The LongPath

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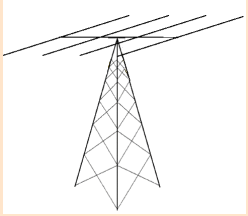


From the President

by Bruce Smith, AC4G

If you were able to make the last meeting in June, you noticed that I was unable to make that meeting. Suzy and I were on our way to see our youngest daughter be "hooded" and receive her Doctorate in Public Health from Loma Linda University in southern California. We had a good time, participated in several days of celebrating, and we all also visited Palm Springs and Big Bear Lake, while we were out west. I have got to get used to calling her 'Dr. Smith'. Thanks to our very competent Vice President Fred Kepner, K3FRK for conducting our meeting. I am told you had a very successful meeting and a good program.

I hope you have considered and have purchased a banquet ticket for you, your spouse, and perhaps another ham friend to participate in our annual banquet held mid-August in conjunction with Huntsville Hamfest at the Signals Museum of Information Explosion, 1806 University Drive, Huntsville, AL 35801. The club web site has all the pertinent information you need to plan and purchase your ticket(s).

I am looking forward to our meeting to discuss finalization of plans for both the banquet and Hamfest. I am hoping the caterer has been contacted again and is ready to serve us. I am hoping we have coordinated and received some door prizes to give away like we have in the past. I know our Grand Prize donated by Yaesu and Gigaparts has been paid for and picked-up, a Yaesu FT-710 HF Transceiver. I am hoping the other loose ends have been dealt with and that our members are ready to pitch-in to help make both the banquet and Huntsville Hamfest a huge success this year. Please attend this meeting on July 8 to help us know the things needing additional attention.

I am designated to do our program this month. I completed my program and hope each member will find it useful in their endeavor to seek more ways to add additional DXCC countries to their growing list of countries worked. I am excited to discuss the "Explanation for Low Band "Skewed" Path Long Distance Propagation" to the NADXC membership at our next regularly scheduled meeting on July 8.

I hope each NADXC member was able to participate in Field Day at a location convenient for you. This activity always challenges our emergency preparedness ability but allows for fun and fellowship with other ham radio operators. It gives us a chance to set up equipment and antennas, gain ideas from other hams, run a pileup and

From the President
(continued)

operate under extreme conditions, challenges our operating skills, but also shows us where improvements can always be made. I hope everyone had fun but stayed cool while doing so.

I look forward to once again meeting with all our members on Tuesday, July 8 at Signals MIE at 1806 University Drive, Huntsville, AL at 6:30 P.M. for our next meeting. Please plan to attend, so we can continue to plan together for our big events coming up in a few weeks.

Building an 80-10 Meter Amplifier 60 Years Ago
by M.D. Smith, WA4DXP

Building your own equipment from scratch with assembled parts was quite common sixty years ago. Let me tell you a bit of the 'nuts & bolts' involved (and still would be if you wanted to duplicate the project today).

When completed, I wrote an article and took good close-up photos that were accepted and became the cover story of the October 1963 CQ Magazine. A reprint of the 1963 article is included in the pages immediately following this article.

First question. Who has ever used a 2" steel hole punch on an aluminum rack panel to mount a pair of Simpson 0-1 mil meters for a linear amplifier project?

Not only were holes needed for the meters, but also for tube sockets, between ¾" and nearly 1 ¼" in diameter, often required for large octal sockets like the 3B28 rectifier tubes, which produced almost 4,000 volts DC at 500 mA. Using drill bits of those sizes would make a mess in an aluminum chassis or rack panel.

2 in. Hole Punch

I knew I'd need a mess of machine screws and nuts. I had an assorted box full from a hamfest and another smaller box of 6-32 screws, ¼ of an inch long, the most common size needed for tube sockets, angle brackets, and transformers. The designation 6-32 refers to a #6 size screw with 32 threads per inch.

I assembled all the parts, setting them in place, like the giant tube sockets for the 4-400A power tubes, and the two filament transformers, which fit better than one big one. It also provided me with other options, such as running on low power with only one tube in the circuit.

All of the discussion so far has been about the RF deck designed to fit into a Hallicrafter's box with a gray perforated lift top, just like the HT-32 series of transmitters that I had. Mainly, that's a pair of big output tubes, a heavy-duty B&W tapped tuning coil (for the pi-network), ceramic bandswitch, the filament transformers, and the 100 CFM (cubic foot per minute) squirrel cage blower mounted on the back to cool the big tubes, blowing air into the sealed lower box and then up through the cooling holes in the ceramic sockets, into the tube bases, and around the tubes. I put glass 'chimneys' around the tubes to force the air against the tube bodies. Not required, but they sure ran cooler that way and would last much longer.

To power this beast, I went to Osborne

Building an 80-10 Meter Amplifier 60 Years Ago (continued)

Transformer Company (they still sell transformers out of Michigan) to get the 'plate' or high-voltage transformer that produced 3500 volts on either side of a center tap, for full wave rectification, producing a smoother DC and a bit higher output voltage at 500 milliamperes. That hunk of steel and copper wire weighed fifty pounds. The two high-voltage rectifier tubes (3B23) required a 2.5-volt, 10-amp filament transformer. Lastly, regarding the power supply, I had a significantly large 10 henry, 500 mA choke for the high voltage to provide a choke-input filter, along with six oil-filled capacitors in series and parallel configurations, for a ripple-free DC output close to 4,000 volts. The combined weight of all that steel was over 100 pounds, so I simply bought an old 36" tall steel equipment rack with an open back and a latching door on the front, featuring 3" hard rubber rollers that held the entire thing, plus some spare rack space above for other rack-mounted equipment. (In later years, I acquired some high-power rectifier diodes and replaced the 3B28s with a stack of the diodes, to run cooler, and got even more voltage out of the power supply.)

It took me four months to assemble all the parts, build, and finally test the beast. It worked. When I got to 10 meters, running about 400 watts into a dummy load, it fried the parasitic resistor in the output choke configuration, so I put in larger resistors, but it had some birdies on 10 after that. I wanted an amp mainly for 80 & 40, so I never cared. When 10 meters is open, a hundred watts is usually all you need.

I submitted this article for those who used to build their own tube gear years ago, or for newer hams to give them a flavor of what it was like to build and operate their own 'big gun' on the airwaves.

If you'd like me to email you a copy of the entire article from the 1963 CQ magazine, drop me a note at mdsmith@hiwaay.net, and I'd be happy to send it.

