The SKYHOOK

HOLIDAY CITY AMATEUR RADIO CLUB

www.hcarc.us | September 2017 | Toms River, NJ

Our September Buffet Luncheon

One of our favorite activities is getting together at the Fortune Buffet.

It's an event you and your XYL may enjoy.

On the 2nd Wednesday of September (the 13th) we'll have our buffet luncheon, at the Fortune Buffet on Route 37, starting at noon.

It's behind Ruby Tuesday's, across from Walgreen's, in the Marquee Mall, which is at St. Catherine Blvd.

So take your spouse out (or treat a friend) to lunch.

It's "all you can eat" and our price is only $10, which includes a tip for the waitress and a little left over for the club. Tea is included, but soda is a dollar extra.

Happy Birthday To:

Shirley Goldberg

Janice Loscalzo

Jeanne Poray

Happy Anniversary To:

Doug & Jeanne Poray

Old Radio "Show & Tell"

If you have any old radio equipment you'd like to show us, we'd love to see it. So bring it in to our September Meeting.

We'd like to see those Heathkits, DuMont 'scopes, Meissner kits, Hallicrafters receivers, or that old home brew transmitter, or any interesting-looking parts.

Of course, anything by Collins, Hammarlund, National Radio, Drake, Barker & Williamson, Millen, McMurdo Silver, Boonton, Leeds & Northrup, or Majestic will get special attention.

So come on out and join the fun.

NEXT MEETING:
Thursday September 7 at 7:00 PM
Bldg A, Meeting Rm. #1
Holiday City South Clubhouse
Santiago Drive at Mule Road
Toms River, NJ

Ocean County ARES® News

- September 2017

Walk to Build Comm Support:

Saturday, September 9, 2017. Northern Ocean Habitat for Humanity, Walk to Build fundraiser. Registration starts at 9:00 AM, Dover Avenue on the Lavallette boardwalk (Ocean side). This is a three mile walk on the boardwalk and city sidewalks. Communications operators are needed at intersections, which are essentially turns of the walking course.

Last year we used WA2RES/R in Toms River for the event with no problems. If you can participate, please email me at WX2NJ at comcast.net or let me know on one of the weekly ARES nets. This walk is held in conjunction with Lavallette Founders Day and last year the Mayor invited participants to join in the celebration. Founders Day is celebrated (11 am to 5 pm) at Bay Blvd and Philadelphia Ave (Bay side) and is free to participate. Vendors will be there to sell you lots of food and stuff!

Ocean County ARES Meeting of August 16th:

Newly printed ARES shirts were handed out to those who ordered. WX2NJ went over the changes to Ocean County ARES repeaters, which is much too extensive to describe in full in this letter, but will be summarized below.

SNJ ARES Leadership has decided to replace all D-Star repeaters in the Southern Counties Emergency Radio Network (SCERN) with Yaesu Fusion repeaters and they will be operated only in the digital (DN) mode. Ocean County has been invited to join the SCERN, but will not be part of the financially backed change.

Sometime in September 2017, the Harvey Cedars D-Star repeater will be replaced with a Yaesu Fusion DR-1, but will be operated in the AUTO/AUTO mode. This means analog in, analog out and digital in, digital out. If a digital (DN only, not VW) input is detected, the repeater will automatically be linked to a SCERN private server via Internet and will be linked to all other SCERN repeaters throughout SNJ. This will allow the repeater to be used as an analog (FM) repeater locally with no linking. The repeater will operate on a frequency of 445.36875 MHz, -5 MHz, PL of 131.8 This frequency is temporary and will be revised when coordinated.

The D-Star repeater (removed from Harvey Cedars) will be installed in Berkeley Township on a municipal 150 foot tower near the Berkeley Township Police Station. The base of the D-Star antenna will be at approximately the 125 foot level or 173 feet above sea level. This D-Star installation will be stand-alone with no Internet linking. It will allow the EOC to deploy D-Star Go-Kits, which are already built, to be used in Ocean County emergency applications. The D-Star repeater will operate on a frequency of 445.36875 MHz, -5 MHz and this frequency will not be changed. The D-Star repeater will not activate the Fusion repeater at Harvey Cedars and vise versa.

