HAMATEUR CHATTER

The Milwaukee Radio Amateurs Club

October 2011, Volume 19, Issue 10

One of the World's Oldest Continuously Active Radio Amateur Clubs—since 1917

Presidents Letter

Last month I mentioned one of the pictures taken by the CQ magazine photographer during his Field Day visit would appear in Popular Communications magazine. Well, it is not just in the magazine but the cover! Dave Schank KA9WXN a club member and member of the board (as well as President of MAARS, on the board of West Allis, Chairman of Wisconsin Association of Repeaters, and probably some other titles I don't have listed - and you say you are too busy to participate in club functions) can be seen taking meter readings of the channel 36 TV transmitter (at the community repeater site / TV transmitter site). There is also a short sidebar article in the magazine on Dave and the picture. Congrats Dave.

Now you say so what about the picture of Dave and the TV transmitter, it doesn't have anything to do with the club. Well, while looking through the magazine (and the latest CQ magazine) an ad for the 2012 CQ calendar can be seen. The background of the ad is a picture of none other than Pat N9LKH (5.13 trustee), yours truly, and others at the MRAC / MAARS Field Day (part of the same photo session as the Pop Comm cover). I haven't seen the calendar yet to see what month we might be. Too bad you are not in any of those pictures!

The September meeting featured Kermit Carlson W9XA, vice-director of the Central Division of ARRL. Those who were there said it was a very good meeting. One person was heard saying too bad there weren't more people there, but "I guess there's nothing we can do about that." Well, that person couldn't be more wrong.

The attendance at a meeting is something the membership can absolutely do something about. And in fact, they are the only people who control the meeting attendance. What can people do? How about talk about the club to other hams, especially newer hams. Why not invite or even bring someone new to a club meeting? As I have mentioned before, we don't seem to have any problem promoting other clubs and activities, yet we can't seem to promote our own. Things like the October meeting which will feature the story of building of a Moxon antenna for some HF bands (and which was used at Field Day). Then there is the November meeting which requires the participation of the membership - Show and Tell Antenna Installations. Take some pictures of your antenna installation (you do have an antenna of some sort don't you?) for all to see. You don't even have to get up and talk, just answer any questions others may have.
Don't care about talking up the club? Do you have someplace else to go on the last Thursday of the month? If the attendance keeps going down, then you will have to find something else (but maybe those people won't ride you like I do).
The following is addressed to non-MRAC members (but members should definitely read it too).
Are you a new ham? Do you have a Technician license and a new HT? Are you a member of a radio club? Is it a repeater club? For years MRAC has said we are not a repeater club. Some people seem to have a hard time understanding the point of a radio club that is not a repeater club. In fact MRAC was a club long before there even were repeaters. Club members were involved with getting some of the first repeaters in the Milwaukee area on the air. Yes we do have a repeater. A repeater which has had one natural and 1 operator induced malfunction in 10 years.

MRAC Officers:

Terms Expiring in 2012

- President – Dave,WB9BWP
- V-President– Vacant
- Secretary – Mike, KC9CMT
- Treasurer – Vacant
- Director – Mark, AB9CD
- Director – Dave,KA9WXN

Terms Expiring in 2013

- Director – Al, KC9IJJ
- Director – Hal , KB9OZN
- Director – Vacant

The Club Phone Number is: (414) 332-MRAC or

(414) 332- 6 7 2 2

Visit our website at:

www.w9rh.org

Mail correspondence to:

M. R. A. C.

P.O. Box 240545

Milwaukee, WI 53223

Presidents Letter concluded.

Maybe you are a seasoned ham interested in contests. Maybe you belong to a contest club.

Yet we sponsor a contest. Maybe you are a big DX op. Maybe you belong to a DX club. Yet we have a number of members who have worked a lot of DX. We had a program that included a ham who is (or at least was at the time) #1 on the DXCC Honor Roll. Then of course there is Field Day. Does your club operate Field Day? Can your club say it has operated in every Field Day since the first in 1930? Has your club been a QSL manager for a Space Shuttle amateur radio operation? How about having been a VEC (probably not since there are only 13 others in the country)? How about running classes in amateur radio licenses (all grades) for a total of about 40 or 50 years?
Running regular auctions since the 1930's. I could go on but since our history book is over 100 pages (it is free and available electronically for anyone to read) this newsletter can't possibly list everything.

Well, so what. Those things are from our past? There have been plenty of companies who were in business for many years only to fall apart and disappear. Just being in operation for almost 95 years does not guarantee any type of future. Let's see, lately. How about being the first club in the area with electronic newsletters, Field Day featuring telescopes, movies, digital modes and ATV. The FM simplex contest, a hamfest operated in conjunction with another club, even Field Day with another club, meetings with ARRL employees and board members as part of the programs. How about 3 meetings with Gordon West WB6NOA (and even repeater IDs and announcements by Gordo). Other meetings on foxhunting (by someone who has participated in national foxhunting contests), the conversion of a gasoline powered car to electric, F.I.R.S.T Robotics, Logbook of the World, remote radio operation, software defined radio and even giving away an SDR kit (I wonder how that kit is doing), mobile HF CW, one man DXpeditions, weak signal VHF contesting and much more. All of that has happened in the last 10-12 years.
Who knows what's coming next.

If you are already a member how about getting more involved with the club.
We have a lot of things on the to-do list for the next year or so, including a special event HF operation at Superfest next year. If you are not a member, why not join? Speaking on behalf of the board of MRAC we would love to have you. Stealing a line from the movie Contact, "Want to take a ride?" Ride along with us and do some stuff, do some radio, and maybe have more fun than you thought you could from a radio club.

Board of Director's Meeting Minutes

Meeting called to order at 7:05 PM by President Dave DeFebo, WB9BWP.

Present: Dave, KA9WXN Mark, AB9CD, Dave DeFebo, WB9BWP Michael, KC9CMT, Al, KC9IJJ, , Joe, N9UX.

Absent: Hal, KB9OZN.

Dave, WB9BWP made a motion to accept the minutes of the last meeting as published in the HamChatter, seconded by Michael KC9CMT. Accepted by a vote of 6-0

Treasurer report not read. Our Club has no treasurer.

PRELIMINARY DISCUSSIONS:

Life membership qualifications: 60 years old with 20 years with the Club.

Kermit Karlson from the ARRL Central Division will be giving a presentation at Thursdays', September 29th meeting.

The club still needs to reimburse Dave KA9WXN for expenses incurred at the MRAC/MAARS club picnic.

It was decided that the Club would purchase tables at the upcoming area swapfests, MRC91 & WAARC. The club also wants to advertise the upcoming FM Simplex contest in February.

The Marinette repeater has shown interest in linking their repeater to ours via IRLP.

