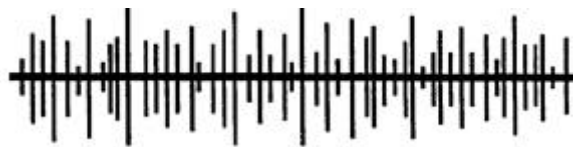


# WHITE NOISE



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Volume 9, Number 3

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## We're Making Changes

Your *White Noise* has been the result of the dedicated efforts of a few members. Terry Taylor, W5JFM, is the Editor and primary writing contributor. Carolyn Yates, XYL of Joel Yates, N4JOA, formats the newsletter, then proofreads it. The 200 plus copies are printed and then Doug Welcker, WB4KGY, and John Green, WB4MOZ, complete the folding, stapling, and bulk mailing.

Regretfully, the pressure of other responsibilities has compelled Carolyn and Joel to resign, and we are grateful to them for their many expert hours they have provided.

As we move on, our image may evolve. Bill Manley, KB4XE, has joined the *White Noise* staff to lend support in the publication, and the addition of new photographic features.

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## UPFRONT

### Transmit Deviation and Packet

by Bill Slack, NX2P

The importance of properly setting your transmit audio level, which directly affects your transmit deviation, cannot be understated. The graph at the end of this article shows the relationship between the signal level required for 99% copy and the transmit deviation. On the right side, this relationship is shown in relative terms: performance in decibels, and power required at

the transmit end. It is easily seen that a transmit audio level, even slightly higher than ideal, affects the path quality tremendously. Note that lower deviations have a less severe effect.

Two factors cause the degradation in performance at deviations above 3.5 kHz: First, some of the transmitted signal's energy falls outside of the receiver's passband, resulting in a lower overall signal and waveform distortion. Second, the squelch circuit response time becomes slower and is more likely to "false", or operate improperly. With an excessive

deviation, the squelch circuit will close for a few milliseconds in the middle of receiving data, causing a total loss of that packet. While both of these factors occur in voice communications, small amounts of distortion and signal loss are hardly noticeable.

Nearly all TNCs have the transmit audio set too high when new. While the deviation limiter circuit in your radio will take care of most of the problem, this circuit usually permits about 5 kHz of deviation. Some radios do not have a limiter circuit, or it doesn't work very well, or is mis-adjusted. Signals with 7 kHz deviation have been monitored.

It is recommended that the transmit deviation be set to 3.0 kHz using a deviation meter or service monitor. If you don't have this test equipment, first try sending out a packet message in your local area, or asking your local network SYSOP. Chances are someone will be happy to help. If not, the following procedure will get you close.

The transmit deviation adjustment is made by varying the audio output level of the TNC. Most TNCs have an adjustment potentiometer accessible without opening the case, but you may have to go inside. To find out for sure, read the manual. It is not recommended that you adjust the deviation limiter on the radio, since distortion will result. The deviation limiters on older rigs also don't work very well, either.