73 de WX2NJ
Bob Murdock
Ocean County Amateur Radio Emergency Service® EC

Ocean County Skywarn News

This past August 12th Skywarn training was held at the Atlantic County OEM Tony Canale Training Center in Egg Harbor. Training was taught by Dennis Dura (K2DCD), Regional Skywarn Coordinator and the class was from 10 am to 12:30. There was literally standing room only as there was a record 99 participants for the class. Dennis said that it was the largest class he has ever taught. The class was scheduled and coordinated by Dave Larcombe (KD2KVZ) of Atlantic County ARES/Auxcomm.

We had 5 participants from Ocean County so we have new Skywarn members. We had participants from as far as Delaware, PA and Indiana. It was such a success that another set of training will be scheduled for some other counties to the west and possibly in the Ocean/Monmouth area to recruit for more active

members. We're hoping to get a class closer to home to make attendance easier.

The National Weather Service really wants an active and robust Skywarn in the Mount Holly office. Skywarn is a GREAT source of information for the NWS and they are looking to really rejuvenate the local program. With that in mind, Tom (N2XW), Ocean County Skywarn Coordinator, and myself (KC2OON), Asst. Coordinator are now holding informal nets when bad weather is approaching or eminent. We use the WA2RES north repeater 449.825 and N2OO south repeater on 146.835 during weather events. You can always make reports on the Ocean County Skywarn Facebook page as well. We're also always looking for new Skywarn members and if you're interested you can contact me at kc2oon@yahoo.com

Urb's Online Course For Extra Class

Beginning in mid to late September, W1UL is offering an online guided-study Extra Class licensing course. This course differs substantially from the normal ham-cram.com independent study licenses prep because the Extra class pool is 50% larger than the Technician or General Class pools, making associations between question and answers more difficult. In addition the Extra subject material is more challenging. A book costing less than $20 may be required.

Candidates will complete and report on their results of assignments and participate in discussions on a dedicated online reflector. The pace of the course is initially targeted at one subelement (out of 10) per week but actual progress depends upon the pace of candidate assignment completion.

The course will terminate with a two hour review session immediately followed by a VE test. The principle location for the review session is the Gloucester County ARC field house in Mullica Hill, NJ. However W1UL will conduct a review session and VE test for any club in the SNJ section or any location within 70 miles of Tuckerton, NJ provided there are at least three candidates, (not all necessarily from the same club), a club furnished site for the review/VE session and the club provides two additional Extra class VEs.

At this point in time an indication of interest is the only requirement, not looking for a commitment at this time. Reserve a tentative spot now since participation may be limited.

Call Urb W1UL at 609-937-5487 with questions or email Urb at urb@ham-cram.com .

Our VE Crew

Larry K2QDY (Liaison) 732-349-2950,
Urb W1UL, John KQ4WR, Stan KB2PD, Steve N2WLH,
Murray KD2IN, Paul N2QXB, Larry WA2VLR, Tony KD2GSO.
*License exams are given by appointment at 7pm on the second Wednesday of each month at Holiday City South Clubhouse, Bldg A, which is at the corner of Mule Rd. and Santiago Dr. Call Larry Puccio, K2QDY, at **732-349-2950** for information.*
Directions: From either Route 37 W or Davenport Road, take Mule Road to Santiago Drive. Turn into the parking lot from Santiago Drive, and park near the pool. Enter the building nearest the intersection.

