

# Long Path



Volume 22 Issue 1

SEM DXA NEWSLETTER

September, 2004



## President's Report

Greetings Fellow DXers

I hope all of you had a most enjoyable summer even though a little wet. It was a long dry one as far as DX activity though. Other than a couple short openings on 6 meters in early June, and the **YVØD** DXpedition, our summer DX activity was uneventful. Let's hope this fall and winter turns out better.

While on the subject of DX, our September presentation will be a DVD on **3C2MV**. I also will be bringing along a DXpedition to 8Q by **VK6LC** to show if time permits. Hope you can all make it.

Our elections went well, and the only change this year is the position of Vice President. John, **K8JM**, opted out due to personal matters and Ken, **W8LU**, stepped in to take his place. Thanks John for the years of service and good luck to Ken, and thanks for volunteering to fill in.

Our September meeting starts a new year, and with that a renewal of memberships. We did good last year and I am hoping we can do better this year. When you talk to some of your

friends on the air invite them out to see what they are missing. I am currently working on getting **K6MYC**, Mike Staal, to one of our meetings and if it happens should be a good draw. As you know he is the CEO of MSquare and travels to many countries, **YVØD** included, putting on a new one for us. He is not only a good HF operator but excels at VHF/UHF. I am hoping this one pans out. I/We are open to any other suggestions, so don't hesitate to jump up at one of our meetings.

That's it gang and I hope to see each and every one of you at the meeting on September 10th. Best 73 and DX

**K8SIX**



## SEM DXA Meeting!

Our first meeting of the new season is September 10. Fortunately, **SEM DXA** management has obtained permission to use the Clawson-Troy Elks Club again this season. Pleasant surroundings along with an excellent beverage and food selection. Be sure to attend and bring along a friend. Fellowship and libation combine for a great time. Remember; Clawson-Troy Elks Club, 1451 East Big Beaver (16 Mile Road), Troy, Friday, September 10! Dinner orders taken at 5:45. Meeting begins at 7:30 PM.

## Dues - Dues - Dues

Your membership fee is due now. Please get together with our Treasurer **N8CQA** to settle. Remember, our membership dues are used to fuel our monthly meeting programs. Without this, we would be unable to provide the quality information and entertainment sessions we all have come to expect at **SEM DXA** gatherings!

## SEM DXA CLUB OFFICERS

*President:* Al Bailey, **K8SIX**

*Vice-president:* Ken Schang, **W8LU**

*Treasurer:* Buck Switzer, **N8CQA**

*Secretary:* Stan Arnett, **AC8W**

*Director:* Ted Pauck, **K8NA**

*Web Site Editor:* Ken Schang, **W8LU**

*DXCC Checker:* Bill Jones, **N8KF**

*DXCC Checker:* S.Arnett, **AC8W**

*VUCC Checker:* Al Bailey, **K8SIX**

*VUCC Checker:* S. Fleming, **K8KHZ**

*CQ Checker:* Mike Rudzki, **N8MR**

**DX Kooks!**

Anyone that has been listening around 14195/14200 recently couldn't help but notice two serious head cases that are seemingly always there. **IT9RYH** and **VE3OGZ** are at the top of the Lid List with their goofy operating practices. **IT9RYH** appears to look for mischief opportunities and causes deliberate QRM to any DX stations he might run across. **VE3OGZ** plants himself on 14200 and calls endless CQs without listening first or even bothering to listen for anyone answering his CQs. **W3UR** made some comments in his September QST DX Column about interference in general in this portion of the 20 Meter Band. An e-mail note to Bernie resulted in these comments:

*Hello Gerry*

*Thanks for reading the column and for your comments. VE3OGZ and this IT9RYH are real kooks! The ARRL would not allow me to print their calls. And to be honest with you those two don't need any more publicity. The best thing is to ignore them. Don't give them the attention they desire. Second is for as many people as possible to report these idiots to their authorities. That means the Canadian and Italian governments. These two are eventually going to do something wrong and the authorities will then be able to shut them down. Again thanks for reading the column and your comments.*

73

Bernie, **W3UR**

**June Minutes**

No Minutes for the June **SEMDXA** Meeting are available. The major topic was our annual elections. All Officers have been returned with the exception of Vice-President. **W8LU** will replace **K8JM** in this capacity.

