming through it, I couldn't help but think of radio broadcasting over the net. I can't have been the first to think of it. (I couldn't quite tell. Was that what the writer in "Feedback" was complaining about?) It wouldn't satisfy the "community-local-culture" oriented broadcasters and real radio traditionalists. But it would certainly supply an outlet for a lot of the political and alternative music people. I notice that even a lot of the ham radio crowd has gone into computers, though they seem to be into creating their own networks. Can you suggest a pointer to anything on Net radio broadcasting?

Thanks in advance for any help.
Walt

Sure, some great information is out there. An Internet search will pull up some stations, but that can be messy, with thousands of unrelated pages coming up for "internet" and "radio." If you have Winamp, one of the best sources of independent Internet radio info is Shoutcast at <http://www.shoutcast.com>. For any type of licensed radio station broadcasting in Real Audio, try the MIT Radio Station list at: <http://wabr.mit.edu/stations/list.html>. If you are interested in the "bits'n'bytes" of how to put up your own bitcaster, you might be interested in subscribing to the Streaming mailing list. For more information, contact thejoes@sprynet.com. We're working on getting more

'Netcasting articles. And a regular 'Netcasting column is starting with the next issue, written by Joey Manley, moderator of the Streaming List and formerly of the Free Speech Internet Television Website.

1710-kHz AM Mystery Station

Hello,
I really enjoy receiving my *Hobby Broadcasting* and read it cover to cover. I have a mystery station that I have been monitoring for about six months on the X-band. Specifically, 1710 kHz, which sounds like digital traffic. I have copied this station as early as 7:30 AM and as late as 11:30 PM local time in Centerville, Ohio. My receiver is my car radio and it sounds like it flutters and skips in. Low powered handshaking? I am not sure. Could any of the readers of *Hobby Broadcasting* decode this and let me know via e-mail who or what it is. Thanks. Look forward to seeing you at Hamvention '99 in the flea market.

Good DX,
Fred Lehman WD8MGO

Hi Fred,
This station has been heard all over the Eastern U.S. and Canada. I've heard it several times in Pennsylvania with a weak signal, playing entire pop/rock CDs. I could hear an announcer at several points, but unfortunately, it was too weak to copy. According to National Radio Club's DX News, this is W807 in Glasford IL, "non-profit experimental broadcast under temporary authority". The article says this is the reincarnation of WR63 which left 1650 for 1610 on November 25, 1998 until mid-December when they left the air. According to the article,

they returned on January 15, 1999. These callsigns aren't like some of the temporary FCC callsigns that I had seen before, so I don't know if this is a pirate or if it actually is a licensed, experimental station. For that matter, I haven't seen any reports of the station in the past month, so I don't even know if they're still on the air.

See you at Dayton!

A Great Plug!

Dear Andrew and Yvonne,
Thanks for the subscription reminder! You're right, I don't want to miss the current *HB*. With everything that's happening right now toward the establishment of a legal LPFM service, I'm counting on you guys to keep me in the thick of things!

The coming months promise to be the most exciting ever for those of us interested in becoming community station owners; and there's never been a better time for a publication like *Hobby Broadcasting*.

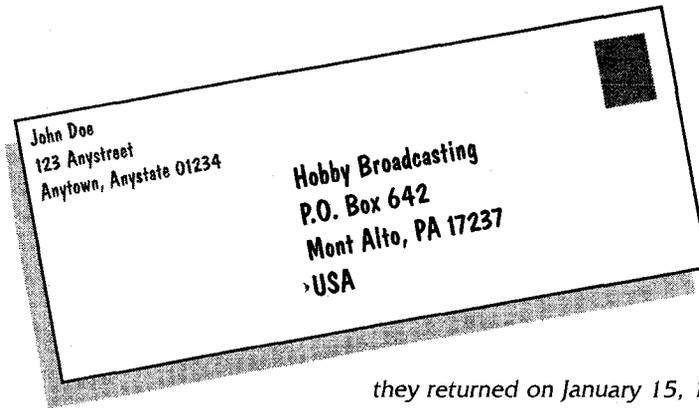
Sign me up for another year!
Douglas Gagliardi

Thanks for the great plug! We're planning to improve *HB* over the upcoming year...and hopefully take it to a level higher than what you've come to expect from us.

Low-Power FM: Call on Congress to Open the airwaves

Brief background: The FCC proposed a low-power FM radio service (LPFM) in the winter. The period for public comment is over on June 1st.

The proposal is long and complicated, but basically, the FCC suggests 3 possible tiers of service:



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500-1000 watts, 50-100 watts and possibly 1-10 watts. It's pretty clear that the 500-1000 watts is not that relevant in terms of broad-based access. The other two levels are.

Enemies of LPFM are powerful: Rep. Billy Tauzin, for example, who heads the committee that has oversight over the FCC and who gets substantial campaign support from the National Association of Broadcasters. There are also those who are in favor of the proposal. However, if the LPFM debate unfolds in a political vacuum, those against the proposal will win. The only way that a serious challenge can be mounted is through PUBLIC PRESSURE. This means:

- * Direct public contact with the FCC.
- * Direct efforts to get your legislators to stand up and be counted.

In this message, I have included a one-page letter that doesn't go into too much detail, but will provide the FCC with a general sense of what a useful low-power FM service would consist of. We urge that you send copies of the letter to:

- * The FCC
- * Your Congresspeople and Senators
- * A copy to me (or at least notification that you sent letters), to use for publicity purposes.

All legislators' addresses will be posted on our Website:

<http://www.citizensmedia.org>

and are also available at:

<http://www.visi.com/juan/congress/>

Please copy the letter below and paste it into whatever word processing program you use. It's very important that you personalize the letters and, if at all possible, send them out using the letterhead of any group/company/organization with which you happen to be affiliated. If you have the time and energy, I encourage you to check out the LPFM proposal, which is at: http://www.fcc.gov/Bureaus/Mass_Media/Notices/1999/fcc99006.txt and write whatever kind of letter you like. At CMC, we're about trying to get people into the process, not dictating what to think.

Incidentally, a extensive study by our friends at OMB Watch last year showed how much more effective letters are than any other form of communication, especially e-mails, which can be ignored very easily.

[LETTERHEAD]
[DATE]

Chairman William Kennard
Federal Communications
Commission
The Portals
445 12th Street, SW
Washington, DC 20554

Dear Chairman Kennard;

I am writing [I am writing on behalf of my organization] in support of your proposal to create a low power radio service. I [we] have been concerned about changes in radio that have occurred over the last few years, most particularly, the loss of localism and the abdication of many radio stations from any serious public interest responsibility.

Given that almost everyone has a radio, the potential of that medium to fulfill a democratizing and inclusive cultural mission is enormous. Radio should reflect the tremendous diversity of our culture, serving as a point of entry for newly arrived and non-English speaking Americans, providing information and discussions of important local issues and making available cultural/musical programming that is deemed not demographically appealing enough for broadcasters to carry.

Citizens with something to say should be able to know they have access to a small, locally-based station which is run by their neighbors. [The mission of my own organization, which is... would be greatly served were we able to get such access].

I [we] feel that the 1-10 watt and 50-100 watt stations are the heart and soul of this proposal and should be prioritized. Although I [we] believe that the 500-1000 watt service can be included, such stations should not be allowed in urban areas, where crowded radio dials will allow for very

few new stations as it is.

To fulfill its most important function- accessibility-LPFM owners should be restricted to a single station and should live close to the broadcast area of the station. Cross-media ownership should not be allowed.

I [we] commend you for your foresight in proposing this service and hope that you are able to succeed in your plan to open up the airwaves to new voices.

Sincerely yours,

With letters in hand, as well as the 1200 signatures we have on petitions, I will be approaching legislators face to face to see how they respond to the will of the people. To this point, Ed Markey, who is on the key FCC oversight committee, has been unresponsive, as has Allston-Brighton congressman, Michael Capuano. Barney Frank has been on our side, but needs more pressure to take a leadership position.

If anyone can make my access to these people easier, please let me know.

After educating these legislators on the overwhelming level of grassroots support for LPFM, I will then approach the mainstream media and let them know where these politicians stand.

CMC/RFA and the Mass. ACLU will be sending extensive joint comments on the Proposal to the FCC near the end of May. We will post drafts of those comments on the CMC Website.

The fight is on. Join it!

Steve Provizer
Citizens' Media Corps/Radio Free
Allston
23 Winslow Rd.
Brookline, MA 02446
617-232-3174
<http://www.citizensmedia.org>
<http://www.radfrall.org>

For more information on the process of how the FCC is determining

Continued on page 45



Broadcasting News

FCC Explores Creation of Low-Power FM Radio Service for Local Communities

(FCC) On January 28, 1999 the FCC proposed to license new 1000-watt and 100-watt low-power FM (LPFM) radio stations, and also sought comment on establishing a third "microradio" class at power levels from 1-10 watts. The Commission's goals are to provide new opportunities for community-oriented radio broadcasting, foster opportunities for new radio broadcast ownership and promote additional diversity in radio voices and program services, while protecting the integrity of the spectrum. New LPFM stations could provide a low-cost means of serving urban communities and neighborhoods, as well as populations living in smaller towns and communities.

The FCC's consideration of the institution of a low power radio service requires broad participation and involvement by all segments of the public as well as the industry. This site has been designed to provide information on the FCC's proceedings concerning low-power radio.

The Current Proceeding at the FCC Notice of Proposed Rulemaking

On January 28, 1999, the FCC adopted a Notice of Proposed Rulemaking, which is available in a variety of formats from the FCC Webpage. The Notice proposes rules for the creation of a low power FM radio service. The statements of Chairman Kennard, Commissioner Ness, Commissioner Powell, and Commissioner Tristani and the dissenting statement of Commissioner Furchtgott-Roth are available here.

In the NPRM, the Commission said the proposed new services could meet a variety of local needs and capabilities from broad community coverage to smaller neighborhood areas. The Commission proposed one service with primary status to operate at a maximum power of 1000 watts and maximum antenna height of 60 meters, which would produce a service area with a radius of about 8.8 miles, and another service with secondary status to operate at maximums of 100 watts and 30 meters with a service radius out to 3.5 miles. The FCC also asked for comments on the establishment of a 1- to 10-watt microradio class of stations with an antenna height of 30 meters with a service radius of one to two miles.

The Notice of Proposed Rulemaking proposed a number of interference protection criteria that would help to ensure that any new low-power FM radio service would protect existing radio services and preserve the technical integrity of radio service today, which has been fostered and maintained by existing FCC rules. The NPRM proposed minimum distance separations between LPFM stations as the best practical means of preventing interference between low-power radio and full-power FM stations. In the NPRM, the Commission stated that it would require co-channel (or same channel) and first adjacent-channel protections, but felt that third adjacent-channel and possibly second adjacent-channel protection would not be necessary in view of the low power levels and other factors. It specifically asked for comments on any potential adverse effects from LPFM stations on future digital radio developments, particularly In Band on Channel systems.

The Commission proposed to require the LP 1000-watt class of stations to follow most or all of the rules applicable to full-power broadcasters, and sought comment

on its inclination not to apply most radio station service rules to new LP100 and 1- to 10-watt microradio stations. The Commission also asked for comment on whether LPFM stations would need to generate revenue from advertising or underwriting, and whether the population in these service areas could sustain an advertising base. Alternatively, it asked for comment on whether these LPFM stations should be strictly noncommercial and whether educational institutions are the best potential LPFM licensees.

What Can I Do?

The Commission is seeking comment on the proposals contained in the Notice of Proposed Rulemaking. Comments are due June 1, 1999 and Reply Comments will be due July 1, 1999. For information on the FCC Comment process, including information on filing written comments see our How to Participate in the FCC Process page. To file comments electronically in MM Docket 99-25, see the Federal Communications Commission Electronic Comment Filing System. This is only a proposal at this time; no license applications will be accepted unless rules are adopted, at which time the commission will specify application-filing procedures.

What's Next?

Once the FCC has reviewed and considered the comments received in response to the NPRM, it has several options. The FCC may either adopt a rule or rules, issue a Further Notice of Proposed Rulemaking, or decide not to adopt rules at all. For more information see the Low Power AM and FM Broadcast Radio Stations web page provided by the Audio Services Division. This page describes unlicensed broadcasting, outlines the rationale behind the FCC's enforcement of its radio licensing scheme, and issuance of warnings, injunctions, seizures or

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finer against unlicensed broadcasters.

Facts About Low-Power FM Radio

* **Low-power FM (LPFM) refers to a new FM radio service proposed by the FCC.** If adopted, the proposal would create one or more new classes of service in the existing FM radio band. The FCC has proposed to license 1000-watt stations, which would serve areas with a radius of approximately 8.8 miles, and 100-watt stations, which would serve areas with a radius of 3.5 miles. The Commission also sought comment on whether to license stations between 1 and 10 watts, which would serve areas with 1 to 2 mile radii. Currently, in most circumstances, commercial FM radio stations will be licensed only if they can operate at a power of 6000 watts without causing interference at the selected location and channel, although stations may be permitted to go on the air with as little as 100 watts.

* **The FCC has received thousands of inquiries about low-power radio from citizens across the country.** Hundreds of favorable comments were filed in response to a preliminary FCC proceeding, and thousands of Internet inquiries have been made by citizens from across the country. Dozens of newspapers, including the *Los Angeles Times*, *Boston Globe*, and *Nashville Tennessean*, have voiced support for low-power radio. Cities, elementary schools, universities, Native American tribes, independent musicians, churches, entrepreneurs, and various minority groups have all come out in favor of low-power FM. The National Association of Broadcasters and others in the broadcast industry have voiced opposition to the FCC's proposal, contending that a change in the interference standards will harm current stations and their listeners and also could jeopardize a transition to digital radio.

* **The FCC is not proposing to license radio "pirates."** The FCC has proposed to apply the same character qualifications to LPFM broadcasters that apply to full power broadcasters. The character qualifications, if adopted, may disqualify

license applicants who have intentionally and persistently violated longstanding prohibitions against unlicensed broadcasting. Where unlicensed broadcasters persisted in operating after the Commission took action against them, the Commission has proposed that those broadcasters be deemed per se unqualified for LPFM licenses. The Commission, however, seeks comment on whether illegal broadcasters who ceased operation after being advised of an enforcement action should be eligible for LPFM licenses.

* **The FCC does not expect low-power FM stations to interfere with the service areas of existing radio stations.** Traditionally, the FCC has allotted FM stations by requiring specified distance separations between stations on the same channel and three pairs of adjacent channels. The use of distance separations for determining channel allotments has proven to be an effective and straightforward means for maintaining the technical integrity of the FM radio service. As a result, FM stations have a service area within which their signals are "protected" from interference by other stations. The FCC has sought comment on whether it should consider modified separation standards for the LPFM service by not requiring LPFM stations to be separated from stations operating on the third adjacent channels and possibly the second adjacent channels. The Commission has stated that the relatively low maximum power levels of the proposed LPFM suggest that these modified standards may pose only a minimal risk of interference to existing services, especially if the Commission were to impose additional technical factors to reduce further their interference potential. The FCC will examine the interference issue very carefully and will not adopt any action to cause undue interference or impede the development of terrestrial digital radio.

UK Government Stalls Fight for Independent Radio

Trevor Brook's 13-year battle with the United Kingdom government over its refusal to grant an independent shortwave radio license led him

to submit his case to the European Court Of Human Rights in August 1997. The court now seeks more information from the government.

Only one in five cases survive as far as this stage. In his original application to the court, Trevor Brook asserts that by consistently refusing to issue a shortwave license, the United Kingdom government has unreasonably and persistently stifled media development and has breached Article 10 of the European Convention On Human Rights.

On September 9, 1998, the court invited the United Kingdom government to submit its views about a possible violation of human rights. They have responded to this request by asking the court for a series of extensions to the usual time limit. Trevor Brook has now been advised that a fourth time limit for the government's submission has been set by the President of the court, following the latest appeal for more time from the Department of Culture, Media, and Sport.

Trevor Brook comments: "Perhaps they don't have enough civil servants to read through all the correspondence over the past 13 years on this matter. This is like a child which has not done its homework. This latest amazing prevarication parallels the historical record of obstruction since 1986. A request for extra time is often read as an indication that the other side is having some difficulty justifying its position."

Brook operated Radio Fax, which broadcasted daily from Ireland on 6205 kHz in the early 1990s, until the station was forced to close down by the Irish authorities. The location in Ireland, where the government much more loosely regulates the broadcasting spectrum, was chosen because such a station was illegal in the United Kingdom.

Swatch Satellite Fails Broadcasting Mission

In late April, the Swiss watch manufacturer Swatch announced that it would pull its attempt to transmit messages from space via its Beatnik satellite. The notice was seen as a general victory for the

Continued on Page 44

WHOT



TO

Radio Free New York

Last issue, we featured Part one of an interview with John Calabro, who has helped operate some of the most widely heard pirates in the United States from 1971 to 1989 (and possibly ever). Part one of the interview featured Perry and John's early years, their involvement with WGOR, their first "real" station, WCPR, WFAT, the beginning of WHOT, and several others. At the conclusion of the last article, the FCC agent was intent on coercing Perry into letting him in to see the station so that a fine could be issued. And here is the conclusion of the interview, but certainly not the end of John and Perry's radio activities!

An interview with John Calabro: Pt. II

Perry stood his ground and refused. The FCC agents were very belligerent (what a shock) and they started to get on the cops' bad side—the cops had come in and seen Perry's father in the wheelchair, and they finally told the FCC to come back with a warrant—or else. They told Perry's brother that if the FCC banged on the door again, they would come back and arrest them on the spot! The FCC proceeded to storm off.

Perry and Pete got all the transmitting equipment out of the house, and WHOT was off the air.

A week went by and the FCC didn't come back. Then another week. Well, a listener of ours,



The earliest picture of John and Perry,

Johnny Lightning, offered his apartment building as a new location for WHOT. He had been

begging us for a transmitter for over a year. "What the heck," we thought. We set up WHOT at his house, and did an AM/FM simulcast on New Years Eve. The longwire left a lot to be desired, but we did get one long-distance call—from Washington, D.C.—that guy deserved an award for pulling us in!

