THE WONDERFUL WORLD OF DOWNHOME RADIO

by
Bob Pratt, WD8AQX
with additional kibitzing from
Dan Murphy, KA1CM

I cued up the tape and watched the second hand slowly creep toward the 12. The tubes were warmed up and the time was approaching to put them to use again. 5....4....3....2....1....I hit the mike switch and announced to the tiny world that might be listening, "It's 4:15 and WXRD on 1200 kilocycles begins its broadcast day". The station break on tape followed, then my theme song. "Music with a Smile" was once again on the air.

The year was 1960 and I was a high school student. Radio was in my blood, but I hadn't yet discovered the world of ham radio. The station I was operating was on the AM broadcast band and I was the DJ in my home studio. But the real beginning goes back even further.

It was 1955 and my father, a real tinkerer sort of a guy, brought home a new reel-to-reel tape recorder from his favorite department store. An old Revere model, it truly changed my life and that of my best friend, Dan Murphy.

"Murf" lived about 6 blocks away and we had become instant friends in the third grade. Our interests brought us to many common fields of adventure, including the weekly publishing of a neighborhood newspaper when we were 11 years old and endless hours of experimentation with electricity and photography. The tape recorder provided a new challenge.

With my father's help, we prepared "radio programs" consisting of us playing the piano and an old ukulele and singing such great hits of the day as "The Yellow Rose of Texas" and "Memories Are Made of This". It didn't matter that we weren't particularly talented at the time. It was all great fun.

The Knight Wireless Broadcaster rebuilt around 1957 and still operational today.

Murf: As I recall, we had been "playing radio" even before the arrival of the tape recorder. I remember using a floor lamp as an imitation microphone, and switching the lamp on to indicate that the "mic" was live. When the tape recorder arrived on the scene, we were ready to go.

Soon the "live" entertainment turned to records and we began playing the roles of disk jockeys, spinning old records on the family record player and announcing the hits. At some point in time, it occurred to us that it might be real fun to actually put all this out on the air. But how?

That problem was initially solved with a device known as the "Knight Wireless Broadcaster", an AM radio transmitter kit sold by Allied Radio. Murf was the first to get one and although it didn't sound the best, it did put out a signal that was receivable for a block or two. It also had the unique characteristic of zapping anyone who tried to hook it up to a record player or other audio device. It had only half wave rectification and no power transformer. The tubes, two 50C5's and a 12AX7, had their filaments strung in series and the chassis was capacitively coupled to one side of the power line, which occasionally made for some real surprises when we got our hands between the transmitter and the audio coax from the record player. But it worked and it gave us our first "on the air" signal. The year was 1956.

Some time after that, perhaps early the next year, I came across another friend who had an old Knight Broadcaster that was not working well. He also was no longer interested in radio and wanted to get rid of the thing. A couple of bucks and it was mine, but it was in desperate need of repair.

Murf was the electronic whiz in those days and he offered to rebuild the transmitter, including modifications to improve the fidelity and remove the inherent hum. That last step proved to be a real blessing because the new power transformer and full wave rectification also removed the shock hazard. I no longer had tingling fingers and hair that stood straight out from my head.

The nearest electronics parts store was RSE on Fenkell Avenue in Detroit. It was well known to radio amateurs and electronic repair shops in the area. Murf headed over to pick up the parts. To this day, he remembers that first encounter well.

Murf: When I first bought something there, they asked for my name for the sales receipt, and when I said, 'Murphy', they broke into gales of laughter. It turned out that they had lots of customers with long, hard-to-spell Polish names, and instead of writing the actual name on the receipt, they would often just put down 'Murphy', chortling at the incongruity of it all. So when they finally got a real Murphy, there was lots of joking about it. I probably should have insisted that they write Wjockerzlskicz or something on the slip.

