



the RARA RAG

Published by
ROCHESTER AMATEUR RADIO ASSOCIATION, INC.

VOL. 48

January 1996

NO. 5

THE CODE IS DEAD! LONG LIVE THE CODE!

The death knells of code are still premature, but at the latest World Radiocommunication Conference, WRC-95, New Zealand introduced a proposal to eliminate the Morse code requirement for amateur operations below 30 MHz. Even though a handful of other countries joined in the proposal, the Working Party took no action on the matter other than to refer it to the committee which establishes the agendas for future conferences. Look for this issue to be discussed in the World Radiocommunications Conferences of 1997 or 1999. Meanwhile, get on the bands and operate some code!

Within the past two years CW has been abandoned by the Coast Guard, Western Union, AT&T, and as of October first, by the MARS program and all Department of Defense agencies. Whether we like it or not, the rest of the world has realized that modern digital modes and modulation techniques are more reliable and require less operator training. The argument that CW is the only signal that gets the message through when nothing else will, is obsolete. At my place of employment, we regularly pass digital traffic over HF at speeds of up to 2400 bits per second, with 100% reliability. No, this equipment is not yet available to amateurs, but I am convinced it is only a matter of time. Of course, you can still argue convincingly that CW equipment is much easier to construct; it is.

Being that amateur radio competes for young peoples attention with modern personal computers (and lamentably loses, in most cases), the more we can integrate the use of PCs over ham radio, the more young people we will see entering the avocation. Should CW die? I would never advocate that, but you can't ignore the great increase in our ranks since the advent of the no-code license. By the way, do you know why Japan has so many licensed hams? The Japanese have had a no-code option for quite a while longer than us; and most Japanese hams elect it.

Continued on next column

RaRa MEETING

January 5, 1996

8:00 P.M.

Henrietta Fire Hall

3129 East Henrietta Road

Grounding, Bonding and Shielding
by Larry Hill, N2AJX

Did you have a ham radio club in your high school? Did you have one in your college? Have you bothered to see if there is still one there, or one in the school in your neighborhood? Does the school sponsor a science fair? Why not contact the science teacher and suggest an introduction to ham radio. If you don't feel like making a presentation yourself, the ARRL can lend you videotapes that will do the job for you. When the tape is finished, you sit back and answer questions. As I am writing this, I also prepare for just such a presentation for a church group and a cub scout pack. I have the video from the League, who was kind enough to also send a stack of their *Archie's Ham Radio Adventure* comic books. These services are provided by the ARRL at no charge to members. You *ARE* a member, aren't you?

Your membership to RaRa can cost you a mere eight dollars if you take advantage of our ARRL membership program. As an affiliated club, RaRa

continued on Page 2 Column 2

SILENT KEYS

Harold "Bud" Virkus

KA2UBP

November 23, 1995

Daniel R. Smith

KB2JW

November 30, 1995

Russell T. Foster

NE2B

December 2, 1995

the **RARA RAG**

PUBLISHED BY

ROCHESTER AMATEUR RADIO ASSOCIATION, INC.
P.O. Box 93333, Rochester, NY 14692-8333

Editor.....Neal Eckhardt, WB2EKP
80 Authors Avenue, Henrietta, NY 14467 (716) 359-2672
Internet:eckhardt@cyber1.servtech.com

Managing Editor.....Dick Goslee, K2VCZ
24 Elaine Drive, Rochester, NY 14623 (716) 334-1762

Advertising Editor.....Dick Goslee, K2VCZ
24 Elaine Drive, Rochester, NY 14623 (716) 334-1762

continued from Page 1 Column 2

members can enroll or renew with the ARRL at a discount. For one year memberships, the discount is two dollars. The League offers the discount to RaRa as a rebate for the benefit of the club treasury. The Board of Directors passes the discount directly to you. To sign-up or renew your membership to the League, get an application from RaRa membership chairman Alex Piccirilli NV2Y. Your check for ARRL membership must be made payable to RaRa. Let's keep Alex busy! Renew in the ARRL right away!