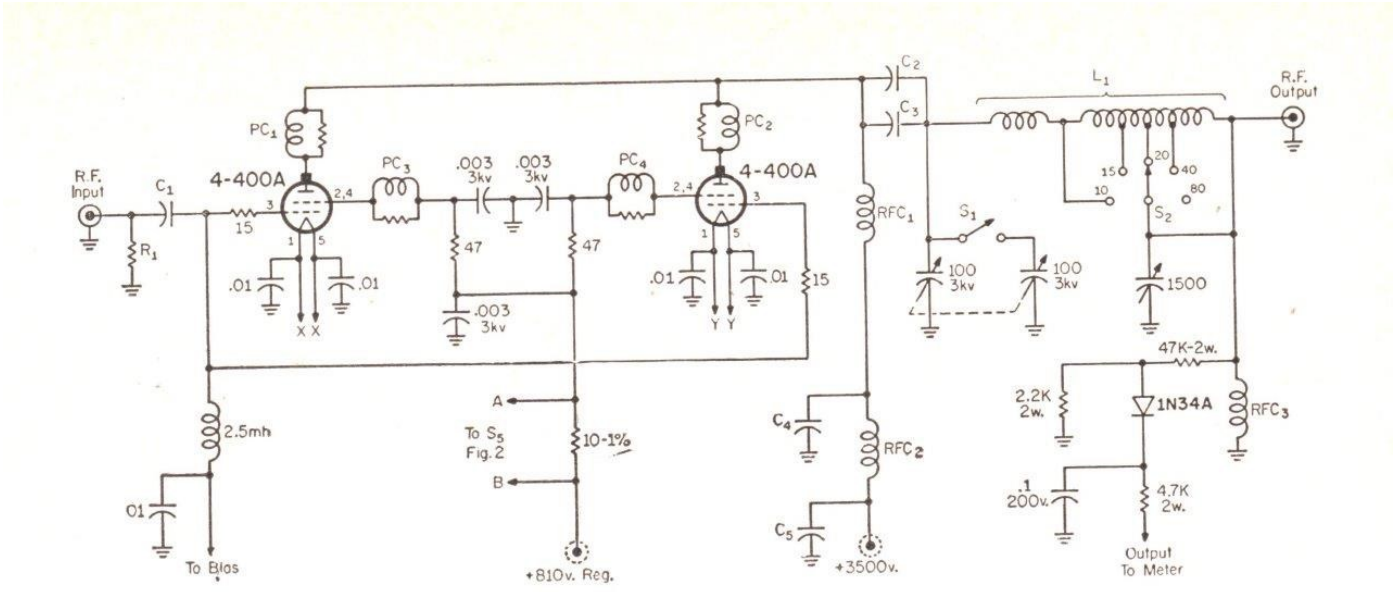


Fig. 1—Circuit of the 2 kw p.e.p. linear amplifier. All capacitors are disc ceramic unless otherwise noted and all resistors are 2 watts unless otherwise indicated.

Closeup of the original schematic included in the October 1963 CQ article


October 1963
50¢
CQ
A Table-Top
2 Kw Linear
See page 30
The Radio Amateur's Journal

A 2 KW P.E.P. Linear Amplifier

BY M. D. SMITH*, WA4DXP

Here is a linear amplifier that is basic in design. Using swamped grid input, it requires 100 to 150 watts of drive and loafs along at 1 kw input. This table top linear is flexibly metered and has a series of safety controls to prevent accidental damage (to linear or operator).

THE following linear amplifier for 80-10 meter operation was designed over a period of seven months. During this time, numerous other circuits were investigated to determine their most outstanding features. The features from past amplifiers, new ideas, and standard amplifier practice were combined in a linear that would satisfy the following basic requirements:

1. The amplifier had to deliver 2 kw p.e.p. as well as 1 kw c.w. and almost 1 kw a.m.
2. The unit must be rugged, simple in basic design and easy to build.
3. It had to be easy to put into operation, that is, very little adjustment after construction such as neutralization.
4. Designed along commercial broadcast lines in preserving components and insuring foolproof operation.
5. Finally, it had to be compact and neat for desk-top operation.

The completed unit meets the above requirements in that it is one of the most stable, easily adjusted, and rugged linears available. It compares favorably with others costing three to four times as much.

It uses a pair of Amperex 4-400A tetrodes in swamped grid which requires no input tuning. The amplifier will require an exciter that is in the 100 to 150 watt power range.

In actual operation, the linearity, checked with a Heath HO-10 monitor scope, is excellent. With both of the 4-400A's in operation, it's actually hard to hold it down to 1,000 watts c.w.

*Smith Broadcasting, POB 7372-A, Birmingham 13, Alabama.

Circuit Details

Amplifier—The heart of the linear is the pair of 4-400A tubes. The heavily swamped grid combined with ample parasitic chokes makes this linear one that just won't "take off" with the first application of r.f. Many commercial broadcast transmitters use a pair of 4-400A's with nearly 2,000 watts of d.c. input.

Input Circuit—The advantage of the swamped grid is that it is easy to build, requires no tuning on any band and allows tuning of the exciter at full output using the non-reactive resistor as a dummy load. The voltage developed from the current in the 100 ohm resistor is coupled through the 0.001 mica transmitting capacitor to the grids of the 4-400A's as shown in fig. 1.

Output Circuit—The output is coupled through two 500 mmf, 30 kv "TV Doorknob" capacitors to the B&W Model 850A Pi-Network inductor. The tuning capacitor is a dual section (100 mmf per section) with the second section placed in the circuit manually for 80 meter operation by switch S_1. The 1500 mmf loading capacitor can be any type. (The author used a surplus broadcast variable available from Fair Radio.[1] It bears the part number 3D9400 and costs $1.95. This is a five section job and each section is rated 20-402 mmf.)

A standard relative power output circuit is included in the main schematic, but it can be omitted if desired. Note that the 10 mh safety choke is *not* a part of the relative output circuit. The safety choke lowers the voltage on the tuning capacitor plates and provides a d.c. discharge

[1]2133 Elida Road, Lima, Ohio.

Front view of the 2 kw p.e.p. table top linear complete in its cabinet. The output tuning controls are on the right side of the linear. The left knob is the bandswitch, the upper dial, loading and the lower dial, plate tuning. The switch, S_1, between the two dials adds the second section to the plate capacitor to enable tuning 80 meters.

