Experimental Broadcaster's

Newsletter

Volume 6, Number 4
April 1989

As Gomer Pyle used to say, **SURPRISE, SURPRISE, SURPRISE!** (The EBN is on time for a change). Ed. Guest editorial follows:

In The FCC's attempt to let the market place partially govern broadcasting, bags of worms keep popping up. For example, are we really any closer to an AM stereo standard? Leonard Kahn (KAHN system) is still engaged in lawsuits with Motorola (CQUAM); Canadian stations have AM stereo; The U.S. apparently is still divided into three camps, go with CQUAM, go with KAHN, let the whole thing go to ----.

Not only is AM Stereo still in a quagmire, FMX - touted as a major break through - is running into trouble. Some feel the NAB stands to gain monetarily from FMX - thereby creating a conflict of interest. An FM reception study done by Bose Corp. and the Massachusetts Institute of Technology (MIT) gave poor grades to the system. Even the proposed "Super Radio" turned out a dud.

Then there's the matter of terminating the Radio Telephone First Class Operators License. Transmitter operators now only need a Third Class Permit - easily obtained by answering a few non-technical questions. Repair of the transmitter is supposedly done by persons with a technical knowledge and who can accomplish the task safely. Station owners must decide who is competent to do so for their particular stations. But what about "el cheapo" owners that hire less than competent personnel to save a buck.

Other areas alive with comment and criticism are "short spacing" between FM stations, relaxing the IF interference specifications, translator abuses, proposed state licensing of broadcast engineers and techs, and a lottery scheme to decide which applicants actually get a station authorization. Where do we draw the line between "free speech" and "obscenity". Is broadcasting truly a world of politics, power plays, lobbyists and games of chance?

Where in all this is broadcasting addressing that warn phrase:

"In the public interest".

Elliott P. Farquart

(Comments invited)

In This Issue:

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Letters From Our Readers

The Kranker Broadcasting Corporation
WIBK MusicRadio

March 17, 1989

Greetings to "Experimental Broadcasters Newsletter" readers from WIBK, "The Kranker Broadcasting Corporation!"

A friend recently showed us a copy of your fascinating publication. Our station has a long and elaborate history too lengthy to describe in one letter. Some of the air personnel who started at our station went on to bigger and better things, as we are near a major market, but the core of air personnel who were part of it from the beginning, are still involved or at least interested.

WIBK signed on more than 12 years ago on 1580 AM with different call letters. What eventually became our permanent AM transmitter was a Hallicrafters BC-610H extensively modified, and configured to operate at 500 watts utilizing 4-400 tubes in both final and modulator. In 1982, the station was actually moved to a new location at great discomfort to our backs, carrying plate supplies and digging ground radial systems!

In the Fall of 1987, we acquired FM equipment, however, and set this facility up at an entirely new location. This year (1989), we will be moving the AM transmitter again (groan!) to the FM site, and for the first time, simulcasting on both FM and AM, and also making arrangements to install a new Cetec console. We will have the option of running separate programming on AM/FM.
Our FM station operates typically at about 130 watts.

Our format largely consists of a unique oldies/recurrent/current mix ("Better Music Then and Now") that is rotated on a card file system developed and maintained on a Macintosh computer. We

Stereo FM 96.7 / AM 1580

It appears "John Paul" (Jones) knows the difference between Night and Day . . . . . (Lee Knyte and Tom Deyh). No address was written on the envelope so I assume they don't want their real names OR their address known.

When you get a chance fellas - send in some pix of your equipment and studio - ok?