The 1996 issue of The ARRL Radio Amateurs Handbook arrived at my house a few weeks ago. It has a lot of updated articles, and much re-written information on the basics. It comes with a disk of ham radio related programs for the IBM and clone community. My friends, this is one great book; it belongs in the hands of all amateurs. There is more here than you will absorb before next years issue comes out!

My inside source from the Internet, Dale Fravel N2LWY tells me that the FCC Interference Handbook now is available on the Internet. This is a 22 page booklet that includes the same information and illustrations contained in the recently published Interference to Home Electronic Entertainment Equipment Handbook. It includes information about identifying interference sources and curing interference problems. Dale says this one is well worth checking out at <http://www.fcc.gov/Bureaus/Compliance/WWW/tvibook.html>.

The Rochester Hamfest Committee has established a page on the World Wide Web to promote the Rochester Hamfest. Harold Smith tells me it is growing all the time, and that he is establishing an ever-increasing number of links with other amateur radio related pages. The address for the Rochester Hamfest home page is <http://www.vivanet.com/~rochfst/hf/main96.html>. Thanks to the Hamfest Committee, and to Jim Collinworth N2JC for the announcement of the page at the December general meeting.

About seven percent of you will be receiving a letter from me at about the same time you see this issue of the Rag; perhaps you have it already. Please consider it carefully; the only one setting limits for you and for RaRa, is you. If you don't get the letter and want to know what it's about, ask someone who did! :-)

The nominating committee for next year's slate of officers and Board members has been assembled, and by the time you read this will already have met at least once. If you are approached by any of them in the next several months, I hope you will consider

continued on next page

VOL. 48 JANUARY 1996 NO. 5

OFFICERS.

President: Chris Reich, WB2DYJ.....254-2906
Internet: cnr@rfc.comm.harris.com
Vice President: Art De Bruycker, W2YGW.....223-4353
Secretary: George Lloyd, N2UIO.....637-9499
Treasurer: Richard Goslee, K2VCZ.....334-1762

BOARD OF DIRECTORS:

Lloyd Caves, WB2EFU.....671-7079
Neal Eckhardt, WB2EKP.....359-2672
Internet: eckhardt@cyber1.servtech.com
Keith Freeberg, N2BEL.....458-8246
David Hassett, K2SQI.....621-1846
Edwin Holdsworth, N2EH.....624-1929
Joseph Hood, K2YA.....865-9092
George Muller, WA2IEO.....381-6151

Club Historian: Bruce Kelley, W2ICE
Public Service Coordinator: Edwin Holdsworth, N2EH
License Testing Directors: George Platteter, AA2FO
Membership Chairman: Alex Piccirilli, NV2Y
Licensing Course Director: Art DeBruycker, W2YGW
Hamfest General Chairman: Harold Smith, K2HC
K2JD Engraving: Edwin Holdsworth, N2EH

The RaRa RAG (USPS 605-440) is published monthly except July and August by the Rochester Amateur Radio Association, Inc., 24 Elaine Drive, Rochester, New York 14623. Subscription is \$5.00 per year (included in the \$10.00 annual membership dues). Second class postage paid in Rochester, NY.

POSTMASTER - Send address changes to The RaRa Rag, P.O. Box 93333, Rochester, New York 14692-8333. Full permission is granted for reprinting articles provided a credit line is given to the RaRa Rag. The Rag exchanges, with other organizations publications.



Amateur Radio News Service

it an honor. They will be telling you, in effect, that having observed your interest in club activities, you are someone who stands tall among your peers, and are invited to a higher calling. The committee has the full trust of the Board in their judgment; you should too.

