LLOYD ESPENSCHIED RECEIVES A.W.A. PLAQUE FROM F.C.C. CHAIRMAN

Distinguish Guest Rosel Hyde, Chairman of the Federal Communication Commission, presents Lloyd Espenschied A.W.A. Plaque for outstanding work in historical radio. To Chairman Hyde's right is Toastmaster Raymond Guy, pioneer broadcast engineer.

NEW EQUIPMENT FOR A.W.A. SHOWS -- checking the club's treasury revealed a few extra bucks above what is normally required to keep the organization going. A quick conference gave approval to purchase amplifier and speaker for use when presenting an AWA show -- replacing an old amplifier using a pair of 616's. The new equipment was used at the National Conference and the fall meeting. The move was felt reasonable since all equipment up until now (amplifiers, tape decks, projectors, etc.) have been provided by members. In addition, these same members also purchase the film and tape as well as present the shows -- all gratis....

WELCOME FIN STEWART from New South Wales, Australia..... About the time you read this bulletin, fellow collector Stewart will have arrived in California for a several month vacation here in the states. Fin is rated as a top light bulb collector. In addition, he has an outstanding collection of early tubes and wireless equipment. His name has appeared several times in the A.W.A. Bulletin. His itinerary is a little uncertain but he expects to work his way across the country and be in the east by spring. To make his trip more interesting, Fin is bringing a small collection of foreign tubes for swapping!
FIRST WIRELESS STATION

Recognize the above building? It is doubtful whether any of our readers operated from this "shack" for it was erected shortly after the turn of the century by Marconi near Babylon, Long Island and may well be the first commercial wireless station in the country. Radio interests had the foresight to preserve the building and in later years it was moved to RCA's Rocky Point location where the picture was taken in 1937.

Famed RCA Historian George Clark is at the left and Bill Gassett, W8CRM at right. Note the huge multiple tuned longwave antennas in the background.

Their visit was mentioned in a 1937 RCA News Bulletin written by Clark. The article mentioned many familiar names and places: Hammond's castle (Gloucester), Sayville, New Brunswick, 500 cycle spk sets, Harvey Butt, diversity receivers, Riverhead, iconoscopes, 66 Broad St., Millikan, etc.

W8CRM was representing Ford's radio activities at the time and had a royal reception. In passing, we might mention that Bill was instrumental in acquiring much of the valuable wireless equipment in the Henry Ford Science Museum at Dearborn.

EATON TUBE COLLECTION AGAIN----- this famous "lost" collection has been mentioned before (Vol. 5, #2, p.5) but no reference has been made that the original report fully describing each tube with final summary is located in the A.W.A. Historical Archives! The same file also contains an original picture measuring 20" in length showing each of the 41 historical tubes in minute detail. A treasure for the tube historian! The A.W.A. is very grateful to Ted Duvall for this valuable information.

AWA Nets

PHONE

Every Sunday - 12 Noon
3890 or 3885 Kc. depending on conditions. AM or SSB.

CW

First Wednesday each month.
8 P.M., E.S.T.
3580 Kc.
REGISTRATION
Amateurs checked in from all 10 Call Areas -- Seattle, Washington to Tampa, Florida and from New Brunswick, Canada to Arizona. See you in Rhode Island at the 1969 Conference!

WESTINGHOUSE -- Bruce Boyd (W3QA) reminds us that one should not overlook the fact that Westinghouse developed and manufactured more receivers (including Radiolas) and transmitting equipment in the 1920's than is generally known. It would appear various articles in the OTB seemed to lean more toward G.E. This was quite unintentional on our part -- strictly a matter of circumstances -- just using copy as it comes in. One of these days we're going to run the story on pioneer KDKA -- Westinghouse's great contribution to broadcasting!

NEW EQUIPMENT IN A.W.A. MUSEUM
PRINTED MATERIAL: WA5HAU, W2EB, W3AW, K4PT, W4VM
COLEY TUNER: W3DAS
MITC.: KEPOI, Bill Laverty

DIFFERENT -- odds things find their way to A.W.A. The latest is a WWII Italian Radio Military Code Book found in a wrecked plane in Sicily. The same donor also gave us a German instruction book on radio he lifted from a plane hangar during the German invasion!

WRITING TO A.W.A.?
How about including a self addressed stamped envelope? Sometimes as many as 10 to 12 letters are received in a single day. This makes a difficult situation working with limited time and funds. (In fact, letters from non-members are no longer answered!)

HISTORY OF BROADCASTING IN BELGIUM
A historical record of radio broadcasting in Belgium consisting of 37 large typed sheets was recently at A.W.A. from Jerry Tyne. The material starts in 1910 with much detail information of the 1920's -- a very specialized report for the research type historian -- only one catch -- it is written in French!

DON'T LAUGH -- but according to Perry Cornwell there may come a time when the old big AC consoles of the late '20s and early '30s will be collector items. He is referring to the large Majestic, Zenith consoles, etc., many housed in beautiful cabinets with ornate doors. Until recently they were a drug on the market -- you couldn't give them away! Space was the main problem -- we might add that most of these old sets were fairly good electrically...main problem usually being a condenser replacement....

CANDID PHOTOGRAPHER AT WORK
The chartered bus to the Smithsonian eliminated lotsa headaches and parking tickets....
Good old days

Ray Guy and George Sterling show how it was done in the old days over WDM. There is no question about their engineering abilities -- but onlookers have doubts they would be a big success as a vocal duet. We repeat again that the transmitter was in operation but feeding a dummy antenna!!

SUPER POWER STATIONS

will be a feature of the 1969 Historical Conference Radio program. Through the efforts of Art Goodnow (W1DM), a very valuable record in original photographs and material was received from Vern Collins. Vern represents CONTINENTAL ELECTRONICS, the builders of NAA (Cutler), WNC (West Australia) and other megawatt installations. The material will be copied to 35 mm. slides for projection.

The key figure and brains behind these super power stations is a fellow named James Weldon who heads Continental. The pro's remember Jim for his design and engineering of several outstanding 50,000 watt AM stations as well as Doc Brinkley's super power AM station in Mexico back in the 30's.

Important

NEW A.W.A. MEMBERS NOT being accepted at this time. We've hit our limit of 500 -- from now on new members will be accepted when there is an opening. In addition, prospective members MUST write for an application form which requires signature of two (2) sponsoring AWA members of good standing. All money will be returned unless accompanied by this form properly filled out and approved by the Membership Committee.

IN RETROSPECT

This informal panel, smoothly handled by Perry Ferrell (left), provided Bill Halligan, Ralph Boutcher and George Sterling (right) an opportunity to reminisce about the old days. It was an enjoyable session that brought both laughter and applause.
Radio Hidden In Camera Gets A New Home

204A's WITHOUT BASE -- several of these tubes were sold at the recent A.W.A. Auction (Washington) by W6RKM. Anyone have a clue as to their origin or use? W6RKM has no info and we've never seen any made like this -- wires coming out of both ends. Internal construction indicates they were made in the mid 20's and close examination shows they never had a base...maybe they were made special for high frequency use...

TESLA'S TOWER -- has received much publicity of late -- climaxed by Lee Anderson's illustrated talk at the recent conference. Lee produced pictures that left many old timers aghast at their clarity. The lecture was thorough and covered subjects not generally known. Several commented they were unaware of the magnitude of Tesla's work in Colorado.....As a followup -- Jack Allison of Commack, Long Island, took a group of boys from his high school (where he teaches) to the one time Long Island tower site. In addition to the building (now used commercially), they located granite blocks and other remnants of the tower base.