**K6MYC - YV0D**

What follows here is the communications between **K8SIX** and **K6MYC** regarding the possibility of having **K6MYC** appear at one of our meetings and talking about the recent Aves Island DX-pedition.

*Hello Al and all at SEMDXA*

*I appreciate you thoughts about our trip and safe return. And I want to emphasize "SAFE RETURN". The whole trip was fraught with problems but it was without injury or loss or damage of equipment. It could have been much worse! I also appreciate your invitation to come and tell the "inside story" of the YV0D DX-pedition. I would hate to put your club to the expense of the flight cost from Fresno Ca. Maybe we can both be served by doing this get together at the same time as the AES yearly Superfest in Wisconsin. We have not gone to the Superfest for a few years but would consider it this year if you can arrange your meeting time to co-inside. I am open to discussion on this as time goes on. Right now I don't want to go anywhere for a month or so.*

73,

Mike Staal, **K6MYC / YV0D 6M and 2M Operator**

*Greetings Mike,*

*Yes it could have been a lot worse. Just take the recent storm that hit Florida for example. Had that hit Aves you would have been in deep trouble.*

*I contacted AES and it seems the Superfest is going to be on April 2nd. We usually have our meetings on the second Friday of each month but in this case we could move it up to April 1st which is the first Friday of the month. The only problem I see with that would be getting to Wisconsin in time for the Superfest on Saturday. What time does the Superfest typically start? If you were to put on a*

*presentation on Friday night we could take you to the airport on Saturday morning early and most likely be able to make it work.*

*The club pays for airfare but I am sure we can work something out. We also pay for your dinner Friday evening as well as a hotel if needed and breakfast in the morning and we are happy to do so.*

*We have plenty of time so give it some thought and you may want to contact AES to verify everything prior to committing to airfares, etc. I am anxious to hear the tales. :)*

*Keep in touch and rest awhile. I was hoping the storm would pass you guys as I heard you on six meters one day but not loud enough to pull out calls and reports. I am sure had you been there longer we would have done it. I only need Aves now on six meters. I have CW, SSB, RTTY and PSK covered and all bands so I am a happy camper.*

*Take care Mike and best 73 and DX.*

**K8SIX**

**VE No Code**

Radio Amateurs of Canada (RAC) has proposed formally that Industry Canada (IC) eliminate Morse code as a ham radio testing requirement for operation in bands below 30 MHz in Canada. RAC wants IC to continue to make Morse testing available to Canadian amateurs still wishing to have that qualification specified on their certificate, however. At the same time, the RAC wants IC to require applicants for the basic examination to score at least 80% before permitting operation below 30 MHz.

**For Sale:****Home brew power amplifier for sale. Specifications follow:**

Covers 10 through 80 including 30, 17 & 12 meter WARC bands.

Single 4-1000A Eimac Ceramic Tetrode

Eimac forced air socket system and chimney

Squirrel cage blower system

**K8RA** silver plated tank coils

Outputs up to 3,000 Watts!

Pole pig power supply, dual voltage 3,300 or 6,700 VDC

Fully metered, grid current, plate current and plate voltage

National Micrometer Turns Counting Rotary dials for tuning and loading

Vacuum-type variable capacitors for tuning and loading

Tuned input circuit

Vacuum-antenna switching relay

Fully shielded aluminum cage

Fully shielded power supply with casters

PTT relay for direct transceiver keying

**Price for quick sale at \$500.00**

Contact **K8NA** if interested.

**k8na@wideopenwest.com**

**Audio Filter**

Recently your Editor submitted an article for publication in QST. The article described an audio filter based on a recycled Personal Computer Speaker. One would have thought this manuscript would have been a slam-dunk since there is much interest in weak CW signal work. But, alas, the present group of QST Committee members did not agree and the article was rejected. *Their fearless leader suggested that the article be submitted to another periodical such as CQ Magazine since it was not suitable for QST!* Evidently they seem to think that Morse is either dead or fast going in that direction.