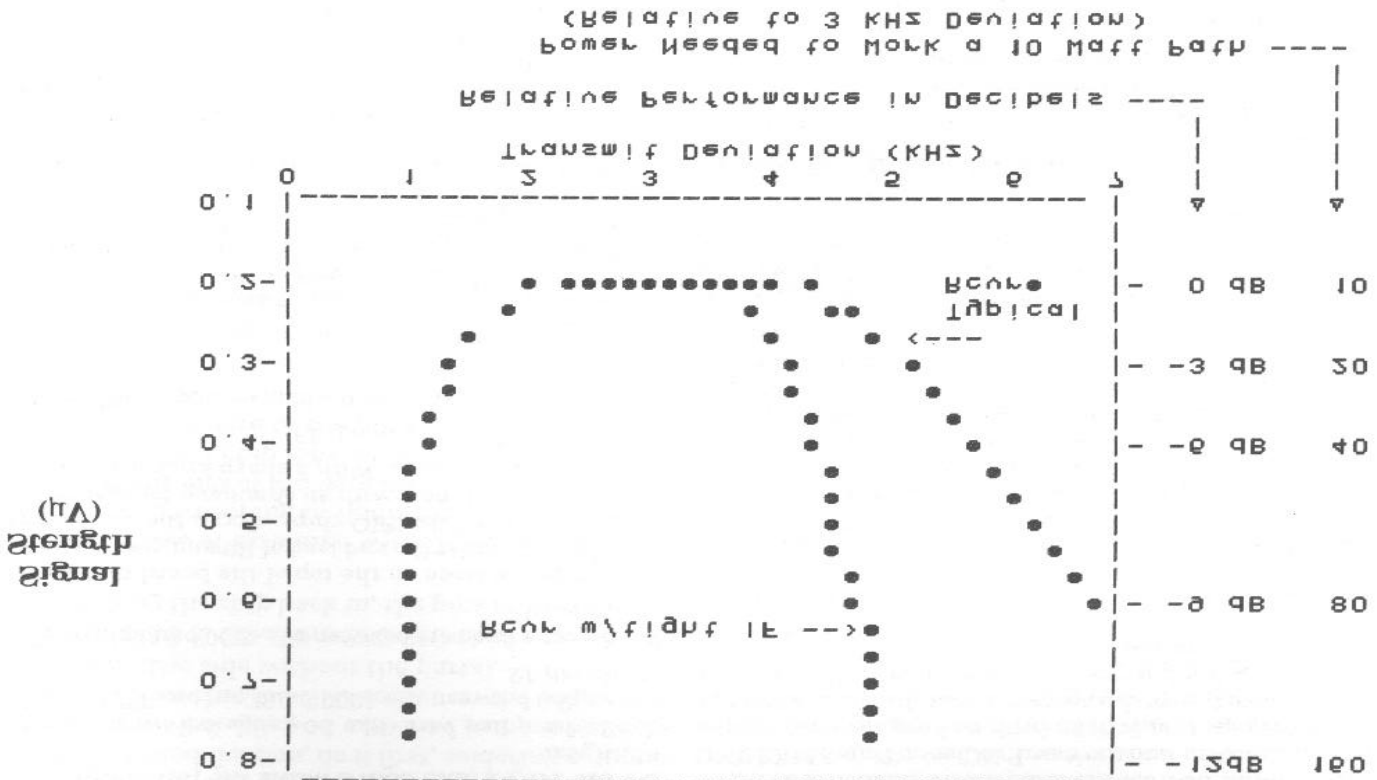
1. Obtain another receiver to listen to your transmitted signal.
2. Locate the audio output adjustment potentiometer on your TNC. (Consult the manual).

3. Put your TNC into "CALibrate" mode. (Check your manual on how to do this. With most TNCs you can type CAL at the "cmd:" prompt and then press the letter K to key the radio (transmit). Pressing D makes it "dither" (oscillate) between transmit tones rapidly, which is a better way of setting deviation than with a single tone. If necessary, use only the lower tone to set deviation. Pressing Q shuts off the transmitter and returns you to the "cmd:" prompt.)
4. While listening on the receiver, adjust the TNC's audio output upwards until the audio on the receiver does not get any louder. Find this point carefully by repeating the adjustment a few times. This is where the radio's limiter begins limiting the deviation, usually 5 to 7 kHz.
5. Now adjust the TNC's audio output level downwards until the audio on the receiver is about one-half as loud as it was. (Note: most TNC manuals say to leave the audio level at maximum - but this is often 5 kHz deviation, much too high). The audio on the receiver should sound soft but not faint.

At this point the transmit deviation should be between 2 and 4 kHz, which is much better than 5 to 7 kHz.

Some combinations of TNC and radio are very difficult to adjust, because the adjustment is very sensitive, giving you either too much audio or not enough audio. The fix for this is to add a resistor in series with the transmit audio line to the radio. Something in the range of 10K or 20K Ohms should work fine.

# White Noise



Received Signal Strength for 10 Watt Copy vs Transmit Deviation

## CHIRPS by Terry J. Taylor, W5JFM

New News! New technology is about to be released that will revolutionize Amateur Radio RF communications. Both digital and analog communication will be affected by what will take place in the new design of circuits that will very rapidly obsolete present day radios and related equipment.

