

The Jersey Broadcaster

NEWSLETTER OF THE NEW JERSEY ANTIQUE RADIO CLUB



March 2017

Volume 23 Issue 3

MEETING NOTICE

The next NJARC meeting will take place on Friday, March 10th at 7:30 PM at Princeton's Bowen Hall (70 Prospect Ave.). Directions may be found at the club's website (<u>http://njarc.org</u>). This month's program includes a talk by member Charles Blanding titled "The History of New York FM Radio." We'll

also continue to collect 2017 dues prior to the March 30th cutoff date.





Reported by Marv Beeferman

The ON-LINE Broadcaster

The Jersey Broadcaster is now on-line. Over 150 of your fellow NJARC members have already subscribed, saving the club a significant amount of money and your editor extra work. Interested? Send your e-mail address to mbeeferman@verizon.net. Be sure to include your full name.

I was not able to attend the February meeting but thanks to the efforts of member Dave Sica, I followed most of it online. For those of you who find it difficult to attend NJARC meetings and who are not aware of this great resource, you should try it. On the evening of the meeting, just go to the club's website (<u>http://</u><u>njarc.org</u>) and click on the live webcast link.

Thanks to Prof. Mike Littman for his presentation that gave us an overview of New Jersey's contribution to world science and technology. Dr. Littman introduced the term "radical innovations" and went on to divide them into major categories such as ideas, inventions, industries and manufacturing. For example, ideas were represented by such NJ luminaries (whose contributions Dr. Littman termed "new science") as Joseph Henry (first practical electric motor and practical electrical telegraph), John von Neumann (stored program digital computer) and Albert Einstein (theory of relativity).

Dr. Littman added a nice touch to his presentation by demonstrating the creation of an Edison wax cylinder recording. He covered a stiff paper cylinder with brown wax and, using a sharp needle mounted on the diaphragm of an early phonograph, recorded "Mary had a little lamb." On a second machine, using a blunt needle (so the grooves of the recording would be preserved), he played back the nursery rhyme.

Over 50 years ago, the first weather satellite, TIROS, was controlled through the tracking station at InfoAge's Camp Evans. Since that time, technology has improved dramatically, and the newest generation of satellites are giving breathtaking new insights on the weather. On Sunday, February 26th at 2:00 PM, the presentation "From TIROS to GOES: Weather Forecasting with Satellites" will be held at the InfoAge Space Exploration Center (ISEC) at the Project Diana site. The lecture will include a discussion of the evolution of the technologies, forecast modeling and the limits to what meteorologists can do. A donation of \$10.00 is suggested.

InfoAge will also hold a Veterans and Armed Forces Appreciation Day on Saturday, May 20th from 12:00 (Noon) to 8:00 PM with beer, food, wine and live bands. The day will feature access to all exhibits including military vehicles, vintage WWII military equipment, shipwreck artifacts, a miniature train show, models of Historic WWII battles and, of course, vintage radios. A 5K Race is also scheduled. A \$5.00 (children \$2.50) donation is requested and active and retired military with ID's enter free.

Our condolences go out to Steve Goscinsky on loss of his wife Lisa of 40 years. Steve noted: "Like many of our wives, she kept reminding me that I had too many radios and when I would sell something at a hamfest or swapmeet, I would refrain from telling her that I sold 5 pieces and bought 6! Not all of the club members know me well because I am still working (at 65). She always accompanied me to the Christmas parties which we enjoyed immensely."

A reminder that our winter repair clinic at InfoAge is on February 18th and reservations are being accepted for our Spring swapmeet in Parsippany on March 18th.

<u>FINAL CALL FOR DUES</u> (Membership Cutoff Date - March 31)

For members receiving the *Broadcaster* by mail, check the code next to your name on your mailing label. Honorary (H) and Lifetime (L) members are exempt from paying dues. For the rest (Code 1/17), dues will be collected at monthly meetings and club activities or you may send a check made out to the "NJARC" to our membership secretary:

Marsha Simkin 33 Lakeland Drive Barnegat, NJ 08005

Payment via PayPal is also available at the club's website but it will cost the club a fee. If you're receiving your *Broadcaster* via email and you're not sure about your membership status, it will be provided to you when you pay or you can contact Marsha at:

mhsimkin@comcast.net (609-660-8160)

While you're at it, you might want to consider a lifetime membership. In any case, <u>please renew early and avoid the</u> membership cutoff date of March 31st!