Rather than tossing the article into the trash bin it will be published here in the **Long Path** in two parts. Part one is the article itself and part two will include the schematic diagram and assembly details. Your Editor will be able to supply matched component sets as well as a printed circuit board at cost for this project if you are interested in duplicating the filter.

*Also, a complete sample unit -ready to go- is available for any Club Member to use and evaluate. If you are interested in trying the filter, you may contact the me at: **W8GF@aol.com**.*

**W8GF**

**Audio Filter!**

This article is about recycling a popular personal computer component, the speaker accessory and combining this with a very sharp audio filter. Usually coming in pairs, only one is useful in this application - stereo right- or the one containing the amplifier and controls as well as the stereo headset jack (not all types have this feature). The other unit -stereo left- contains only a speaker. Occasionally I have seen the two

mixed. Maybe you can figure out how to recycle the left over. One possibility, is to continue to use the second speaker since it is powered by the same stereo audio amplifier chip. If you decide to purchase new units, don't fret about the price because you can buy a pretty decent pair for under \$10.00 at many stores including Micro Center Stores. At a recent ham swap, I managed to get a good supply of used units for \$5.00! With new units, I found that the highest quality units in that price range are marketed by iConcepts. The details follow, but first, a bit of history might be useful for our younger readers. Old timers, standby.

The November, 1949 QST contained an article describing a station accessory called "Selectoject". This circuit was implemented with vacuum tubes and provided a sharp audio filter capable of either boosting or rejecting a range of low audio frequencies. (Select/Reject, thus the acronym Selectoject). The unit was featured in several ensuing issues of the Radio Amateurs Handbook. It employed a regenerative technique akin to the early regenerative receivers.

A short time later, National Radio began marketing a similar product and carried the name SELECT-O-JECT". This unit was based upon the QST article and referenced Dr. O. G. Villard as the patent holder and sold for about \$25.00 (1950 dollars that is!). In actual fact, if one could obtain the parts, this station accessory would be a worthwhile construction project even today. The vacuum tubes used are still in plentiful supply at this late date however the tandem potentiometers required are difficult if not impossible to locate.

I had the opportunity of hearing one of these devices in action at the station of Carl Moline, W8GB a died-in-the-wool CW DX operator in the mid 1950s. Carl had his unit tied together

with his National NC125 Receiver. What the NC125 lacked in IF selectivity was largely made up with the SELECT-O-JECT. Being a newcomer to DXing, I was very impressed to the point that I can still recall 50 years later the difference this filter was able to produce.

Shortly thereafter, the Q-Multiplier came along thanks to R. L. Drake and the Heath Company. The Q Multiplier operated in the IF stages, typically 455 kHz, rather than audio. Even though the Q Multiplier required getting into the circuitry of most receivers of that era to install, it over shadowed the audio filter idea. It too, was capable of notching audio heterodynes as well as boosting desired signals.

In recent years some transceiver manufacturers have added audio selectivity with mixed results. The audio reject feature on the other hand was largely eliminated for SSB applications with the use of modern digital heterodyne detection circuitry which performs extremely well.

Many Radio Amateurs including myself have been less than satisfied with CW audio filters as used in even top-of-the-line HF transceivers available today. Digital Filters (DSP) seemed to offer promise early on but in the final analysis, even these types are not really effective with weak CW signal processing. Possibly, down the road, effective software algorithms might be developed. As it stands, their best application (DSP) seems to be with SSB signals

Low frequency active filter technology has come a long way in recent years. High pass, low pass and bandpass filters using vacuum tube technology was eventually replaced with solid-state devices beginning with the ubiquitous 741 Operational Amplifier. Besides DSP, switched capacitor filtering has found its way into ham ra-

dio gear but since neglected.

