Experimental Broadcaster's
Newsletter
Volume 5, Number 3
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FMedia, "*A newsletter of fact and opinion about FM radio and related technologies*" is published monthly by Bruce Elving, Ph.D., Publisher, P.O. Box 24, Adolph, MN 55701-0024. Dr. Elving also publishes the **"FM Atlas and Station Directory".** The newsletter price is $45.00 per year, single issues are $4.50. The 11th edition of "FM Atlas" (176 pages) is at the printer's - advance orders are $10.50 per copy. This book lists FM translators and boosters, call numbers, maps, and directories giving station formats, stereo, polarization, SCServices (SCA) and more. Covers the United States, Canada, and Mexico. Good reading!.

Dr. Elving and Panaxis exchange newsletters on a regular basis. The recent issue - Volume 2, Number 2-February, 1988 of FMedia has an excellent editorial which discusses low-power community stations.

In 1978 the FCC, perhaps bowing to commercial radio interests, did away with "class D" stations. These were stations of 10 watts or less which could be licensed to "institutions" such as schools, churches, and community groups working "in the public interest". Existing stations were allowed to remain on- the-air but were urged to move up to 100 watts or more. A sort of "you need POWER to be a REAL radio station". According to FMedia's editorial this may have been one of the contributing factors for unlicensed FM stations popping up here and there.

The editorial goes on to confirm what many low-power (unlicensed) broadcasters have surmised - FCC field operations tends to ignore very low-power stations. Provided however that COMPLAINTS of interference, or of their operation, are not communicated to the FCC. If an FCC agent is "officially" informed by the public of a violation then he/she has no choice but to investigate and ultimately stop the activity.

The newsletter also covers some FM station history's in selected areas for the period of 1954 through 1988. ..... Continued on page 7

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BUSTED

An amateur radio operator was cited and fined $750.00 in the Chicago area recently. He was rebroadcasting satellite music on the AM band with the aid of a tower. No power level was mentioned. Apparently he was using the system so he could listen while driving around town - any other audience was not a consideration.

Two unlicensed FM stations at the University of Amherst in Massachusetts went off-the-air. Someone notified the FCC of the operation - possibly student politics was involved.

A radio amateur, Jerry Gastil, K6DYD faces up to 10 years in jail and a $10,000 fine for deliberately jamming FBI communications.

WHAT'S HAPPENING AT THE FCC

It will be a lean year for the FCC. Their 1987 budget was just over $107 million, their proposed 1988 budget is only $99.6 million. About 75% of the budget goes to personnel in the way of wages and benefits. So called "fixed costs" such as telephones, computers, office space and mail account for only about 13%.

Where to cut back is a problem. You can cut down on travel, paper supplies, pencils, and the like only so much. Consideration has also been given to a reduction in purchases of technical and computer equipment. And, there is some talk about reducing their subscriptions to trade magazines ($161,000/year). It appears however the bulk of expense cutting may have to come from a loss in personnel.

Even in view of possible cut-backs, and the loss of personnel, the Field Operations group intends to continue its enforcement of the Rules.

PART 15 CHANGES

There has been some talk about revisions to Part 15 of the FCC Rules. Apparently the changes have not yet taken place. A proposal for changes in Part 15, going by the name of Docket 87-389, is before the commission. Action has been delayed while waiting for further input from the public. The Amateur Radio Relay League (ARRL) and some 10 other organization have already shown concern about the proposed changes.

The proposed relaxation of Part 15 should indeed cause concern. In part it would permit low-power operation on almost any frequency as long as it did not cause interference. This would open the door to a flood of "Wireless speaker" systems, in-home broadcast devices for video and audio, wireless microphones on the TV bands, and who knows what else.

While many experimental broadcasters would appreciate less restrictions this proposal might not be beneficial. The FCC invites inputs and has set a deadline of March 7 to receive comments. Call your local FCC field office for additional information and the address to which comments should be sent.