No report given on any possible Christmas party.

Old Business:

The Club still has been working on ways to attract new members into the club. More discussion and work needs to be done in this regard. We are a club that does things, not necessarily a repeater focused club. Club members though should be expected to attend the meetings.

Repeater: No repeater report this month.

New Business:

SwapFest: MRAC wants to have a ARRL sponsored event next year. Dave, KA9WXN will be filling out the proper paperwork with ARRL to get our club event recognized. The Secretary will be printing out complimentary tickets for distribution to area clubs as a promotional tool. Door prizes for the 2012 swapfest has been discussed. Further discussion on this topic is needed.

Club Flyers: Flyers should be made up in advance of all club activates such as the May auction and our February Swapfest.

Club Anniversary: MRAC will be Celebrating our 95th anniversary in 2012. QSL cards need to be designed and printed out along with certificates and flyers for this special event. There will be a special event station at the AES superfest.

Licensing Classes: The board of directors has been discussing picking a date during the spring of 2012 in which to offer licensing classes in conjunction with other area clubs. AES will provide a facility.

Club Nets: **A Committee is needed to work in this area**.

Field Day 2012: The board is considering purchasing a joint banner with the ORC at the pioneer village site. The Pioneer Village site will be used for JOTA again this year on October 15th.

A Motion was made to adjourn the meeting at 8:45 by Mark, AB9CD, seconded by Joe, N9UX.

MRAC Membership Meeting

Our Membership Meeting was called to order at 7:18 by Dave DeFebo, WB9BWP. The Mic was passed for introductions.

Our presentation this month was provided by Kirmit Karlson, W9XA, the ARRL Central Division, vice-director. He came up from Chicago for our meeting alone. Kirmit set up a table for ARRL promotion. He discussed some important issues facing the Amateur Radio community. There are approx. 2.5 million Hams worldwide, with 650K in the US alone. There were 30K new licenses granted in 2009; new licensing in on the rise. W9XA does not like the present ARRL website and is seeking a revision of its parameters. He also discussed Senate bill 1755-Amateur radio emergency Act of 2009. HR 4809– FCC Commissioners' Resource Act.

Kermit explained that the FCC's broadband plan released by the FCC for comment puts some of the Gigahertz bands at risk of reassignment. ARRL is investigating this. Note that the plan does not mention BPL at all in its 395 pages. BPL for all intent is a dead issue.

Kermit went on to a power point presentation introducing many people that work at the W1AW main ARRL site. ARRL education services offers Emergency Management courses that are very reasonable at $30 per class for members. The ARRL has 76 sections. The ARRL publications are NCJ, QEX & the QST. They also offer more than 150 different books.

LOTW was briefly explained and promoted as a useful source material for DXers'. QST is working on publishing a digital issue every month to compliment their printed issue.

All-in-All Kirmit Karlsons' program was excellent and inspirational.

We would do well to have him back again sometime in the next few years.

Dave DeFebo, WB9BWP then lead a short business meeting. For the second month in a row attendance was low at this very well put together meeting. Upcoming programs:

October : Mark, AB9CD will give a presentation on building a Moxon antenna.

November: A show and tell antenna discussion is planned, So please take digital photo's of your outdoor antennas' for this meeting.

December: No Meeting.

January: Our president will field questions regarding electronics

February: Joe, N9UX will give a short program on the upcoming FM simplex contest.

March and Beyond: No programs scheduled as of yet.

A motion was made to adjourn at 9:16 PM . Motion made by Mark AB9CD, Second by Al, KC9IJJ.

Room returned to condition as found upon arrival.

Respectfully submitted,
Michael, KC9CMT

Next Regular Meeting

The next meeting will be October 27th at 7:00PM. We meet in the Fellowship Hall of Redemption Lutheran Church, 4057 N Mayfair Road. Use the south entrance.

Please do not call the church for information!

Club Nets

Please check in to our nets on Friday evenings.

Our ten meter SSB net is at **8:30 p.m.** at **28.490 MHz USB.**

Our two meter FM net follows at 9:00 p.m. on our repeater at **145.390 MHz** with a minus offset and a **PL of 127.3 Hz.**

Visit our website at: **www.w9rh.org**

Or phone (414) 332-MRAC or 332 - 6722

Chatter Deadline

The **DEADLINE** for items to be published in the **Chatter** is the 15th of each month. If you have anything (announcements, stories, articles, photos, projects) for the 'Chatter, please get it to me before then.

You may contact me or Submit articles and materials by e-mail at: **Kc9cmt@earthlink.net**

or by Post at:

Michael B. Harris

807 Nicholson RD

South Milwaukee, WI 53172-1447

Experimenter's Bench

Some Generally useless Rambling on Tuned Circuits and how they apply to multi band or (Trap) Dipoles!

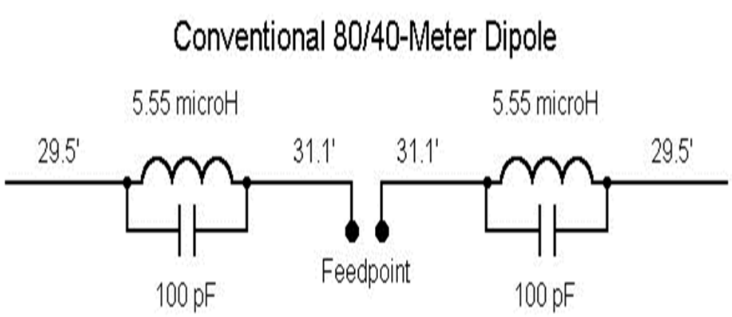
by KG4BIN David Morgan

The trap antenna, was invented mostly for convenience. It was not invented for maximum efficiency. As with all antennas, trap antenna adherents claim they get good results--and they do. But whether they get better results than they would with other types of antennas of comparable size, is a question very hard to answer. The answer would require that the trap antenna and the alternative be placed in nearly the same position at the same height, and few of us can afford the space, time, or money for such comparisons. However the trap antenna is cheap, easy to build and can cover many bands, without having to resort to a tuner.

The most common type of trap antenna, is the parallel tuned circuit, that is resonant at or just below the edge of the higher frequency band to be covered, with extensions to make up the length of the lower band. These antennas will be shorter than a full-size dipole at the lower frequency, since the trap acts like an inductor at the lower frequency, much like a mid-element loading coil. However, the inductive reactance is not a product of the coil alone, but of the tuned circuit making up the trap.

Virtually all radio communication involves the use of resonate circuits, in one way or the other. Any tuning element, involves resonance; without it we could neither transmit a stable signal, nor could we select the desired signal with our receivers. In the old days, when big spark gaps furnished the transmitted RF and mechanically shaken cohers were the receivers, resonate circuits as such, were unknown-and radio's usefulness was sorely limited.

