New York City
Amateur Radio Emergency Service

NewsLetter

So I was looking through some of the past issues of the news letter last night when I realised that I have been doing this fishwrap for a year now! That's not to say that it is the NewsLetters' first birthday, it was already running in Staten Island, but it is the first birthday of the NYC-ARES NewsLetter. Happy Birthday!!

This birthday is sadly also the last birthday the NewsLetter will have. We are closing it in favour of the new website which contains much of the same information. There's no point creating the same information twice and storing it in the same place.

It remains for me to say thanks to all those whom have helped over the last year and wish the new website all the best.

Thanks de Mark, KC2ENI

In this issue…

Up-coming Events

None that I know of. Would the EC's please send me a list of their activities?

For Sale

Nothing for sale this month. Don't forget that you can list anything you have for sale here. It only costs you an email.

Web Site Matters

You'll have noticed that the ARES website has undergone a major personality change this month. N2TEE has kindly taken over as the webmaster and come up with the new design. He has some very good idea's and like the NewsLetter he needs input to make it current. You can email anything you have for the site to N2TEE@AOL.com

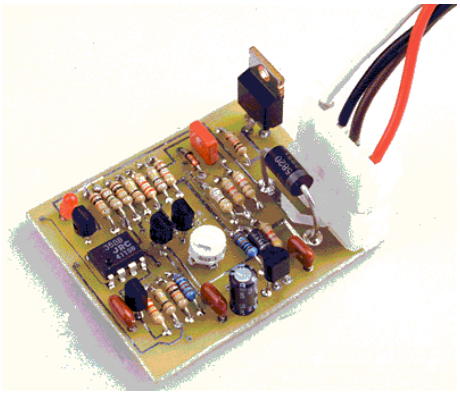
Gizmo!

So this is the fourth installment of *Gizmo!* And already we are having to move it to a new forum. Future installments will appear on the new web site.

This month we look at a frequncy extender for the Ramsey FX kits. There are a few of these about in the group and they could all benefit from a few more channels as well as some CTCSS tomes too. This article first appeared in QST's May 1996 issue.

With this shirt-pocket-size charge controller, you can easily protect your batteries from overcharging when using solar panels—even while portable!

By Michael Bryce, WB8VGE



Many hams take their low-power (QRP) rigs to the hilltops and countryside. Packing a small solar panel to power the rig, they're in for a grand time! One of the benefits of running QRP is its diet-like demand for energy. Most QRP/portable setups need only a 5 to 10-W solar panel to supply more than enough juice to operate the rig for days—even weeks at a time—if the sun is shining.

Most of the hams I know who operate QRP/portable don't enjoy carrying a car battery around with them. Instead, the sealed (gelled) lead-acid battery has become quite popular. Depending on the current required by your rig and accessories, suitable battery capacities can be had ranging from 1.2 Ah to 6 Ah. Batteries with capacities of over 6 Ah begin to add noticeable weight to your backpack. Common sense dictates you carry more water and food than battery packs.

A 5-W solar panel can produce more than enough power to fully charge a small gelled lead-acid battery. If you leave your battery and solar panel connected all day while you're out exploring the countryside, it's

quite possible you'll have a cooked battery by the time you get back in the evening. To prevent such damage to your battery, you need a charge controller.

Many of us not taking ham radio to the woods are installing solar-powered packet weather stations. By using a micro-powered TNC, an H-T and a weather interface, all you then need to provide up-to-the-minute weather on a packet network is a source of power. [1]

Micro M Features

Here are some of the features most hams want in a portable solar-power control system:

Low current consumption
Light weight
Ease of use
Simple setup without extensive test gear
Ruggedness—strong enough to stand up to portable use and abuse
Able to handle 1 A of panel current

With those guidelines in mind, the Micro M came to be.

The Micro M

The Micro M is a small charge controller using a single power MOSFET as a series switch. It can handle up to 2 A of array current and is protected against overvoltage and reverse polarity. A four-terminal connector marries the controller to your battery and solar panel.