The FCC has many areas of concern. It is undoubtedly difficult to coordinate all of them with some degree of uniformity. A relaxation of Part 15 rules could increase the level of interference in an already radio-wave filled existence. On the other hand they put tight restrictions on other areas. One of these is the non-acceptance of certain types of computer cases because they allow radio frequency interference to leak out. Another is the adoption of rules for TV antenna and cable switches. Switched signals must be suppressed 80 dB from 54 to 216 MHz and 60 dB for 216 to 550 MHz.

Are they restricting interference in some areas but encouraging it in others?

What's Happening in Radio Land

The AM STEREO fight continues. The public has been the losers all this while. No new immediate hope is foreseen. Receiver manufacturers don't mind improving their line with wide-band and pre-emphasized/de-emphasized and noise-suppressed audio...but ad stereo capability? - Not yet they say.

Which came first - the chicken or the egg?

Authors of various articles have blamed the FCC for not making a firm commitment by simply "adopting a standard". They decided to leave it "to the market place". But which comes first - the chicken or the egg? Without receivers stations are reluctant to spend bunches of money to install a system that no one can receive. On the other hand the receiver manufacturers don't want to develop radios for a system that is not yet, and may never, be fully functional.

In the midst of all this Kahn and Motorola wave their fists and threaten law suits, patent infringement and anti-trust violations.

The whole thing is becoming a "no-win" situation. The only hope, and it looks pretty slim, is that AM station owners simply go ahead and "DO IT". Take a chance and hope for the best.

Guest Editorial by Y. A. Chai, Senior Member of Cable Associated Transmission Systems (C.A.T.S.)

Broadcasting as most of us know it may be entering a new era. A trend which started rather slowly is gathering momentum. Its the "sell-out" of the big networks.

NBC has sold two of its networks just recently and is currently proposing the sale of some of its station holdings as well. They have also donated their David Sarnoff Research Center to SRI. CBS has closed their CBS Tech Center. In general network programming is finding little play at "local" stations. All of this may be pointing to a fall of the network empires which we've known for almost 60 years.

Smaller stations, in an effort to be more "localized", will present a new challenge for programmers, engineers, management, and even equipment manufacturers. Equipment salespersons will have to develop many smaller stations as potential clients rather than depending on multiple sales from one source.

AM radio has been going down hill for a number of years. Attempts have been made to better programming, widen frequency response, allow day-timers "pre-sunrise" operation, permit some day-timers to go with night-time operation, bring stereo to AM.....all in an effort to save the medium. None have been overly successful.

"There are not enough FM channels!" some say. "Since AM station allocations are

Radio Land, Continued

"full-up", and some can't operate at night, "why not open a new FM band?" "This should give everyone a chance!". This gave birth to the idea of "FM2".

Originally "FM2" channels were proposed for 225 to 230 MHz. The FCC explained that this band of frequencies was being used by the military - it could NOT be made available. The next proposal (which never actually made it to the FCC) was for 220 to 225 MHz. Amateur Radio operators jumped on this as quickly as the proponent uttered his idea. After all, this band had been given to HAMs for Amateur TV communications!

The latest FM2 frequency proposal is to use TV channels 32 through 34. This would create 90 new FM channels in the UHF band. At least one TV proponent, Greg DePriest, Vice President of the Association of Maximum Service Telecasters, is against the idea. He points out that that many AMers are just not able to make it as it is - they just go "belly-up". The question has been asked "do we really need MORE stations. In some areas we have too many stations already competing for the market dollar, and not necessarily "in the best interests of the public."".

In the metropolitan areas (New York, Chicago, Los Angeles, etc.) the airwaves are already "wall-to-wall" with stations. Each claiming to be "the best" and "different" or "in tune with their audience", etc. While, in fact most are over audio processed, play the same "hits" as other stations, and may be automated most of their broadcast day. Is a city full of broadcast band "Juke Boxes" really serving "in the public interest"? Do we really need more of the same?

On the other hand, why not TV channels 32 through 34? In someone's wisdom years ago our present FM band was sandwiched between channel 6 and 7. This of course has caused no end to interference problems between FM stations and those 2 TV channels.