If you're designing a circuit and your major requirement, is to obtain resonance at some single desired frequency, you have an infinite number of values to choose from! No matter what size capacitor you choose to use, it will have a definite capacitive reactance at your desired frequency, and all you will have to do to achieve resonance is to provide an inductive reactance of exactly the same value at the same frequency.



Let's look at the more conventional trap antenna and simplify it to just 2 bands, like 80/40 or 20/10. A full size #14 copper wire resonant dipole will have a gain of about 2.1 DBI in free space, but it has this gain only in one ham band. We can use the gain figure, as a standard against which to measure trap antennas for two bands. The first thing we see is that performance of a two band trap antenna of conventional design, depends very heavily on the Q of the trap. There are many trap designs, but here is a table of one pretty good design with coils of various Qs. The gain is for free space.

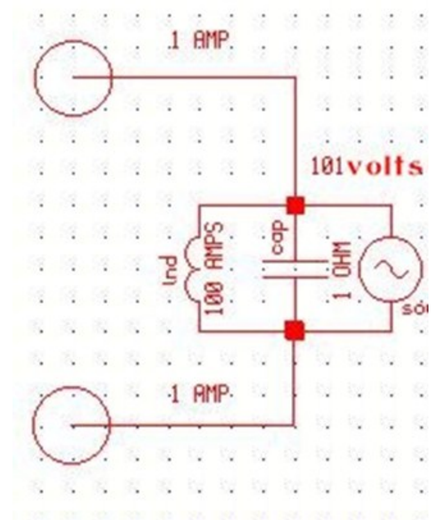
Q	High-Band Gain (dBi)	Low-Band Gain (dBi)
50	0.7	1.7
100	1.4	1.8
200	1.8	1.9
400	2.1	2.0
800	2.2	2.0

The Q of a coil, is the ratio of energy stored in the coils magnetic field, to the energy dissipated in the coils resistance and radiation losses!

Long thin coils, require more wire and so have a higher resistance, while at the same time producing smaller magnetic fields.

Large short coils, also have smaller magnetic fields and because of it's size, is more subject to radiation losses.

The "square coil", strikes a balance between large magnetic fields, for energy storage and small enough size, to minimize radiation, and so has an optimum Q.



The voltage drop across any single impedance in a resonate circuit, is affected by the Q as shown here. This circuit has a Q of 100, since 1 amp of current overcomes losses to maintain 100 amps of circulating energy. If the impedance of the capacitor is 1 ohm, a voltmeter will measure 101 volts across the capacitor. Although only 1 amp is flowing in the external portions of the circuit. The meter impedance must be taken into account, since it will load the circuit and effectively reduce Q.

Avoid low-Q trap coil designs. It is fairly easy to homebrew airwound coils with a Q of 200, and common coil stock usually meets this figure. Even the best series-wound coaxial trap coils will not have Qs higher than about 400, and most coils with Qs claimed to be higher than 400 will not retain that Q under the influence of a chemistry-lab atmosphere. Nonetheless, a dipole with a gain of 1.8 or so will not yield results noticeably worse than a full size dipole, since a half dB of lost gain translates into less than a tenth of an S-unit.

The sample conventional 80/40-meter trap dipole in Figure 1 uses traps tuned to 6.75 MHz. With a Q of 200, the traps equalize performance on the two bands at just above 1.85 DBI in free space. This is only about 0.35 dB down from a full size dipole for each band.

Coaxial-Cable Trap Construction

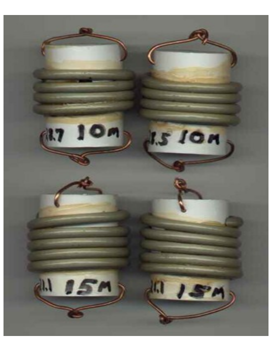
Coaxial-cable traps are inexpensive, easy to construct, stable with respect to temperature variation and capable of operation at surprisingly high power levels.

Coaxial-cable antenna traps are constructed by winding coaxial-cable on a circular form. The center conductor of one end is soldered to the shield of the other end, and the remaining center conductor and shield connections are connected to the antenna elements. The series-connected inner conductor and shield of the coiled coaxial-cable act like a bifilar or parallel-turns winding, forming the trap inductor, while the same inner conductor and shield, separated by the coaxial-cable dielectric, serve as the trap capacitor. The resultant parallel-resonant circuit exhibits a high impedance at the resonant frequency of the trap.

I constructed the traps using RG-58/U coax. PVC pipe couplings were chosen for the trap forms: they are very inexpensive and readily available in useful diameters. 12 gauge solid wire was used to form "bridle wires" for electrical termination of the coax and electrical and mechanical termination of the antenna wire elements. The coax turns were spread slightly until the desired resonant frequency was reached, as measured by a dip meter. After adjustment the coax turns were secured by coating with lacquer.

Table 1. Specifications of the traps used in this antenna.

band	trap form	coax length	coax turns	design frequency	actual frequency
10 meters	3/4" PVC coupling (1.375" OD)	20.25"	4	28.85 MHz	28.5 MHz, 28.7 MHz
15 meters	3/4" PVC coupling (1.375" OD)	26"	5.25	21.225 MHz	21.1 MHz
20 meters	1" PVC coupling (1.625" OD)	35.5"	6	14.175 MHz	14.2 MHz
30 meters	1.25" PVC coupling (2.0" OD)	46.25"	6.5	10.125 MHz	10.12 MHz
40 meters	1.5" PVC coupling (2.25" OD)	61"	7.75	7.15 MHz	7.15 MHz



The 10 and 15 meter traps, wound on 3/4" PVC pipe couplings.

I used this simple method to connect the traps to the antenna wire elements. I soldered a short (approximately 2") wire pigtail to the bridle wire on each end of the trap. Then the antenna wire was looped through the trap bridle wire and secured to the pigtail using an electrical wire nut. This made trimming the lengths of the antenna elements easy, as the connections could be readily disassembled. Once the element was tuned, the connection was soldered, to prevent oxidation. When the antenna trimming was complete I used a nylon cable tie to secure the antenna wire loop to the pigtail to strain relieve the connection.

I used 12 gauge stranded household electrical wire for the antenna elements. This wire is very inexpensive when purchased in 500 foot spool quantities at home centers. The insulated jacket causes the wire to have a velocity factor somewhat lower than that of bare copper wire.

Center and End Insulators

The antenna center insulator was constructed from a piece of scrap Plexiglas. The center of a half-wave dipole is a current feed point so just about any insulating material will work here. Plastic cable ties are used to secure the antenna elements and the RG-58/U feedline to the insulator. A rope attached to the topmost hole is used to support the antenna center.