The Micro M is easily built on a double-sided PC board. It's so small, you can fit *four* assembled Micro Ms into your shirt pocket! The Micro M is light on your budget, too. You can build your own Micro M for under $25—much less if you've got a well-stocked junk box. Parts are readily available by mail order. A PC board and a complete kit of parts can be purchased, too. [2]

How It Works

Refer to **Figure 1**. R1, R2, and R18 form a voltage divider to feed a fraction of the battery's terminal voltage to one section of an LM358 op amp (U1A) configured as a voltage comparator.

We need a reference voltage to compare to the sampled battery voltage. The Micro M uses a 2.5-V reference diode. I chose the National LM336Z 2.5 (D1) as it is easy to come by and inexpensive. Since we're not launching missiles, the 5% tolerance of D1 is more than ample. R4 limits the current to the LM336Z.

To prevent U1 from oscillating at the state-of-charge turn-off voltage we'll select, R5 and R6 provide a small amount of hysteresis. With the values shown, there's a window of about 0.4 V between the off and resume voltages.

When U1A switches states, the signal is applied to U1B. This section is also configured as a voltage comparator. But now we compare the output of U1A to a fixed voltage source supplied by R8 and R9. This squares up the switching before passing the signal along to the output transistors.

There are three transistor switches used in the Micro M. If a photovoltaic (PV) panel is connected to the charge controller—and the sun is shining—DS1 illuminates when Q1 turns on. R12 limits the current flowing through DS1.

At the same time, Q2—now fully saturated—pulls Q3's base low. Q3 conducts and applies the battery voltage to the gate of the power MOSFET, Q4. With Q4 on, array current flows. Q4 is in series between the

PV array's negative lead and ground. By using a power MOSFET in the negative lead, we avoid the need for complex high-side switching components.

Zener diode D2, R17 and C1 protect Q4's gate from damage caused by static discharges coming in from the array leads. R16 connects Q4's gate to its source, ensuring that Q4 turns off completely.

By using the battery voltage to turn on Q4's gate, we're assured that Q4 will turn on hard. Q4's gate must see at least 10 V to be fully enhanced. At lower gate voltages, Q4 operates in its linear region. Although this isn't what we desire, it also means the Micro M will charge a battery with its terminal voltage as low as 7 V! The power MOSFET I used can be replaced with an enhanced-gate MOSFET. Enhanced-gate MOSFETs are fully enhanced with only 5 V on the gate (DK IRLZ44).

When the battery's terminal voltage reaches the OFF set point, U1 switches states and everything shuts off. DS1 goes dark and Q4 stops conducting array current. At this time, the battery's terminal voltage begins to fall. When the terminal voltage drops to approximately 0.4 V below the OFF set point, the entire process repeats. So, a fully charged battery causes DS1 to blink on and off. The blink rate is determined by the size of the solar panel and battery capacity. Battery conditions such as age and depth of discharge have an effect as well.

Although the circuit's current requirements are next to none, I added U2, a small, 100-mA voltage regulator. It serves more as a safety device than a voltage regulator. U1 is quite happy until you apply over 16 V to its V_{CC} input pin. (This is easy to do if you connect the solar panel to the battery input terminals.) Without U2, the LM358 would end up a crispy critter. U2 is bypassed by C3, C4, and C5 to ensure stability. Without U2, the off voltage would vary as the supply voltage moves about. U2 prevents this from happening.

I've been known to connect something up backward now and then. To prevent such an occurrence from cooking the Micro M, D4, a 1N4002 diode, provides reverse-polarity protection.

A 3-A Schottky diode, D3, prevents the battery from discharging into the solar panel at night.