One morning after a WHOT show, as Perry and Pete and Ed and I were warming up my car outside JL's house (with him staying on the air to entertain us as we drove home) I spotted two guys running into his house—it

was the FCC! He opened his door when they knocked because he

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saw that Perry forgot his glasses—and he thought it was him!

When he saw two FCC agents, he tried to shut the door and they were pushing it in! Later, I saw the damage that they had done to his steel door—it was bent! He did not let them in either—and after about 15 minutes we saw them leave and get into one of their “super cars.”

They didn't know that I was behind them as they drove off, so I tailed them! I followed them into Manhattan, where one of them got dropped off at a hotel—this worried us—had they formed another task force to get us? The driver then headed for the Lincoln Tunnel, with me still on his tail—as he was waiting for a light—I drove right up next to him and honked the horn—you should have seen how startled he was when we all gave him the raspberry (among other things) and we told him to go back to New Jersey and stay out of Brooklyn! He took off—running the red light in the process!



We knew that we were now living on borrowed time. The FCC knew exactly where we were—and we had even chased them out of Brooklyn, for pete's sake (no pun intended).

What did we have to lose? We decided to pull out all the stops and go out in as big a way as possible!

It was the middle of winter—the longwire was still up at Perry's—so we brought the AM & FM back there and signed on as WHOT AM & FM with full power, hell bent on

going wild!

Perry wanted to avoid being arrested, so he would sign us on, and then go to my house for the duration of the show. Every minute we were on the air we were expecting the FCC to come busting in at any second! We did the show with one eye out the window at all times, fully prepared to keep the signal on throughout the entire bust!

If they came without a warrant we would not let them in, and we would be live on the mike the whole time, giving a play by play of the whole event. We even bought a 50 foot mike cable so one of us could go out into the hallway with the FCC while they tried to bust us!!

We went on night after night—and held nothing back—we even stopped using loops and gave out Perry's home number—why not? They knew where we were!

Well, we went wild on the air—night after night—and the FCC didn't show up! Why, I don't know!!

We never mentioned the FCC visits on the air—but that's all we had on our minds during those shows—they *would* show up at any second—and we were ready! We were going to make up for WFAT's bust, when we signed on as they ran up the stairs. We always kicked ourselves for not broadcasting the entire thing!

The end of winter came, and we suspended the AM shows for the season—only because we prefer the winter propagation, no other reason. WHOT FM was on practically every night! We even ordered a separate phone line for the station, 996-6915. What a number! So as the fall of '86 approached, we planned for the biggest New Years Eve show ever! We were back on AM, FM (with a friend's 400-watt amp), and we were being rebroadcast on WFUN

The John'n'Perry timeline

WMPI	1971-1972	A low-power "clock radio" station
WPBC	1972	A low-power "clock radio" station
WKRK	1972-1975	A low-power "clock radio" station
WCPR	1975-1976	Triggered the NYC AM pirate explosion

—FCC raid against WCPR 2/7/1976—

KDBX	1976	One shot a couple of months after WCPR bust
WFAT	1977-1979	The best-known NYC AM pirate ever

—FCC raid against WFAT 4/15/1979—

WBEE	1977	During Hurricane Belle
WDBX	1977	Testing - saving WFAT calls for New Years Eve
WPOT	1977	Testing, also used callsign WFSR, See WDBX
WICE	1977	One-shot snowstorm station
WBAD	1978	Two-week station from John's house
WILD	1979-1980	FM precursor to WHOT
WGUT	1980-1985	New Year's Eve AM station + "snow shows"
RNI	1987	Al Weiner's offshore station

—FCC raid against RNI 7/28/1987—

WHOT	1980-1989	FM and AM. Hank's proudest "hour"
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—FCC raid #1 10/25/1985—

—FCC raid #2 1/1986—

—FCC raid #3 7/6/1989 First FCC use of DEA tactics with U.S. Marshalls—

RFNY	1990-present	Currently relayed by WBCQ on shortwave
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on 91.9 with a kilowatt! And the FCC still didn't show up. In early '87, we commissioned our friend to build us a 200 watt amp—might as well go out with lot's of power.

More simulcasts, more fun. Then in the summer of '87 we signed off WHOT in order to do RNI. We did a 'farewell' show that lasted 3 days! We didn't tell the listeners why—except to say that they would still be able to hear us.

In October of '87, after RNI, we strung up a brand new longwire and went on as WKBW/KXOK (because we had their jingles) for one incredible show. Then WHOT AM & FM returned to the airwaves. Still no FCC!

We were on six days a week. A typical show was from 8PM to 6 or 7 in the morning.

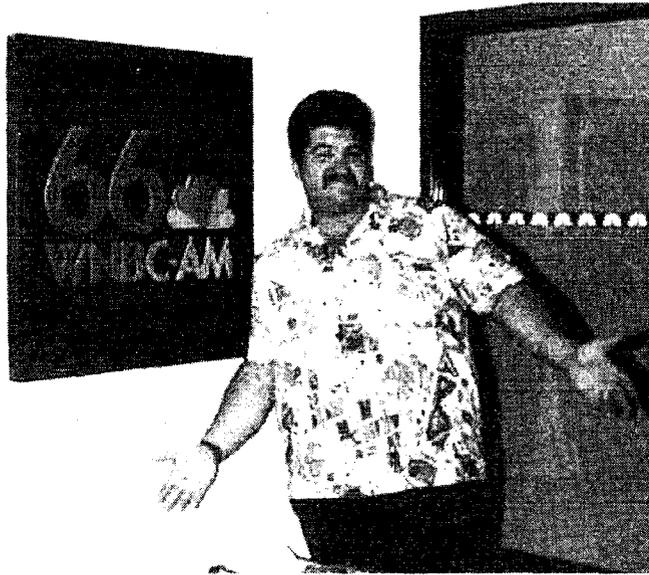
We continued with our normal routine—FM all the time, FM with occasional AM simulcasts in winter through early '88. Then a grounding problem developed with the AM side. In late '88 into '89, Perry tried several times, but we had too much RF feedback on the AM.

We concentrated on the FM until the FCC finally did return—July 6 1989, two day's after a marathon 16 hour July 4th broadcast—which is also available on video!

How long did WHOT run?

September 28, 1980 to July 6, 1989, an incredible run!

Do you think that the FCC fell for the "wild'n'crazy" act and



thought that you were a different station? I remember that the shortwave listeners of the time were like "Oh yeah, WHOT is run by the guys who were busted as WFAT a few years ago."

I can say this—during WFAT's run, according to Judah Mansbach himself, he and Henry Paulisen (then head of the NY office) used to quarrel whether or not WFAT was Cavaliere and Calabro from WCPN. Mansbach was sure that it was, and Paulisen said it wasn't. Mansbach wanted to officially visit Perry's house but couldn't get permission from Paulisen. They were thrown off because WFAT was being picked up by only two monitoring stations (Maine and Michigan—I believe—unless it's Massachusetts & Michigan), but



not New York. They could not triangulate! The best they could do was determine that WFAT was coming from somewhere between Boston and Philadelphia.

We'd sign on on completely random nights, never saying when the next show would be, and our ground wave did not reach 201 Varick Street. The FCC formed a special task force of over 21 agents from NY, D.C., and Virginia. They

were stationed along the east coast—two on top of the World Trade Center. There were two helicopters on standby, in case WFAT signed on. This went on for two weeks and just by dumb luck we did not do any shows during that time. The projects where Perry lived were having the windows painted, so we had to cut down the longwire and stay off the air for three weeks. Pure coincidence.

Paulisen suspected that PRN and WFAT were the same operation, so they went up to New England for a while—came back empty handed. They even visited an AM station in Cape May, NJ—thinking that it was them signing on after hours. Paulisen had the monitoring stations instructed to call his home anytime, 24 hours a day, if WFAT's signal was detected.

The budget for the unprecedented task force ran out and everybody went home. Next thing you know, we're back on testing.

Perry's mother comes in and complains to Perry about the interference he's causing on Channel 7 on their TV—only problem is that the transmitter is off. Perry grabs his AM/FM/TV band radio and tunes in between channels 6 and 7 only to hear someone keying up and talking. He plugs the radio into his tape deck and captures

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Judah on tape! He's parked outside Perry's building, in an FCC car, in the dead end, waiting for WFAT to sign on.

Perry pulls out his binoculars, and sure enough the light blue car has "U.S. Government FCC" painted on the door.

Jud is talking to another agent—possibly parked nearby, but out of range for the TV radio—and he's saying how he is sure it's Cavaliere—but Paulisen doesn't agree, etc! Suddenly we were aware that it was almost over.

So, we fooled everybody except Judah.

As far as WHOT—I still don't know why they waited four years to come back, but they only found out about us because of the 'rat'.

So did you play much of a role in RNI? I know that you were on the air with RNI because you guys were the first thing I heard when I tuned in RNI in July 1987. It seems that RNI was like a little break from WHOT and that was about as far as it went.

When we met Ed Armstrong, he introduced us to Alan and his former partner JP (Pirate Joe), so we've been their friends since way back when. I have a tape of a phone call I made to Sally Jesse Raphael on WMCA in 1976 where I'm telling her that "RNI" is coming! I tell her that it will be broadcasting from a ship called the MEBO II.

That was the plan back then! At the last minute, Alan decided to try one more time for a license and postponed the ship plan to do it. He eventually got the stations up in Maine, and you know the rest of that story.

When he called us in late '86 and said *The Sarah* was almost ready, we made plans to sign off WHOT for bigger and better things like an offshore radio station that we expected to last

more than five days!!

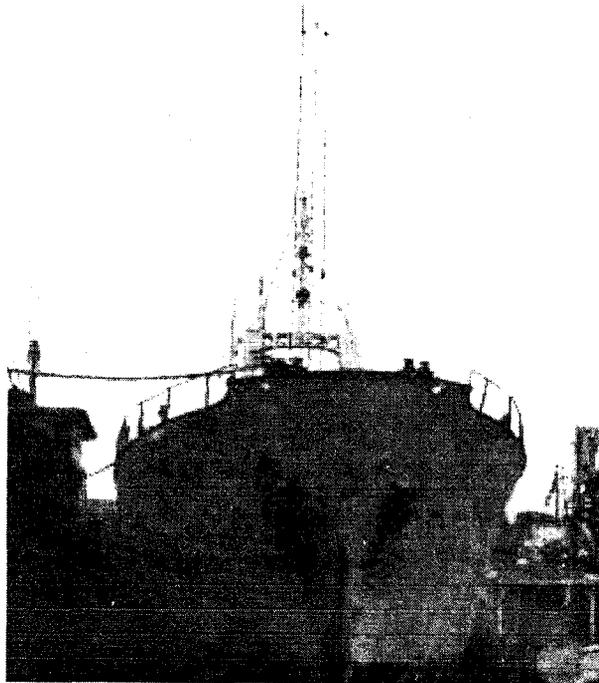
That, of course is a whole story in itself.

How well did you guys get along with the RNI crew? I had heard rumors that the "WHOT guys had a falling out," but that's about it. By the early 1990s, it seemed like everyone on RNI was airing their personal laundry on the air.

We were the RNI crew! When RNI signed on, the entire crew was Alan, Randi, myself, Pete, Perry, Ivan, and Josh (I forget his air name, but he co-hosted the Randi Steele show). JP had deserted Alan and moved to the west coast in the early stages.

Once the excrement hit the fan—everybody and their mother was suddenly a member of RNI!

It was a shock to everybody when



The rusty hulk of "the good ship" Sarah, well-known for the escapades of Radio Newyork International and the movie Blown Away!

JP walked into the WNBC studio during an RNI interview with Alan Colmes and declared that he was now RNI's number 2 man and he was giving orders!

This didn't sit well with Pete and myself—having lived on the ship in the weeks and months prior to the voyage, fingers bleeding from some of the dirty work of prepping that rusty hulk for seaworthiness without seeing neither hide nor hair of JP, or anyone else besides Randi, around! Alan even left his diary with Pete while he was away—and Pete read the passages of how hurt Alan was that JP had deserted him, saying that he was wasting his time with the ship project. One hint of publicity and JP is on a plane to NY—and he's number two man again?

This, of course, is some



Hank "Music" Hayes scores it big on MTV in the summer of 1987.

of the negative side of the affair which people don't know about. Suffice it to say that Alan was unprepared in managing an event of this magnitude, and unprepared for managing the group of people involved. We put up with as much as we could, and managed to make a deal with a Long Island station, WNYG, for RNI to take over the station every Saturday, sell spots, etc.

This lasted until October—when we left in the middle of a show—drove to Perry's house, put up a longwire and went back on AM all in one afternoon (WBKW/KXOK show).

Without going into the gory details, Perry, Pete, and myself resigned from RNI in early '88.

Toward the summer of '88 Alan and JP called and asked us to return, the ship was going back out and was to operate on AM only. We agreed, but they were shut down right away again.

The rest of '88 and '89, until the WHOT bust in July, WHOT went as wild as possible. In '89, we tried to do what the Beatles did with the original intent of the 'Let It Be' project: get back to the roots of doing what we loved doing—fun radio. This went well until the raid—the first using the same tactics as the DEA—U.S. Marshalls tagging along, arresting the equipment IN REM. The Eastern District U.S. courthouse had a new Assistant U.S. Attorney and he was eager to help Judah put a stop to us!

Flash to 1990. Alan makes the deal with WWCR—Randi and the new RNI crew want us excluded due to bad blood resulting from the '89 raids. We decide to go on WWCR ourselves, and despite the RNI crew's attempt to block us—we succeed.

As you know, RNI self destructs after a few months—which vindicated me as being the villain—I wasn't there



The current staff of RFNY.

anymore! I was having a ball on RFNY—but spending \$75 per hour, plus an 800 number for phone calls, and phone line charges to Tennessee added up to almost \$1000 per month! We had to stop after 48 or 50 weeks.

What did you do between the RFNY stint on WWCR and on WBCQ?

I always had my ice cream business. Perry and I channeled our energy into forming a Beatle cover band and playing local and long-distance gigs—which we still do to this day! We've opened up for Beatlemania several times at conventions, and we headlined at a Beatle convention in Syracuse, NY. We've even played on the stage at the Cavern Club in

Liverpool, England in August 1996 during a week-long Beatles convention there! It was wild! Perry plays lead, I play drums (and bass). We play out in the Allentown/Bethlehem area occasionally—maybe we could meet there next time. As a matter of fact, this past September, we opened up for Gary Lewis and the Playboys and Freddie Cannon in Allentown at a state-fair type of event.

Why have you continued to broadcast for 28 years? Has anyone ever told you that you're stuck in 1975 and that you should just grow up and get on with your life?

Once radio gets in your blood, that's it. We still dream of doing what we do on a legal station one day. The time wasn't right when we got started—radio had moved away from personality and fun. As the 80's came and went we had so much freedom and fun on WHOT that working anywhere else would have been torture (and it was—I worked here and there).

In the '90s, we've been doing shortwave on and off, and have been having a blast with the band. There may come a time



Hank, Pete, and Jim on the air in 1984, the early days of WHOT.



when a fan of our brand of radio is in a position to put us on the air, who knows.

How have you and Perry managed to stay together as a broadcasting team for so long?

The thing is that we crack each other up, just like we did so many years ago. Our senses of humor blend well.

What is so important about free radio?

My reason for doing all those years of broadcasting was that I believed in the opening line of the Communications Act: "The air-waves belong to the people". What to do with this limited resource? Someone came up with the idea of licensing the use of the frequencies rather than selling them, because it would be unfair to allow this limited resource to be owned by a few.

After all these years it turns out that the license is just a formality. The average person who had the desire to broadcast is locked out. I feel that there should be a lot more than 100 FM channels—why not 500, or more?

Of course the powers that be are against that. We've always been on the air to prove that a community like Bensonhurst could support a radio station of its own. Just being there was our protest.

What do you think of all of the new political pirates ("microbroadcasters") that have sprung up all over the country in the past five to ten years? (such as Steal this Radio in NYC)

While I am 100% opposed to their political beliefs, I am impressed with how far the movement has gotten. I give Steve Dunifer a lot of credit. I agree that there should

be a band set up for local, low-power community broadcasters—and Perry and I have been advocating that since 1974!

Do you think that "someone" will ever relay RFNY programming on 1710 kHz?

I'm sure we're being rebroadcast somewhere!

To keep up with the latest events from this legendary station, be sure to tune in live every Saturday Night at 9:00 PM Eastern Time on 7415 kHz. They also offer plenty of info, not only about Radio Free New York, but also about WHOT and their earlier efforts on their Web page. It's at: <http://rfny.simplenet.com/>. Who knows? They might even place this interview on line. You can e-mail Hank Hayes directly at:

gigantor@geocities.com.



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FM

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- Autotest function
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- High audio quality

88-108MHZ
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PCS - FM and AM Broadcasting transmitters!

Broadcast Warehouse FM LCD Transmitter Kit Review

by Marconi

The FM LCD PLL No-Tune Exciter/Transmitter kit was ordered by phone, from the UK, direct from Broadcast Warehouse. It cost 89.95 UK pounds, including UK postage, and arrived promptly by recorded delivery. The unit is also available ready built. Note that this is a mono unit. For stereo, it must be used in conjunction with a stereo encoder. Two pages of instructions were provided. These were:

- * Introduction, features, specifications, brief soldering guide, assembly instructions, power-supply recommendations, legal warning.

- * PC board assembly drawing including component identification, parts list, and set-up instructions and a note on pre-emphasis.

- * The high-quality double-sided printed circuit board has a component placement silk screen on the top side, and top and bottom solder resists, which assist in making good solder joints.

This kit marks a departure from the usual practice of kit manufacturers, in that it is a no-tune unit. The three adjustable inductors have been pre-set by Broadcast Warehouse, and require no further modification. The only other adjustable components are a variable capacitor (to set the center frequency of the PLL reference oscillator) and a variable resistor (to set the audio gain). If no frequency counter is available, the reference variable capacitor (VC) can be left in its center position (half meshed), in which case, the output frequency should typically be +/- 1 kHz from the displayed frequency.

The frequency is programmed by

using two push buttons, each push increments or decrements the output frequency by 100 kHz (0.1 MHz). This ease of programming will appeal to intellectually challenged kit builders who find the prospect of setting dip switches to alter the output frequency too daunting. The unit boots with the last programmed frequency.

