

My Radio Life
by
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Others have written in the Static of how they became interested in Amateur Radio and various HCARC members have urged me to do the same.

So, here goes. I hope my story doesn't bore you too much. It's quite long, because I've been around for quite a while.

I remember first being entranced by radio at age three. Possibly what sparked my interest, even at that young age, was because my Dad, in 1929, bought a radio. He had waited until superheterodynes became available and cheaper. The thing was in a box which my parents mounted up in the shelves above a desk. The speaker was separate and placed in a corner behind a chair.

I can remember being fascinated by Dad turning the dial up in the desk and the sound changing down behind the chair. I specifically recall lying on the floor, with my head practically in the speaker, listening to; "If I had the wings of an angel, over these prison walls I would fly..."

A few years later, my Dad bought a Philco console model with the speaker built in. I'm glad this wasn't our first radio. I might never have become interested in the function of this exciting new medium. I do remember being disappointed, however that the new set did not have short wave. I had heard about this new strange kind of radio on which one could receive broadcasts from countries all over the world. But Dad opted for the less expensive 1933 model rather than the 1934 offering which boasted the short wave band. "People buy these sets and only listen to short wave for a few weeks before becoming tired of it," I remember hearing him say in response to my pleading for a radio that would allow me to listen to the world.

But my interest in radio persisted. I remember one day, lying on the front lawn when I was about six, looking up at the sky and imagining seeing radio waves being intercepted by the wire antenna strung across the roof of our house.

Intent on getting a short wave set, I began

saving my allowance and picking up what money I could as well as getting a commitment of financial aid from my folks. So, in 1937 before we moved from St. Paul, Minnesota to Washington, DC, I managed to buy a Philco mantel model radio. It had the regular broadcast band plus TWO short wave segments. One of these brought in police calls, which I found fascinating. The other band spanned from about 6 megacycles to around 18 megacycles. I started listening to hams on 20 meters and was hooked by the thought of becoming one. I listened to the BBC and was entranced by the sound of Big Ben. I heard the ranting of Adolf Hitler on the German radio. This radio stuff was all very interesting to me.

In the 5th grade, we had library day. We would walk from the school to the local Saint Anthony Park Library about a block away. Most of my classmates looked for the kinds of books ten-year-olds should be interested in, but not me. I had discovered the Radio Amateur's Handbook, then a relatively small publication put out by some outfit in Connecticut called the American Radio Relay League. I would immediately go to the shelf where that intriguing book was located, take it down and peruse the pictures and drawings contained within the some 200 pages. I couldn't understand the circles and jagged lines, but I was fascinated by them nevertheless.

Just before leaving St. Paul, while in the Cub Scouts, I met my Den Leader's younger brother. I remember his name was Walter Fish. He was about 18 and studying to become a ham. I remember visiting him one evening and seeing the 160 meter phone transmitter he had just completed. It was built on a piece of wood, about 1-1/2 by 2 feet and had many glowing tubes. He had it hooked up to a light bulb as a dummy load and had screwed up the trimmers on a broadcast set so it could receive 160 meters. I recall being transfixed by him turning the transmitter on and seeing the light bulb glow brightly. Then, when he talked into the microphone, you could hear him come out of the speaker and the bulb would get brighter with each word he spoke.

I was hooked. But then we moved.

About 1939, I was no longer satisfied with

nothing more than a broadcast set with a short wave band. I wanted a real communications receiver. I had begun to buy radio magazines and had seen ads for wonderful receivers such as the Halicrafters S-19R, Sky Buddy and S-20R, Sky Champion. Even better, were sets such as the SX-17 and SX-25. But these were pricey for a twelve-year-old and I settled for an AC/DC Echophone EC-1 for \$19.95. It had all of the short wave bands and even tuned up as far as 30 megacycles. In addition to 20 meters, I could listen to 160 meters, 75 meters and 10 meters. There was no amateur band at 15 meters in those days. There was another strange place on the dial around 7 megacycles where all one could hear was a jumble of noise. I didn't find out until later that this was the 40 meter band which was then entirely CW.

World War II began December 7, 1941 and Hams were immediately banned from the air. I remember listening to W1AW which was given special permission to operate for about a week following the outbreak of war to inform everyone that all amateur operation was suspended until further notice.

Fearing that my little AC/DC EC-1 might not last the War, I set my sights on a Sky Buddy. By mowing lawns and delivering newspapers, I managed to collect enough money to go down to Sun Radio on F Street in Washington and plunk down the \$33.95 necessary to purchase the more robust looking receiver. The price of the Sky Buddy had already increased from the \$29.95 which had prevailed for several years previously.

With the war on and no chance of operating on the ham bands, I slowed in my attempts to get my ticket. I think it's called "incentive licensing". I had no incentive to get a license, if I couldn't use it. But, I soon heard about something called the War Emergency Radio Service (WERS). It would provide me my chance to get on the air, sort of.

WERS, which was part of Civilian Defense, was mainly staffed by hams, but one did not need an amateur license to participate. One could be a part of WERS with as little as a Restricted Radiotelephone License. This only required answering a few legal questions, no technical ones. I immediately boned up

on these and obtained the license and signed up with the Montgomery County, Maryland WERS organization which had been issued the call letters, WMDD.

WERS did not give one unrestricted use of amateur frequencies. It employed the old 2-1/2 meter band from 112 to 116 megacycles. Operation was limited to two drill periods per week, each just 2 hours in length. Operation could also take place during air raid drills. The closest station to me was at the Bethesda Station of the Montgomery County Police, about a mile and a half from my house.

But, WERS gave me a chance to meet some real licensed hams and I began to learn a lot more, especially learn how little I know.

I've been learning that ever since.

I also joined the Washington Radio Club and began taking the bus down to Capital Radio Engineering Institute at 16th Street and Park Road where the Club held its meetings. Through the Washington Radio Club, I met many interesting and knowledgeable people. I learned more about radio and the traditions of Amateur Radio, especially the key role the ARRL played in its founding and continued existence. One particular Elmer was Gill Dawkins, W3EJB.

