IN THE BEGINNING . . .

Georg Simon Ohm

Bob Thomas, W3NE

The Ohm family of Erlangen, Germany, was quite unlike families of today, and even in their own time for that matter. The father was a locksmith, but despite that rather ordinary occupation and with no formal education whatever, he had such a thirst for knowledge that he educated himself to a remarkably high level. When his sons, Georg and Martin reached an appropriate age he taught them advanced mathematics, physics, chemistry and philosophy well beyond the level they might have learned at a typical school of the day.

In 1805, when he was eleven, Georg was reluctantly enrolled with his brother in the Erlangen Gymnasium for additional education. That turned out to be a disastrous, frustrating experience because "teaching" was by rote and by simply subjecting students to numbing, uninspiring books they were expected to interpret themselves. George eventually escaped that stultifying environment to enroll at the University of Erlangen where he overcompensated into a life of partying and good times. It didn't take long for his father to yank him out of there and send him to Switzerland, where worked as a mathematics teacher and later a private tutor. Ohm then returned to Erlangen where he received a doctorate in mathematics and became a lecturer. Prospects were limited at Erlangen and his salary was only sufficient to support a pauper's existence, so Ohm left and taught at various low quality state-run schools until he finally secured a decent position as lecturer at the Jesuit Gymnasium in Cologne in 1817. That was when he really began to flourish.

Georg Ohm published his mathematical discoveries that defined the precise relationships of voltage, current and resistance in an electric circuit, known today as *Ohm's Law,* in his 1827 book, *Die galvanische Kette: mathematisch bearbeitet* (The Galvanic Circuit Investigated Mathematically). It was the first example of *circuit analysis* – the mainstay of modern electronic equipment design. Ohm's monumental work, surprisingly, was universally dismissed by the German scientific establishment which, contrary to what you might think today, discounted the value of theoretical analyses in favor of practical laboratory experimentation. On the other hand, there had been no success among scientists using laboratory experimentation to correlate the relationships that exist between voltage applied to a resistive circuit, current flowing in the circuit, and resistance in the circuit. Results varied from lab to lab and many researchers could not even duplicate their own measurements! Therefore no one, except Ohm, who had proved them mathematically with his circuit analysis, was able to precisely define conditions in an electric circuit.

Ohm was able to have his own laboratory at Cologne but before beginning his lab tests in support of his calculations, he analyzed procedures that had been used by others in their failed attempts to achieve meaningful results. One-by-one he identified each of the careless methods used by experimental physicists in their vaunted laboratories. First, he recognized that one of the largest uncontrolled variables was the change in voltage applied to a resistive load when the resistance was varied. It previously had been improperly accounted for by many laboratory investigators and was completely ignored by others. Ohm understood the reason for the effect; it was the first time anyone had identified what is known today as the *internal resistance* of a voltage source. To eliminate the variability of applied voltage from batteries in his experiments, the resourceful Ohm employed heated thermocouples, which exhibit essentially zero internal resistance, to generate a constant voltage unaffected by variations in load current.

Another variable that had been unaccounted for or ignored in earlier experiments was presence in the circuit of a galvanometer used to measure voltage or current. Consisting basically of a compass inside a coil of wire, a galvanometer was the only instrument available in that era capable of measuring current. They were usually custom made by the experimenter or an assistant, each was different from the others, but worst of all the effect of their resistance in the circuit they were measuring was often ignored. Ohm was meticulous in the way he used galvanometers to ensure the effects on measurements by their presence were either eliminated or properly accounted for.

Laboratory experimenters often had to make their own wire conductors in short lengths as a second thought to the main objective of conducting an experiment. That resulted in reliance on conductors with uncontrolled variations in cross-section and possibly made of material with unknown resistance, both of which contributed to uncertainty in measurements. Ohm carefully made his wire of silver strips with constant cross-section and in lengths sufficient to obviate need for joints except at reliable terminals. His laboratory measurements were highly accurate and proved beyond doubt that his calculations were correct: In an electric circuit with a direct (d-c) voltage source and resistance, current is directly proportional to applied voltage and inversely proportional to the circuit resistance, expressed mathematically as, $\mathbf{I \approx E/R}$. After defined units were adopted that proportionality was subsequently changed to the now familiar $\mathbf{I=E/R}$.

