

ELECTRIC RADIO

celebrating a bygone era

Number 1

MAY 1989

AMPLITUDE
MODULATED

K5FZ

HOUSTON, TEXAS



ELECTRIC RADIO

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The Purpose of Electric Radio

Electric Radio is published for amateur radio operators and others who appreciate vintage radio equipment. It is hoped that the magazine will stimulate the collecting of, and interest in, this type of equipment. The magazine will provide information regarding the modification, repair and building of equipment. We will also work towards a greater understanding of amplitude modulation and the problems this mode faces.

Electric Radio Solicits Material

We are constantly searching for good material for the magazine. We want articles on almost anything that pertains to the older amateur equipment or an operation. From time to time we will also have articles and stories relevant to the C.W operator and the SWL. Good photos of ham shacks, home-brew equipment and A.M operators (preferably in front of their equipment) are always needed. We also welcome suggestions for stories or information on unusual equipment. For additional information please write us or give us a call.

ED:

This afternoon after I finish this page I'll load the magazine onto a disc and take it into Durango to the printer. I find this process so amazing. A few years ago this would have been science fiction.

I've prepared each page and the cover exactly as it will appear in the magazine. I know this issue will have some errors but I'm sure that with each issue down the road readers will see improvement.

I enjoy playing the role of "editor", however I find writing agonizingly difficult. I'm hoping it will get easier as time goes on.

I have a tentative plan for the magazine and I'd like to lay it out. This first issue of 1000 copies is being mailed out free to a list I've compiled that consists of mostly am operators and people that I know are interested in vintage equipment. The next issue - which incidentally will be 50% larger at 48 pages - will go to those who subscribed from the first mailing and to another list I have compiled. And I think that subsequent issues will be handled similarly. If anyone that isn't on my list wants a free copy of the magazine they can just drop me a line.

I wish it were possible to provide the magazine at a rate less than \$18. It just can't be done. It might be possible if I didn't have such a limited market, and if I had the support of the Japanese manufacturers.

Early on I decided that I would not advertise solid state rigs or equipment. I received some ads for this type of equipment in response to my general mailing. I don't think I made myself clear in that letter. Although a couple of ads did slip through - you'll see them in the classifieds - that will not be the case in the future. So please remember, "no solid state, only hollow state".

While we're on the subject of advertising: please keep the ads coming in. I think that this is very important to the success of

the magazine. And let's see more gear FOR SALE. If any of you have gear you want to dispose of please send us an ad. I think an observation that one could make, from the classifieds in this issue, is that there is a terrific demand for vintage equipment.

Here's the line-up for the next issue: Bill Eberle, K2EJX, will have an article on his 500 watt home-brew transmitter. Bill-in his 50's now-built it when he was a teen-ager, and still uses it today.

Chuck Dachis, WD5EOG, The Hallicrafter Collector, will have an article on some aspect of collecting vintage gear. He will be providing us with a series of articles.

Bill Kleronomos, KDØHG, who provided the story on the BC-610 this month, is working on an article dealing with the future price and availability of tubes.

Howard Mills, W3HM, should have something on repair/restoration. I talked with Howard last evening on ten meters and he says he'll have something next issue.

Hoisy Hoisington, W4CJL, will have something in the next issue. I think Hoisy has a lot to contribute.

I'm hoping that Fred Huntly-W6RNC will be a regular contributor. I think everyone will agree that his piece, "Reflections down the Feed-line," is very good.

We will also have the story on Leo Meyerson's war-time business, Scientific Radio Products.

I'm presently working on another interview and we have other stories in the works.

I want to thank all the people who came on board at the beginning and provided ideas and encouragement: particularly Fred Huntley, W6RNC, Hoisy Hoisington, W4CJL, Bill Kleronomos, KDØHG, Leo Meyerson, WØGFQ, and my good friend Lloyd Hutterman, W6IOY.

I hope my interest and excitement for what I am trying to do overcomes my many shortcomings. Barry, N6CSW

LEO MEYERSON WØGFQ

An Interview conducted by Barry Wiseman



Manufacturer, Distributor, and Retailer; born in Omaha, Nebraska, March 7, 1911. Education: two years college, University of Nebraska. Married to Helen Wolinsky, March 29, 1933. Children: Larry Meyerson and Darlynn Meyerson Fellman. Six grandchildren.

Career Background: Principal, World Radio, (Wholesale Radio Laboratories), 1935; organized Scientific Radio, 1941; formed WRL manufacturing 1953; Globe Electronics, 1956 (sold to Textron, 1959); formed Galaxy Electronics, 1962 (sold to Hy-Gain Electronics, 1970). Served as president and on the board of directors and is now retired from Chairman of the Board of World Radio.

Association, Clubs and Honors: The list is very long. Following is a partial list that is related to radio: Member Radio Club of America, Life Member International Mission Radio Association, Life member and one of the ten board members since 1977 of the QCWA; also Chairman of Scholarship Committee for QCWA, Member International Amateur Radio Union; First Vice -President National Electronics Distributors of America 1955-56. Life member ARRL, Old Timers Club and Society of Wireless Pioneers. Radio Club of America awarded him a fellowship in 1980. This club is the oldest and most prestigious club in the world, organized in 1909. He was made a QCWA National Director in 1977. The QCWA chapter 154, in the greater Palm Springs area, honored him in 1986 by renaming the chapter after him.

Being retired, Leo has time now to play tennis a few times a week and be a very active ham, mostly on 40 meter ssb. He also has more time for the playing the piano and organ. He and his wife spend winters in Palm Springs, Ca., and their summers in Omaha, Nebraska. Leo maintains a museum located at the WRL corporate offices in Council Bluffs, Iowa. He welcomes anyone to visit at any time.

Leo has the distinction of operating the first broadcast station in Council Bluffs, Iowa. He went on the air briefly in 1924 at the age of 13 with a transmitter he built from plans printed in a Radio Digest magazine. He played records and the piano over the air until "the neighbors complained" and he found out it was illegal. But Leo says there wasn't much regulation back then; licensing was under the jurisdiction of the department of commerce. It wasn't until 4 years later, in 1928, that Leo acquired his first amateur radio license; W9GFQ. Years later, when the call districts were re-organized, he received his present call WØGFQ.

Barry: Could you describe your first amateur radio station?

Leo: My first station was under the stairway in our basement. The first transmitter was a 205A on a breadboard. It took about 400 volts on the plate. I used that on cw in the old 80 meter band. A few months later I graduated to am. First I did some experimenting with loop modulation. What you did was put a few wraps of wire around an old microphone and put it into the rf field near the finals. Of course you pick up a little rf that way. I had sore lips from that experiment. But it worked. The next rig was also on a breadboard. It consisted of a 201A, a 210 and two 203A's -50 watt bottles. I used Heising modulation utilizing an old power co's burned out transformer. I used the good side of the transformer and it worked out fine. I remember it took four neighbors to get it down into the basement and under the stairway. Using an old carbon microphone, that old transformer would really talk. When I modulated it was the sweetest sound you could imagine. By the way, I used a home-made crystal set to monitor the quality of my modulation. In those days my receivers were home-brew. Nothing fancy as I recall.

Barry: What bands did you work?

Leo: In the early days I worked 80, 160 and 200 meters.. I operated cw and am on 80, am on 160 and am on 200 meters.

Barry: What would be the main difference between amateur operation back then and now?

Leo: In my experience and opinion the difference was vast. There were no transmitters and very few receivers in the late 20's and 30's. If amateur radio appealed to you then, you had to build everything from scratch. I always had the feeling that I was a pioneer. There is no way the modern amateur, being licensed today, can in any way relate to those early days. It was certainly thrilling and satisfying to see something you had built finally do the job and

work.

Barry: I've heard a story that goes like this" your father was a grocer and he wanted you to carry on the store. You wanted to get into the radio business. He loaned you \$500 to get started, on the condition that if you failed-and he expected you to- you would return to work with him in the store" Is this true?

Leo: The story is very true. That was about 1934. I originally asked my father for \$500 but he said I couldn't get started on that and suggested \$1000. I respected my father's business acumen and I believe he, in his own way, was testing me. My father came to this country as an immigrant in 1906, during the Russian/Japanese war. He was penniless and made a big success in the grocery business. He also taught himself to read and write the English language. The one thing I learned from my father was to stick to your guns and work like hell. Success is not something that is handed to you. You must work diligently.

Barry: How did you start?

Leo: I started by going to Chicago. There was a couple of streets there with nothing but parts houses, radio stores, surplus places and so on. We called it "Radio Row". I bought parts of all sorts; transformers, resistors, condensers; anything I could find at a good price. I also bought a lot of surplus gear and some Sears receivers. Sears made some receivers at that time that would cover 160 and 80 meters. For some reason they couldn't sell these receivers so I got them cheap. To provide some interim financing I cashed in an insurance policy. In retrospect I wonder if I would have gone into business if I had known how much I was going to have to struggle. Who knows! I had more determination than brains. Youth and dedication to a dream keep you going. And I really felt that the amateurs needed the help that I could provide. I remember that in those days when I ordered parts -before I started my own business-I

would have to wait 4 or 5 weeks. Shipments were slow and parts were in short supply. I started soliciting the amateurs in the 5-state midwest area utilizing the callbook as my source of potential customers. This took some time and I struggled plenty. Sometimes when I was on the road I slept in the car. With nothing coming in, trying to support a wife and the usual expenses of light, rent etc., it was tough. My wife started working to help. My first piece of office equipment, after a used cash register, was an A.B. Dick mimeograph machine. I started soliciting several thousand hams with the personal touch (something lacking to-day) and started getting a few replies. Our store was really like a log cabin. No insulation and there were cracks in the walls. If it was snowing, and there was a wind, the snow would come right through.

Barry: What did you start out manufacturing?

Leo: I figured there had to be a market for transmitter kits because all the parts needed to build your own weren't always available. My hunch was correct. I put some simple kits together and the orders started coming in; sparingly to begin with. And then to my surprise some of the fellows asked if I would wire them also. That is what sparked me to start manufacturing. In 1939 or 1940 we put together a 616 outfit called the WRL-70. We built about one or two hundred of these and had plans for a 150 watt job. Things were getting into high gear and then the war came along and I was out of business.

Barry: Do you have a WRL-70 in your museum?

Leo: No, I sure don't. And I haven't seen one of those for years.

Barry: What did you do during the war?

Leo: I started a company called Scientific Radio Products with another ham named Al Shidler and operated it all during the war manufacturing quartz crystals for the military. (Ed: This is a story in itself and

will appear in next month's issue).

Barry: After the war?

Leo: I let Al Shidler take over Scientific Radio products. He moved the company from Council Bluffs to Omaha and then out to Colorado. During the Korean war he was very busy manufacturing crystals again. He later sold the company to TRW. I always wanted to manufacture transmitters so I got back into that. After the war there was a terrific demand for all types of amateur gear and I was happy to be a part of it.

Barry: Tell me about the transmitters you manufactured?

Leo: Well our biggest seller was the Globe Scout series; starting with the Globe Scout 40 and running through many models to the Deluxe that came out in 1960. We manufactured about 48,000 of these. The Deluxe model came out after Textron had bought Globe. I think we manufactured only about one or two hundred of these. The Globe Kings were also a big seller. We sold them all over the world through our export corporation. We sold approximately 27,000 of these. Globe Champions -all models- approximately 12,000. The Chief-a 90 watt job-7,000. The Globe Trotter about 2,000. The High Bander probably 500 or so. The Globe Sidebander about 1000 although we could have sold more. At this time we were getting a lot of flack from the die-hard am operators. They said if we brought out a side band rig they'd stop dealing with us etc. Well I never really pushed the Sidebander for those reasons. It was a very good rig though.

Barry: Why did you use the AX 9909 tubes in the Champion? I can't think of another rig that uses that tube. Right now that tube sells for about \$100.

Leo: As I recall, at the time this was the only tube around that would accomplish what I wanted: 300 watts input using a pair of them.