During the War, while in high school, we had what was known as the Victory Corps. Because of my supposed knowledge of radio, I was tapped to teach a radio communications course as part of the Bethesda Chevy Chase High School's Victory Corps. I suggested to my students that a good way of demonstrating completion of the course, was for everyone, including me, to obtain an amateur license. Unfortunately, my parents moved to Silver Spring half way through the semester and Montgomery Blair High School, where I had to go, did not have a radio course in its Victory Corps. I was given the choice of marching around the athletic field with a wooden gun over my shoulder or learning Japanese. Though I chose the Japanese course, I didn't learn much. I always thought the instructor, who was a fellow student, was about two lessons ahead of us - as I had been when I was teaching radio over at BCC.

During the 1940s, reading books and

magazines, including QST; I became very intrigued by the higher frequency bands as well as by a new form of broadcasting which had begun operation in early 1941 - frequency modulation. In those days FM broadcasting occupied the band from 42 to 50 megacycles. There was an experimental FM station operating in Washington on 43.2 Mcs with the call letters, W3XO!

I first tried to listen to W3XO on my Sky Buddy which tuned to somewhere around 45 megacycles. Of course, on a receiver designed for AM with an IF about 10 Kilocycles wide, the 75 kilocycle deviation FM sounded awful. But, I was listening to UHF, which VHF was called then; and I was listening to this new kind of radio station. In about 1943, my folks bought a used Stromberg Carlson radio phonograph console that included the 42 to 50 Mcs FM band. I was elated. I would finally be able to hear W3XO properly. But, I was wrong. The set had the average sensitivity for FM radios of the day, approximately 10 microvolts for 20 dB quieting. W3XO was located in about the worst place in DC for a UHF (VHF) broadcasting station, near Wisconsin Avenue and M Street in Georgetown - only a couple of blocks from the Potomac River. But occasionally, during the summer months, I was able to hear clear, although fading, FM signals from places like Chicago. I remember particularly the Zenith station, W51C on 45.1 Mcs. I had discovered Sporadic E propagation and became even more hooked on the higher frequency bands.

But I had to have something better than that Stromberg Carlson. I had read that General Electric had an FM tuner called the JFM-90, which boasted a sensitivity of 4 microvolts for 20 dB quieting. I had to have one. For my sixteenth birthday, my father brought a JFM-90 back from New York City. He had gone to considerable trouble to get it, having to travel down to Cortland Street which was then "radio row". To get there and back to his hotel, he had to use the New York subway, a conveyance he intensely disliked. But, I had my JFM-90 and clear reception from W3XO.

One man I met in those days was Mel Wilson, W1DEI, who would become a great friend years

later. Mel was interested in the mechanism which caused Sporadic E and had postulated that weather conditions had something to do with it. He was working at the Naval Research Lab in Southeast Washington and had an apartment near there. I remember visiting his apartment and seeing a stack of weather maps about three feet high on the floor. He also had several racks containing FM receivers attached to Esterline Angus chart recorders. The FM receivers were tuned to the frequencies of various FM stations in places like Chicago, Cleveland and Boston. When a chart would indicate reception via Sporadic E, Mel would try to correlate it with weather conditions prevailing at the time.

On graduation from high school, I attended Washington College in Chestertown on Maryland's Eastern Shore for one year. Of course, I took my JFM-90 with me and installed it along with an FM dipole in my dorm room. Remember that the FM band was then 42 to 50 Mcs, so the dipole consisted of wire supported on insulators mounted on a strip of wood. Being for the 7 meter band the thing was 9 feet long. I came in for more than my share of razzing, but I was able to hear the Philadelphia FM stations and occasionally stations from as far away as New York City.

During the summer of 1945, I worked at the National Bureau of Standards Ionosphere Field Station at Sterling, Virginia, about where Dulles Airport is today. I learned a lot, including how to read Ionosphere soundings. The station had an Ionosphere sounder with one or two 813s in the final. With a bunch of motors and gears, the thing would sweep from about 3 Mcs to 18 or 20 Mcs. This, and a number of direction finders, made Sterling a fascinating place to work.

But something else was going on that summer. The war in Europe had ended and speculation was that the Pacific conflict might not last too much longer. No one knew, of course. If we had had to invade the Japanese islands, it could still be a brutal and protracted struggle. Nevertheless, incentive licensing reared its head. I felt that, now, I had the incentive to obtain an amateur license. The theory did not present much of an obstacle. From my

own reading and the tutelage of some very good Elmers, such as W3EJB, I had only to review the questions in the License Manual in order to assure myself of passing the written exam. But the code was another matter. I had sort of learned it, but never practiced and obtained any speed. The amateur license required one to send and receive at 13 words per minute. There was no Novice or Technician license with a 5 word per minute test. You did 13 WPM, or you flunked.

There was no reliable code on the air. The hams were not yet back on. So I rented an Instructograph machine. This was a big black box with punched paper tapes with the code on them. You could vary the speed from a few words per minute up to 30 or more. Every waking moment, when I wasn't at work out in Virginia, I listened to code, as well as practicing my sending. By the time the first atom bomb was exploded over Hiroshima, I was ready to go down to the FCC and take my test for a Class B amateur radio license. Class B was all a newbie could get. You had to have that for a year, before you could take the Class A which gave you phone privileges to 20 and 75 meters. With a Class B, you could operate CW anywhere and phone on all bands except 20 and 75.

By the way, I had turned 18 and immediately received my draft notice with instructions to report for a physical. I ended up taking three physicals before they finally gave up on me. My vision didn't meet their standards. It's interesting that I later spent 36 years working at the Johns Hopkins Applied Physics Laboratory on US Navy weapons systems. I'm sure they could have found something useful for me to do in the Service.

The War was over! And, it was only a few weeks after VJ Day, that the government reinstated SOME amateur operation. Those who had had station licenses before the War were given immediate access to the 2-1/2 meter band where WERS had been. I had acquired an Abbot DK-3 transceiver and used it under the WERS call WMDD-23. In those days, the term "transceiver" meant not only that there was a combination transmitter and receiver in one box, but that the same

tube was used for both functions. The bias on the grid was switched to cause the tube to function as a self excited oscillator or as a superregenerative detector. As a matter of side interest, I had bought the DK-3 from F.E. Handy, W1BDI, who had been a well known ARRL official before the War but was serving as an Army officer at the War Department in downtown DC. His son, Ed, was in my BCC Victory Corps class. I heard later that Ed Handy did obtain his ham license.

I was not able to get on the air myself, with only an LSPH (Licensed Since Pearl Harbor) ticket - no station license. Since prewar hams were desperate to get back on the air, I was able to quickly sell the DK-3 for a good price.