QUEEN MARY and QRM CONTEST; A.W.A. has received many requests for copies of these two magnetic tapes played at the Conference. Unfortunately, neither time or facilities are available to make additional copies. Sorry.

A No. 2 Brownie camera fitted out as a radio receiver by Dutch underground agents during World War II recently was transferred from one local historical association to another—at a meeting of a third historical group.

On behalf of George Eastman House of Photography, Reginald Heron, assistant curator of the equipment archive, presented the camera to Bruce Kelley, secretary of the Antique Wireless Association, for display in its museum.

Those attending the meeting, many of whom were Kodakers, were intrigued to see how the undercover agents attempted to preserve the hiding spot of the clandestine radio. Numbered film backing appears in the camera exposure window to indicate that the camera contains a partially exposed roll of film and should not be opened.

DATE VERIFIED -- word was just received confirming weekend for the 1969 Historical Conference:

OCTOBER 3, 4 and 5th
East Greenwich, Rhode Island

VIRGINIA HISTORY FEDERATION, an association of Virginia's Historical Societies, is particularly interested in obtaining information, pictures, notes, in fact -- any material relating to the history of communication that took place in the State of Virginia. The President of the organization is Calvert "Bill" Tazewell, W4NGU. Bill would appreciate hearing from you:

Lt. Col. C.W. Tazewell (USAF Retired)
P.O. Box 1244, Norfolk, Virginia 23501
The Collector

BOB FLANAGAN (WALHAU) picked up 500 feet of litz wire and is now in the process of winding some long wave coils... lotso luck Bob!

OREN GAMBILL (W5WI) finds picking kind of slim out in Oklahoma -- result -- Oren has made several nice replicas of early gear. On the catalog side -- he has added some Duck and E.I. to his bookshelf.

JOHN SCHEEREL (W2HDR) had a fb write-up in the Albany newspaper covering his large collection of receivers. A real nice picture shows John with a breadboard.

GAY RENN (Bresexport, N.Y.) writes that he has a Garod Neutrodyne -- one of the first AC sets using a 112 and 199's with 210 output and 216-3 as rectifier. Gay also found a couple Crooks and an Eola 5-50. Good going for a young fellow in high school.

AL MARCY (W4ID) our magazine and club bulletin collector has been under the weather for several months. A recent letter from Al tells the situation looks much better and he hopes to finish his new library this winter.

JOHN CAPERTON (Louisville) has done alright in his recent travels. The gem of the lot is a beautiful 3E-95A he picked up in Massachusetts and W2EI's rare Norden-Hauk. In addition, John adds a Fleming valve; a McMurdo Silver Masterpiece, an Astron, Radiola AR and many other "goodies". He promises a picture sometime in the near future.

JACK REUMAN (W5BOW) located a rare McMurdo sliding plate variable condenser. Unfortunately, the name plate is missing. Why do they do this? Jack also found a loading coil for his DP-501 which completes the unit.

JOE PAVEK (W5QEP) reports burglars broke into his store but took only cash and ignored merchandise and his collection. Joe proudly displays a new RCA condenser microphone. It has great historical value since it was the one used by FDR on his acceptance speech in 1932 in Chicago!

MARTHA HOPPERSTEIN (Lafayette, Ind.) gave 17 volumes of Rider Manuals to the Smithsonian for reference. They originally belonged to a serviceman who "threw in the sponge" on radio repairs and went into selling modern furniture!

DON RATHKE (St. Louis), a strong advocate of vacuum tubes, wrote us a letter with some interesting comments on John Frye's article titled "Twilight of the Vacuum Tube" published in a recent copy of ELECTRONICS WORLD. We're afraid Don has a losing battle -- solid state is now moving into UHF and high power applications -- areas which until recently still used vacuum tubes.

KEN RICHARDSON (Ithaca, N.Y.) finds casual mention about early broadcasting in the OTR of interest. He tells us that he built the first broadcast station in Florida -- WFAW -- a 50 watter for a Miami newspaper in early 1922.

FRANK SHANNON (K4GW/W3JR) is finally all set -- he acquired an old Navy Type 38-LR3 receiver plus a couple other items for his early wireless shack... just like the ole days.

SONNY CLUTTER (Vienna, Va.) finds things are picking up in Virginia for he added a Clapp-Bantham HRL, Grebe 9 and 13, de Forest Interpanel, loose couplers, etc. to his collection... Good going! Sonny tests his WD-11's by using WD-11 adapters and lowering the filament voltage... the test readings are about the same as a 199.

FRANK PAGANO is still locating sets in the Metro area. He tells us that some of the junk sets should not be thrown away. Frank strips the "junkers" and sells the copper for 34¢ a lb. and brass @ 71¢/ Ib......

ERV BARMUSEN (W5BPM) thumbing through some letters we came across a real nice color shot from Erv showing 15 tubes from the tube collection of W2CHW of which there were 3 de Forest audions: a single wing, double wing and a Hudson filament. The tubes were all recessed in a nice mounting board.

BILL LAVENTY (Lansdowne, Pa.) visited A.W.A. back in October and told of some of his adventures in handling old equipment. When he has a little spare time he buys/sells/swaps...Bill sold or swapped over 170 sets last year! This means he puts lotso miles on his car picking up the stuff -- and then dozens of hours packing for shipping. The whole business sounds like a big headache (and backache) but Bill seems to enjoy playing with the old sets. Read his unfortunate mishap in Washington elsewhere in the Bulletin.
BOB CLOUSER (Montclair, Calif.) made a visit to his hometown back in Pennsylvania and found a mint Freed-Eisemann NR-5 and a Bulldog 1" spark coil the owner had bought from Duck in 1915 -- it pays to go home! Bob also visited the Memorial Museum in Harrisburg (mentioned in last OTB) and found the radio exhibit very disappointing -- few pieces and in poor condition.

FRANK ATLEE (K4PI) came north on a trip and ended up returning with a rotary spark set (Murdock) and many other pieces of gear including a de Forest set using honeycomb coils.

Bob Fabris, our flying friend from San Jose, visited a bookshop while in Washington and returned with several early books including an autographed by Jenkins.

KEN CONRAD (W2IIE) found a real odd-ball National made sometime in the early 30's. It appears to be the forerunner of the HBO -- it uses 4 separate FB-7 type coils which are inserted in the front where the HBO drawer normally goes... Ever hear of this one?

JACK GRAY (W8JDV) exhibited his beautiful magnetic detector and RJ-5 Audion Control box at the Conference. One comment: They were so perfect that it was suggested he scribble on the bottom of each "REPLICA" so they would never be taken for originals! Jack is currently working on a couple booklets covering his museum and WLM -- more on these later.

THOHN MAYERS (W6AX) sent A.W.A. a copy of a 1908 Call Book listing early commercial stations -- original on loan from Vance Phillips, W6GH. Real interesting copy -- too bad we don't have room to re-print it.

FIN STEWART (N.S.W., Australia) writes that he recently acquired two German Loewe tubes: A "3 in 1" envelope and a rare "2 in 1" envelope. Fin also reports a Phillips Type "N" plus several other "goodies"...

LAUREN PECHAM (Breesport) in addition to tubes and BC sets, Lauren is also the owner of a rare marble base WSA detector. Pictures and write-up of his collection will appear in next OTB.

WARREN JOHN SON (Ft. Wayne, Ind.) had a real nice article in the Annual Report published by the MAGNAVOX Co. of which he is an employee. Well illustrated, it shows an exceptional collection of early receivers Warren picked up in his immediate area. Do we have other members working for this pioneer company?