As the unit is no-tune, home constructors can have more confidence, provided that they have correctly followed the assembly instructions. The resulting unit will have the same high specification (low levels of harmonics and spurious) as the prototype units.

As usual with Broadcast Warehouse equipment, no schematic was provided. Broadcast Warehouse has informed me that the reason schematics are not provided is not a disinclination for them to be circulated or published, but the fact that the engineers at Broadcast Warehouse do not work from schematics themselves, being sufficiently old school and immersed in their profession to carry the whole design in their heads. Nevertheless I suggest that a schematic remains an essential fault-finding tool, and should be provided.

Circuit Description

The transmitter uses the standard PLL architecture. The voltage-controlled oscillator (VCO) is based on a Fairchild MPSH10 NPN bipolar transistor and it operates at the output frequency. The center frequency of the VCO is set by an adjustable inductor, which forms a tank circuit with a BB809 varicap diode. This varicap

is used as both the audio modulator, and as the VCO control element, as it is connected to the DC output of the PLL loop filter.

This DC feedback path enables the output frequency to be locked to the frequency of a stable crystal reference oscillator. The audio input circuit is totally passive. Optional pre-emphasis is provided, by the fitting of a single capacitor in the audio input path. Two alternative capacitors are provided, one for European 50-microsecond pre-emphasis and one for USA/Japan 75-microsecond pre-emphasis. If the unit is to be used with a stereo encoder, the pre-emphasis must be disabled. This is achieved by shorting out pre-emphasis capacitor C19 (not C11, as stated in the instructions).

The output of the VCO is connected to common base buffer stage, based on a MPSH10. At the output of this buffer, a sample of the signal is passed to the f_{in} input of the synthesizer IC. Next is an amplifier stage, also using a MPSH10. The DC emitter current of this stage is returned through one of the outputs of the PIC. Because the PIC can sink up to 25 mA, this enables the PIC to enable and disable the output of the exciter by shutting down this amplifier stage. The PIC derives this information from the lock detect (LD) pin on the synthesizer IC.

A bifilar 4:1 impedance transformer based on a small ferrite toroid is used to achieve a wideband match between this amplifier and the output stage, a trusty old 2N4427, operating in class-C mode.

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Two adjustable inductors and four capacitors make up the output match for the 2N4427.

The inductors have been preset by Broadcast Warehouse. The output matching network incorporates the harmonic filter. The 2N4427 is provided with a push-on aluminium heatsink. No output socket is provided, so a piece of coaxial cable must be soldered to the PC board.

The PLL is implemented with the popular (i.e., lots of pirates use it) Motorola MC145170 PLL frequency synthesizer IC (MC145170 data sheet). This synth chip has a three-wire serial interface, consisting of data in, clock, and enable. The frequency reference comes from an 8-MHz crystal, trimmed by a variable capacitor. The lock detect (LD) output of the synth chip drives an input of the PIC. The PLL loop filter uses an LF351, which is a low-noise, low-distortion, J-FET input operational amplifier. Use of an active op-amp loop filter running from the +12-V supply allows the VCO tuning voltage to have a much wider range (5 to 10.5 V for 87.5 to 108 MHz in the unit I built), so the whole frequency band can be covered without having to make any adjustments to the VCO tank coil. Compare this with the Broadcast Warehouse 1-W PLL (see the Fall 1998 issue of *Hobby Broadcasting—Ed*), where the PLL loop filter is passive, and the range is limited to the +5-V supply to the PLL chip. In this latter case, the tank coil of the VCO must be adjusted to ensure that the center frequency of the VCO is within lock range of the PLL.

The synth chip is programmed by a Microchip Technology PIC16F84 FLASH/EEPROM (Electrically Erasable Programmable Read-Only Memory) 8-bit microcontroller, also running off the reference clock. This chip runs code written by Broadcast Warehouse, which resides in the chips internal EEPROM. Pro-

gramming information is derived from two momentary action push switches. This allows the frequency to be set in 100-kHz steps, from 87.5 MHz to 108 MHz. Holding a switch down results in a rapid change of the programmed frequency. The synth is programmed on power-up and whenever one of the switches is altered. This chip incorporates 64 bytes of data EEPROM, this is used to store the programmed frequency. Because this memory is non-volatile, the unit boots up to the last programmed frequency.

The PIC also drives a 16-character by 2-line LCD alpha-numeric display. This is used to display the output frequency, and the loop lock status. Note that this feature is not a frequency counter, it just displays the programming information that the PLL chip receives. For this reason, if you manage to make such a hash of constructing the latter RF stages so that they oscillate independently, the display will not assist you in this matter. For confidence, the output of the unit should still be checked with a frequency counter or scanning receiver so that you can check to see if the output frequency is where you think it is.

A small voltage regulator provides a stabilized 5-V supply to the synthesizer and micro-controller chips. There is provision on the board to fit a 7812 or similar voltage regulator. This is covered in more detail in Web Surf's review of the Broadcast Warehouse 1-Watt PLL no-tune Exciter with LCD.

The only equipment required to test this unit is a +12- to +15-V stabilized power supply, capable of delivering 500 mA and a small dummy load.

Construction

The double-sided printed circuit board (PC board) supplied has plated through holes, making the removal of a wrongly placed component difficult, so extra care is required when fitting the components. Because the kit extensively uses 0.125 W resistors, a small bit on the soldering iron is essential.

Any potential constructors new to soldering are advised to practice on a scrap PC board with some cheap, unwanted components before moving on to the real thing.

The ICs were supplied loose in the polythene bag with the rest of the components. Although there is a tendency amongst some to go over the top on ESD (electrostatic discharge) precautions, both the ICs are CMOS and, therefore, are potentially susceptible to static damage. A bit of anti-static packaging would have been preferable. The LCD display was supplied in an anti-static bag. The PIC was supplied with a socket, making it possible for it to be changed in the event of firmware upgrades.

No veropins were supplied, I fitted four to make it easier to connect the DC supply and audio input connections. The values printed on some of the ceramic capacitors were extremely faint, needing a magnifying glass to read. There is a 4:1 transformer to be constructed. This is not difficult because the instructions are clear. I suggest using a little silicone sealant (e.g., Maplin YJ91Y) to glue the transformer to the PC board after testing is complete.

Four plastic pillars are provided to hold the LCD PC board off of the main PC board, the idea being that the whole unit can be mounted on the front panel of a completed transmitter. I decided to do things slightly different, and joined the LCD display to the main PC board with a piece of 14-way ribbon cable (use 20-way and peel off the six spare ways).

This allows the main PC board to be mounted at your convenience, whilst still mounting the LCD display on the front panel. Also, Broadcast Warehouse suggested a slight degradation of phase noise could be possible with the LCD positioned directly over the main PC board.

I was not able to detect any

difference in my measurements. I fitted the two push-button switches and the audio-gain variable resistor to the top of the PC board. Because the push-button switches are push to make, another pair of switches could be fitted in parallel with those mounted on the board. This extra pair mounted on the front panel.

The unit took a shade over two hours to build, and worked first time.

Test Results

When the unit is powered up, the LCD briefly displays Broadcast Warehouse's Web address, then the stored output frequency is displayed. The unit takes approximately 20 seconds to lock. This long lock time is a consequence of having a good low-frequency audio response. While the loop is locking, the LCD displays the message "Please wait." The RF

108 MHz.

Table of Output Power versus Frequency

As can be seen from the graph, the output power remained over 800 mW for the whole frequency band. The plot of the VCO control voltage, taken from pin 6 of the loop integrator op amp, demon-

strates that the VCO control voltage is properly positioned within its valid range. If at the extremes of the frequency band, this voltage became too high (for example, greater than 11 V) or too low (for example, less than 2 V), the loop would be in danger of losing lock with variations over time and temperature, or under high audio modulation. The center of this range could be changed by altering the adjustable core of the VCO tank coil L1 (using a proper trim tool to avoid breaking the fragile ferrite core), but as the part supplied was ready adjusted, this was not necessary. The slope of the control voltage plot gives the tuning sensitivity of the VCO as approximately 4 MHz/V.

Output Power Versus Supply Voltage

The frequency was set to 98 MHz, and the supply voltage was increased to 15 V. The table above shows the supply current and output power as the supply voltage was reduced from 15 V.

The unit lost lock at 7.5 V, at which point the PIC shut down the RF output. Referring to the control voltage table, you can see the reason for this; at 98 MHz, the required VCO control voltage is about 7.5 V. The output of the integrator op amp cannot swing any higher than the supply voltage, so it is necessary for the unit to lose lock when the supply voltage drops below the required VCO control voltage.

output is suppressed by 55 dBc during this period. When lock is achieved, the message changes to "Locked" and full RF output is available.

Frequency Response and Output Power

With a 13.8-V supply, the output power and VCO control voltage were accurately measured and plotted (see the graph). The supply current varied from 217 mA at 87.5 MHz to 196 mA at

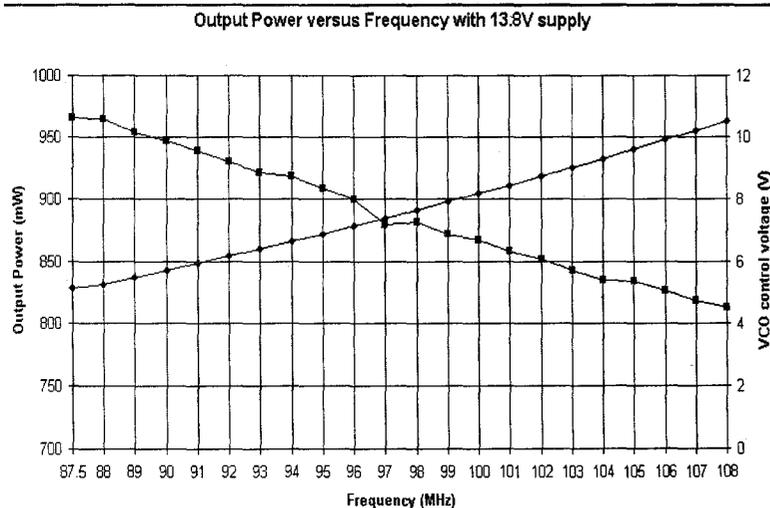
strates that the VCO control voltage is properly positioned within its valid range.

If at the extremes of the frequency band, this voltage

Supply Voltage (V)	Supply Current (mA)	Output Power (mW)
15	224	997
14	209	890
13	194	791
12	178	684
11	163	583
10	145	482
9	127	379
8	105	275
7	32	0

How the supply voltage affects output power

became too high (for example, greater than 11 V) or too low (for example, less than 2 V), the loop would be in danger of losing lock with variations over time and temperature, or under high



Harmonic Number (dBc)	Level 88 MHz	98 MHz	108 MHz
2f	-62	-70	-73
3f	-63	-64	-65
4f	-66	-67	-69
5f	-74	-68	-73

Figures for harmonic suppression



As a consequence of this lock loss, referring once again to the control voltage table, the more perceptible amongst you will note that at an output frequency of 108 MHz, the unit will require a supply voltage in excess of 11 V to stay locked.

The efficiency of this unit is good for a no-tune output stage—especially for a 1-W output power unit. If you remove the 32 mA consumed by the logic, display and regulators, the DC to RF efficiency of the RF stages at 15 V is 35%. With this level of current drain, battery operation is pos-

sible, bearing in mind that the unit will shut down the RF output if low battery voltage causes the loop to lose lock. The instructions make it clear that a regulated DC power supply of +12 to +15 V is required for correct operation. Notice that this is different from Broadcast Warehouses' 1-W tuned PLL unit; in that unit, the loop components are driven from an on-board +5-V regulator. In this case, the lower limit on the voltage supply is the class-C output stage falling out of conduction.

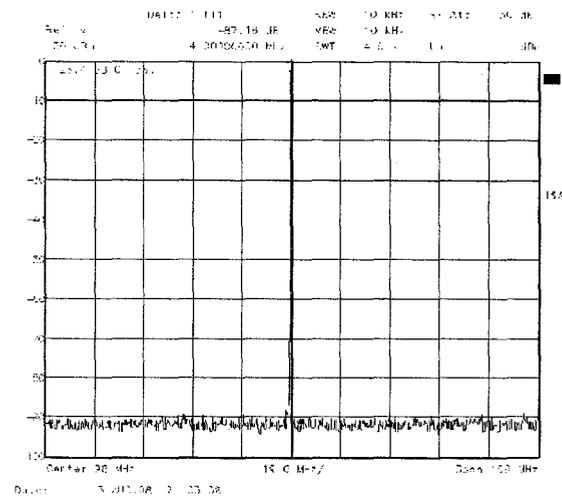
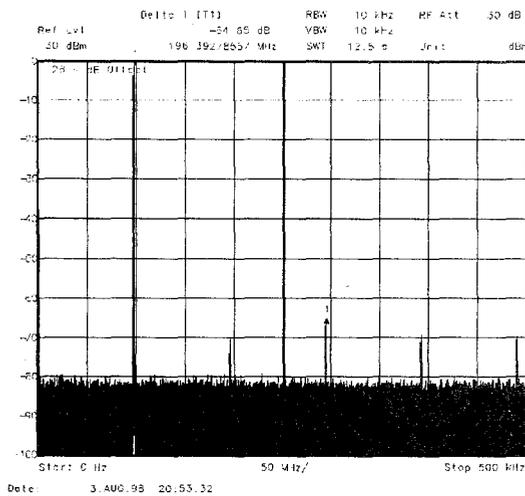
The output device stays sufficiently cool—even when operating

at +15 V supply.

Spectral Purity

Using a 13.8-V supply, the harmonics were measured on a spectrum analyzer at 88-, 98-, and 108-MHz center frequencies.

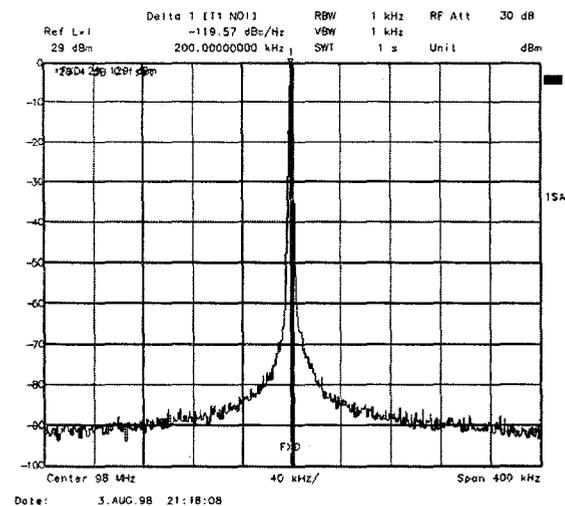
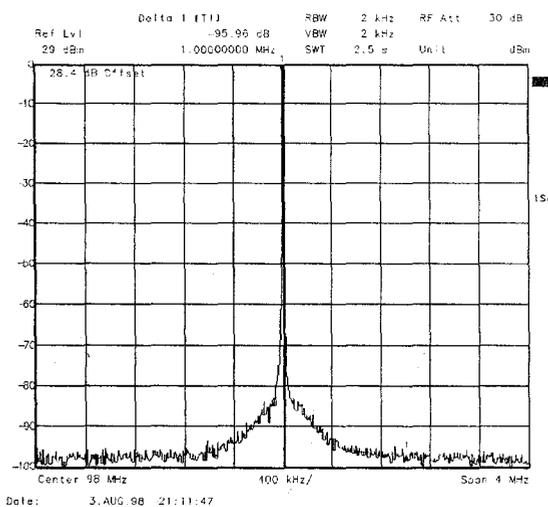
As can be seen from the table and the spectrum analyzer plots, the worst harmonic is at -62 dBc, better than the -60 dBc specification figure. No spurious outputs could be found at all—even using a high-quality spectrum analyzer and looking down to a staggeringly excellent -95-dBc noise floor at 1-MHz offset. This level of



Plot of spectral purity, 98 MHz 0.88W, 500-MHz span (left). Plot of spectral purity, 98 MHz 0.88W, 200-MHz span (right)

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Plot of spectral purity, 98 MHz 0.88W, 4-MHz span (left). Plot of phase noise, 98 MHz 0.88 W, 400-kHz span (right)

spurious performance is unprecedented in units of this nature. It attests to the careful design and layout that has obviously gone into this unit.

This amount of harmonic and spurious suppression is the best I have seen in units of this level of output power. It is perfectly good enough to be connected directly to an antenna.

Mismatch Tolerance, Audio Response

Because of the small output power capability of the unit, coupled with the low supply voltage, bad VSWRs are unlikely to damage this unit. Audio response has not been measured...yet. This will be the subject of further work. By ear, the audio sounded fine, with no hums or whistles.

In Use

The unit can of course be directly connected to an antenna or used to drive an RF amplifier for more

output power. The vast majority of RF amplifiers currently have to be tuned to the operating frequency, although Broadcast Warehouse manufactures a range of broadband amplifiers (87.5 MHz to 108 MHz).

The additional complexity in a broadband RF amplifier over a tuned amplifier is not that great, and, in my opinion, more amplifiers of this type should/will become available. Presently, broadband (87.5 MHz to 108 MHz) antennas for transmitting use are even thinner on the ground, although once again Broadcast Warehouse supplies a Jaybeam one, and I'd be interested to hear how much work is being done in this area.

It's worth noting that only the exciter determines the close in spurious products of the complete RF chain (assuming that subsequent amplifier stages are working properly), and any external RF amplifier will need its own harmonic filter to follow it to keep harmonic radiation down to an acceptable level.

Broadcast Warehouse 1-W FM LCD PLL No-Tune Kit Versus Broadcast Warehouse 1-W PLL (Tuned) Kit

The 1-W FM LCD PLL No Tune Kit has the following advantages over the 1-W PLL (Tuned) Kit:

- * Better specification (better harmonic rejection and close in spurs)
- * No tuning
- * LCD frequency display
- * Easier to set frequency
- * Frequency-control switches can be brought out onto front panel.
- * RF output shut down on loss of lock
- * Better reference oscillator
- * Probably better low-frequency audio response (to be checked)

The 1-W FM LCD PLL No-Tune Kit has the following disadvantages over the 1-W PLL (Tuned) Kit

- * More expensive (£89.95)

as compared to £57.95

- * Slightly less output power
- * Slightly more complicated to build.
- * Needs +12-V stabilized supply (1-W tuned unit will run at lower voltage if reduction of output power can be tolerated)

Conclusion

This is an excellent, high-quality unit using modern technology, which will set the standard to which other units will be compared. It's relatively easy to build, needs no tuning, needs a minimum of test equipment to set up, and has an RF technical specification and results that will be hard to beat. I recommend that Broadcast Warehouse supply a schematic with future units. Contact Broadcast Warehouse.