I didn't have much time for hamming anyway. I was off to Rensselaer Polytechnic Institute in Troy, NY. Not long after arriving, I received my first station license with the call, W3KMOV. When 10 meter operation was authorized, some of us put the RPI club station, W2SZ, back on the air. Later, we were active, when we had time, on 20 and 75 meters. We began a college net, with Union College in Schenectady, Lehigh, West Point and Yale, along with others participating.

A year after passing my Class B exam, I was eligible to take the Class A. While home from RPI, I went down to the FCC office in Washington and passed the Class A and, at the same time, took the exam for the First Class Radiotelephone License.

Not content with operating only from the club station, I built my own rig consisting of a 6V6 crystal oscillator mounted on a 4 x 6 inch piece of wood. The thing ran about 6 Watts and I used it on 80 meter CW from my dorm room. There was an empty field out back with light towers at one end. So, my half wave dipole ran from one of the towers to the dorm building.

While at RPI, I helped start WRPI, a campus carrier current station. I even acted as a disk jockey one morning per week, going down the hill to the Troy Record Shop and borrowing a stack of records, then hauling them up the hill to play the next morning. Then, that afternoon, I would haul them back down again. How they were able to sell those

records after all that playing and hauling by a bunch of RPI kids, I don't know. I also spent some time at WHAZ, RPI's 1 kW AM broadcast station on 1330. WHAZ shared time with two New York City stations and thus operated only six hours per week, from 6 PM until Midnight on Monday evenings. But, it gave me a place to hang my new First Class Radiotelephone license.

Sill interested in the higher bands, I built a 6 meter transmitter with an 829 in the final and an 815 modulator. I even used this in the dorm for a while without much success.

While President of the RPI Radio Club, I asked Ed Tilton, W1HDQ, then VHF Editor of QST and author of the column devoted to the higher bands; to appear as a guest speaker. I had been reading Ed's columns which he had begun in 1939. They were one of the things which had heightened my interest in the higher frequency amateur bands. Having Ed Tilton as a guest speaker, began a long friendship which lasted until his death in the mid-1990s. Incidentally, I followed Wayne Green, W2NSD, as RPI Radio Club President. Wayne later became the publisher of 73 Magazine.

In 1950, the summer I graduated from Rensselaer, I operated from home on 6 meters. My folks were living in an apartment in Silver Spring by then. Television was coming along and a few neighbors had TV sets. My 4 element beam was on the roof, supported by a piece of 2-by-2 stuck down a vent pipe. Being on the first floor the 300 Ohm twin-lead ran down the side of the building and in the window. To rotate the antenna, I had to go up 2 flights of stairs, climb an iron ladder and lift a trap door to get out onto the roof.

It wasn't long before my folks received and eviction notice. It didn't cite TV interference, which I had plenty of. It only stated that we were operating an appliance not normal to the conduct of a household, or words to that effect. I brought the matter to the attention of ARRL and actually met with Paul Segal, their General Council at the time. The League was considering making mine a test case because of the "normal appliance" aspect. But my folks were completing a new home and I was about

to take a job in Minneapolis. So we chose not to fight the eviction. My folks moved into the unfinished attic of their house and I headed for Minnesota. Of course, I took the 829 6 meter rig with me.

I accepted a job with Minneapolis Honeywell as a Production Expediter at their gyro plant. A Production Expediter is the lowest form of management and despised by everyone in positions above and below that level. I lasted less than a year.

While in the Twin Cities, I operated on 6 meters with my 829 rig from a rented third floor room with a wire dipole stretched across the ceiling. Through my operation, I met many good ham friends and managed to work 22 states during the summer of 1951.

Leaving Honeywell, I took a job with the University of Minnesota Radio station, KUOM, a 5 kW AM on 770 Kcs. Three days per week, I was in the studio and two days at the transmitter. It was another chance to use my First Class Phone license and I learned a lot about studio procedures and practices, including how to splice audio tapes. The station had two Ampex 300 machines, which were the nuts in those days. By the way, I saw one of those same machines, not one like it but the same machine, in a radio museum in Minneapolis in 1996, 45 years after I had worked at KUOM.

In the fall of 1951, I returned to Washington and obtained a job with the Johns Hopkins Applied Physics Laboratory where I remained for 36 years rising to the level of Senior Staff Engineer. At APL, I worked on various Navy missile programs including Talos, Terrier, Tartar, Standard Missile and Tomahawk. For several years, I was Chairman of the Standard Missile Correlation Task Group, which maintained the interfaces between various parts of the missile itself and between it and its shipboard fire control system. Later, I became a Project Engineer for launch systems in the Tomahawk program with special emphasis on vertical launch from 688 Class attack submarines. Just before retiring in March 1988, I oversaw the generation of a specification to put GPS on Tomahawk.

In Amateur Radio, I continued my 6 meter

operation from my parents' home in Chevy Chase, Maryland. It was a very poor location with a hill to the northeast, the direction where most of the activity was. To help overcome this handicap, I decided I needed a bigger antenna. Most 6 meter operators in those days used 3 or 4 element beams. So, I built a 5 over 5 antenna and wrote it up for QST. The article appeared in the June, 1955 issue and was reprinted in Spanish in Rivista Tlegraphica Electronica de Argentina two years later.

In 1956, I moved to my own home in Rockville, Maryland and continued 6 meter operation, but with only one of the two 5 element beams. Now with several hundred Watts to a 4-250 modulated by a pair of 811s, I was able, for my first time, to participate in F2 propagation, working EI2W in Ireland CT3AE in the Madeira Islands, as well as a number of South American, West Coast and Alaskan stations. It was Solar Cycle 19, the biggest yet on record.

But, radio had to contend with another activity which entices young men. In the fall of 1958, I got married and later sold the Rockville house to move to an apartment in Silver Spring, in preparation for building our own home in Burtonsville, Maryland.

Once installed there, I became interested in HF contesting and joined the Potomac Valley Radio Club. PVRC is one of the foremost contest clubs in the world and I met a lot of interesting people and learned a great deal about operating. One of the great people I met was Vic Clark, W4KFC, who later became President of ARRL. Vic played a key role in my life later on.