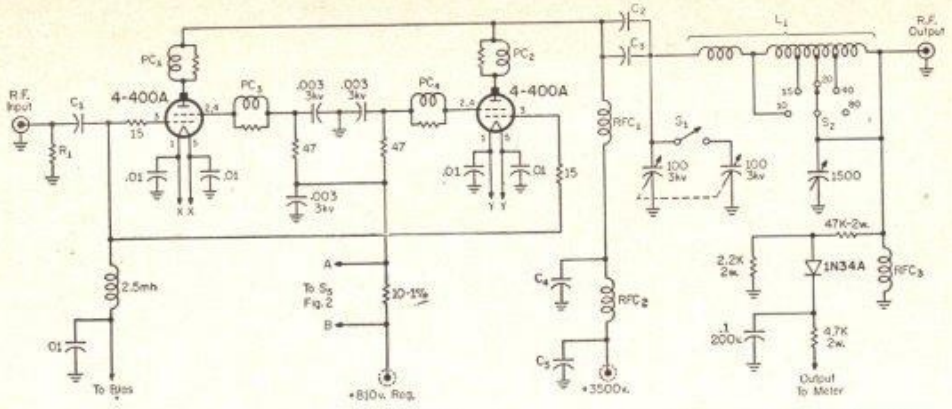


Fig. 1—Circuit of the 2 kw p.e.p. linear amplifier. All capacitors are disc ceramic unless otherwise noted and all resistors are 2 watts unless otherwise indicated.

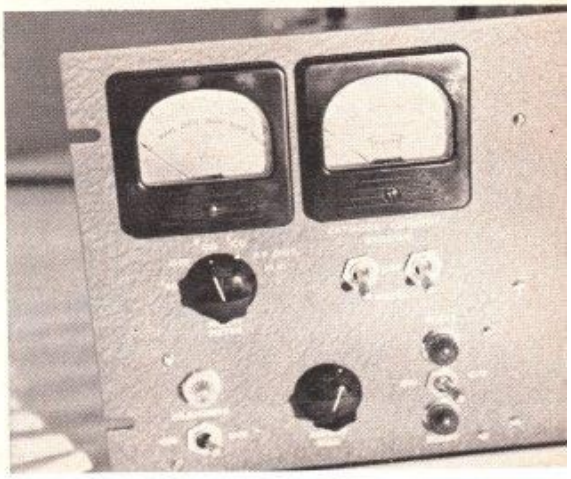
C_1—.001 mf 1 kv transmitting type mica.
C_2, C_3—500 mmf, 30 kv TV type capacitors.
C_4, C_5—500 mmf, 20 kv TV type capacitors.
L_1—B&W 850A Pi-network.
PC_1, PC_2—3t #14 busbar, 1½" dia wound around four 220 ohm 2 watt resistors in parallel.
PC_3, PC_4—3t #18 wound tight and spaced evenly on a 47 ohm 2 watt resistor.
R_1—100 ohm 100 watt non-inductive resistor.
RFC_1—145 mh, 800 ma. National R-175A or equiv.
RFC_2—Ohmite Z-50.
RFC_3—10 mh, 1 amp. r.f. choke.
S_1—S.p.s.t. ceramic rotary mounted on 1" standoffs.
S_2—Part of L_1 assy.

path should one of the coupling capacitors short.

Control And Metering Circuits—So far, the linear is more or less standard. It is simple in basic design and construction. However, the control circuits are one of the most outstanding features of the linear and are applicable to many other amplifiers. As shown in fig. 2 two Amperite thermal delay relays are used in the safety system. These relays have heat sensitive contacts which either open or close after the heater has been on for a pre-set time. The 115NO15 operates on 115 volts a.c., has normally open contacts and closes after fifteen seconds. When the filament switch, S_1, is first closed, the filament power light and blower come on. A small amount of current passes through the Globar resistors R_1 and R_2. At first the tubes will not even show a glow (a far cry from the surge of current normally observed without the series resistors), then as the Globar thermistors heat, their resistance goes down and the voltage on the filaments of the 4-400A's slowly rises until it reaches a steady state of about 4 volts (10 seconds). After fifteen seconds, the thermal delay relay closes and allows full voltage on the filaments. By preventing this harmful cold surge current, the filament life of the tubes should at least be doubled.

The other thermal delay relay is a 115NO180. It has a delay of three minutes. This is the plate delay relay. Even if the plate switch S_2 is thrown, nothing will happen until three minutes have elapsed. This gives all tubes ample time to warm up before the high voltage is turned on. A "ready" light will come on after the allotted time, showing that the relay has closed and that high voltage may be applied. The other pilot light is the plate indicator showing that high voltage is on. If one should care not to wait three minutes to apply high voltage, a relay with a shorter delay time can be used; just unplug one relay and plug in the other.

The bias supply is a bridge network of silicon rectifiers. The BIAS ADJ. control (located on the front panel) determines the bias voltage on the grids when the terminals of TB_1 are *shorted*. If they are open, the full bias voltage (250-300 volts) is put on the grids, thus cutting them off. The terminal will normally go to a relay which



Front panel view of the metering and control circuit for the 2 kw p.e.p. linear amplifier. The left meter, calibrated from 0-5 kv, is used for the multimeter and is controlled by the switch below it. The right hand meter is for cathode current and switches S_3 and S_4 are below it. The filament toggle switch S_1 and PL_1 are in the lower left corner. The center knob is the BIAS ADJUST control and the plate toggle is between PL_2 and PL_3 on the right.

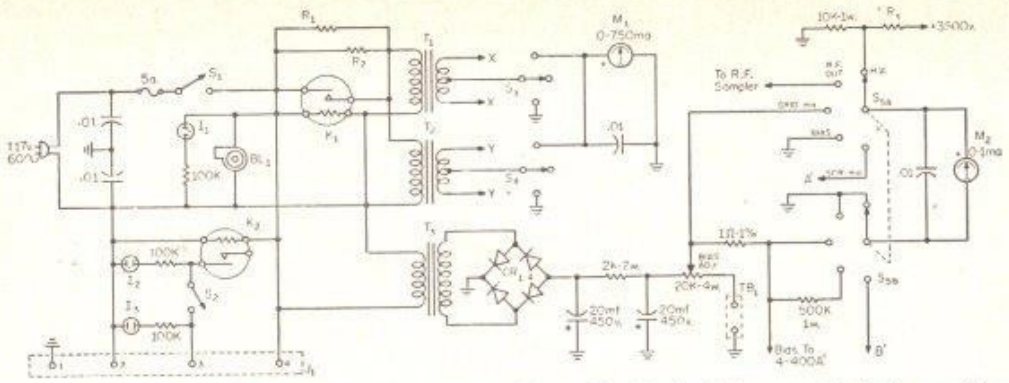


Fig. 2—Control circuit and bias supply for the 4-400A linear. This circuitry is incorporated in the amplifier chassis with power supply control connections being made via J_1.

B_1—100 c.f.m. blower. Dayton #2C781 or equiv.
CR_1, CR_2, CR_3, CR_4—Silicon Rectifiers, 1N1096.
I_1, I_2, I_3—NE-51 Neon bulbs and Dialco Neon Panel assemblies.
K_1—Thermal Time Delay relay. Amperite 115NO15.
K_2—Thermal Time Delay relay. Amperite 115NO180.
R_1, R_2—G-C Globars. Type 25-910.
R_3—Five 1M 2w. resistors in series.
S_2, S_6—S.p.d.t. toggle, center off position.
S_5—D.p. 6 position non-shorting rotary switch.
T_1, T_2—5v, 15 amp filament transformer. Triad F11U or equiv.
T_3—250v, 25 ma. Stancor PS-8416 or equiv.