CLUB COMMITTEES

Refreshments:	John Rogers & Tony Kuzinski		
Webmaster:	Steve N2WLH	N2WLH@yahoo.com	
Publicity:	Paul N2QXB	732-279-3911	
Programs:	Tony KD2GSO	732-930-5779	
Sunshine:	Dave WA2DJN	WA2DJN3@verizon.net	
Field Day:	Larry K2QDY	732-349-2950	
VE Sessions:	Larry K2QDY	732-349-2950	
Membership:	Doug KC2TZC	732-928-2316	

Holiday City Amateur Radio Club

Toms River, New Jersey

Web Site www.hcarc.us

President	Tony Kuzinski	KD2GSO	732-930-5779
Vice President	Paul Hansen	N2QXB	732-279-3911
Treasurer	Larry Puccio	K2QDY	732-349-2950
Secretary	Marge Penn	KD2LNT	732-736-0115
Executive Board	Doug Poray	KC2TZC	732-928-2316
Executive Board	John Roberts	KQ4WR	732-350-1162 ext 33
W2HC Trustee	Larry Puccio	K2QDY	732-349-2950

Membership is open to all interested persons. Ham license is not required. Dues are $25.00 per year, payable Jan 1st. Members joining during the year will have the dues prorated. Family membership $30.00 per family.

Meetings are held on the first Thursday of every month, at 7:00 pm.
Location: Meeting Room #1 in the Holiday City South Clubhouse.
Directions: From either Route 37 W or Davenport Road, take Mule Road to Santiago Drive. Turn into the parking lot from Santiago Drive and park near the pool. Enter the building nearest the street corner.-

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Our New Lending Library

We've started an informal library of books. If you have any reference books, such as “Handbook for Radio Communications”, “Radio Amateur's Handbook”, “ARRL Antenna Book”, “ARRL Operating Manual”, or “Reference Data for Engineers..” that you would like to lend, bring them to the meeting. If no one is interested, you take them back home, because we have no place to keep them.

Be sure to have at least your callsign in each book for identification, and get a receipt from the borrower.

If you would rather not bring them in, make a list of what you have, with a brief description of each, and bring the list. But obviously that arrangement's not nearly as convenient for either the lender or the borrower.

Sunspot Cycles Never Die

-They just fade away.

Cycle 24 is continuing to fade away, leaving the ten-meter band for local communications only. Twelve, fifteen, and eighteen likewise. Twenty provides occasional daytime DX, but if you prefer something more consistent, there's Forty and Eighty.

On the other hand, reduced solar radiation seems to provide less D-layer signal absorption, and maybe fewer hurricanes and tornadoes.

Russ Young WA2VQV reports that he worked a couple special stations:

LZ284SKD in Bulgaria, in memory of one of the Saints of the Eastern Orthodox Church, 17Jul 2125Z 30m CW KN22dq 4894mi NE; and

II2FIST in Italy, celebrating the 30th anniversary of the First Class Operators Club, 7Aug 2138Z 20m CW JN45tq 4165mi NE.

Russ also reported regarding his health, his indoor loop antenna, and Ed Picciuti's indoor antenna trouble: “My health is pretty stable. If Ed's building has aluminum siding it was probably blocking his signal from getting out. My siding is some composition material.”

Meet George “Ike” Icenhower WB2BNB

A Meet the Members feature by Doug Poray KC2TZC

As a new member to our club, George Icenhower Jr. spent his career working for Verizon with responsibilities ranging from electronic repair to computer programming. He earned his amateur license in December, 2016 and quickly upgraded his status to General Class. George’s call sign is WB2BNB. In addition to using an Yaesu 1200 and a Yaesu 3200 DR rig, he utilizes an Alinco DX SR8, a MFJ 9420, and a MFJ 9440 for QRP operation. George has a Hustler 5 BTV folded dipole, a PAR EndFedZ, and a Comet GP-1 for his antenna complement. He enjoys working the 20 and 40 meter bands and is also active on 2 meters.

George was interested in amateur radio 30 years ago but other things got in the way. He decided, “now was the time“. George’s memorable amateur radio experiences include working Africa with only 5 watts and participating in Field Day demonstrating ham radio to a large group of people. Other activities that George finds interest in include camping, hunting, target shooting, fishing, and motor cycling.