HIGH SPEED MORSE TELEGRAPHERS

(Above) Stu Davis, W2ZH, at the sending end of the "Bonus Line". (Below) Ralph Graham, W4RJX, casually working the mill close to 50 WPM. These two fellows almost stole the Conference. The most flattering remark heard was, "He's faking it, it is impossible to copy that stuff!" The proof, however, was the large pile of telegrams that accumulated in little over 30 minutes. Ralph is judged by some as the World's Un-Official Code Receiving Champion... having perfect copy at 77 WPM while he was Instructor in Signal Corp!

TELEGRAMS AVAILABLE: Did you provide a telegram for the Morse Demonstration at the Smithsonian? If so, would you like to have the ORIGINAL TYPED by Ralph Graham as he copied it from the high speed Morse line?? Send Link Cundall SASE envelope and identify contents of telegram and he will send you Graham's copy -- a wonderful momento commemorating an occasion to go down in history. (Note: Following the demonstration, all messages were sent via ARRL Tc 'Nets.)
ATTENTION: Send old time ads to AWA, Holcomb, N.Y. Write ad on separate sheet of paper and double space. Be sure and give full address and zip code at END OF AD. Ads are not accepted for modern gear. All ads are free to A.W.A. members. (Who is the member who wanted some 1918 and 1919 WIRELESS AGE magazines? We received the ad but you neglected to place your name and address. Sorry, but we couldn't print it....

FOR SALE: 1 KW Packard Wireless spark transformer (std. type) which I purchased from Packard Co. in 1917. Excellent condition with manual, will accept any reasonable offer. Wally Beckman, W1AA/W4KGM, 92 Lagoon Blvd., Massapequa, L.I., N.Y., 11758

SWAP -- exact replica breadboard to mount your Atwater-Kent components for Mod. 10, etc. Boards are made of mahogany (fitted ends) and rounded similar to original. Will also supply brown eyeletts, spaghetti, etc. for what have you? Roland Matson, K1OKO, Highland Ave., Pinehurst, N.C., 01866

FOR SALE: Old time brass knurled nuts like binding posts (4 sizes), all kinds of brass screws, etc. Stainless, brass, Acorn, Wing, etc., In fact, have just about any type of nut or screw you may need in restoring an old set. Send stamp for list or let me know your needs. Walt Streezer, W3EIR, 3011 Frazer, Northfield, Mich., 49075

FOR SALE: SWAP -- large variety of receivers and misc. parts. Also have new Radio- trons UV-200 and UV-201 (brass base and glass tip) in original white and red boxes at $5 each. Also new RCA UV-201A's for $3.50 write me your needs. Bill Laverty, 118 N. Wycombe, Pa., 19090

FOR SALE: SWAP/SELL -- large stamp collection of U.S. Mint Commeratives, etc. 1920-1968 Want early radio gear. Write: George Starry, 422 James St., Intrope, Pa., 15650

WANT: COPY OF TAPE recording made during the Morse Demonstration at recent Conference. Need same for record. Would very much appreciate hearing from anyone who has copy. Stu Davis, W2ZG, 1149 Weber St., Union, N.J. 07083

TRADE or SELL: 7" Teletone TV receiver in working condition. Want old radio gear, books, etc. Jack Berman, W1GWW, 28 New Haven St., West Roxbury 32, Mass.

WANT: de Forest items for memorial in de Forest's home town. Art Treufler, 120 Fourth St., Council Bluffs, Ind., 51501

WANTED: Early crystal detectors - Ferron,1106, Grebe, Murdock, Crystalod, B.I., Duck, Remler. Cash or swap for early magazines, catalogs, etc. R.G. Middleton, 1920 Meadow Lane, Walnut Creek, Calif., 94595

FOR SALE: Western Electric spherical tubes Type 101-F @ $4.00 each and Type 102-F @ $3.00 each. Also have brass telegraph keys and sounders for sale. Rodney Schrock, 402 Lincoln St., Somerset, Penna., 15901

WANTED: Front panel mounting meters - R.F. imp., DC ma., 0-10 VAC, 0-500 VDC. Also pre-1924 modulation transformer (5-10 w.) and constant current coil and UV-216's. Old station photos, BC mikes. Paul Mundt, 1465 G. St., Arcata, Calif., 95521

WILL PAY $100 for a Thorarson FLEXIBLE 1 KW wireless spark transformer with 110 v. prl. and 25,000 v. sec. Must be in good condition. These spark transformers were made around 1915. This is the type with the magnetic shunt adjustment at the TOP. Robert Golka, 38 Park St., Brockton, Mass., 02101

SWAP -- a quantity of foreign tubes plus many old books and magazines for what have you? Send SASE for list. C.E. Clutter, 120 Tapawingo Rd., S.W. Vienna, Virginia 22180

WANT: Remler Type 505 Panel std. varicoupler and Type 502 variometer. Swap or cash, Roland Matson, Highland Rd., Pinehurst, Mass., 01866

FOR SALE: Historical antenna insulators from the original Rocky Point installation. These insulators date back into the early 20's and were given to the Massapequa (L.I.) High School Radio Club to sell in order to build up the radio club's treasury. Large size: 1x1x10" 3 for $2 or $1 ea. Small size: 1x1x6" 6 for $2 or $.50 ea. Letter authenticating origin will be sent with the larger ones. Also have several of the huge type (over 5 feet long) used on the VLF antennas. Write: Jack Allison, Box 7, 9 Genesee Frve, Commack, L.I., N.Y. 11725
YES, IT IS TRUE
Elliot Sivovitch, our Smithsonian Host, gave an interesting talk and demonstration on Nipkow scanning disc TV. One problem: the extremely small size picture and the large lighted auditorium. Not to be outdone — he snapped his fingers and four men wheeled on the stage one of the five largest TV receivers ever made — a special model made by Du Mont! Turning on the switch, members in the hall saw an inning of the World Series!

A.W.A. HISTORICAL RADIO CONFERENCE
Schedule
Invitations have been received and accepted to hold our Annual Historical Meet in September at the following locations:
1969—New England Wireless Museum
East Greenwich, Rhode Island
1970—Henry Ford Science Museum
Dearborn, Michigan
1971—Smithsonian Institution
Washington, D.C.


SELL—Have a few Marconi un-used envelopes for $1.00 each while they last. Bill Traver, P.O. Box 365, Pollock Pines, California 95726

Top Morse Operators Send Telegraph Messages
WASHINGTON (K4GT) — Two of the country's top Morse operators fired messages across a telegraph wire yesterday in a reenactment of a dying art.

The operators, E. Stuart Davis of Union, N.J., and J. Ralph Graham of Washington, gave a demonstration of high-speed telegraphy at the annual convention of the Antique Wireless Association, a 1,000-member organization of radio buffs.

The wire they worked was set up on the stage of a Smithsonian Institution auditorium. Davis, using a semi-automatic sending key called a "bug," fired dots and dashes at Graham with machineman speed for 32 minutes, while radio operators in the audience tried to follow the uncustomed clatter of a Morse sounder.

Clayton Hansen, Federal Communications Commission engineer who acted as narrator, announced they had moved 76 messages, or well over the 100-an-hour rate they said was maintained in the old days.

Davis and Graham are both former Western Union and Associated Press telegraphers.