In Preparation

- * Phase Noise Measurements
- * Audio Measurements (frequency response, signal to noise, total harmonic distortion)

Review Revision History

The review unit was purchased at the end of July 1998. The PC board is marked *bw0001*. RF measurements were made August 3, 1998. This review was prepared August 15, 1998 and updated on August 20, 1998 after evaluating a revision 2 PIC, which Broadcast Warehouse started shipping in the week beginning on August 17, 1998.

The differences between revision 2 and revision 1 are:

- * The up and down frequency buttons have been swapped
- * Fast frequency change on programming button hold down has been slowed down
- * Bug fixed in Lock Detect function

The author can be contacted at radio@irational.org. Please see his Web page at: <http://www.irational.org/sic/radio>.

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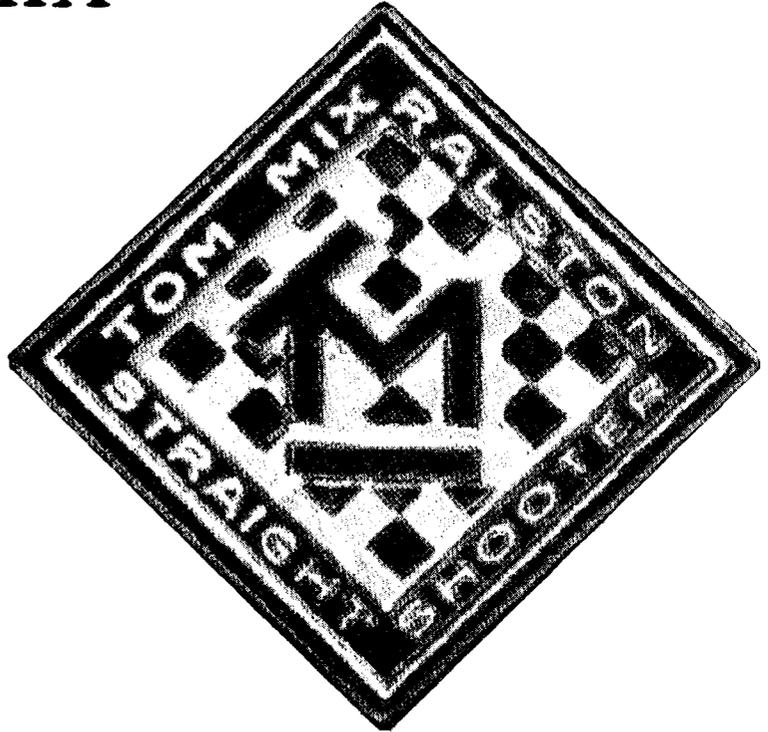
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THE TOM MIX RALSTON STRAIGHT SHOOTERS ARE ON THE AIR!



Jack French

Radio's Tom Mix had little similarity with the actual Tom Mix. However, even the "actual" Tom Mix bore little relation to historical fact.

Thomas Hezekiah Mix was born in a rural area of Cameron County, PA on January 6, 1880. Later he would claim Oklahoma or Texas as his birthplace and assert he was "one quarter Cherokee," but all of his ancestors were Irish or English.

Like most boys of his era, he did

not finish grade school. He enlisted in the U.S. Army in 1898, and although he eventually made sergeant, he never saw combat nor left the U.S. He deserted from the Army and never went back.

Later, Tom (and his press agents) embellished his military record to include membership in Teddy Roosevelt's "Rough Riders," wounds from both the war in the Philippines and Cuba, and action in the Boer War and the Boxer Rebellion. None of this was true.

His short time as a lawman included brief stints as a town marshal in Oklahoma and a deputy sheriff in Kansas. However, by the time he became a silent film star, his press releases claimed he was also a Texas Ranger and a U.S. Marshal.

In the course of his flamboyant career, he was married seven times to six women. The one he married twice, Olive Stokes, wrote one of his biographies, "The Fabulous Tom Mix" in which she forgot to mention the other six marriages. Tom fathered four daughters by four different wives and one of his

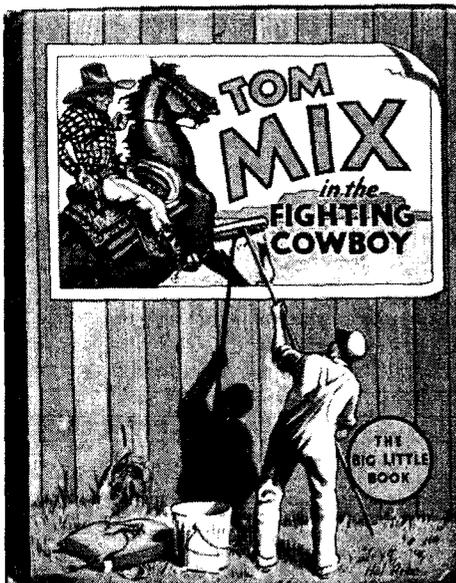
offspring, Ruth Mix, also acted in movies and was in her father's circus.

At the height of his silent movie career, he was one of the biggest stars in Hollywood and he spent money as fast as he earned it. But by the early 1930s the "talkies" were in and Tom was out. He lost millions in the Stock Market Crash, but used his name and showmanship to begin a new career in the circus world.

In early 1933, Charley Claggett, then a young employee of the Gardner Advertising Company in St. Louis, convinced the Ralston Purina Company to sponsor a new radio show about Tom Mix.

A Gardner official was able to catch Mix at one of his circus stops and got a contract signed on the back of an envelope. This gave Ralston permission to impersonate Mix on the air and one of the most popular juvenile series was launched a few months later.

The Tom Mix radio show debuted September 25, 1933 from New York City with Artells "Art" Dickson in the lead and veteran character actor, Percy Hemus as "The Old



Wrangler."

Roland Martini was the first script writer. The radio show was a solid hit, the sales of Ralston cereal boomed, and everyone was optimistic.

After two seasons the production was moved to Chicago (so the show would only have to air once) and Jack Holden became the new voice of Tom Mix.

Hal Peary and Willard Waterman were added to the cast in supporting roles. Charles Tazewell, an eccentric fellow who wore a heavy overcoat daily, even on the hottest summer days, became the new script writer and held the job for the next nine years.

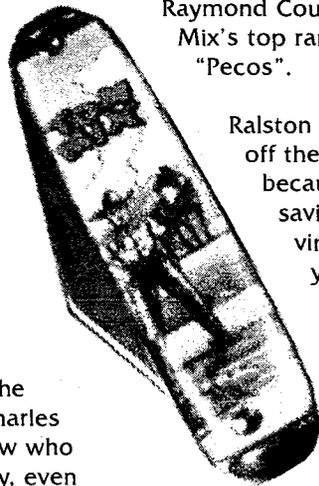
The demand for the radio premiums offered on the program began strong and stayed high for the nearly 20 years the series was on the air. Virtually every type of premium was offered: guns, rings, air planes, books, lariats, coins, bandanas, badges, stationery, cowboy clothes, make-up kits, telegraph sets, periscopes, branding irons, etc.

The Ralston box tops were pouring into St. Louis and truckloads of radio premiums were routed through the postal system into the hands of anxious kiddies.

Russell Thorson took over the role of Tom in 1938 and played him for the next four years before going on to become "Jack" in "I Love a Mystery." A youngster on the show, one of the several who played Tom's ward, "Jimmy," was none other than George Gobel. He, of course, went on to become one of the '50s biggest TV successes.

Three of the longterm supporting cast members on Tom Mix had joined in 1935; they were called the "Ranch

Boys Trio". This group, consisting of Jack Ross, Ken "Shorty" Carson, Joe "Curley" Bradley, sang songs and played bit parts. Bradley (whose real name was George Raymond Courtney) played Mix's top ranch hand, "Pecos".



Ralston pulled the series off the air in mid 1943 because of daylight savings time, convinced that the youngsters would not give up an extra hour of playing outside to come in to listen to Tom Mix.

"They were wrong, of course," Claggett told me in 1976, "but by the time they realized their mistake, we'd lost our time slot and it took me a year to get it back.

In June 1944, Tom Mix returned to network radio. Curley Bradley became the new Tom Mix and George Lowther (who was in New York City writing the scripts for Superman and Dick Tracy) was hired to become the new writer on Tom Mix. Percy Hemus had died a few years before and instead of finding another "Old Wrangler," the part of Sheriff Mike Shaw was elevated to Tom's new sidekick.

Curley Bradley recalled, in a 1982 radio interview with John Dunning, that several actors auditioned for the part of the sheriff, including a 300-lb. former vaudevillian, Leo Curley.



When they were done, Leo confided to Bradley, "I sure need this job. I'm down to my last five bucks, but if you'll put in a good word for me, I'll buy the drinks tonight." It was probably more Lee's talent than Bradley's approval that got him the role. Bradley was married three times

and Claggett attended two of the nuptial events. He married a hotel employee's daughter and later divorced her to marry his producer/director on Tom Mix, Mary Afflick. Later, he divorced her to wed his third wife, Margaret.

Unlike Bradley and the real Tom Mix, the radio's Cowboy Marshal avoided the ladies completely and never married.

On the radio series, Mix and Mike Shaw were lifelong bachelors, constantly in each other's company, fighting crime from the TM Bar Ranch near Dobie, Texas. Strange that the sleaze media did not question the sexual orientation of Mix and Shaw, as they did of two other crimefighting bachelors, J. Edgar Hoover and his top aide, Clyde Tolson.

Tom Mix held its grip on thousands of kiddies in its 15-minute time slot at 5:45 pm until 1949 when it was converted to a half-hour show. Most of the juvenile programs were now 30-minute complete episodes (Straight Arrow, Bobby Benson, Sky King, etc.), and Ralston followed suit.

But the crush of television doomed the new format; Tom Mix ended in June 1950. Yet as veteran announcer, Don Gordon, concluded on that final broadcast, "In the heart and imagination of the world, Tom Mix rides on, and lives on, forever.

The real Tom Mix had died in auto accident in 1940 in Arizona and the radio show extended his career by 10 years.

Now, nearly a half century after his last film and radio series, his museum in Dewey, OK is a continuing tribute to his fame. A Tom Mix Festival is held annually at DuBois, PA and attracts hundreds throughout the U.S.

In addition to the 26 radio episodes in circulation, there are hundreds of Tom Mix premiums that are regularly traded among his fans today.

Jack can be contacted at otrplano@erols.com



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Is Internet radio a “station in a can” or “child’s play”?



Here’s the scoop on the background of WHAK Radio, one of the first wave of computer-only stations that are hitting the bitstreams.

By Becky Loch & Darren M. Fitzgerald

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WHAK: An idea forms

WHAK Radio came from an idea I had about two years ago. I wanted to start a pirate radio station to broadcast something different than what was being heard on regular radio. About eight months ago, this almost became a reality—until the FCC started cracking down hard on the pirate stations in the U.S. Because I am not one that is prone in getting myself in deep trouble with Uncle Sam, I decided against the station.

Around that same time I was surfing the MP3 channels on IRC (See below). I came across a

young guy playing music over the Net via Real Audio. I thought that it was pretty cool. Sad to say he didn’t last too long. But it started me in my quest for information on broadcasting via the Net. Looking into Internet radio, I found that the FCC has no current control over what is played. Finally, freewill over what I can say and play, without reprimand from the government. Things were looking up! After approximately seven months of gathering information, software, and one great home-built computer system, I set out and started WHAK Radio. Below are the basic essentials that I needed to get it started.

Server Software

The first and most important piece of equipment needed was a computer with Real Audio Server installed on it. This is what the listeners connect to, allowing them to hear your Live streaming audio. This was no problem for a computer geek such as myself. Real Audio has a free version at <http://www.real.com> that allows a maximum of 25 listeners at one time. Looking to be the next Howard Stern with a large following via the Net, you will need to buy Real Audio Server Plus or Internet Audio Server, both having a large price tag. This computer has to be connected to

the Internet via a high-speed connection. The high-speed connection is required because each listener consumes a percentage of the bandwidth or connection speed.

Real Audio allows you to record your audio at different frequencies. The higher the frequency, the more bandwidth it consumes. I record my music at 16 Kbps (Kilobytes per second)—this sounds pretty much like AM radio. At this encoding rate, a standard 56K-modem connection will only allow approximately two listeners before it starts to break up. I decided on a company called *Blue Hill Communications* (<http://www.bhcom.com>) for my server. Blue Hill rents servers with a very fast connection to the Internet and are capable of Real Audio installation.

Transmitting computer

The next item that is needed is what I call the *transmitting computer*. The transmitting computer will need a Real Audio

Encoder (also a free program that can be obtained from <http://www.real.com>. This takes your live audio and compresses it and sends it to the Server. On most systems, the Real Audio Encoder will tie up your sound card due to it's programming. When your sound card is tied up you are only able to record from a microphone and your CD-ROM. You will not be able to broadcast WAV files or MP3 files until you install an additional sound card in your system.

* MP3 is an audio compression that takes audio and shrinks it to about 1 MB/minute of music. A standard audio CD, on average, holds 19 songs. A CD holding MP3 compressed music can hold about 163 songs. (An average song being four minutes).

* IRC (Internet Relay Chat). This is a server that allows people to type to anyone in the world. Taken from the phone chats and puts it in cyberspace.

Computer System

My current computer is a Pentium II 450 with a Sound Blaster PCI 128 used for playing

my music. I use a program called *DJ Power* (<http://www.djpower.com>) that allows me to mix WAV, MP3 files, and live voice in a very easy-to-use manner. I decided on a 450-MHz computer because the DJ Power program is a large processor hog. The second sound card is a Sound Blaster 16 used for recording. The Real Audio Encoder does the entire recording and streams (sends) it to the server. I have an ISDN connection to the Internet that ensures me streaming is not slowed down. Your configuration does not have to be exactly the same. Be creative and experiment with some of the hardware till it best suits you.

Conclusion

Well there you have it, everything you need to get you started on an online radio station. At this point nothing can hold you back, just use your imagination. If you are looking for more information stop by my Web site at <http://www.whak-radio.com>. WHAK is not a professional radio station just a hobby that I started for fun. After a few weeks of being on the Net, I have found that people like it. So, as long as people want to listen, I will broadcast.



Coming Up Next Issue

Carrier-Current Radio (Pt. 2)

Internet Radio

Y2K Radio

Danish radio legend Stig Hartvig Nielson

PCS Electronics MAX-1 transmitter reviewed

And more!

All of these articles are tentatively assigned



Some Other Internet-only stations

It's often said that to become good at radio, it's necessary to listen and understand what good radio really is and why it's good. With that in mind, here's a list of just a handful of the current online offerings.

- | | |
|--------------------------|---|
| Loud Factory | http://www.loudfactory.com/ |
| GOA Blaze | http://goa.communications.net/ |
| Inebriated | http://www.inebriated.cx/ |
| 200-Proof Techno | http://www.200proof.com/ |
| Cracked Radio | http://www.cracked.net/ |
| Coredump | http://pitfall.org/coredump/ |
| RedNeck Radio | http://24.1.140.198/ |
| Kind Radio | http://www.kindradio.com/ |
| Radyo Gurbet | http://listen.to/RadyoGurbet |
| Audiogarage | http://129.170.246.122/ |
| Plucky's Cartoons | http://24.93.10.10/ |
| SmackMaster Radio | http://radio.mountaincycles.com/ |
| MP3spy | http://www.mp3spy.com/ |
| Left Coast Punk | http://www.leftcoastpunk.com/home.html |
| Black Goat Radio | http://www.wondermeat.com/ |
| MuZicStation | http://ibsd.rmx.co.jp/musix/ |

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The German Pirate

by Reiner Palma

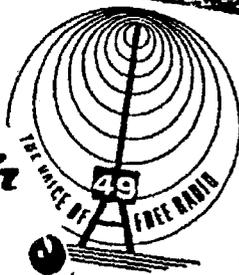
Radio Partisan
mobile on short wave - 48m



Hardy's Top Ten



Radio Valentine



radio Valentine

Frequency... 6250 kHz 49m.
Power..... 250W
Time... 11.00 - 12.24 CET
Date... 7.1.1976
S I N F O
3 3 3 3 3

Thank you for your reception report.
L-Karte von Radio Valentine

The music hobby pirates on shortwave originated as a direct effort of the offshore radio stations in the 1960s. In fact, these offshore vessels started broadcasting in 1959 outside territorial limits, most of them off the British coast, but also off the Dutch/Belgian and even the Scandinavian coast. These latter stations targeted the Benelux countries, West Germany, Denmark, and Sweden. These floating radio vessels showed the kids in

Europe in those days that it was possible to provide programming that appealed to the youngsters: not only the music, but the style of presentation.

Apart from Radio Luxembourg, there were hardly any private commercial radio stations in Europe. The government-controlled radio stations mainly broadcasted speech, rather than music.

In Germany, a number of FM pirates were occasionally active in larger cities. At the beginning of the 1970s, the first radio freaks liked the idea of starting their own shortwave stations, putting out musical programs after the example of the offshore stations.

In the early days, broadcasts occurred at irregular times, without station IDs and addresses weren't even mentioned.

Scene in the Mid-1970s

But in England, for instance, there were stations in the late 1960s and early 1970s, giving out mailing addresses. In the course of 1973, the German shortwave pirates also started to mention contact addresses to build up the same kind of relationship with its listening audience.

A true pioneer was Time Radio. This German station used an address in Eindhoven, Netherlands, from the summer 1973 onwards.

From 1974, more and more German shortwave pirates were audible on shortwave. Radio stations with colorful names, such as Radio Free Germany, Condor Radio, Hit Radio International, and Radio Sunshine were active on Sunday mornings.