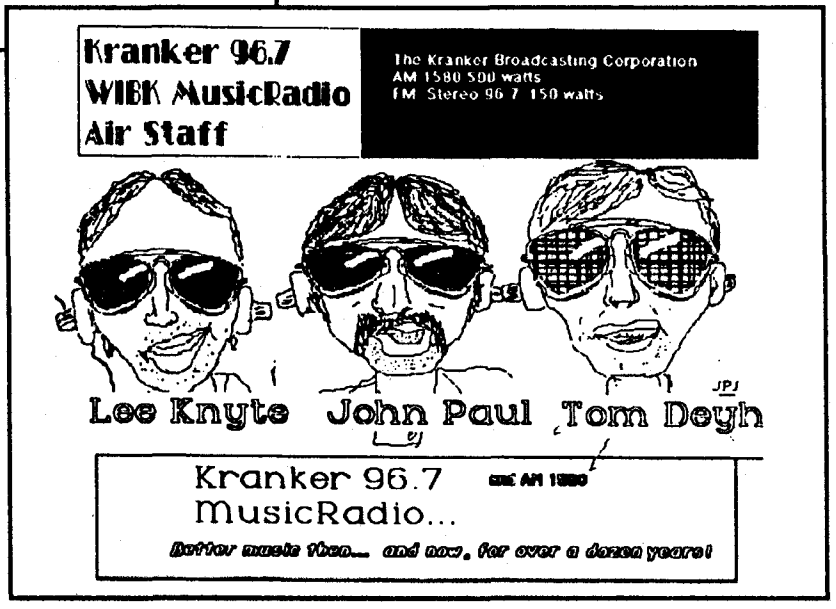
Ed.

FCC Tid Bits

Congress and ex-President Reagan had different ideas of what direction the FCC should take in regards to broadcasting de-regulation. The result was 2 openings on the Federal Communications Commission were left unfilled since 1987.

President Bush is expected to make appointments to these two openings shortly, perhaps hoping to get Congress to work with him not only on FCC matters but other matters as well. There is even the possibility that Bush will replace the present FCC Chairman, Dennis Patrick, although his term is not up until 1992.

What kind of trickle-down problems will arise from all of this is anyone's guess. The FCC was going strong on de-regulation, had a small budget, and could not effectely police much less enforce various Rules. Pirate radio for example has had little difficulty in the last few years . Certainly some Pirates were shut down and fined - but these were ones that chose a "high-profile" which the FCC couldn't ignore. The "low-profile", non-interference Pirates have been untouched, some having operated for several years without mishaps.



Letters, Continued

run promos, PSA's--pre-taped and live, and "freebie" commercials, news and weather along with the music, and some special programming. In other words, we are pro in every sense of the word. We have over 500 carts in our collection (mostly Audiopak A-2's and A-3's), a growing CD collection, thousands of 45's and LP's. The "vinyl" disks are rarely used on the air these days, and the turntables are used primarily for carting up material. We have worked professionally in the business, and hope to turn the Kranker into something important one day.

Our studio equipment currently consists of:
3 Tapecaster cart machines, 1 BE cart machine, 2 Technics MK1200 turntables, 1 Fisher CD player, 2 Sony TC-765 and 1 758 reel deck and several other decks, our faithful home built stereo console utilizing T.I. bi-fet chips, DBX processing, and other goodies.

Our transmitting equipment consists of:
FM- Gates (Harris) M-6095 exciter
Gates M-6146 stereo generator
military surplus VHF RF amp (Philco mfg). model AM-912 currently utilizing 4X150 final.
AM- Hallicrafters BC-610H military surplus extensively modified.

Our antenna designs are simple and relatively inexpensive.
The AM design is the most cumbersome, as it is a helical wound design supported by a heavy wooden structure built from 20 foot 2 X 4's. The active part of the antenna is plastic tubing wound with the appropriate number of feet of copper wire for our frequency. When it is impractical to erect a tower of appropriate height for AM, this at least allows the proper electrical length (if not physical) to be reached. This structure sits in the center of a traditional design (scaled down) ground system common to all AM systems.
The FM antenna is a Cushcraft AR-2, currently positioned about 35 feet above ground.

Perhaps after installation of the new console and AM equipment, we can send you some photos of our facility.