This new technology is called Colesic Orsimanet Transemory, or COT. Apparently, research has been conducted using the element Actinium, Ac, which has an atomic number of 89 from the Periodic Chart of the Elements. Discovered just about 100 years ago by a Frenchman, Ac research recently has changed the way scientists think about electrical circuits, and it has moved ideas into a new dimension for taking voice communication (and/or data) and having it reach

a desired location anywhere in the world.

COT, using various amounts and sources of Ac, enables communication circuitry to sub-miniaturize what we think of as being extremely small, to about a millionth of the size of what we know today. This is accomplished by certain tricks learned in nuclear physics research. The still yet secret techniques take what we consider as a normal miniaturized circuit, and the function (not size) of that circuit can be shrunk to an extent much in the same way that computer data is compressed. This takes the circuitry down into the subatomic level, and then using a bussing technique for groups of subatomic particles, the circuitry can be simplified, thus making obsolete present day thought in printed circuit board techniques. This, also, allows for a much higher efficiency rating, thus reducing power requirements. Some of the prevalent thought using COT amounts to an efficiency equivalency of getting a hundred watts of power using a small power source such as a small watch battery. Conceivably, a fully functional radio with a hundred watt output could be placed inside a watch, even a small woman's watch. The interface to the new radio will be the interesting part to figure out. The technology is truly amazing and unbelievable.

The question you are probably thinking now is how soon is COT going to affect the manufacture of Amateur Equipment, and should you hold off on buying anything new until the new technology equipment is being marketed. Timing is everything, as most company executives know, but the advent of new COT embellished radios could be sooner than you think. Depending on when you are able to read

this column, if you haven't seen any new release of COT equipment by April 1 of this year, then wait a year and you'll see the big media splash on April 1, 1998. Remember, you read about it here first! April Fools!!

... CHIRP, COT, CHIRP!!

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### **An Intro to APRS Part 3 of 5 STAYING ON TRACK**

With the advent of the Global Positioning System, or GPS, APRS has matured into an accurate and useful means of tracking moving stations in real time. As mentioned above, this concept was used early in the history of APRS to track contestants in a cross-country marathon. Since then, the ability of APRS to decode the NMEA-0183 GPS serial protocol data has allowed hams to track the movements of mobile and portable stations, and locate stations in remote areas.

Locating a transmitter is made easy using DF equipment and APRS. Antenna azimuth readings and signal strengths adjusted for antenna gain are entered into the system via keyboard. The operator can then draw a circle the radius of which is proportional to the signal strength, or use the azimuth and signal strength readings to plot a point on the map. Points are plotted or circles drawn using similar data from other APRS stations. If three or more circles or plots intersect, the transmitter is close to that intersection. Just the thing for locating a jammer.

APRS can also receive data in real time from

weather stations such as those made by Davis and Peet Brothers. The data include wind speed and direction, temperature, hourly and daily rainfall amounts, and sometimes barometric pressure. If the data from enough weather stations is included on an APRS map, a good picture can be made of an area's weather conditions. Obviously, this could come in very handy when the weather turns nasty.

APRS has shown that it can be very useful to participants in the SKYWARN program. By using weather data obtained from APRS, they can provide much more information on storm development, evolution, and movement than they would be able to provide by using the equipment they have on hand at their individual QTH. Better still is the potential ability to track a storm. By sending mobile APRS/GPS stations out to the periphery of a storm where visual observations can be safely made, the location and movement of many kinds of weather disturbances, including hurricanes, tornadoes, and large thunderstorms, can be monitored. Once the direction of a storm has been determined, an estimate of its path can be made, and warnings issued to those on its projected path to prepare for its arrival. Since LORAN also uses the NMEA-0183 protocol, APRS can be used to aid in navigation by using the long-established LORAN system. Boaters and pilots are the obvious beneficiaries, as are those adventurers that are equipped for LORAN, but lack GPS capability.