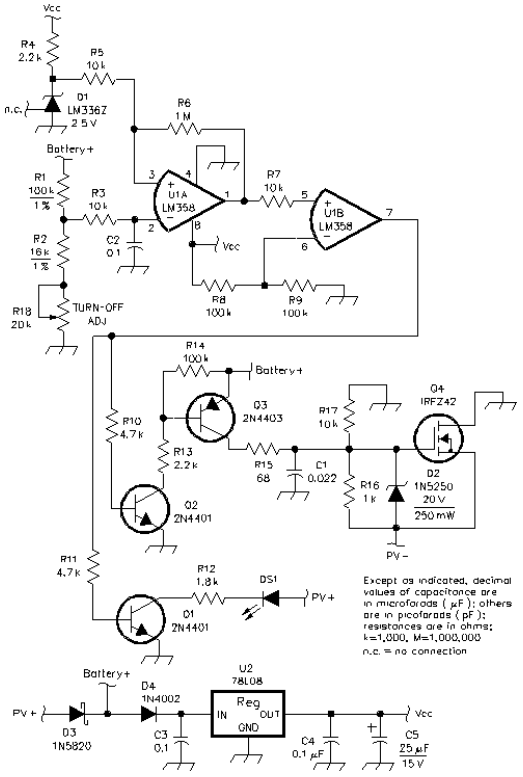


Figure 1— The Micro M circuit. DK part numbers in parentheses are Digi-Key (Digi-Key Corp, 701 Brooks Ave S, Thief River Falls, MN 56701-0677; tel 800-344-4539, 218-681-6674; fax 218-681-3380; on the Web at http://www.digikey.com). Parts are also available from Hosfelt Electronics, 2700 Sunset Blvd, Steubenville, OH 43952; tel 800-524-6464; 614-264-6464; fax 614-264-5414. Equivalent parts may be substituted.

D1—LM336Z 2.5-V reference diode (DK LM336Z2.5)
D2—1N5250 Zener diode (DK 1N5250BCT)
D3—1N5820, 3-A Schottky diode (DK 1N5820CT)
D4—1N4002 (DK 1N4002CT)
DS1—Red LED (DK P300)
Q1, Q2—2N4401 NPN transistor (DK 2N4401); 2N2907 (see text)
Q3—2N4403 or 2N3906 PNP transistor (DK 2N3906A); 2N2222 (see text)
Q4—N-channel power HEXFET (DK IRFZ42)
R18—20-kW PC-mount trimmer potentiometer (DK 36C24)
U1—LM358 op amp (DK LM358AN)
U2—78L08 regulator (DK AN78L08)
Misc: PC-board pin-header (DK A1470); in-line plug (DK A14282); male pins (DK A1441); female sockets (DK A1440).

Assembly

You can build your own version of the Micro M using any method you choose. However, if you're planning to use the Micro M in the outback, I highly recommend using a PC board. [3] The PC board for the Micro M is double sided with plated-through holes, and has provisions for a board-mounted AMP connector. This makes connections to and from the Micro M painless. You can also hard wire the Micro M into your own application if you desire.

Because this is such a simple project, assembly requires only a mindful eye on the single electrolytic capacitor and other polarity sensitive components. Be sure all solid-state devices are installed correctly. Use a grounded wrist strap when handling the power MOSFET. It's static sensitive, but very hardy once installed on the PC board.

Normally, using a socket for U1 is a good idea. However, I recommend you pass on using one if you plan on using the Micro M out in the field. Solder U1 to the board if you plan to do backpacking in the south 40.

The PC board is quite small and compact, so it's easy to create a solder bridge. A small-tipped soldering iron and a steady hand are required.

Setup and Adjustments

After ensuring your PC board has no solder bridges or incorrectly placed components, connect the Micro M battery input terminals to your power supply. Set your power supply for 14.2 V. [4] This is the turn-off voltage for a fully charged 12-V gelled lead-acid battery.

Set trimmer R18 (TURN-OFF ADJ) fully CCW. With your VOM, probe the gate lead of Q4. You should measure about +12 V on the gate. Slowly turn R18 clockwise until Q4's gate voltage drops to zero. You may want to repeat the preceding steps to ensure you have the trimmer set as closely as possible to your turn-off voltage. That's all the adjusting you need to do. Because the trimmer is easy to bump, apply a glob of paint or other sealer to hold it in place.

Deflux the board with denatured alcohol and then apply a conformal coating to the PC board. This prevents oxidation from forming between the various traces and pads on the PC board. If you desire, the PC board can be potted to seal out the environment. Although not very attractive, I have sealed an entire Micro M using hot-melt glue. The heat from the glue doesn't seem to hurt the components in any way.

Putting the Micro M to Use

All you need to do is connect a solar panel and a battery to their proper locations (PV and BATTERY), respectively. If you use the AMP connector, you'll need to add the necessary wires. Of course, it's a good idea to use different color wires to avoid confusion in the woods.