Sincerely,

WIBK AM/FM, "The Kranker"
J. P. Jones V.P. & C.E.O., C.E.
J. P. Jones
Tom Deyh Prog. Director
Stereo FM 96.7 / AM 1580

Mini - Lesson (RF Coil Calculations)

Andy from England called today and brought to our attention that we didn't give any specs on the coils used in the "Lighthouse Keeper's Filter" which was shown in EBN Vol. 6, No. 2/3.

Coil winding has always been a little scary and perhaps little understood by those just starting in electronics work. Much of electronics seems like a bit of black magic but rest assured coils can be fun.

A of wire of any length exhibits a characteristic called inductance. The inductive value increases when the wire is formed into a coil. Inductance is measured in units called Henry's , named after Joseph Henry - a physicist who did a lot of experimentation with magnetism.

Continued on page 4

Dear EBN:

Regarding article on GMRS in your latest issue:

Asking the FCC field office for info on GMRS is not a good idea, in my opinion...It's likely that the local field office is in the dark about GMRS. I also do not recommend going to local two-way radio dealers for advice if one is new to the service. GMRS was almost fatally screwed by the two-way industry and by FCC ignorance.

Of course, the situation has turned around as GMRS personal users organized and demanded FCC action to improve the service and add more privileges. The recent rules changes you wrote about are an important step. The service still has problems but fortunately there is a support group.

It is the best source of GMRS info barnone - - the Personal Radio Steering Group, Inc. (PRSG) out of Ann Arbor. Not-for-profit group. They publish the Personal Radio Exchange (PRE) newsletter and tons of information literature on how to license, how to choose equipment, etc. Free info is available for SASE.

The PRSG runs a 24-hour computer bulletin board at 313/995-2100 (300/1200/2400 baud) with news bulletins and introductory info on the service available to any caller. PRE subscribers can access the conferences, swap shop, etc.

I have authored articles on GMRS in Popular Communications magazine. The latest article, explaining the changed rules, will appear in a few months.

The address is:
Personal Radio Steering Group, Inc
PO Box 2851
Ann Arbor, MI 48106
313/MOBILE 3 voice line

Benn Kobb KC5CW / Federal Communications TechNews

P.S. Loved that photo of R. Caroline

Letters, Continued

Dear EBN,

I managed to turn up a really good commercial grade 4-bay FM antenna at a flea market. Its installed but I haven't yet been able to use it. Here is the reason:

I was working alone on the top section of my new 80 ft. antenna tower. When I had completed my work, I discovered that I had, over the course of several trips up the tower, brought up about 300 pounds of tools and spare hardware. Rather than carry the now unneeded tools and hardware down by hand, I decided to lower the items in a small barrel by using a pulley which, fortunately, was attached to the gin pole at the top of the tower.

Securing the rope at the ground level, I went up to the top of the tower and loaded the tools and hardware into the barrel. Then I went back to the ground and untied the rope, holding tightly to ensure a slow descent of the 300 pounds of tools and hardware.

Somehow I failed to consider I only weigh 155 pounds. Due to my surprise at being jerked off the ground suddenly, I lost my presence of mind and forgot to let go of the rope. Needless to say, I proceeded at a rather rapid rate up the side of the tower.

In the vicinity of the 40 ft. level, I met the barrel coming down. This explains my fractured skull and broken collarbone.

Slowed only slightly, I continued my rapid ascent, not stopping until the fingers of my right hand were two knuckles deep into the pulley. Fortunately, by this time I had regained my presence of mind and was able to hold tightly to the rope in spite of my pain.

At approximately the same time, however, the barrel hit the ground, and the bottom fell out of the barrel. Devoid of the weight of the tools and hardware, the barrel now weighed 20 pounds.

Remember I only weigh 155 pounds. As you might imagine, I began a rapid descent down the side of the tower. In the vicinity of the 40 ft. level, I met the barrel coming up. This accounts for the two fractured ankles and lacerations of my legs and lower body.