Barry: In 1956 you formed Globe Electron-

ics. Why did you form another company?

Leo: That's a good question and it takes a little explaining. The demand for our equipment was so tremendous that other companies like Henry's and Harrison asked if we would sell them our gear for re-sale. So, as any businessman would understand, it was necessary to make a clear distinction between our sales and manufacturing. Globe Electronics was formed so that we could sell products to other companies. We had about 25 or 30 sales reps. that covered the country. We also formed our export corporation at this time that sold our products world-wide.

Barry: Why did you sell Globe Electronics to Textron?

Leo: In 1958 we came out with our CB-100. We had 10,000 orders over night. I thought, "My God what am I going to do. I went to my banker and he said "Leo didn't you know you were going to have orders like this". I said, "Hell no I thought we'd be lucky if we had 4 or 5 hundred". We could have handled that. But you could imagine that to get into production for 10,000 units I would have needed over a million dollars. So I was in a dilemma. The banker said that it would be best if I could find a large, well financed, company to buy me out. So we sold out to Textron, a large conglomerate, and I became the president of the Globe division of Textron. About a year later Textron moved Globe to Rockford Illinois. When they did this they broke the contract they had with me. That's when I started Galaxy.

Barry: How many employees did you have in manufacturing at Globe Electronics in the peak years, in the late 50's?

Leo: About 350. We were the largest employer in Council Bluffs.

Barry: Who were some of the key employees you've had over the years?

Leo: Al McMillan was probably our most trusted employee. He was with us for over 20 years. Among other fine employees who

made contributions were: Jim Noland, approximately 10 years; also George Hladik and John Hunt about the same length of time. Sam Fidone was with me from about '48 till about '57. He actually engineered the rigs or designed them to my specifications. He hated ssb and didn't want to be involved in it. Marv Gehr-who came from Collins- engineered our Galaxy line. He is presently an engineer for Telex HyGain.

Barry: Your export company- WRL Export Corp.- sold your equipment all over the world. What was the extent of that?

Leo: Well we sold transmitters all over the world. I remember once we sold 500 Champions to Pakistan. I think they were used in the military there. And a lot of equipment went to South America. Years later my wife and I went to South America for a vacation. I was very surprised to see Globe Kings used as broadcast transmitters in small communities. The Scout was being used by police departments and that sort of thing. I visited one radio station that was using the Globe King. They were broadcasting music at the time. They had the back door open, had a big fan running and were on the air 14 hours a day. They were operating up around 1500 kc so it was a small matter to bring the rig down from 160 meters.

Barry: What was your reaction to ssb coming on the scene? What was your company's strategy?

Leo: My reaction to ssb was very positive. I had a very fine engineer-Fred Berry- of Kansas City working on a 50 watt job in '53. My other engineers, particularly Sam Fidone, thought I was crazy and were vehemently opposed to ssb. My strategy was to develop a ssb unit and market it when the time was right. Unfortunately we had a fire in 1954 and the one unit that we had built-the prototype-was lost or destroyed. To this day I am frustrated over that. I believe the fire started accidentally but I think foul play entered into the disappearance of

the sb prototype. Another idea I had was to bring Wes Shrum from Chicago. He had built some side-band units. But he wouldn't move to Council Bluffs. He suggested that I come to Chicago but I said that I couldn't do that.

Barry: Did you think that ssb would almost totally replace am?

Leo: No I did not. I thought that it would be very popular and I wanted to manufacture a rig for the market but I never thought it would completely take over as it has done.

Barry: Did you anticipate what was about to happen to all the great companies like WRL, Johnson, Hallicrafters and so on?

Leo: Yes I did. I could see the handwriting on the wall. That's the main reason I sold Galaxy.

Barry: What about Galaxy?

Leo: Well first of all let me say something about Marvin Gehr, the engineer. I think he was very intelligent and ahead of his time. I hired him away from Collins, where he had done work on the KWM-2. He was most responsible for the design work on the Galaxy's. The first rig we came out with I called our "gold plated" rig; the Galaxy 300. It had kind of a gold color. It was for 20, 40 and 80 meter sideband. We were one of the first companies to come out with a sb rig that was partially transistorized. Our vox was transistorized, and part of the audio system. The next rig was the Galaxy 3; it was smaller and had more solid state devices. Then we came out with the Galaxy 5 for 5 bands. And so on. I sold Galaxy to Hy-gain in 1970.

Barry: What in your opinion really caused all the companies to fail?

Leo: Japanese competition. The Japanese had superior engineering, and attractive packaging, and for the money, the U.S. companies just couldn't compete.

Barry: Could anything have been done to prevent this?

Leo: No nothing in my opinion could be

done at this point in time to prevent the actual dilemma.

Barry: Today the Japanese totally dominate the amateur radio business and for that matter the whole electronics field, worldwide. What do you think of this?

Leo: Naturally I don't like this situation but in addition to my previous remarks the Japanese have superior management abilities and their liaison with their employees is superior. To my mind those are important factors.

Barry: What could the U.S. do to get back into the electronics manufacturing business? I mean back into it on the scale that it was after WW II?

Leo: In my opinion this country would have to revolutionize and start at square 1. American industry has stagnated because of attitude, work habits and labor/management problems.

Barry: Amateur radio has been changing constantly since its beginnings. What are the big changes that you see and how do you feel about them?

Leo: Amateur radio has been going through a metamorphosis since its early beginnings. Today a transceiver is referred to as an appliance and that's exactly what it is. What makes amateur radio "tick" is gone and what I saw as an early amateur, "the magic" the idea of communicating without the benefit of wires, has disappeared.

Barry: Right now the ARRL is particularly concerned with growth in Amateur Radio. They feel that unless the rate of growth is increased Amateur radio will not prevail. Any comment?

Leo: ARRL should have acted much sooner about the growth of amateur radio. ARRL as well as QCWA must recognize the fact that the world has changed and our ideas and approach to younger folks has to change as well. For instance I have advocated a no code license at ten meters and up for years. Cw was and still is a great mode but almost all other services have

TESLA by John W. Wagner W8AHB

and RADIO

I thought it would be very appropriate to have an article about Nikola Tesla in the first issue of the magazine. I asked Jack—who has been studying and researching Tesla for many years—if he would contribute something. What follows is a letter he sent along for publication. Ed.

Dear Barry:

Tesla is perhaps the most misunderstood and underrated legitimate scientist that has ever brightened the scroll of human advancement. What that man discovered in a single burst of invention changed the world more than it had been changed before—and that change has taken place in a mere 74 years. I am speaking of the period of our horse and buggy days up until the day we walked on the moon (1895 to 1969).

Most history books do not look upon 1895 as any great date, but indeed it was. In that year Tesla's system of polyphase hydroelectric current was used in the harnessing of Niagara Falls, the first large scale polyphase hydroelectric system in the world. From that day forward a revolution ensued, and it continues today. Why? Because ENERGY, other than FREEDOM and EDUCATION, is the single most important social aspect of our lives. Without electrical power our lives would be very different indeed. Please do not misunderstand, I am not saying that without Tesla we would not have a form of energy; I am saying that it was Tesla who discovered the grand principle of the rotating magnetic field at precisely the right time that made great things happen when they did. Michael Faraday in 1831 found the key that would

eventually start this revolution, but Tesla built the lock as well as the door—then proceeded to open it.

But you wanted me to talk about RADIO. However, it was necessary for me to address ENERGY first because that is all radio is—ENERGY. And that is how the fundamentals of radio were established—by Tesla, I might add.

Many different men had been struggling for a long time seeking a way to send messages without wires—just as men had been searching for the secret of flight. If you have ever travelled to an obscure town in Kentucky (the name escapes me now) you would find a statue of Mahlon Loomis who is reported to have found a way to send wireless telegraphy. All due credit to the man for trying—and perhaps even accomplishing some measure of success, but he laid no grand principles—no foundation for radio as we know it today. And there were probably several others as well who have made similar claims.

This is not the case with Tesla though. He was establishing the fundamentals of radio even before he knew exactly the nature of his discoveries. But it did not take him long once he realized the significance of what he was doing—that his discoveries in the field of high frequency -high voltage alternating currents, was also capable of transmitting intelligence. However, you must understand Tesla: He was a man of definite priorities. In his most productive period he realized the greatest need of mankind was ENERGY, and he was correct. Therefore, most of what he wrote and spoke about was in that area. But this did not mean he was oblivious to the need for the transmission of intelligence.

If one wants to explore patent specifications and lectures prior even to 1894 it seems incontestable that Tesla was laying fundamentals for radio before anyone. This is by virtue of: (1) The idea of inductive coupling between the driving and work-

ing circuits; (2) The importance of tuning both circuits, that is, the idea of an oscillation transformer; and (3) The idea of a capacitance loaded open secondary circuit.

The results of his research were made available to the world through lectures and publications; and Marchese Guglielmo Marconi was a very interested witness to these fundamental revelations. While Tesla pursued the double barrel approach of transmitting power and intelligence, Marconi was busy pursuing only the transmitting of intelligence, and he was using seventeen of Tesla's patents.

At first this did not seem to bother him, but very soon when the world started to recognize the ocean spanning feat that Marconi had accomplished, the pangs of injustice were keenly felt. He fought in the courts for preservation of his rights, but it was not until June 21, 1943, that the United States Supreme Court finally decided in his favor. Of course, by that time Tesla and Marconi were dead, so nobody really cared.

In summary, the Court found that Tesla, in patent #645,576 applied for September 2, 1897, and allowed March 20, 1900, anticipated the following features of the Marconi patent: (a) A charging circuit in the transmitter for causing oscillations of the desired frequency, coupled, through a transformer, with the open antenna circuit, and (b) the synchronization of the two circuits by the proper disposition of the inductance in either the closed or the antenna circuit or both.

"By this and the added disclosure of the two-circuit disclosure of the two-circuit arrangement in the receiver with similar adjustment, he anticipated the four-circuit tuned combination of Marconi." ("United States Reports," pp. 15, 16.)

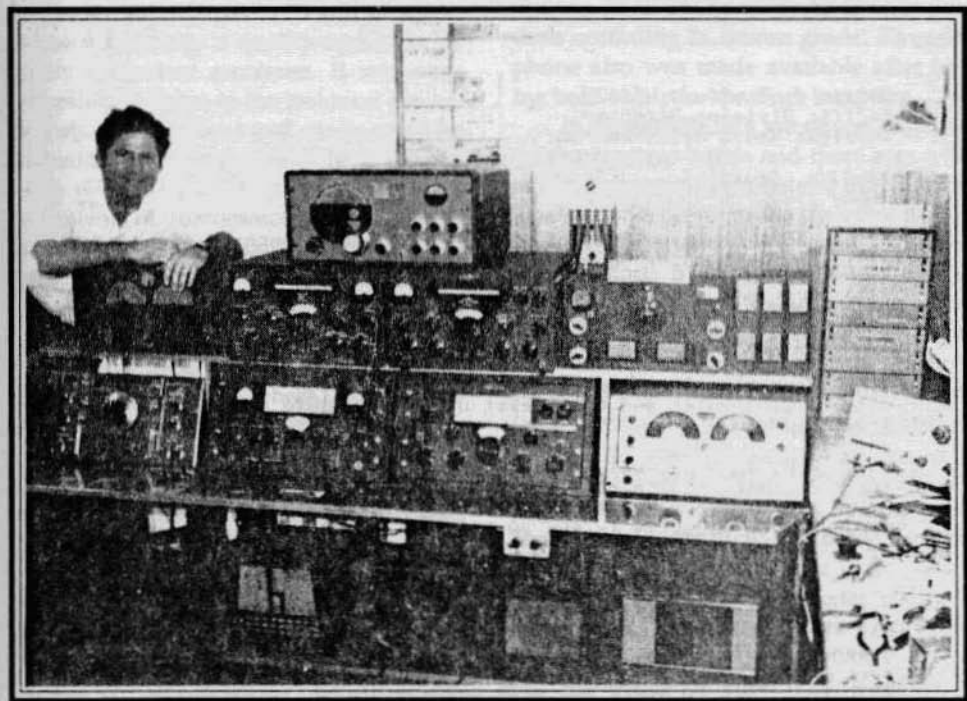
John Stone was a contemporary worker in the field of radio with Tesla, and his comment is highly significant. In evaluating the work of Sir Oliver Lodge, Marconi, J.J. Thompson and others he stated:

"Among all those, the name of Nikola Tesla stands out most prominently. Tesla with his almost preternatural insight into alternating current phenomena that has enabled him some years before to revolutionize the art of electric power transmission through the invention of the rotary field motor, knew how to make resonance serve, not merely the role of a microscope, to make visible the electric oscillations, as Hertz had done, but he made it serve the role of a stereopticon...He did more to excite the interest and create an intelligent understanding of these phenomena...than anyone else...and it has been difficult to make any but unimportant improvements in the art of radio telegraphy without traveling, part of the way at least, along a trail blazed by this pioneer who, though eminently ingenious, practical and successful in the apparatus he devised and constructed, was so far ahead of his time that the best of us mistook him for a dreamer." (J. S. Stone, "Fames of Nikola Tesla" Liberty, Oakland-San Francisco, July 11, 1917.)