Upcoming Events

February 18th - Winter repair clinic at InfoAge

March 18th - Parsippany swapmeet

April 14th - Monthly meeting at InfoAge; topic TBA

May 6th - Spring Repair Clinic at InfoAge May 19th - Monthly meeting at InfoAge; Radio Scavenger Hunt

June 9th - Monthly meeting at Princeton; Show & Tell, Hints and Kinks

July 14 - Monthly meeting at Princeton; topic TBA

July 22nd - Summer Tailgate at InfoAge

March 2017

THE JERSEY BROADCASTER is the newsletter of the New Jersey Antique Radio Club (NJARC) which is dedicated to preserving the history and enhancing the knowledge of radio and related disciplines. Dues are \$25 per year and meetings are held the second Friday of each month at InfoAge or Princeton University.

The Editor or NJARC is not liable for any other use of the contents of this publication.

PRESIDENT: Richard Lee (914)-589-3751 radiorich@prodigy.net

VICE PRESIDENT: Sal Brisindi (732)-308-1748 salb203@optonline.net

SECRETARY/NEWSLETTER EDITOR: Marv Beeferman (609)-693-9430 mbeeferman@verizon.net

TREASURER: Harry Klancer (732)-238-1083 klancer2@comcast.net

SERGEANT-AT-ARMS (WEST): Darren Hoffman (732)-928-0594 amcmatador@aol.com

SERGEANT-AT-ARMS (EAST): Rotating

TRUSTEES: Ray Chase (908)-757-9741 raydio862@verizon.net Phil Vourteis (732) 446 242

Phil Vourtsis (732)-446-2427 pvourtsis@optonline.net Bill Zukowski (732)-833-1224 nocusr@optonline.net

TECHNICAL COORDINATOR: Al Klase (908)-892-5465 al@ar88.net

TUBE PROGRAM CHAIRMAN: Al Klase tubes@njarc.org

SCHEMATIC PROGRAM: Aaron Hunter (609)-267-3065 <u>ahunter01@comcast.net</u>

CAPACITOR PROGRAM: Matt Reynolds (567)-204-3850 mattr04@hotmail.com

RESISTOR PROGRAM: (To be announced.)

WEB COORDINATOR: Dave Sica (732)-382-0618 dave.sica@njarc.org

MEMBERSHIP SECRETARY:

Marsha Simkin 33 Lakeland Drive Barnegat, N.J. 08005 (609)-660-8160 <u>mhsimkin@comcast.net</u>

AMRAD'S LAST GASP

By Marv Beeferman

My choice for the NJARC 2017 BCB DX Contest was, for the most part, totally arbitrary. I decided on an early 20's battery set but that was as far as it went. An Amrad Neutrodyne that I purchased at a recent NJARC swapmeet in Parsippany looked promising, so, as not to be disappointed from the outset, I checked the audios and found them to be good. Except for the tubes, there's not much left to go wrong with radios in this category so I put it "on line." I found the power switch to be a little intermittent at first but once that problem was settled, the radio seemed to be functioning properly. I used 90 volts for the "B" supply and 45 volts for the detector; there were no provisions for a "C" supply.

I don't know if it was poor "ether" conditions or poor design, but this fivetube radio did not perform as well as I expected when compared to one and twotube regenerative sets that I have entered in the past. I tried at least three different nights over the contest period but the big mileage Mexicans and Cubans remained elusive. However, in one way, by investigating a little about the history of this radio, I was rewarded in a different way.

The American Radio and Research Corporation (AMRAD) has an interesting history beginning with J. P. Morgan but it's a little too convoluted to go into here. However, full details may be found in Volume 1 of *Radio Manufacturers of the* 1920's by Alan Douglas.

The rest of the story begins with an article I first published in the February 2016 Jersey Broadcaster titled "The Marvel Radio Receiver and the Road to the Neutrodyne." This article traced the events leading to the use of Hazeltine's Neutrodyne circuitry in commercial radios. Beginning in May, 1922, the Wireless Specialty Apparatus (WSA) Company decided to begin protecting its patents associated with crystal technology. The company issued warnings in magazines such as Radio and Radio News outlining its patent status and claiming that any other company making or selling crystal detectors was liable for a patent infringement suit and an accounting for damages. Having huge success with its "Marvel"

crystal set, WSA's patent warning had the effect of scaring off Freed-Eisemann dealers and, in parallel with a decline in radio sales, the company found itself on shaky financial footing.