Did you know that the RaRa testing team is one of the few in the nation that sends the test results to the FCC electronically? If you pass an exam on Saturday morning, the FCC is notified on Monday. By Wednesday of the same week, if not earlier, the license is processed, and on Friday the license is **IN YOUR HAND** ready for signature! Meanwhile, if you're looking for a new callsign, the FCC will tell you what it is over their 1-800 number. By now, you know that I have verified this through personal experience. George, Warren, Alex, Stan, and Ray are doing a great job as our testing team. If you still have some upgrading to look forward to, you could do a lot worse than to accomplish it at the County Office Building on the third Saturday of the month (but don't try!). For details, contact George Platteter AA2FO.

A KB2WBS update: 8-year old Alex has passed his Technician theory exam and now holds the Technician Plus license. He became quite pleased with himself as I pointed out that he officially outranks some of the Space Shuttle astronauts! Thanks, by the way, to Irv Goodman AF2K for sending Alex his first piece of NTS traffic! Perhaps you'll be as surprised as I was to learn that, according to the ARRL, there are only about two dozen hams in all the U.S.A of Alex's age or younger. Now if you'll excuse me, I've got to sew these buttons back on my shirt....

FOR SALE: Drake MN-7 Antenna Tuner, like new. Only \$125. Irv Goodman, AF2K, (716) 671-4430.

M. ORNSTEIN

WB2YYB

CONTRACTING

(716) 334-3258

Roofing

Gutter Cleaning

Residential & Commercial	Free Estimates
Attic Ventilation	Seamless Gutters

January Calendar

5 - RaRa Meeting - 8:00PM - Henrietta Fire Hall
3129 East Henrietta Road

20- RaRa VE Testing - 111 Westfall Rd. 8:30 AM

PUBLIC SERVICE - HENRIETTA DUATHLON

by Dave Payne, KA2J

The Henrietta Duathlon, consisting of a 3.5 mile run, 11 mile bike tour, and another run of 1.5 miles, was held on Sunday September 11th. The weather was cool and crisp and the event went smoothly and efficiently... thanks to the participation of volunteers, such as a dedicated group of radio operators from the Rochester Amateur Radio Association. Radio operators Jon Dickason (N2JAC), George Platteter (AA2FO), Phil Donato (N2GLU), and coordinator Dave Payne (KA2J), did their part to provide the necessary communications. Also, Henrietta Auxiliary Policeman Neal Eckhardt (WB2EKP) had his radio available in case he was needed during the event.

SNYDER AND SNYDER Attorneys at Law

Accidental Injuries
Wills & Estates
Social Security Disability
Real Estate
Divorce
Adoptions
Stock Broker Liability
Securities Arbitration

Discount for Licensed Amateurs

Paul I. Snyder
Jeanette F. Snyder
Sherwood M. Snyder, W2KFU

(716) 546-7258

183 E. Main St.
Suite 1024
Rochester, NY 14604-1681

SUMMARY OF THE MINUTES OF THE BOARD OF DIRECTORS MEETING OF DECEMBER 6, 1995

In Attendance ; WB2DYJ, WB2EKP, NV2Y, AF2K, WB2EFU, K2VCZ, N2BEL and N2UIO.

Absent ; WA2IEO, K2YA, K2SQI, W2YGW.

- Call to order. WB2DYJ called the meeting to order at 7:36 PM.
- After some discussion, the Board of Directors has agreed on three persons to serve on the Nominating Committee. Irv Goodman AF2K, Alex Piccirilli NV2Y and Robert J. Erskine W2NVZ.
- License Class. The Board of Directors agreed on the start date of the next set of classes. Classes will run again starting February 19, 1996 till May 13, 1996. Testing will be May 20, 1996.
- Membership Chairman's Report. NV2Y reported that the response to his letter was better than expected. There were about 28 replies to Alex's letter. Expected response was guessed to be about 3%, but about 12% responded. Results were considered to be excellent. There are now 704 current members in good standing. It was also mentioned that RaRa is now the 14th largest club in the United States.
- Public Service Report. N2EH stated that the Ginna Drill is now over. All went well.
- Awards. N2BEL reported that there will be awards and a 50-50 raffle at the January General meeting. The 50-50 raffle will be tried to see how it goes.
- Hamfest Committee Report. N2EH reported that there are a few more vendors that signed-up for the up-coming Hamfest. Also, we are now on listed on the Internet.
- New Business. AF2K pointed out that it's time for people to report any changes in their status for the printing of the new RaRa Directory. AF2K said that he'd mention this on the next Sunday night net so that people would be aware of this situation.
- WB2DYJ asked if there was anymore business. There was none. K2VCZ entered a motion to adjourn. The motion was seconded by all present.