The encounter with the barrel slowed me enough to lessen my injuries when I fell on to the pile of tools and hardware and, fortunately, only three vertebrae were cracked. I am sorry to report, however, that as I lay there on the tools and hardware, in pain, unable to stand, and watching the empty barrel 80 ft. above me, I again lost my presence of mind, I let go of the rope.

Ex-tower climber, Iam Sore

Mini-Lesson (R F Coil Calculations)

Continued from page 3

In radio work we most often deal with inductances whose value is much less than a Henry. These would be milliHenry (mH) 1/1000th or .001 Henry, microHenry (uH) 1/1000000th or .000001 Henry, and sometimes nanoHenry (nH) 1/1000000000th or .000000001 Henry.

The formula for finding the number of turns required for a coil of a specific inductance must include:

The radius (r) = 1/2 the inside diameter
The coil length (l)
The number of turns required is (N)
The value of inductance is given as (L)

Like so: $$N = \frac{\sqrt{L(9r + 10l)}}{r}$$

Inside the radical we have the inductance we want specified in Henrys (L) times the quantity of 9 times the radius (r) plus 10 times the length (l). We then find the square -root of that mess and divide by the radius (r). This gives us the numbver of turns required (N).

This formula is fairly close for both space wound and close wound coils. Space wound usually means a space between turns equal to the diameter of the wire itself. Close wound is where the turns (insulated) are touching each other. An air-wound coil simply means the center of the coil (the coil form) does not contain a magnetic or metal material. The form can be paper, plastic, wood, etc. A temporary form can be a metal drill or rod which is removed after the windings are completed. The coil would then be self supporting with an "air-core".

Some other factors get into the act also. These include the wire size (diameter), the "form factor" which deals with the ratio of diameter to the length of the coil and whether the coil has a single layer or multiple layers of turns. Optimum coil dimensions are when the length is about 3 times the coils diameter. The formula above is for single layer coils and is close enough for pratical use.

The following shows typical turns required using #14 wire, air core, space wound, diameters of 1/2, 3/8, or 1/4 inch, for the inductances used in the "Keeper's" filter.

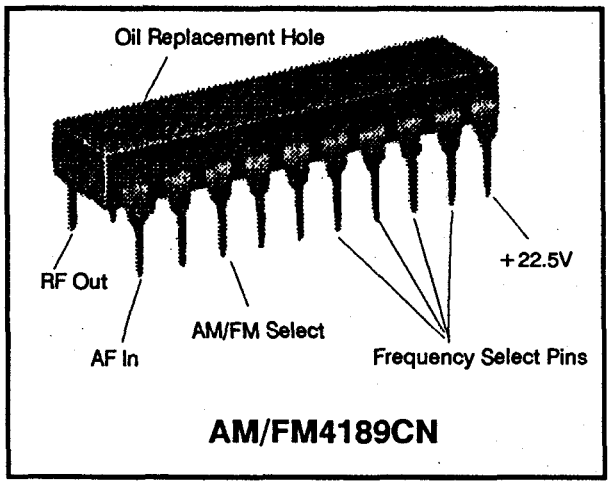
	.06 uH	.127 uH	.165 uH
1/2"	2	3 -1/2	4
3/8"	3	5	6
1/4"	4-1/2	7-1/2	9-1/2

Interesting Stuff Department

NEW PRODUCT REVIEW

It's been reported that Taxifolia Electronics of Taiwan has perfected a new X-MOS LSI chip called the AM/FM4189. It's a complete frequency-programmable AM and FM 50 Watt transmitter in a single package.

X-MOS refers to the internal structure of the transistors used in its circuitry. The early FET's (field effect transistor) such as the IG-FET (insulated gate-FET) worked fair at radio frequencies but were primarily low-power devices. Later came the V-MOS which used a "V" channel cut in a substrate with a triangular abrasive tool. Pekoe and Oolong from the Republic of China soon after developed the now well-known T-MOS devices.