Unfortunately, Georg Ohm was an unhappy man for much of his life. None of his teaching jobs were particularly fulfilling, many were plain drudgery at low quality schools, and he was so underpaid at some colleges he often lived in poverty. He was an inward-looking person who never married or made many friends. Several influential German scientists at high levels blocked his advancement and downgraded his achievements causing them to be largely ignored within Germany. It was not until 1841, that the genius of this man was internationally recognized with award of the Copley medal by the prestigious Royal Society – *of England, yet!* It took another four years before he finally acquired the stature he deserved in his own country, when he was finally made a full member of the Bavarian Academy. He received an even higher honor in 1852 with appointment as Experimental Professor of Physics at Munich University, just two years before his death.

Richard A. Moll, W3RM

There are hams who eat and breathe amateur radio, but Richard Moll has gone far beyond the confines of the hobby as a well-rounded, public-spirited ham who has chalked up a remarkable record of service and achievement in our field, but also as an exemplary human being dedicated to helping people in need. The presentation that follows will illustrate not only W3RM's stellar amateur radio accomplishments, but the way he has combined his ham activities, to this very day, to benefit a broad swath of deserving humanity.

As he was getting interested in ham radio, Dick was fortunate to be a neighbor of Brad Martin, W3QV, who taught him the fundamentals of radio with emphasis on practical operating skills. Brad had been active in the ARRL as Director and SCM, and he instilled in Dick a love of CW and traffic handling. Thus, when his first ticket arrived ca.1948 and he got on the air as W3PDJ, Dick immediately became immersed, not so much in DXing - that was to come later - but primarily handling ARRL NTS traffic on the EPA Net on 3610 kc., a frequency tuned so often it is claimed by some to be "corroded" into his dial. His ardor for traffic handling also drew him to the 40-meter SSN (Swing Shift Net) and it was not long before he had *two* ARC-5 rigs in operation at once, one on 80 and the other on 40, transferring traffic every evening between the EPN and SSN. Not bad for a high school kid who was simultaneously being called to dinner by his anxious mother!

All through high school Dick and his close pal, Harry Martin, W3PSH, Brad's son, became totally immersed in ham radio. The enthusiastic pair conducted radio and code classes for any schoolmate they could snare. Dick even taught code to his sister, saw her through licensing, and then built a compact rig to enable her to keep in touch with the family while away at college. Dick and Harry became active in the Keystone Amateur Radio Association, a small club that opened new opportunities with intense Field Day participation, especially for hot operating on 40 CW, where Dick excelled by his uncanny ability to simultaneously copy three calls at once: the one in contact, one above frequency, and another below! Dick's sending is impeccable, described by Brad Martin as, "as good as a machine."

But life is made of adversity as well as success. A seminal event occurred in Dick's life when Harry Martin - his best buddy - was tragically killed in an airplane accident. The two had been so close, and Dick's sorrow so profound, that he was able to overcome his grief only by radically reshaping his life's ambitions because, as he confided to his sister, "now I have two lives to live." And indeed he has done that – and more!

One of the ways Dick fulfilled his vow to honor Harry Martin was through participation in the Big Brothers Association of Philadelphia, where he became a member of the Board of Directors. Over the years, Dick successfully mentored several young boys through their perilous teenage years and into early adulthood. In fact, Dick became foster father to the son of an earlier charge who had suffered an untimely sudden death. That "Grandson" and another foster son, have become successful in business, married and now have children of their own, who Dick proudly calls his "Grandchildren," and who fondly call him "Pop-Pop." One of the boys he raised has commented that, "He gave me a future." So close have they become, that in 1997 Dick legally adopted them as his sons and heirs. Now, that doesn't have anything to do with amateur radio. However, it speaks volumes about the character of the man, the same character qualities that he still brings to every aspect of his rich association with amateur radio.

