EXPERIMENTAL BROADCASTER'S NEWSLETTER

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THE SKY'S THE LIMIT!

Poor Captain Midnight.....The FCC must have had to put their best detectives on this case. As you may remember Captain Midnight skillfully overrode HBO's ground-to-satellite signal with his own. The result was a "statement" that when the public is upset about something they will find a way to react. Captain Midnight's statement was heard (and seen) by a million plus people. Now that's REAL pirating!

The FCC of course HAD to find him. They can't allow the entire future of the satellite services to be put in danger. By a process of elimination they concluded that only a few large-dish facilities were available for such a venture. In addition that dish and transmitter would either have to be more powerful than HBO's or be in a better transmitting position. Since the satellites are in geosynchronous orbit above the equator they reasoned that the transmitter would have to be in one of the southern states.

They found it in Ocalo, Florida. Captain Midnight was fined $5000. He also lost his amateur radio license - pity....

For that kind of exposure and notoriety $5,000 is not too bad of a price tag. In "prime time" on network T.V., you can easily spend that much for a few seconds of advertising (while the viewers run off to the bathroom or "frig"). Captain Midnight had the FULL attention of HIS audience, and will be long remembered.

FOOD FOR THOUGHT

So you've always wanted your own radio station. Have you considered forming a corporation and selling stock? If we could get 100 EBN subscribers to kick in $1000.00 each we would have enough for a sizable down payment on an existing station. No, I don't have any particular station in mind - I don't necessarily have $1000.00 to put into one either..but it's a thought.

IN THIS ISSUE

We could use some pictures of any station changes or any new arrivals on the scene. We have some words from KKTO, a mini-lesson on phone line feeding, and a schematic for a 15 watt shortwave transmitter from Europe. As always, we'll appreciate hearing from you!

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NICE TO KNOW STUFF

Bill D. of WKXN has sent along some interesting phone numbers. If you want to add a little pizaaazzzzz to your news and PSA's your should give these a try. These are all TOLL FREE numbers so you have nothing to lose:

800-424-8807 U.S. Dept of Transportation Audio Service
800-424-0214 Educational Office Broadcast Service
800-424-9090 White House Press Office
800-621-8094 American Medical Radio News
800-368-5744 AFL-CIO Audio Service
800-424-8086 National Education Association Hotline
800-238-5342 National Cotton Audio Service
800-424-9820 Citizen's Choice News
800-424-5040 National Assoc. Manufactures Dial
800-368-5667 Business Line

A larger list should be available in future issues. Bill apparently has some more he's working on. If you have some programming sources or contacts that could be helpful to other EBN subscribers , and would like to share them, we'd like to hear from you. Remember, up to a point your PSA's, NEWS, WEATHER, REPORTS, will make your station sound more "professional".

Short wave radio station applications are on the rise. While Europe has had numerous SW broadcast stations for years the U.S. has only been slightly interested. That seems to be changing. This might be a whole new approach to getting on-the-air , WITH an FCC license. We're not talking just local anymore..this is "world-wide" broadcasting! It may not be limited to plain AM either. Station NXDE plans to use the Kahn/Hazeltine AM stereo system (apparently because it offers less "platform motion" on high frequency transmissions). Stereo AM on SW is new to the FCC of course so they don't know handle this one yet. It also appears that Sony is "gearing-up" for just such a possibility. They are looking into Stereo shortwave receiver manufacturing. It may be that one day EVERY radio will be an AM,FM and SW - stereo type. For more info on NXDE call its founder, H Dickson Norman, at (205) 749-1898.

WHAT'S NEW AT THE FCC

The FCC is releasing public notices which list FM construction permit applications. These contain the name, address, state, frequency and file reference number. Included are applications which have been received but not yet accepted and those which have been found unacceptable for consideration. If you're thinking about trying for a licensed station you should look into all the info you can get. For more information call George Enuton (FCC) 202-632-6908.

A LETTER FROM THE "DARKSIDE"

KKTO FM, THOUSAND OAKS, CALIFORNIA, went dark last February. The knock on my door wasn't my Avon lady bringing gifts of Men's Cologne. Instead I was greeted by two little old men who presented BADGES. Yes, they were from the FCC and wanted to "inspect my station".

Following the inspection of my transmitter I asked who turned me in. Was it KNJO?...No KMDY?....No "Then WHO?" I asked. If their answer doesn't grab you by the long wire then nothing will....it was the OTHER pirate station in town!

Before they left I felt it was my obligation to return the favor. Of course they'd go right over and shut him down..right?.....WRONG To this date the FCC has not only not shut him down but they have agreed with him to let him know when they'll BE in town. This way he can shut down just while they are there. If this isn't a case of out right discrimination I don't know what is.