Typical press release covering A.W.A. Conference. This one was in a Florida newspaper. (K4GT)

NOTICE: Report on ANNUAL MEETING and election of officers was not available as we go to press. Full report in next Bulletin.
On Review


An account of a trip by K2AEG to Swan Island to verify the location of a broadcast station identifying itself only as RADIO AMERICAS ...operating on 1157 kc. and 6.0 mc. Tom writes in an easy manner and the reader will find his special chartered plane trip to this remote island in the Caribbean absorbing. Old timers will remember the island as a relay station for the United Fruit Co. in the early days ... UF Co. abandoned their installation sometime in the early 30's but a new station was setup a few years later by the U.S. Government for weather and aeronautical purposes (FAA). This installation plus occasional EFW amateur operation are the only OFFICIAL stations on the island. However, as Tom surmised, there was another setup -- a 50,000 watt BC job plus a 5000 watt SW xmt distant from the official FAA buildings. Who are they? How did they get there? Suggest you read the article which covers several pages plus interesting photos ... (Copy from Brad Burnham)

FROM SPARK TO SPACE --- The Story of Amateur Radio in Canada (146 pages).

This book is a Canadian version of Clinton de Sota's "200 Meters and Down" it presents in somewhat chronological order the history of amateur radio in Canada from the earliest days to present. Compiled earlier this year by the Saskatoon Amateur Radio Club under the very able direction of Bill Parker, VE5CU, it is an easy reading book fairly well illustrated. Although the contents are strictly Canadian, the U.S. amateur radio historian will find much information of interest. The scope is quite broad -- from Signal Hill (1901) to recent club activities-- and from W0 land to VE8's in the North. The copy at WA2BRD Headquarters was received from Bill Greenwood, VE3FW. Interested? Send $2.50 to Saskatoon Radio Club, Box 751, Saskatoon, Sask.

RADIO YESTERDAY PRESENTS "THUNDER LIKE OLD TIMES" is the title of a new LP Monaural recording just released by NOSTALGIA RECORDINGS, INC., 525 Main St. New Rochelle, N.Y. 10801. We had the good fortune of receiving an advance disc and was so pleased with it one was immediately ordered as 1st prize at the Historical Conference.

The maker or producer of this unusual recording is CBS Engineer Dave Golden, WA2MWD, whose hobby is collecting early radio programs. His transcription library is believed to be one of the largest in the country. With this material, Dave has selected themes of old time radio broadcasts and made a recording we feel is a "must" for the radio historian. We particularly admired his beautiful job of blending or mixing the 90 transcriptions on to one recording -- absolutely flawless. My wife has mixed feelings on this historical stuff -- so when I asked her to listen to the record I gave her two minutes before she would walk away. One half hour later she was still listening as No. 90 came to a finish!! everything from Amos and Andy to the theme song of Easy Aces.

SURPRISE IN THE SKIES is the title of an article by Jim Ashe, W6BLZ, in the November issue of "73" magazine. It has absolutely nothing to do with historical radio -- but we're a radio astronomy buff and just had to tell you about it. ... The author reviews in layman's language all that is known to date about the newly discovered "pulsars" or pulsating radio stars. A few years ago we had quasars to wonder about (and we still do) -- and now the four mysterious pulsars which give off tremendous radio signals as accurate as an atomic clock from unknown sources far beyond our galaxy. Are they some form of a pulsating "white dwarf" or a neutron star? Jim devotes 6 pages to the subject. Good reading.

EARLY WIRELESS STATIONS by Ed Mariner, W6BLZ, October, 1968 issue of HAM RADIO magazine. Excellent copy for the amateur just getting into the historical game but old stuff to the pro. Of particular interest were the fine pictures of some old timers plus one of the SS ASIA aground off the China Coast. BI knows his stuff -- too bad they shorted his copy....

VIE RECIEVER described in October, 1968 issue of HAM RADIO magazine presents a little work for the home constructor but results in a set that can pick up most signals in the medium low frequency range. Of greater interest however are three pages listing all the Aviation Weather (FAA) stations operating between 200 and 400 kc. The list appears complete -- stations from Florida to Alaska -- by city and frequency.
**Cosmic Static at 144 Meters Wavelength** by Grote Reber, Journal of the Franklin Institute, Vol. 285, No. 1, Jan., 1968

As most of you know, AWA member Grote Reber returned to U.S.A. in 1967 after spending four years in Tasmania where he made radio observations of the southern sky on the longer wavelengths. His illustrated report should prove of interest to the radio astronomer—particularly since most of this work is normally done in the VHF/UHF spectrum. His observations found several low frequency radio sources outside our galaxy. He used an antenna consisting of 192 dipoles covering several acres.

**Electronics Hobbyist** magazine, 1968 Fall/Winter issue, contains 8 articles by Art Trauffer -- ranging from constructing a transistor amplifier for your crystal set to modernizing an old pedestal type telephone. Art, as you may recall, is the Curator of the de Forest Museum out in Council Bluffs.

**Pioneer Operator Is Commended For Handling 1905 SOS That Saved 17 Lives**

The above heading was printed two years ago in a Newport, R.I., newspaper and covered an article which told about Benjamin Reynolds who may well be the first ever to receive a "distress call" from an American vessel -- Dec. 10, 1905!

Ben was on duty at Goat Island Torpedo School when he heard "Help -- we're sinking" from Lightship 58 off Nantucket Shoals. It was his action that sent a Coast Guard ship to the stricken vessel that probably saved 17 lives.

The Special Commendation was given to 65 year old Reynolds by Admiral W. J. Smith, U.S.C.G. after an interval of 61 years...

(Copy received from Nelson Moss)

**O.O.T.C. Gathering**

The OLD, OLD TIMERS CLUB held one of their largest meetings at the Historical Conference with well over 100 officers, members and guests in attendance. WAZ officiated with W6AX and W7JY holding the record of having traveled the greatest distance.

**Intermediate Frequency Vacuum Transformer**

The St. James Super-het pictured in the last OTB on p. 3 (W2CKQ) may have some interesting features including the unusual I.F. transformer shown below. Note the resemblance to a vacuum tube. I wonder how one would repair an open winding...Bim-bim-m...
PRESIDENT WELCOMES GROUP

A.W.A. President Batterson W2GB, an old time brasspounder, had originally planned to greet the group with a 1 KW spk set; however circumstances prevented bringing the transmitter to the banquet hall.

MORE ON A.R.R.L. MUSEUM: Roland Bourne, W1IANA, plans a series of illustrated articles covering the League's Amateur Museum at Newington, Conn. The first of the series started in the October issue of QST. Remember -- the museum is open daily to the public and is an outstanding exhibit of early amateur equipment...

FRANK DAVIS -- our old friend and retired Curator from Dearborn was reported by Charles Williams, W7AN. Frank is traveling all over the country with a trailer and checked into Seattle, Washington back in October when he visited his daughter who lives only a block from W7AN. Williams gave Frank the red carpet treatment including a visit to pioneer Bob Palmer, W7RD, who has a commercial collection hard to beat.

VLF STATION N4K listed in June QST is rated at 1000 KW. -- not 100 KW thru typographical error. Kinda hard to get used to this 1000 KW stuff. (Tnx W7AN)

ANNUAL BANQUET HIGHLIGHT

Attendance approached 300 with over 200 at the banquet -- an unusual turnout for a limited interest hobby. Toastmaster Ray Guy proved to be the hit of the evening as he smoothly guided and introduced the many distinguished guests. His efforts...
Sounds like a crazy combination doesn't it? Warren Green (W7JY) picked up a one tube BC set in Vancouver made by DE FOREST-CROSLEY and bears a plate saying it was made in Toronto, Ontario. It is a dead ringer for a Crosley Type 51. Here's a rare one. Anyone have information on this combination?