The meeting was adjourned by WB2DYJ at 8:47 PM.

LEAGUE INCREASES ELEC- TRONIC FORMS OFFERINGS, PREPARES TO INTRODUCE CONTEST YEARBOOK

In an effort to make ARRL contest forms more quickly and easily accessible, the League offers them electronically via its automated information server (that also contains a wealth of other files). Concurrently, contest announcements in QST have become shorter and more "user friendly," aimed at acquainting newcomers with the general outline of each contest, how to operate in it, and what awards are available for participation and achievement.

Printed copies of the complete rules for all ARRL contests will be made available in a new publication called The ARRL Contest Yearbook; the 1996 edition of this booklet will be available in December, by mail, for \$5. Also included in the Yearbook are contest summary sheets, dupe sheets, zone maps, ARRL section lists, and an extensive Field Day package for clubs.

It should be noted that it is possible to participate fully in ARRL contests without obtaining the Yearbook, by downloading summary sheets and generating one's own log and dupe sheets (that are automatically generated by the contest software now widely available and used).

The ARRL's Automated Information Server is at info@arrl.org. Send a new message to info@arrl.org for each batch of requests. Each line of the message should contain a single command. Valid info e-mail commands are:

help (Sends this help file);

index (Sends an index of the files available from info)

send filename (Sends "filename")

quit Terminates the message.

*.RLS files are the rules for the different contests;
*.FRM files are entry summary sheet files that can be edited with your contest result data. Use an ASCII text editor when inserting your contest data.

tnx ARRL Letter

Next Rag Deadline January 15, 1996

LEAGUE CALLS RULES ENFORCEMENT "DISMAL," ASKS FCC FOR ACTION IN SEVERE CASES

The ARRL has told the FCC that its recent track record in Amateur Service rules enforcement has been "dismal."

In comments on an FCC proposal to adopt a standardized schedule of monetary forfeitures (fines) for rules violations in all services, the League said that while there have been only a few cases in the Amateur Service where prompt enforcement action was needed "badly and quickly," the necessary action did not take place "despite repeated (FCC) promises."

The FCC asked for input on all aspects of a Forfeiture Policy Statement that had been invalidated on procedural grounds in US circuit court last year. The Commission asked for input on the advisability of adopting a standardized forfeiture schedule rather than using a case-by-case approach to setting fines.

The ARRL said that the Commission has probably arrived at a reasonable forfeiture schedule but that administration of the schedule is "the more pressing matter." The League said that at issue were whether the fines were sufficient to (1) cause recipients not to violate a particular rule in the future, and (2) deter others from violating the same rule.

The ARRL said that the forfeiture proceeding (in CI Docket 95-6) should be far broader, to include a review of the overall effectiveness of monetary forfeitures as an enforcement tool, given that as presently used such forfeitures are often either ignored or contested.

The League said that in the few cases of amateur rules violations in recent years, FCC promises of action have gone unkept and the problems "persist visibly." The ARRL suggested that forfeiture amounts for amateur rules violations be adhered to (instead of greatly reduced) and that collection efforts be carried through.

The League said that in the past four or five years the Amateur Service has been "very much in need" of FCC assistance in a few specific, persistent enforcement cases, but that almost no assistance has been forthcoming. "The League's representatives have repeatedly met," the ARRL said, "with the commissioners and their staffs, the staff of the Compliance and Information Bureau (CIB) at all levels, and before that with the Field Operations

Bureaucrats," to seek assistance with a handful of cases that were impossible to resolve cooperatively.