In the beginning, only short hourly or 30-minute music programs were aired. During the heydays of Germany's first pirate boom, programs were becoming more and more professional. As far as professionalism is concerned, there were two stations whose names must be mentioned: Radio Gloria International and the legendary Radio Valentine. No doubt, these stations were the most-known names in the German shortwave free radio world in the 1970s!

Radio Gloria International

Radio Gloria regularly broadcasted on third Sundays using a powerful transmitter. Most broadcasts lasted several hours. The station was operated by a Hannover (large city in the north

of Germany) high school teacher (!), teaching Latin and theology. His aim was to protest with his radio station against the established government-controlled radio scene. He had the opinion that good and progressive music was banned from the German stations, an undemocratic behavior. He put together his own music shows, and bought a lot of albums and singles. In this way, he could make his own choice out of more than 6000 singles and countless albums.

Apart from the records, he bought tools and pieces of equipment. After studying circuit diagrams, he worked long hours in the middle of

the night and constructed his first and very own shortwave transmitter. Then he erected a high antenna (clearly visible for each and everyone!) in a densely populated part of Hannover and connected it between two high buildings.

With this equipment, the high-school teacher started putting out up to six-hour programs on Sundays. A diet of progressive rock music was aired on shortwave. From Leipzig to Helsingborg, his station ID was to be heard: "This is R.G.I."

Because of his regularity, the German Bunde-post and police became aware of these lively, but also illegal, activities. According to German law, broadcasting with

homemade equipment on shortwave is forbidden and could result in imprisonment for as long as five years!

What had to happen did. On September 19, 1976, the authorities struck totally unexpectedly. It happened in a little farm, located a bit south of Bremen. The operator didn't even have enough time to switch off his transmitter...

That same evening when he arrived home, he discovered that

a-m-radio alternative music radio Radio Gloria International free radio on land

the authorities had been searching in his house. All studio equipment, singles,

and records had been confiscated. When the teacher had to appear in court in May 1977, he was fined DM 4150 (!), plus the cost of the court case. *(In 1999, 1 DM would equal approximately \$1 U.S., but we don't have the 1977 conversions on file. Regardless, the fine amounted to the equivalent of thousands of U.S. dollars).*

In addition to the fines, the school board retaliated against him and he had to quit his job as a teacher. A few years later, he went for a period to Italy and started a commercial radio station (also under the name Radio Gloria), aimed at German holiday travelers.

The raid on Radio Gloria Interna-

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tional also had serious consequences for a functionary of the Radio Investigation Service (Funk-

action would be undertaken against Gloria. During a later court case in June 1979, he was fined DM 1200. Apart from that action, he was transferred to another job within the Bundepost organization.



The simple, crude studio of Radio Gloria

kontrollmessdienstes). He had tracked down RGI already some time before the actual raid, but hadn't informed his superiors. RGI's programs gave him a thrill, so he sent a reception report. During a telephone call with the RGI operator, he said that he very much enjoyed the programming and assured the teacher that no

Valentine's four-hour program schedule was aired every first Sunday. The programs sounded really professional and were multi-lingual. Valentine's programs could easily bear comparison with commercial stations.

In September 1976, Radio Valentine introduced a power

amplifier having an output of no less than 1000 watts PEP (peak envelope power)! This power increase caused more problems with the Bundepost trying to track the station. In October 1976, the Valentine lookouts spotted the German Bundepost clearly trying to track down the station. Radio Valentine's November 7 broadcast had to be finished prematurely; two Bundepost cars (one with a direction finder) were driving in the vicinity of the secret transmitting location.

The interruption of the December 5 broadcast was also because of Bundepost activities. At first, the Valentine people were not aware of the danger because the Bundepost was approaching the transmitter site with a civilian car. Then the crew had their suspicions that the occupants were instructed in detail from three vans equipped with sophisticated direction finders and directional antennas. These vans were not far away from the civilian car.

The transmitter site was located in Belgium territory, a few hundred meters from the Belgian/German border. According to law, the German Bundepost wasn't allowed to take any action simply because it was abroad. But this fact didn't prevent the authorities from continuing their action. This was something that the Valentine crew didn't take into account!

At the moment the Germans entered the transmitting site, in cooperation with Belgian officials, the transmitting equipment and antenna were already taken away and none of the Valentine people were there. Only two persons were stopped, but it appeared that both were not really involved with the operation. They were close to the location in their ignorance and felt there was no reason to run away.

The Valentine crew couldn't safely transfer the transmit-



The Radio Valentine staff in action.

ting equipment back to Germany: It had to be left behind, not too far away from the location. All was found by the German authorities, but confiscated by Belgian police. The houses of Valentine's advertisers were searched and other tough measures were taken. Even the houses of the two persons being questioned at the transmitting site location were searched in the next few weeks. In one case, a

complete studio, tapes, records, and magazines worth DM 7000 were confiscated. The Bundepest was in the supposition that this studio had been used as a recording studio for Radio Valentine shows.

During the months after the raid, Radio Valentine did a few attempts to return to the airwaves as a legal, commercial station on AM or shortwave with daily

transmissions. There was, for instance, a rumor that Radio Valentine would be commencing transmissions from a platform in the Northsea! None of the plans could be realized; Radio Valentine went silent forever!

Radio Partisan

The raids on two of Germany's most popular and important stations almost completely silenced the other stations in the country. Those that were active at the end of 1976 first "went underground." They were sporadically active for very short periods of time at special occasions, such as Christmas.

One station, however, Radio Partisan, tried one more time to carry out a regular service, from the north of Germany in 1977. Radio Partisan started officially on March 13, 1977 with shortwave broadcasts on 6250 kHz. The station used to change its transmitter site each broadcast to avoid a dreaded raid by the Bundepest. For security reasons, programs lasted only two hours, at a maximum.

Now that you've seen it, DON'T MISS IT!



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QSL to: _____

Many thanks for your correct rec. report.

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 TIME: _____
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 SINFO: _____
 TX-POWER: _____

Radio Partisan ON 48 mtr. FREE RADIO BAND

In early 1978, a new transmitter with a power of approximately 200 watts became operational. That made Radio Partisan, in those days, one of the strongest pirates on shortwave.

As was discovered later, the Bundepest had already started to track down Radio Partisan in the Summer of 1977! Because of the fairly brief transmissions, they were not able to put an end to Partisan's shortwave activities. In the autumn of 1977, the Partisan owner was cautioned; the Bundepest had been opening some of the listener mail that was sent to the station. As a result, they could make use of a search warrant to undertake direct and rapid action in case they would successfully track down the station.

In April 1978, it almost happened. Following several attempts to track down the station with direction finders and directional antennas, the authorities were convinced they had almost discovered the transmitting site. That was five minutes before close down. When they were only 250 meters from the site, Radio Partisan signed off, forcing the Bundepest to leave empty handed!

Later, the station operator was

told that they suspected a little farm was the actual broadcasting location. They were prepared to get a search warrant. The result would have been rather embarrassing because Partisan's location was not in, but merely nearby the farm.

Then came May 7, 1978. Just like every month, Partisan planned a mobile transmission and had already installed its equipment on a site in northern Germany. Technical problems forced the operator to cancel the broadcast and go back to his house. At 1100 UTC, Partisan signed on from the operator's house, but he had to sign off only 30 minutes later because the relatively high-powered transmitter caused interference to radios and TV sets. Approximately two minutes later, a Bundepest van stopped in front on his house. Two police cars manned by seven policemen accompanied the Bundepest van.

During the search, the Radio Partisan operator was caught. Another person, who was also involved with the station, took to his heels and ran away just in time! Confiscated were the shortwave transmitter, an FM transmitter, amplifier, cassette recorder, etc. The Radio Investigation Service's people forgot their expensive, specialized equipment, enabling the Partisan

operator to make a detailed study of the methods and equipment that the Bundepest was using to track down illegal radio stations.

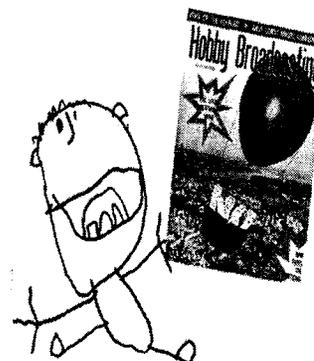
A few days after the raid, the Partisan operator received a telephone call from a Bundepest official in which the latter expressed his opinion that the wrong transmitter had been confiscated: the transmitter power was too low and the crystal frequency wasn't corresponding with the frequency used by Radio Partisan on the day that the raid occurred. In December 1978, the Radio Partisan operator was fined DM 225, plus the costs of the court case. The confiscated equipment was not returned.

Conclusion

The raid on Radio Partisan meant the end of the German pirate scene on shortwave, at least for the next few years. It was in the mid-1980s when greater activity from German stations was observed.

Reiner Palma has also written a book entitled *Die Deutschen Kurzwellen-Stationen 1970-1978, It's 108 pages, all in German, and features QSLs and information concerning more than 50 German pirates from this time period.* 

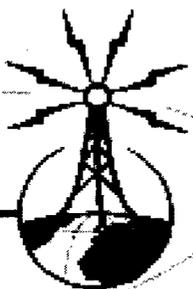
Lotsa radio!



<http://www.frn.net/rfi>

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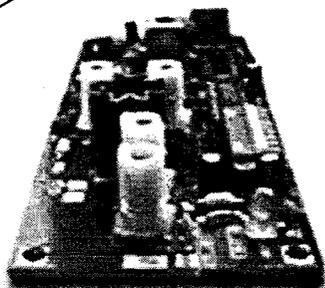


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AM Carrier-Current Broadcasting:

A Permissible Free Radio Alternative!

by The Dude

In view of recent events in the USA, frequent LPFM raids, short-wave operators receiving NAL's (Notices of Apparent Liability), and Washington deciding the fate of questionable legal LPFM proposals, an alternative outlet is needed for free radio broadcasting NOW!

One of the options is intentional radiating, transmitting with an antenna, on AM/FM via the Part #15 FCC rules. However, this is very limited in power and range. Although it is very fun to do, it's not really practical in my opinion. There is cable FM, where your signal is distributed via the area's

WARNING:

Unlike working with typical electronics equipment, the safety of working with carrier-current projects depends, in part, on correct wiring. Thus, the potential shock hazard with carrier-current is greater. To be safe, contact a professional before working with carrier-current systems.

cable television provider. But to do that you have to have an agreement with the CATV provider to set up such a station on their system. Even if they said yes, they might charge you a fee to use their system. Also, a lot of CATV systems wouldn't do it, since many do not offer FM radio as part of the service. However, my hat is off to those cable FM stations that have a great working relationship with their local CATV providers, and have maintained very successful free radio FM stations via cable FM.

You could syndicate your programming and pay for airtime on shortwave stations like WBCQ and WWCR. But that's expensive, and you can forget about trying to reach a local audience that way. Or, you could try and borrow airtime via local college stations. But what do you do if the station doesn't allow an open multi-format that changes whenever the next DJ's shift changes? More and more college stations today have a fixed, one-type format where they allow you to air only what suits them. But what if you're many kilometers from the nearest college station, where no one local would hear your programming?

What you want is a station that you can set up yourself, that's not too expensive, that every household in the neighborhood and further can easily receive. A station where you provide programming of whatever you want, when you want to, whether it be once a week or 24 hours a day... And best of all, do it license free!!! Such a broadcast system does exist... It's a little known technique called AM Carrier-Current Broadcasting.

AM Carrier-Current, (AM C-C), in a nutshell, is a broadcasting technique where you send your signal to follow the path of the village power lines by coupling to the AC power lines. This is permissible since the signal is controlled, and limited, to where you are radiating. The simplest, and most common use of C-C is the wireless intercoms that you use to talk to someone in the basement workshop from the kitchen. When you buy a wireless intercom, you might ask yourself, "Where's the antenna?". The antenna is what you plug the intercom into, the house wiring. When you key the PTT button from the unit in the kitchen, the signal is transferred to the intercom's power cord. From there it travels down the kitchen's wiring to the circuit breaker box. From there the signal then travels up the circuit wiring to the basement, and to the power cord of the intercom in the basement.

How can a radio signal do this??? If you look at the bottom plate of your wireless intercom, or in the manual under "specifications", it might list FREQUENCY. On my intercom it lists two frequencies, 230 kHz for channel A and 260 kHz for channel B. Those are some pretty low frequencies... And low frequency radio signals tend to like, or are more resonant with, long wires. Even though these intercoms are tied to the wiring mainly for talking from one room to another, they do put out a strong enough signal that it radiates from the wiring. I've used a portable receiver that tunes down to 230 kHz, and it receives the intercoms' signals very strong

anywhere in the house! In fact, at street level, I could hear the intercoms' signals over 100 meters down the street, radiating from the power lines!

What wireless intercoms do is what we want to do on a larger scale on the medium wave, AM, broadcast band. In my opinion, doing Carrier-Current with low power AM seems more efficient than trying to radiate from a resonant antenna on the AM broadcast band. To broadcast on the AM band efficiently, you need to construct an antenna many meters in length, and most people don't have the property space to do so. And consider this... Most of the signal is wasted in space... With AM C-C you can do it anywhere you have power lines coming in at the transmitter site. Also, since the AM signal follows the path of the power lines, the signal will end up in houses and buildings, where the potential listeners are.

At this time I'd like to mention about a book that's, in my opinion, the bible of carrier-current broadcasting. The book is Carrier-Current Techniques: Wired-Wireless Broadcasting by Ernest Wilson, of Panaxis Productions. This book is the foundation of what got me into understanding and applying AM C-C broadcasting. The book I have, copyright 1979, explains what carrier-current is in layman's terms, the history of, FCC rules to C-C, selecting a frequency, home brew AM transmitters, RF coupling to the power lines, reducing interference, coaxial cables, off-air monitoring, building studio facilities, studio telephone patches, where to get commercial gear, AM C-C repeaters, viewing RF waveforms of your signal, mathematical formulas, home brew linear amplifiers, and more.

The latest catalog I received from Panaxis Productions

Hobby Broadcasting

TENTATIVE SUMMER EVENTS CALENDAR

June 4-6 Rochester hamfest, Rochester, NY
716-424-7184

June 12 Eastern PA Section hamfest, Bloomsburg, PA
717-752-6851

June 27-30 National Media Education Conference,
Minneapolis, MN 303-756-8380. We won't
be attending, but will be providing
information.

July 10 Midwest Division Convention, Kansas City,
Missouri. 816-436-0069

August 1 Shenandoah Valley ARC, Winchester, Virginia
540-667-8629

September 4-5 Shelby ARC Shelby, North Carolina
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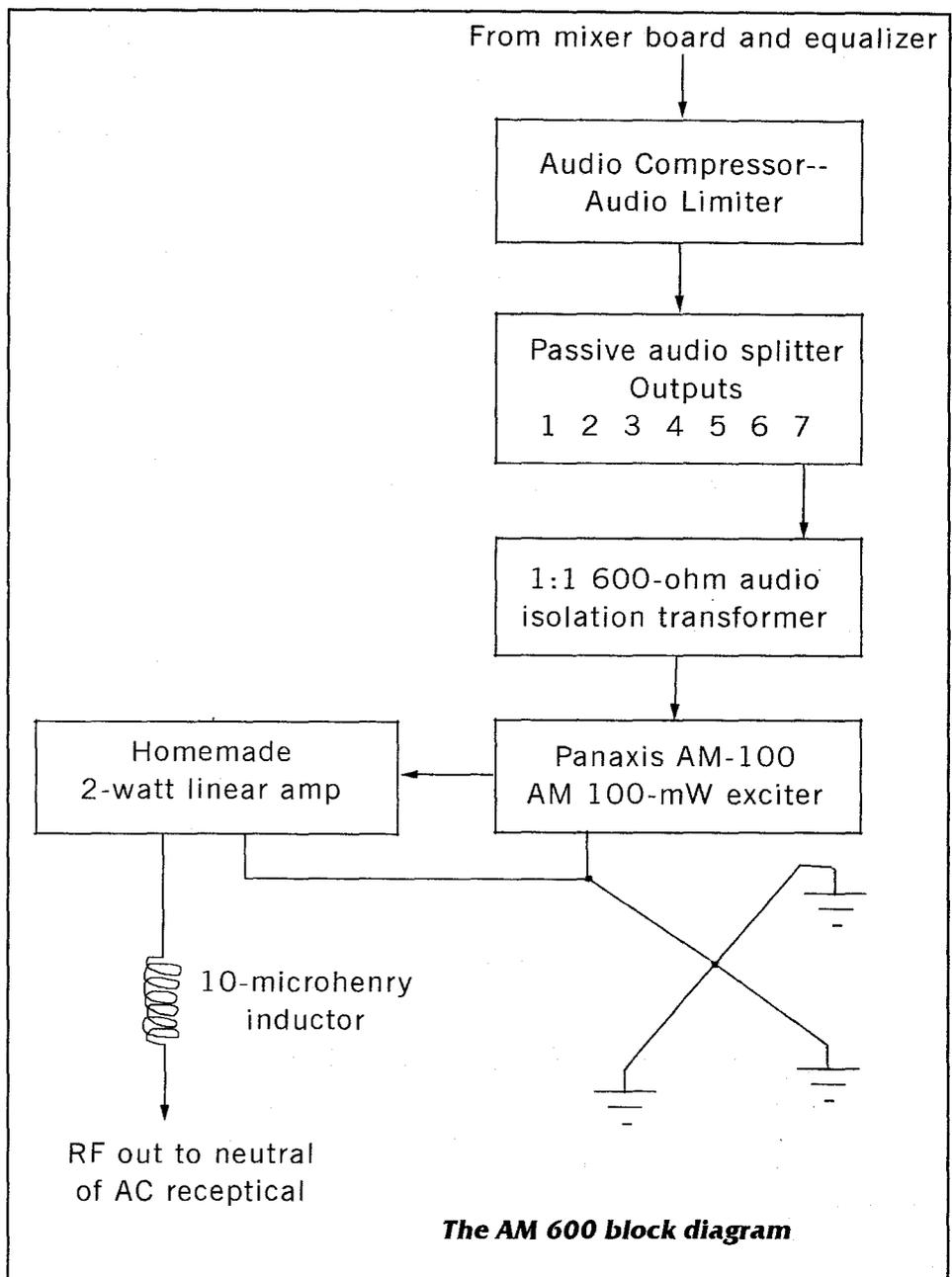


listed the book at \$12.50 US. You can locate Panaxis at their Website, <www.panaxis.com>; contact them by writing to P.O. Box 130, Paradise, California 95967, USA; or call them at (530)-534-0417 (voice) or (530)-534-9002 (fax).