This is but one of many wonderful testimonials to the greatness of Tesla, but it is a hard act to follow. I think at this time I will tell you my little plan that probably has very little hope of success. As many of you already know, I teach the third grade in a public school, and each year we adopt some project to honor and perpetuate the name of our class hero, Nikola Tesla. This year (1988-89) we have engaged a sculptor to make a bust of Tesla in bronze which we hope to be able to donate to the National Museum of American History of the Smithsonian Institution in Washington, D.C. The cost is only about \$1800, but it is definitely museum quality. If anyone is interested in making a contribution you can send it to "The Nikola Tesla Memorial of Dexter Community Schools," 2704 Baker Rd., Dexter, MI. 48130. The Tax Free ID Number to use for this donation is 38-6007821.

Mike Palmer

K5FZ



I'm 40 years of age, first licensed in 1963 and enjoy other radios I have restored besides the 32V-1 /75A-1 in the QSL card. These include a KW-1 prototype, RME-69 receiver, Hallicrafters SX-42, HRO, HRO-60, NC-183D. I have others waiting to be restored. I've operated many modes over the years: ssb,cw, rtty, sstv, but I have never enjoyed ham radio as much as I do today, restoring and using the old equipment. This is the most exciting period of the hobby to date for me.

There are many facets of the radio hobby as we know: ssb,cw, rtty, packet, amtor, sstv, dx etc. Now there is time to add one more, "Antique Amateur Radio". The interest is growing. I know this. I'm excited about it and I'm excited about Electric Radio. Now is the time for both.

I work as an electronic technician for Motorola on modern equipment such as vhf/uhf fm mobiles, handie talkies, pagers and cellular telephones. I have no interest in vhf/uhf fm in ham radio. That would remind me too much of work.

Ed:

I think Fred's letter expresses the concerns and frustrations of all Am'ers.

Member:
Society for Promotion
of Amplitude Modulation

Fred E. Huntley, W6RNC
P.O. Box 47B
Nevada City, Calif. 95959

March 11, 1987

Rodney J. Stafford, W6GCV
 Pacific Division Director
 American Radio Relay League

Dear Mr. Stafford:

I would like to inform you of the continued non-recognition by the ARRL organization, of the interests and concerns of those radio amateurs using Double Sideband Carrier Modulated A.M.

A. Up until a few weeks ago, there was an F.C. packet amateur station operating daily on 29.95 khz. in the middle of standard frequency segment utilized by A.M.ers for many years.

Recently, it was discovered this operation was unauthorized under F.C.C. rules and the packet station removed somewhere around 29.3 Khz. (CW)

Now, in March QST, under minutes of January Board Meeting, Item 86 states that a committee is investigating a change of F.C.C. rules proposal to make it possible for packet FM operation at a lower frequency (presumably in the 29.95 Khz. region habitually used by A.M.ers.

B. In the January QST magazine there appeared a table entitled: "The Considerate Operators Frequency Guide." Nowhere in this guide was there any mention of the A.M. mode. A fellow 3EM member, Mr. Rideout, WA6IPD wrote to QST about this omission and received a very curt reply from the Manager of the Regulatory Information Dept. of ARRL that "Due to space and size constraints we intend to retain the present general format in which the Considerate Operators Frequency Guide appears in QST."

C. There appears to be a direct connection between the conscious non-recognition of the A.M. mode of emission and the problems of interference experienced by A.M.ers. on 29.95 khz. and elsewhere on the amateur bands.

D. A.M. operation has many interesting facets, is in no way obsolete or inferior, and does have its advantages. There is a good number of radio amateurs nationwide who use A.M. emission. And, in my opinion, there is a greater percentage of technically advanced amateurs using A.M., than in other emission modes.

CONCLUSION AND QUESTION: DOES THE ARRL INTEND TO REPRESENT ALL RADIO AMATEURS AND ALL THEIR MODES OF EMISSION (INCLUDING A.M.) OR ARE THE A.M. AMATEUR OPERATORS OUTCASTS AND SECOND CLASS CITIZENS IN THE AMATEUR COMMUNITY?

Sincerely yours,

Fred E. Huntley,
W6RNC

copies: to AARRL Directors

Reflections Down The Feed-Line

In the late thirties, when I got my first ham ticket, it was a class B license. After one year, a ham was eligible to take an exam for the high Class A licence. Class A gave the ham the privilege of operating phone on 75 and 20 meters. Class B hams could operate on 160, 10 and 5 meters.

In the pre-war years 75 and 20 meter phone was strictly a quality operation by highly competent amateurs. It was very interesting to listen to the technical discussion about equipment and much could be learned by listening to them. There was virtually no mention of personal matters and certainly no bickering or back stabbing, like occurs today, occassionally, among sidebanders

The young squirts, way back when, went on 160 meter phone mainly and that band was a mass of wall to wall heterodynes in the northeast, where I lived. While 75 phone was very dignified, the hi-jinx and bantering was commonplace among the younger element on 160. Five meters sounded like 160. Some hams got their start bootlegging on five.

Pre-war, almost all the transmitters were home built, while most of the receivers were commercially manufactured. However there was still a respectable amount of hams using home-built receivers at this time.

After WW2 ham radio became a whole new "ball game". An avalanche of creativity and pent-up energy was released. Tons of surplus military equipment of every description became available. Many new commercial manufacturers of radio equipment emerged, along with the old stand-bys, to release a wondrous variety of new radio gear for the amateur operator.

The post war years- from 1946 through the 50's- were probably the golden years of amateur radio, with lots of enthusiasm, lots of equipment, and lots of building and modification.

AM phone was in it's heyday with

By Fred Huntley W6RNC

manufacturers such as Collins, E.F. Johnson, World Radio, plus others, bringing out fine models of radio equipment. The ham phone bands became well occupied. The licensing system was changed around 1950 and the class A and B system was abolished. All hams were allowed to operate on all phone bands, in specific portions according to license grade. 40 meter phone also was made available after having been solely for cw since inception.

In the middle 50's ssb phone emerged on the amateur bands and there was a bit of rivalry between AM'ers and the "Donald Ducks" for a place on the dial. Eventually things really heated up and some described it as warfare. By the 70's am was on the ropes and facing extinction; being overwhelmed in numbers by ssb operators. But a few am operators never gave up and provided the continuity for the modest comeback this quality mode of phone transmission has made today.

What was am phone like in the "old days"? It was exactly like you hear it on the air today, with 10 meters being the closest to the old original. That's why a lot of amateurs are turning to 10 meter am, even ones who became sidebanders. They want to relive their days of glory on am.

AM has a different quality than ssb. The audio is more life-like and even the same person will sound noticeably better on a good am transmitter. Also am operation is more leisurely paced. The am operator makes his spiel-uninterrupted by back chatter- and has a chance to put his feelings into his presentation.

With the prevalence of sideband phone operation, there emerged a threat to am's longevity. A few amateurs wanted am to be abolished by the FCC. Petitions to the FCC for such action began to be filed. In 1980 the threat became very serious, spurring the issuance of the old Press Exchange newsletter to organize AM'ers in defense of their emission mode. This newsletter

SPAM : a short history

by the founder Don "Hoisy" Hoisington W4CJL

I should have asked you how long a piece you wanted; 50 words, 500 words, 10,000 words???? Tell you what I'm going to do. I will enclose a lot of information in this regard and since you are the editor Barry, you can help me out by composing the final draft.

After you have digested the material presented here-with you will find that the original editorial by Jim Fisk, in the June, 1967 issue of 73 magazine "started the ball rollin". Four of us local Am'ers got together and decided to make an effort to Preserve and Promote AM. As you will well remember, at this time there was still a big rush to go ssb. So we had 500 of the first membership cards printed and placed a small ad in CQ magazine. At this time we didn't ask for even an sase but since this station, where I was employed as Chief engineer, allowed me to make xerox copies at cost (.05) and as postage was still quite reasonable we were able to make some progress with great assistance by am contacts on 40m and 75m.

We ran out of membership cards about 1970 and had another 500 printed still the same size because it was cheaper. Hi. I must point out that in the beginning we called our group ADVANCED MODULATION for the simple reason that the 100% modulated 1kw am transmitter only required 250 watts in each sideband. Not very much "talk power" compared to ssb. By use of Ultra-Modulation (QST Oct. 1956) Taylor Super-Modulation and W6QYT balanced modulation "Upside - down" circuit (W3PHL- W4CJL-March 1970 CQ article) and other forms of Positive Peak Extension we are able to produce greater Talk Power with control of the negative cycle at 100%. It was only after we elected Floyd-WA5TWF- as our President that we decided to separate into two forms of am promotion. The promotion of special circuits was left to myself.

The third set of membership cards were printed along about 78 with a 500 printing.

Please believe me we did not expect all the former members to continue to operate am down thru the years. Silent keys, moves to ssb, cw etc. all took it's toll. When we elected Floyd Dunlop, WA5TWF, the summer of 83, we had a few memberships cards left and told Floyd that he should start a new membership roll ...from scratch. He then came up with a beautiful certificate which is being used at the present time. Floyd for the first time began to ask for contributions from all members. He did a beautiful job for 5 years until he had a sudden heart attack and became a silent key, June 15th, 1988. Please note all the form letters he sent out and the work he did planning special events and so on. He did not have a regular job with income, but lived with his parents. Just how he did manage to make ends meet all those 5 years I just don't know.

I gave him 100% control of everything with only occasional suggestions.

The copies of the AM Press Exchange of July, 1988, explains about our electing the present President, Norm Scott, WB6TRQ. Norm has done a good job. John, W5MEU of San Antonio, was able to obtain most of the records that Floyd had kept.

With the present cost of printing and postage I recommend that we ask prospective members to include \$1 with their application. Norm has not asked for any contributions since taking office.

Your interest in my W9XBR broadcast back in 1932 is appreciated. Actually it could have been more serious, with my spending some 30 years in the Federal Pen at Lansing Kansas. (ed: Hoisy is referring to his first (illegal) broadcast station. He lost his ham license for a year as a result.) I am working on this article and will send it to you shortly. My first experience in broadcasting was the summer of 1935 when I was vacation replacement at KOY-Phoenix, AZ. Since they were still using motor generators and storage batteries this might also be interesting.

Thanks a lot for your interest and hope your project is successful. We really need a publication such as you have proposed. I plan to be more active on 75 meters -3860-3890 khz, after 9.30 MDST, so if you are around I would love to have a chat.

Best 73, Hoisy

Ed: Hoisy sent me a mountain of material on the beginnings of SPAM. It was very interesting going through it. The editorial that Hoisy says "got the ball rollin" is a classic. It is the most energetic attack on am and Am'ers that I've seen. Obviously written with the intent of hastening the demise of am, it had the opposite effect: it caused the Am'ers to organize and fight for the preservation of that mode.