W3RM's amateur radio expertise converged with his dedication to serve in 1989 when a missionary from his church embarked on a Christian mission in Haiti. Prior to leaving home for Haiti, the minister's wife was coached by Dick in obtaining her Novice ticket, and he assembled a 10 meter station for installation at the mission. Those were turbulent times in Haiti, following a military coup supported by the U.S. government. There were horrific human rights violations, including random beatings of poverty-stricken civilians, murders of dissidents, torching of the mission, and a total ban on international telephone calls. Dick worked the Haiti station at dawn every morning, passing traffic for the mission hospital, handling personal messages and phone patches, and arranging on the U.S. end for delivery of radio and life support supplies. He did this for five years, becoming the lifeline for Americans struggling in an unspeakably hostile environment. Not only that, when another mission was later established in the Dominican Republic, Dick repeated his dedicated effort for them as well.

Fifty years ago, Hurricane Diane ravaged the East Coast and the Phil-Mont Mobile Radio Club responded. Dick had become interested in mobile operation years before when he and W3QV drove around the neighborhood with Brad's SW-3 in search of noise sources in the 10-meter band. He subsequently became active in Phil-Mont and, as the club's emergency response took hold, Dick drove to Stroudsburg, PA. He was ferried in a row boat, carrying a battery powered two meter AM rig under his arm, across the rampaging river to isolated East Stroudsburg. Setting up his station in a jail cell(!), Dick handled vital emergency and health and welfare traffic continuously, the only link between East Stroudsburg and the outside world, until telephone service was restored twenty-four hours later. His close association with Phil-Mont has continued over the intervening years, but always in the background in unglamorous, but critical roles. The club can always depend on Dick's operating skill to rack-up a superlative Field Day score on 40 CW (Photo1); he was an ORS for many years, keeping us informed of latest news from ARRL Headquarters; he ran MCW code practice training sessions on our repeater every week, sending at speeds from 5- to 30-wpm in response to individual listeners' requests. His continuing service as Treasurer is a valued asset for smooth financial management, and beyond finances, Dick is a steadying influence in all club matters. As an independent endeavor, Dick established and administered with utmost integrity, the W5YI VE Testing Program in suburban Philadelphia.

Few people - even hams - will tolerate their sleep being disturbed by radio, but Dick willingly permits it, carrying on a tradition established in the 'fifties by Brad Martin. At that time, some eighty members of Phil-Mont had crystal-controlled radio gear in their cars and at home, all operating on 29.493 Mc.(as we said then). Brad ran his monitor receiver 24-hours a day so, regardless of the time, anyone in difficulty had only to get on "the frequency," give a shout, and Brad would be right back for them. After the club migrated to a 2-meter repeater (not un-coincidentally with the call W3QV), Dick Moll continued the tradition of full-time monitoring, even enduring 4 AM kerchunkers, to ensure he will be available to help in case of a late-night emergency. How many clubs are blessed with a member possessing that kind of dedication?

One of the behind-the-scenes accomplishments by W3RM was acquisition of 501(c)(3) charitable status for Phil-Mont, opening the way for administration of the Claude R. Haring, Jr. W3IIM Memorial Scholarship, by the Foundation for Amateur Radio. Dick oversees the financial health of the fund, encourages donations, and recommends recipients to FAR. Another scholarship award has since begun through Dick's efforts submitting appropriate forms and soliciting donations. Again, however, his involvement goes well beyond those official duties. Recipients of the scholarships are young college-bound hams and university students. Some of