By using Ernest Wilson's book, I was able to fabricate a push-pull linear amp for my AM C-C station that I still use. I still use that book as a reference guide, since I'm still learning a lot about this subject. Yes... I am really plugging Ernest's book a lot here, but I've yet to find a more complete guide at this time that has information about Carrier-Current broadcasting. I may be wrong about this, but I've yet to find information even on the Internet about it... If anyone out there does know more about information about C-C, please write in!!!

In the Fall of 1998, I decided to get my AM C-C station out of storage, and back into operation. The frequency that I'm using is 600 kHz, and I call my station AM600. Figure A is a block diagram of how AM600 is currently set up at the time of this writing. The reason I've chosen 600 kHz is it's the lowest frequency that my transmitter will go down to, without modifications. Luckily it is a free frequency in the two areas where I've used AM600. Since I am using the power lines to carry my signal, 600 kHz follows long power cables more efficiently than a higher frequency of 1 MHz.

At 1 MHz, and higher, the signal doesn't carry as far on the power lines. At 2 watts, I can hear AM600 at street level during daylight hours for about 2 kilometers. At night time, at street level, the range is about 1.1 kilometers before



AM600 is drowned out by several other stations due to mediumwave nighttime propagation. However, 600 kHz is not an allocation for those clear channel 50,000 watt stations. So I lucked out there too...

Probably the most intriguing thing about AM600 is how the station is RF coupled to the power lines. Instead of having a system where the final RF output is coupled to the AC HOT of the house wiring, AM600's final RF output is directly coupled to the AC Neutral. To my knowledge, there is no documentation that says how this can be done, or that it can be done at all.

Every AM C-C station that I've heard of, or read about, is coupled to the AC HOT.

So why did I decide to couple to the Neutral? There's a story behind that... Back in early 1989 I was fooling around with an AM oscillator circuit that probably only put out microwatts of signal, and I was looking for an antenna to load it up to. At that time I had a 30-meter longwire antenna that I used for shortwave reception, so I loaded the AM circuit to it. I was only able to hear the signal for about 20 or 30 meters. Disappointed, I thought about loading directly to the house wiring's AC

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Neutral, just to see what would happen. At that time I had no idea what Carrier-Current was.

To my surprise I had a booming signal anywhere inside the house, but that signal radiated to only a couple meters outside the house, except where the power lines were coming in down from the power utility pole. The signal didn't stop there... With a Walkman radio, I was able to hear that signal for about 100 meters, following under the power lines on my street. Even though I couldn't hear the signal beyond 100 meters, at street level, I walked to the end of the street, about another 50 meters.

At the end of the street was a utility pole with a power transformer that had a ground cable running down the pole to a ground rod. When I got within 1 meter of that pole my AM signal just boomed right in by radiating from that pole's ground wire! I figured that this signal had to be carrying into people's homes by traveling down the power lines. Just because the signal was too weak to radiate 10 meters down to street level from the power lines, doesn't mean that the signal just stops there. I continued

doing this for about a month, until my stupidity got the best of me. The easiest way to increase that AM oscillator's output was to increase the supply voltage. I ended up increasing the supply voltage to the point where that AM circuit went up into a big puff of smoke, and I faced some angry parents.

For two years I didn't do anything else with AM transmitting, until Spring 1991. At that time I'd moved into the ground floor of an apartment complex with absolutely no outdoor antennas allowed. I tried FM stereo broadcasting with indoor antennas. However, the best range was in one direction maxing out to about a couple hundred meters. In other directions I had dead spots and multipath reflections as close as 30 meters from the antennas.

I then looked at AM broadcasting to possibly take up the slack. By that time, I'd learned what AM Carrier-Current was, and bought an AM transmitter kit. Out of cost cutting, lack of parts, or just sheer laziness, I decided to try loading up the new AM transmitter directly to the building's Neutral of the AC wiring. By doing so, I covered every building on my street, seven of them, with 100 milliwatts, mW, of signal. Out in open fields, away from the buildings and power lines, my AM signal was non-existent. I thought, "so what... The signal is going where I want it to..."

However, I did have a big problem of hearing a loud 60 Hz AC hum in my AM signal. So I grounded the transmitter's chassis to the only ground in the building, a cold water pipe of the building's plumbing. That helped reduce the humming a little, and it also increased my range a bit. What I had was a ground loop, a condition where more than one ground current is flowing on a single ground cable. Ground current from the studio equipment, mostly being induced by the step-down transformers in each piece of equipment, was traveling down the audio cables to the path of least resistance to a ground-like potential, my AM transmitter. To stop that from happening, I've added two 1:1 600-ohm isolation audio transformers between the audio outputs of the compressor / limiter and the audio inputs of the transmitter. There's two audio transformers, since there's two audio channels feeding the transmitter, one for the LEFT and the other for the RIGHT. After doing that, I had a good clean signal covering the neighborhood on 600 kHz AM.

Because the system of coupling RF directly to the Neutral seemed to work so well for me at the other locations that I've broadcasted from, I still do it today. This system is cheap, easy, and safe since I'm not worried about an electrical fire hazard so much, and for me it seems to work well. I have added a few other modifications that can be seen in fig. A. I've added an RF linear amplifier that I've made via Ernest's book. The chassis and power supply came from a junked Realistic TRC-57 CB radio. All I did was

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gut out the motherboard and build in its place Ernest's linear circuit and a seven-element Chebyshev harmonics filter that I got out of the ARRL Amateur Radio Book.

I get about 2 watts out of this amp. Tied to the chassis of the transmitter, (exciter in Fig. A), and the linear amp are cables to an independent earth ground system, that's meant only for the exciter and linear amp. Because it was fall with crappy cold weather, and the fact that I'm limited in supplies and money, I used three separate one-meter-long brass rods, all pounded in the ground and tied together to the main cable tied to the exciter and

linear amp. Temporarily, this makes AM600's grounding more efficient. I do plan to have a much better, more permanent, ground system soon.

At the RF output of the linear amp, I'm running 5 meters of RG-58 coax

cable to an unused electrical outlet. Another thing good about transmitting on the AM broadcast band is that you can run long lengths of cheap coax cable with

which adds another 37 ohms of impedance to the RF circuit. When you load up to the power lines, you don't know what the exact impedance is going to be, but you can bet that it will generally be lower than 20 ohms. From the inductor, the RF is connected to the AC outlet via a polarized AC plug.

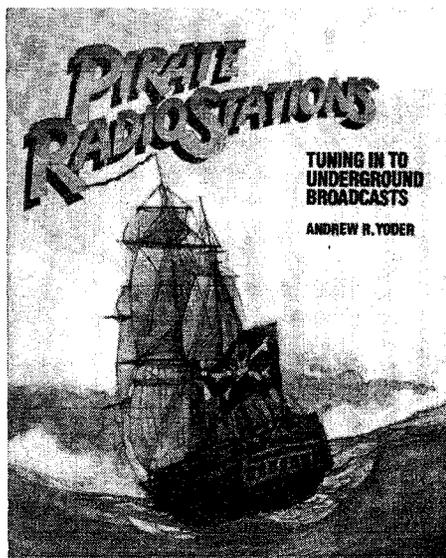
Here's where there's a potential for an AC shock hazard. When you look at a North American AC receptacle outlet, you'll see two vertical slots, and hopefully a small hole that looks like a "D" tilted forward. In the National Electric Codes, there's a system used to identify what these slotted holes should be. Of the two slots, the smaller slot is AC HOT, while the larger slot is AC Neutral, and the D-shaped hole is Ground.

With an ID system like this, you can tell what's HOT, Neutral, and Ground by just looking at the receptacle, even if it's installed upside down. Be aware of how the



An LPB carrier-current transmitter--fired up and ready to broadcast!

little or no loss. At the AC outlet end of the transmission cable, the outer braid is not connected to anything. In this case, I figured that it didn't need to be. However, on the center conductor I've added a 10 microhenry inductor,



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receptacles might be installed in an older house, or if you know that the receptacles were installed non-professionally. I've found outlets where the HOT and Neutral were reversed! If you know how to use an AC voltmeter, I'd advise you to check the AC receptacle that you want to load your AM C-C station to, to make sure Neutral is Neutral, and HOT is HOT.

If you're unsure, then please get help from some one who's knowledgeable in residential wiring. If you're in a house that's old enough to have receptacles with only two slots that are the same size, I'd advise you to avoid even trying to use those outlets for C-C broadcasting, or for anything else for that matter. I can't stress enough the importance for you to be careful when working around 120 Vac. The 120 V wants the path of least resistance to ground. If that happens to be you, because you've touched a live 120 Vac HOT conductor, the current can kill you.

You could load to the Ground hole on a receptacle, since it is supposed to be tied to the Neutral at the panel box. I've done that before with no problems. So you might ask, why not just load up to the outside of the panel box? And I'll say that you most certainly could. This might sound ridiculous... But when you live with more

than one person in the same household, loading to a receptacle outlet using a polarized plug looks better to most people. That in itself could make or break the existence of your station. And I have yet to see anything that says that you must load a AM C-C station my way or anyone else's. If you have developed a way to effectively couple your AM C-C RF to the power lines and out to the neighborhood, then by all means go for it... Then write back and tell us about it, since I'm still learning this.

As far as testing AM600 goes, I do not use any really extravagant equipment. Right now the equipment at my disposal consists of a boom box, digital voltmeter (DVM), a diode, a Walkman radio, a car with AM/FM stereo, an audio frequency (AF) generator, a portable 1-30 MHz shortwave receiver, a frequency counter, and my own two ears. Because I don't have a shortwave receiver or power meter that reads down to 600 kHz, and I no longer have an oscilloscope, I quickly made up a simple RF voltmeter using a diode with a DVM. On my homemade RF linear, I have two exposed SO-239 connectors that I use as RF test points. Exposed is the center conductors... One SO-239 is to measure the RF input from the exciter unit and the other SO-239

is to measure the RF output from the linear and harmonics filter.

My DVM does not measure RF voltages in the AC mode. However, with a 1N4148 diode I can rectify to a DC voltage that my DVM can measure in DC mode. If you'd like to try this, you'll need a fast switching silicon diode. It doesn't need to be a 1N4148, but that's what I had in stock. If you use a DVM, polarity will not really matter since DVM's will give the reading in + or - . However, polarity does make a difference with an analog voltmeter, and let's assume that you have one.

Looking at the diode, you've got two leads and on the body of the diode is a black marking. The lead that's the closest to that black mark is the negative, or cathode, end of the diode. The other lead is the positive, or anode, end. If you have alligator clipleads with your meter, clip the negative cliplead to the anode of the diode. Connect the positive cliplead to the independent ground of your transmitter. The cathode lead of the diode acts as our RF probe. With the transmitter on (with no audio put to it, since we want a dead carrier signal). This is assuming that you have your station set up already. Set the voltmeter to around the 10 Vdc scale, and with the diode's anode clipped onto the negative meter lead, touch the diode's cathode to the RF output of your transmitter. You should see several volts deflected on the meter.

Off my test points in my linear amp, I measure 6.5 V at the output and 0.81 V at the input. By no means is this an accurate way to measure your RF signal, but it is a very quick and easy way to see that you have a measurable signal. It can also aid in troubleshooting where you have RF voltage in a circuit, and where you don't. I didn't really want to touch on this in depth, but this diode and voltmeter trick is something that anyone can do.

***This article will be continued
in the Fall issue of
Hobby Broadcasting***

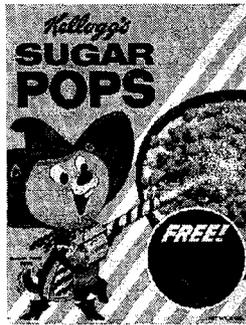
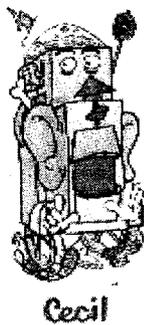
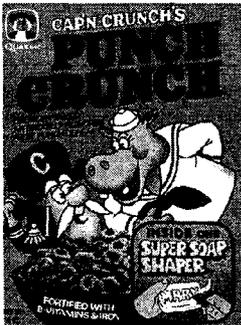
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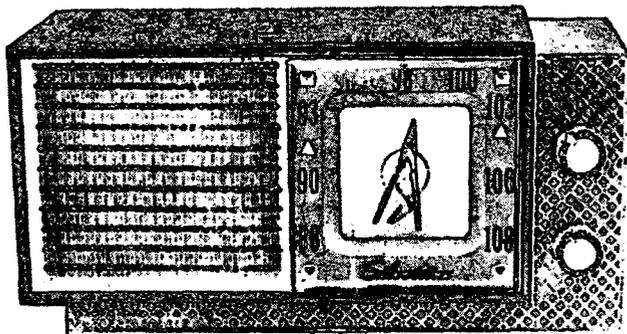
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FM BANDSCAN

BY RADIO ADDICTION
FMBANDSCAN@JUNO.COM

I haven't heard a word from the Radio Addiction folks in the past few months, so this is Andrew at the *Hobby Broadcasting Worldwide HQ* with the FM broadcasting news.

Of course, the big news is occurring at the FCC headquarters. In the next few months (if we're lucky), we'll discover if the FCC will draw up plans for low-power FM broadcasting or if the NAB will have their way. Even if some form of LPFM system is passed, it will be interesting to see if it will be a truly low-powered system (i.e., 100 watts or less) or if it will be a high-powered system. Just allowing 10-watt stations on the air would be a tremendous boost, but the 1000-watt stations would help very few people because the coverage ranges of such stations are so huge and the spectrum space is finite.

One of the best resources available to check for clear frequencies and to see how many LPFM stations can fit in your area is the LPFM channel search on RECnet (<http://www.recnet.com/rec/lpfm/chs-rec.htm>). Just type in the latitude and longitude for the area where you would like to broadcast from and it provides a frequency-allocation list, complete with slots available for 10-watt, 100-watt, or 1000-watt stations, and also a map with the exact point of the proposed transmitter so that you can see if it is exactly where you want the transmitter to be located.

Assuming that the results are all correct, this Web page is amazing! I can see that, assuming no other LPFM stations are on the air, there is a potential for either four 10-watt stations or four 100-watt stations from the general location where I live. No 1000-watt stations could be run from this location, given the

band crowding in the relatively nearby Washington, DC and Baltimore markets. In addition, the REC group also has proposed variations of the plan, with fewer limitations on the 10-watt stations, allowing more stations to broadcast (assuming that the FCC would choose their plan, as is). Among other variations, the REC plan would allow 10-watt stations to broadcast on 87.9 MHz, which is currently reserved as the top edge of television channel 6.

Old-time FM pirate

Just today, I had a chat with an FM pirate who has been on the air on weekends since the early 1990s. The station uses a Panaxis FMX transmitter amplified up to 8 watts output. The station also broadcasts with an

is well-equipped with plenty of audio, CB, FM, and shortwave equipment. According to the operator, the station has been heard many miles away from the transmitter with their format of punk and hard rock music. And the slogan is the kicker: "Radio Free Limestone, we're not brain surgery, but we do mess with your mind."

Free Radio Berkeley Celebrates 6th Anniversary

The following is a press release from Free Radio Berkeley:

Despite a Federal Court injunction against its founder Stephen Dunifer, Free Radio Berkeley returned to the



LPB carrier-current transmitter on 1620 kHz in the expanded AM band. The operator features local music and has even had several bands play live on the air.

Radio Free Lime Stone

Also included in this column is a photo that was sent in by the operator of Radio Free Lime Stone, which broadcasts on 101.3 MHz. As you can see in the photo, the studio

broadcast airwaves on Sunday, April 11 at 8 PM. Established as a Free Speech voice, a direct challenge to FCC regulatory authority and as a means to break the corporate stranglehold on the free flow of information, news and cultural expression, Free Radio Berkeley will resume a daily broadcast schedule as soon as circumstances permit.

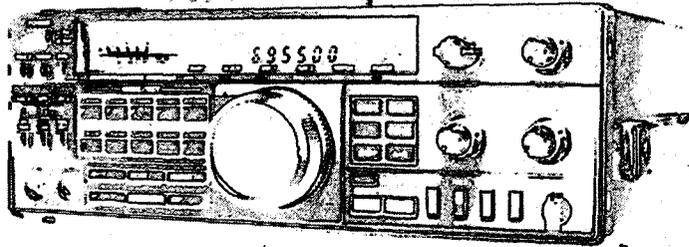
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SHORTWAVE BANDSCAN



ayoder@cvn.net PO Box 642, Mont Alto, PA 17237

In the past quarter, shortwave activity has started to pick up again in North America, recovering from the FCC raids that temporarily scattered broadcasters from the airwaves. Unfortunately, the activity hasn't entirely recovered, but some bright weekends have left us with the promise that more interesting programming will grace our receivers over the summer months.

Once again, special thanks to all of the contributors who mailed or e-mailed loggings for this column: Rainer Brandt (Germany), Jerry Coatsworth (Ontario), Bill Finn (Pennsylvania), Harold Frodge (Michigan), Zacharias Liangas (Greece), Greg Majewski (Connecticut), Cachito Mamani (South America), Charles Poltz (Pennsylvania), Larry Russell (Michigan), Lee Silvi (Ohio), Tim Taylor (Pennsylvania), Tom Venney (Michigan), Patrik Willfur (Finland).

The Bill Finn Real Audio Pirate Clip Site

It always seems that many people are fascinated with shortwave pirates, but comparatively few people ever tune in and actually hear these stations. Probably the biggest drawback to listening to shortwave pirates is owning a decent shortwave radio--one good enough to pull in relatively weak signals.

The next difficulty is that shortwave pirates (in North America, at least) broadcast with "hit and run" tactics. There is no schedule and the broadcasts could appear at any time.

Bill Finn is working on a few of these problems. He's been posting loads of recent broadcasts in the Real Audio format on his Web page. This way, you can hear some shortwave broadcasts, as they would sound

straight from the radio (complete with atmospheric, jamming, etc.), unlike hearing a cassette.