Because of the enormous debt KKTO incurred in 1985 ($15,000) it was forced to sell off its equipment - both transmitting and production. As you may recall from our November 1984 article, KKTO operated 3 separate stations - 2 FM's plus and AM with 2 repeaters. The FM operated on 102.3 at 35 feet above ground, 130 ft HAAT and 900 above MSL.

We had a strong position here in Thousand Oaks with our NEW WAVE/dance format. In fact if was so popular that KROQ (Los Angeles) began to implement it themselves! We know this because on 4 separate occasions they announced on the air ....If you like that pirate station in Thousand Oaks you will LOVE the new KROQ.

We gained a 90% penetration among students attending 3 local high schools, 1 college (Moorpark), 1 University (Cal Lutheran), and the Dallas Cowboys training camp (could listening to KKTO while training have made them #1?).

Because of what we feel is discrimination on the part of the FCC, and on advice of several lawyers, KKTO will return to the air upon completion of our new transmitting facilities. Two working control rooms have already been acquired.

The new KKTO will operate on 90.3 at an HAAT of 350 feet and 1800 feet above MSL. We'll have line-of-sight of the California coast from Port Hueneme to Santa Barbara plus 7 other high population areas including Camirillo (35,000), Fillmore (20,000), Moorpark (13,000), Newbury Park (7,000), Oxnard (105,000), Santa Barbara city (85,000) suburbs (25,000), Simi Valley (100,000), Thousand Oaks (100,000), and Westlake Village (12,000). This is a potential audience of 500,000 +!

All this is line-of-site (remember the EBN Mini-Lessons!), the elevation is good, and 40 watts ERP should make a good showing. The transmitter will be located in a MILK TRUCK along with a small studio. All the music will be on HQ cassettes and 6 dual JVC decks with Dolby C. Mixing will be done with a Sony Mixer. Audio quality should be superb.

We intend to return to the air in September 1986. We'll resume our old (and very successful) format. Six of our former disc jockeys have agreed to return also. It will be a time to remember!

I have learned several things during all of this. A citizen has rights! Most people don't know their rights however, or choose not to ignore them. These rights are for your protection, KNOW THEM and use them to your advantage! For example,(1) you don't have to let FCC inspectors on your property (2) they must show their ID on request (or demand) (3) before your let them on your property demand to see a VALID search warrant (4) you are not REQUIRED to accept certified or registered mail (if you accept it the courts may assume you have read it) (5) sign nothing (remember you have to SIGN for a certified or registered letter) and ADMIT TO NOTHING (6) never volunteer any information (7) if they ask where you got the transmitter tell them "from a little old lady in Pasadena"..be cool!

I have spoken with an attorney and it appears the FCC has left itself open for a lawsuit by their apparent act of discrimination. As you know, while in litigation I will be able to continue to operate. It could take years for the courts to act.

Pirate broadcasters must unite if we are to get any laws changed. Don't forget the airwaves are for the public. Know your rights. Exercise them. Seek legal advice. Don't be intimidated.

Our sign-on (and maybe our new address) will be announced in the up- coming EBN. Keep those cards and letter coming. Steve W.

KKTO Radio
KARIS COMMUNICATIONS

FLASH: One of our subscribers just called to let us know he has a working prototype of a circuit he put together. He is now producing AM stereo by the Kahn system. As soon as he's able he'll get a schematic to us. The C-QUAM system may be losing popularity. If anyone has any input of AM stereo development let's hear about it!

MINI-LESSON More on the care and feeding of audio lines

Every now and then we are faced with getting our audio from one place to another by means of wire. The wire itself offers little opposition to the transfer of audio signals but that wire's surroundings are a different matter.

A characteristic called capacitance exists between any two conducting surfaces. Two wires running along side of each other, or one inside of another (coaxial cable) have some value of capacitance between them. Capacity tends to keep the voltage across it from changing. The term Capacitive Reactance refers to this opposition to change. It is mathematically defined as Xc = 1/ (2 pi x f x C) where pi = 3.1416, f is frequency, and C is capacitance in Farads. Xc is measured in Ohms.

Note that as the frequency of change increases the opposition gets greater (Ohms are less). This capacitive reactance affects the transmission of the higher frequencies. For example, suppose you have an audio line 100 feet long which has a distributed capacitance of 5000 pF. Using the formula you'll find Xc to be about 1600 Ohms at 20 kHz. This poses no big problem if the standard 600 ohm (broadcast) load is used. The total impedance is still very nearly 600 ohms. We've exaggerated the values here to illustrate the point.