While active in PVRC, I participated in Sweepstakes and DX contests, winning one Phone Sweepstakes for the Maryland/DC Section. The high spot of my HF contesting came in 1970, when I operated with W1FJJ (now W1FJ) as PJ9AF from Curacao in the Netherlands Antilles in the CQ Worldwide Phone DX Contest. Al and I came in first in the World in the Multi-operator/Single transmitter category with over 48,000 points. This amounted to over 4,800 contacts in the 48 hour contest period.

But the VHF bands were my first love and in

1968, then living in Silver Spring with a new wife (the one I'm currently still with after 41 years), I bought a used Swan-250 and got back on 6 meters for Cycle 20 which proved much inferior to Cycle 19. Nevertheless, I worked a lot on Sporadic E, including KH6. It's a good haul on Sporadic E from Maryland to Hawaii.

Later, I acquired the Drake twins along with the receiving converters and transmit converters for 6 and 2. I also got on 220 and 432 and managed to work aurora on both of those higher bands as well as on 2 and 6.

But broadcasting had always been another of my interests, especially FM broadcasting. About 1959, a friend who I had met on 6 meters, Bob Carpenter, W3OTC, and I began talking about putting on a station. We studied the rules, looked for potential locations and began preparing an application. We were confident we could do all of the engineering work ourselves, which we did.

In those days, FM was only mono. The FCC was just beginning to study the various proposals for stereo broadcasting. When we received our Construction Permit they still hadn't come out with stereo rules. But we began to assemble materials to build the station. In my early days at APL, I had worked on weekends for WASH at its Wheaton, Maryland transmitter site and thus knew Everett Dillard, the station's owner. Mr. Dillard had, in the back room, a big grey box which he had received from Major Edwin H. Armstrong the inventor of superregeneration, the superheterodyne and FM. The box contained a 1 kW amplifier using a pair of 4-400s and a 3 kV power supply. It had been employed by WASH prior to Dillard acquiring a 5 kW RCA transmitter. Mr. Dillard had later replaced the exciter from the RCA transmitter with an REL Serrasoid modulator, which was considered the best available FM exciter at the time.

So, I negotiated with Mr. Dillard to buy the big grey box AND the RCA exciter. I think we paid about \$1,000. We had also bought seven sections of Rohn 25 tower. But the building owner where we had contracted to put the station, demanded that the tower be painted white. No red and white or grey for

him. So, I got a couple of painting gloves and a can of white paint, propped each tower sections up on sawhorses in my backyard and proceeded to paint the tower. Then I hauled the sections, a few at a time, on the roof of my old second-hand Plymouth, from my home in Burtonsville to Bethesda where the station was to be located.

In June, 1961, FCC came out with their stereo rules. Bob and I were well on our way to assembling equipment, but decided we had to hit the air with stereo. If we could be first in the Washington area with this new type of broadcasting, it should give us a leg up. And we needed more than a leg up. We were licensed for 1 kW at 200 feet above average terrain whereas all the other area FM stations were running 20 kW at 500 feet above average terrain.

But how to generate stereo. No stereo broadcasting equipment was yet available - no exciters or control room consoles. I had seen a magazine article showing how CHFI in Toronto had managed to produce stereo. The Canadians had begun this new form of broadcasting months before we did in the US. The article showed that CHFI had an RCA exciter like the one we had purchased from Mr. Dillard and that they had used this in conjunction with a piece of H.H. Scott test equipment that had been developed to test stereo receivers.

That was our answer. We bought a Scott 830 Stereo Generator. But the RCA exciter required low impedance to drive the reactance tube modulator, so it contained a transformer to do the impedance transformation. That would never do. To generate acceptable stereo, one must maintain phase with one or two degrees up to at least 150 kHz. A transformer couldn't do that. The article I saw, said that CHFI had employed a cathode follower to obtain the necessary low impedance, but it provided no details on its design.

Bob came through, designing a cathode follower. He also built a stereo console for the control room.

Since we had built our own transmitter, we were required to do extensive testing to show FCC that we met standards. Stations using commercial

transmitters needed only to note the transmitter model on a form and they were home free. But not us. We had to do a lot of cobbling as well as borrowing of commercial test gear in order to perform what was known as "Proof of Performance". Some of my old friends from the Washington Radio Club came in handy when we needed to borrow expensive specialized test equipment to get the job done.

But we DID get it done, and on November 12, 1961 WHFS hit the air from a basement room in the Bethesda Medical Building. The Nation's Capital had its first stereo FM station.

Since news of the issuance of broadcast Construction Permits appear regularly in Broadcasting Magazine, the trade publication for broadcasters, the granting of a CP to High Fidelity Broadcasters Inc. of Bethesda, Maryland was one of the items the magazine carried. This announcement was seen by a young soldier at nearby Fort Mead who was about to be released from the Army. Marlin Taylor had worked briefly in radio in eastern Pennsylvania before going into the Service and was anxious to renew his broadcast career. So, he went to the address given for our company. Bob was surprised to see a young man in uniform show up at his front door, and Marlin was just as surprised to find that the headquarters for High Fidelity Broadcasters Inc. was a modest home on a Bethesda side street.

Bob and I hired Marlin to handle the day-to-day operation of the station, while I retained the official title of Station Manager and President of High Fidelity Broadcasters Inc. Bob was Chief Engineer and did most of the technical work.

Marlin Taylor left us before we sold WHFS to go to Philadelphia and then on to New York putting two stations on the maps of those two major markets. He is currently running several channels for XM Satellite Radio, including the 40s channel to which I listen frequently.

A young man I hired when Marlin left was Richard Mostow, W3YAV. Dick had some publishing experience, having put out the yearbook for the Washington area radio and TV performers union.

By the way, even though we had become broadcasters, both Bob and I were smart enough to keep our day jobs.

When we sold the station in 1963, I suggested to Dick Mostow that he start a monthly magazine listing the selections to be played on Washington/Baltimore FM stations which offer classical music and program their music in advance. WHFS had published its own program guide we called "Stereo Notes". Dick took me up on the idea, coming out with Forecast FM and asked me to author an equipment column. I began "Technically Speaking" with the first issue and submitted a monthly column for the next twelve years, until Dick sold the magazine.

In my 36 years at APL, I was active in the radio club. This led to my receiving a call one evening in early 1969 inviting me to a meeting in downtown DC concerning "Oscar East". I immediately asked who Oscar East was, saying that I didn't know anyone by that name. But I was told that it was an organization not a person, an organization being formed to carry on the work begun by Project OSCAR on the West Coast. Of course I knew Project OSCAR had built and launched the first Amateur Radio satellites and was eager to attend the meeting to learn what was planned.