To check it out, see Bill's Shortwave Pirate Audio Page:
<http://members.xoom.com/billfinn/audio/>

At this point, the stations include: Radio Eclipse, Reefer Madness Radio, Radio Metallica Worldwide, WHYP, WKND, WLIS, WMFQ, WMPR, and WMPR / Jimmy the Weasel. Also included is an unidentified station that Bill heard on March 31, 1999.

And here's a note from Bill regarding some of the technical specs of the setup:

The listening equipment used was a Realistic DX-390, usually a 70-, or 60-, or 28-foot long wire and occasionally the built-in whip antenna. To record, I use a Radio Shack unidirectional dynamic microphone into a Teac cassette deck. Some of the SSB shows might sound off frequency. That is a result of my BFO impairment on this radio. Maybe its time to dust off a DX-440!

If you have a Real Audio or Real Media clip of a shortwave pirate and you want to put up here, send me an e-mail description of its length, etc. I'll put it up. Xoom says this Web space is unlimited and thats good. I am trying to figure out how to do a live Real audio stream via the Web page. The goal is to hook my DX-390 or DX-440 through the soundcard and stream stations I can hear on 6955 live.

1998 North American Pirate Radio Activity

Greg Majewski is keeping a database of station activity, as logged in the *Free Radio Weekly*. With the arrival of

Free Radio Weekly #155, he counted up the activity for the year and since October 31 (the big bust). These figures include North American stations only. Here is what he found:

Top Ten for the Year:

- #1 Radio Metallica Worldwide with 80 broadcasts
- #2 Mystery Radio with 59
- #3 Radio Nonsense and Free Hope Experience, both with 45
- #4 Voice of the Pig's Ear with 40
- #5 Radio Azteca with 34
- #6 WMPR with 29
- #7 Radio Eclipse and Take it easy Radio with 27
- #8 WSRR with 25

From October 31 to the beginning of 1999, here are stations with more than one broadcasts:

- #1 Blind Faith Radio with 6
- #2 KMART, CJNH, and Radio Bob Communications Network with 5
- #3 WACK with 4
- #4 Radio Metallica Worldwide, Radio Eclipse and Take It Easy Radio with 2.

North American Stations

Just as with the last issue of *Hobby Broadcasting*, we're not going to include all of the stations that were on the air, but rather feature a few of the broadcasters in a little more depth. This way, you can learn more about stations, rather than having the same brief notes repeated for every operation.

One of the new stations that took the airwaves this spring is Radio Free America. This station broadcasts like many novices--regularly, often for long periods of time, and with little regard to when people are listening. And that's refreshing! Unlike most of the veteran pirates, which broadcast

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strictly during weekend late afternoons and evenings, Radio Free America typically broadcasts in the evenings during the middle of the week.

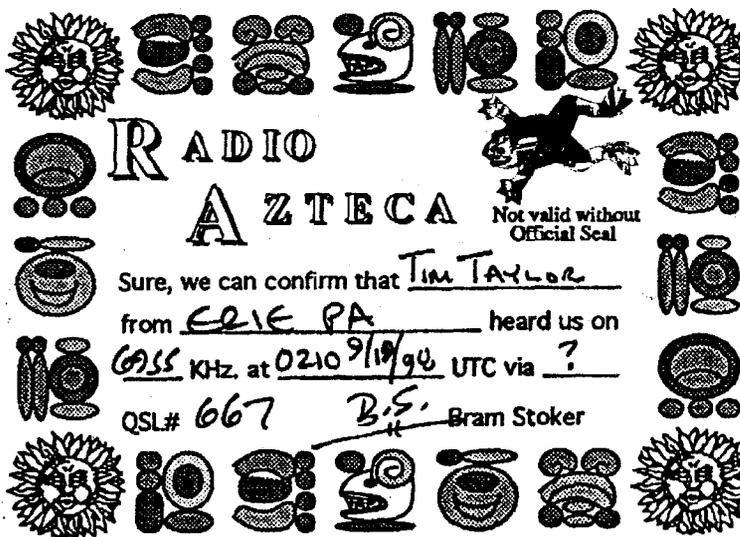
Another oddity of Radio Free America is that they always broadcast within a few hundred Hertz of 6957.8 USB kHz (announced as "6958 kHz"). Considering that USB mode is used, the RFA transmitter should be frequency-agile. Perhaps the station has moved up a few kilohertz to avoid potential interference from other pirates and from the Canadian military amateur radio net that checks in every day at 2200 UTC on 6955 kHz USB.

The RFA programming consists of a wide variety of rock music with two male announcers (who often sound drunk) and greetings to listeners. Some of the music played includes hip-hop, techno, 70s album rock, and new "alternative" rock. During one broadcast, station DJs "The Doc" and "The Duke" mentioned that they're trying to appeal to everyone, although they stated that "country music is crap."

Presently, the station is taking listener requests and feedback via telephone numbers. At this point, they don't have a mailing address or an e-mail address, and no QSLs have been sent out. However, considering the newness of the station, this could change by the time that you read this.

One of the other stations that was reported by most of the North American contributors for this issue was Radio Azteca. Unlike Free Radio America, Radio Azteca has been broadcasting semi-regularly for much of the decade.

Bram Stoker hosts a one-man comedic variety show, mostly consisting of stories and comments that relate to



shortwave listening and sex in one way or another (typically, shortwave listening and sex are somehow combined). The Radio Azteca slogan is "The station for everything that's gross, but tasteful." Well, I don't think that everything broadcasted on Radio Azteca is particularly tasteful, but much of it is quite humorous, as its popularity among shortwave pirate listeners proves.

Although the station is humor-oriented and the production values aren't particularly smooth, great attention is paid to the program scripts. Surely, Bram must have gone through many notebooks scripting his programs over the years. Also, in contrast to RFA, Radio Azteca shows typically contain almost no music, usually only music intervals from the *Rocky & Bullwinkle Show*, used to bumper various segments.

If you hear Radio Azteca (typically on weekends near 6955 kHz), be sure to write for one of their many QSL cards via P.O. Box 1, Belfast, NY 14711. Tim Taylor did recently...and he received a QSL, which is pictured in this column.

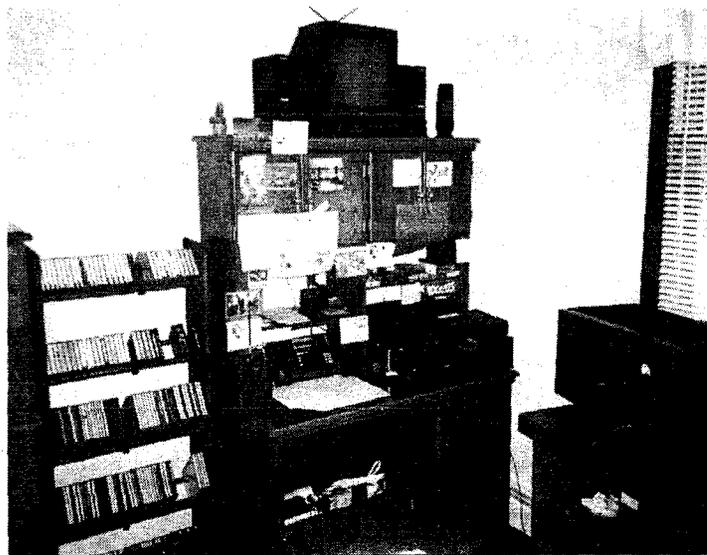
Off the air

So far, we've had plenty of information about what's been on the air, but what about what's no longer there?

By now, all of the regular shortwave pirate listeners in the United States know that P.J. Sparx from WREC has retired and the station has disappeared. The station, possibly the most active and widely heard North American pirate in the 1992-1998 time frame featured its final broadcasts in September and October 1998, just before the FCC cracked down and closed several of the most-active stations.

The news about WREC is not that the station is returning (as far as I know, it's gone for good), but that P.J. took the time to send in a few great photos from the station, which are featured in this article.

WREC was a favorite of many in the mid-1980s.



The studio of WREC. Notice the Johnson Viking II transmitter at the far right, the mixer (at the right of the desk), the Sony 2010 shortwave receiver in the center of the desk, and the CD collection at the left.

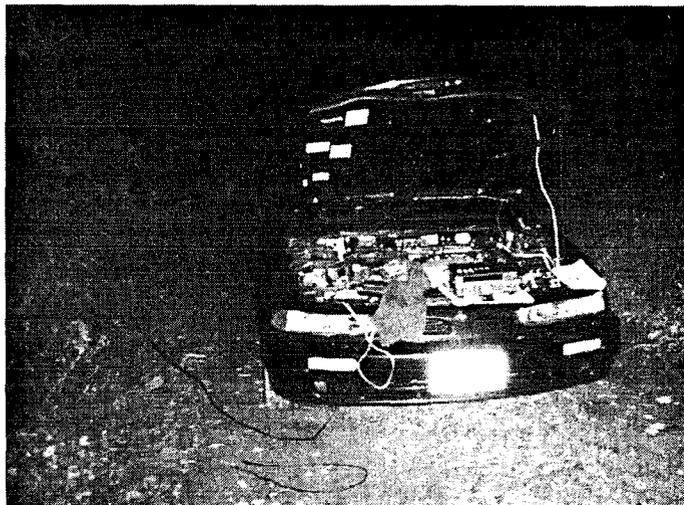
But now that the station is gone, one of its most-notable characteristics is that it was never closed by the FCC--an important footnote after it made literally hundreds of hours of broadcasts over the course of seven years.

For years, the FCC has stated that all pirates are eventually busted. WREC proves that such is not necessarily the case. Good luck with your retirement, P.J.!

26th International SWLCS DX Camp

(Radio 510 International) 30TH OF JULY TILL THE 1ST OF AUGUST 1999 MERCHWEILER, GERMANY

Once again, Merchweiler opens its doors to the many



WRECbroadcasting from a "fixed mobile" location. The car is on a dirt road at night. The Kenwood TS-450SAT transceiver is sitting at the front of the car. The coaxial cable runs from the back of the transceiver to a dipole antenna, mounted in trees.

radio freaks who make the journey to Saarland in Germany. This is the best meeting around and should not be missed. There are plenty of pirates/listeners and clubs around and plenty of chat for the three days. You can bring a tent and crash out in the field or take a B&B for around DM30 per night. I'll be there (third time!), running around with my video/camera and DAT recording the event. I'll have a report on my Web site and also interviews for a radio show.

SRS has a site all about the event:
[http://www.srs.pp.se/](http://www.srs.pp.se/articles/merch.html)

[articles/merch.html](http://www.srs.pp.se/articles/merch.html)

Check out their excellent homepage which is the best around <http://www.srs.pp.se>

If you need more information, write to:

Shortwave Listeners Club Saar,
Postfach 1230,
66585 Merchweiler (Saar),
Germany.

AM Pirates heard in Greece

Pirate radio is often thought to be a primarily American or Western European phenomena (at least in these parts of the world). But Zacharias Liangas in Thessolonika, Greece checks in with some logs of the Greek and Serbian AM pirates. Like the Russian pirates, these stations broadcast above the top end of the AM band and are rarely reported. Aside from the logs from Zacharias, I don't think that I've ever seen reports of any of these stations.

The format is: frequency at the far left, then time in UTC, and information. Any station names are in italics. It would be interesting to see if any of the Serbian pirates are still active since the regular NATO bombing started.

3215 *Velvet* (harmonic of 1608), Greece, with old songs from 1730. At 1810 with ID and telephone number. Basic freq not heard. Upon my telephone call to a mobile phone, he advised me that its power was 500 watts and the location is 80 km from here. The station transmits occasionally. Fair signal

3993. 1737, Greece, with Turkish (?) songs and near 1800 with Turk-Greek songs. After 1801, the signal vanished

Pirate Tocatti Radio, Italy?, 1655 ID ed after R National (pirate from Komotini) closed down for QSO 2336 /25.3 On the frequency, some pirates were talking in USB!

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info@radio510.org
<http://www.radio510.org/>**

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Broadcasting News

(Continued from Page 12)

amateur radio community, which had vigorously opposed the experiments.

The transmissions were part of a novelty publicity campaign that revolved around "Internet Time," a universal metric time standard centered in Switzerland, created by Swatch. With Internet time, a day is broken up into 1000 segments, called *beats* by Swatch. To tie all of this in together, Swatch planned to send a satellite, called the *Beatnik*, into space to retransmit messages sent by people on the Internet.

One catch. Swatch decided to broadcast the messages on the radio frequencies from 145.800 to 146.000 MHz, which is part of the 2-meter band. This radio band is strictly licensed for noncommercial amateur-radio use only. According to amateur radio sources, the "Beatnik" satellite is a mini-Sputnik and AMSAT-FR project formerly known as *RS-19*). According to the same sources, AMSAT-FR signed an agreement with Swatch, not realizing that the company had made a separate contract with the Russian Space Center to transmit illegally via this equipment. But after signing the agreement, they were legally bound to uphold their end of the deal.

By this point, the amateur radio community began to protest the intentions of Swatch. One of the prime protesting locations was the Swatch Web page, where visitors may enter a message onto the page, like a bulletin board. Originally, the messages were intended to be broadcast via the satellite. Instead of innocent messages, however, the page became inundated with messages such as these:

Watch your swatch! Made by people who couldn't care less about international law, just make profit of non-informed people, no matter what!

Funny Swatch tried to convince us that: "We see this as totally in tune

with the spirit of freedom of communication and a democratic way of using radio as a means of communication." The rules were made in a democratic fashion, through international treaties and agreements.

Swatch wants us to believe they have a better use or the spectrum - rules be damned. Why can't you just admit your plan was legally flawed and that's why it is not flying???

Of course, some Swatch enthusiasts countered with other messages, such as these:

Get real you hams. Amateur radio is nothing.

Keep talking with your stupid radios and stay off the web.

Wake up to yourselves. The amateur bands will be taken from you.

Do not be concerned about using amateur frequencies as they are not required for anything else.

In all, more than 5000 messages have been entered into the Swatch page. From the several hundred sampled, most were opposed to the Swatch attempt to use the amateur 2-meter band for commercial purposes.

On April 22, Swatch announced: *Unfortunately, the Russian transmission satellite "Gellios", a key link with the MIR space station, was severely damaged a few days ago. Swatch has decided to assist the Spaceflight Control Centre and donate the batteries supporting the beatnik satellite to the MIR cosmonauts, thus canceling the possibility of any radio transmission from space.*

However, in order to spread your messages, we have decided to launch a virtual beatnik that will carry your messages around cyberspace.

Mission unaccomplished.

Although this is an amateur radio issue, it also has implications for hobby broadcasters. For example, if a hobby broadcasting (or low-power, noncommercial) band is established, would companies attempt to take over the frequencies by brute force? If so, would governments attempt to stop the violations or would they remain

idle, as in the Swatch example?

Swatch's campaign might have failed, but other companies will certainly be inspired to attempt similar publicity stunts.

FCC Commissioner Kennard's NAB Speech Glitched

On April 20, 1999 FCC Commissioner Kennard addressed the NAB convention in Las Vegas, Nevada. The importance of this speech might not have been Kennard's words, but rather how they were transmitted...or not transmitted.

The speech was carried by the NAB live over their Website via Real Video/Real Audio. Those watching the video live noted that just as William Kennard was beginning to talk about low-power FM (at 27:33.5 into the speech), his image was replaced by a slide, and jazz music could be heard in the background. At 27:55.9, the video and audio returned to feed, seconds after the Commissioner had stopped talking about LPFM.

On the FRN Vines (<http://www.frn.net>), some proponents of LPFM questioned the occurrence, speculating that the NAB was attempting to censor the speech. At least one of those in the forum complained to the NAB about the "glitch" in the media. After the complaints, the NAB Web page included the following disclaimer "Due to the length of this year's FCC Chairman's breakfast, we had to change videotapes at approximately 30 minutes, which was in the middle of Chairman Kennard's speech. This unfortunate technical glitch caused a roughly 10-second gap in the Chairman's speech that we were not able to capture."

The NAB page did not mention why a streaming audio/video feed would require a video tape (just an audio/video input would be necessary) or why those in charge of A/V on this speech would be prepared with backup audio and video sources, but not a standard-length VHS video tape (120 minutes in the fastest speed).

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Feedback

(Continued from Page 10)

possibilities for a new, licensed LPFM service, see the *Broadcasting News*.

Crossed Fingers

Andy,
Great journal, very much needed and highly informative. No HF activity here, but hope to in the future. Who knows what will happen. Looking forward to working with my local community-affairs LPFM license. We hope. Anyway, a great year and thanks for *Hobby Broadcasting*.

Joe

DIY Radio Austin

Dear Sir/Ma'am,
Enclosed please find a check for \$12 for a one-year subscription to *Hobby Broadcasting*. I am also interested in receiving back issues.

I am the producer of Austin Airwaves, a weekly news and public affairs program that frequently focuses on media issues, including the micro-broadcasting movement. Over the last couple of years, I have produced several "Pirate Radio Updates" and am currently planning another in the next few weeks.

In the past, I have interviewed numerous "pirate" operators from around the state and nation. I have interviewed folks with stations in Tampa, Little Rock, Los Angeles, San Francisco, and elsewhere. I've interviewed Stephen Dunifer several times, both in the studio and on the phone, and have helped him out at several national and international radio conferences.

Austin Airwaves airs on KO.OP Radio, 91.7 FM, Friday 6-7 PM Central Time. I am also the founder of this four-year-old, non-commercial community station.

The focus of the next "Pirate Radio Update" will be the FCC's proposed "legalizing" of microbroadcast stations. I have been following this story, some-

what, and would appreciate being kept informed of late-breaking developments.

Jim Ellinger
Austin Airwaves
P.O. Box 49492,
Austin, TX 78765

SW Bandscan

(Continued from Page 43)

- 1522 unIDed , old songs, fair
- 1625 Scirocco old folks 444
- 1640 low signal no ID for half hour, 1730
- 1663 unIDed old songs, 1816, fair
- 1624 Dynamitis, old songs, good
- 1628 Mous kanali #2, CQ for after sign off 1836
- 1620 1911, unIDed soft old songs, mike test, old rock songs
- 0- idle QSY
- 1702 1933, Serb pirate
- 1637 1940, very old semitraditionals, fair
- 1642 1947, QSO w Junior
- 1650 1919, Serbian ID ed as Radio Sumaidi, good
- 1618 2028, Radio Neo Risio ??? much music very small ID , waited more than 1 1/2 hour for ID 333
- 1781 2125, Serb pirate
- 1803 2116, Greek QSO

Question of the month

Tim Taylor responded to our question about the degradation of pirate radio programming.