To fight back, Freed-Eisemann gathered together a group of other New York crystal set makers in what was called the Independent Radio Manufacturers or IRM. They retained the prominent law firm of Pennie, Davis, Marvin and Edmonds (PDME). Through one of its PDME lawyers, the IRM group learned of an invention of Hazeltine (originated by him in 1919) which was then being processed through the Patent Office. Hazeltine's innovation was to add a circuit to each radio frequency amplifier stage which fed back a small amount of energy from the plate circuit to the grid circuit with opposite phase to "neutralize" the feedback through the tube's interelectrode capacitance which was causing parasitic oscillations. This effectively prevented the highpitched squeals that had plagued early radio sets.

Almost immediately, companies like Andrea, Garod and ultimately Freed-Eisemann were producing Neutrodyne radios. In fact, Freed-Eisemann did quite well with its Neutrodyne model NR-5; sales in 1923 were four times the previous year and profits 100 times higher. So what about Amrad? When Neutrodyne licenses were issued in April 1923, being a member of the IRM, Amrad got one. But, despite being backed by quite a lot of money, Amrad never seemed to be on the "cutting edge" of radio and was considered by one writer as "technologically backwards." Alan Douglas (Radio Manufacturers of the 1920's) noted that "Amrad might have done well to introduce a Neutrodyne in 1923, but it did not." What is considered "an amazingly incompetent decision," Amrad didn't offer their Neutrodyne receiver immediately (although it was already in production as early as February, 1923) and delayed its introduction until the Christmas season of 1924. Apparently, this decision cost Amrad thousands of potential sales and the company lost a tremendous amount of money and respect.

Amrad's introduction of its "Neutrodyne" (it had no specific model number) seemed to be "too little, too late." The company went into receivership in April 1925 and this was effectively the end of the line for the original founders. The Amrad "Neutrodyne" was the last model produced before the company went bankrupt. But, there was still a little life left in the old company. As Alan Douglas

points out:

"By 1925, the Neutrodyne trademark had become a bit shopworn, but still signified to the public a reliable, easy-to-use radio. Armstrong regenerative sets, on the other hand, were definitely outmoded and were under attack from many quarters for their oscillating/interfering tendencies. Powel Crosley had made a great success of regenerative models, but he needed something new, and he wanted a Neutrodyne license."

Powell Crosley purchased the remains of Amrad for \$39,000 and not only got his Neutrodyne license but a complete Amrad factory as well as Mershon condenser licenses. Soon, Crosley and former Amrad workers were producing new "Amrad" Neutrodynes, both battery and "AC" models, which had a distinctive "Crosley" look. Such models included the S-522, AC-5, AC-9, S-733 and the "Royal" series. Future plans were to keep the Amrad line as a higher-priced, quality radio while Crosley produced the cheaper models. As Douglas notes, if it hadn't been for the stock-market crash and Depression, Amrad probably would have survived via Crosley ownership. But, the factory closed its doors in 1930 and the factory equipment and many personnel went to Cincinnati.

The Amrad's "Neutrodyne" in my collection is somewhat different than the standard early Neutrodynes of the era. It consists of one RF amplifier, a detector and three stages of audio amplification using 01A tubes. The receiver is also very compact resulting in one of the smallest 1924 Neutrodyne radio receivers.

My example also has a factory Bradleyohm-E variable resistor in the detector "A" supply circuit in addition to the filament rheostat. This was added to perhaps obtain more accurate control of the detector filament voltage, but the control is not shown in 1924 Amrad advertising or photos of other examples. Serial number 1429 is stamped into the front Bakelite panel so this appears to be an early model.

The radio also came with an original inspection tag with a "test" and "inspection" date of February 5th, 1923. This implies that Amrad had working Neutrodynes in production early in 1923 but, for some strange reason, the company waited until Christmas 1924 to advertise them for sale and resulting in the company's ultimate demise. Thus, my Amrad "Neutrodyne" is somewhat unique in representing the last radio produced by the original company before it was purchased by Crosley.

Volume 23 Issue 3



The author's Amrad "Neutrodyne." Note the "Bradleyohm-E" detector filament control at "R" which is not shown in advertised versions.



Interior of the Amrad "Neutrodyne." The single, vertical neutralizing capacitor at "C" consists of two pieces of insulated wire inside a brass tube. The tube was slid back and forth to adjust the capacitance.





Member Bruce Ingraham recently completed the construction of a new display for our very popular "Hands On" room. It is called the "Farmers Riddle" and it is a take-off on an age-old puzzle of a traveler who must cross a river while carrying three items that are antagonistic to each other. The boat that is to be used can only carry the traveler and one item at a time.