### THE TOY BOX

So what do you need to get started in APRS? All you need is your packet station and

the APRS software, which is freely available as shareware. If you can access the Internet, the address is:

<ftp://ftp.tapr.org/tapr/SIG/aprssidig/files/upload>

On the World Wide Web, the address is:

<http://www.tapr.org/sigs/aprssidig/files/upload>

A recent version for DOS is APRS77D.ZIP. For Windows users, there is Winaprs 1.10. These programs are rather large because of the maps that they provide, so be sure you have enough storage space on your disk before you start. Another source is one of the many ham-related BBSs that have a version of the APRS software freely available for downloading from the hard drive. Your APRS station can have virtually any level of complexity you can afford, from an IBM compatible 8086 computer to the latest Pentium-powered full-size and laptop machines. You should have a hard drive in your machine, and a color monitor, but a monochrome monitor will work. Some hams go a step farther, and use the GATE function to crossband digipeat APRS data on HF with a complete packet system dedicated for that purpose alone. Others set up mobile APRS stations, so they can respond to changing events.

73

de Larry

KC7LVZ@WB7VMS.#MURPH.OR.USA.NOAM

*(Editor: Current file versions are aprs787.zip and wapr140.zip.)*

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(130mV RMS on the Fluke, good to 10KHz), I measured the tones with the default digital filtering of the M1 engaged. The 2200Hz tone showed as 2272+-1, the 1200 Hz tone showed as 1278+-9 (14 samples each, standard deviation reported).

--- high frequency ---

My RF test goal was simple. How reliable is measurement of my 757GX VFO? Working at 15 MHZ, the Lo-Z input (only one suitable for this measurement) has an advertised sensitivity of 5 mV. I used a scanner antenna supported about an inch away from a resistor I used as a load. The counter's bargraph was about 3/4 scale deflection from the ambient noise. The transmitter's VFO was allowed to stabilize or about half an hour and then brought to within 5 Hz of WWV's 15 MHZ carrier. Transmitting 25 watts into the dummy load resistor, the counter hit full scale bargraph and displayed a frequency of 15.012 MHZ. At 100 watts, the M1 displayed 15.001 MHZ. Accuracy doesn't look so good under reasonable ham shack conditions, but the M1's 50 ohm input is at least usable whereas the 3000A's was not under similar circumstances.

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## **AEA INKS DEALS TO SELL PRODUCT LINES**

**from the ARRL Letter**

Advanced Electronic Applications (AEA) has closed deals to sell its product lines to two other companies, but the AEA name will live on. Former AEA Chairman Mike Lamb, N7ML, says AEA's line of antennas, antenna analyzers and cable-testing equipment was sold, effective

March 7, to Tempo Research of Vista, California. Tempo will handle all technical support, warranty and after-warranty service and plans to produce the products in the antenna, antenna analyzer and cable-testing line that AEA had been producing before it ceased operation late last year. Tempo will continue the AEA name under a separate division. Lamb says he will assume a primary marketing position with the new division.

Lamb said he's excited about the prospect of continuing a role with a portion of the AEA product line that he had a particular interest in. He said he hopes to work on new product development as well.

Timewave Technology of St Paul, Minnesota -already a major name in ham radio gear- is buying the rights to all other AEA products, including its digital line. But Timewave president Randy Gawtry, K0CBH, asked the amateur community to give the company a few --weeks to set up the new product line before calling. "Watch our Web page," he said (it's at <http://www.timewave.com>). Gawtry says a purchase agreement is in place, and Timewave is in the process of making the product line transition from AEA to Timewave and hopes to be manufacturing products soon. Timewave will have the right to use the AEA name for one year (AEA model numbers will be continued, however). Gawtry said Timewave also will handle technical support and warranty and after-warranty service for the new product line, which will include AEA's DSP-232 multimode TNC, introduced last year.

Callers to the former AEA number are now

being directed to either Tempo or Timewave, as appropriate. Tempo Research is at 619-598-9677. Timewave's number is 612-452-5939.

**TO CONTACT AN OFFICER OF THE GROUP:**

President: Doug Welker WB4KGY@WB4MOZ  
561/686-3747

Vice-President: Mike Michaels K2GPI@WB4MOZ  
561/976-0478

Secretary: Bill Rabun KE4GUM@N4JOA 561/688-2088

Treasurer: Joel Yates N4JOA@N4JOA 561/737-6229

(All numbers shown above are home phone numbers.)