The meeting was at the apartment of a young Comsat PhD named Perry Klein, K3JTE, now W3PK, and included representatives of various amateur radio clubs affiliated with various Washington area organizations active in space. The gathering led to the formation of the Radio Amateur Satellite Corporation, or AMSAT. I became Life Member Number 10 and was somewhat miffed in getting a two digit number. AMSAT life memberships now number in the thousands.

I was tagged to provide publicity for the new organization and to act as liaison with the Australians who had built a satellite which had been languishing on the West Coast for several years. AMSAT made arrangements to receive this spacecraft, refurbish it and obtain a launch. Australis-OSCAR-5 was sent aloft January 23, 1970

AMSAT's first satellite and the first Amateur Radio satellite launched on a non-military rocket. It carried 10 meter and 2 meter beacons and included a command system which demonstrated to the-powers-that-be that amateurs could control their satellites.

AMSAT soon began work on another satellite, one which would offer two-way communication between hams on the ground using a transponder with a 2 meter input and a 10 meter output, what was termed "Mode A". AMSAT-OSCAR-6 (AO-6) was launched October 15, 1972 and immediately displayed a problem. It had a mind of its own regarding whether it was ON or OFF. Keeping it in the desired condition, required what became known as "intensive use of ground command".

While AO-6 was being built, I was asked to become AMSAT's Vice President for Operations. In this post, I was responsible for coordinating the work of various command stations which had been set up around the world. AO-6's antics kept me and the command stations busy for the life of the satellite.

As a member of the AMSAT Board of Directors during the 1970s, I met Bill Dunkerly, WA2INB, who was also serving on the Board. Bill, at that time, was Managing Editor of QST. In need of a conductor for that magazine's VHF column; he, knowing of my interest in the higher frequencies and that I was regularly meeting a magazine column deadline, asked me if I would like to take on the task. I jumped at the chance, particularly since I had been an avid reader of the column since the 1940s. My friend, Ed Tilton, W1HDQ, was one of my heroes. I felt honored to take over what Ed had begun and follow in the footsteps of other notable VHF column conductors such as Sam Harris, W1FZJ, and Bill Smith, K0CER.

My first column appeared in the April, 1975 issue of QST and the last one in November 1992, a span of nearly 18 years.

With encouragement from my PVRC friends, I studied both theory and copied code from W1AW in anticipation of taking the Extra exam. Hoping I was sufficiently prepared, I went down to the FCC

office and managed to pass the written exam as well as the 20 word per minute sending a receiving test.

At that time, the Commission had a program in place (sort of a forerunner to the current Vanity Call Program). If one had an Extra and paid \$25 one could receive any one-by-two call available. Many took advantage of this opportunity. But I wanted a W and a call never before held by an amateur. That was a tall order. I had used the AMSAT call, W3ZM some, but only for AMSAT nets and schedules. But while doing so, I received a number of calls saying something like, "Harry, where have you been? I haven't heard you in a long time." W3ZM had been held by another of AMSAT's founders, Harry Helfrich, who had passed away. AMSAT had obtained W3ZM in his memory. I did not want to continually go through such exchanges with my own two letter call, so I held off applying for one.

In 1976, a series of meetings took place at FCC to help prepare the US position for the 1979 World Radio Conference. I was able to take vacation from my APL job to attend one or two of these sessions. During a break at one of the meetings, I approached a PVRC friend who worked at the Commission and asked if they couldn't make available the "X" calls which had previously been used for experimental stations. He and a cohort went out of the room and returned with several rule books and proceeded to go through them to determine what rules would have to be changed to assign "X" calls to amateurs.

A few weeks later, I had occasion to talk with Prose Walker, then head of the Amateur Division at FCC, on another subject. In the course of the conversation, I asked him about issuance of the "X" calls to amateurs. His reply was, "We're working on it." On the basis of this encouraging response, I applied for the call that had been held by Washington's old experimental FM station. A month or so later, W3KMOV became a thing of the past and I've been known as W3XO ever since.

In succeeding years, I've been happy to hear many other "X" calls appear on the bands and take some pride in possibly helping making it happen.

My VHF operating continued, with Worked

All States being achieved on 6 meters and 37 states logged on 2 meters before leaving Maryland for Texas in 1988.

I viewed my stewardship of The World Above 50 MHz not merely as a means of reporting what was happening, but as an opportunity to make things better in terms of increased enjoyment and occupancy of the higher frequency amateur bands. And, through the column, I was able to accomplish several objectives which remain in place to this day; and which, I believe, enhance VHF and above operation.

From reading overseas VHF columns I learned that the Europeans had a system of grid squares, called "QRA Locators", which had become very popular as collectibles, just as we collect states. I devoted the September, 1979 column to the system and suggested that we should have something similar over here. I even gave a talk on the subject at one of the Central States VHF Conferences and was practically laughed off the stage.

But, I kept up the pressure for acceptance of a grid system here in North America and worldwide. In the September, 1980 column, I featured a proposal by G4ANB which was later accepted by the Europeans at a meeting held at Maidenhead, near London, England. Thus, the new system became known as the Maidenhead grid system.

A few months later, I was asked by John Lindholm, W1XX, then the League's Communications Department Manager, to become a member of an ad hoc committee he was setting up to examine the ARRL VHF contest rules. I had long felt it unfair that VHFers in the Northeast, not only had more stations to work, but also had many more ARRL Sections nearby than did those in most of the rest of the Country. So I accepted John's invitation, and at the first meeting urged that the multipliers used in these contests be changed from ARRL Sections to the new Maidenhead grids. After considerable discussion regarding the pluses and minuses of such a major rules-change, the other members of ad hoc group agreed to the proposal. John lost little time in instituting the change and in launching the VUCC which provides recognition for

those working certain numbers of grid squares on the various bands above 50 MHz. The Maidenhead grid system is now almost universally accepted by VHF operators worldwide and has greatly benefited operation on all of the bands above 50 MHz.

VHF amateurs owe a debt of gratitude to those responsible for crafting the system and to John Lindholm and the other members of the ad hoc committee for accepting it. I am proud to have played a small part.