Floyd Dunlap, WA5TWF, worked very hard for SPAM. He was totally dedicated to the preservation/promotion of am operation. Fortunately for the AM fraternity, other individuals within the Spam organization have carried on after his death.

In the early SPAM literature it is suggested to members that they not make any "un-complimentary remarks" to side-band operators. I think this is something we should remember today. The literature also suggests that Am'ers should try to create as much good-will between the various modes of operation as possible.

I think it's very important that all Am'ers and others interested in vintage equipment be members of Spam and support the work the group is doing.

SPAM

TO JOIN:

SEND \$1 TO: NORM SCOTT, WB6TRQ
P.O Box 67
Potrero, Ca. 92063

continued from page 6

dispensed with it. We can't keep our heads in the sand. I believe a no code licence would entice more young people into amateur radio.

Barry: What do you think of the renewed interest in old equipment and am operation?

Leo: I think it's great. It could be that this will stimulate amateur radio in general. To me it's good news. I haven't paid much attention lately to what's going on regarding am activity but I'm going to start listening around a little more in the future.

Barry: Finally, what do you think the future looks like for amateur radio?

Leo: My honest appraisal of amateur radio for the future is not very encouraging. We have to recognize the attitude of the younger generations coming up and appeal to their thinking. We must establish a liaison between amateur radio and the computer world. That could be the challenge for amateur radio in the 21st century.

Ed:

After I had finally put the interview together, and after I'd talked with Leo at length for the third time, I realized that there was some things about him that didn't come out on the printed page.

Leo is a very compassionate and caring individual. He has always been involved in civic groups and charity work. He has done much for the people in Council Bluffs and other places.

He is a people person. He has friends everywhere and the hams that were Leo's customers years ago really feel that he cared about them. He is remembered for giving quality service with a personal touch.

I think that the story coming up in the next issue about his war-time business-manufacturing crystals- is fascinating. Stay tuned.....

The Saga of the BC-610

By Bill Kleronomos KDØHG

How An Amateur Transmitter Went to War

In our modern era of communications gear and the silicon and microprocessor chips that make it possible, we would do well to go back to the time when a basic, solid, and simple piece of radio equipment could serve this country's military and civilian communications needs for a period of over a third of a century- and do it without the kind of perpetual technical problems and cost overruns so prevalent in modern military communications equipment. This one item of transmitting equipment has served us so well that it's creator, a ham from Chicago- Bill Halligan- and his firm, the Hallicrafters Company, have received numerous citations and awards from both military and civilian agencies in recognition of this fact.

The transmitter I'm referring to, of course, is known best by the military nomenclature of BC-610. Many of you have used a surplus 610 over the years and know what I'm speaking of. Those of you who have never owned or used one of these transmitters and love to operate AM or CW with vintage equipment ought to consider the acquisition of one of these venerable behemoths for restoration and use on the air.

The story of the 610 begins back in 1938, when the Hallicrafters Company brought the HT-4 transmitter out on the amateur market. In an era when nearly every amateur made his own transmitter its introduction created quite a stir. Its features included 450 watts output on CW; 325 watts on AM phone. The HT-4 had a number of convenience features such as the ability to cover any three adjacent ham bands with a set of quick change coils, and final band-switching with a front panel switch, as well as the ability to cover all bands from 160 through 10. As time went on, the HT-4 became the HT-4B, which added provisions for VFO type operation. Now we're talking real deluxe hamming for 1940! By the way, the HT-4 sold for \$400 in 1940, and

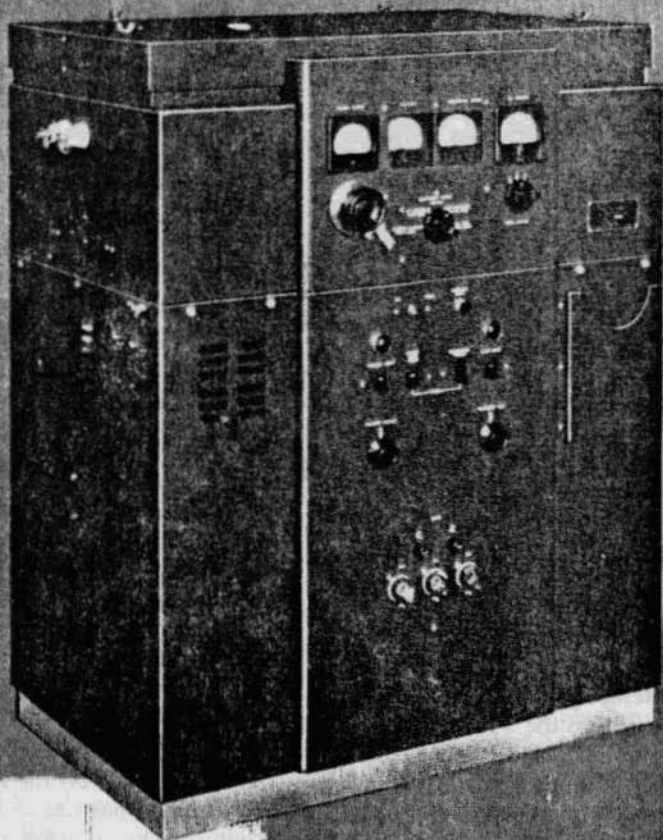
my New York Times World Almanac says the average worker made about \$25 weekly back then, so I suspect that this unit was on more amateur's wish lists than actually in ham shacks.

As 1940 rolled in, Hitler had invaded Poland and most of Europe was at war. While President Roosevelt had proclaimed the United States to be neutral, many in the American military believed our involvement in the war was inevitable and preparations were being made within the War Department to outfit our military with the latest in aircraft, vehicles, and other war equipment. What the Army desperately needed was a radio communications set with a reliable range of at least 100 miles capable of being used in vehicles in support of armored tank divisions. Being in a rush to procure some type of satisfactory communications set, the Signal Corps began to look over what was available on the Amateur market, and discovered the HT-4. It was inherently rugged and stable, and its high power output made possible the desired communications range, day or night, on ground wave. Hallicrafters made some modifications to the HT-4, including adding some relays, an improved antenna tuner, and made the units weather tight, and the BC-610 was born.

In these days of solid state equipment it's hard to imagine anyone considering a transmitter some four feet high and three feet wide and over 300 pounds for mobile use, but that was the case. The 610, associated receivers, antenna tuners, and spare parts became known as the SCR-299 communications set, and a one ton truck was developed to carry all this stuff around as a mobile communications command post; power being supplied by a trailer mounted generator. With the use of an audio patch panel this communications set could be used to transmit voice messages from field telephones located miles away.

During the war years, the BC-610 pro-

hallicrafters RADIO



Model HT-4E

TELEPHONE AND TELEGRAPH TRANSMITTER

"The Voice of Victory"

Photograph reproduced from 1945 Handbook by permission of ARRL

vided yeoman service for the Allied armies in every theater of the war. British generals Montgomery and Alexander first communicated via the BC-610 during the Allied invasion of North Africa in 1942. Our own General Eisenhower personally credited the SCR-299 communications gear as making possible Allied victories over general Rommel during the campaign in Tunisia, North Africa. On the Pacific front, an SCR-299 communications truck was the only means of communications between New Guinea and Australia for several months, and the list of achievements for this remarkable piece of communications gear could go on and on. Credit should also be given to the radio amateurs in the war who kept this gear running, often while under heavy shell fire.

After the end of the war, the BC-610 began to show up on the surplus market, and was an instant smash in the amateur community. In spite of the fact that hundreds were given the deep six off the decks of ships returning to the States, they were easily available for reasonable prices in the \$100 to \$200 range at surplus dealers in Chicago and New York's famous "Radio Row". Unfortunately, with the end of the war, television came into its own, and the '610's prewar design generated harmonics—lots of them well into the VHF spectrum, and this old workhorse began to lose popularity to the new TVI proofed equipment entering the amateur market. However, the 610 continued to be manufactured, and the later models did incorporate improved shielding and TVI suppression. Many amateurs using the later models today report little, if any, TVI. The BC-610 continued to be manufactured into the mid 1950's, although due to advances in communications gear it was no longer used as mobile equipment. Replacing it was the modern T-368 transmitter.

If you're interested in acquiring a BC-610 for amateur use, here's some tips. For better reliability and TVI suppression, select a

postwar model, if possible. The BC-610A through F models were produced until 1945, and the last model manufactured was the "T" model sometime around 1954. The last time the 610 appeared as 'new' government surplus was 1980, and most of these were reduced to parts, unfortunately, by surplus dealers. This has been the sad fate of many of these fine old transmitters since the SSB era began as many of the 610's components are ideally suited for a stout linear amplifier or antenna tuner. By the way, an authoritative source I interviewed for this story claims that the government still has a number of 610's in storage and could surplus them out again in the future.

Make sure the transmitter you're interested in has the plug in tuning units to cover the bands you want to operate on. Also, you might want to acquire the matching BC-939 antenna tuner as well as the associated speech amplifier unit. It is possible to drive the audio input with a high fidelity audio amplifier for a real quality sound, and I recommend doing so. And as always, follow safe practices when working on the BC-610 or anything else containing lethal voltages! Bleeder resistors can fail and plate supply relays do stick closed—unplug the transmitter and use a shorting stick EVERY time you work on the innards. And, when away from your shack, even for a minute, turn off the high voltage to protect loved ones and house pets. Cats are notoriously attracted to warm, dark crevices! We often forget these rules of safety in this era of silicon breadboxes, so be aware! 2500 volts gives one only one error!

Consider yourself fortunate if you can acquire a good operating or restorable BC-610 as there's precious few left. And while you're on the air with it, you can always mention that your transmitter received a commendation from a U.S. president in our country's hour of need. Eat your heart out, Yaesu!

QCWA by Esther Given W6BDE, QCWA Publicity Chairman

The Quarter Century Wireless Association is an organization of radio amateurs first licensed 25 or more years ago, who are interested in preserving the history and traditions of amateur radio and perpetuating the development of amateur radio communications by its pioneers. It's membership forms a reservoir of knowledge and experience benefiting all radio amateurs and the furtherance of public welfare.

Organized 42 years ago QCWA's active membership has risen from 54 charter members to over 11,000 world wide. Membership is open to any amateur who was first licensed 25 or more years ago who now holds a valid amateur radio license. The license may have lapsed in that period but the important factor is the original interest and issuance of license was 25 or more years ago. QCWA membership brings a new phase to amateur radio appreciation and provides active participation to an elite and highly regarded organization.

The first QCWA chapter was established in 1951. To-day 169 chapters located within easy travel distance of major population areas allow members an opportunity to share local activities and fellowship. A QCWA chapter may be formed when ten or more QCWA members meet, elect officers and petition a charter. Chapter members must be current members in good standing of the national organization.

QCWA mails a quarterly journal to U.S. members, sponsors cw and phone nets, QSO parties, recognizes outstanding achievements in the Amateur Radio Service with special honor awards, offers recognition to members who reach 50 years of ham activity with endorsements for each 5 year increment thereafter, and recently has honored eight members who received their first amateur radio license 75 years ago. In addition QCWA sponsors an annual college scholarship program which recognizes scholastic abilities and future

goals of young amateurs. In 1988 QCWA awarded seven \$700 scholarships.

QCWA welcomes any current amateur licensed 25 or more years ago. Membership information and applications may be obtained from QCWA Headquarters, 1409 Cooper Dr., Irving, TX 75061.

Review: Chuck Dachis, WD5EOG-THE Hallicrafter Collector- has put together a 30 page booklet, "Product List", listing the various pieces of equipment that Hallicrafters has produced over the years. Chuck says that in the future he hopes to add photos and publish it as a book. The booklet, as far as I know, is the only reference material available on this company. I recommend it. It should be very useful to anyone interested in Hallicrafters equipment. \$10 to Chuck Dachis, 4500 Russell Dr., Austin TX 78745

Information Needed:

In future editions of Electric Radio I plan to have a regular section listing the frequencies used for an operation around the country. I would appreciate hearing from anyone involved in a regular group or net operation on hf or vhf. It might also be interesting to learn what's happening in other countries.