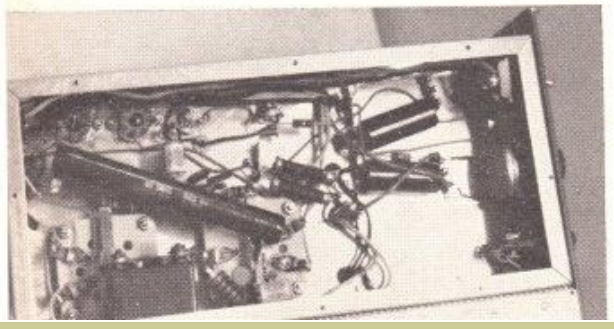
will break the connection for receive and short the terminals for transmit. (Note: I chose to place a 10K pot across the terminals of TB_1 and adjusted it during receive operation so that the finals drew about 50 mils of current for regulation purposes. This is not necessary with a well regulated supply, but the voltage rose from 3500 to 4200 thus exceeding the 2 kv each or 4 kv total rating of the filter capacitors.)

The plate current meter is located in the cathode circuit. It measures both plate and screen current, but since screen current is comparatively small, it will read plate current for all practical purposes. Two filament transformers are used, so it is possible to meter either one or both of the tubes. The toggle switches S_3 and S_4 have "center-off" positions and it is possible to cut one of the tubes out of the circuit completely by breaking the cathode ground connection. This is ideal for running reduced power.

Power Supply—This is a very conventional circuit and only brief description is necessary. The transformer is rated at 3500-0-3500 volts at 400 ma, but will easily deliver quite a bit more for amateur use. It has two inputs that may be paralleled for 115 volt operation or series for 230 volt operation.

Both filament and plate power are operated by 115 v.a.c. power relays and provision can easily be made for manual operation.

Bottom view of the input section of the linear amplifier with the bottom plate removed. The 100 ohm non-inductive resistor and the 1 kv mica capacitor may be seen over the 4-400A sockets.



Mechanical Layout

The amplifier is built on an 8¾" grey wrinkle standard rack panel, a chassis 7×15×3 inches, another 2½×9½×5 inches and a 15×17 inch bottom plate. The bottom plate is cut into two pieces . . . one 15"×7" and another 15"×10" which is used as the foundation for the bandswitch and tuning components. The small chassis is bolted, on its end, to the main chassis and bottom plate. The r.f. output connector and the h.v. connector are located on this small chassis. The relative power output circuit is located inside the small chassis.

The B&W coil is mounted directly on the bottom plate, but the lower tuning capacitor is mounted on one inch insulators to allow the shaft to come through the front panel at the proper height. The loading capacitor is bolted to the side of the aluminum angle bracket and also bolted to the small back chassis with a piece of angle iron. An off-set ball joint drive is used to permit proper alignment of the shaft when it comes through the front panel.

The 4-400A tube sockets had to be sub-mounted ¼" to allow clearance for the cabinet top. The tubes can be sub-mounted at any depth, so long as the air holes at the base of the tubes are not covered up.

The blower, a 100 c.f.m. size (although a 60 c.f.m. could be used equally as well), is mounted on the back of the main chassis. It must be removed to put the linear in the cabinet, and then installed from the back by means of wing nuts. The top and bottom of the blower mounting flange had to be trimmed to allow flush mounting with the top and bottom of the main chassis.

Testing And Operation

As mentioned earlier, testing is extremely simple. The filaments were turned on to check the

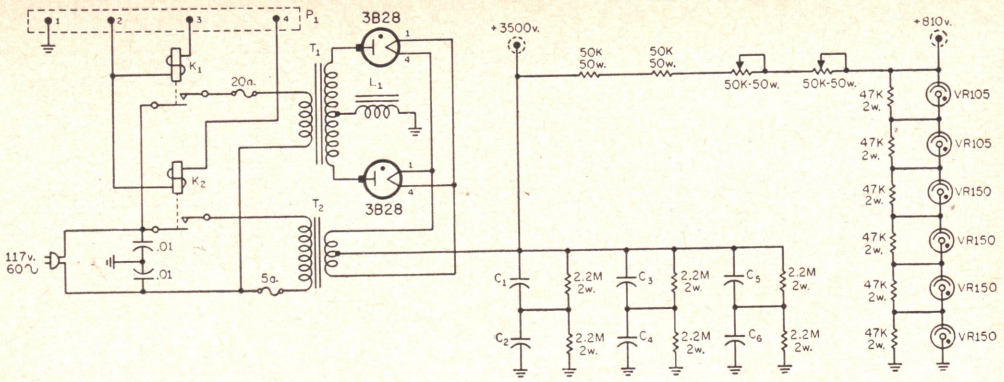


Fig. 3—Plate and screen supply for the 2kw linear. All control functions are handled from the amplifier chassis via P_1.

C_1, C_2, C_3, C_4, C_5, C_6—4 mf 2 kv oil filled. Available from Fair Radio.

K_1, K_2——D.p.s.t. 115 v.a.c. relay. Potter Brumfield #PR7AY.

L_1—10 h, 500 ma. Available from Fair Radio.

T_1—3500-0-3500 v.a.c. at 500 ma. Osborne #8924. Osborne Trans. Co., 3834 Mitchell Ave., Detroit 7, Mich.

T_2—2.5v, 10 amps, filament transformer. Triad F5U or equiv.

filament-saver circuit. At first there was no glow, but ten seconds later they were at almost full brightness, and when the delay relay closed, there was a final bright glow as the filament reached the full five volts.

Three minutes later the "ready" light came on showing that the plate switch could be closed. Both the cathode current switches were placed in the center OFF position to prevent any current from being drawn when h.v. was put on the plates. The bias voltage was set for maximum, about 310 volts and the plate switch was then closed. The multi-meter indicated 4200 volts on the plates. First one, then the other cathode switch was placed in the METER position and, as was expected, since the bias was at cutoff, no current flowed. As the bias was lowered (TB_1 was shorted) the static plate current began to climb until it reached the rated static current of 180 mils (90 mils each). At this point the tubes were showing a dull red glow which is normal.