The four double-pole double-throw knife switches represent the farmer and three items. The goal is to get the three items to the other side safely by operating the switches in the proper sequence and direction within the puzzle's given constraints. If you make a wrong move, a raucous buzzer sounds to indicate that you made a wrong move. It is a fundamental display of logic. We hope that children of all ages will find it amusing as well as educational.

Bruce constructed the display out of junk box parts (some of my own) along with excellent wood working talents. We are fortunate to have such creative and resourceful volunteers in our group. On February 3rd, member Harry Klancer and I gave an abbreviated version of our traveling radio show to a lunch meeting of about 40 retired businessmen in Fair Haven (Red Bank) NJ. The group is called the Root Beer and Checkers Club and yes, we drank root beer. Quite a few of the members were ex-Bell Labs employees. The presentation was well-received and one member indicated that he had an artifact that he would donate to the museum. In fact, the group had plans to visit InfoAge and the RTM on the following Wednesday.

About a dozen club members showed up as planned and Harry gave them a detailed tour of the museum. On member, Jules Bours, brought the artifact he had mentioned the previous week. It turned out to be a magnificent presentation case holding samples of three sections of the early Atlantic telegraph cable, probably dating back to Victorian times. The fine wood case has a hinged lid with beveled glass.

The three samples, each about six inches long, represented the "Shore" end cable, the "Intermediate" cable and the "Deep Sea" cable. Closer to shore, the cable needed heavier armor to protect against such dangers as anchors. Cross sections of each type of cable was also included in the display.



The brass label reads as follows:

SUBMARINE CABLES MANUFACTURED & LAID FOR THE CENTRAL & SOUTH AMERICAN TELEGRAPH COMPANY BY THE India Rubber Gutta Percha & Telegraph Works Co. Limited SILVERTOWN LONDON Our donor, Jules Bours, is an insurance agent and real estate broker and he told us that he had the display on his office desk for many years. How he obtained it is a sad tale we are all familiar with. He had sold a house for a client and on the day of closing, the client was cleaning things out and was about to throw the item in the trash. Apparently, many years ago, a family member had acquired it in London and passed it down through several generations as a "family heirloom." Unfortunately, its significance was lost as each generation passed until the final owner decided he had no interest in it.

Thus, Mr. Bours rescued this fine artifact and it now sits in the early telegraph and wireless section of the museum. Marconi was inspired to create long distance wireless to provide competition to expensive and vulnerable undersea cables.

Many thanks to Mr. Bours!



FOUND SOUND

By Dave Sica

The following article incorporates an idea suggested by Dave to deal with two **Broadcaster** issues that have been difficult to tackle. The first is the fact that eight pages sometimes limits the amount of material we can contain in an article. Second, we are still having problems getting members to receive the on-line version. Dave has suggested that we provide a link (only available in the on-line version) to "additional material" that can expand on an article and make it more thorough and interesting. The link can be found at the end of this story...Ed

Found photography is a genre of photography and/or visual art based on the recovery (and possible exhibition) of lost, unclaimed, or discarded photographs. As far as I know, there is no formal equivalent genre of "found sound," but as we all know from home-recorded acetate discs and old spools of wire recordings, it exists. Here's my brush with "found sound."

The story began (as many stories seem to do) in a bar, about two years ago. But it actually had its genesis way before that, in 1967, in a church in Sayreville, New Jersey. I was in seventh grade at the local Catholic school. I learned to play the guitar, not very well, but well enough to strum out the three or four chords required to play music at the then-newly-popular folk mass. A couple of years later, by the time I was in high school, I was still a lousy guitar player but I had risen administratively to the rank of folk group copotentate, or whatever it was called. My infinitely more qualified co-leader was a fellow student who played guitar much, much better than I did. I never knew, nor did she ever mention, that music ran in her blood.

Skip ahead now to the bar. We had, somewhat flippantly, organized a "grade school reunion." I arrived fairly late (on my way home after an NJARC meeting, no less!) but the party was still going strong. It was fun catching up with several old friends that I hadn't seen, literally, in over forty years.

At one point, my former folk group friend pulls me aside and says she has something to show me, knowing from all my Facebook posts about radios, records and music, that I'd find interesting. The bar was one of those local joints that had been there forever, and liked to post things of local interest on their walls. She showed me photographs they had of her mother as part of a singing group that performed on USO tours back in the '40s. They performed, I learned, as "The Moore Sisters" (possibly because "The Ethier Sisters didn't' have quite the right ring to it?) All the time we were growing up, I never knew this about her mom. She pretty much kept quiet about it, at least as far as I was ever aware. Anyway, it was a fascinating story and I WAS impressed.