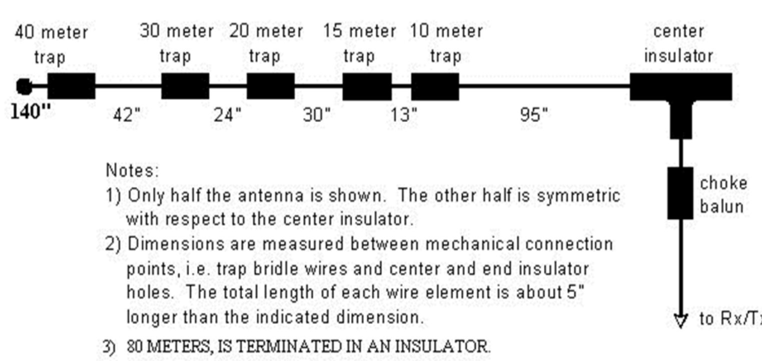
Choke Balun

I constructed a choke balun near the antenna center insulator by wrapping approximately 6 feet of the antenna coaxial-cable feedline as a single layer winding on a scrap polyethylene food container that was approximately 4 inches diameter. I used cable ties through small holes drilled in the container to secure the coax winding.

Some amateurs argue that a balun is not necessary when feeding a dipole with coax. The simple choke balun used here is trivial to construct, and I do not feel it is worth the risk of feedline radiation problems to omit it.

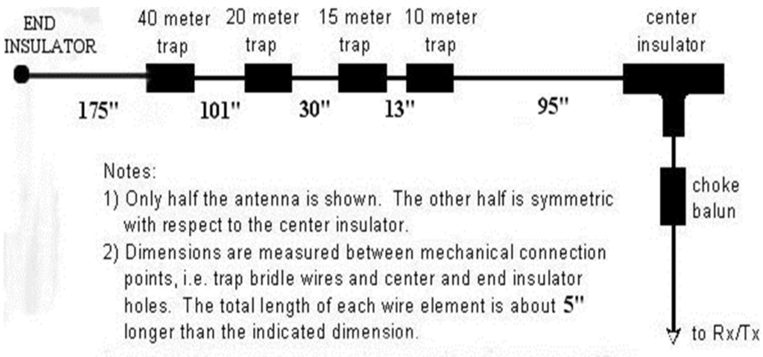
Antenna Dimensions

The final dimensions of the antenna are shown below. If you try to duplicate this antenna you should start with longer lengths and then trim as necessary, as the lengths will be affected somewhat by height above ground, and by proximity to building. An antenna analyzer, such as the MFJ-259 that I used, greatly speeds the trimming process.



The Experimenters Bench Continued

If you are not interested in the 30 meter WARC band, here are the dimensions of the antenna without the 30 meter traps. You may note that the 80 meter end sections are significantly longer in the version without the 30 meter traps: much of that difference may be due to the larger percentage of the 80 meter section length.



Electrical Measurements

One of the most often quoted disadvantages of trap antennas is reduced bandwidth. But the useful bandwidth of the coaxial trap dipole described here is sufficient for no-tuner use over much of the 6 bands. As the measurements in Table 2 illustrate, the antenna performs with better than 2:1 SWR over the entire 10 and 15 meter amateur bands. Almost all of 20 meters is usable with less than a 3:1 SWR. The 40 and 80 meter bands were trimmed for operation within the CW band segment.

Table 2. 2:1 and 3:1 SWR Bandwidth (Measured with MFJ-259 Antenna Analyzer).

amateur band	2:1 SWR	3:1 SWR
10 meter (28.0-29.7 MHz)	2.2 MHz	4.23 MHz
15 meter (21.0-21.45 MHz)	640 kHz	1.04 MHz
20 meter (14.0-14.35 MHz)	190 kHz	330 kHz
30 meter (10.1-10.15 MHz)	100 kHz	190 kHz
40 meter (7.0-7.3 MHz)	50 kHz	110 kHz
80 meter (3.5-4.0 MHz)	60 kHz	200 kHz

Early Radio: Combat Communications

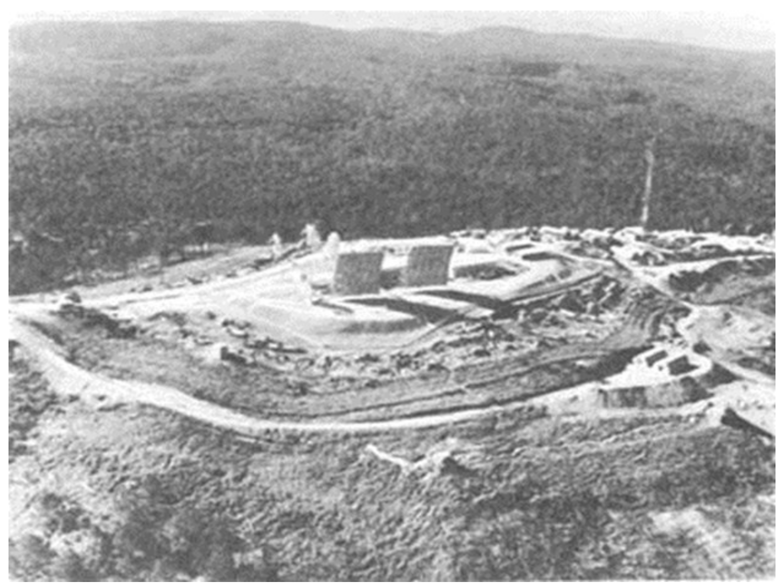
Integrated Wideband Communications System in Vietnam

The Integrated Wideband Communications System was a microwave and tropospheric scatter communications web that eventually spanned the entire Republic of Vietnam and Thailand. The equipment was commercially procured, installed by a contractor, and the system was, therefore, of commercial fixed-station improved quality throughout. It constituted the Southeast Asia portion of the global Defense Communications System which had been delegated to the Army by the Department of Defense through its Defense Communications Agency.

The completed system became by far the largest communications complex the Army had ever undertaken, creating an equivalent of the Bell Telephone System for South Vietnam and Thailand. However, the integrated system did not come into being quickly, easily, or, for that matter, inexpensively. An urgent request for the fixed-plant system had been made in mid-1964, accompanied by a required implementation date of December 1965. The implementation date, however, was not met; in fact, fifteen months elapsed from the date of the contract award until the first link became operational in December 1966. This initial link was a small part of Phase I of the three ultimate phases of the Integrated Wideband Communications System.