The Micro M can fit inside just about any QRP rig made. Two strips of double-sided foam tape or epoxy will hold the PC board in place. There are two holes in the PC board that accept #4-40 screws.

With a solar panel and battery connected, and the panel sitting in the sun, all current is directed toward the battery. DS1 will be on. When the battery terminal voltage reaches 14.2 V, DS1 will go dark. After a few seconds, the LED will turn back on. DS1 will then blink on and off signaling a fully charged battery. Don't disconnect the array from the battery at this time. Allow the Micro M to fully charge the battery. You can leave the Micro M connected indefinitely without harm to the battery.

Odds and Ends

You may be wondering why there is no heat sink on Q4. The MOSFET specified has an extremely low R_{DSon}. Even with a drain current of 1 A, there's hardly any voltage drop across the MOSFET. With an R_{DSon} of 0.035 W, the power dissipated by Q4 is only 0.14 W with an array current of 2 A.

LEDs have always been tough to see in bright light. You can replace the LED specified with one of the high-brightness LEDs available. (Check with various surplus electronic parts suppliers for great prices on high-brightness LEDs.) On the other hand, you can elect not to use the LED at all to reduce current drain. If you go this route, you can eliminate Q1 and its associated support components (R11, R12 and DS1).

Packing a rig and enough battery power to operate it can be a lesson in engineering. I've used two 7.2-V R/C NiCd packs wired in series (14.4 V) with great success. The only requirement is that the rig being powered by the battery packs must be able to handle the higher operating voltage. The higher voltage also adds a bit more kick to the transmitted signal. Of course, you'll need to reset the state-of-charge to reflect the use of the NiCd batteries.

No matter what battery type you plan on using during your trip to the great outdoors, don't use standard fuses. Such fuses are great if you're sitting at home, but out in the middle of the forest, how many spares are enough? I suggest you use a PolySwitch device in your portable setup. These resettable fuses are like circuit breakers, but faster and entirely solid state. A suitable Raychem PolySwitch is available from Digi-Key (part number RUE110). Rated at 1.10 A at 30 V, it should be suitable for many QRP rigs. Best of all, it's only a buck!

Part Substitutions

A variety of dual op amps can replace the LM358. I've used an LM2904 without any noticeable difference in operation. If you build your version of the Micro M on perfboard, two sections of an LM324 or LM224 op amp will do.

The 1%-tolerance resistors used for R1 and R2 have a 50-PPM temperature coefficient and have better temperature stability than standard resistors. You can get by with standard 5%-tolerance resistors if need be.

Many NPN and PNP transistor substitutes (such as the 2N2222 and the 2N2907) will work fine in place of the transistors I've specified. I've used a variety of power MOSFETs in the Micro M with equal success, including the IRFZ44, IRF511, IRFZ40 and IRFZ30.

Whether you're camping on a mountain ridge or providing emergency communications, you'll find the Micro M an invaluable accessory to your backpack. What do I use my Micro M for? Why, to recharge my solar-powered weed trimmer, of course!

Mike Bryce, WB8VGE, began building early on. His first homebrew project—a transmitter out of the Handbook—began only two days after his Novice license arrived in 1975. Since then, the homebrewing never stopped. Mike currently holds an Extra Class license.

Mike's written several storage battery and alternative energy articles for QST. A busy guy, he also writes a monthly QRP column for 73 Magazine, a column for Radio Fun, and is a frequent contributor to QRP Quarterly and Nuts and Volts Magazine. Mike is a past president of the Massillon Amateur Radio Club.

An avid QRPer, Mike spends most of his spare time building projects. His main interest, however, lies in alternative energy sources, particularly solar energy. Mike operates Sunlight Energy Systems, a small company he started in 1984 that's geared toward advancing the use of solar power. Since 1978, Mike's entire radio shack has been running on solar power. Now, 50% of his house is solar powered, too! You can reach Mike at 2225 Mayflower NW, Massillon, Ohio 44647.

Notes

[1]An Ohio state park uses a Micro M controller to protect a lead-acid battery used in an announcement box along a walking trail.