The concept of an "X" channel device has been around since before the V-MOS devices were developed. The theory behind the "X" channel indicated that both a high power and Ultra High frequency device could be built into a very small package. Naturally many semiconductor manufacturers have tried to produce the device.

Taxifolia Electronics' breakthrough came with the idea of making the "X" channel with N-doped semiconductor material on a Q-doped substrate. The desired high power was achieved but only at low frequencies. This was due to the electrical "stickiness" of the Q-doped substrate. They fixed this by developing an entirely new substrate made from Gallium, Osmium, Gandolinium and Oil which they nicknamed GO-GO. This worked slick as a whistle.

Their new device, the AM/FM4189, has FOUR individual sections all on ONE substrate with 89 X-MOS transistors, hence the name 4-1-89. These are combined with on-chip couplers to make a complete transmitter. All components except the frequency programming switches are contained within the unit. Input is at pin 1, output is at pin 20.

The four sections are: (1) a Wainscoat reference oscillator. (2) a Quadruped Morgan direct-FM oscillator. (3) a Mobius strip phase/frequency comparator, and (4) push-pull cascode buffer and power amplifier.

The specifications are not too shabby either. It's supposed to have a 20 MHz bandwidth on any band from AM broadcast (545-1605 kHz) to television UHF channels at 800 + MHz. A bi-quinary thumb wheel switch connects directly to the device for finite frequency selection - in 15 Hz steps.

The 20 pin package measures only .5 inches by 1.5 inches. Operating voltage is 22.5 at an idle current of 3.6 milliamperes. At full power output, either AM or FM mode, the AM/FM4189 yields 50 Watts at a maximum current draw of 2.6 Amperes. Power output may be reduced to zero by shorting certain pins to ground.

Availability of the AM/FM4189 had been restricted to engineers and designers but is now being made available to all. A consumer (all hi-impact plastic) version should sell for about $1.49 at most electronics stores such as RADIO SHACK. Check them out, ask for it by name. The device is due for release on the first day of April, 1989.