the candidates have already benefited from Dick's amateur radio mentoring, and have used their ham activities as a means to demonstrate their capabilities and thirst for advancement. This year a recent recipient also benefited from Dick's business acumen. At a crossroads in a career decision whether to accept a corporate job or to become an entrepreneur in a field he loved, Dick advised him to form his own business. Following Dick's advice and encouragement, the young fellow now counts several clients for his services as an independent Information Technology consultant. Dick Moll also pursues his hobby on a grand scale well beyond traffic nets, local club activities, and mentoring budding hams. His expanded horizon is exemplified by two DX-peditions he conducted with N3MT, another product of his mentoring who has developed into a well-rounded amateur highly proficient in CW operation. The first trip was in 2001 to Turks and Caicos, where they operated as VP5/W3RM, making 4500 contacts in just two weeks. The next year the duo traveled to Aruba where, as P40RM, they batted out 7500 QSOs within three weeks to DXers all over the world (Photo 2). And on top of that, Dick, a renaissance man if there ever was one, mastered the intricacies of scuba diving in several weeks of intensive training before embarking for the Caribbean so he could have a relaxing, physically stimulating diversion during breaks in the operating schedule.

Many major activities and accomplishments of W3RM have been recounted here, however, there are also numerous smaller, but no less significant, contributions to amateur radio worthy of note that he continues to carry on:

- ✓ Provides practical advice and encouragement to youngsters so they can set realistic goals for becoming good hams without succumbing to "New Equipment Envy"
- ✓ Lends rigs to give newcomers a start
- ✓ Provides sound advice on design and construction of practical antennas (from a man who never owned - and never needed - a beam!)
- ✓ Explains to new hams how to operate equipment, become involved in traffic nets and be good citizens of ham radio
- ✓ Counsels us all when things go wrong
- ✓ Publicizes ham activities in the press
- ✓ Exercises patience in all of the above
- ✓ Emphasizes everything said in this entire document *by example!*

The Atlantic Division Website lists numerous criteria for the Ham of the Year Award. In reviewing our presentation, it is the hope of the Phil-Mont Mobile Radio Club that the judges will recognize that Richard A. Moll, W3RM, fulfills each and every one of those criteria to the fullest extent, and that he should be designated Ham of the Year for 2006.

Respectfully submitted, Robert G .Thomas, W3NE
on behalf of the Phil-Mont Mobile Radio Club, Inc.

Photo 2: Dick Moll, W3RM operating PA40RM during 2002 Aruba DX-pedition

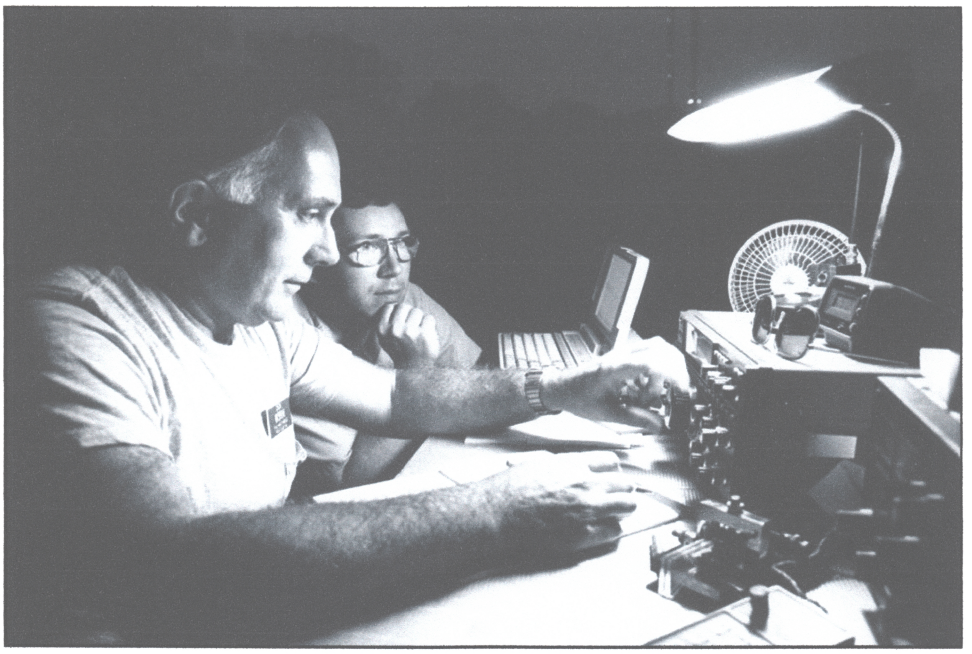

Photo 1: W3RM building up the score for Phil-Mont on 40CW during 1994 Field Day

WHO IS NEMO?