By 1958 we had two AM broadcasting stations on the air, admittedly rather sporadically. Both were using modified Knight Wireless Broadcasters and long wire antennas on the roof. The call letters we used for my station were WXRD, made up in 1955 to stand for W (the required first letter for stations east of the Mississippi), X (experimental), R (Robert) and D (Daniel). Murf's home station bore the call WMDJ, standing for "Murphy the Disk Jockey". According to White's Radio Log, neither call was in use anywhere in the US in those days.

Radio Station WMDJ with Murf as the DJ, circa 1958

Murf: This method of picking call letters wasn't unique. Some years later, when I moved to the Boston area, I found that there was a station with the call letters WXHR. This was a "real" licensed station, but it had also been put on the air originally by an engineer and tinkerer who operated a business called "Harvey Radio". Hence, I recognized the call letters as having been derived from "eXperimental Harvey Radio" -- a fact not known to most listeners of the station.

My station consisted of the transmitter and a passive audio mixer made up of resistors and potentiometers. Its output was fed into the microphone input of the transmitter. I had one microphone, a record player and, of course, my dad's tape recorder (he had long since given up trying to keep my probing fingers off of it).

Murf had gone somewhat beyond my humble setup. He had a Fisher preamp which allowed audio mixing, a turntable, an old rickety Pentron tape recorder and a newer microphone. The tape machine was always in need of repair and frequently chose its own speed of operation, generally somewhere between the normal 3 3/4 and 7 1/2 inches per second. If nothing else, it made for programs of unpredictable length.

Murf: That Pentron tape recorder was a mechanical marvel. While its speed was never truly consistent or constant, frequent application of oil did help. In its later years, it used almost as much oil as an old Ford. Unfortunately, I got careless or a bit overzealous once or twice in my application of the oil. Needless to say, oil on the capstan, capstan roller, heads, and tape is not a pretty situation. In any event, the machine tended to smell of hot oil after it had been on for a while.

In those days, the AM radio band was not as heavily populated as it is today. There were several places on the band where no stations could generally be heard, even at night. We started at 1000 kHz, moved after a time to 640 kHz, then 1240 kHz and finally settled at 1200 kHz a year or so later.

When we weren't using the air waves for our DJ'ing, we sometimes chatted like young hams by keying the B+ on our transmitters to talk and turning up the AM radio to listen. Several other friends joined in this activity too and we occasionally had three or four in a roundtable type of chat. Our real love was broadcasting, however, and it would be many years before we would also realize our interest in ham radio.

As we grew into our new hobby, we longed to expand our outreach beyond a few short blocks so others

might hear our fabulous on-the-air styles. Using all of the resources at hand, Murf again put his electronic talents to work and designed several new transmitters, each better than the one before.....

Murf: More powerful, perhaps, but "better" may be stretching things a bit. I did construct a transmitter using an 807 tube as the final RF stage. Power input to the final was about 50 watts, but I doubt my coupling circuits were very efficient at that point, so it's hard to say how much RF power it actually put out. It had other problems too, which I became aware of one afternoon when we got a call from a listener to tell us he was enjoying our programming. Naturally, we were excited since we didn't often get calls from people who had discovered us totally by accident and had listened long enough to figure out what was going on. However, I got a bit worried when he mentioned that he was a ham radio operator and was picking us up on the 160 meter band, i.e. three times our supposed operating frequency of 640 kHz. Clearly, my output stage left something to be desired with regard to harmonic suppression.

It was also true that when this transmitter was on, it came in EVERYWHERE on the radios in our house. This, I think, was mostly due to the simple circuits and lack of shielding in those old tube radios and the fact that our signal radiated from the feed line as well as from the nominal antenna. In any case, it annoyed my parents considerably at times, but we didn't let that slow us up.

That transmitter was built with an old standard design -- a class C plate-modulated final amplifier stage. Most of my design ideas came from the 1957 edition of the Radio Amateur's Handbook. I didn't get a ham license until many years later, but the book was a wealth of information and ideas for circuits. Apparently in that era, SSB was still a relatively new technology for many hams, and good ol' AM was still in wide use on the ham bands.