Extended AM Band to Cover 1605 - 1705 kHz

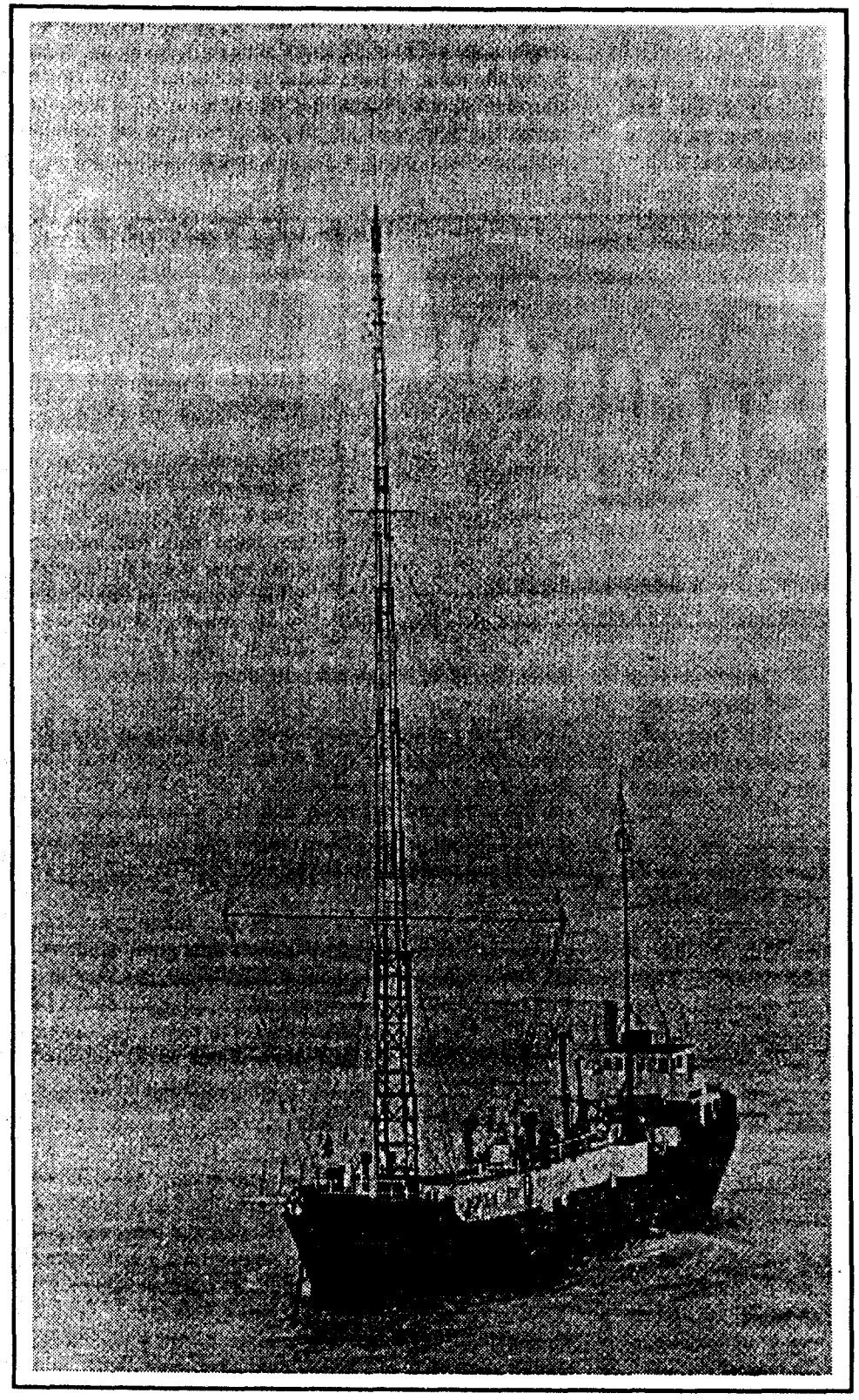
The 1605-1705 kHz band will be available to Canadian, South American and North American Broadcasters beginning July 1.

Canadian border areas have priority for frequencies of 1610, 1630, 1650, 1670 and 1690 kHz with power limited to 1 kW. Farther inland, 10 kW power is permitted as long as protection is given to stations south of the border.

There has been some talk that a no-licnese band between 1700 and 1710 kHz will be available for low-power broadcasters some time next year. Transmitter power would be limited to -60 dBk for either AM or FM. Antenna height would be limited to 300 cm above average terrain.

The FCC refuses to comment, however our inside contact reveals April first of 1990 as a possible start date.

More Stories of Radio Caroline



The second home of Radio Caroline, the m.v. Mi Amigo is shown here resting at anchor off the Essex coast.

Radio Caroline first begun its broadcasts in 1964 from the m.v. Caroline, a converted Baltic Sea passenger ship anchored in international waters off the Essex coast. Later that year she was joined by a rival operation Radio Atlanta using the former Radio Nord ship m.v. Mi Amigo. After a few weeks of operating independently, the two companies decided to merge, the m.v. Caroline upped anchor and sailed to a new anchorage in Ramsey Bay off the Isle of Man to become Caroline North serving the north of England, Scotland and Ireland, the Amigo remained in its position off Walton on the Naze covering the lucrative London and South East area of England.

The adventures and misadventures of the two ships have been well documented*, they both remained on the air in defiance of the British Governments Marine Offences Act which outlawed the pirate radio stations and were eventually silenced in March 1968 when they were towed into Amsterdam.