The audio filter described here is a tandem multiple feedback bandpass design which provides an effective four poles. Resistor values are charted for bandpass center frequencies of 400, 500, 600, 700 and 800 Hz. Capacitor values are fixed at 1200 pF. Best results are assured by matching paired capacitor values within 10 pF. All resistors are metal film type, 1%, 1/4 Watt. Most weak-signal operators prefer low audio frequency tones. You merely pick what is best suited for yourself within the range noted. Formulas are provided if your taste lie somewhere between those noted. Put your PC to work using one of the popular spreadsheet programs that probably came bundled with your software. After plugging in the formulas, select a center frequency, Q and capacitor value and you can very rapidly crank out resistor values to match the new bandpass center frequency. It is unlikely that your calculations will match exactly available 1% values. Pick the closest value and you won't be far off. Reiterating, matched capacitor values are quite important however.

Two points to consider are circuit gain (Av) and Q. It is recommended to keep the gain at unity (one) and the circuit Q no higher than 5 or 6. The higher the Q, the sharper the bandpass response but values of R2 and R2A become quite low and other values widespread and out of range for available 1% tolerance resistors. Also, resistor temperature coefficients (100 PPM in this case) tend to reduce overall stability. If this does not discourage you, then you can select from 1% combinations -either series or parallel- or use 1/2% resistor values (much higher cost!). Also my experiments with higher Q values made receiver tuning very touchy while using typical modern 10 Hz tuning steps. Some Transceivers have 1 Hz tuning steps which can reduce or eliminate this problem.

The Operational Amplifier specified, CA5160, is designed to work well in single supply applications such as this one. Best results are had with power supply voltages in the +5 to +8 VDC range. If another type is selected, check its' data sheet performance under single supply conditions. The CA5160 can easily provide a 3 volt peak to peak swing with a 5VDC supply. If you elect to try another type Op-Amp, you will probably need to include a split DC power supply. Under this condition, eliminate resistors R4 and R5 (also R4A and R5A) and ground the Op-Amp plus input. An Op-Amp like the TL082ACP would be a good choice since it combines two devices in a single 8-pin minidip package.

In order to minimize power supply hum, additional power supply filtering is almost mandatory when using this filter with PC speaker units. These low priced units offer terrific versatility but are made to a very demanding component budget. Looking at a typical printed circuit board, one wonders how in the world they are able to work so well. Most of them use a single stereo chip based upon the TDA2822 device. These are 8-pin minidip packages and generally use no heat sink! Supply voltages can be as little as 2 VDC or less but most of the units I have looked over have DC supply voltages in the 7 to 12 VDC range. Resistors R6 and R7 together with electrolytic capacitors C6 and C7 provide necessary DC supply filtering. Current flow in the tandem filter assembly is in the order of 5 mA. Thus, the resistor/capacitor filter (tandem Pi-Sections) depicted will do an adequate job.

One additional point while on the power supply subject, about half of the speakers checked out had internal power transformers with the balance using wall-style transformers. Those with wall-style transformers yield additional space inside to locate the audio filter circuit card. In the case of the

internal transformer units, all had the line cord tied directly to the transformer with no on/off switch. Also, some used halfwave rectification while others used a bridge rectifier system. The half wave systems can be fraught with problems. First, the ripple is 60 Hz rather than 120 Hz which complicates filtering and secondly, on audio peaks the power transformer (typically under-sized) goes into magnetic saturation which generates heat and causes DC output voltage regulation to deteriorate significantly. My recommendation is to stick with a unit that has bridge style rectifiers if possible

Most PC speakers I have run across have a standard have a 3.5 mm jack to allow headset operation. I added a standard 1/4" jack in addition in the units modified. Optionally, you can obtain an adapter which has a 3.5 mm plug mounted together with a 1/4" jack for your headset. Additional wiring is simple, merely connect the jack in series with one of the speaker leads. Both channels of the PC speaker amplifier input should be connected together with the audio input signal from your transceiver. In my modifications, I added an RCA-style phono connector to allow connection to the transceiver headphone jack. The connecting cable should be shielded to minimize RF pickup. You could also plug the filter input directly into the transceiver remote speaker jack but this disables your speaker options.

One further idea about the filter. I modified my Yaesu SP-767 speaker by adding the filter and an amplifier ripped from one of the PC speakers. Using a wall-style transformer, adding a power on/off switch, and filter in/out switch on the rear panel completed the modification. No changes were made in the front panel which has a headset jack mounted right up front. This unit also worked ex-

remely well and might be preferred since it is shielded from any stray RF floating around your shack. Also, it is aesthetically pleasing to the eye! Just about all PC-style speakers are housed in plastic enclosures and could be vulnerable to stray RF.