The League cited amateurs' long record of self-policing and said that in recent years, while the ranks of amateurs grew significantly, "it is remarkable how well the tradition of self-enforcement in the Service has been sustained."

The League said that over the past three years it has consistently sought action in two cases of "repeated, persistent malicious interference" and other rule violations. "Despite repeated promises from numerous members of the CIB staff, the Commission has done absolutely nothing to address these two cases.

"The perception," the League said, "in the minds of large numbers, perhaps the majority of active radio amateurs, due to the almost complete absence of any Commission enforcement presence, is that the Commission is a 'paper tiger' when it comes to enforcement of its own rules.

"The irony of the situation is that it would take only a very few, occasional, but visible enforcement actions in the more egregious cases to promote significant compliance results. This has always been the case, and would be today, if there was any effort at deterrence on the Commission's part."

The League went on to say that the FCC has not kept its part of an agreement between it, the FCC, and the Amateur Auxiliary (AA) program, by not using evidence gathered by AA volunteers in enforcement matters. Those volunteers have become demoralized as a result, the League said.

The League said that the FCC is handicapped in its use of forfeitures as an enforcement tool because, while it can quickly assess a forfeiture, it has no ability to collect it. When a notice of apparent liability is issued, if the subject of the forfeiture does not respond or submit payment, the matter goes to the US Attorney General for collection. Red tape ensues and can lengthen the process into years. Even if a fine eventually is paid, there is no public information of the payment, thus there is no deterrent value to others.

As a result of these administrative roadblocks, the League said, the FCC is forced to choose enforcement actions carefully, and there is a "widely held belief" among its licensees, and not just Amateur Radio licensees, that it is highly unlikely that a civil action will ever be instituted to collect a forfeiture assessed by the FCC.

The League cited as an example an ongoing case of malicious interference in the New Orleans area, involving Amateur Radio repeaters, where notices of forfeiture were issued to four amateur licensees two years ago and are still not collected. The ARRL said that the result has been that, since then, the

interference problem has grown significantly in that area.

The ARRL suggested that standardizing monetary forfeiture amounts, as the FCC has, could be one solution. Another is following up with actual collection of the fines, perhaps through a procedure for private contractual collection of administrative forfeitures through civil litigation on behalf of the Commission.

tnx ARRL Letter

THE CASE OF THE QUICK THINKING PROFESSOR

A man who had just won \$100,000 in Las Vegas began to panic because he had never seen so much money before. So, in the middle of the night he dug a hole in his backyard and buried the treasure, to keep it safe until he came up with a better place for it.

The next morning when he checked on his hiding place, he froze when he discovered nothing but an empty hole in the yard and his money was gone. He found muddy footprints leading from his backyard to the house next door, which was owned by a deaf-mute.

Furious, he grabbed a gun and hurried across the street to the house of a professor who knew sign language. He roused the professor from his bed, dragged him back to the deaf mute's house, and demanded, "You tell this guy that if he doesn't give back my \$100,000 right now, I'm going to shoot him!"

The professor conveyed the message in sign language, and the thief signed back, that he had buried the money in his own back yard under a cherry tree.

The professor then turned to the enraged man and said... "He says he would rather die than tell you where your money is."

tnx The Readout

BIMINI TOPS **DODGERS**

VORNRAN MARINE CANVAS
at Fabric City



Our Boat Covers Are Tops.

1800 N. Clinton Ave., Rochester, NY 14621
(716) 266-6440

UPHOLSTERY Chuck Vornran **DRAPERIES**
WB2OZS

Advertisement

ANTENNA TUNERS

There has been much nonsense published in articles and books on the subject of antennas. Even antenna manufacturers publish out-right lies about their products! This is the reason that the ARRL doesn't accept antenna advertisements in QST which include any gain claims. IF the ARRL had to take this step is it any wonder that the average ham gets confused? It would take a large book to correct much of this misinformation, so this article will only deal with a small part of it, namely antenna tuners.