If the line length is increased to 200 feet, the total capacitance increases to 10,000 pF and the Xc drops to 800 ohms. The vector sum of 600 (resistive) and 800 (reactive) = about 400 Ohms. I don't want to go into a vector analysis here so just take my word for it - if terminated with 600 Ohms, the level at the output end of the cable would be about 70% of that at the input end. Your audio would be down about 3 dB at 20 kHz.

Of course this gets worse as the line gets longer, or if you have a high capacity line, or if you try to get a higher frequency through it. The way around this is to use a lower value termination. A rule of thumb is the load should be 1/10th or less of the reactance. For our 200 foot example therefore the load should be 800/10 or 80 Ohms or less. Under these conditions there is only a 1% loss.

This is also true when using telephone lines for audio. Telephone lines not only have capacitive reactance but also inductive reactance. The amount of inductance is dependent on the length of the wire, not how close it is to another wire. This reactance is in series with your audio but does the same thing - attenuates your audio if the line is longer, or the frequency is higher. Again, the technique is to use a lower value of load to compensate. The following page shows methods of connecting transformers to compensate for long audio (telephone) lines. Also included are two passive limiters (to keep your audio from cross-talking to adjacent telephone lines). Phone line level should be less than 10dBm.

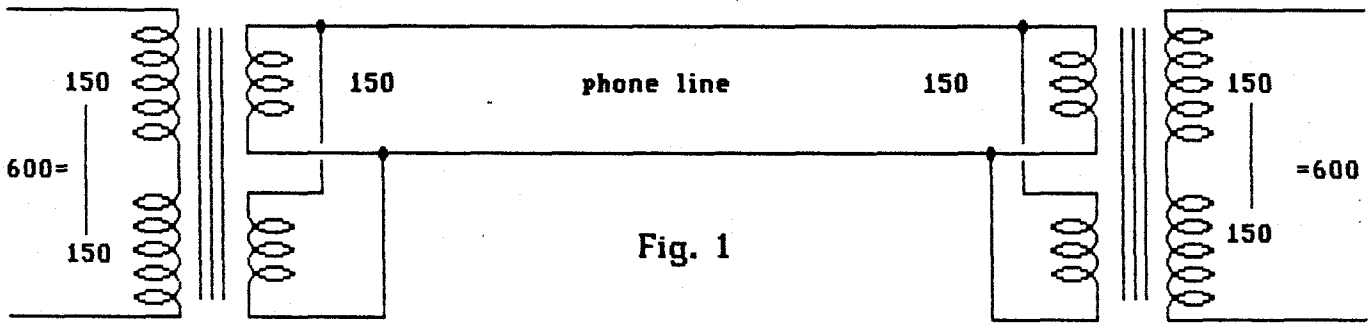


Fig. 1

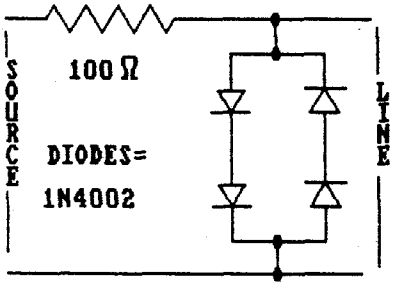


Fig. 2

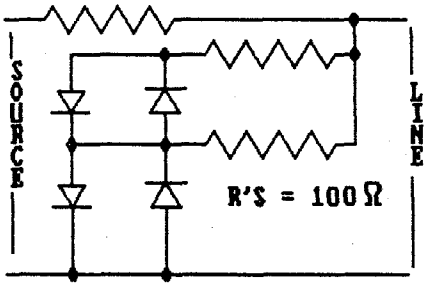


Fig. 3

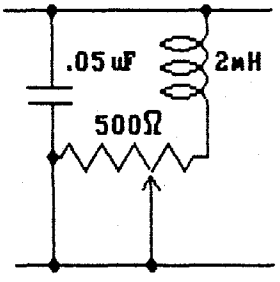


Fig. 4

Fig. 1 shows a dual 150 ohm primary and secondary transformer. One of the characteristics of inductance is that it increases (or decreases) as the square of the turns ratio. This simply means if you double the number of turns the inductance increases 4 times. Therefore...if two windings of the transformer are connected in series (twice as many turns) the impedance also increases 4 times. In this case from 150 ohms to 600 ohms. If the windings are connected in parallel they simply appear as a winding with larger diameter wire...the impedance is still 150 ohms in this case. The 150 ohm connections of each transformer are connected to the phone line. The 600 ohm connections are your input and output (studio end, transmitter end).