August 3 Presentations On YouTube

In case you missed them, the two great presentations given at the Holiday City Amateur Radio Club meeting on August 3 are available on the Internet:

Doug Poray KC2TZC gave a presentation on his Antique Radio Club which can be found here:

https://youtu.be/XsyU_-ntgUg

Larry Puccio K2QDY gave a presentation on his ham radio station and antenna setup which can be found here:

https://youtu.be/2BSL5uPsAc0

New Jersey, Iowa & NH QSO Parties

New Jersey, Iowa, and New Hampshire all have their QSO Parties on the same weekend, Sept 16-17.

http://www.k2td-bcrc.org/njqp/njqp_rules.html

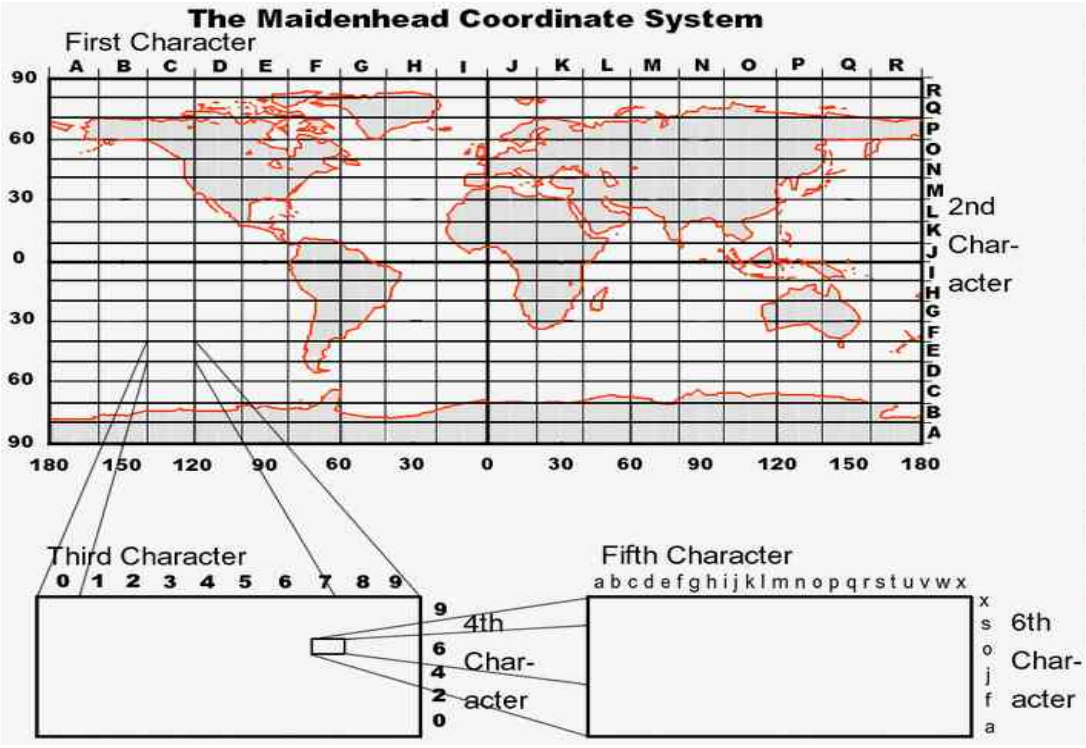
http://w0yl.com/sites/default/files/2017-rules-FINAL-v02.pdf

http://www.w1wqm.org/nhqso/NEW_HAMPSHIRE_QSO_PARTY_RULES.pdf

DX Opportunities For September

Thanks to NG3K for gathering the list, & to Wikipedia, GoogleMaps and QRZ.com for many of the details.