CLEVER IDEA: Art Trauffer describes in Elementary Electronics magazine an original idea (at least to us). He removed the guts of an old bell ringer telephone and placed a small transistor radio inside, Unlike most conversions of this type -- he attached the two bells to the volume and tuning controls. You have to use the right model to pull this trick in order to get the correct spacing -- in this case he found that Model 12-1150 from the Radio Shack was the right size. How does it work? Why you turn the bell to tune in a station!

Receiving Champion

Dave Veazey (W4ABY) receives 1st prize from George Sterling (W1AE) for winning the QRM CONTEST. Dave's triumph was the result of copying the greatest number of call letters in a huge pileup of CW-ICW-RAC and SPX signals!
RESTORING BLACK FINISH ON BRASS DIALS

by Roland Watson, KLOKO, ex-W7CUF

The restoration of metal dials has always been much more difficult and involved than the bakelite or composition type. The following is a proven method for restoring black, brass dials such as found on Arads, Kennedy 26L, Clapp-Bastman, Radiolas 5 and 6, RADA models and hosts of others.

Metal coloring has been practiced for many years by chemists and electroplaters and there are many formulae that can be used. Most of these for producing a black color on brass usually use ammoniacal solutions of copper salts such as copper sulphate, water and ammonia. I tried many formulae with little success until I used the following which I purchased in powder form from Ethone, Inc., West Haven, Conn. The trade name for their brass blackeners are "Brass Activator" and "Ebonol C". The other chemical that is required is a 50% solution of hydrochloric acid (HCL) which can be purchased at any chemical supply house.

Since very little chemical is required to cover a dial (with its knob removed), start out by mixing a quart of each of the activator and the Ebonol C by mixing the dry powdered Activator -- 1 lb./gal. of cold water, and the Ebonol C -- 1½ lb./gal. of cold water. Mix the hydrochloric acid -- ½ acid to ½ water by volume.

Use a stainless steel container for mixing and pour the powder into the water slowly, and stir with a clean stick while pouring. A glass container should not be used because the water temperature rises very rapidly as the powder is mixed into the water. Since the chemicals must be kept at a temperature of 210 degrees F. while using, I found steel most suitable. I've had Pyrex glass containers break while simmering on a hot plate.

When mixing the acid and water, pour the acid into the water, slowly, while stirring with another clean stick...

Caution: Always pour any acid into water slowly -- never water into acid.

Whenever I'm using a strong acid I always have a neutralizing solution nearby made up of a few tablespoons full of bicarbonate of soda and water. If I get acid on my hands or clothes I can quickly neutralize it with soda solution. And, lastly, be sure you have adequate ventilation.

Pour about 2 inches of Activator and Ebonol C into separate containers and place each on hot plates and bring to a simmer and keep at this temperature until finished.

Tie a piece of copper wire to the dial (through the hole) and hang in the acid solution which is in its own container. The existing black finish on the dial will begin to dissolve right away -- but leave the dial in the acid for about 3 minutes.

After the dial is removed from the acid, wash it in running water and rub it with very fine steel wool. After a few minutes the dial should be bright and clean. If some of the original black finish is still left -- place it back into the acid and repeat the process. Rinse the dial in alcohol to remove any oil that the dial picks up from the fingers and place on a clean piece of paper.

Pick up the dial with a clean stick and place it into the Activator solution for three (3) minutes. Remove the dial from the Activator and rinse in cold water and then in hot water. The dial will now be colored a greyish green. Still using the stick, place the dial into Ebonol C solution and leave it there for 10 minutes. Remove the dial with the stick and wash under running water.

The dial can now be handled and it should be washed under running water with a piece of cloth until all the fuzz which resembles velvet is washed away. If the original numbers have been washed away they can be replaced by applying white lacquer to the letters with a stick. Wait a couple minutes and wipe the unwanted white lacquer with a piece of cloth that has been dipped
into a thinner and then rub the cloth together so as to let some of the thinner spread through the cloth. Too much thinner washes away the white numbers.

After the lacquer has dried, which took only a few minutes, the dial can be waxed with a good paste wax and it should now look as good as the day it was first made!

This backening process is part of the same process that I use to restore the white silvered dials used on the Kennedy 110 and 220 and certain General Radio dials. I shall take up the restoration of white satin finish dials in a later issue of the Bulletin. For the benefit of collectors who do not wish to restore their dials to the method just described — it really is not as difficult as it may appear — I will restore your black dials for a small fee or a trade.

73, Roland Matson, Highland Rd., Pinehurst, Mass. 01866

(Ed. note: We've seen some of these restored dials and they are beautiful.)

AMATEUR OF THE YEAR AWARD

George Grammer (W1DF), QST Technical Director, receives A.W.A. Plaque from Radio Foundation President Ed Redington, W4ZN. George was judged outstanding Amateur of the Year for his numerous contributions to our hobby for over a period of 40 years. He performed admirably as Luncheon Toastmaster — in fact, he pulled the trick of the year! Unknown to Chairman Kelley (who thinks he knows what is always going on...) W4ZN and A.R.R.L. Director Gil Crossley worked in the program a "Citation of Merit" presentation to the General Chairman for his years of outstanding work to A.W.A. and A.R.R.L. Yes, Kelley was taken completely off guard!

A.W.A. AUCTION

The auction at the National Conference proved to be quite interesting to those who attended. Joe Pavek, W9QEP, (see photo) was right up to his usual form and things moved along at a good pace. He was ably assisted by our old friend Lloyd Sherman (W3CDY) from Franklin Institute who volunteered with his XYL Elinore to handle the records. Most disappointing was the absence of Bill Favery which proved to be somewhat baffling since he had brought down a station wagon of "goodies" from Philadelphia.

The mystery wasn't solved until Sunday afternoon. Seems Bill and Mel Comer had put up at the Navy Club. Going to the club's garage Sunday morning found it locked and no one in attendance. Four hours later after calling the manager, police, firemen and breaking in — the pair finally got their car out — but by then it was 1 P.M. and the auction was over!

What did some of the stuff go for? Here is a cross-section of the sales: Crosley 51 $21, Brandes phones $2, Baldwin phones $6.50, MB-5 receiver $15.00, AK-35 $10.00, AK-20 $17.50, etc. All told, 76 items were auctioned off... some were excellent "buys" and others fairly close to present market value.

DE FOREST TRANSFER

Who is the owner of a de Forest transmitter of the late teens or early 20's who gave same to W2QV at the recent National Conference (Washington) ??? The owner forgot to affix a tag with his name and call letters and Link overlooked the same information in all the hustle and bustle... We would like to acknowledge this piece of equipment and send the owner an ownership receipt.... (ps -- W2QV is now in the process of restoring it...)
SPIRITUALIZED DX LISTENING ON LONGWAVES

By Brad Burnham

For the DX enthusiast who prefers to log them and leave them, Aircraft and Marine Navigation Aid radio stations (200 to 530 kc.) offer an interesting challenge. No time is wasted, each station can be logged almost immediately since the broadcasts are a continuous repetition of identifying code letters. A few stations carry an additional schedule of voice weather information but identifier modulation is superimposed on the speech. If you want a weather report minus code symbols, just flip in a narrow rejection filter and you hardly notice the code or the tonal gap. If you want an identifier without speech, a narrow pass filter does it nicely.