The Three Phases

In Vietnam, Phase I of the Integrated Wideband Communications System, incorporating and expanding the BACK PORCH links, was primarily intended to provide more circuits from Saigon and north throughout the country. A new extension was built from the Monkey Mountain site in Da Nang to Phu Bai, a large U.S. encampment area just south of the imperial city of Hue. In the center of a huge triangle between Saigon, Nha Trang, and Pleiku, an important circuit and system-switching facility was built on top of Pr' Line Mountain, a short distance to the southeast from Dalat. High-capacity links were to be provided between Pr' Line and the three corners of



PR' LINE MOUNTAIN SIGNAL FACILITY, *a key site of the Integrated Wideband Communications System.*

the triangle. Numbers of short links were built in and around the capital city area, where the fixed systems of Phase I replaced earlier tactical microwave circuits. Phase I of the integrated system was not intended to support a large troop buildup but was to provide the communications for up to 40,000 U.S. troops in Vietnam, primarily advisers and helicopter units. As the force level in Vietnam grew, the requirements increased, and General Westmoreland's communicators were forced to ask for the Phase II upgrade. The Department of Defense approved Phase II in January 1966 and scheduled its completion for October 1966.

The primary purposes of Phase II were to expand both the major north-south backbone trunk system and the Saigon microwave complex, and to extend the fixed-plant system into new areas in support of combat operations. Sixteen new sites were to be added, involving twenty-five new communications links; nine Phase I links were to be upgraded to a higher capacity. In all, the total number of terminals was doubled, and the circuit total was tripled. When the Saigon-Nha Trang tropospheric scatter link was upgraded to carry 240 channels, it was the world's first tropospheric scatter link to achieve daily operation at so large a capacity. In August 1966 the Secretary of Defense approved Phase III of the Integrated Wideband Communications System, which would provide support for 400,000 troops. The primary objective of this phase was to extend the wideband system into the Mekong Delta area in order to meet the needs of expanding combat operations there. No new major relay systems were included in this phase, but many short links were added around large nodal sites in the existing wideband network. The first link of Phase III would not be completed until December 1967.

Concurrent with the award of a letter contract to Page Communications Engineers, Inc., for the Vietnam portion of the fixed plant system, the Army awarded the contract for the Thailand portion to Philco-Ford Corporation. In Thailand progress was made in the same phase pattern as in Vietnam. With the obvious exception of combat action, the problems experienced in Thailand during the ultimate completion of the wideband system paralleled those in Vietnam.

Problems and Delays

The installation project moved forward relentlessly, if somewhat unevenly at times, amid diversified problems and difficulties of funding, managing, supplying, and manning, which invariably accompany any large-scale effort. This effort, however, was unique in Army experience for its size and complexity. Implementation of such an ambitious project could not be expected to come easily. Construction and operation at the many sites, ultimately fifty-nine sites in Vietnam, fell short of the expected timetable. This situation was hardly surprising in view of such serious obstacles as remote sites and transportation difficulties in Southeast Asia and funding and programming delays in Washington. In retrospect, it is to the credit of everyone involved that the undertaking turned out as well as it did.

Because of these delays, Phase I and II were not completed on schedule. The last link of Phase I was not accepted by the government until January 1968, two years and one month after the original requested operational date of December 1965. Not until February 1968 did the last link of Phase II go into operation in Vietnam, a year and four months after the date requested, October 1966. The remainder of the Integrated Wideband Communications System, Phase III along with a few additional modifications, would not be completed until much later in 1968. In the meantime, commanders at all levels urgently demanded that the system be completed as soon as possible.

Such demands for the completion of the system, however, could not be easily met. The military had chosen to install a fixed, commercially procured system. And the commercial equipment needed for this system was entirely different from the communications hardware previously used in a war zone; it was custom built and enormously costly. In addition, engineering, manufacturing, testing, acceptance, and operation presented many difficulties at all levels. But it was the great expense of the system which surprised and chagrined many. At Army and Department of Defense levels in Washington, the major impediment was getting money. The time-consuming process of funding had to come before anything else could be done. The budgetary mills of government could only grind out the funds slowly by increments. Yet, piecemeal funding, and the resultant bit-by-bit contracting and installing, apparently cost more in the long run than a single lump-sum allocation at the outset. For example, a Strategic Communications Command report dated 7 June 1967 states, in part: "This office has received a retransmission from Page Communications Engineers, stating that existing Phase III money would be exhausted by 15 July 1967 and that if additional incremental money was not forthcoming, the program will suffer in increased cost."

In mid-1966 the Assistant Secretary of Defense had returned a third addendum of the wideband communications program to the Defense Communications Agency for additional justification. The authorities in Washington were questioning the need for all the money that was being sought for channel expansions of trunks not yet in service and replacements of mobile combat systems at greatly increased capacity. They disbelieved the reports and requirements coming from the Southeast Asia war zone and insisted that the funds be minutely justified. The requirements had to be stated in detail, despite the fact that no one could determine the precise requirements far in advance. Frequently, changes had to be made in the system-in such matters as site location, equipment, and number of circuits-during the process of contracting and even of construction. Unforeseen demands continually arose requiring changes and, usually, expansion, even after installation had begun or had been completed. Not until May 1966 were the Phase I and II contracts with Page Communications Engineers, Inc., finally "definitized" for Vietnam. And four months earlier, Phase III had already been launched, calling for more circuits, more terminals, and the upgrading of older terminals. This phase involved more equipment and larger antennas to provide more channels, resulting naturally in a plea for more money.

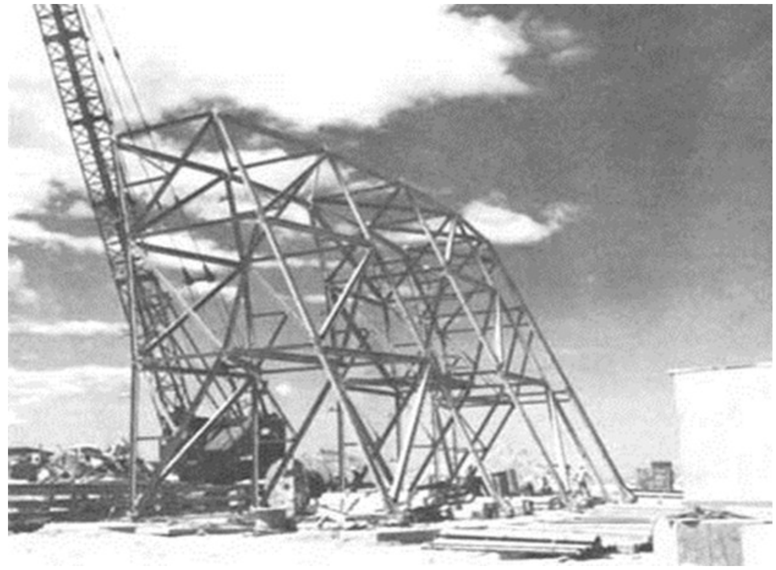
The increases and changes occurring in the midst of the funding and approval process were not the result of inefficient planning. Rather, because of the graduated nature of the troop buildup and the constantly changing situation caused by combat activities, the volume and type of traffic and the disposition of subscribers were not known early enough or in sufficient detail to enable proper engineering of the trunking system. The logical steps in fixed-plant network engineering-traffic, plant, transmission, and equipment engineering-could not be followed in this case.