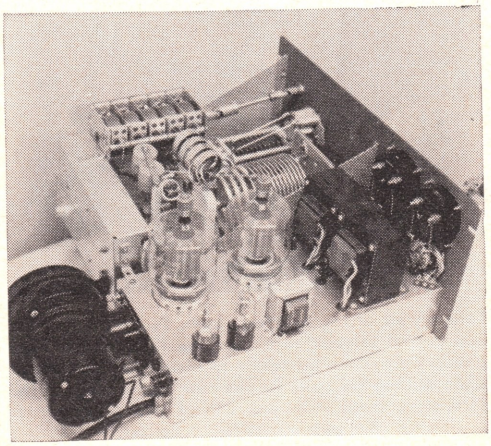
Previously the HT-32B was loaded into the linear and it was now possible to inject a small amount of r.f. for tuning. Another method would be to set the bias control for cutoff, add r.f., then back down on the bias until 200 mils were being drawn. Now, with the multi-meter in the R.F. OUT position, it is easy to find resonance and load for maximum r.f. output.

Throughout the entire procedure, nothing unusual happened and ten minutes after the filament switch was thrown, the linear was putting a solid 1,000 watts c.w. on the 40 meter band. There wasn't any trouble with harmonics or parasitics on *any* band at any time.

The input impedance is approximately 100 ohms, a slight mismatch for 50 ohm transmitters. It would be best to use RG-11/U for connections from exciter to transmitter. It will be best to use as short a lead as possible, although, as much as six feet seems to work fine.

The cost of parts for the linear was about $175, excluding the cost of the 4-400A's which sell new for $48.00 each. The cost of the power supply is far lower than commercial units . . . about $150.00. The total cost of the linear is far below many other commercial linear amplifiers and it features broadcast quality and ruggedness found only in the most expensive linears on the market today.

If you have been running "barefoot" for a while and you aren't satisfied with the thorns of QRM and the bruises of QSB, then try on some shoes . . . "Shoes—Size 2 kw." ■



A three quarter rear view of the 2 kw p.e.p. linear amplifier shows the layout of the input chassis in the foreground. The two plug-in time delay relays are in the lower left corner. Alongside them is T_3, the bias supply power transformer. The two transformers near the front panel are T_1 and T_2, filament transformers for the 4-400As. The output tuning section is built on the bottom plate and the rear chassis, mounted on its side, contains the relative output circuit, the r.f. output connector and the high voltage connector The parasitic chokes may be seen connected to the plate r.f. choke which also mounts the two TV type coupling capacitors.

Tales From the Museum: Oliver Heaviside (1850-1925)

by Bob DePierre, K8KI

The story of Oliver Heaviside is one of a sad personal life, fraught with huge difficulties, but with monumental achievements that seemingly came out of nowhere. He was a self-taught genius, but a maverick that created so many personal problems. He lived his whole life in the London area, and quit all of his formal training at age 16. He had only one paying job in his entire life, which was just for a few months as a telegraph operator at age 19. But this short experience guided the rest of his life, as there he became aware of difficulties with the Transatlantic cable, and of Maxwell's new equations.

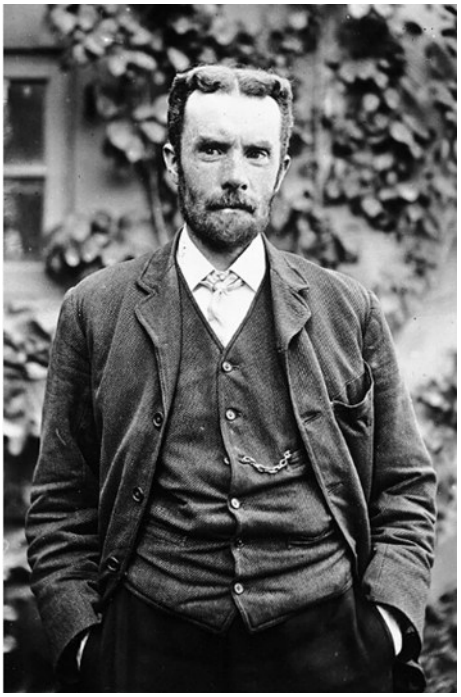


Fig. 1. Heaviside ca 1900

Heaviside's entire life was marked by his solitude and financial troubles, as well as his unconventional lifestyle isolated from the academic community and his confrontational approach to authority.

James Maxwell published numerous papers on his new theories in the 1860's and later, before his death (at age 48) in 1879. Heaviside had immersed himself in those papers starting around 1869, and by 1876 he was publishing his own papers, albeit in an obscure magazine. He would usually deliver his papers to a grocery store, for pickup by a third party, due to his dislike of people. He continued this for about 40 years, and was constantly and vehemently at odds with the British Post Office, which was responsible for engineering of the underwater cables.

The underwater cable story starts with William Thomson (later Lord Kelvin), who had gotten involved in the design of the first underwater cable. Many others were involved, but at the time they thought pulses would travel via coaxial cable in the same way they did on overhead telegraph lines. But Thomson was a very forward thinker. Instead, he modeled (1855) his version of an infinitesimally small resistor/capacitor network, integrated over 2,000 miles, as shown below.

This model did an excellent job of modeling the smearing and distorting of a pulse as it travelled a long distance. Unfortunately, his method was little understood at the time, and he was over-ruled in favor of a lower cost coaxial cable. That first cable was installed in 1858, but failed in 3 weeks. The first message on it was between Queen Victoria and President Buchanan, and was 98 words long. It took 16.5 hours to send. When that cable inevitably failed, Thomson was never ignored again. His insights did lead to the installation of a second transatlantic cable, which was successful. But his model was still missing some-

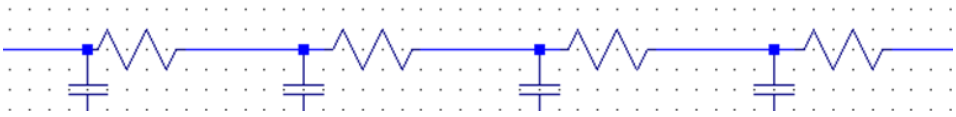


Fig. 2. Thomson's Transmission Line Model

Tales From the Museum: Oliver Heaviside (1850-1925) (continued)

thing.

By 1876, Heaviside had largely mastered Maxwell's Equations, especially as they would apply to these cables. He added series inductance to the model, which revolutionized the way you had to look at the situation. But he was alone with few to hear him.

His addition of inductance (Fig. 3) factored in loss, leakage, and signal distortion. You could now see how signals reflected and how to prevent it. It explained how the characteristic impedance of a cable is determined by its capacitive and inductive characteristics. If you terminate a cable in its characteristic impedance, you get no signal reflection. This not only accurately modeled the behavior of signals in cables, but showed how signals propagate as waves. The inductor created a voltage drop which is proportional to the rate of change of current. This subtle improvement had profound consequences. The result was no longer represented as merely diffusion along the cable, but as a wave!