[2]A complete kit of Micro M parts including the PC board is available from SunLight Energy Systems, 2225 Mayflower NW, Massillon, OH 44647. Price: $25, including shipping to any US location. The double-sided PC board with plated-through holes is $12, including shipping. A template package containing the *double-sided* PC-board pattern and a part overlay is available from the Technical Department Secretary, ARRL, 225 Main St, Newington, CT 06111. The price is $2 postpaid for ARRL members ($4 for nonmembers). Please identify your request for the BRYCE MICRO M TEMPLATE.

[3]The PC board artwork in Circad format is available from CompuServe in the QRP section of the HAMNET forum (the file name is MICRO.ZIP). This file includes the schematic, top foil, bottom foil and silk screen along with an ASCII version of the setup instructions. You can also obtain this file from the ARRL BBS (860-594-0578) and from the Internet (ftp to **oak.oakland.edu**, **dir pub/hamradio/arrl**).

[4]A flooded-cell lead-acid battery requires a bit higher voltage to fully recharge.

KNOW YOUR STUFF!

Boro Meetings

Brooklyn meets on the 3rd Wednesday of the month at the Sephardic Community Center (Annex Building), 1901 Ocean Parkway (at Avenue S).

Manhattan/Bronx meets on the 3rd Thursday of the month at Red Cross 150 Amsterdam Ave. (66th Street). Manhattan/Bronx Net on 444.050 PL 114.8 at 8 PM Tuesdays. All are welcome to check in and also to come to the meeting.

Staten Island meets on the 4th Friday of the month at St Vincents Hospital at 355 Bard Ave. (nr Castleton).

Monday Night ARES Net Schedule

All are reminded that it is the sole responsibility of the scheduled NCS and alternate to keep each other posted as to their availability and replacement. This means that if you are unable to fulfill your scheduled assignment, YOU are responsible to find a replacement. If this involves swapping for another night with the scheduled NCS/ALT, then by all means do so (and fulfill your end of the bargain)! This schedule is being forwarded to N2VLT for hard copy printing and to OEM for advanced notice of who is expected for that night. I would like to see either the NCS or alternate at the OEM office. Any other operator intending on showing up at OEM must notify and obtain the OK of myself, as per OEM officials until further notice.

If there are any questions with this policy or the schedule, please feel free to contact me via email or phone.

NCS Schedule for 2001

Date	ARES NCS	Alt	RACES NCS	Alt
January 1, 2001	N2NOV	N2ZRC	N2NOV	N2ZRC
January 8, 2001	KE2UN	WA2RF		
January 15, 2001	AB2IZ	KC2ENI		
January 22, 2001	N2TZX	N2VLT		
January 29, 2001	W2JER	KB2KWI		
February 5, 2001	KC2AYG	W2MPL	KE2UN	KB2IQX
February 12, 2001	WA2RF	KE2UN		
February 19, 2001	N2ZRC	N2NOV		
February 26, 2001	KB2KWI	W2JER		
March 5, 2001	KC2ENI	AB2IZ	N2TZX	WA2RF
March 12, 2001	W2MPL	KC2AYG		
March 19, 2001	N2VLT	N2TZX		
March 26, 2001	N2FWR	N2NOV		
April 2, 2001	N2NOV	N2ZRC	AB2IZ	KC2ENI
April 9, 2001	KE2UN	WA2RF		
April 16, 2001	AB2IZ	KC2ENI		
April 23, 2001	N2TZX	N2VLT		
April 30, 2001	W2JER	KB2KWI		
May 7, 2001	KC2AYG	W2MPL	N2ZRC	N2NOV
May 14, 2001	WA2RF	KE2UN		
May 21, 2001	N2ZRC	N2NOV		
May 28, 2001	KB2KWI	W2JER		
June 4, 2001	KC2ENI	AB2IZ	W2MPL	KB2KWI
June 11, 2001	W2MPL	KC2AYG		
June 18, 2001	N2VLT	N2TZX		
June 25, 2001	N2FWR	KE2UN		
July 2, 2001	N2NOV	N2ZRC	KC2AYG	N2TZX
July 9, 2001	KE2UN	WA2RF		
July 16, 2001	AB2IZ	KC2ENI		
July 23, 2001	N2TZX	N2VLT		
July 30, 2001	W2JER	KB2KWI		
August 6, 2001	KC2AYG	W2MPL	KC2ENI	AB2IZ
August 13, 2001	WA2RF	KE2UN		
August 20, 2001	N2ZRC	N2NOV		
August 27, 2001	KB2KWI	W2JER		
September 3, 2001	KC2ENI	AB2IZ	KB2KWI	KE2UN
September 10, 2001	W2MPL	KC2AYG		