Now, fast-forward about another year and a half to last November. I'm down in my wretched hell-hole of a basement, surrounded by dangerous-looking stacks of musty radios and TVs, and floor-toceiling towers of records threatening to bury me thoroughly enough that it'd require a rescue dog to find me. It's in this cheery environment that I occasionally pass a pleasant hour or two sifting through stacks of 78s, attempting to separate the occasional grain of wheat from the all-too-abundant chaff. Imagine, if you will, my surprise when after innumerable copies of what appear to be various incarnations of nineteen-forties versions of Milli Vanilli and Rebecca Black. and my fourth (or was it the fifth?) album of "South Pacific," I see a label with "The Moore Sisters" printed on it. I grabbed it, ran upstairs, checked it out,

and sure enough it seemed to be them. I contacted Yvonne Ethier Coyle's daughter, Yvonne Coyle Kronowski, and told her about it. We verified that it was in fact her mom on the record and I offered to put it up on YouTube so they could hear it. She informed me that her mom loves music "of her generation" (and still plays the guitar!) and, incredibly, has never owned any of her own records, so this would be a really nice surprise.

Days after, I noticed a post on Facebook that her mom's 90th birthday was coming up in December and they were planning a nice party for her. I related this story to my wife at dinner one night and she burst out with "You've got to give her the record!" I countered with "But no one can play 78s any more. (Not normal people, anyway!)" To which she replied "Then give her one of your damn record players to go with it!"

A fabulous idea. The only catch was, I knew that despite the towers of treasures in the basement, I didn't have a working or restorable 78 player handy. But... I have a super-power: I belong to the best antique radio club in the world. So I put out a clarion call to our members and within days I had several offers of 78 players. Tom Cawley did the handoff of a really nice looking and working, small Philco 78-only phonograph to me in the parking lot outside our Holiday Party. It probably looked like we were doing some sort of drug deal!

So, mere days before the birthday deadline, my wife and I drove to Sayreville and delivered the record and the player to the daughter. She promised to let me know how things went, and she did. She posts a lot on Facebook, and wrote that when her mother opened the package, she thought at first it was a picture of a record. When she finally realized that it was a record of one of her performances, she said "Oh, but I have no way to play it" - at which point they showed her the record player. A Facebook post from her daughter was reward-"Thank you and your friends that ing: made this possible! She said she is going to play it again and again this afternoon. You really made her day!"

Responses to the Facebook post were

equally rewarding:

What a great birthday present!! This is great... Best regards to your mom on her birthday That's awesome! I didn't know she didn't own her own records. I always remember Aunt Yvonne singing at family barbecues and get-togethers Oh what a wonderful idea! I'm sure your mom enjoyed it!

Well, it made my day too. I actually got two really great "vintage-related" Christmas presents this year, and being able to do this was one of them. (Maybe I'll tell you about the other in an upcoming issue.) It's really nice to see this stuff out there and being used. And what better way to be used than in the hands of a 90year old former World War II girl-group star, helping her relive a bit of her glory days!

Amongst "floor-to-ceiling" towers of

records" Dave was able to locate a Moore Sisters original.

"Oh, but I have no way to play it!



March 2017



"Tom Cawley did the handoff of a really nice looking and working, small Philco 78-only phonograph to me in the parking lot outside our Holiday Party." Yes, Mrs. Coyle <u>did</u> have a way to play her record.



These three Ethier sisters, Yvonne Coyle (left) and Viola Balon, both Millville natives now living in New Jersey, and the late Uxbridge resident Bella Wayland (far right) pose for this picture in 1944 as members of the stage group The Moore Sisters. The Moore Sisters toured USO camp shows during World War II, playing for Gen. Douglas MacArthur on one occasion. The photo was submitted by brother Rene J. Ethier of Blackstone.





ADDITIONAL CONTENT

For more information associated with the above story, please click on the following link:

http://bit.ly/2lrMyqW

A "MINI-ACADEMY" AT INFOAGE

By Marv Beeferman

On the evening of February 8th, NJARC personnel participated in an IEEE Engineering Mini-Academy. The project was captained by our Technical Coordinator Al Klase, who had devoted a significant amount of time and expertise into the project. The Mini-Academy was designed to stress two aspects of the engineering design process - building and testing a prototype.