1. No problems with the switch.
2. Received replacement TNC's for the Belle Glade site.
3. Arcade antenna replacement, weekend of 21 February.
4. APRS talk @ MIA and Orlando. Balloon tracks AMSAT to provide high altitude balloon support via WEB page. TAPR WEB site now has real audio clips on various subjects.
5. Heard Island using PAKSAT to forward logs, pictures, and general information.

### OLD BUSINESS:

1. Welcome new Board of Directors.
2. "White Noise" mailed on Tuesday, 11 February.
3. Handout: ROSE Switch list, and Node's list.

### NEW BUSINESS:

1. BOD meeting scheduled for February.
2. FADCA meeting this Sat at the Orlando Hamfest.
3. Hamfest coming soon. See List.
4. Club registration renewal form completed. (\$61.50).
5. Renewal of coordinators for all BBS's, nodes, and switches due this month.
6. PBPG encourages members to volunteer their services.
7. BARDS meeting scheduled for 16 February @ Motorola.

## PBPG MEETING MINUTES FOR FEBRUARY 1997

The meeting was called to order by President Doug, WB4KGY @ 19:30 hrs.

18 members/guest were present.

TREASURER'S REPORT: Given by Joel N4JOA. Accepted as read.

### TECHNICAL REPORT:

By Doug, WB4KGY

## BREAK/WORKSHOP/ ADJOURN

Doug, WB4KGY, presented a video and excellent talk about our packet stack, K4PKT, and how it works.



WPB switch K4PKT  
*KE4GUM photo*

Today's thought, "If called by a panther, don't anther". Ogden Nash

HAPPY TRAILS  
BILL KE4GUM  
BILLYBOB

## **PBPG MEETING MINUTES FOR MARCH 1997**

The meeting was called to order by President Doug, WB4KGY @ 19:34 hrs. 18 members/guest were present.

TREASURER'S REPORT: Given by Joel N4JOA. Accepted as read.

### TECHNICAL REPORT:

1. No problems with the switch. Pres, VP, and Sec visited the switch last month.
2. At Arcadia, installed 440 Yagi antenna toward Sarasota to complete the 9K6 link on

Saturday, 21 Feb. This completes the first cross state dedicated backbone. Had problems connecting past Sarasota due to problems merging the network routing code from the East and West coasts. This is being resolved by John (WB4MOZ).

### OLD BUSINESS:

1. Re-registration of PBPG frequencies was completed with submission at the Orlando Hamcation FADCA meeting.
2. Pres, and VP are updating the PBPG inventory & Bill (KB4XE) will enter it into a database program.
3. "White Noise" publication was mailed Monday, 3 March. One member has not received their copy as of this date. Delivery to Broward county is taking ten days.
4. Sold 50 ft. of the 7/8 hard line - much more available.
5. Handout of: Rose switch and NODE'S lists.

### NEW BUSINESS:

1. BOD meeting set for 24 March 1997.
2. BUTTON BOYS PBPG pins will be ordered by KE4GUM, for club members.
3. Stuart HAMFEST event in 2 weeks. Watch BBS for dates.
4. Memberships are being taken by Joel (N4JOA).

### BREAK/WORKSHOP/ ADJOURN:

1. An excellent presentation was given by Terry (W6LMJ [Lost My Job]).

SUBJECT: Spark Gap To Space.

Meeting adjourned @ 21:00 hrs.

HAPPY TRAILS  
BILL KE4GUM



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## White Noise

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(K2GPI) was formed conduct an audit of the books to establish a "fire wall" between the old and new Treasurer.

### WORKSHOP

1. Doug, WB4GKY, gave a CRACKER JACK program on RUNNING THE ROSE. Many members helped with the presentation, most notably BOB, WD9ATM. A really good time was had by all.

### ADJOURN

=====

Meeting was adjourned at 21:04 hrs.

### THOUGHT OF THE DAY!

Bookie: A pickpocket who lets you use your own hand.

Respectfully submitted;

HAPPY TRAILS

BILLYBOB 73



Officers Bill KE4GUM, Doug WB4KGY, and Mike K3GPI visit the WBP switch

*KE4GUM photo*