Another aspect of VHF operation which bothered me was the lack of beacons in the US. Particularly on 6 meters, beacons operating in other countries had proven invaluable. But FCC rules permitted unattended operation only for repeaters. So, in the name of the JHU/APL Amateur Radio Club, I drafted a petition to FCC for a Special Temporary Authority (STA) for W3VD, our club station, to operate a beacon on 2 meters. The STA was granted, and with the help of my friend Jack Colson, W3TMZ, another APL Club member, we installed a 10 Watt beacon on the Lab grounds located between Baltimore and Washington. During its year of operation, the W3VD 2 meter beacon collected reception reports from the Carolinas to the Canadian Maritime Provinces proving the value of beacons for spotting enhanced VHF propagation.

As the one year authority was ending, I wrote a report to the Commission, also in the name of the APL Club, on the results of the operation. Along with this I submitted a Proposal for Rulemaking to allow unattended beacon operation in the United States and its possessions. Within the year, FCC acted on our proposal and instituted rules changes allowing unattended beacon operation. Beacons have proven a boon to VHF operators everywhere. Now there are some one hundred 6 meter beacons in operation across the Country and many 2 meter beacons as well. In recent years, beacons on 70 cm, 33 cm, 23 cm 13 cm and even 3 cm (10 GHz) have been put on by various groups and individual hams. In this area, the Roadrunners Microwave Group, of which I am a member, operates beacons on 432, 903, 1296, 2304, 3456 MHz, 5760 MHz and 10 GHz in the Austin area and others in San Antonio and

elsewhere in south Texas.

As the conductor of the QST VHF column, I began receiving many complaints, particularly regarding the June VHF contest concerning big mountain-top stations monopolizing the low end of the 6 meter band for the entire contest period. The complaints cited the fact that some intrepid operators had journeyed to rare Caribbean islands for the contest. These represented new countries for many, but contact with them was inhibited by the loud signals from the mountain-top-kilowatts taking up much of the portion of the band where these DXpeditions and other DX stations usually operate. Even when no contest was taking place, many 6 meter operators frequently ragchewed on the calling frequency of 50.110 or very close to it. Thereupon, a group in south Florida proposed to me that a section of the band be established for contact with stations outside the U.S. Specifically, they suggested that 50.100 to 50.125 MHz be set aside as a "DX Window".

Believing this to be helpful to those seeking to work new countries, I began promoting it in the Column. Of course, I received much hate mail. But I also received a lot of support. After several years of pounding away on the idea, it finally became generally accepted. Later, ARRL noted the DX Window in their contest rules and now the 6 meter domestic calling frequency is generally recognized as 50.125.

A similar situation began to develop on 2 meters. Prior to about 1980, Technician Class licensees were allowed to use only 145 to 147 MHz. Thus, there were two SSB calling frequencies on 2 meters, 144.110 which the Generals and above used and 145.025 employed by Technicians. The band from 144.0 to 144.1 was, and still is, reserved for CW operation only. The same is true of 50.0 to 50.1.

When FCC announced that they would be opening all of the 2 meter band to Technicians, there was an immediate cry of 144.110, here we come! Fearing that a large new group congregating around 144.110 would lead to severe crowding, I suggested in the column that 144.200 be the calling frequency for everyone. For this idea, I received wholehearted

support from the SWOT (Sidewinders on Two) organization, without which I am sure my urging would never have been heeded.

Although calling frequencies continue to be abused by some who never seem to move off of them, the freeing up of the low end of the 2 meter band has proved very worthwhile. With Earth-Moon-Earth (EME) becoming more popular, along with the new digital modes, the first 150 kHz of the band has seen more and more use by these activities. With many QSOs taking place on 144.110 and nearby, as they now do on 144.200, it's difficult to say if these worthwhile pursuits could have been accommodated.

In the mid 1970s, I joined an organization which had begun with a small group of six meter enthusiasts in San Antonio called the Six Meter International Radio Klub, or SMIRK. SMIRK was created to promote six meter operation much like Ten/Ten does for ten meters. I received SMIRK Number 800. Now membership now runs well over six-thousand in some fifty countries. I am currently serving as SMIRK President. Incidentally, another HCARC member, Dale Richardson, AA5XE is SMIRK's Secretary. SWOT is the equivalent promotional organization for two meters. I'm proud to hold Number 300 in that worthy group.

One of the dreams I had long pursued was that of hams on the ground being able to talk with other licensed amateurs on spacecraft and eventually the Moon and hopefully some day, Mars. To this end, I began to investigate the possibility of amateur operation from Skylab. I knew that Owen Garriott, W5LFL, was scheduled to go on that ambitious mission and had even heard that the head of the Skylab program had made positive comments regarding possible amateur operation from the orbiting laboratory.

So, with the help of Dick Fenner, W5AVI, who worked at the Johnson Space Center in Houston, I began to investigate further. It was soon determined, however, that the project was too far along to permit the hull penetrations necessary to accommodate antenna cabling. So, the idea had to be dropped.

But, I didn't give up on the dream of hams

operating from space. When the Shuttle program came along, I resurrected the idea and drafted a proposal to allow Shuttle astronauts who held amateur licenses, to be able to operate. I ran this by my colleagues in AMSAT who liked the idea, then sent it on to ARRL in order to get their blessing. With only slight wording changes, the proposal was submitted to NASA jointly by AMSAT and ARRL.

We were all surprised and delighted when NASA accepted it and plans were immediately begun to provide equipment for Owen Garriott to use on Shuttle Mission, STS-9. The equipment, provided by Motorola, consisted of a specially modified 2 meter handi-talkie which had to undergo extensive testing before NASA would approve its inclusion in the Shuttle payload.

In recognition of my role in making W5LFL's operation from the Shuttle possible, my wife and I were invited to witness the launch from the VIP stands about three miles from the pad. I can tell you that seeing a vehicle of this size from so close up is like nothing you have ever experienced.

Vic Clark, W4KFC, then ARRL President, was to also be present and we had made arrangements to rendezvous on one of the local repeaters near the Cape. When I called Vic, I was shocked to hear one of the locals respond to tell me that W4KFC had died suddenly of a heart attack the day before. Vic's loss cast a pall over what was otherwise a wonderful event.