Publications worth reading

"Offshsore Radio" by Gerry Bishop

"Broadcasting from the High Seas" by Paul Harris

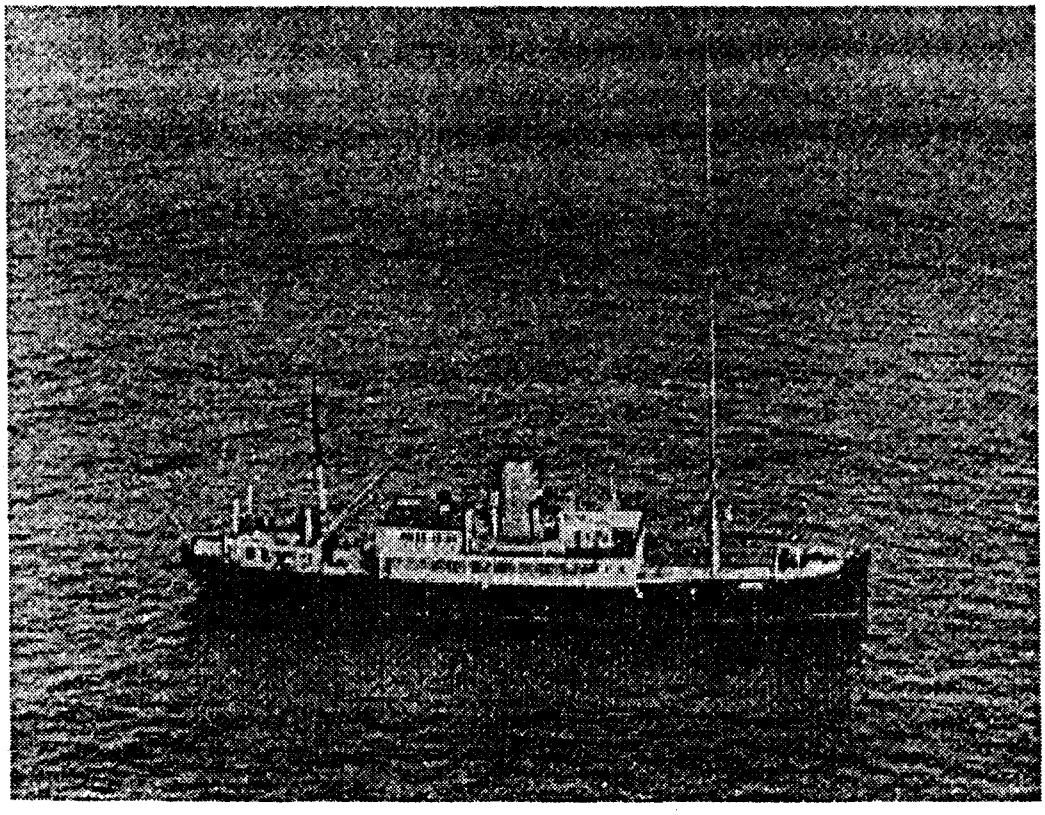
Both available by mail order from East Anglian Productions, 21-23 Walton Road, Frinton on Sea, Essex - Write first for prices.

Radio Caroline, Continued

The m.v. Mi Amigo -Studio 1

A varied Play List....

The Way of the World, Earth etal
Guitar Man, Bread
Michelle, Beatles
H2o, darrly Hall & John Oates
Synchroncity 2, The Police
Year of the Cat, Al Stewart
Break the Chains, Private Lives
This Masquerade, G Benson
Fever, Peggy Lee
Private Life, Grace Jones
Moondance, Van Morrison
Bouree, Jethro Tull
What a fool believes, Doobie br.
Kashmir, Led Zepplelin
Firebird Suite, Stravinsky
Run with the Pack, Bad Co.
Piano C. no 2. Rachmaninoff
I Love you Porgy, Nina Simone
Granchester Mdws, Pink Floyd
Minnie the Moocher, C Callaway



The m.v. Caroline, original home of Radio Caroline as she appeared in 1964.

The two Caroline ships, m.v Mi Amigo and m.v. Caroline, were towed to Amsterdam in March of 1968. They stayed there until 1972 when they were both sold.

Sadly the original Caroline ship was sold for scrap and broken up!

Radio Caroline began broadcasting in 1964. They are celebrating their 25th anniversary this year!