Tim says: "I, for one, am a fairly new listener to the hobby (since 1997). I realize that Jimmy the Weasel and Radio Bingo do play some strange parody clips, but I would guess that their intention might have been for good reasons. Like possibly to play these parody clips to use as a "filler" to fill-in the spaces that the FCC leftover from the October raids (well, it's just a thought)."

Well, that's a positive way to look at it! I have to admit enjoying hearing Radio Bingo the few times that I've tuned in!

Conclusion

Thanks to everyone for all of the support for this column so far. 

FM Bandscan

(Continued from Page 40)

Citing compelling circumstances, former listeners and programmers decided to re-establish this alternative voice for the community despite potential legal and regulatory ramifications.

Even though the Federal Communications Commission (FCC) is currently entertaining the possible creation of some type of low power FM broadcasting service, its proposal is severely flawed and faces incredible opposition from the National Association of Broadcasters.

Speaking on behalf of Free Radio Berkeley, Paul Griffin stated, "We have been silent for too long. The prospects of obtaining a license from the FCC at any time in the near future are very remote. We are going back on the air because that is what our listeners want us to do."

Steal this Radio Update

Recently, Steal this Radio took the revolutionary position of suing the FCC for the right to broadcast before the FCC could take action to close the station.

Although the case is far from completion, Steal this Radio has gained the uphand in the preliminary proceedings. In one important decision, the judge decided that those from Steal this Radio were allowed to simply use their on-air pseudonyms, not their real names, much to the disagreement of the FCC lawyers.

Such as action could prevent the FCC from taking action against the individual members of the station, whether the court case is won by the FCC or by Steal this Radio

Conclusion

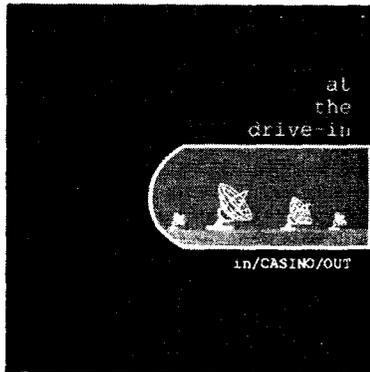
Remember to send your FM broadcasting information (news, cassette recordings of stations heard, loggings, photos, and news clippings) to Radio Addiction via the e-mail address in the header or via P.O. Box 642, Mont Alto, PA 17237. 

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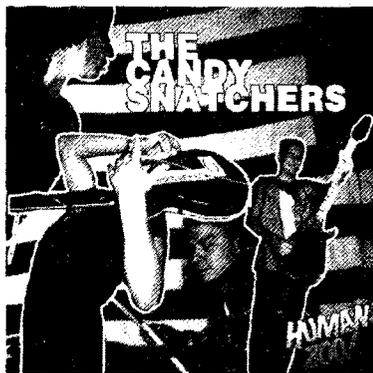
Airplay: Music Reviews



At the Drive-in "in/CASINO/OUT"

Fearless Records
13772 Goldenwest St. #545, Westminster, CA 92683

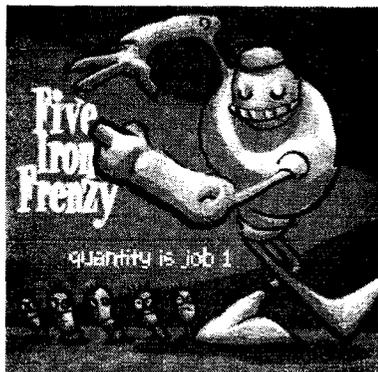
I know that this band has been receiving a good bit of press lately, but that doesn't make me like this any album any more. On the positive side, this is well performed and it more energetic and driven than most emo-punk these days. And, at times, it sounds quite a bit like Fugazi. Still, I don't find any of it particularly catchy. The lyrics seem self-indulgent and contrived, like someone who's taken one too many "Introduction to Poetic Verse" classes. It just doesn't seem justifiable to scream and jump up and down while waxing poetic.



The Candy Snatchers--"Human Zoo!"

Go-Kart Records
P.O. Box 20, Prince Stret Stn., New York, NY 10012
<http://www.gokartrecords.com>

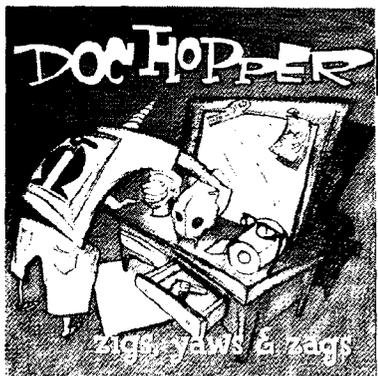
Yes! Now this CD absolutely rips. After some of the CDs that I received this time, it also proves to me that I haven't become entirely too old and jaded. This band reminds me a lot of the New Bomb Turks and maybe the Loudmouths. It's kind of a heavy, blazing version of all of that trashy '50s fast cars/ fast women culture. No songs really stand out, but there are no bad songs either. Lyrically, there's nothing worth mentioning here.



Five Iron Frenzy "Quantity is Job One"

5 Minute Walk Records
2056 Commerce Ave., Concord, CA 94520

This pseudo-ska CD is a real disappointment after the last one we reviewed. It's just a mish-mash of throw-away songs, including one cover song that's nearly identical to the original, that vary wildly in style. I suppose that this is where the title fits in. The best cut on here isn't even listed on the sleeve: "These are Not My Pants (The Rock Opera)." This starts off like a Meatloaf ballad and bounces through about 10 different musical styles (reggae, rap, metal, country, etc.) without a flaw. A hilarious novelty song that is an absolute must-play for DIY radio stations.



Doc Hopper "Zigs Yaws & Zags"

Go-Kart Records
P.O. Box 20, Prince Stret Stn., New York, NY 10012
<http://www.gokartrecords.com>

This CD isn't bad. They shared their previous live release with Weston, a pop-punk band from near Philadelphia. This release has its pop-punk moments, but it even delves into folk-punk ("Bright Eyed and Bushy Tailed") and metaltinged punk ("Ceremony for a Fat Lip."). Overall, it's a solid release from a band that you could imagine breaking into the Top 40 some day.

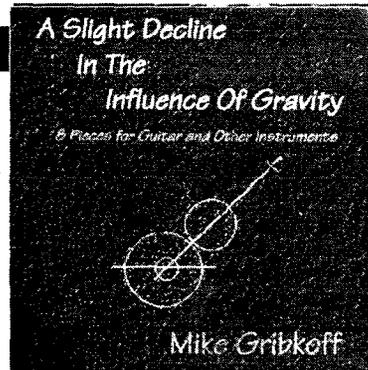
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Mike Gribkoff "A Slight Decline in the Influence of Gravity"

DreamSea Records
818-957-7650
gribkoff@dreamsea.com

Good radio station background music here. It's all instrumental acoustic guitar, with occasional piano and synthesizers used primarily for incidental effects. At times, this sounds almost like the light acoustic guitar segments from Yes songs. At other times, it sounds more like improvisational jazz guitar. Although this was recorded on a CD-R and evidently only promoted as a demo, the performance and recording is excellent. This is perfect broadcast material for late nights or for classical- or light-formatted stations.



L.E.S. Stitches "Staja98L.E.S."

Ng Records
61 Van Dam St., New York, NY 10013
<http://www.ngrecords.com>

The second release from the Lower East Side Stitches is punk in the early vein--it sounds influenced by bands like the Dead Boys and Iggy and the Stooges, except with 1990s recording (guitars are smooth and layered, producing a very "big" sound). The snotty vocals generally convey a sense of despair concerning their current living conditions ("Down the Drain," "NYC is Dead," "Disgusted," "Frustrated," "Another Let Down," "Could Just Die," etc.). Overall, the CD seems very solid and well done, but not particularly catchy. Unlike many albums, there are no standouts here for radio airplay. In general, this CD has essentially no crossover potential and would only be good for punk-formatted stations and shows.



OX Fanzine #33 "Cruisin"

OX Fanzine
P.O. Box 143445, 45264 Essen, Germany
<http://www.punkrawk.com>

These guys at OX have the right idea. For DM 6,90 (somewhere around \$7, I think), you get a very professional 130-page punk magazine with a compilation CD (32 bands, 78 minutes)! That's a bargain...if you can understand German. On the plus side, many of the bands are from North America or England and sing in English. Although this is a punk rock comp, there's plenty here for most types of rock formats: Mucus 2 sounds like the Kinks or Stones around 1964, The Wonderfools do FatWreck-style pop-punk, the Angry Samoans play their all-time punk classic "Lights Out," party rock with The Gerbils, etc. Loads of good stuff here and the price is right.



Sounds for Little Ones

Dish Recordings
P.O. Box 107, St. Helena, CA 94574

Remember how much fun it was going to the little amusement parks as a kid? Not the ones with all of the roller coasters--the kiddie parks where talking animal statues abound and the scariest rides are the spinning tea cups or the rotating airplanes. Believe it or not, someone traveled around to different amusement parks to record the audio from those talking animal statues and from a variety of ice cream trucks! The difference between live audio and recorded is amazing! These samples sound downright demented when you don't have "Hilda the Hippo" there to reassure you that she's really cute and pink, not an axe-wielding murderer with a propensity for fairy tales about "Stuart the Stork." Really, this should be treated more as a sound effects CD than anything. It's fantastic for anyone trying to create an off-kilter mood that can't be met with traditional sound-effects records.



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Airplay: Video Reviews



Fugazi/Jem Cohen "Instrument"

Dischord Records

3819 Beecher St. NW, Washington, DC 20007

<http://www.dischord.com>

Fugazi and their label, Dischord, have had a fascinating impact on the music culture of the 1980s and 1990s. In every direction, their art and beliefs seem to meld. For example, there's no hype. Anywhere. Their ads always have a great photo and the line "Records and Stuff We Sell." Their press sheets are equally honest and matter of fact, unlike those from most any other label. This might seem irrelevant, but it's not. Hang on.

If you are familiar with Fugazi albums, you can see that they are fascinated with textures, both visually (you'll see this from thumbing through the liner notes and other packaging) and audibly (with layers of guitar sounds). Like their ads, their music is artistic with a very honest, straightforward approach (just guitar, bass, and vocals).

Jem Cohen, an independent filmmaker who had been working with Fugazi since 1987, painstakingly filmed, taped, and edited this video. Cohen's work fits in perfectly with Fugazi--a brilliant collage of video and effects, blending astoundingly well. Cohen also seems to fit in with Fugazi ethically, noting in the promotional material that he had no desire "to create...any

kind of promotional vehicle."

Unfortunately, the desire to create art as well as humbly avoid being "rock stars" is evident. Although beautifully crafted by focusing on the "texture" of the events (rather than the importance), the video somehow makes Fugazi seem smaller than life. For a video such as this, it seems that the art should be driven by the music, not vice versa. The result is a video that's more intriguing than fun to watch.

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 - 115. LUNGFISH 'Artificial Horizon' ^{*} (C)
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 - 113. MAKE-UP 'In Mass Mind' ^{*} (C)
 - 112. SMART WENT CRAZY 'Con Art' ^{*} (C)
 - 110. FUGAZI 'End Hits' ^{†*} (C)
 - 109. HAPPY GO LICKY 21 live songs from '87-'88 CD ONLY (E)
 - 108. AUTOCLAVE 11-song posthumous CD, all previously released. CD ONLY (D)
 - 101. BLUETIP 'Dischord No. 101' ^{*} (C)
 - 90. FUGAZI 'Red Medicine' ^{†*} (C)
 - 40. MINOR THREAT CD has every song! Teen Idles, Minor Threat SOA, GI*, Youth Brigade CD ONLY (E)
 - 14. DISCHORD 1981 ^{*} (D)
- ^{*}regular CD, price (C) / [†]Cassette, price (C) / ^{††}CD single, price (C)

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mail for list: hbradio@yahoo.com

FOR SALE: 150 watt stereo FM transmitter. Comes with Comet ant. and 80 ft of 50 ohm cable. \$ 1800.00. For more info, contact. Luis@MusicNetworkdjs.com

I am interested in buying in older (mid 1960's to early 70's) broadcast, recording equipment... Mics, booms, headphones, turntable, cart machines, consoles, reel to reels, cartridges, "ON AIR" signs, ... ?? What have you got? e-mail descriptions and price to Steve Hill zuzu@swbell.net

WANTED: 1. Reel-to-Reel - Audiophile-Quality from either the 1970's or early '80's. Must have selectable speeds, separate record buttons for left and right channels, etc. 2. Cart machines & parts. Please Email descriptions & prices to: 105.5fm@usa.net

WANTED: LP's of Easy Listening, Big Band or older jazz. Please email me with list of albums and asking price. I am not a collector, these will be used on-air. I also am looking for starter equipment for a 30- to 40-watt FM station. E-mail me at able@tomatoweb.com

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6. Other broadcast and cellular rated items.
7. Used Towers, used towers, used towers, different types s.s. and Guyed, big and small good and bad, old and new. rdstyles@mindspring.com

WANTED: The Los Angeles International Dream Center, a non-profit organization rebuilding downtown Los Angeles, is looking to start a radio station to help our surrounding community. We are new to radio, but have a vision to help those around us. We are located at the old Queen Of Angels Hospital in downtown LA. We are looking for low cost or donated equipment (we have a 501(c)(3) number for tax credits) and information on how to get started. please help! meatfed@earthlink.net

WANTED: .5, 1, Or 1.5 preamp, and 5, 10, Or 15 for FM10A. Also need mixer, and a AM transmitter, Anybody has A good deal, i'll buy a more powerful FM trans. REPLIES: 3WS@msn.com

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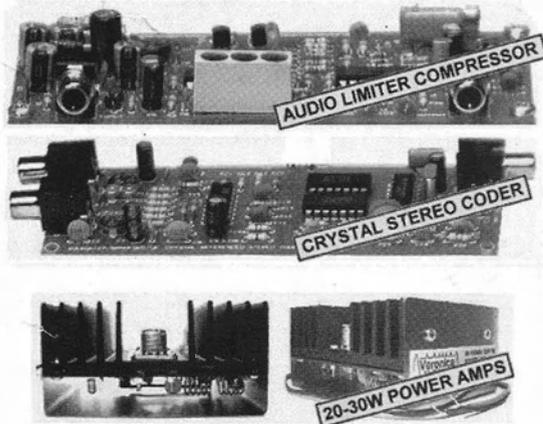
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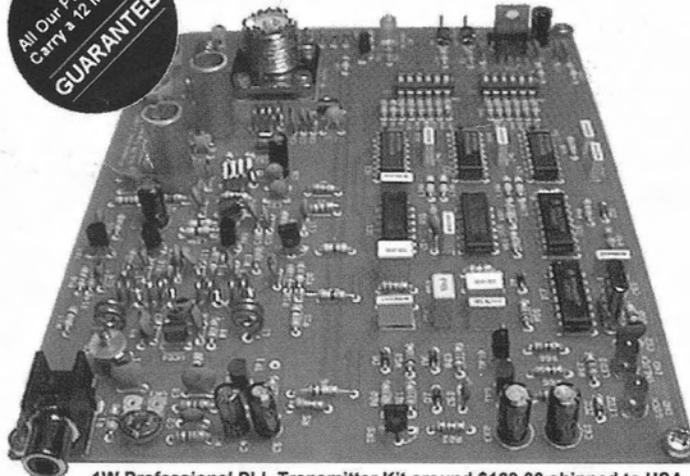


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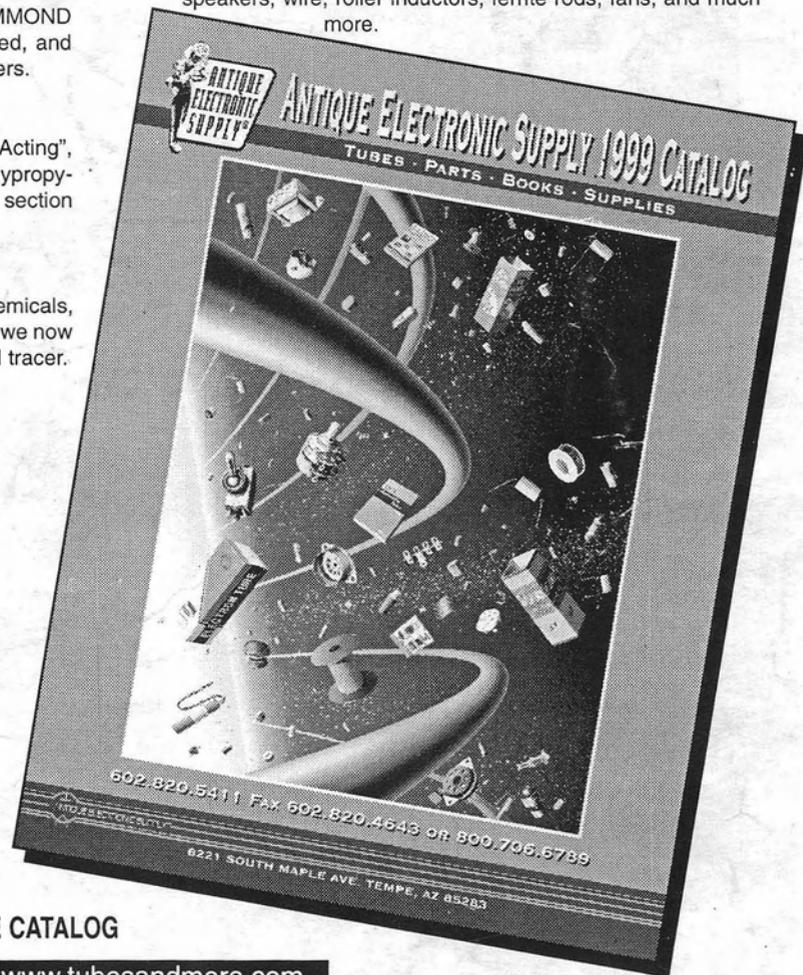
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