The one component that was hard to come by for this project was a modulation transformer, especially one intended for wide-band audio. I wound up using the output transformer from a defunct hifi audio amplifier, but in reverse. I fed audio in (from another hifi amplifier of 25 watts or so) to what had been the speaker output leads, and inserted the other side of the transformer into the plate circuit of the transmitter. The impedance match was "close enough", as we say.

I still recall when I first got that transmitter on the air and got in the car to see how far I could go and still hear it on the car radio. I was thrilled and probably also a bit worried when I had driven a couple miles along 6-Mile Road and was still picking it up. Fortunately for us, we never came to the attention of the FCC, at least not as far as I know. We never received an unexpected knock at the door followed by an FCC guy with a warrant as has happened to other basement broadcasters over the years. It probably helped that we never got so organized at this that we went out selling commercials on our stations. If we had any "commercials", it was only those that we made up in the style of Saturday Night Live.

Once we got our drivers licenses, one of our great pastimes was to pick a radio station of interest, direction-find its transmitter and drive over to its facilities for a visit. Station engineers were usually friendly and willing to show us around. Over a three or four year period, we saw virtually every station in southeastern Michigan, northern Ohio and southwestern Ontario.

One of our finest experiences was a trip to the transmitter and studio of WMUZ in the days when it was a Muzak station playing background music. We found the station located off an alley somewhere in the north central part of old Detroit. It wasn't much to look at. Further, we found it was in the process of being disassembled for transport piece by piece to a new location across town. The only employee there, a young hassled engineer, was at his wits end trying to carefully remove parts of the station while keeping a steady chain of music and commercials going. He first viewed our arrival as an irritation, then a blessing.

He asked if we knew how to spin records and work an audio board. Indeed we did. "Great", he said with some relief. "You", he pointed at Murf, "Sit here, run these records in order and call me when it's time to read a commercial". The first couple of hours went well. Then it was my turn. Except for once knocking the tone arm across a record while reaching for the next album, I also produced a few relatively seamless hours of lightly interrupted music suitable for elevators and the weary. Over the next couple of weeks, we returned several times to repeat these stunning performances.

By 1960, I had quite a home operation going. After my high school classes ended for the day, I would return home and fire up my station. The transmitter, a 7 Watt Murphy special with excellent audio quality, was connected to an antenna running out to a backyard tree from my second floor bedroom window. It slid up to frequency in a few

short minutes and stabilized there. The tube-operated five-channel mixer, complete with cuing circuitry, interfaced between the mike, Garrard record player and the old trusty Revere tape recorder. The on-the-air sound quality was quite professional.

My program of top-40 hits began at 4:15, right after station sign-on. I played records for my high school friends, read news from the afternoon edition of the Detroit News, announced school and community activities, and gave weather reports. At 5:00 PM, the Dan Murphy program hit the airwaves via tape. In those days, Murf didn't arrive home from school until nearly 6:00 PM, too late for my daily schedule, so he taped a half hour program every night for use the next day. At 5:30, after his program, it was album time where I played cuts from the latest top hit album until my dad arrived home from work at 6:00 PM. By then, my signal was reaching out about 2 miles and several friends from school were among the regular audience.

Radio Station WXRD with Bob at the controls, circa 1960

Murf: I shudder to think about those old programs, particularly the ones I did. Bob usually played it pretty straight, but I became enamored of a few odd radio styles along the way, and they were reflected in my show. One influence was Ralph Bingie (sp?), a guy with a talent for doing different voices and simulating a lively conversation among 2 or 3 people, with all parts played by himself. In attempting to copy this technique, I invented a character, sometimes in the role of my "engineer", who was often interjecting himself into the program, usually to my feigned annoyance. As time went on, I finally figured out that "Charlie" was a genuine annoyance to the few listeners I had and reluctantly phased him out.