This equation, as well as the whole subject of transmission line theory, is the one taught in textbooks today. That solution was embedded in sinewaves, as discovered earlier by Fourier. Heaviside found that there was an "extra current" that seemed to be oscillating back and forth. The load was actually bouncing the signal back onto the line as standing waves. Both diffusion and wave propagation exist together. "Loading coils" were now added at intervals to greatly extend the range of the underwater cable.

Maxwell derived his equations in the era before 3-D calculus, and thus required some 20 equations to express properly. Enter the uneducated Heaviside, who introduced new concepts during this period. Those were the divergence (del dot) and the aptly named curl (del cross, which reduced the number of 3D equations to only four). I had thought that Maxwell never saw his equations written in the form we use today, but if he died in 1879, he might have read how Heaviside had improved on his work.

Heaviside introduced other important concepts, such as signal propagation via the "Heaviside Layer" in the ionosphere, which showed how radio signals don't always run in a straight line. But he was a hermit to the end. Many of his achievements only became mainstream posthumously. He won several financial awards, but refused almost all of them, living on the mercy of his family. He finally died in 1925, of injuries sustained from falling off a ladder. Those concepts he introduced are today taught in engineering classes worldwide.

One might wonder why, if the two Telegrapher's Equations are so important, we can no longer even find them in the ARRL Handbook. For one thing, hams rarely have transmission lines long enough to severely distort our signals. For another, the coax cable manufacturers have already based their designs on them - the cables' characteristic impedance and their expected loss are derived from those equations. And we're already familiar with the concept of standing waves. We just don't have to deal directly with those equations any more.

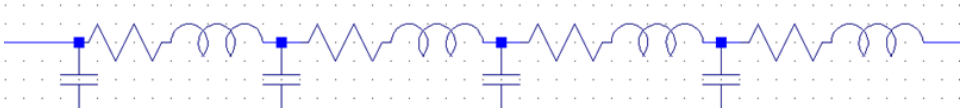


Fig. 3. Heaviside's Addition of Inductance to Transmission Line Model

Upcoming DX Contests

by Chuck Lewis, N4NM

Venezuelan Independence Day Contest, (CW, SSB, DIG), 160 – 10 M

July 5. 0000Z to July 5, 2359Z
Exchange: RS(T) plus Serial #
See page 77, July QST and www.radioclubvenezolano.org

Marconi Memorial Contest, (CW), 160-10M

July 5, 1400Z to July 6, 1400Z
Exchange: RST plus serial #
See page 77, July QST and www.arifano.it

DARC RTTY Sprint, (DIG). 80 & 40M

July 8, 1800Z to July 8, 1929Z
Exchange: RST & DARC member #; others send serial number
See page 77, July QST and www.darc.de

IARU HF World Championships (SSB/CW), 160 - 10M

July 12, 1200Z to July 13, 1200Z
Exchange: RS(T) plus ITU zone; IARU HQ stns send HQ abbrev.
See page 77, July QST and http://www.arrl.org/iaru-hf-world-championship

Walk for the Bacon Contest, (CW 13WPM MAX), 20M 5 Watts max.

July 17, 0000Z to July 18, 0300Z
Exchange: RST. SPC, Name, FP member # or power
See page 77, July QST and www.qrpcontest.com/pigwalk20

LABRE DX Contest, (CW/SSB), 160 – 10M

July 19, 0000Z to July 20, 2359Z
Exchange: RS(T), 2-letter state or 2-letter continent
See page 77, July QST and www.labre.org.br

Maidenhead Mayhem Contest, (CW/SSB/DIG), 160-10M

July 20, 0000Z to July 28, 2359Z
Exchange: 4-char, Grid
See page 81, July QST and www.w9et.com/rules.html

Trans-Tasman low bands challenge, (CW/SSB/DIG), 160-40M

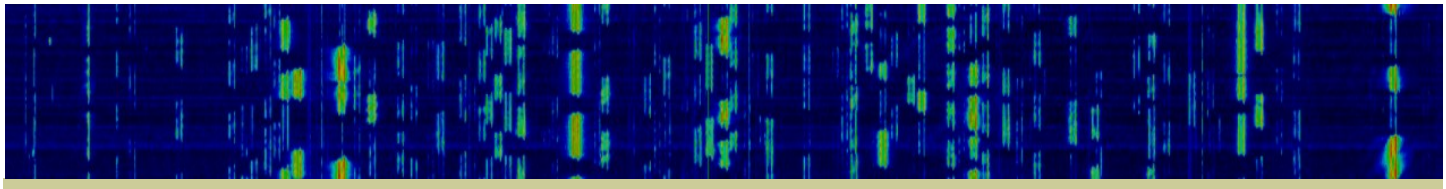
July 19, 0800Z to July 19 1400Z
Exchange: RS(T), Serial #
See page 77, July QST and www.wia.org.au

Russian Radio Team Championship (SSB/CW), 40 – 10M

July 19, 0700Z to July 19, 1459Z
Exchange: RS(T) + ITU zone or mbr code
See page 77, July QST and www.srr.ru/chempionat-rossii-po-radiosvyazi-na-kv-rrtc

RSGB IOTA Contest (CW/SSB), 80 - 10M

July 26, 1200Z, to July 27, 1200Z
Exchange: RS(T), Serial #, & IOTA# if island
See page 77, July QST and www.rsgbcc.org/hf



Upcoming DX Contests
(continued)

Run for the Bacon QRP Contest, (CW), 160-10M

July 20, 2300Z to July 21, 0100Z
Exchange: RST, SPC, Member # or power
See page 77, July QST and
www.wwsac.com/rules.html

Slovenia contest club

European HF Championship (CW/SSB), 160-10M
Aug 2, 1200Z to 2359Z
Exchange: RS(T) plus 2-char. year first licensed
See: https://euhf.s5cc.eu/euhfc_rules/

WAE DX Contest, (CW), 80 - 10M

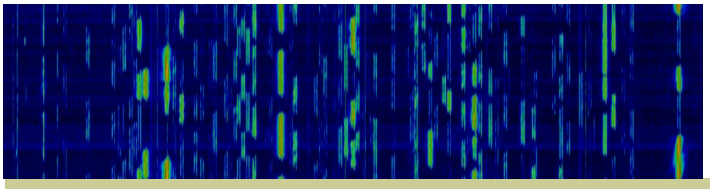
August 9, 0000Z, to Aug. 19, 2359Z
Exchange: RS(T) plus Serial #
See: http://www.darc.de/referate/dx/contest/waedc/en/rules/

OTHERS:
10-10 Int. Summer Contest, SSB, 0001Z, Aug 2 to 2359Z, Aug 3
SARL HF Phone Contest, 1300Z-1600Z, Aug 10

Alabama QSO Party

Don't forget!!! Alabama QSO Party: July 26, 1500Z to July 27, 0300Z

Dates & times often change or are misprinted in the journals; beware. See also: http://www.contestcalendar.com/contestcal.html



2025 Banquet Tickets Available

Featured Presentation: "My DX Journey Around the Globe " by James Gallo, KB2FMH

Grand Prize: Yaesu FT-710 AESS HF/50MHz 100W SDR donated by Yaesu and Gigaparts.