I stated earlier that Vic Clark would play an important role in my life. During the time I was working on getting NASA approval for amateur operation from the Shuttle, the then AMSAT President, Vern Riportella, WA2LQQ, (now a silent key) attended a meeting at the Johnson Space Center regarding amateur operation from the Shuttle, without even informing me that the meeting was to take place. This upset me so much that I drafted a letter resigning from all of my association with AMSAT. Vic hearing of my plan to send the letter, called me and convinced me to recant, which I finally did. If it hadn't been for Vic's very diplomatic and skillful persuasion, I would not have later run for the AMSAT Board and certainly never would have

become its President.

On returning to the fold, I insisted that Rip make manned space an official department and name me as its head. Whereupon, I became AMSAT's Vice President for Manned Space.

In this capacity, I was AMSAT's representative on the SAREX Committee which was chaired by Roy Neal, K6DUE (now a silent key). Roy had been an NBC newsman and had covered many of NASA's projects going back to Apollo and before. So, he was well known by NASA folks, particularly at Johnson Space Center. Since everything seems to have to have an acronym, the term, SAREX, was coined to stand for Shuttle Amateur Radio EXperiment. Roy, in his chairmanship of this committee, was key in getting amateur radio back on the Shuttle following the Challenger tragedy. I was happy to be able to do my part.

In 1986 I decided to stand again for the AMSAT Board, having dropped off ten years before. Partially because of my work getting amateur operation going on the Shuttle and partly from name recognition due to writing "The World Above 50 MHz", I was elected and served as a Board member until 2003. From 1998 until stepping down from the Board in 2003, I served as Board Chairman.

In the late 1980s AMSAT was embarked on an ambitious project to put up a geostationary satellite. It was called Phase 4. Phase 1 was considered the beacon satellites such as OSCARs 1 and 2 and Australis OSCAR-5. Phase 2 were the low altitude transponder spacecraft such as AO-6, 7 and 8. The Phase 3 birds, AO-10 and 13, were in high apogee elliptical orbits. The first of these, Phase 3A, was lost due to a launch vehicle failure in May, 1980.

But, it became clear to all of us on the AMSAT-NA Board that a geostationary satellite was beyond our capability, both technically and financially. Principal in the financial area, was the fact that such a satellite could be used by only half of the world's amateurs. If it was placed to cover all of the US, it could not serve Europe and Asia. Thus, all of the funding would have to come from the Americas, mostly from here in the US. Sufficient

funding did not seem attainable, so the AMSAT-NA Board, including me, reluctantly decided to shelve the Phase 4 effort.

The term "NA" had begun to be appended to AMSAT to distinguish our North American based organization from other AMSAT groups which had sprung up all over the world. There was AMSAT-UK in Great Britain, AMSAT-DL in Germany, JAMSAT in Japan and numerous others.

Just as we were deciding not to pursue Phase 4, Karl Meinzer, DJ4ZC, came to our 1991 Board meeting with a proposal for an international project to build and launch another Phase 3 satellite. This would be Phase 3D. Despite misgivings on the part of some Board members we accepted Karl's proposal, and work was begun.

One of the major efforts was fund raising and Doug Loughmiller, KO5I, who had become AMSAT President succeeding Vern Riportella, and I began efforts to raise the million or more dollars it was concluded the project would require. Doug had asked me to become his Executive Vice President, so I held that position as well as VP for Manned Space.

The following year, the Board asked me to assume the Presidency so that Doug could concentrate on fund raising. With some reluctance, I accepted. My reluctance centered mainly around the concern that manned space would take a back seat. But, I found that Frank Bauer, KA3HDO, who worked at Goddard Spaceflight Center in Greenbelt, Maryland was interested in the manned space position. Thus, one of my first acts as President, was to appoint Frank Vice President for Manned Space. In recognition of a name change by NASA, the title of that position is now, Vice President for Human Spaceflight. I needn't have feared. Frank has done a superb job ever since and still serves in that capacity. In recent years, it has been especially fortunate to have a strong person handling that aspect of AMSAT's activities because of the work associated with the International Space Station. Frank now serves on the ARISS (Amateur Radio on the International Space Station) Committee which includes representatives from a number of countries including Russia.

Another of the tasks I took on as President was the collection of what was due AMSAT from a company located in the Virginia suburbs of Washington called Interferometrics. Through Jan King, W3GEY's, work with both AMSAT and that company, AMSAT had an agreement to provide Interferometrics with design information on the Microsat series of satellites which AMSAT had built and launched. In return, Interferometrics was to pay AMSAT a specified fee for each of that type of satellite they built. Since they had built and launched one such satellite, the fee schedule indicated that they owed AMSAT the sum of \$42,000.

I made collecting that money my first order of business. Obtaining it required several trips to DC from my new home in Texas to beard the hard-nosed Interferometrics CEO, Mr. Dennis Fecteau, in his den. I also had to do quite a bit of digging to come up with all of the documentation AMSAT had promised. But, I was finally able to gather the material and collect what was due us.

Sometime during 1992, Doug Loughmiller decided to take a position with the University of Surrey in England. That institution, thanks to the work of Martin Sweeting, G3YJO, had become preeminent in the Country's space effort. Martin has since been knighted for his accomplishments. It is interesting that in the early 1970s, Martin made a trip to Washington to attend an AMSAT Board meeting to learn about this amateur satellite stuff. Under Martin's tutelage, the University of Surrey and its commercial offshoot, Surrey Satellite Technology have built a number of amateur and commercial spacecraft for Britain and several other countries.

With Doug Loughmiller leaving for England, the job of fund raising in support of AMSAT-NA's role in Phase 3D, fell to me. So, I set out, writing letters to AMSAT members commercial companies and foundations. I wrote articles about Phase 3D for QST and other publications. I made arrangements with ex US Senator Barry Goldwater, K7UGA, to appear in a video which AMSAT produced promoting Phase 3D and seeking contributions to support it. Dick Jansson, then WD4FAB now KD1K, and I put on a Phase 3D presentation for the

ARRL Board which resulted in the League mounting a campaign which raised over a HALF MILLION DOLLARS. Another very successful effort involved the Hoover Foundation. Pete Hoover, W6ZH, the grandson of US President Hoover, pledged matching funds which resulted in the raising of a total of over TWO-HUNDRED-THOUSAND DOLLARS. We also garnered very generous financial support from AMSAT-UK and JAMSAT. The JAMSAT contribution came following a trip Keith Baker, KB1SF's, my Executive Vice President, and I made to Japan to attend the JAMSAT annual meeting in Kyoto. Altogether, we in North America raised approximately TWO MILLION DOLLARS in support of Phase 3D. AMSAT-DL with some assistance from the German government came up with a like amount.