It's true that UHF TV has not grown as much as the FCC had hoped. Many of the channels are unused. What channels have been taken often consist of back-to- back movies. Instead of a giant "Juke box" (as on radio) we have instead a number of airwave "Movie Boxes". Do we need more of this also?

If an "FM2" band ever becomes a reality you can bet your booties that them that has the bucks will somehow get there first! Will low-power experimental broadcasters ever have a space they can call their own? Do they really want to get involved in the "big time" radio mess anyway?

Y. A. Chai

Yester-Year Pirating

Operating a transmitter without a license is as old as radio itself. In its early days unlicensed stations were strictly the realm of radio hobbyists. No one else understood how radio worked, much less knew how to build such a device.

Radio programming as we know it didn't exist, nor did regular hours or a specific frequency assignment for that matter. Stations operated on whatever frequency they wanted and whatever power they felt necessary. If they didn't think the frequency was right for them, or their power was not sufficient - they simple changed them! Programming included religious "Sermons", talk, news perhaps, but very little music.

The Federal Radio Commission was formed to establish some kind of order to the chaos. Some basic rules were set to paper and frequency bands were loosely defined. In 1934 the FRC was changed to the Federal Communications Commission as it took on the added responsibility of ALL electronic communications. Unlicensed radio stations still persisted.

Though given the power to enforce the new "Radio Regulations" the FCC has had some rather difficult times doing so. A case in point was station WUMS. WUMS was established by David Thomas in the early 30's. He provided a service to river boats and ferries along the Ohio river. The transmitter was homemade. The original frequency was 1235 kHz - later changed to 2004 kHz and then 1560 kHz in 1938. Programming consisted of "messages" and some entertainment. Perhaps this was the first "Travelers Information Service". The station had never obtained a license.

The FCC cited WUMS for operating an amateur radio station without a license. In 1939 the case appeared in Federal Court. The Federal court viewed the evidence and decided WUMS was not operating on the amateur bands. WUMS therefore was not an amateur radio station and the charges were dropped!

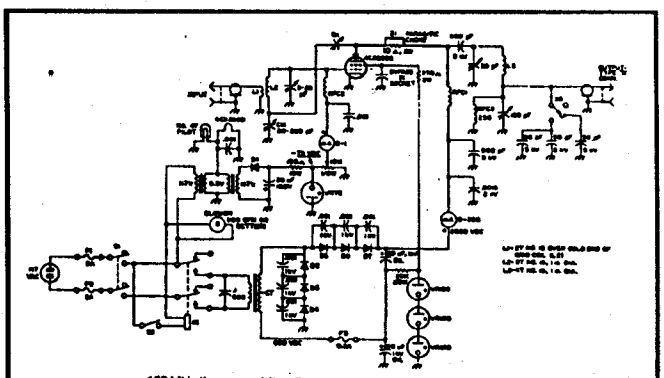
During some transmissions WUMS was heard as far away as China. Obviously the FCC could not let this go on so again the station was cited. The year 1948 - 9 years after its first citation! The FCC was taking no changes this time. They prepared what they felt was an "air-tight" case. The costs of preparation, and prosecution in Federal Court, cost close to $10,000 - a lot of money in 1948! The case was thrown out of court!

After almost 50 years of operating without a license, WUMS left the air in the early 80's. Its transmitter has joined the many artifacts at the Smithsonian Institute in Washington. That's pirating!

Modern-Day Pirating

The following is a typical 150 to 250 watt linear amplifier schematic. It is very similar to that used in commercial broadcast FM transmitters. Typical drive required for full output is about 10 watts. It appears to have been originally designed for amateur radio frequencies

Circuit was submitted to the EBN by WHPR - "Hi Power Radio", an unlicensed station, who claims to useing a modified version on the air.