Begin	End	Call Sign	Entity	QSL via	C	ITU	CQ	Grid	Miles	Dir	IOTA	Modes*	Bands
	*MODES: C=CW, D=Digital, F=FM, J=JT, P=PSK, R=RTTY, S=SSB												
Sep 05	Sep 22	3B8/PA3HGT	Mauritius	LotW	AF	53	39	LG89sq	9304	E	AF-049	SD	40 20 10m
Sep 16	Sep 28	5T5OK	Mauritania	LotW	AF	46	35	IK28aa	3762	E		CSR	160-6m
Sep 01	Sep 10	7Y94I	Algeria	7X2DD	AF	37	33	JM16mq	4061	ENE	AF-094		
Sep 07	Sep 15	A25AL	Botswana	Auto Buro	AF	57	38	KG28ma	7660	ESE		C	
Sep 15	Sep 25	A25BI	Botswana	LoTW	AF	57	38	KG28ma	7660	ESE		CS	160-6m
Sep 15	Sep 25	A25SP	Botswana	Buro	AF	57	38	KG28ma	7660	ESE		CS	160-6m
Sep 15	Sep 25	A25BE	Botswana	LoTW	AF	57	38	KG28ma	7660	ESE		CS	160-6m
Sep 06	Sep 13	CN2HZ	Morocco	LotW	AF	37	33	IM63aa	3631	ENE		S	
Sep 01	Sep 04	E51JHQ	South Cook Is	LotW	OC	62	32	BG08cs	6927	WSW	OC-013	S	80-6m
Sep 13	Sep 25	E6AG	Niue	LotW	OC	62	32	AH56bw	7094	W	OC-040	SD	80-6m
Sep 06	Oct 01	FO/DF1YP	FRENCH POLYNESIA	DF1YP Buro	OC	63	32	BH52bp	6262	WSW	OC-046	SD	20-15m
Sep 17	Sep 23	FP/M0WUT	St Pierre & Miquelo	M0WUT	NA	9	5	GN16tw	1015	NE	NA-032		“all”
Sep 17	Sep 23	FP/M0BLF	St Pierre & Miquelo	M0BLF	NA	9	5	GN16tw	1015	NE	NA-032		“all”
Sep 17	Sep 23	FP/DK2AB	St Pierre & Miquelo	DK2AB	NA	9	5	GN16tw	1015	NE	NA-032		“all”
Sep 17	Sep 23	FP/G3ZAY	St Pierre & Miquelo	G3ZAY	NA	9	5	GN16tw	1015	NE	NA-032		“all”
Sep 17	Sep 23	FP/DH5FS	St Pierre & Miquelo	DH5FS	NA	9	5	GN16tw	1015	NE	NA-032		“all”
Sep 17	Sep 23	FP/G7VJR	St Pierre & Miquelo	G7VJR	NA	9	5	GN16tw	1015	NE	NA-032		“all”
Sep 30	Oct 20	H40GC	TEMOTU	LotW	OC	51	32	RH37mm	8288	W	OC-100	CSRP	160-10m
Sep 09	Sep 15	HB0/DL2SBY	Liechtenstein	LotW	EU	28	14	JN47sa	4026	NE		CSR	80-10m
Sep 14	Sep 21	HD8M	Galapagos	WB2REM	SA	12	10	EI48aa	3108	SSW	SA-004		
Sep 01	Sep 16	J68HZ	St Lucia	LotW	NA	11	8	FK94ma	1966	SSE	NA-108	CSR	160-6m
Sep 15	Sep 20	JW/OM6TC	Svalbard	OM6TC Buro	EU	18	40	JQ78wo	3526	NNE	EU-026	CS	HF
Sep 02	Sep 09	OJ0/OH2BR	Market Reef	OH2BR	EU	18	15	JP90mh	3980	NE	EU-053		HF incl 60m
Sep 09	Sep 22	SV5/HB9OAU	Dodecanese		EU	28	20	KM36sm	5195	NE	EU-001	SRP	40-10m
Sep 20	Sep 26	T88XA	Palau	LotW	OC	64	27	PJ77bi	8704	NW	OC-009	CS	160-10m
Sep 27	Oct 02	V63FKR	Micronesia	JR1FKR	OC	65	27	QJ98aa	7743	WNW	OC-010		
Sep 12	Sep 28	VK9CGJ	COCOS & KEELING	W7GJ	OC	54	29	NH87jt	10448	NNE	OC-003		6m
Sep 28	Oct 30	XT2AW	Burkina Faso	M0OXO	AF	46	35	IK92dh	4756	E		CSD	40-10m
Aug 26	Sep 17	XV9WJR	Vietnam	WA7WJR Dir	AS	49	26	OK30it	8933	N		C	40 20m
Aug 28	Sep 13	YJ0AT	VANUATU	LotW	OC	56	32	RH43am	8431	W	OC-035	C	40-10m