The difficulties encountered in obtaining adequate funds and establishing firm requirements were not the only factors contributing to the delays in the fixed communications project. From the very beginning of the program, problems of site concurrence and site access were almost endless. For isolated sites, the problem was especially time-consuming, beginning with the initial engineering surveys to find suitable locations. There were delays in getting aircraft and ground transport to remote areas in order to survey hilltop sites, and to make tests to determine the adequacy of proposed radio paths. Time was also consumed in obtaining permission from the local government to use these sites. Other delays ranged from the care required to avoid desecrating sacred trees in Thailand to the payment exacted for future harvests in

Vietnam. Site acquisition difficulties involving the terminals on bases already established were often only a matter of building space. In many cases, installation commanders who had agreed to furnish space were not able to do so when the time came for construction. These commanders discovered that their own unanticipated expansion had taken all of the available space. In addition, the space requirements for the system increased beyond original estimates. Buildings had to be erected, and in some cases expanded, to meet new requirements.

Production capacity and shortage of materials for the wideband system constituted another significant problem area. There were approximately 150 U.S. subcontractors providing material for the fixed communications in Vietnam and 100 subcontractors for Thailand. Page and Philco-Ford, the prime contractors, made every effort not to engage in direct competition for equipment by avoiding whenever possible the same vendors. In many cases, however, these prime contractors found themselves inadvertently competing with one another because the second-, third-, and fourth-tier vendors were furnishing components to the principal subcontractors for each. In addition, procurements by other government agencies with equal or higher priority than the Integrated Wideband Communications System as well as increased purchasing by commercial firms saturated the market. The industry was saturated to such a point that even the offer of premium prices could not cause delivery dates to be moved up. Business was so good that many firms refused to accept a contract or subcontract with a penalty clause. In many cases, subcontracts were awarded to firms that offered the earliest delivery dates and not necessarily to those with the lowest prices; however, the majority of suppliers failed to meet promised delivery dates. The basic causes of these failures were the delayed delivery of components or raw materials and the shortage of skilled labor.

The transportation of material, once it was finally available, was one of the most serious problems in the program. The accelerated buildup in Vietnam caused seaports and airports to become congested with cargo of every type imaginable destined for the war zone. Special-mission aircraft was the only means of getting the fixed communications hardware to Southeast Asia quickly. Throughout the period of installation, the U.S. Air Force Military Airlift Command provided special flights to bring the sorely needed electronic equipment into Vietnam. In addition, because a very active war was being waged and ground movement was constrained, the Air Force combat cargo aircraft and the Army cargo helicopters were often the only means of getting the hardware to the sites. Site construction was accomplished in a variety of geographical and geological areas that include the rice paddies of the Mekong Delta, the mountainous, rocky mid-country region, and the sandy beaches along the coast. Each location presented a unique problem. Building and antenna foundations in the delta area had to be of a spread-footing design to prevent sinking in the water-soaked clay of the rice paddies. In sandy areas, the problem of soil erosion was so severe that it frequently appeared to defy solution. The very pronounced wet and dry seasons in Southeast Asia also controlled construction schedules. It was virtually impossible to accomplish any outside construction on communications sites during the rainy seasons. Other problems affecting construction of the wideband system were the remoteness of some sites and the security restrictions at practically all sites. Army cargo helicopters were used extensively to transport men and material



A 120-FOOT ANTENNA FRAME UNDER CONSTRUCTION ON VUNG CHAU MOUNTAIN, QUI NHON

to mountain sites such as Pr' Line, Hon Cong Mountain near An Khe, and VC Hill at Vung Tau. Often considerable stretches of new road had to be built even before the actual work could begin. Use of the Vung Chua Mountain site, for example, just north of Qui Nhon, required the construction of thousands of feet of new road. In addition, an enormous amount of rock and dirt had to be removed from the site in order to provide a flat surface on which the facilities could be built.

In the latter months of 1966 additional delays and difficulties in construction and installation were caused by enemy action. Earlier, the big military communications sites had remained remarkably free from enemy harassment. It was almost as if the enemy favored the new communications services which Southeast Asia was receiving for the first time in its history. On Thanksgiving Day 1966, however, a costly ambush of a communications equipment convoy occurred near Dalat in the hills of south central Vietnam. The convoy, manned by 1st Signal Brigade soldiers and contract civilian workers, was attacked while en route to the mountaintop site at Pr' Line.

COMBAT SOLDIERS OF THE 1ST SIGNAL BRIGADE FIRING MORTARS FROM PR' LINE

Eight Page employees and one 1st Signal Brigade trooper were killed and eleven men were wounded. Two of the soldiers in the convoy, Staff Sergeant Gerald H. Bamberg and Specialist Walter S. Rogers, were cited for valor in holding off the enemy and preventing the complete annihilation of the convoy.

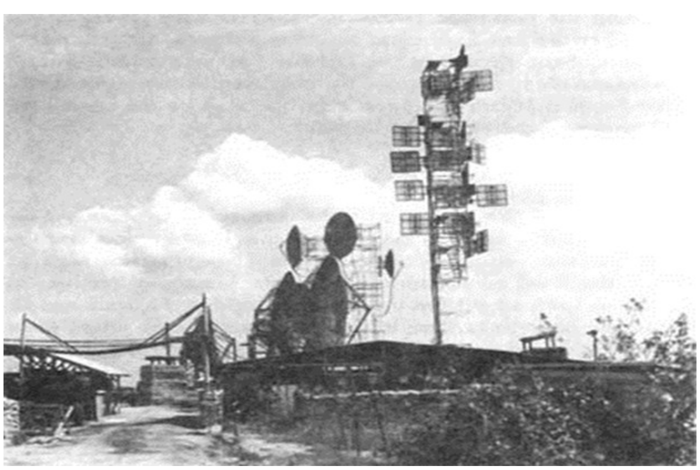
Another major attack affecting communications facilities occurred on the night of 26 February 1967 at DA Nang. The enemy launched a large surprise rocket attack against the DA Nang Air Base. One of the first enemy targets was the Army's signal compound on the base. Fortunately there were no casualties, but the rockets completely destroyed four vans in the communications complex which housed the temporary mobile message relay facility. Replacement vans were rushed to Vietnam by the Strategic Communications Command's 11th Signal Group in the United States, enabling reactivation of the tape relay in ten days. Actually, no circuits or links were completely out for more than a few hours, partly because of quick rerouting of circuits and partly because the enemy had failed to damage the big radio and technical control vans located adjacent to the tape relay facility.