150 MHz linear amplifier. Capacitors should have 1 kV rating.

Letters

Dear EBN,

Now for some good things which have been happening around here. This might be called making and renewing friendships via "pirate" radio. About 14 years ago I was doing my thing in low power FM radio in Hollywood. I made the acquaintance of one "Bib Bob" who had taken some course in radio announcing, liked much of the same music as I, and wanted to be on the air with me. We did a show for about a year on a weekly basis and had lots of fun even though my equipment was junk compared to what I have now and the signal only went a hundred feet at best.

I then moved to my present location, and my friend never drove a car, but used city buses for transportation. So with the greater distance and so on we lost touch with each other. It then turned out that Bob moved to within four blocks of my present location a few months ago, but I only found this out last December. I was on the air on a Sunday as usual broadcasting the "Subgenius Hour of Slack" show when my doorbell rang. When I answered, someone was standing there with a portable radio which was tuned to my station....no not the FCC to my relief, but none other than "Bip Bob" after all that time! He'd been hearing the show for a few weeks, and finally realized it way my station and got my address from a mutual friend. We are back together , and will soon resume our old style fun shows. Bob is living in some kind of boarding house and several others there are listening to my stuff as well.

Now for some different but equally interesting stuff. Thanks to your EBN, I figured out that the Arabic station I heard last spring must be the one called "ET" a few issues ago. He's re-appeared again, and since mid December last year has been putting out one very strong signal here, this time on 91.1 instead of former 90.3. I taped part of his broadcast which contained his phone number and PO Box address. I called and it was indeed the station you featured as "ET". It is called "--------" and is specifically aimed at the ------ community but they speak perfect English and were very friendly and eager to talk. I've since written to "ET" and hope to hear from him soon. He's very professional sounding, and has a remote controlled transmitter site. Seems like the most ambitious "experimental broadcaster" I've heard of to date. I hope to make "ET's" acquaintance and see his set up.

Have you ever listened to Glenn Houser's "World of Radio" show on WRNO shortwave? He not only gives info of interest to the short wave listener, but also covers "pirates" on AM and FM as well as shortwave, and talks about current stuff at the FCC and new equipment, etc. One of his recent shows was of particular interest. Apparently some revisions have recently been made to Part 15 Rules and limitations to low power stations is more liberal now. Also FM is permitted. What the exact technical restrictions are he did not say, only that several companies are now marketing low power transmitters for both AM and FM and that in his area real estate companies are using these devices along with a machine playing a tape loop to advertise houses for sale. On HCJB's DX partyline show I heard their medium wave (AM) commentator in Colorado say that he had heard one of these transmitters on the air and tracked it down to a location over two miles away! I'm sure you're up on this stuff, but some of these shows for short wave listeners can sometimes give us experimental broadcasters some news of interest as well.

73's

Roger

Letters, continued

Dear EBN,

Thank you for the lesson. I guess I am too used to finding correct information in technical books to be suspicious. Besides, the information in the rest of the book was pretty good, I didn't think to doubt Zeke's word. I just wish your help had come a little sooner.

I found a cruddy-looking transformer that checked out in a old PA amplifier and I wired it into the circuit. I warmed it up into a dummy load, checked for proper voltage at the tube pins, and found all correct according to the diagram. I decided to go on the air for a short test.

I arranged for a test with a friend about 2 miles away at 3:00 A.M. on Sunday morning, and tried my tune-up on 88 MHz. My friend heard a carrier on that frequency, all over the F.M. band, and saw it producing "neat diagonal lines" on every V.H.F. channel on his T.V. Needless to say, I shut down, and haven't switched on since.

I am now the proud possessor of a nicely constructed, steel-cased, high power RF jammer. Now, I'm going to try building the 5 watt unit on the lower half of the page. Perhaps this time I will get on the air.

Thanks,

P.D.

Please inform us when you change your adress. Now that we're bulk mailing the EBN with the notice (Address correction requested) on the envelope you'll still get it - but delayed several weeks. This is because the post office takes to to 3 weeks to return it to us with the address correction. We then send it to the new address by first class mail. The whole process can take as much as 30 days.

Please also note the date on which your EBN subscription expires. It's located at the upper right corner of your address label. Please renew early to avoid missing an issue.