September 17, 2001	N2VLT	N2TZX		
September 24, 2001	N2FWR	AB2IZ		
October 1, 2001	N2NOV	N2ZRC	N2VLT	W2MPL
October 8, 2001	KE2UN	WA2RF		
October 15, 2001	AB2IZ	KC2ENI		
October 22, 2001	N2TZX	N2VLT		
October 29, 2001	W2JER	KB2KWI		
November 5, 2001	KC2AYG	W2MPL	WA2RF	KC2AYG
November 12, 2001	WA2RF	KE2UN		
November 19, 2001	N2ZRC	N2NOV		
November 26, 2001	KB2KWI	W2JER		
December 3, 2001	KC2ENI	AB2IZ	KB2IQX	N2VLT
December 10, 2001	W2MPL	KC2AYG		
December 17, 2001	N2VLT	N2TZX		
December 24, 2001	N2FWR	N2TZX		
December 31, 2001	N/A	N/A		

Monday Night Net Script

New York City Amateur Radio Emergency Service Net Script. January 2001

Calling all ARES stations, calling all ARES stations! Good Evening! This is the New York City ARES Net, which is conducted on the WB2ZSE repeater, and meets Monday nights at 8pm local time. Tonight your Net Control Station is_____
(your call, name, location.)

This is a directed net, and all communication must go through the Net Control Station at all times. Is the alternate Net Control Station on frequency, and are you prepared to follow along? (drop) I will now pause for five seconds to allow for any emergency or priority traffic for the Net. (drop. pause 5 seconds)

The purpose of this Net is to call together the volunteers enrolled in the New York City District Amateur Radio Emergency Service, for disseminating information regarding emergency communications, preparedness, and related topics of interest. ARES is sponsored by the American Radio Relay League. [At this time...the NCS may insert "PRE-CALLUP TRAFFIC" if necessary.]

(Check-ins)
At this time I will take check-ins for the Net in the following manner: Net Control will conduct a "Roll Call" by Borough. Each station will be called twice. If there is no response, Net Control will move on to the next station. Please respond ONLY with your call sign, OR your call sign and the word TRAFFIC, if you have traffic for the Net. When you are acknowledged, Net Control will respond with the PROWORD "Roger". An "Open Call" will be issued for each Borough, for all stations not listed on the Call up Roster. All stations checking into tonight's net will be required to SECURE at nets end. Please listen to, and follow the instructions issued at the end of tonight's net. We will now begin call up for tonight's New York City ARES Net.

Callup Roster UPDATED: January 2001

--BRONX--
KA2BRH JOE
KA2KCR JOSE
KB2WUS FRANK
KC2AYG GUY
KC2BEF FRANK
N2ZRC ARTIE
WB2SEB SERGIO

--BROOKLYN--
AB2IZ ADAM
AB2LB KEN
KA2KDQ RICHARD
KB2IQX BILL
KB2NYG MATT
KC2BGT SAL
N2NDU HIP
W2JER JERROLD
W2MPL MIKE

--STATEN ISLAND--
KA2VAU STEVE
KC2DPP ALLAN
KC2CYE MIKE
KC2GUZ STEVE
KF2EO MIKE
N2BGR BILL
N2NOV CHARLIE
N2QXB PAUL
N2TEE JOE
N2UMC FRANK

N2VLT CHARLIE
N2ZWT RAY
N2ZYF KAREN
WA2RF RON

--MANHATTAN--
KA2WCB WALLY
KC2COP CHARLIE
KC2ENI MARK
KE2UN JOHN
N2TAW JAMES
W2BH BILL

--QUEENS--
KC2DHJ JOHN
N2CKK NELSON
N2EOI HARVEY
N2FWR JOHN
N2LDV LENNY
N2QHS RICHARD
N2SHQ TEDDY
N2TZX ANDY
WA2USJ JOE
WB2KDG STEVE
WB2TGY BOB