Fund raising was not the entire job. There was a lot of other work to do. It had been decided that AMSAT-NA would be responsible for producing the spaceframe and a large adaptor called the SBS for Specific Bearing Structure. This was an approximately 8 foot diameter ring about 2 feet high. The Phase 3D spacecraft would reside inside the SBS which would then support the commercial payloads above it. When one considers that costs for launching a commercial satellite can run some FIFTY to ONE-HUNDRED-MILLION DOLLARS and the cost to build such a satellite can run a like amount, one can appreciate the importance of the role played by the SBS. Both the Phase 3D spaceframe and the SBS were built by students at Weber State University in Utah under the direction of AMSAT volunteers. This represented but one of AMSAT's continuing efforts involving education.

In addition to the construction of the spaceframe and the SBS, AMSAT-NA was to handle the integration of the spacecraft. This required lab space and a clean room. Since two of our principal technical people lived in Orlando, Dick Jansson and Stan Wood, WA4NFY, it was logical that that area be the site of the Phase 3D Integration Lab. A location adjacent to the Orlando International Airport was secured and equipment begun to be moved in. But a full-time director of the operation

was required. It fell to me to find one. Learning that Lou McFadin, W5DID, who had modified and tested much of the hardware that had gone onto the Shuttle for SAREX, was about to retire from his job at NASA's Johnson Space Center, I induced him to take on the position of Phase 3D Integration Lab Manager. That required both persuasion and quite a bit of finagling with regard to remuneration and benefits to get Lou to accept. But, he did. Others were brought on board as well, all as contract people, not employees of AMSAT-NA. This made book-keeping much easier. AMSAT has only one full-time paid employee, Martha Saragovitz who maintains our Silver Spring, Maryland office.

Throughout 1992 while serving as AMSAT President, I kept up the QST column, "The World Above 50 MHz". That same year, my wife and I put on the Central States VHF Conference here in Kerrville. It was quite a year. But, it became obvious to me that it was time to turn the column over to someone else. One of the reasons, I had hung on to the column was that I feared the League would do away with it. I did not want that long tradition begun by Ed Tilton to be dropped from the pages of QST. But Dave Sumner, K1ZZ, ARRL General Manager, assured me that the column would continue and said that he had persuaded Emil Pocock, W3EP, to handle the job if I cared to step down.

With Dave's assurance that the column would continue and be in good hands, I relinquished the reins to Emil. He did a fine job until turning the Column over to my old PVRC friend Gene Zimmermann, W3ZZ, several years ago.

Though in some ways, I hated to stop conducting the QST Column; not having to meet a monthly deadline was a great relief, particularly with the workload the AMSAT Presidency represented.

In September, 1997, I attended the Small Satellite Conference in Logan, Utah where I met two gentlemen from the University of Toronto, Dr. Robert Zee and Dr. Kieran Carroll. They described an astronomy satellite the University was designing and planned to propose to the Canadian government. It was called MOST (Microvariability and Oscillations of Stars). I immediately observed some

flaws in the design and suggested that AMSAT might be of assistance. Receiving a positive response, I drafted an agreement which, with a few changes, was accepted by the University. This began a major effort by a number of AMSAT volunteers to improve the space worthiness of the MOST satellite. AMSAT's suggestion resulted in the University of Toronto being awarded the funds to build and launch the MOST spacecraft. In accordance with the agreement we had concluded, AMSAT received the sum of \$400,000 (Canadian).

I goes without saying that the accident which befell AO-40 (known as Phase 3D prior to its launch) a few weeks after its successful orbiting aboard an Ariane 5 launch vehicle in November, 2000; was a huge disappointment to me and to all involved in the planning, building, testing and funding of this very ambitious spacecraft. Despite the significant damage the satellite sustained, the command system, central computer, one of the S Band transmitters plus the 70 cm and 23 cm uplinks, continued to function for several years. I, and many others, were able to use AO-40's 2401 MHz downlink for QSOs across North America and throughout the world for several years. In an attempt to convince those who hadn't tried AO-40, thinking microwaves too hard for them, I wrote an article entitled "AO-40 for Us Appliance Operators" which appeared in the November, 2003 QST.

Over the years, I have been pleased to receive several awards. One came in 1982 when I was the first recipient of the Wilson Award from the Central States VHF Society. This award, honoring my old friend, Mel Wilson, W2BOC, formerly W1DEI, was instituted by the Society following his death the previous year. Mel had been a long-time CSVHFS member and had contributed much to knowledge of propagation at VHF frequencies, particularly Sporadic E.

In the early 1990s I was nominated by Ray Soifer, W2RS, to become a member of the Radio Club of America. This is the oldest radio club in the World and it is indeed an honor to be a member. A few years later the Club Board elevated me to Fellow which was an even greater honor.

In 1996, I was selected by the Dayton Amateur Radio Association to be its "Ham of the Year". This is a great honor for anyone but it was particularly pleasing to me that year as I shared the honors with two radio giants, John Kraus, W8JK, who was selected for the "Special Achievement Award" and Bill Orr, W6SAI, received the "Technical Excellence Award".

Though I stepped down from the AMSAT Presidency in the fall of 1998 and from the Board five years later, I continue my interest in AMSAT and Amateur Radio in general. I am currently active on the bands from 50 to 3456 and have equipment for 10 GHz. I have just acquired a Flex 5000 software defined transceiver and am slowly learning the ins-and-outs of this new kind of radio and what it has to offer.

As well as AMSAT, I am a Life Member of IEEE, ARRL and the Central States VHF Society as well as holding memberships in The Radio Club of America, QCWA, The Roadrunners Microwave Group, the North Texas Microwave Society, SMIRK, SWOT and, of course, the Hill Country Amateur Radio Club.

So, at 81, I keep my hand in and stay interested. I hope to be around for at least one more Solar Maximum and to see the launch of the German Phase 3E, the AMSAT-NA Eagle and possibly an amateur package aboard an Intelsat geostationary satellite - a potential opportunity AMSAT is presently pursuing.

Amateur Radio is becoming more exciting to me every day. And, I'm still learning.