Some 80 local high school students were divided into two groups. The first group was guided in the assembly of a simple FM transmitter using a single transistor that emphasized the concept of "bread-boarding." Following assembly, the students got to attach their mobile device to the transmitter and listen to the transmitter on nearby digital FM radios provided by the membership. (I was quite impressed that one of the groups I was working with chose to broadcast Frank Sinatra.) In addition, Al had set up a spectrum analyzer so the students could visually compare the intensity and frequency of each of the transmitters.

The second group was taken to another location where they were given a short lecture on radio transmission and then allowed to use AM radios supplied by the NJARC membership to "DX" some distant stations. After each group accomplished their task, locations were switched.

The students were supplied with all the materials they needed and very detailed assembly instructions were provided. Unfortunately, two of the groups that I worked with were somewhat advanced and decided to use the schematic. Yes, a little knowledge could be a dangerous thing and numerous assembly mistakes were the result. However, a third group that followed Al's great instructions to the letter got their transmitter running immediately. Also, since some of the parts are rather small and difficult to mount on the breadboard, the boys seemed to enlist the long nails of the girls when assembly became difficult.

Member Ray Chase was assigned to the Radio Technology Museum (RTM) and museum tours were offered if parents wanted to come early or wait for their kids. About 8 to 10 parents visited early or stayed through the event and Ray said "it was good to meet parents who are involved in and support their children's education. We may have obtained a teenage docent candidate in the deal."

Thanks to the following individuals who helped make the evening a great success (hope I didn't leave anybody out): Marv Beeferman, Ray Chase, Al Klase, Steve Rosenfeld, Jules Bellisio, Vince Lobosco, Harry Klancer, Stacey Shipman, Tom Sedergran, Dave Snellman, Bruce Williams and Len Newman.



Jules Bellisio goes over some fundamentals prior to the FM transmitter assembly.

March 2017



Harry Klancer goes over some DX fundamentals.

2017 NJARC DX Contest Results

Category A - Crystal Radios

No entries

Category B - Primitive tube receivers- 1 or 2 tube

No entries

Category C - 1920's Battery sets

Winner

Marv Beeferman 6,262 pts. 1926 Amrad Neutrodyne 5 tubes, 30ft. L antenna MDS 750 kHz WSB Atlanta, Ga. 717 miles

Category D -Other Tube radios sold for home entertainment

Winner

Phil Vortsis 7,494 pts. Zenith 10S567 using built-in rotor Wave Magnet loop ant. *MDS 740 kHz KTRH Houston, Tx. 1150 miles (from Myrtle Beach, SC)

Matt Reynolds 7,226 pts. Philco 38-4 using HDTV antenna w/50 ft. coax MDS 570 kHz Radio Reloj Santa Clara, Cu. 1,279 miles

Gerry Dowgin 6,941 pts. RCA Model 128 using 40 ft. L antenna 20 ft. high MDS 1170 kHz KFAQ Tulsa, Ok. 1209 miles

Frank Feczko 5,214 pts. Hallicrafters S-72 (1951) using built-in loop MDS 1540 kHz KXEL Waterloo, Ia. 950 miles

Richard Lee 3,435 pts. General Electric Model 422 (1951) using internal loop MDS 1120 kHz KMOX St. Louis, Mo. 860 miles

Category E - Amateur, commercial and military tube type radios

Winner

Al Klase 10,162 pts. Hammarlund HQ 120 (1938) using Skywaves shielded loop MDS 1200 WOIA San Antonio, Tx. 1558 miles

Category F - Any radio of your choosing

<u>Winner</u>

David Snellman11,987 pts. Sangean ATS 909X using Super Select-A-Tenna MDS 540 kHz XEWA San Luis Potosi, Mex. 1999 miles

Joseph Serafin 9,498 pts. Radio Shack DX 390 using Terk tunable loop MDS 570 kHz Radio Reloj Santa Clara, Cu 1279 miles

Edward Suhaka 6,014 pts. Sears Silvertone Model 3002 (1954) using random length antenna in attic MDS 1540 kHz KXEL Waterloo, Ia. 950 miles

Franck Feczko 5,022 pts. Candle TK-1848-XSTR (1968) using ferrite and Select-A-Tenna MDS 1540 KXEL Waterloo, Ia. 950 miles

Category G - Light weight- any radio weighing less than 1 pound.

Winner

David Snellman 12,740 pts. Sony SRF-M37W using Terk loop MDS 750 kHz YVKS Caracas, Ve. 2,106 miles

Compiled by Tom Provost

* MDS=Most Distant Station