Introduction - FMedia, continued

The history that I found particularly interesting was that of the San Francisco-San Jose Area of California. It brought back memories!

1964 KWME/KDFM : Originally founded as K...Warner, Morse, Edwards - the names of the owners. Second FM station in the San Francisco Bay Area to install the latest technology - a STEREO GENERATOR. The CE was *Ernie Wilson*. Sold to Petler Advertising who changed the call to K...Diablo Fine Music (located near Diablo Valley). Wilson remained as CE. Sold to Schofield Broadcasting early 80's.

1970 KVHS : Actually went on the air April 1969 with a licensed 16 Watts ERP from Clayton Valley High School (Concord). CE/faculty advisor/broadcast- electronics teacher until 1978 was *Ernie Wilson*. Original frequency was 91.1 MHz but was changed to 90.5 MHz at the request of KCSM (College of San Mateo) so they could increase power by moving to 91.1 MHz. The move to 90.5 MHz by KVHS also permitted an increase in power. Increases were to 250 watts, 1000 watts and then 5000 watts ERP over a period of 3 years. Later reduced to 410 watts when the transmitter was relocated off campus to a 600 foot high hill a few miles away. Although decreased in power - coverage area tripled! Several broadcasting students worked part-time at KDFM above, its sister AM station KKIS, and a nearby AM day-timer KWUN.

1976 KPOO : Started by the son of a Rabbi, Meyer Gottesman, as "poor people's radio". A group of citizens desiring to help the poor, homeless, indigent and "hippie" population of San Francisco. Some of the equipment used at KPOO was surplus from KVHS. Wilson and Gottesman had numerous discussions during KPOO's construction.

Ah.....memories!..... (anybody hear a horn blowing?)

Unclassified, Barter, Trade, Bulletins

FOR SALE: 3 items.....(a) Cart machine, Tapecaster (mono), 700-RP, Excellent condition. W/extra motor $325.00 or best offer. (b) SWR-Field Strength meter (Selfix) Model 6681. $20.00 or best offer. (c) Stereo Mixing Console, Atus- AM500 (brand new - never used). * stereo inputs, 2 mic inputs, EQ and much more. Only $225.00 (retail $370.00) Perfect for experimental broadcasting.

Contact: Jim Klauck (203) 726-9083

FOR SALE: 1 watt F.M. transmitter, incredible sensitivity, adjustable from 70 - 230 MHz. Includes instruction manual, $50.00. Write Paul D., PO Box 14204, Phoenix, AZ 85063

FOR SALE: ICOM 45A, 450 MHz amateur band mobile transceiver. Used once - original box and manuals. Make reasonable offer. Also have TrippLite 450 watt power inverter (12 VDC to 117VAC), Best offer. Ernie (916) 534-0417

FOR SALE: Panasonic Technics SP-10 MK II in factory base w/Autdio Technica tone arm; SL-100A & SL-1200 MK II TTs; Stanton 310 TT preamps, new (2). Best Offer. B Royster, KQM, 1019 Cordova St, San Diego CA 92107. Phone (619) 223-3413

Experiments with FME Loop Filter Improves Performance

Several of our "technical type" EBN subscribers have passed-along the results of their experiments in past issues. The sharing of radio and radio circuit theory is what this publications is all about. We appreciate all the input we can get.

The latest communication included a trial modifications to our Panaxis FME circuit. Although it has not been thoroughly tested in our lab it appears to have merit.

The Low frequency response and stereo separation may be improved by adding a small value electrolytic capacitor to the output of the loop filter. The most recent version of the loop filter shows this addition as C31.

The latest printed circuit includes a "universal" output configuration. This permits the choice of several possible output circuits. Anything from the conventional series or parallel tuned circuit to that of tunable low-pass or band-pass circuits may be employed. Trimmer capacitor and coil pads are arranged so they can accommodate either series or parallel installation.

We encourage experimentation for the sake of knowledge. See your local library for books on VHF solid-state tuned circuits. Pass along your successes (and failures) to the rest of our readers.