Best DX is usually after midnight to avoid man-made interference, and before dawn to take advantage of peculiar increases in distant signal strength. Regional electrical storms raise the background noise level and make summer listening generally less rewarding. As a consequence of tone modulation each station radiates a continuous carrier and two keyed sidebands. Using a tuned radio frequency receiver with a stable regenerative detector that can be held in weak oscillation, six heterodynes can be noted for each station: below and above the lower sideband, below and above the carrier, below and above the upper sideband.

Various services and countries do not all employ the same audio tone or degree of modulation which leads to more technical involvement. A brief attempt to classify stations by tone frequency revealed roughly: 600, 700, 750, 1000, 1200 and 2000 cps.

Since a large number of telegraph receiving filters would be necessary to accommodate the spread in modulating tones, it is convenient to use a single narrow audio filter and carefully tune to maneuver one of the four sideband heterodynes into the filter passband. For example: Inserting a 560 cycle filter cuts the receiver output passband to 84 cycles between -3db points and 231 cycles between -40db points. This arrangement has proven quite useful for pulling weak marginal signals out of noise and for separating almost hopelessly superimposed calls.

When first tuning through the 200 kc. to 530 kc. region there is an impression that the number of readable navigation stations is quite small, mostly locals and a few powerful installations designed for worldwide coverage.

PIioneer TV Guest

Dr. Elvin Kurtz, Professor Emeritus from State University of Iowa with Elliot examining equipment used at W9XK between 1932 and 1939. Pioneer Kurtz was instrumental in setting up the first Educational TV Station in the world (W9XK) which preceded Purdue and others. The school’s activities were verified in a recent Ford Foundation research. A total of 359 Visual/Audio educational programs were broadcasted during this period.

Most amateurs enjoy reading Morse on or near 500 kc. where they listen to marine traffic; however, in a period of about one month a list of over 100 navigation stations can be accumulated by slow tuning and diligent logging; always working right at the limit imposed by background noise. This represents only a small fraction of the 500 Canadian (two letter), 3000 United States (three letter) and 4000 International aircraft navigational stations listed in Federal Aviation Administration Handbook 7350 Location Identifiers.

Do not overlook DX that is crowded by strong local signals. For example, the station at Rochester-Monroe County Airport repeats ROC at 400 kilocycles. Due to transmitting antenna directional characteristics you may hear only RO with no C. With a location only a few miles from the airport I have logged the following stations very close to their frequency:

<table>
<thead>
<tr>
<th>CALL</th>
<th>KILOCYcLES</th>
<th>LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>FME</td>
<td>391</td>
<td>Oshawa, Ontario, Can.</td>
</tr>
<tr>
<td>CYE</td>
<td></td>
<td>Ft. Meade, Maryland</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Crystal Lake, Penna.</td>
</tr>
<tr>
<td>Callsign</td>
<td>Location</td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>---------------------------------</td>
<td></td>
</tr>
<tr>
<td>ZBB</td>
<td>Bimini, Bahamas Islands</td>
<td></td>
</tr>
<tr>
<td>ROC</td>
<td>Rochester, N.Y.</td>
<td></td>
</tr>
<tr>
<td>KN</td>
<td>Kingston, Ottawa, Canada</td>
<td></td>
</tr>
<tr>
<td>PD</td>
<td>New Brunswick, Canada</td>
<td></td>
</tr>
<tr>
<td>ZR</td>
<td>Sarnia, Ontario, Canada</td>
<td></td>
</tr>
<tr>
<td>SMA</td>
<td>Swan Island, Caribbean</td>
<td></td>
</tr>
<tr>
<td>LC</td>
<td>Quebec, Canada</td>
<td></td>
</tr>
<tr>
<td>HBD</td>
<td>Hubbard, Ohio</td>
<td></td>
</tr>
<tr>
<td>KB</td>
<td>Kleinberg, Ontario, Canada</td>
<td></td>
</tr>
</tbody>
</table>

Work on the weak ones, that is the real secret of DX listening. The north pole signal was received from Ruby, Alaska with the call RBY and from Europe was heard LUX in Luxembourg. During day and night one can hear a strong signal near 200 kilocycles from TOK, Tokorima, Solomon, in the far Pacific. They must have a power plant with an immense antenna!

Believe it or not but there are a number of stations sandwiched in between the 500 kc. marine frequency and the broadcast band. They all appear to be Canadian. I have heard them all the way from Shearwater, Nova Scotia (FR) through to ZT at Port Hardy in British Columbia. The signature of the latter is unique. Instead of using a telegraph tone modulation their call is a musical chime or gong beating out Morse letters ZT sounding like:

"boing boing bink bink boing"

Have your tape recorder handy to capture this one because you think you must have Fu Manchu!

To listen to these longwave signals it is not necessary to have a mountain top location with a special antenna and a modern receiver. The stations logged were all received using a very ordinary wire antenna in the attic of a two story house. The receiver is a Navy RNL-2 manufactured by National in 1942.

**"GOLDEN YEARS OF BROADCASTING"**

A History of Radio Broadcasting

The latest A.W.A. show presented at the recent conference (Marriott Ballroom), has already brought many requests for additional showings -- and again the A.W.A. has to say "no" -- for the same reason they limit the showing of THE GOLDEN TWENTIES. Both are amateur productions and not intended for general use. In addition, the electronic and projection setup is relatively complex requiring special equipment. (Yes, Kelley is aware the audio was too high at the Marriott for those near the speakers. The noise from the two projection fans made it difficult to set the correct level.)

---

**TYPE IP-49 SILICON DETECTOR**

made by Wireless Speciality Apparatus Company and used as a paperweight by Jack Beaman, W2QY. No, he doesn't want to sell it!

---

**PHOTOGRAPHS AVAILABLE**

Pictures in this issue covering the recent National Conference are available at $1 each or 6 for $5 postpaid...

8 x 10" glossy

Send order to Treasurer:

Link Cundall, W2QY
69 Boulevard Pkwy.
Rochester, N.Y. 14612

---

"Come on, Ed, I'll show you how to make an oscilloscope out of your TV set."

(from Loggers Bark, ARRL CD Bulletin)
MUSEUM MAN—Curator Joseph E. Stebner, his hand resting on a model of the register, sits before a picture dating back to 1889. The "73" in the picture, which came from a WU office in Cleveland, was telegraphers' jargon for "Best Regards".

NEW YORK—Walking through the Western Union Museum, one can almost hear the echoes of the first telegraph message sent by Samuel Morse 130 years ago.

With more than 2,000 items in the present collection, the heritage and early development of Western Union is all within reach of visitors to the Museum. The Museum, now located at WU Headquarters, originated in 1915. At that time, Equipment Engineer H. W. Drake acquired a modest collection of telegraph equipment which he planned to use for reference purposes.

Older pieces of equipment were acquired through donations, and thus, the idea for a museum was born.

Cabinets that had previously housed exhibits at the Columbian Exposition in 1892 were taken out of storage and used to display these items.

Today, the Museum covers approximately 6000 square feet and is considered one of the most complete collections of telegraphic communications history in the country.

Appointed Curator in 1962, Joseph E. Stebner, Specialist, Equipment Control, has obtained many additional and rare exhibits for the Museum.

He has also loaned equipment to other museums such as the Smithsonian Institution. He recently fulfilled a request from the U.S. government to provide equipment for their display at the New Hemisphere Exposition in San Antonio, Texas.

Items from the collection have been used in motion pictures, theatrical productions, and television shows.

The most notable film to borrow pieces from the Museum was "Gone With the Wind".

Of all the many interesting pieces in the Museum, Mr. Stebner finds one, in particular, most intriguing. It is a replica of a device called the register.