A high quality G4 glass-epoxy printed circuit board and all resistor and matched capacitor components are available from the author. Included is a schematic diagram and parts layout and additional assembly notes. The circuit board dimensions are 2.8" X 3.5". It would be a simple matter to build the unit on a breadboard available from Jameco, Radio Shack and others. Don't trying using selected 5% carbon film-type resistors. They just are not stable enough in this application. Included in this package is a schematic of a power audio amplifier that will complement the filter if one is disposed to all home brew construction.

The results are quite gratifying. My station is equipped with three transceivers each of which provides DSP signal conditioning. As noted earlier, CW DSP does a passable job processing signals on each of the three to varying degrees. On the other hand the audio filter presented here does a superior job -especially with weak/noisy CW signals. Very often, I noted that this filter was able to provide decent copy of CW signals that were not with DSP. All low-band DXers will appreciate this feature. Here are some numbers to cogitate; with a 500 Hz center frequency, audio signals (including QRN) 100 Hz apart are attenuated a minimum of 15 dB while those spaced 200 Hz apart are attenuated 25 to 30 dB! Now that's audio selectivity!

The best way to adjust audio level is to preset the built-in gain on the PC speaker amplifier at a suitable level and use the station transceiver's audio gain control and adjust to your taste. An optional trim potentiometer can be

added to the circuit board if desired. Pads are included for this option.

Now, some final thoughts on DSP. Digital signal processing techniques are employed in the IF amplifier chain in some systems while others work strictly in the audio realm. In either case, they generally follow a similar path. First, the signal -be it audio or IF frequencies- is digitized, checked for coherency and finally returned to it's analog form after trapping undesired products. As usual, the devil is in the details. Coherency is determined by often arcane software techniques. Manufacturers of DSP systems are unlikely to leave source code un-guarded! My hat's off to anyone that tries this route. My audio bandpass filter design will be a tough act to follow in any event.

**W8GF**

*Note: Next month's Long Path Issue (October, 2004), will include a schematic diagram, parts list, construction details and kitting availability details. If any Club Members are interested, this additional information can be obtained earlier by sending an e-mail request to W8GF@aol.com.*

# SEMDXA MEMBERSHIP RENEWAL

South Eastern Michigan DX Association (SEMDXA)

Date: \_\_\_\_\_

Application for new membership \_\_\_\_\_ or Application for renewal \_\_\_\_\_ (check one)

Full membership \_\_\_\_\_ or Associate membership \_\_\_\_\_ (check one) Dues: \$15.00 annually

(See SEMDXA website for membership requirements)

Present Call Sign: \_\_\_\_\_ Previous Call Sign: \_\_\_\_\_

Name: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_

State/Zip Code: \_\_\_\_\_

Telephone: \_\_\_\_\_

E-mail address: \_\_\_\_\_

*MAKE CHECK PAYABLE TO SEMDXA*

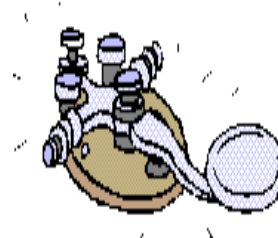
*Make payment at next SEMDXA meeting or mail with remittance to:*

*Leon Switzer, Treasurer*

*427 Jeffrey Avenue*



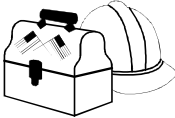

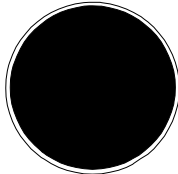
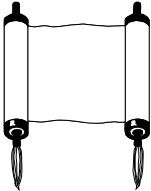
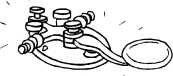
*Royal Oak, Michigan 48073*

**NOTE: TO RECEIVE THE CLUB NEWSLETTER "THE LONG PATH" YOU MUST PROVIDE YOUR E-MAIL ADDRESS!**



# September 2004

## SEMDXA Monthly Planner

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday																																																								
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