Special Thanks:

To Harold Storrer, WD8MRE, the publisher of the old AM Connection. When Harold found out that I was starting a new publication he packed up copies of all the issues he had published and sent them to me. They have been very useful. Along with the parcel he sent encouragement and advice. Thanks Harold

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Perhaps an explanation is in order relative to my earlier comment that we hold little hope of success in this venture: For some reason that is bewildering to me historians have not been very kind to Tesla. He created our system of polyphase alternating current used throughout the world, and he gave us every essential of radio, as well as many other wonderful discoveries. Yet historians seem to want to perpetuate the names of Thomas Alva Edison and Marchese Guglielmo Marconi for the accomplishments clearly made by Tesla. I wonder why?

If you visit the electrical display of the Henry Ford Museum in Dearborn, MI, you will see Edison's name in distinct prominence, but you will not see Tesla at all. The Smithsonian, I understand also displays Edison in prominence. However, I want to see for myself just as I did with the Henry Ford Museum, so I am leaving in the morning for Washington, D.C.

I would like to wish you every success in the world with your new publication. And no, I do not think Electric Radio is a misnomer; I like it.

sincerely, Jack

John W. Wagner W8AHB



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continued from page 11

continued for 3 years, and after it ceased operation, the present AM/Press exchange was born to continue as a clearing house for information on all aspects of an operation.

Also, W4CJL formed SPAM-The Society for Promotion of Amplitude Modulation-, to preserve this mode of operation on the ham bands. For a number of years, WA5TWF, (now a silent key) was president of SPAM and did a tremendous amount of work to foster am in amateur radio.

Today am hamming is on an even keel and is making a modest comeback. Most of the am operators use the old equipment from the 50's and even 40's but there is a trend of new arrivals to am using modern all-mode transceivers. One of the attractions of am today is the camaraderie of am operators and new recruits are welcomed like a brother.

In America today there is a nostalgic segment of the population that values the highlights of past years: the quality years goneby. Big band music has a large following, classic autos have a large following; so why not classic amateur radio? Which is what am operation today is all about.

AM'ers today recognize and treasure the quality past years of amateur radio: "The Golden 50's". While it is good to focus on the future, it is also well to remember our heritage. In my mind am operators are one of the last main repositories of the true amateur spirit. Long may we modulate: "Double Sidebands with Carrier...FOREVER"

Information Wanted: Does anyone know anything about a transmitter made by a man named Pierce? It had a pair of 807's as modulators and another pair as finals. I understand he made about a 150 of these units. I would appreciate hearing from anyone with information. Ed.

Letters

The following letter is very representative of all the letters I received in response to my general mailing. Ed.

Stephen L. Sauer WA9ASZ
1274 Londonerry Lane
Greenwood, IN

Dear Barry:

How strange. after being out of ham radio for the last 12 years or so, I got interested again last fall. It has taken me until today, the same day I received your letter, to get my old but newly purchased equipment working so I could have my first phone (am) qso in a dozen years.

But I have been monitoring 10 meters am and I knew your name the moment I saw it. I have been keeping a log of all the am operators I have heard, and their equipment, waiting for the opportunity to contact them. Unfortunately I live in an apartment building which bans outside antennas and all transmitting equipment. I'm ashamed to admit it but I have a 10 meter dipole hanging from the ceiling and to-day I worked Arizona with the HT-32B. Unfortunately I got into the cable line. I guess I still have some work to do on the station. Hi.

I hope you tell others that there are hams out there working to get on and monitoring am even if they can't operate. I have heard so many of the hams talking about how they're gathering up the good old equipment. I have acquired the following equipment since last fall: SX-115, SX-101A, SX-101MK3, SX-110, S-107, HT-32B, HT-40, Johnson Challenger, and a Johnson Ranger. Incidentally, you would not realize that our hobby is declining if you were to attend any of the ham fests in this area. They are extremely crowded and if you want any good tube type equipment

you need to buy a table and purchase from the dealers when setting up the night before the hamfest begins. At the Indiana hamfest a week ago one operator said he brought 20 receivers with him, yet when the hamfest began at 8 am he only had 3 left.

I know your classified section will be very well accepted. There are many hams out there using (or trying to use) the old equipment and they have learned a lot about digging up sources for parts. That information needs to be shared. I need to know where to go for that odd crystal, for tubes, transformers, etc. We have a company here in Indiana that will make transformers to specs. That information needs to be made available. Sure I buy extra rigs for parts like most, but I hate to see a rig which could be repaired cannibalized because parts were not available.

It amazes me when I listen to the Am'ers and hear them say exactly the things that I have been saying, have the same interests that I have. We may be a small group (or maybe larger than we think), but we are very dedicated and sincere in our endeavor. And qso's are becoming qso's again.

73 Steve WA9ASZ

P.S. How about a regular feature on troubleshooting older tube type gear? Or an article on the problems that some particular rigs always seem to have?

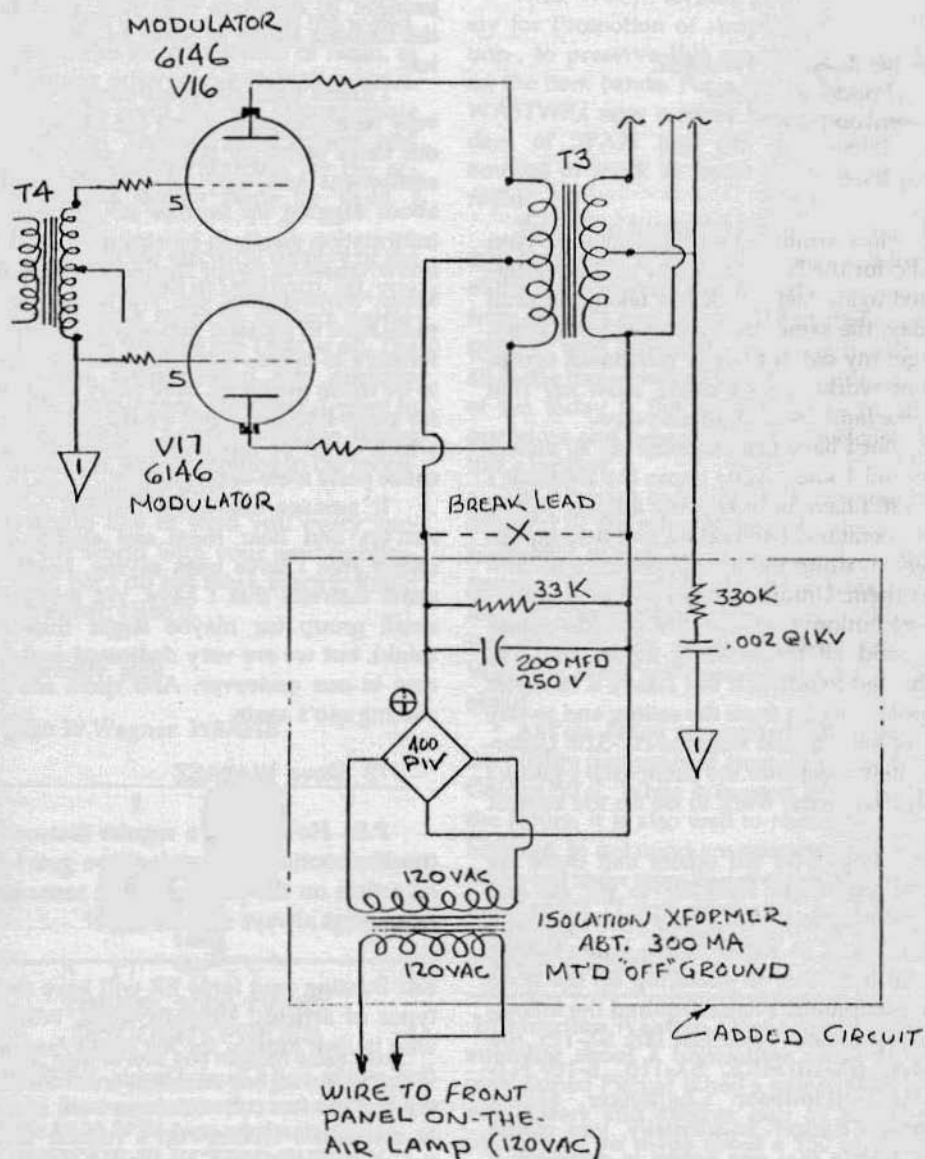
Ed: Starting next issue ER will have those types of articles. Howard Mills, W3HM- who is well known for his repair/restoration work- and Chuck Dachis, WD5EOG, - the Hallicrafter collector- have both agreed to contribute articles on a regular basis. I'm also considering some type of column where readers would send in questions and I would have them answered by individuals with expertise in the pertinent areas.

Valiant Audio Mod

submitted by Dick Kaitchuk KA9LYR

original design by William Lill W9ABC

drawn by Tom Kaitchuk WB9EAW



THE SUPER MODULATION AUDIO PROCESSING GROUP

Society for the PROMOTION of ADVANCED MODULATION

QUESTION: WHAT IS ADVANCED MODULATION???

ANSWER: ADVANCED MODULATION is AM with DOUBLE-SIDEBAND-REDUCED CARRIER.

ADVANCED MODULATION is the circuit introduced by W60YP in 1947 and very successfully used by W3PHL for over 10 years and by W4GJL since 1970.

ADVANCED MODULATION is the application of additional POSITIVE side-band power limited only by the UNDISTORTED power output of the modulators and the FCC power limitations of 2 kW PEP in each sideband.

ADVANCED MODULATION will allow POSITIVE PEAKS to reach 150 to 300% without any distortion produced by the transmitter and when received with a sync. detector or product detector.

ADVANCED MODULATION WHICH INCORPORATES NEGATIVE CYCLE IDENTIFICATION-NEGATIVE PEAK CLIPPING, the TAYLOR SUPER-MODULATED, the ULTRA-SERIES modulated circuit or the ULTRA-MODULATION circuit allows control of the NEGATIVE PEAK to reach only 100% but allows the POSITIVE PEAKS to reach 150 to 300% depending on the UNDISTORTED output of the MODULATORS.

ADVANCED MODULATION is the simple addition of a low-level negative cycle attenuator. In standard broadcasting the FCC allows 125% positive peaks with less than 1% distortion. All of these circuits can be supplied by W4GJL-the KEY SPAN STATION for the cost listed below.

ADVANCED MODULATION in the elementary stage is the simple art of talking close to your mike and across it to eliminate "breath" noises. This eliminates room noises and gives your voice a "POLARIZED" effect. Please POLARIZE your mike to allow more energy in the POSITIVE PEAKS.

The SOCIETY for the PRESERVATION of AMPLITUDE MODULATION as a QUALITY COMMUNICATION MEDIUM and the PROMOTION of ADVANCED MODULATION recommends to all AM STATIONS to use the above modifications to give your station a LOWER SOUND. Remember only AM stations that use ADVANCED MODULATION will be in a position to meet the competition for band-space of SSB.

WHY DON'T YOU TRY ADVANCED MODULATION---YOU'LL LIKE IT.....!!!

Any one or all of the above circuits with instructions for their use can be supplied by writing to W4GJL and enclosing \$2 for each article to cover cost of printing and mailing. Order all five modifications for only \$5.00

STATE OF THE ART AM

Society for the PROMOTION of ADVANCED MODULATION

DON "HOISY" HOISINGTON - W4GJL

Don "Hoisy" Hoisington
Founder-Chairman-SPAM
202 Baker Drive
Florence, AL 35630

DON "HOISY" HOISINGTON
Amateur Radio W 4 CJL
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**Dead-line for June issue
May 15**

WANTED: Older HRO-5,7 etc. mint condition. Also Collins 32V series TX. N.E. Ohio area. K8CFC, (216) 741-8999.