And where did he go?

by Bob Thomas, W3NE

From its inception and through WW-II, ordinary radio broadcasting captured public interest with vibrant first-hand reporting of events *as* they were happening from *where* they were happening. Sports, cultural, political and battlefield events that occurred beyond the confines of cozy studios were transported directly into the homes of an audience that craved the vicarious participation this medium brought them. Of course today we have television "Team Coverage," with idiot field correspondents standing in ocean surf bringing us superficial accounts of trivial events and interviews with drunks at sports bars. Not so with radio remotes; they enabled listeners to "see with their minds" what was happening through colorful, graphic audio reports of Real News.

Remote pickups became such crucial components of radio programming that early broadcasters soon dedicated telephone lines exclusively to handling originations from the field. According to the late Bob Morris,W2LV, veteran employee of NBC, around 1923-24 Westinghouse applied the quite logical term "Remote" to those lines and associated broadcasts. This apparently caused apoplexy among the management of NBC, who were loath to use the same terminology as an arch competitor. So, as befits corporate micromanagement, it was decreed that within the NBC Red Network, programs originating outside the studio and their related facilities would be referred to *only* as (get this) *"Wire Telephony as an Adjunct to Radio Broadcasting."* This meddling naturally did not sit well with the more practical operators, who immediately began to discuss among themselves alternatives to the ridiculous legislated terminology. A member of the engineering staff named George Stewart, suggested *Nemo* as NBC's substitute for "Remote." *Nemo* had a quirky appeal to the engineers, who accepted it by acclimation! The new term stuck, and soon began appearing everywhere within NBC – patch panel labels, switcher nomenclature, program logs, and even in high level technical papers. Although initially an industry buzzword, *Nemo* soon became known even to the early broadcast audiences, who were made to feel like "insiders" by the many broadcast fan magazines that covered personalities and inner workings of the business until the early fifties.

It's not clear today what prompted George Stewart (assumed spelling) to suggest *Nemo*. One possibility is the contemporary *Little Nemo In Slumberland* comic strip – the first realistically-drawn cartoon with quality color printing – which chronicled young Nemo's adventures with dragons, monsters and trips to Mars. Another possibility is "Captain Nemo" in Jules Verne's *Twenty Thousand Leagues Under the Sea*, certainly a remote if there ever was one. In more recent times various meanings were attached to the NEMO acronym, and Disney/Pixar released the animated film, "Finding Nemo," but they all postdated original NBC terminology.

Nemo remained well understood and widely used as the "in" synonym for a remote broadcast until some years after WW-II. By the late 'fifties, however, its use had begun to decline. Perhaps that was due to a new generation of engineers and operators who were entering the broadcast field, especially television, with no ties to tradition, and a public that no longer cared about what was behind the mike and camera. Certainly at RCA, there was no inclination to employ the term on studio or portable equipment, despite the association with our NBC subsidiary. Oldtimers at NBC continued to use the term until recently, but even there, they have finally reverted to the more rational term "Remote," eschewed so many years ago by earlier white tower executives. About the only place *Nemo* will be encountered today is on the 75-Meter SSB "Nemo Net," an informal gathering of broadcast pioneers. For the most part, however, our old friend *Nemo* has passed from the broadcast scene, gone but not forgotten!

But wait – as the infomercial says –*That's not all*. After initially writing this article in 1996 for a local antique radio club newsletter, I was contacted by fellow Phil-Monter, N3QMH, who was free lancing installation of digital audio studio equipment at several Philadelphia radio stations. Bill said a Broadcast Engineering Airtrak-90 digital console he recently installed came with a sheet of labels for customizing control nomenclature with titles like STUDIO-A, MIC-1, and MASTER, and that two of them were marked *NEMO!*

Maybe our old friend has not completely disappeared after all.