Traffic

We will now proceed with traffic for the Net. (Call stations with traffic). (After traffic, proceed with your topic. If you do not have one, call for late check-ins, out of area check-ins, and non-ARES stations supporting the Net)

We will now begin securing all stations checked into tonight's net. When you are called, please respond with your call sign and the word "secure". (Call all stations checked into tonight's net)

Closing

New York City ARES wishes to thank WB2ZSE for the use of this repeater, and all those who checked in this evening. Next weeks Net is scheduled to be conducted by:
_____ with _____ as alternate.
(callsign) (callsign)

This is _____ saying SEVEN THREE to all, and THANK YOU (call sign) for joining us on this weeks' Amateur Radio Emergency Service NET!

(First Monday)

All RACES members please standby for the New York City Radio Amateur Civil Emergency Service Net!

This is _____ saying SEVEN THREE to all, and THANK YOU (call sign) for joining us on this weeks' Amateur Radio Emergency Service NET!

I am now returning this repeater to regular amateur use at _____local time. This is_____. OUT!
(call sign)

REMEMBER! (Check-in procedures)

"Each station will be called twice". Call ONCE then DROP. If no response call 2nd time. Still nothing, move on! "An open call will be issued for each Borough, for all stations not listed". Do this at the end of EACH Borough call up, NOT at the end of the entire Roster! Don't forget LATE CHECK-INS, OUT OF AREA CHECK-INS, and NON-ARES check-ins.

NYC ARES TAC FREQS

TAC Channel	Output Frequency	Shift	PL Tone	Location
TAC 01	147.270	+	141.3 / 127.3	Manhattan
TAC 02	147.000	-	136.5	Manhattan
TAC 03	444.200	+	136.5	Queens
TAC 04	145.230	-	114.8	Brooklyn
TAC 05	145.270	-	88.5	Queens
TAC 06	448.625	-	136.5	Queens
TAC 07	443.300	+	88.5	Bronx
TAC 08	147.240	+	94.8	Bronx
TAC 09	447.925	-	114.8	Brooklyn
TAC 10	444.050	+	114.8	Manhattan
TAC 11	146.730	-	88.5	Brooklyn
TAC 12	445.825	-	156.7	Staten Island

SAME codes for WX-alert radios

Use these SAME codes in the newer weather radios to be notified for only the counties that you are interested in.

TRI-STATE / S.A.M.E. CODES

NY

ST. COUNTY	SAME #	NWR TRANSMITTER	FREQ MHz.	CALL	WATTS
NY Bronx	036005	New York City NY	162.550	KWO35	500
NY Kings	036047	New York City NY	162.550	KWO35	500
NY Nassau	036059	New York City NY	162.550	KWO35	500
NY New York	036061	New York City NY	162.550	KWO35	500
NY Queens	036081	New York City NY	162.550	KWO35	500
NY Richmond	036085	New York City NY	162.550	KWO35	500
NY Rockland	036087	New York City NY	162.550	KWO35	500
NY Suffolk	036103	New York City NY	162.550	KWO35	500
NY Westchester	036119	New York City NY	162.550	KWO35	500

CT

ST. COUNTY	SAME #	NWR TRANSMITTER	FREQ MHz.	CALL	WATTS
CT Fairfield	009001	New York City NY	162.550	KWO35	500

NJ

ST. COUNTY	SAME #	NWR TRANSMITTER	FREQ MHz.	CALL	WATTS
NJ Bergen	034003	New York City NY	162.550	KWO35	500
NJ Essex	034013	New York City NY	162.550	KWO35	500
NJ Hudson	034017	New York City NY	162.550	KWO35	500
NJ Hunterdon	034019	New York City NY	162.550	KWO35	500
NJ Mercer	034021	New York City NY	162.550	KWO35	500
NJ Middlesex	034023	New York City NY	162.550	KWO35	500