WANTED: Pair of jumbo 4 pin tube sockets for 810,872, etc. 250-300 pf vacuum variable, Bill Kleronomos, KDØHG, P.O. Box 1456, Lyons, CO 80540. (303) 823-6438.

WANTED: FYO paddle ; bandsread coils for a National SW-3 receiver. Phil Rand, W7XK, Harriman Rt Box 170, Klamath Falls, OR 97601. (503) 356-2381.

FOR SALE: Tubes- new & used. 254W,HK54, 24G, 3CX100A5, 4X150A, 809, 813, 826, 829, 1625, 1629. Many others.

WANTED: 4-400A's, 4-125A's 6000 tubes. Tony Wheeler, K9BBA, RR1 Box 215, Carlock, IL 61725. (309) 376-7721.

WANTED: Warrior linear amp in fair condition. Pair 572B tubes and chimney for 4-1000 tube. Joe Freriks, Box 2607, Humboldt, Sask. S0K 2A0, Canada.

Wanted: Heathkit vfo-VF1, or similar vfo for use with a Heathkit DX-40. Joe Cook, K5VDD, 2151 FM 740 N, Forney, TX 75126 (214) 722-3551.

FOR SALE: Clough-Brengle CLB-60007 R-C Bridge -\$18. Lambda model 25HV power supply-\$18. Uher reel tape deck-\$25. Shipping extra. Call for information. Dave Minchella, KE2GE, (716) 359-3337.

WANTED: Looking for modulation transformer for Heath Apache transmitter and a Johnson Viking II in good condition. Bob DeRosa, WA2VMO, 417 Britton, Ave., Staten Island, NY 10304. (718) 984-4170.

WANTED: One model 502-C Electrovoice matching transformer and one EV-212 microphone. Richard Roxas, W3NCC, 265 Sleepy Hollow, Pittsburgh, PA 15216. (412) 561-3557.

WANTED: Manual for National 300 and Johnson Challenger. Power supply for Multi-Elmac and the cables for receiver and transmitter. Wayne Moore, KA9OZK, 29376 CR 118, Elkart, IN 46517. (219) 295-8216.

WANTED: GLB 2 meter synthesizer schematics, block diagrams, theory of operation info, etc. Also Poly-Comm 6 schematic. Joe Furfur, W7ISJ, 10332 Camino Dela Placita, Tucson, AZ 85748 (602) 886-3087

WANTED: Service manuals for Collins 30-S-1 amplifiers. David Norris, AA5GY, 640 Josephine, Batesville, AR 72501. (501) 793-2280

FOR SALE: Clegg 22'er, am 2 meter transmitter, xtal control, 117 vac/13.8 vdc, 20w, manual, excellent-\$35.+ UPS. Panoramic Panadaptor model PCA-2T-200-\$50.+UPS. Clay Mitchell, W8JNZ, 3685 N. Dixboro Rd., Ann Arbor, MI 48105. (313) 662-6663 res. (313) 259-5048 wk.

WANTED: 6,000 htz mechanical filter for Collins 51J4 receiver. Part #500-B60 Collins 526-9009-00. W6RIQ, 2371 Portor, Altadena, CA 91001.

CLASSIFIEDS

WANTED: A 5 khz am filter for a Hallicrafters SX-146 receiver or any 5 thru 6 khz filters for a 9 mhz I.F.. C.T. Addair, N8IYV, 1782 St. Rt. 193, Dorset, OH 44032.

WANTED: SX-88, KWM-1. **FOR SALE:** National HFS receiver 27 to 250 mhz-\$200. KWM2A/PM2-\$650. Mike Palmer, K5FZ, 16707 Creeksouth, Houston, TX 77068. (713) 444-7737.

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WANTED: Meissner signal shifter with coils and Harvey Wells TBS-50B transmitter in good physical condition. Not required to be in working condition. James Schliett, K4IMQ, P.O. Box 93, Cedartown, GA 30125. (404) 748-5968.

WANTED: HQ-170 schematic. Also VFO alignment procedure for Globe King 500-B. Dave Taylor, WA6PBJ, 11428 N 64th Pl., Scottsdale, AZ 85254. (602) 998-3684.

FOR SALE: 32V2 good for parts-\$100. + shipping. M. Heiman, K7BDY, Box 744, Showlow, AZ 85901. (602) 537-2450.

FOR SALE: 1925? Western Electric mic. Big, back snaps off and says "back" on it.
WANTED: Argonne AR-57 mic and other studio and ribbon mics. Also need old "short wave league" pins and momentos. Bob Crowley, N1DDZ, 37 Castle Gate Rd., Wayland, MA 01778 (617) 926-5026 ext. 5528 days.

FOR SALE: Hammarlund HQ-170-A-VHF-E.C. Heathkit HX-10-Maurader-E.C.
WANTED: Collins 75-A receiver, 30K Amp. Don Whitaker, K8OMO, 8775 Edison St., Louisville, OH 44641. (216) 935-2960.

WANTED: Collins 32V3 in good condition and complete. **FOR SALE:** Johnson Viking II with vfo in good condition. Harvey Imhoff, WB7VON, 12405 W. Ranchettes, Tucson, AZ 85743. (602) 682-7327.

TRADE: New xmtg rf chokes 2mh 400 ma, hv filter caps, 2w, pots, misc meters, air variable caps, small/medium power transformers. **WANTED:** Tubes: 6SQ7, 6SA7, 6SC7, 6SK7, 26A6, 833A DUD or what have you to swap. W6RNC, P.O. Box 478, Nevada City, CA 95959.

WANTED: Ranger II schematic and manual, photocopies are fine. Also interested in purchasing a Johnson Viking 500 in good working condition with manual. Carmine Iannace, KA2PAP, 239 St. Johns Ave., Yonkers, NY 10704-2715. (914) 476-2172.

WANTED: Very old or unusual Hallicrafter equipment, entire 1934 "H" & "Z" line of Silver-Marshall. Parts, memorabilia and manuals. Chuck Dachis, "The Hallicrafter Collector", WD5EOG, 4500 Russell Dr., Austin, TX 78745.

FOR SALE: BC-639A antenna tuning unit-\$125. Also BC-614E speech amp-\$65. Both are for a BC-610. **WANTED:** Circuit diagram for Stancor transmitter model 60-N. Barry Sims, W7JKY, 19950 S. Forest Hill Dr., Oregon City, OR 97045. (503) 631-3219.

FOR SALE: Heath Apache, working, very clean-\$75. SB-10 ssb adaptor-\$75., Hammarlund HQ-129X-\$75., Gonset Communicator AM linear-\$75. Edgar Reihl, WA9ULU, 1715 Illinois Rd., Northbrook, IL 60062. (812) 272-7125

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WANTED: Need copies of diagrams/manuals for Eico 730 modulator, Elmac AF 67 and Johnson Ranger. Cash or swap. Chester Ksen, W8VQL, 29572 Bridge, Garden City, MI 48135. (313) 421-4065.

WANTED: One or two good 812-H tubes. The one with the carbon plates. **AVAILABLE:** Will copy the instruction manual for my Hammarlund HQ-129-X: contains operating instructions, parts listing, wiring diagrams, alignment procedures, etc. Twenty-Two 5 1/2 x 8 1/2 sheets, defray copy & mailing cost. J.M. Huckabee, AA5BU, 12,419 RR-2769, Austin, TX 78726. (512) 258-1575.

WANTED: BC-1031 panadaptor or Hallicrafters S-35 panoramic receiver (has 5" panadaptor with SX-28). Has anyone ever seen one? Sam, W6HDU, Box 101, Alameda, CA 94501.

WANTED: ARRL (or other) Amateur handbooks; 20's thru 60's. Mac McKnight, WK7U, 3414 Keir Ln., Helena, MT 59601. (406) 475-3355.

WANTED: Ceramic spacers for open wire feed, 4 1/4" x 1/2" dia., 3" wire spacing, marked CSJ-61192 (or approx. equiv.). Bruce Batchelor, N4ALI, 1233 Chimney Top W, Mobil, AL 36695. (205) 639-1563.

WANTED: Diagram or manual for Harvey Wells Bandmaster Senior transmitter, model TBS-50C, plus any modification to 160 meters. K.J. Guge, K9KPM, 1107 Woodrow Ave., Lombard, IL 60148. (312) 627-4490.

WANTED: Crystals for Lafayette model HA 460 and HA 410 tranceivers. Also looking for Ebco Skysweeper 4-ring halo antenna for 10 meters. Harry Schools, KA3B, 1606 S. Newkirk St., Philadelphia, PA 19145.

FOR SALE: HQ-110 clean-\$75. Tubes: \$1.25 to \$5. on most. Send SASE for list.

WANTED: Heath Marauder, also parts for DX-100 transmitter. Marty Drift, WB2FOU/5, 108 Hickory Ln., Hickory Creek, TX 76205. (817) 497-6023.

WANTED: Johnson Ranger II. Ozzie Diaz, WB6ICM, 6221 Roblar Rd., Petaluma, CA 94952. (707) 795-1642.

WANTED: Manuals for Clegg Thor, DX-100 & Johnson Challenger. Will return or pay for copying/postage. John Morehead, N9HRS, 500 E. Higgins Rd. #101, Elk Grove Vlg., IL 60007. (312) 593-2111.

WANTED: Hammarlund HC-10 converter (signal slicer), National external converter cabinet for NC-303. John Martin, W4KYL, RD2 Box 171-A1, Montrose, PA 18801 (717) 278-2654.

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WANTED: Collins 6 khz filter F455B-60 and crystal calibrator 8R-1 for 75A-3 receiver. All replies answered. Don, KC9PO, 809 Spear Dr., Normal, IL 61761.

FOR SALE: Hammarlund HQ-170-\$175. Hammarlund HQ-110-\$95. DX-40 & vfo-\$55.**WANTED:** HRO-50 coils,HRO-60 receiver, Collins S-line, Collins 51J4. Mike Linger, WA5MOE, 1502 Feather Run Cl., College Station, TX 77840. (409) 693-1461.

WANTED: Viking Ranger in good condition. Gerald Vance, 2723 Sharon Rd., Jarrettsville,MD 21084. (301) 836-7632.

WANTED: DX-100 or Viking transmitter in good conditon. Also need good 250th tube. Alan Bergman, WØPUF, 909 E. Ohio St., Rapid City, SD 57701. (605) 342-6920.

WANTED: Two AX9909 and two 809 tubes. Don Hilliard, WØPW, P.O. Box 563, Boulder, CO 80306. (303) 497-3279 wk.

FOR SALE: Yaesu FTDX- 560 transceiver-\$195. on air now. **WANTED:** Kenwood TS 820 or equiv., with am mode. Excellent to mint condition. Robert Willey Jr, WA4UQD, 5600 N.E. 3Rd Ln., Okeechobee,FL 34974. (813) 763-8752.

FOR SALE: KWM2A like new with PM2 power supply -\$825. 312B5 vfo-\$225. George Cato, K4RYH, 915 Hunterhill Dr., Roswell, GA 30075. (404) 993-5403.

WANTED: Self supporting tower-50 to 60 ft. Prefer heavy duty with rotor plate.(315) 487-9410 Gary after 7pm.

WANTED: Clean Hallicrafters S-53A receiver. Also Edison phonograph cylinders. Gary Harmon Jr, K5JWK, 6302 Robin Forest, San Antonio, TX 78239. (512) 657-1549.

FOR SALE: Heath Seneca unmodified-\$100. DX-100B broken band switch-\$60. TRI State P/U. Daniel Petruskewic, WB2CUS/ 3, 53 McKinley Dr.S.V. Rd #2, Effort, PA 18330 (718) 397-0245.

FOR SALE: 8008 tubes-\$10. **WANTED:** good 833A tubes. Steven Wenger, KA9QLF, 803 S. Church, Jacksonville, IL 62650 (217) 243-3920.

WANTED: National HRO with National speaker and power supply. I would like condition as original as possible. Ian Campbell, VE3IEO, 12 Bell Harbour Place, Woodbridge, Ontario, Canada L4L 6W2 (416) 856-5547.