Banquet tickets and more information are now available on the club website.

2025 Jun25	2025 Jul31	Morocco	CN2DX	F5LRL	By F5LRL fm nr Kenitra; 40-6m; CW SSB FT8; to continue until Aug 30
2025 Jun26	2025 Jul04	Ogasawara	JD1BMH	JD1BMH Buro	By JG7PSJ fm Chichijima (IOTA AS-031); 40-10m, perhaps 80m; CW SSB RTTY; QSL via JG7PSJ direct
2025 Jun27	2025 Jun29	Puerto Rico	KP4NET	LoTW	By KP3JAC NP4AD WP3B fm Vieques I (IOTA NA-249); 40 20 10m; CW SSB
2025 Jun28	2025 Jul14	St Pierre & Miquelon	FP	LoTW	By KV1J as FP/KV1J fm Miquelon I; HF + 6m; mainly SSB FT4 FT8, some CW; QSL via KV1J (B/d) or Club Log OQRS
2025 Jun29	2025 Jul03	Iceland	TF	LoTW	By N6ELF as TF/N6ELF fm various TF POTAs; 30-10m; SSB FT8; 20w; QSL via N6ELF direct w/ SASE
2025 Jun30	2025 Jul05	Dodecanese Is	SV5	LoTW	By S55DX as SV5/S55DX fm Kos I (IOTA EU-001); HF; QSL via S55DX (B/d)
2025 Jun30	2025 Jul05	Turkey	TC0MAR	HA8LLH	By HA8PX HA8LLH YO5OED fm Marmara I (IOTA AS-201); 30-15m
2025 Jul03	2025 Jul10	Honduras	HR9	LoTW	By K6VHF as K6VHF/HR9 fm Roatan I; 80-6m; SSB CW RTTY FT8 FT4; 100w; QSL via K6VHF Buro or Club Log OQRS
2025 Jul05	2025 Jul11	Mozambique	C94RRC	Club Log OQRS	By OK8AU UA3QLC R7AL fm Inhacamba I (IOTA AF-103); HF; CW SSB FT8; 2 stations
2025 Jul05	2025 Jul13	St Helena	ZD7TIM	LoTW	By N0UI; 40-10m, perhaps 6m; CW SSB, perhaps RTTY; QRV in IARU HF Contest (low power, CW); QSL via N0UI
2025 Jul05	2025 Jul15	Grenada	J38DX	LoTW	By GM5RDX and J38LD fm Calliste (IOTA NA-024, FK92ca); 80-10m; 100w; QSL via Club Log OQRS
2025 Jul08	2025 Aug06	Benin	TY5FR	LoTW	By DL1BUG fm Cotonou (JJ16fi); 80-10m; CW SSB; 100; QRV for IARU HF; QSL via DL1BUG Buro or Club Log OQRS
2025 Jul10	2025 Jul15	Cyprus	5B	LoTW	By WJ2O as 5B/WJ2O; HF; QRV for IARU Contest; QSL via N2ZN
2025 Jul11	2025 Jul25	Iceland	TF	VE2XB	By VE2XB as TF/VE2XB; 160-6m
2025 Jul13	2025 Jul19	Mozambique	C93RRC	Club Log OQRS	By OK8AU UA3QLC R7AL fm Chiloane I (IOTA AF-098); HF; CW SSB FT8; 2 stations
2025 Jul14	2025 Jul20	Belize	HQ9HC	LoTW	By WA5LEE W5BAK WB5HJV W5WK WP4VW fm Roatan I (IOTA NA 057); HF
2025 Jul14	2025 Jul23	Svalbard	JW0V	I8KHC	By OK2WX; 160-6m; CW SSB FT8
2025 Jul16	2025 Jul19	Dodecanese	SV5	LoTW	By WJ2O fm Rhodes as SV5/WJ2O; HF; QSL via N2ZN
2025 Jul17	2025 Jul24	Aland Is	OH0	LoTW	By DL4XT as OH/DL4XT; 40 20 15 10m; CW SSB; QSL via Club Log OQRS
2025 Jul17	2025 Jul25	Maldives	8Q7YY	OH7O	By OH7O fm Rakeedhoo I; HF; mainly SSB, some FT8
2025 Jul24	2025 Aug02	Svalbard	JW	LoTW	By SP9HGN as JW/SP9HGN fm SOTAs JW/VS-265, JW/VS-413, JW/MS-154; 40-10m; SSB FT8; EFHW
2025 Jul26	2025 Aug09	Iceland	TF	LoTW	By F5TGR as TF/F5TGR; 40 30 20 15 12 10m; CW FT8 SSB; QSL via Club Log OQRS

DXpeditions in July 2025

Reprinted with permission of Bill Feidt, NG3K

2025 Jul28	2025 Aug01	Rodrigues I	3B9SP	Club Log OQRS	By DK6SP; 40-6m; CW SSB FT8
2025 Aug02	2025 Aug08	Ogasawara	JD1BRC	JH7CSU	By JH7CSU fm Higashi-machi, Chichijima; HF; mainly CW
2025 Aug02	2025 Aug10	Mayotte	TO3K	LoTW	By IV3JVJ IK3ZAQ IZ3NYS fm IOTA AF-027; 80-6m; CW SSB FT8 FT4; 100w; QSL via IV3JVJ
2025 Aug03	2025 Aug18	South Cook Is	E51KEE	LoTW	By ZL2KE fm Rarotonga I; 40-10m; CW SSB; QSL via Club Log OQRS or IK2DUW
2025 Aug08	2025 Aug11	Br Virgin Is	VP2V	LoTW	By KK4LWR as VP2V.KK4LWR and KD8RTT as VP2V/KD8RTT fm Tortola I; HF, focus on 6m; 100w; QSL via home call direct

June 2025 Financial Report

by Bob DePierre,K8KI

We have now funded 3 DXpeditions, one of which one of our club members will travel and operate (AG4W is going to Equatorial Guinea in October). The big activity now is the hamfest next month, where we will once again sponsor the annual DX Banquet. Of course, we will need help - lots of it, and we're looking for volunteers now. You can see from the budget report that we have sold 30 tickets so far. Last year we sold 101 tickets, and the effort was well worth it! We need to spread the word about our event (that's you), and write to various other clubs about it. We need to gather prizes, especially during the Saturday portion of the hamfest. We'll need help with setup. I've already hired the caterer and picked up the grand prize. We need to take care of the speaker. The list goes on, and there's work for every member to pitch in. I must also add that our membership (including families) only contributes about 1/3 of the total attendees at the banquet. So, club attendance at this event has been historically underwhelming. Can we change that this year? And please tell me if you are willing to volunteer to help out this year.