CURRENT FLOW Vs ELECTRON FLOW

By Bob Buus, W2OD

Did you ever wonder why conventional current flows from positive to negative but the electrons which constitute the current flow go from negative to positive? This was a source of confusion for me in my youth. I could understand how a cathode in a vacuum tube would boil off electrons which would flow to the plate or anode of the tube. But the conventional current flow through a vacuum tube was from plate to cathode. Using a vacuum rectifier in a power supply, the plate or anode would be connected to the ac voltage and the cathode would produce the positive dc output voltage. How confusing!

Actually, the problem was created by Ben Franklin in his early electrical experiments in 1746. At that time, there were two known types of static electricity. Vitreous electricity was produced on a glass plate by rubbing it with silk. Resinous electricity was produced on an amber rod by rubbing it with fur. These two types of electricity were physically attracted to each other.

Leyden jars had been invented the previous year. These were capacitors that could store static electricity. They were made from a jar or bottle with a metal foil covering the outside for one electrode and metal foil (or water) on the inside for the second electrode. Two conductors separated by an insulator (glass) makes a capacitor that can store charge. Franklin conducted many experiments with Leyden jars (in fact, he called a collection of Leyden jars a “battery”). He noticed that if he charged the inside of a Leyden jar with vitreous electricity and charged the outside of another Leyden jar with resinous electricity, the jars behaved the same.

From that observation, Franklin proposed that there was only one type of electricity and hypothesized that the vitreous electricity was simply an excess of charge and that resinous electricity was simply a shortage or lack of charge. Thus he proposed that the virtuous charge was positive and the resinous charge negative. He added that this was just a guess since he had no way to determine which direction this charge flowed. He thought that other experimenters in the future would measure this flow and correct his assumption if he had guessed wrong.

Well, it took until 1892 before J. J. Thompson discovered that the charge carrier was the electron and it had a negative charge based on the traditional definition of positive and negative proposed by Franklin and used for nearly 150 years. Had Franklin guessed the opposite (that resinous electricity was positive), the electron would have been found to have a positive charge by Thompson and the conventional current flow would then be consistent with the electron flow. And I would have been less confused in my youth. So now you know.

[Editor's note: Within a battery, the electrons do go from positive to negative, so the positive element is the cathode, and the negative element is the anode!]

Is Morse Code Really Vail Code?

by Urb LeJeune W1UL

Introduction

Samuel Morse, in conjunction with Joseph Henry and Alfred Vail (pictured on the left), invented a telegraph system, before the invention of telephones. Their system was capable of sending messages over long distances using pulses sent to a machine which, in turn, made marks on a moving paper tape.

It is irrefutable that Samuel Morse invented a code based on dots and dashes which subsequently became dits and dahs to more closely resemble the actual sound of transmitted code. However, Morse’s code is not what we use today on the ham bands.

Joseph Henry

Henry was a scientist who served as the first Secretary of the Smithsonian Institution and he was highly regarded during his lifetime. While building electromagnets, Henry discovered the phenomenon of self-inductance. He also discovered mutual inductance. Henry developed the electromagnet into a practical device. He invented a precursor to the electric doorbell that could be rung at a distance via an electric wire and the electric relay. The unit of inductance is the henry, named in his honor. Henry's work on the electromagnetic relay was the basis of the practical electrical telegraph, invented by Samuel

Morse and Sir Charles Wheatstone, separately.

Albert Vail

Alfred Lewis Vail was an American machinist and

inventor. Along with Samuel Morse, Vail was central in developing and commercializing
American telegraphy between 1837 and 1844. Vail and Morse were the first two telegraph operators on Morse's first experimental line between Washington, DC, and Baltimore. Additionally, Vail took charge of building and managing several early telegraph lines between 1845 and 1848. He was also responsible for several technical innovations of Morse's system, particularly the sending key, an improved recording registers and relay magnets. Vail also created the modified Morse's concept of code which is virtually unchanged with the code we know and love to this day.