Fig. 2 shows a simple limiter circuit. A series resistance is connected between your source and the line (or transformer input). A double set of back-to-back diodes turn on whenever the line level rises above 1.6 volts peak-to-peak. The excess voltage is dropped across the 100 ohm resistor. Output never exceeds 1.6 volts p-p.

Fig. 3 is a variation that produces a softer limiter. At a level of across the output. Since the series and shunt resistors are equal in value the voltage is halved (-6 dB). If the input level continues to increase past 1.6 volts p-p the upper diodes turn on shunting the output with 47 ohms. This drops the output to 1/3 (-10 dB).

Fig. 4 is a resonant parallel circuit with a resistor between the coil and capacitor. When the resistance is maximum (swinger to the left) the circuit has little affect. As the resistance is decreased Swinger moved to the right) the high frequencies on the line are boosted. This is a simple equalizer used to compensate phone lines but can be used on any type of audio line.

WANTED, FOR SALE, EXCHANGE, BARTER, TRADE, BULLETIN BOARD

EXCHANGE: Cassettes on a one for one trade. Want air checks of pirate AM,FM,SW stations worldwide. Foreign replies are most welcome - English language preferred. Inexpensive C60 cassettes ok. Would also like to hear from EBNer's in my area for a possible get-together. Contact Bill Coleman Jr, 114 Circle Drive, Rocky Mount, NC 27804

WANTED: Used stereo cart machines for a student run station. Contact Ron Badger, 1616 Slate Run Rd, New Albany, IN 47150

FOR SALE: GATES YARD with power supply. $300.00 plus freight. Contact John Hart, 4437 Jeanne, Virginia Beach, VA (804) 499-8146

FOR SALE: Lots of electronics stuff that's cluttering up my shed. 150 to 174 MHz tube-type receiver strips (Motorola), ICOM 45A amateur 430 MHz transceiver (new in original box) with programmable mic, Amplica satellite receiver, LNA, downconverter (never used), computerized dish positioner (MTI) used as demo unit only, Chaperral polarotor. Heavy duty power supply +12, -12, +28, +36, all at 1 amp or better. Also have 600 ohm broadcast type (mono) step attenuators (for building your own console), strip-chart recorders, 1 amp and 5 amp VARIACs, 4CS250B 250 watt power tetrode tube (in original box- never used), and Millen grid dip meter (needs tube). Also have big power supply for 12 and 5 volts up to 20 amps or so (weighs 60 pounds). Double sided pc board, unetched, 2 oz copper, 1/16th inch G10 epoxy glass...good stuff to make your own boards. Make some kind of reasonable offer on anything of your choice. Call Ernie (Panaxis) at (916) 534-0417 to discuss it.

FOR SALE: Two CBS Stereo Volumax peak limiters, unmodified, good condition. $160.00 each or best offer. (203) 336-5606

WANTED: Most recent copy of DESQview software with manual. Will trade for equity. Also interested in internal or external modem, memory expansion card, etc. Also exchange of Public Domain IBM software or shareware. Call Ernie at (916) 534-0417

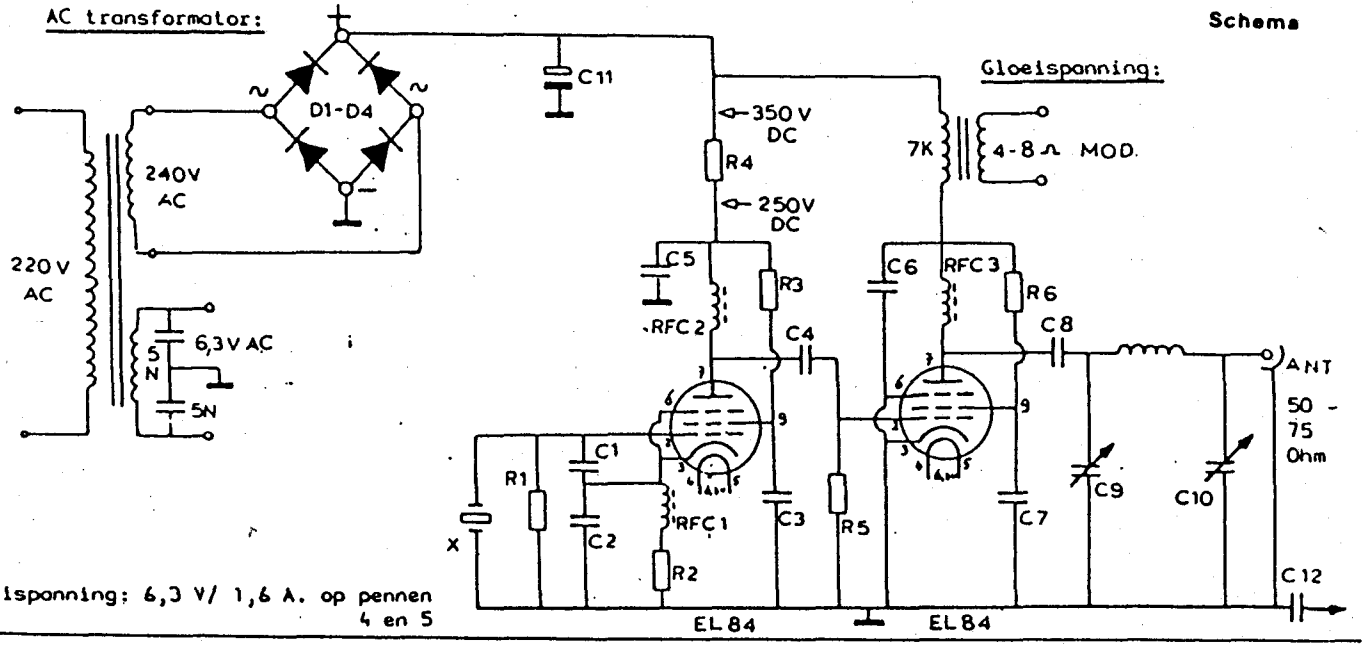
CHECK THE MAILING LABEL ON YOUR EBN ENVELOPE..... The upper right corner shows your expiration date.