Bulletin Board

WANTED: Contacts swith U.S. low power broadcasters and free radio stations. I can provide you with mixeed format music programmes. I also have many mega mix/ 12" remites as these are for the European market they could well be different to the ones in your collection. Please send replies to the EBN. Mark Richards - NFM Radio - England

HELP: I need help in getting my own cable FM station off the ground. Broadcasting is a new beginning for me, but I am persistent. I have gotten as far as writing a proposal to my area cable company. No Resuslts. Seems like California is far behind when it comes to serving its communities. I have all the nessary equipment needed with the exception of a stereo generator/FM modulator but that's not really a problem. I would be glad to hear from any EBN subscriberss with help or further info on cable broadcasting. Contact Garland Drake, 2955 McKee Rd., San Jose, CA 95127

FOR SALE: EPSON PX-8 lap top computer - - complete with word processor, calc., basic and more software! Included are an internal modem and one external modem (for when on the road) and EPSON printer! Computer and accessories are only six months old - - have to sell! Asking $500.00. Call Jim for more info. (518) 7902-9290

FOR SALE: Liquidating radio station - must sell all equipment! Included are EV mics, Carts, Spring Booms, Shock Mounts, CD Players, etc. All in excellent condition. Make offer or ask for more info! . . . .ALSO. . . . TAPECASTER 700 RP Cart Machine with extra motor, excellent condiition - $375.00 . . . . PANAXIS Stereo Compressor/Limiter. Built recently - sounds HOT! Asking $110.00 . . . . 10 Watt FM transmitter. Recently built, excellent range and sounds great! Mounted in 19 inch panel and chassis, tunable from 89 MHz tq 108 MHz. Asking $450.00. Call Jim (518) 792-9290

WANTED: AM100 with PS700 power supply and AMA5000 in working condition. Albert, (714) 531-6052

FOR SALE: LPB AM Carrier-Current System: TX-20, 20 Watt transmitter with factory optional audio limiter board, LA2-20 2- Watt Linear RF Amplifier (repeater), T-8 Power Line Interface (one only), two-way power splitter, three-way power splitter, two user manuals, Mint condtion. Asking $1150.00 (delivered). For more information, photos, datdasheet, send SASE to: PO Box 4702, Martinez, GA 30917.

FOR SALE: CBS AUDIMAX III (AGC)$200.00. HARRIS Peak Limiter M-6631 - Solid Statesman FM limiter, $250.00 or $400.00 for both. Also SONY 377 reel-reel 1/4 trach tape deck $150.00 plus shipping. Contact H. Edgar Cole, 1108 Bartow Rd #i-101, Lakeland, FL 33801

FOR SALE: Various computer goodies for IBM (AT) or compatibles. Video Seven VGA graphics card - drives any type of monitor, even 800x600 super VGA. Video Seven VEGA-Deluxe, runs any kind of monitor (except VGA) - produces 640x480 VGA resolution however on Multisync type monitors. Also J-Laser printer driver - used for FAST printing of text and graphics on Hewlett-Packard LaserJet II printers. All include manuals and current software. Call to discuss your needs. Ernie, (Panaxis) (916) 534-0417.

CREDITS: Thanks to our good subscriber friend in England for the Radio Caroline Souvenir book. It is from this book, compiled by Andy Archer, that pictures and history of Radio Caroline have made it to the pages of the EBN.

CREDITS: Thanks also to World Radio magazine from which we excerpted the "tower" story and modified it for publication in this issue of the EBN.

NOTICE: EBN subscriptions for the first year are $20.00, 6 months for $12.00. Ongoing renewals are $18.00 a year. Check your address label - it shows you when your subscription expires. Renew promptly so you won't miss an issue. We need a few more subscribers to keep the EBN healthy. Tell your friends.

NOTICE: Please let your editor know if you're not receiving your EBN in good condition. This new folded format may not make it through the mails too well. Two covers from the last issue arrived safely but without the newsletter inside.