By the way, we're not limited to just thinking about these old programs. A few taped examples survive to this day, so I'm able to confirm by direct evidence that they really were as embarrassing as I later came to suspect.

In retrospect, some things weren't too bad. We cooked up various pieces of radio "production" -- station identifications, themes, and the like. With that and the capabilities of the audio mixers that we had bought or built, the sound was, in some respects, almost professional.

We've titled this article "Downhome Radio", but it could have been "basement" or "bedroom" radio as well, since those were the usual locations for our home-brew studios. We even operated from the backyard a few times, stringing mic cables and audio lines from basement to backyard and doing "remote" broadcasts! Keep in mind that the tube-based audio circuits of those days were fairly high impedance. Any wire longer than about 6 feet was likely to result in progressively less high frequency response and progressively more hum. Hence, our feat in originating a remote broadcast from at least 50 feet away was a considerable technical accomplishment.

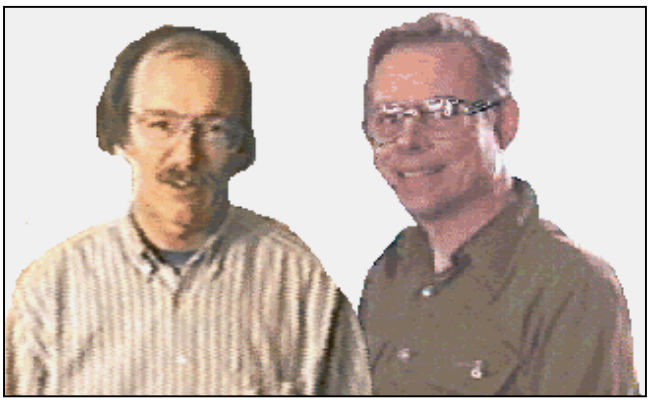
Murf and I both started college in 1961, I at Wayne State University in Detroit and he at MIT in Boston. We joined our respective campus radio stations to gain real broadcasting experience. WUBG was the station at Wayne on 600 kHz., later to become the more dignified WAYN.

Murf: At MIT, the campus station operated both AM and FM and went by the call of WTBS. If that call sounds familiar, you've probably been watching cable TV. Yes, that call now belongs to Ted Turner and is assigned to his flagship TV superstation. It was good fortune for the MIT station when Turner decided in the late '70's that he really wanted Turner Broadcasting System as his corporate identity and was willing to pay a tidy sum for the cooperation of the MIT station. By then, the identity "Technology Broadcasting System" was a bit old hat anyhow, and the new call letters WMBR (for Walker Memorial Basement Radio) gave the students of that era a chance to create a new identity.

Before going off to college in the fall of 1961, I worked full-time for about six months at a Detroit broadcast operation consisting of WJLB-AM and WMZK-FM at that time. My primary training for the job had been my years of basement broadcasting plus some high school courses that helped prepare

me to pick up an FCC First Class Radiotelephone license. It was with some reluctance that I finally headed off to college and left my job at a "real" radio station.

A lot of years have passed since those early days of "downhome radio". We both became hams in the mid '70's and have enjoyed many a QSO in such diverse modes as CW, SSB, RTTY and packet, some of them while operating HF mobile. But broadcasting lingers as a treasured sideline. Shortly after getting my ham license, I enjoyed a brief stint as a producer of programs for WBFG-FM in Detroit. And for the past several years, Murf has been the Sunday night host of the Folk Show heard throughout New Hampshire on 50,000 Watt WEVO-FM and its affiliates.



When not transmitting to the world on Amateur Radio frequencies, as they do today, the authors (pictured below with Dan on the left and Bob on the right) perform other duties.

Bob works with computers as an electrical engineer in the Detroit area, while Dan works in New England as a software engineer.

Published in the Edison Radio Amateurs Association Newsletter, April, 1995