COMPUTER BULLETIN BOARD FOR RADIO STATIONS Coming soon. One of our subscribers is in the process of setting it up now. We'll let you know as things develop.

15 WATT AM BAND OR SHORTWAVE TRANSMITTER

The following is a typical schematic for a crystal controlled transmitter. Simply by changing the crystal to the desired frequency, and selecting the proper values for the tank circuit (C9, C10, and coil), it may be used at any frequency from AM broadcast to the 41 Meter band.

As shown the circuit is designed for the 48 and 41 Meter bands. The value of C9 is 150 pF variable, C10 is 1000 pF variable (or two 360 pF in parallel. The coil is about 6 microhenries. This is about 18 turns, 1 inch in diameter, 1 inch long, number 16 varnished wire.



Gloeispanning: 6,3 V/ 1,6 A. op pennen 4 en 5

ONDERDELENLIJST:

R1	100 k	1/2W. weerstand
R2	150 Ohm	"
R3	15 k	1 W.
R4	4,7 k	3 W.
R5	33 k	1/2 W. massa weerstand (géén draad)
C1	27 pF	of 5-47 pF trimmer
C2	220 pF	400 V.
C3	10 nF	"
C4	470 pF	500 V. keramisch
C5	10 nF	500 V.
C6	4,7 nF	1000 V.
C7	10 nF	500 V.
C8	1 nF	1000 V. keramisch
C9	150 pF	variabel (een iets kleinere buis voldoet ook)
C10	1 nF	variabel (bijv. oude radio RX; 2 x 500 pF aprallel)
C11	470 uF	400 V. elco (mag ook 300 of 400 zijn)
C12	0,5 uF	Is niet noodzakelijk; als een ingebouwde modulator wordt gebruikt moet deze aangesloten worden tussen de negatieve pool van de modulator en de aarde van de zender.

Die spoel wordt aangesloten tussen de voeding en de versterkertrap. Als een echt goede modulatie wordt gewenst, moet het beste voltage van deze trafo worden berekend en zelf gewonden worden.

D1-D4: Diodes voor voeding. IN 4007 diodes (1A/1000 V) of andere 1A/500 V. diodes zijn geschikt.

Het π L tankcircuit is ontworpen voor de 48m. band, maar werkt ook in de 41m. band als enkele windingen (2 à 3) van de spoel worden verwijderd. Het is eveneens mogelijk een parallel resonant tankcircuit te gebruiken in de anode van de oscillatorbuis. Smoorspoel RFC2 moet in dat geval verwijderd worden, als minder harmonischen gewenst worden. De spoel van deze LC-tank moet variabel zijn en de condensator ongeveer 65 pF. Als de tank gebruikt wordt op de oscillator, krijgt de versterkerbuis meer stuurvermogen en zal de hele kring beter funktioneren.

De impedantie van de antenne kan het best 75 Ohm zijn, als een normale halvegolf dipool antenne in gebruik is. Het is ook wel mogelijk 50 Ohm kabel te gebruiken, maar uit ervaring blijkt, dat de beste SWR wordt bereikt met 75 Ohm + dipool.