At last, by the end of 1966, despite all delays and difficulties, the first circuits of the wideband system were tested, accepted by the Army, and "cut to traffic," that is, put into service passing actual communications. Brigadier General Robert D. Terry accepted the first link of the Integrated Wideband Communications System on 21 December 1966. This was one of two links which carried traffic between Phu Lam and the Tan Son Nhut Air Base in the Saigon area. These were the first fixed sites completed in Vietnam. The first links in Thailand had been put into use a little earlier, on 5 November, following the completion of tests between Korat and Udorn.

After the cutover of the first links, the wideband communications system flourished, fed by the multimillion dollar contracts to civilian companies and pushed by the thousands of combat signal troops that joined the 1st Signal Brigade in the 1966-1967 period. By mid-April 1967, hundreds of circuits in the integrated system had gone into service and eleven sites had been completed in Vietnam.

Combat Mobile Equipment Used in the Interim

It should be noted, however, that because of the long delays invariably encountered since the submission of the initial requirements in August 1964, the fixed communications system could not keep pace with the huge buildup of U.S. and other Free World military forces in Vietnam. Keeping in mind that Phase I of the over-all system was designed to support 40,000 troops in Vietnam and that Phase II had a ceiling of 200,000, it can easily be understood that the Army communicators had many problems when the U.S. strength alone exceeded 350,000 men the day the wideband system's first circuit was put into service.



SITE OCTOPUS, OUTSIDE SAIGON,
A MAJOR COMMUNICATIONS HUB IN 1967

The solution to these problems, however temporary, was to use every piece of medium and heavy tropospheric scatter, microwave, and other mobile and transportable multichannel radio equipment that could be deployed into Vietnam.

Throughout the long months of delay in the fixed communications project, the buildup of troops continued as did their appetite for long-haul circuitry. Consequently, the mobile tropospheric scatter and microwave links of the Defense Communications System were rushed into service and abounded throughout the country, not only providing circuitry from the backbone system to locations that would one day be served by the fixed communications being installed, but also supplementing the backbone system itself. In October 1967, eleven months after the first fixed-plant link was accepted, approximately 70 percent of the circuits of the Defense Communications System in Vietnam were in fact provided by mobile equipment inadequate for fixed-station standards. They were operated by the corps area signal groups of the 1st Signal Brigade.

Status at the End of 1967

Regardless of the long, continued, and heavy dependence on mobile equipment for the long-haul Defense Communications System in Vietnam, enthusiasm among the customers ran high in 1967 as the fixed communications system became a reality. At mid-year in 1967, all praised the progress made by Phases I and II. Most of the basic links were in service or were being tested prior to activation. Wind-up activities of Phases I and II peaked in 1967, and by the end of November testing had begun on the final thirteen of seventy-six links.

The last link of Phase I in Vietnam, between Vung Tau and Pleiku, was accepted on 27 January 1968, and acceptance of the last link of Phase II, between Vung Tau and Long Binh, followed one month later.

The total system upon completion of Phase II consisted of seventy-six communications links operating at fifty-eight sites in Southeast Asia. Of the more than ten thousand circuits, nearly all reached their destination by both tropospheric scatter and microwave radio trunks. However, a few circuits passed through a recently completed submarine cable system. This system, approved by the Department of Defense in February 1966, comprised six links, capable of sixty voice channels each, connected to the major communications sites at DA Nang, Qui Nhon, Nha Trang, Cam Ranh Bay, and Vung Tau in Vietnam, and Sattahip, south of Bangkok in Thailand. The installation was completed in May 1967. This dependable cable system, protected by its undersea route and interconnected with the fixed-station radio system at these six sites, constituted a valuable segment of the ever-growing Southeast Asia Wideband System.

Site construction meanwhile was progressing on the Phase III effort of the integrated system. Practically all of Phase III implementation occurred in 1968. While the first Phase III link in Vietnam, a 60-channel link between Vung Chua Mountain and Phu Cat Air Base, was accepted by the United States Government during December 1967, the entire system would not be completed until 1969.

VE Testing:

Saturday, October 29th, 2011 - AES - 9:30 AM-11:15 AM

Saturday, November 26th, 2011 - AES - 9:30 AM-11:15 AM

ALL testing takes place at: Amateur Electronic Supply 5720 W. Good Hope Rd. Milwaukee, WI 53223

Area Swapfests

November 5th Milwaukee Repeater Club Hamfest
Location: Elks Club Milwaukee, WI
Sponsor: Milwaukee Repeater Club
Website: http://www.mrc91.org

MRAC Working Committees

Field Day

- Open

FM Simplex Contest

- Joe – N9UX
- Jeff – K9VS
- Brian— K9LCQ

Ticket drum and drawing

- Tom – N9UFJ
- Jackie – No Call

Newsletter Editor

- Michael-KC9CMT

Webmaster

- Joe Schwartz—N9UX

Refreshments

- Hal—KB9OZN

Membership Information

The Hamateur Chatter is the newsletter of MRAC (Milwaukee Radio Amateurs' Club), a not for profit organization for the advancement of amateur radio and the maintenance of fraternalism and a high standard of conduct. MRAC Membership dues are $17.00 per year and run on a calendar year starting January 1st. MRAC general membership meetings are normally held at 7:00PM the last Thursday of the month except for November when Thanksgiving falls on the last Thursday when the meeting moves forward 1 week to the 3rd Thursday and December, when the Christmas dinner takes the place of a regular meeting. Club Contact Information

Our website address **http://www.w9rh.org**

Telephone **(414) 332-MRAC (6722)**

Address correspondence to:

MRAC, Box 240545, Milwaukee, WI 53223

Email may be sent to: **w9rh@arrl.net .** Our YAHOO newsgroup:

http://groups.yahoo.com/group/MRAC-W9RH/

CLUB NETS:

• Our Six Meter SSB net is Thursday at 8:00PM on 50.160 MHz USB

• Our Ten Meter SSB net is Friday at 8:00PM on 28.490 MHz ± 5 KHz USB.

• Our Two Meter FM net follows the Ten meter net at 9:00PM on our repeater at 145.390MHz - offset (PL 127.3)

From the ARRL Newsletter

Heathkit's Amateur Radio Plans Taking Shape

Heathkit Educational Systems hopes to reenter the Amateur Radio market by the end of 2011. Back in August, Heathkit announced its return to the kit business and actively solicited suggestions. The response from Amateur Radio operators convinced Heathkit to develop several Amateur Radio products.