The original register was used on May 24, 1844, to send the famous "What hath God wrought" message.

"I find the replica of the register interesting because it was made by my predecessor who worked from the original sketches used by Samuel Morse. Anyone familiar with patent drawings knows how difficult this can be," Mr. Stebner said.

Tours of the Museum are conducted by Mr. Stebner by appointment only.
placed in operation by Pete Borsi (1.) as old time broadcast men Jack Gray, Lloyd Espenschied, Bob Cobaugh and Andy Shafer look on. A neon lamp proved it was in operation.

DeForest Engineer Perfects New Radio Receiving System

The DeForest Radio Company, Jersey City, N. J. announce the development and perfection of a fundamentally new system of radio reception.

This new system is the conception of and the result of long research by Dr. George A. Somersalo, well known Finnish physicist and former Research Engineer of the DeForest Company.

"The Somersalo system, which is controlled by Arthur D. Lord, Receiver-in-Equity of the DeForest Radio Company, provides a fundamentally new method of obtaining radio frequency amplification without infringing any existing patents it is stated.

In the Somersalo system, selectivity is obtained by the use of a special form of high frequency tuning filter placed in the antenna circuit ahead of the first tube. The rest of the circuit is untuned, the only variable or adjustable apparatus or values being the rheostats if such method of controlling the filament supply be used.

An important feature is that the need of neutralization is practically eliminated. It is, of course, necessary to reduce the inherent feed-back in the first tube by one of the various well-known methods; not to prevent squealing, however, since there is hardly a tendency towards squealing, but in order to sharpen the tuning if such be necessary.

This announcement was made in the fall of 1927 at a time when many manufacturers were involved in patent litigations. Sounds like a handy idea -- what happen ??

MURDOCK HEADPHONES -- 1943

What's the story on Murdock during WWII ?? The company had ads in RADIO NEWS magazine during the war -- but other sources tell the company went out of business in the 30's......

RADIODIA AGAIN -- this time in Hamilton, Ohio. Jack Gray sent A.W.A. a picture of a nameplate bearing the name RADIODIA manufactured by Doron Bros. Electrical Company, Hamilton, Ohio. Needless to say, they soon changed the name for obvious reasons !
New Items...

Two pieces of equipment received from R.P.I. last year may be of interest to members. They consist of a portable transmitter and receiver each mounted on wood boards 16" by 11". The apparatus bears a plate with the TELEFUNKEN name with patent date of 1904 and notes it was sold by the James Biddle Co. of Philadelphia.

The receiver consists of a loading coil connected to a loose coupler with the secondary shunted by a variable condenser. The coherer detector is connected to the coupler through a fixed condenser and the tapper is arranged to strike the underside of the coherer. At the lower right corner is the relay with a pair of switches in the battery circuit. Separate batteries are used in the tapper and coherer circuits and are mounted under the baseboard. Aerial and ground connections are made at the binding posts at the lower left and output is at upper right.

In the transmitter, which is the conventional spark coil setup, the secondary is connected to a spark gap, small leyden jar and coil. The antenna is tapped on to this coil and a separate loading coil (shown at the lower left) is connected in the ground circuit. Twelve odd looking batteries are used mounted in parallel. The sending key is mounted next to the spark coil and is the "strap" type.

---"Link" Cundall, W2QY

WNY HAMFEST

Ever attend a radio convention and note the usual uninteresting names given to the various lecture or meeting rooms, i.e.: The West Room, The Pink Room, etc....?? The Committee at the recent Western New York Hamfest felt it was about time something was done on this score and renamed their four lecture rooms to: EDWIN ARMSTRONG, HIRAM PERCY MAXIM, ROSS HULL and the MARCONI....You guessed it -- all VHF programming was held in the Ross Hull Room with the Q.C.W.A. meeting in the Maxim Room!

YOU NEED OUR NEW CATALOG No. 27-M

Illustrating the most complete line Wireless Keys, Tuners, Helices, Condensers, Spark Gaps, Leyden Jars, Receivers, Head Bands, Anchor Gaps, Antenna Switches, Spark Coils, Variable Condensers, Potentiometers, Transformers, Motor Generator Sets, Buzzoplex and General Electric Apparatus.

WRITE FOR IT NOW.

J.H. Bunnell & Co., Inc.
32 PARK PLACE, (Broadway Block), NEW YORK
By STACY V. JONES

Although few of them will ever see it, all inventors must deal, directly or indirectly, with the United States Patent Office. It is the Patent Office that protects ideas on their way from brain to market.

In 1790, its first year, the office granted three patents, under the careful supervision of Thomas Jefferson, Secretary of State. Since then, it has issued more than 3,360,000, and is turning them out at the rate of 1,250 a week.

The numbering of patents began. No. 1 went to Senator John Ruggles of Maine for a locomotive "designed . . . to prevent the evil of the sliding of the wheels."

Today a patent is obtained by filing an application that meets the requirements, the payment of certain fees, and an average wait of two and a half years. The invention must be new and useful, and represent more than a trivial improvement.

The applications are passed on by a staff of 1,150 patent examiners. Most inventors deal with them through attorneys or agents (nonlawyers admitted to practice).

How to Get a Patent

The Patent Act of 1790, signed by President Washington, was history's first recognition by law of an inventor's intrinsic right to profit from his discoveries. The American patent system has remained basically unchanged since 1836, when

Reprint with permission from New York Times

<table>
<thead>
<tr>
<th>Band number</th>
<th>Frequency subdivision</th>
<th>Frequency range</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>VLF (very low frequency)</td>
<td>below 30 kc/s</td>
</tr>
<tr>
<td>5</td>
<td>LF (low frequency)</td>
<td>30 to 300 kc/s</td>
</tr>
<tr>
<td>6</td>
<td>MF (medium frequency)</td>
<td>300 to 3000 kc/s</td>
</tr>
<tr>
<td>7</td>
<td>HF (high frequency)</td>
<td>3 to 30 Mc/s</td>
</tr>
<tr>
<td>8</td>
<td>VHF (very high frequency)</td>
<td>30 to 300 Mc/s</td>
</tr>
<tr>
<td>9</td>
<td>UHF (ultra high frequency)</td>
<td>300 to 3000 Mc/s</td>
</tr>
<tr>
<td>10</td>
<td>SHF (super high frequency)</td>
<td>3 to 30 Gc/s</td>
</tr>
<tr>
<td>11</td>
<td>EHF (extremely high frequency)</td>
<td>30 to 300 Gc/s</td>
</tr>
</tbody>
</table>
It was in 1882 that a young man arrived in the United States from Stockholm, Sweden. His name was Oscar Hammarlund. He was 22 years old. In Sweden, he had been a special tool designer and inspector of electrical instruments for the L. M. Erickson Company, leading Hammarlund. He came to this country to accept a similar position with the Elgin Watch Company.

After four years with Elgin, he joined the Western Electric Company as superintendent of the Chicago plant. Six years later he became design engineer and plant superintendent of the Gray National TelAutograph Company (now known as TelAutograph Corporation) working closely with the founder, Elisha Gray, who is known as a co-inventor of the telephone.

This team of Gray and Hammarlund, was responsible for the development of the TelAutograph, a revolutionary machine which astounded the world. For here, for the first time, writing was transmitted by electric wire. Among the many Hammarlund features built into the machine was the stylus, which resembled our present-day “automatic” pencil.