NJ Monmouth	034025	New York City NY	162.550	KWO35	500
NJ Morris	034027	New York City NY	162.550	KWO35	500
NJ Ocean	034029	New York City NY	162.550	KWO35	500
NJ Passaic	034031	New York City NY	162.550	KWO35	500
NJ Somerset	034035	New York City NY	162.550	KWO35	500
NJ Sussex	034037	New York City NY	162.550	KWO35	500
NJ Union	034039	New York City NY	162.550	KWO35	500
NJ Warren	034041	New York City NY	162.550	KWO35	500

NEW YORK CITY-LONG ISLAND (NLI) SECTION
NEW YORK CITY DISTRICT PERSONEL

Position	Name	Call Sign	Section	Email
SEC	Tom Carubba	KA2D	NYC-LI	ka2d@qsl.net
DEC	Charles Hargrove	N2NOV	NYC-Citywide	n2nov@lsa.net
EC-Ops	Jerrold Loewenthal	W2JER	NYC-Citywide	jloewe@worldnet.att.net
EC	John Kiernan	KE2UN	Bronx (act.) see Manhattan	
EC	Adam Fine	AB2IZ	Brooklyn	ab2iz@arrl.net
EC	John Kiernan	KE2UN	Manhattan	johnke2@cs.com
EC	Andy Borrok	N2TZX	Queens	n2tzx@webspan.net
EC	Charles Hargrove	N2NOV	Staten Island	n2nov@lsa.net
AEC	Bill Hindin	W2BH	Manhattan	bildin@ix.netcom.com
AEC	Mark Phillips	G7LTT	Manhattan	g7ltt@g7ltt.com
AEC	Mike Lunetta	W2MPL	Brooklyn	w2mpl@att.net
AEC	John LaSala	N2FWR	Queens	fm1483@aol.com
OES	Arte Booten	N2ZRC	Bronx	n2zrc@webspan.net
OES	Jerrold Loewenthal	W2JER	Brooklyn	jloewe@worldnet.att.net
OES	Darryle Mabe	KB2OQX	Brooklyn	kb2oqx@aol.com
OES	Vincent Mattera	WB2AAP	Brooklyn	wb2aap@juno.com
OES	Theda Roy	N2SHQ	Queens	n2shq@gte.net
OES	Nelson Sidman	N2CKK	Queens	n2ckk@juno.com
OES	John Sullivan	KB2KWI	Queens	john9265@aol.com
OES	Charles Nagy	N2VLT	Staten Island	(No E-mail)
OES	Ron Faup	WA2RF	Staten Island	wa2rf@aol.com

FEMA Independent Study Course List

To view a course description, download course materials, enroll in courses, or take the final exam, select the course you are interested in from the list below.

The course materials are provided in Adobe Acrobat Portable Document Format files. These files are not zipped.

Once you download the files you want into the desired directory, open the Acrobat Reader program and then open the files you want to view or print.

Download directions are also available with each course.
It is recommended that the user download the course material files and view them off-line at their convenience, saving time and money for Internet connect charges.

- IS-1 Emergency Program Manager: An Orientation to the Position
- IS-2 Emergency Preparedness, USA
- IS-3 Radiological Emergency Management
- IS-5 Hazardous Materials: A Citizen's Orientation
- IS-7 A Citizen's Guide to Disaster Assistance
- IS-8 Building for the Earthquakes of Tomorrow: Complying with Executive Order 12699
- IS-10 Animals in Disaster - Module A Awareness and Preparedness
- IS-11 Animals in Disaster - Module B Community Planning
- IS-120, An Orientation to Community Disaster Exercises
- IS-195 Basic Incident Command System
- IS-275 The EOC's Role in Community Preparedness, Response and Recovery Activities
- IS-279 Engineering Principles and Practices for Retrofitting Flood-Prone Residential Structures
- IS-288 The Role of Voluntary Agencies in Emergency Management
- IS-301 Radiological Emergency Response
- IS-324 Community Hurricane Preparedness
- IS-346 An Orientation to Hazardous Materials for Medical Personnel
- IS-393 Introduction to Mitigation
- IS-394 Mitigation for Homeowners
- IS-513 The Professional in Emergency Management
- SS-534: Emergency Response to Terrorism (presented by the National Fire Academy-12 hours)