"When we made the announcement on our web page about a month ago, we had no intention of entering the Amateur Radio kit market," Ernie Wake, Heathkit's Director of Sales and Marketing, told the ARRL. "The response was really overwhelming, exciting and scary. The scary part is that the brand name has so much loyalty that we don't want to disappoint the people who have such fond memories."

Wake said that Heathkit is presently working on developing a few Amateur Radio kits. "Initially, the kit line will include a few 'accessories,' like kits for a Dual Watt Meter, Antenna Tuners and the Cantenna," he explained. "Once we are a little more 'settled,' I think we will develop a QRP receiver. We won't rush to market just to get there. We want to develop a line of kits in the tradition of Heathkit. I'm hoping to have one or two kits by the end-of-the-year."

Milwaukee Area Nets

Mon.8:00 PM 3.994 Tech Net

Mon.8:00 PM 146.865- ARES Walworth ARRL News Line

Mon.8:00 PM 146.445 Emergency Net

Mon.8:00 PM 146.865- ARES Net Walworth

Mon.8:45 PM 147.165- ARRL Audio News

Mon. 9:15 PM 444.125+ Waukesha ARES Net

Mon.9:00 PM 147.165- Milwaukee County ARES Net

Tue.9:00 AM 50.160 6 . Mtr 2nd Shifter's Net

Tue. 7:00 PM 145.130 MAARS Trivia Net

Tue. 8:00 PM 7.035 A.F.A.R. (CW)

Wed. 8:00 PM 145.130 MAARS Amateur Radio Newsline

Wed. 9:00 PM 145.130 MAARS IRLP SwapNet d FM-38 Repeaters (IRLP 9624)

Thur. 8:00 PM 50.160, 6 Mtr SSB Net

Thur. 9:00 PM 146.910 Computer Net

Fri. 8:30 PM 28.490 MRAC W9RH 10 Mtr Net SSB

Fri. 9:00 PM 145.390 W9RH 2 Mtr. FM Net

Sat. 9:00 PM 146.910 Saturday Night Fun Net

Sun 8:30 AM 3.985 QCWA (Chapter. 55) SSB Net

Sun 9:00 AM 145.565 X-Country Simplex Group

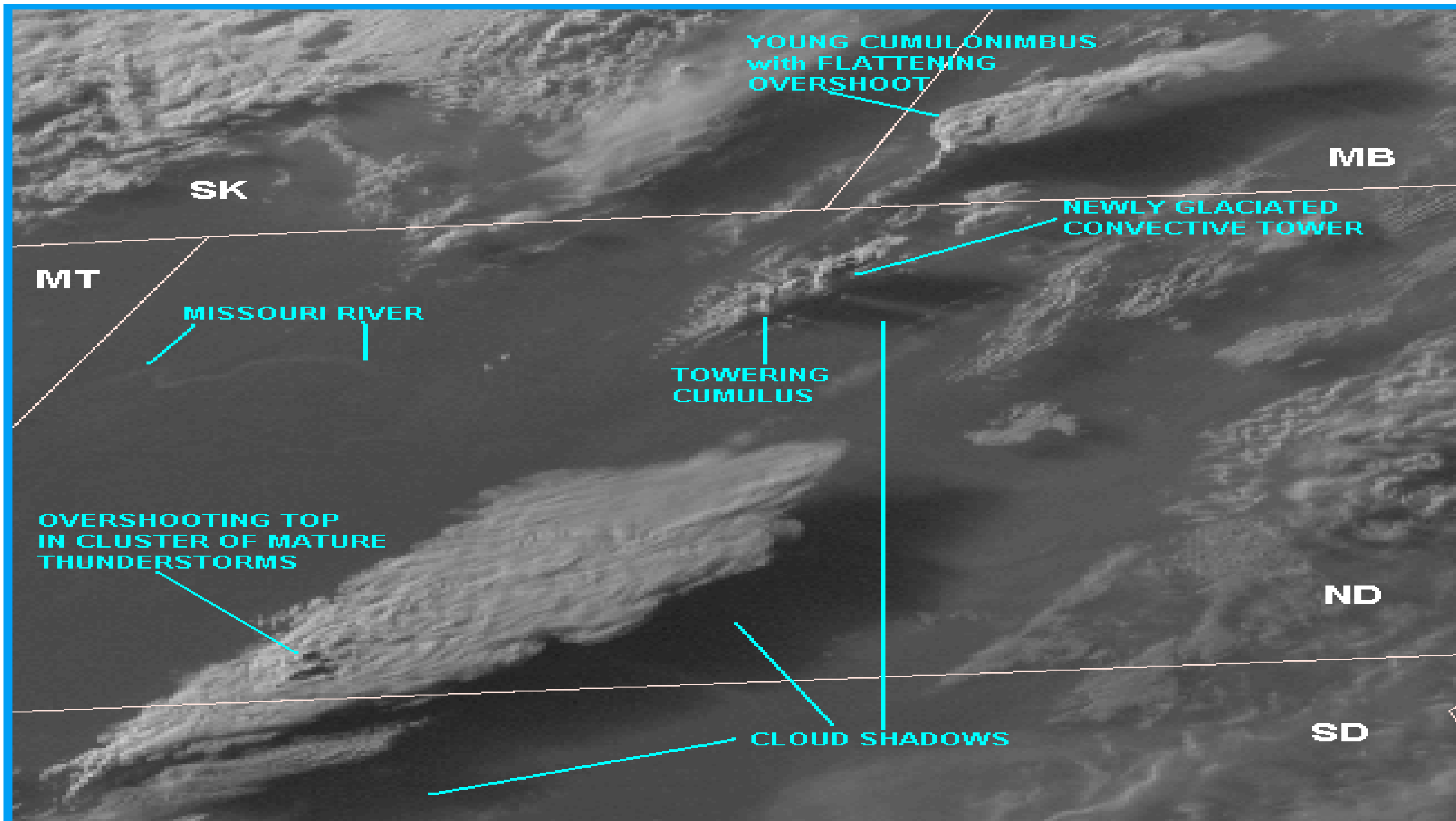
Sun 8:00 PM 146.91 Information Net

Sun 8:00 PM 28.365 10/10 International Net (SSB)

Sun 9:00 PM 146.91 Swap Net

2 meter repeaters are offset by 600KHz - - 70 centimeter repeaters are offset by 5 MHz

SSB frequencies below 20 meters are LSB and for 20 Mtr and above are USB.



"Spotter in Space" View of Northern Plains Thunderstorm Growth
GOES-East Visible Satellite Image
2 June 2011, 8:15 p.m. CDT (3 June 2011, 1:15 UTC)