The company was originally located in a loft on Fulton Street in Manhattan. In order to operate and pay the skilled help, it built a seemingly weird assortment of products. It was not until 1919, when broadcasting first started, that Oscar Hammarlund had an opportunity to put to practical use the results of his many early experiments. It was during these days, before most of today’s radio and electronics manufacturers even existed, that every wireless enthusiast and dabbler in electricity knew of Hammarlund. Amateurs and experimenters turned to the organization for many of their requirements.

Joseph Klein, who was later in charge of the model shop, said that when he joined the company in 1919 at the Fulton Street shop, one of its more complex pieces of equipment, the Armagraph, was in manufacture. This phonograph-type piece of equipment, made up of a rotating disk in which notches were cut and over which a platinum tip contact, was used to train amateur radio operators in Morse code. As the disk rotated and the needle hit each one of the holes, it produced the sound of a dot or dash.

The first Hammarlund capacitor was developed in 1916, not as a product for a specific electronic application, but as a machined item for an experimenter who furnished the plans.

In 1920 the company moved up to 18th Street where about 50 persons were employed. In the 30's the company manufactured thousands of Western Union call-boxes. These small fixtures were installed in nearly every business office. When a company executive wanted to telegraph a message, a turn of the crank on the call-box would send a code signal to the nearest Western Union office. A boy would be sent over immediately to pick up the message.

In about 1925 the company moved to 424 West 33rd Street, where the first Hammarlund- Roberts radio kits were built. These kits, designed for broadcast listening by experimenters, incorporated capacitors, coils, and other items manufactured in the plant.

In the same year the famous Midline variable condenser, an innovation designed by Oscar Hammarlund and his son Lloyd, was developed as the only practical solution to the tuning problem, and is now standard in nearly all home receivers. By 1931 three outstanding broadcast receivers—the Hi-Q-29, Hi-Q-30, and Hi-Q-31 were among the finest home-constructed receivers on the market. Some are still in use today.

The Comet-Pro, the first commercial shortwave superheterodyne, a Hammarlund pioneered product, was just undergoing final engineering touches in 1931. By 1936 the Comet-Pro was in use by the thousands all over the world by commercial operators, in broadcast stations, and by leading amateurs. All the important exploring expeditions included it as part of their standard gear. Early in 1936 the first “Super-Pro” was introduced after over four years of engineering.

The company’s “Super-Pro 600” receiver is still in use by governmental, military, and commercial groups all over the world and has attained an outstanding reputation of which the company is justifiably proud.

Because Hammarlund had specialized in high precision capacitors for use in commercial and military equipment, nearly 99 per cent of this nation's electronic war equipment in 1941 employed Hammarlund capacitors. Thousands of Hammarlund communications receivers were used on all the battle fronts by the Army, Navy, and Air Corps during World War II. Many other military electronic products were designed and built in the company laboratories and factory, some of which more than ten years later were still in the “secret” category.

Later the company moved and occupied four floors of the huge 460 W. 34th Street Building, with additional space in nearby structures, plus a newly completed plant at Mars Hill, near Asheville, N. C. Still later, the company moved its general offices to 53 West 23rd Street, and in 1964 to Mars Hill.

The magnificent tradition of Oscar Hammarlund was carried forward by Lloyd A. Hammarlund, who served as president, and by Martin Koenigsberg and Stuart F. Meyer (Fellow of The Radio Club of America) who later served in that post.
Who is entitled to priority?
by Robert Cobaugh, W2NX

A station operated by the Detroit News, WWJ, is alleged to have antedated KDKA in broadcasting news on regular schedule. It is claimed that on August 31, 1920, a radiophone program was put on the air from the Detroit News Wireless Station and the service thus inaugurated was continued on a regular schedule thereafter. If this could be substantiated, then KDKA, unless it had other claims to priority, would have to yield its crown to WWJ.

The fact is, however, that KDKA was the lineal successor of Westinghouse experimental station that Dr. Frank Conrad had operated on a schedule for a long time prior to the opening of KDKA. Records of the Dept. of Commerce show that WWJ was not on a list of licensed stations until June, 1922, although there was an earlier station listed in the name of the Detroit News and labeled WBL, Nov. 1, 1921. Assuming that WWJ is intitled to the November 1921 date, we find that KDKA antedates it a full year as a regular licensed radio broadcasting station, and if we consider the alleged date of the experimental station as August 31, 1920, we find that the Westinghouse experimental radiophone antedates that by months. Dr. Conrad's celebrated 8WX was first licensed in the monthly bulletin of the Dept. of Commerce, Aug. 1, 1916. It was re-licensed with the same call letters after the war and was published in the bulletin of May 1, 1920. No other station, either experimental or regular, appears in the name of the Detroit News until Nov. 1, 1921.

In support of the claim of priority it is alleged that the Detroit News, prior to the establishing of Station WBL in 1921, maintained an amateur station whose call was 8WX. The claim is also made that station 8CS was listed in the name of an employee of the newspaper. In a list of Amateur Radio Stations published June 30, 1921, 8CS is listed as W.J. Scripps, 3664 Trumbull, Detroit, Michigan with power of 20 watts. In the same volume on page 160 appears the name of Radio News and Music Company, Inc., Detroit, as operators of station 8WX with a power of 1000 watts. Whether this is a station established by the Detroit News is not evident.

In summarizing these listings, it appears that 8CS owned by Scripps, Manager of WWJ, was first listed in the June, 1921 -- whereas KDKA was listed 8 months earlier. Under these circumstances one should conclude the Pittsburg station is entitled to priority on that score alone. But as previously indicated, KDKA could claim Dr. Conrad's experimental station as its origin and go back to August, 1916. (Ed. note: This controversy pops every now and then resulting in interesting reading. An article in IEEE SPECTRUM took a stand, etc., Lloyd Espenschied sums up the whole business by saying the "key" is the definition "of a broadcast". There are many who claim the title -- Fessenden in 1906, Herrold a few years later in San Jose, etc...)
BRANDES
Long Distance
Wireless Receivers

Focusing the eye on two different objects at one time is no more difficult than reading long distance with two receivers of different pitch. For this reason, BRANDES RECEIVERS are all carefully tuned alike, thus intensifying their extreme sensitiveness.

Send stamps for our New Catalogue

C. BRANDES, Inc., Wireless Receiver Specialists
7 LIBERTY STREET, NEW YORK

SAVE $6.00—60%
We sold our stations to the Marconi Co. and have a few keys left on hand. Will operate any transmitter up to 3-kw. Silver contacts. 3" x 3" base, nickel finish.

KEYS NOW $4.00
Formerly Sold for $10.00
On receipt of price we will send to any P. O. address in the U. S. Money refunded if not satisfied.

Massie Wireless Telegraph Co.
Industrial Trust Co. Bldg., Providence, R. l.

Licensed Agents for the Sale of
PERIKON CRYSTALS
(By the W. S. A. Co.)

FOR AMATEUR USE ONLY
$1.00 PER SET

Send for free descriptive circular

GEO. S. SAUNDERS & CO.
BOSTON, MASS.
168 Washington St. 11 Devonshire St.

BOYS—YOU WANT THE BEST

The Prominent Features of
“H-C” Radio Receivers
are—

1. High pitch—very easy to read through static.
2. Extreme sensitiveness on weak signals.
3. Light weight—and comfortable fit.

Every Set Guaranteed to please, or your money back.

“H-C” Radio Receivers are best for amateur or professional

WEIGHT ONLY 10½ OZS.—SEND FOR BOOKLET 20E3

THE HOLTZER-CABOT ELECTRIC CO.
1920-22} E. CORCORAN AV.
CHICAGO, ILLINOIS