Whether it's called "Antenna Tuner", "Transmatch", or "ATU" (Antenna Tuning Unit), it means the same thing. We will refer to it as "antenna tuner" or simply "tuner" for the balance of this article. Briefly, what an antenna tuner does is cancel all reactance in the antenna and transmission line (resonance), and match the resistance of the system, enabling virtual 100% transfer of power. Simply stated, even with a mismatched system, you can deliver virtually all the RF power of your transceiver to your antenna.

In published literature on the subject, some authors (who don't understand the subject at all) have written that the antenna tuner only 'FOOLS' the transceiver into thinking that it is seeing a 1:1 SWR and thus only enables the transceiver to deliver full power. Yes, it does enable the transceiver to deliver Full Power, but it also tunes out all mismatches in the system, including transmission line to antenna mismatch, and also any non-resonance in the antenna itself.

In the real world, a well-meaning ham puts up a simple dipole, then goes through the agonizing procedure of pruning it to resonance at a certain frequency in the band of interest. If successful, he winds up with an antenna that works fine in only a portion of the band (phone, CW, or whatever). If he now gets a simple, inexpensive, antenna tuner, he can tune the entire band. He then realizes that he wasted much time and effort in the antenna pruning. If you have one simple antenna fed with coaxial cable, and a transceiver in the 100-watt class, get an MFJ model 9145D Mobile HF antenna Tuner. The "Mobile" in the title just indicates that there are no antenna selection switches, which are unnecessary when you only use one antenna.

Now that you know that your antenna can be tuned all across a band with an antenna tuner, try it on other bands. A lot more versatility has been given to your antenna system. With the tuner, you can tune your rain-gutter, metal balcony fence, a random wire, the mast supporting another antenna, an indoor antenna, or whatever.

If you've read this article thus far, you have probably come to the conclusion that an antenna need not be physically resonant at any particular frequency. Bravo! You now know more about antennas than the average ham. This knowledge enable you to realize, that with the antenna tuner, you can easily put up a simple multi-band antenna. It is a dipole look-alike because the legs are not cut for quarter or half-wave and therefore not a true dipole. Perhaps "doublet" would be a better name, but call it a dipole anyway, since very few people know the difference! In my QSO's I simply refer to my antenna as a dipole, it keeps the conversations simple.

Since we're not concerned with resonant lengths, what should the dimensions be? Very simple: Make your antenna as long and as high as you can. The lowest frequency of your antenna will be the one where the total antenna length is at least a quarter wave long. All higher bands will work fine. For example, if you have room for only 70 feet, you have a very good 80 through 10 meter antenna, Longer would be better for 80M tuning, but mine is only 64 feet and I use it on 50 meters as well as all the higher HF bands. For the transmission line. I favor 450 ohm open-wire line, but heavy duty 300 ohm TV line could be used. However, in rainy weather the TV line characteristics change, so go for the 450 ohm open wire line.

Of course, with open-wire line, your antenna tuner must have a balun in order to match the line. If your tuner doesn't already have it built in, you can buy or make a suitable 4:1 balun. If YOU intend to buy a new tuner for this type of antenna, I suggest the MFJ Model 962C Uersa Tuner III. It costs about \$120 more than the 941E, but it includes a much superior balun, and if you ever go to 1.5 KW, you would already own a suitable tuner.

Even if you use beam antennas, a tuner could enable tuning the entire band. Whatever your HF antenna type, an antenna tuner will increase its bandwidth.

by Howard Liebman, W2QUV, ARRL Technical Coordinator Trx Worldradio, Nov. '93 via The PROS News, Dec. '94 via GRAMNews December 1994 via Spurious Emmisions

Wanted: Coils and Dial Scale "E" & "F" for tube HRO-60. Please help., I will pay your price. FOR SALE~: Hal ST-6 Demodulator Ex. with manual, \$40.00 or trade. Richard J. LaMark, N2TXL (315) 589 2552.