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WANTED: Hallicrafters HT-20 transmitter, National rack mount HRO, and AX9909 tubes. Bill Smitherman, KD4AF, Rt 4, Box 37, East Bend NC 27018 (919) 699-8699.

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FOR SALE: DX-60B with HR-10B, good condition -\$100. **WANTED:** vfo that will work on a Central Electronics 20A exciter; 9mc type. Prefer one that will plug in and go and will cover 10 meters. Jim Stagg, KE5VM, Rt. 4, Box 1000G, Hattiesburg, MS 39401 (601) 268-2951.

WANTED: Viking Ranger 1 or 11 in excellent condition. Richard Savidge, W3FDE, 1117 Coates, Sharon Hill, PA 19079 (215) 461-0243.

FOR SALE OR TRADE: Two of the old, large, model 55 Shure microphones. Neither works but they look great. John, W9CN, (407) 452-7904.

FOR SALE: T 368C transmitter with manuals. 500 watts am out on 160 thru 20. Lower on 15 meters. -\$450. Bob Sitterley, K7POF, 19545 E. Cronin Dr., Rowland Hts. CA 91748 (714) 594-4757.

FOR SALE: A-3 tri-band beam with 40 ft. tower and roter. Pick up only. Jim Sears, KDØXN, RR#3 Box 154, Gallatin, MO 64640 (816) 663-2535.

WANTED: Hallicrafter S-38 receiver, good operating condition. L Seamans, WA3RTU, 14 Crabapple Ln., Sandy Hook, CT 06482.

FOR SALE: Hallicrafters HT-37 as new. Still in original packing and box-\$175. **WANTED:** Mint HQ-180A. Chuck O'Neal, WA1EKV, P.O. Box 231, Bolton, MA 01740 (508) 779-5051.

WANTED: ART-13 in excellent condition. ART-13 shock mount, Amperite 4HTF4 regulator tube, am modulator deck for GPT 750, either complete or parts. Dale Gagnon, KW1I, 9 Dean Av. Bow, NH 03301 (603) 228-8721.

WANTED: Multi-Elmac receiver; PMR6A or PMR-12A. Jim James, W4IVB, 124 So. St. Cloud Ave., Valrico, FL 33594 () 689-3712.

WANTED: Class B driver transformer (2A3's to 100th's). Also a vac. variable cap 300pf at 20 kv and a filament transformer: 5 volts at 30 amps. Jim Taylor, W4PNM, 2721 Marschalk Road, Augusta, GA 30904

FOR SALE: Ham, SWL, Photography, Railroad books, radio gear and tubes. Large SASE for list. Hal Butcher, 456 Huntington Ave., Hyde Park, MA 02136-3115 (617) 361-5487.

FOR SALE: Meisner Signal Shifter, very clean-\$40. **WANTED:** HQ-170 manual or copy. Herm Renner, WØSCU, HC Rt. Box 227 A, Bruno, MN 55712 (612) 838-3177.

FOR SALE: Amateur radio receivers, transmitters, tubes, books and parts. Send SASE for list. **WANTED:** QRP modules, receivers, transmitters. Ten Tec, MFJ, etc. R. Olmsted, K4UJZ, 608 W. Thompson Ln., Murfreesboro, Tn. 37129 (615) 893-5344.

WANTED: Hallicrafters HT-20 transmitter, at least in operating condition. Also NC-400 receiver. Lamar Wakefield, AA4WI, 35 Ridge Rd., Marion, NC 28752 () 652-4250.

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WANTED: Valiant II, 810's, 500B-60, 500B-31, 455J-60 mech. filters. Dick Machacek, WBONCR, RR#1, Winthrop, IA 50682 (319) 935-3699.

SELL OR SWAP: German WW 2 FUG-11 LF transmitter, Western Electric 9-D aircraft receiver (HF). **WANTED:** 75A4, 51J4, Eddystone 1000, Hallicrafters 5 inch panadaptor etc. Nicholas Oland, W3DSE, 821 Kenhorst Blvd. Reading, PA 19611 (215) 264-4563 days, 378-1411 evenings.

FOR SALE: Globe King 500-575. You pay freight. LeRoy Oldham, WA6DIO, 10180 Stern Ave. Cupertino, CA 95014-3667 (408) 255-9424.

WANTED: Command set equipment, including connectors, racks, mounts, control boxes, receiver, transmitters, VT-25/10 tubes, manuals for BC-348Q and SCR-287. **FOR SALE:** HW-16 and HG-10B Scott Barth, KA6UDZ, 136 W. Edna Pl., Covina, CA 91723 (818) 966-2421.

WANTED: Swan Watt Meter Model WM-2000. Ralph Surridge, K4HOL, 3690 Friedberg Rd., Winston Salem, NC 27127 (919) 764-0712.

WANTED: I found one V70D for my old Globe King 400C. Need another one to put her back on the air. Terry McGillicuddy, WIZUA, Box 555, Bowdoin St., Houlton ME 04730 (207) 532-2644.

WANTED: Heath "TENER", dc power supply for Gonset G-76, copy of Stoner "Novice and Tech. Handbook". John Morehead, N9HRS, 500 E. Higgins Rd. #101, Elk Grove Village, IL 60007 (312) 593 2160.

FOR SALE: Antique and Ham radio tubes, parts, books, knobs, variable caps. Send LSASE with 5-25 cent stamps for 8 lists. Dick Dreher, W5VTJ, P.O. Box 691443, Tulsa, OK 74169 (918) 627-7481 evenings and week-ends.

FOR SALE: Crosely Ace 3B, Precision Equipment Co.-\$100., Crosley Model 51-\$120., Clapp Eatham RZ Radak-5450., Crosley Trirdyne 3R3 special-\$95., Travler portable-\$70., Amrad Neutrodyne-\$140., Aerial Sr.-\$100., Navy type loose coupler-\$225., National HRO with PS, 5886 coils: JB, JC, JD, JE, and F in National wooden box, works fine, has tubes, nice and clean-\$185., National 1-10, has coils, PS, looks original but is a replacement, works fine, National HRO 5TA1 with home brew power supply, coils JB and D, works has tubes, unit also has the power supply that was used by the military-\$145., Hallicrafter SX-28 w/speaker, nice, clean, works but a resistor gets hot-\$175., DeForest DV5 porcelain base tubes, with tips, have 4, each \$25. David McKenzie, K0SVJ, 516 South Exeter St., Eustis, FL 32726 (904) 589-0149.

WANTED: Viking Ranger. Charles Mesenbring, W0EPZ, 4550 N.E. Madison St., Minneapolis, MN 55421 () 572-9503.

WANTED: Johnson 500 transmitter. Also would like old Collins and broadcast equipment catalogs. Rod Sheffer, WA7AMI, 16009 7th S.W., Seattle, WA 98116.

WANTED: 4-125J tubes & A G series transmitting capacitor 1500 pf. Don Spreeman, WA9ZOR, 542 E 20th St., Kaukauna, WI 54130. (414) 766-1175.

CLASSIFIEDS

FOR SALE: MFJ model 752 Signal Enhancer 11, dual tunable ssb/cw filter and notch unit, works with any rig. Ray Paisley, N3ESS, RD 2, Box 260, Landenberg, PA 19350 (215) 268-2405.

WANTED: Coil sets for HRO 50T as follows: A, E, F, G, and AC bands. Willard Wallace, W8YJO, 2833 E. Shaffer Road, Midland, MI 48640 (517) 689-3512.

FOR SALE: H.P. distortion analyzer Model 330B, needs new power transformer, otherwise complete, including all tubes-\$15. plus shipping. William Lill, W9ABC, 244 Neva Ave. Glenview, Ill. 60025 (312) 729-0117.

WANTED: Service manual or schematic for TMC GPR-90 receiver. Chris Jackson, KD2XA, 1166 Greacen PT. Road, Mamaroneck, NY 10543.

WANTED: RME 4301 sideband selector & RME 4302 speaker for RME 4350A. Will buy all if clean. Also a Globe King 500C transmitter; must be clean and working. Jack Busk, W9FQK, 926 Rio Veroe E, Cottonwood, AZ 86326. (602) 634-8070, 9-5pm.

WANTED: Tubes: 816, 807, 811A, 6KD6, strong used or new. Also ARRL handbooks, 1955-1970. Randy Richardson, WB8FWJ, P.O. Box 405, Gallipolis Ferry, WV 25515. (304) 755-3328 wk.

WANTED: Have Navy Ral-7 receiver w/ o P.S. Need schematic and voltage figures for power supply. Tuning chart also helpful. John Rodenbarger, WB9OFG, 3657 Lombardy Pl., Indianapolis, IN 46226.

FOR SALE: Receivers: R-388, R-392, BC-312, RCH (Scott manufacture). Will also trade for National NC-400 and/or HRO-500. Joe Reda, 4237-B Hamilton Ave., San Jose, CA 95130.

WANTED: Clean Lafayette HA-410. Also bandspread and main tuning knobs for NC-125. Darrell Brooks, WA5VGO, 7707 Magnolia, Houston, TX 77023.

WANTED: Centralab PA-13 switch sections, Johnson N250 and Millen 15011 neutralizing capacitors, turns counters (B&W, Millen or surplus BC 610), cabinet for SP-600 receiver. Clark Hatch, WØBT, 2546 SE Peck Rd., Topeka, KS 66605. (913) 235-2721.

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WANTED: 10 meter gear; Gonset Com.IV; Utica 650A; manual or copy for TEK model 453A scope. Greg Richardson, WA8JP, P.O. Box 405, Gallipolis Ferry, WV 25515.

WANTED: Dead or alive, Elmac PMR-7 or PMR-8; BC-375 transmitter and tuning units; Millen 50w exciter and Knight phono oscillator. David Olsen, W6PSS, 310 Maple Ct., Chula Vista, CA 92011. (619) 427-4914

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FOR SALE: 68 yrs collection: 10,000+ items; antiques, radios, televisions, phonos, sound, military, ham, catalogs, books, flyers, brochures. 48 page list-\$1. refundable. F. Yonker, W2IBH, 7 Old Farms Rd., Saddle River, NJ 07458. (201) 825-1895.

WANTED: Following units excellent in appearance and working condition: SX-112, DX-100B, Valiant II, Warrior, Courier. Steve, WA9ASZ, 1274 Londonerry Ln., Greenwood, IN 46142. (317) 882-4598 after 6:00 PM, except Tues & Thurs.

FOR SALE: Johnson Viking II in good condition and good looking. **WANTED:** Pair of good 809 modulators for my WRL Globe Champion 300A; also pair of good AX 9909 finals. James Natale, WØPKS, 17 D Countryside Est., Hays, KS 67601. (913) 625-6461.

FOR SALE: AM'ers & Collectors; Johnson, (3) Viking II with 122 vfo's, Valiant I, mint Navigator, 6N2 vfo, Heath Seneca 6N2, Elmac AF 68, PMR 8, M1050 power supply. All are 100% operational, in excellent or above physical condition. Heath Apache 100% operational, needs cabinet, Viking Courier excellent, needs filament transformer. Manuals for all. Due to health reasons just to heavy to handle any more. Bring your Van, Pick-up, U-Haul or ? and take lot for \$700. Lee, W8WFB, (216) 533-3728., or CBA.

WANTED: Collecting National regenerative receivers, parts and accessories. Glad to correspond with other "Thrill Box" owners. Dean Showalter, WA6PJR, 36308 Panorama Dr., Yucaipa, CA 92399. (714) 797-1782.

WANTED: 810's (new, boxed only), KWM-1 meter, 3 CX 1000A7. Ira Lipton, WA2OAX, 8 Rose Hill Rd., Suffren, NY 10901. (914) 357-8282.

WANTED: EH Scott radios wanted by collector/historian. Also seeking original Scott literature. Jim Clark, "The Scott Collector", 1292 Starboard, Okemos, MI 48864. (517) 349-2249.