The Controversy

Morse's concept of a code for use on his telegraph system required a three part process. A message first required that the individual words be converted to a series of numbers contained in a codebook. The sending operating send the numeric sequences corresponding to the original message. The receiving operator first copied the numeric codes and then converted them into plain English words from the codebook the transmitting operator used. Vail composed a code system virtually the same as we use today. He demonstrated the code to Morse. At a press conference, later that day Morse dubbed Vail's code "Morse Code."

Unfortunately, Vail was a shy and retiring person and never claimed the code he developed. The only thing that the Morse and Vail codes have in common is that both codes sent characters using dits and dahs.

Fort Monmouth New Jersey, for decades the home of the Signal Corps, was originally named Camp Vail. Will history ever give Alfred Vail the credit he so richly deserves? Probably not!

[The Vail code became known as American Morse Code, and was used by all wire telegraph services, like railroads and Western Union. Radio operators have almost always used the International Morse Code, which is easier to learn than Vail's code, which had dashes of three different lengths and little spaces within some of the characters. -Editor]

Hedy Lamarr - Not Just A Pretty Face

By Urb LeJeune W1UL

urb@ham-cram.com

Introduction

Hedy Lamarr was an Austrian and American film actress and inventor. After an early and brief film career in Germany that included the controversial 1933 film Ecstasy in which she is seen swimming in the nude and running naked, she fled from her husband, a wealthy Austrian ammunition manufacturer, and secretly moved to Paris. While in Paris she met MGM head Louis B. Mayer who offered her a movie contract in Hollywood, where she became a film star from the late 1930s to the 1950s.

Hedy Lamarr in 1944

Lamarr appeared in numerous popular feature films,

H. K. MARKEY ETAL, 2,292,387
SECRET COMMUNICATION SYSTEM Filed June 10, 1941 2 Sheets-Sheet 2
Patented Aug. 111, 1942 SECRET Communication SYSTEM Hedy Kiesler Markey, Los Angeles, and George Anthcil, Manhattan Beach, Calif.
Application June 10, 1941, Serial No. 397,412
6 Claims.
This invention relates broadly to secret communication systems involving the use of carrier waves of different frequencies, and is especially useful in the remote control of dirigible craft, such as torpedoes.
An object of the invention is to provide a method of secret communication which is relatively simple and reliable in operation, but at the same time is difficult to discover or decipher.
Briefly, our system as adapted for radio control of a. remote craft, employs a pair of synchronous records, one at the transmitting station and one at the receiving station, which change the tuning of the transmitting and receiving apparatus from time to time, so that without knowledge of the records an enemy would be unable to determine at what frequency a controlling impulse would be sent.

including Algiers (1938), I Take this Woman), Comrade X (1940), Come Live With Me (1941), H.M. Pulham, Esq (1941), and Samson and Delilah (1949).

The spread spectrum patent issued in her maiden name Hedy Kiesler.

At the beginning of World War II, Lamarr and composer George Antheil developed a radio guidance system for Allied torpedoes, which used spread spectrum and frequency hopping technology to defeat the threat of jamming by the Axis powers. Although the US Navy did not adopt the technology until the 1960s, the principles of their work are now incorporated into modern Wi-Fi, CDMA, Bluetooth and Cell Phone technology. This work led to their induction into the National Inventors Hall of Fame in 2014.

[Part of] the Patent award is shown above. It's interesting to note that the US Navy took over the patent in the early part of WWII but never used it until the Cuban Missile Crisis in 1962. The US Navy never returned the patent rights to the inventors and as a result, they never made a nickel on their inventions.

September

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2
3	4	5 Breakfast 9:00am at HC Diner	6	7 HCARC MEETING 7pm	8	9
10	11 Noon lunch at Lisa's	12	13 Noon Buffet Luncheon; License exams	14	15	16 NJ QSO Party begins
17 NJ QSO Party continues	18	19 Breakfast 9:00am at HC Diner	20	21	22	23
24	25 Noon lunch at HC Diner	26	27	28	29	30