Budget Category	2025 Budget	Year to Date	End June	
Year Start	**5803**	5803.41	$10,016.90	
Dues In	**1100**	992.54		
Recurring Exp	**-1106**			
repeater elect	-63	-116		
web hosting/domain service	-77	-16.88		
repeater maintenance	0			
to HARC for Zoom	-50	-50		
use of museum	-400	-400		
DX Plaques	-216			
Miscellaneous	-300	-62	-$62.00	hamfest table
Other Transactions	**-1200**			
Donations/equipment to sell	0	4080		
Dxpeditions	-1000	-1000	-$600.00	Equatorial Guinea
Picnic	-200			
ARRL Bricks	0			
DX Banquet	**730**			
Huntsville Hamfest Donation	500			
venue	-700	-700		
food	*-2400*			
speaker+room+travel	*-450*			
ticket sales	*4100*	1341.19	$605.26	30 tix
raffle	*400*	136.15	$48.25	
grand prize	*-400*	-523.15	-523.15	
beer/wine/soft drinks/glasses	*-200*			
insurance	*-120*			
Year End Bank Balance	**$5,327.00**	$9,485.26	$9,485.26	
Other Asset 3-month CD	$5,225.00	$5,055.07	$5,055.07	
Total Assets	**$10,552.00**	$14,540.33	$14,540.33	
Asset delta	-$251.00	$3,737.33		

Our budget is pretty much on target for what we had planned at the outset, other than $4,080 we have raised from sales of the W4ABW estate.

June 2025 Meeting Minutes
by Bob DePierre, K8KI

Fred/K3FRK led the meeting since Bruce was busy attending his daughter's PhD graduation in CA.

There were 15 members in attendance.

The meeting started with the presentation from Rick/NE8Z on his HC8MD DXpedition to Ecuador and Galapagos Islands. Rick now has a house on the beach in Ecuador, and spends half his time now in Michigan. He spent a lot of time on VHF on this trip.

Voted on new member Van Herridge/N4BGE.

The minutes and budget from May were approved.

The banquet speaker will be James Gallo, who will speak on a number of his DX trips. The grand prize is now in hand.

The DX repeater is down due to storm damage.

The museum is planning to hire a new docent, if anyone is interested.

The Groups.IO channel has been used a few times recently for our club. Is there sufficient interest in using it on a wider scale?

Barry/WA4HR made himself available after the meeting to demonstrate remote ops via his laptop.

Huntsville Hamfest

Mark your calendars!

Huntsville Hamfest will be August 16th and 17th.

The NADXC banquet will be Saturday evening, August 16th. Banquet tickets are now on sale on the NADXC website!

Upcoming NADXC Meeting

Tuesday, July 8, 2025
5:45 PM Doors open / 6:30 PM meeting

Program: "Explanation for Low Band "Skewed" Path Long Distance Propagation" by Bruce Smith, AC4G

Location: Signals Museum of Information Explosion, 1806 University Drive NW, Huntsville, AL 35801 and via Zoom

About the NADXC

2025 NADXC Officers and Directors

President	Bruce Smith, AC4G
Vice President	Fred Kepner, K3FRK
Sec./Treasurer	Bob De Pierre, K8KI
Directors	Chuck Lewis, N4NM
	Mick Bell, N8AU

How to Join

Come to a club meeting or send in an application by mail (form on www.NADXC.org)

Monthly Meetings

Meetings are held at the Museum of Information Explosion at 6:30pm on the 2nd Tuesday of each month. Participants can also join the meeting virtually via Zoom.

This edition of The LongPath published by Fred Kepner, K3FRK

North Alabama DX Club (NADXC)

"Club Fact Sheet"

Who We Are: NADXC is a group of active radio amateurs with a deep compassion for working DX, contesting, and other aspects of Amateur Radio. We welcome everyone who is interested in joining our club. NADXC members are active in all facets of DX and contesting. The NADXC also donates funding for various DXpeditions all over the world. The NADXC sponsors a DX Banquet in mid-August of every year in conjunction with the Huntsville Hamfest in Huntsville, Alabama. NADXC members moderate various programs at club meetings and during the Huntsville Hamfest, covering amateur radio technical and operating topics for all to learn and enjoy. The NADXC sponsors a prestigious award at the end of year for the most deserving DXer of the Year from the NADXC club.

DX Funding Policy: The policy supports major DXpeditions that meet our requirements for financial sponsorship. Details are available on the NADXC website and in the "LongPath" newsletter.

Club History: The NADXC was organized in December 1966 by a group of 12 charter members. The original constitution was adopted and signed on December 19, 1966. The first chairman was Dan Whitsett, W4BRE (SK). In the early-1970's, the NADXC was custodian of the W4, K4 QSL Bureau which became such a huge undertaking that it eventually was passed to other larger clubs. In January of 1977, the club bought a VHF repeater for sharing DX spots and hosting a weekly net on Wednesday nights. The repeater was located on Redstone Arsenal, Weeden Mountain using the frequencies of 147.91/147.31 MHz on two meters. Today, the repeater has been relocated and utilizes the frequencies of 147.90/147.30 MHz, with a callsign of W4QB. The weekly net has been discontinued. In 1980, the club started the monthly newsletter known as the "LongPath" which currently continues to be produced every month.

While organized as a DX club, NADXC members are active in all aspects of the hobby. We trust that this information will be of interest to all and hope all hams have a long and pleasant association with the NADXC.

Requirements for Membership: The NADXC welcomes all hams radio operators who have an interest in DXing. It does not matter whether you are a new ham, a seasoned ham operator, an old-timer to DXing, or a ham who has just been hit with the DX bug; everyone is welcome! See the club website: www.nadxc.org. Dues are paid in January of every year.

Meetings: The NADX club meets the second Tuesday night of every month, with the current location at the Signals Museum of Information Explosion (MIE) located at 1806 University Drive, Huntsville, Alabama and virtually via Zoom. Some members gather early to eat their dinner, socialize, discuss DX worked, and then we have a short business meeting starting at 6:30 P.M. CT. followed by an exciting, interesting program to help, entertain, and teach members about DX and amateur radio in general.

Club Officers: There are four elected officers (President, Vice-President, Secretary, and Treasurer) and three elected directors on the NADXC Board of Directors. The current roster of club officers and directors can be seen of the NADXC web site or in the "Longpath" newsletter, which is uploaded each month to the club website.

Website: The NADXC club maintains a website at www.nadxc.org. This site provides club information and activities throughout the year about a variety of subjects related to the club, DX, and amateur radio.