FOR SALE: ICOM IC-2KL Fully Automatic Solid State Linear Amp, 160 through 10 meters, mint, manual, original cartons, one-owner. \$1150. Irv Goodman, AF2K, (716) 671-4430.

TUCSON AMATEUR PACKET RADIO ADDS SOUND ON WEB

Tucson Amateur Packet Radio Inc (TAPR) has added an audio "virtual meeting, workshop, and seminar page" to its Home Page on the Internet, according to TAPR President Greg Jones, WD5IVD. The address is <http://www.tapr.org/>.

TAPR is evaluating a "RealAudio" system to present packet radio meetings and presentations. The system only allows six concurrent connections, so if you find that an audio channel is busy, try later, Jones said.

The new audio selections include:

The March 1995 TAPR annual meeting in St Louis, with a TAPR/ AMSAT workshop and a seminar on error control coding by Phil Karn, KA9Q;

A national meeting of repeater frequency coordinators on October 7, 1995, near St Louis, including talks by Ralph Haller, deputy chief of the FCC Wireless Telecommunications Bureau, and ARRL President Rod Stafford, KB6ZV; and

An interview with TAPR President Jones on the syndicated radio program "Ham Radio and More," August 13th, 1995.

The TAPR Home Page also contains a primer on amateur packet radio and other packet-related material.

Tucson Amateur Packet Radio also is available by mail at 8987-309 East Tanque Verde Rd, No. 337, Tucson, AZ 85749 (817-383-0000); by e-mail at: tapr@tapr.org and by ftp at: <ftp://tapr.org>

tnx ARRL Letter

RaRa Hotline

(716) 442-0587

24 hours a day

Patrick C. Moyer, N2AIW Attorney & Counselor-at-Law

General Legal Services
ARRL Volunteer Counsel Participant
AOPA Legal Plan
Masters Degree in City Planning

Day and Evening Hours

(716) 427-9907

2128 W. Jefferson Rd • Pittsford, NY 14534



Photo courtesy of Chris Reich, WB2DYJ

Auctioneer Ed Gable, K2MP, offers up for bid a piece of test equipment at the RaRa November Auction. RaRa members sold off a lot of "previously enjoyed" Radios, Computers, Antennas, and other types of electronic equipment at this once a year, members only event.

GLENWOOD

594 HAGUE STREET
ROCHESTER, NY 14606

HOURS:

M-F 9:00 AM - 5:00 PM
SAT 9:00 AM - 12:30 PM

PH: (716) 328-1600

FAX: (716) 328-3630

ELECTRONIC COMPONENT PARTS (NEW AND NEW SURPLUS)

- LARGE SELECTION
- HIGH QUALITY
- LOW PRICES
- IN-DEPTH INVENTORY

WE STOCK THE FOLLOWING:

AC CORDS
CAPACITORS
COAX CABLE
CONNECTORS
DIODES
ENCLOSURES
FANS
FUSES
FUSEHOLDERS

IC'S
LAMPS
LED'S
MOTORS
POTENTIOMETERS
RELAYS
RESISTORS
SCR'S
SHRINK TUBE

SOLDER
SWITCHES
TRANSISTORS
TRIACS
TRIMPOTS
VARIABLE CAPS
WIRE/CABLE
ZENER DIODES
LOTS MORE

TRY GLENWOOD FOR ALL YOUR COMPONENT REQUIREMENTS

FULL LINE DISTRIBUTORS FOR

NTE
PRB
GC/THORSEN
SL WABER
WAHL

Replacement Semi's
VCR Belts & Accy
Tools & Chemicals
Outlet Strips +
Soldering/Drilling
Tools & Accy

TYTON
PROTEK
MUELLER
GOLDSTAR
PALADIN

Cable Ties
Test Gear
Test Leads
Test Gear
Tools