WANTED: Two tube sockets for Elmac 304TL. Modulation transformer for Johnson Ranger transmitter. Ron Reu, WBØLXV, RR1, Box 334, Winfield, MO 63389. (314) 668-6518.

FOR SALE: All band solid state Realistic DX-160 receiver-\$75. Hammarlund HQ 180 top shape-first \$100. Gerald Koch, N4OLR, 401 Garden St., Deland, FL 32720. (904) 985-5748.

WANTED: Telegraph bugs & wireless keys sought for private, non profit collection. Amateur seeks early telegraphic devices, a vintage amateur station, and early photographs or correspondence. Donations of telegraphic parts, inoperable keys or paddles, memorabilia appreciated. John Hensley, WJ5J (QCWA, ARRL), 5054 Holloway Ave., Baton Rouge, LA 70808.

FOR SALE: HP 606 A sig gen., HP 608 CM sig gen., SG3/U sig gen. All-\$500. + shipping. Johnny Ortiz, KP4GN, P.O. Box 532, Guayama, P.R. 00655. (809) 864-0122.

FOR SALE: BC-614E-\$30., BC-348R-\$30., Millen 500 w am transmitter 90881 complete rack mount rig-\$100., National NC-270 excellent-\$75., lots of old tubes. You pay shipping. John Van Meter, WD9JIM, 69-19th St., Clintonville, WI 54929. (715) 823-2381.

WANTED: Could you convert Hygain CB board for me with mic & put in cabinet for am 10 meters? Or swap board etc,? works on 11 meters. Dale Johnson, VE4AED, Box 626, Pinawa, Manitoba, R0E 1L0 Canada. (204) 753-2737.

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FOR SALE or TRADE: Dentron 10-160 tuner-\$100. Yaesu phone patch-\$75.
WANTED: Yaesu 757 GX-2 & Com. 27A. D.C. Smith, NØCPY, 702 Main, Box 48, Hill City, SD 57745. (605) 574-2253.

WANTED: New, old stock type 9909 and 572B vacuum tubes at reasonable prices.
FOR SALE: DA/164/BRA-4 military type 500w dummy load, easily handles kw with blower-\$90. + UPS. Roland Matson, K1OKO, RFD #1 Box 2943, Kennebunk, ME 04043. (207) 985-3751.

WANTED: Need schematic only for RME 69. Looking for clean Johnson 500. Henry Clark, W2IQ, 301 Chestnut Grove Rd., Rt6 Box 301, Dandridge, TN 37725. (615) 397-9796.

WANTED: Good to excellent Philco 60-B cathedral, 1934 ARRL handbook and old or unusual straight keys. David Combs, W5VJW, 2000 Victory Ave., Wichita Falls, TX 76301. (817) 767-0077 evenings.

WANTED: Need S-meter for Hallicrafters SX-25 receiver. Also old Regency ATC-1 car converter (1950's). Steve Miller, WA3JJT, 909 Walnut St., Erie, PA 16502. (814) 454-8990.

WANTED: Elmac AF-68. Will purchase or trade Elmac PMR-8 and M-1070 power supply with manuals. Alvin Bernard, NI4Q, P.O. Box 690098, Orlando, FL 32819. (407) 351-5536.

FOR SALE: National NC 109 general coverage receiver, good condition-\$60. Chuck Hanavin, WB3FJJ, 384 Old Conowingo Rd., Conowingo, MD 21918 (301) 378-4705.

WANTED: Century buzzer sizes 1 1/2" and 2" diameter for use with a crystal detector. Selwyn Blake, K1CPW, 186 Summer, Andover, MA 01810.

WANTED: Top cover for R388/51J4 receiver; Instructions/schemetic for conversion of 51J3 to 51J4 (installation of mechanical filters); Mechanical filters for 51J4, 6Kc/3.1Kc @ 500Kc; dial drum or drum paper for 75A-4 receiver; 2.1, 2.3Kc mechanical filters for 75A-4. Howard Mills, W3HM, P.O. Box 267, Sterling, VA 22170. (703) 430-5555.

WANTED: Schematic or manual for SX-100; var.cap-300pf, 1/8" spacing; need two GGB5 tubes. Jim Heath, N8EXS, 8186 Edward, Fostoria, MI 48435.

FOR SALE: Early books & magazines on radio, television, telegraphy and electricity. To get on our mailing list, please let us know what your specific wants are. New Wireless Pioneers, James Kreuzer, N2GHD, Box 398, Elma, NY 14059. (716) 681-3186.

WANTED: Millen rf amp 90800. Schematics and/or manuals for Ameco AC-1 transmitter and Navy RBB/RBC receivers. Will reimburse expenses. Paul Beckwith, K2LMQ, 6843 Hommellville Rd., Saugerties, NY 12477. (914) 246-3031.

WANTED: Collins mechanical filter 455 if freq-6kc band width part #F-455J-60. D. Angerhofer, WØZUS, P.O. Box 540, Edgemont, SD 57735. (605) 662-7692.

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WANTED: Copy of 30L-1 manual; good size class "B" driver transformer; old 3 circuit tuner; good Baldwin type C headphones. Geo. Bunce Sr., W5DKC, Rt.1 Box 85, Edmond, OK 73034. (405) 341-641

FOR SALE: Brass base WD-11 (open), 1926 Stromberg Carlson 501A set, 1920's tuning fork osc.-\$35. Other early radio equip. SASE. Floyd Paul, W6THU, 1545 Raymond Ave., Glendale, CA 91201. (818) 242-8961.

WANTED: Early spark equip. and books. Also QST before 1927. Edward White, WA3BZT, (302) 475-3355.

WANTED: Diagram for a NC-300. Mark Taylor WC6D, P.O. Box 4659, Modesto, CA 95352.

FOR SALE: Mint Heathkit HW7 QRP rig with hatching power supply and manual-\$55. + shipping. Ed Sauer, KC9SP, (317) 881-1483.

WANTED: AC-4 power supply for Drake T4X, T4XB etc. Seymour Krevsky, W2JBI, 69 Judith Rd., Little Silver, NJ 07739. (201) 741-4918.

NEW AMATEUR RADIO CENTER: BUY, SELL, TRADE new and used amateur equipment. Call for buying or sales quotes. Expert service shop available for all major brands. We locate equipment. (703) 430-5555 or P.O. Box 267, Sterling, VA. 22170.

WANTED: Collins SM-2 or SM-3, w/e 312B4. Bill, KØDEW, (417) 532-7710.

SELL or TRADE: BC-610 H, excellent condition with speech amp.-\$200. or trade for Viking Ranger, Valiant, or Collins 32V-3. Roger Frith, N4IBF, 281 Paragon Mills Rd., Nashville, TN 37211. (615) 331-8806.

WANTED: Manual or copy for Heathkit Apache transmitter.**FOR SALE:** 2050A thyratron tubes-\$2.50 ea. + postage. Larry Szendrei, NE1S, 67 Old Portland Rd., Gray, ME 04039.

WANTED: Early receivers; Howard, Patterson, McMurdo and Sargeant. Send info, description and price. Larry Flegle, N4TMW, 210 Wylie Ln., Woodstock, GA 30188. (404) 928-3022.

WANTED: Pre-war communications and Ham receivers, especially RME equipment, literature and advertising. Ed Gable, K2MP, (716) 621-6692.

WANTED: Am transmitter for 160 meters, low pass TVI filter (52 ohm kw of AM) and com. 64 computer. Jim Dolvin, K4OA, Route 3, Box 1584, Odessa, FL 33556 (813) 920-3138.

WANTED: Type 10, 10Y, VT62 or 801 tubes. Rodney Schrock, KA3NMJ, 402 Lincoln St. Somerset, PA 15501 (814) 445-8187.

WANTED: Any information such as age, manuals, availability of tubes (finals are a pair of 12BB14's) etc. for my Yaesu FT-50 transceiver. Also wish information on how to formulate wrinkle finish. Rick Van Krugel, VE7FOU, General Delivery, Victoria, B.C. Canada V8W-2L9 (609) 598-0842.

WANTED: National NTX-30 transmitter for restoration and to write article for the "Old Timers Bulletin" of the Antique Wireless Assoc. William Fizette, K3ZJW, RD1, Box 55, Henryville, PA 18332. (717) 629-0637 evenings.

WANTED: Power supply or schematic for Millen exciter # 90801. Will buy or trade for nice 75A3. Andrew Howard Sr, WA4KCY, 105 Sweet Bay Ln., Carrollton, GA 30117. (404) 832-0202.

CLASSIFIEDS

FOR SALE: QST magazine collection- 1946 to present-\$40. You pay shipping. Ken Anderson, W4JQT, 2404 Rockbridge St., Vienna, VA 22180.

WANTED: Johnson Valiant or Valiant II in excellent condition. KØRZ, (303) 499-1936.

WANTED: Schematics and/or manual for Stancor 4-40M modulator kit and Sargent 8-34 communications receiver, circa 1934. Reasonable price paid. Bob Mattson, KC2LK, 10 Jane Wood Rd., Highland, NY 12528. (914) 691-6247.

FOR SALE: Johnson 500-\$350. Johnson KW Matchbox-\$175. Jay Bromley, KA5DGH, 102 Stirling Ct., Fort Smith, AR 72903. (501) 646-8845.

FOR SALE: Collins 75A-2 receiver-\$75. Art Rideout, WA6IPD, 2235 Gum Tree Lane, Fallbrook, CA 92028 (619) 728-6834.

WANTED: High voltage coil for Emerson model 600 b & w TV circa 1949. Greg Bruns, 539 Wilsonia Dr., Cincinnati, OH 45205. (513) 471-5284.

WANTED: 7360 tubes, Johnson 500, Collins mech. filters for 75A4: 6khz, 2.1khz, 2.3khz. KW-1 transmitter, AR-88 receiver.

FOR SALE: Hallicrafters HT-4 (I) SN#11 am-cw transmitter. Extra final (250th), modulators (100th), tank coils, grid tuning unit, manual, BC-614 speech amplifier. All for \$300. Howard Mills, W3HM, 7300 Langsford Ct., Springfield, VA 22153 (703) 644-7307.

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For Sale: Rebuilt model 28 ASR, all options, supplies, manuals. Also Ranger 1 and NC-183D. **WANTED:** Keys and telegraph instruments. Warren Berbit, K2UVV, 46A Mile Rd., Suffren, NY 10901. (914) 357-2167.

WANTED: Hammarlund SP receiver manual. Tubes: 6CW4, 6DR7, 6CS6, 6BJ7. Stan Stevens, WA6SKD, 2112 Sandra Dr., Midwest City, OK 73111-2350. (405) 732-7189.

WANTED: KØCRX "collects radios exclusively", specializing in 50's/60's amateur radio transmitters, receivers, accessories, manuals and periodicals. Mike Sewell, KØCRX, 35795 Oriole Ave., Lindstrom, MN 55045. (612) 257-1675.

FOR SALE: Hallicrafters HT-37 transmitter with manual-\$150., 866-A tubes-\$10., 813 tubes-\$25. Eldico EE-3 electronic keyer-\$25. Steve Blaisdell, WØPER, 3120 S. Penn., Englewood, CO 80110. (303) 778-6752 days.

WANTED: High voltage transformer for Heathkit Apache transmitter. Lawrence Moskowitz, KB2AR, 2000 N. Camola Ter., Inverness, FL 32650. (904) 726-6401.

WANTED: Manuals, any info for BC 611-E military hand held. Greg Geiger, NØBDK, 215 Walsen Ave., Walsenburg, CO 81089. (719) 738-2156.

WANTED: Serviceable VHF 2-way radios for donation to Salvation Army vehicles & emergency communications. Also inexpensive service monitor. IRS credit receipts & shipping UPS available. S. Scott Lee, W9NSR, Central Communications, Coon Valley, WI 54623. (608) 452-3230.

WANTED: 32V2 or 32V3, HRO 50 or 60, Mohawk rcvr, Gonset Commander Mobile Transmitter. "Doc" Taylor, WØDQQ, 11 CypressDr., Wichita, KS 07200.

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