



HARMONICS

1916

South Jersey Radio Association

2013



HAM TECH

Vol 4 No. 3 by John - WY2J

OSCILLATORS & FREQUENCY SYNTHESIZERS

Part 2 of 3

Digital Phase Locked Synthesizers

Introduction - In 1952 as W3TNM I built a Johnson Viking II transmitter from a kit. It ran a 180 watts input on CW and 135 watts on AM phone. It contained a crystal oscillator with provisions for 10 crystals selectable from the front panel with a rotary switch. In a way this was a very early frequency synthesizer but with only 10 frequencies, just enough for 2 per band for the 5 bands used in those days. Had Johnson included 3 oscillators, 2 with 10 crystals each, 1 with 5 and 2 mixers to add the frequencies from the 3 oscillators it would have provided 100 frequencies spaced 5 KHz per band. This would have been a useful synthesizer. But crystals in 1952 sold for \$4.00 each and 25 of them would be \$100.00 or 36 percent of the cost of the transmitter, and over twice the price of the external VFO kit that Johnson sold. This early analog synthesizer couldn't compete with the VFO on price.

In the late 50's Hewlett Packard marketed a true frequency synthesizer with 100 KHz to 500 MHz coverage in 0.1 Hz steps and 70 dB down spurious, true world class performance then, but with a price tag of over \$10,000 in 1950's money. Needless to

say none of these units were ever used in Ham equipment, not even by Collins.

The affordable frequency synthesizer did not appear until after the semiconductor industry learned how to make programmable digital counters on a chip that would operate at VHF frequencies. Coupled with a VCO, a crystal reference oscillator, a phase detector and some low frequency filtering the Digital Phase Locked Loop Frequency Synthesizer was born in the late 1960's.

Basics of The PLL Synthesizer - Figure 1 below is a very basic functional block diagram of the single loop digital phase locked loop frequency synthesizer. It is a hybrid of analog and digital functions. Other functions will have to be added to achieve certain levels of performance. This will be discussed later.

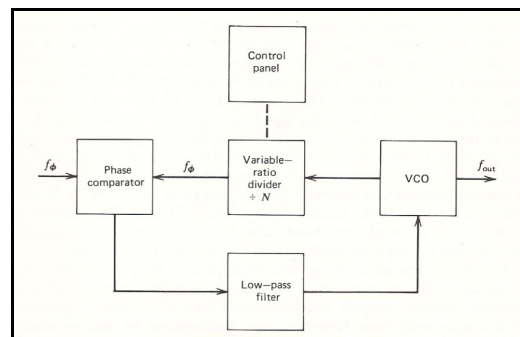


Figure 1 - Single Loop PLL Digital Frequency Synthesizer.

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SOUTH JERSEY RADIO ASSOCIATION

HARMONICS is published monthly and is the official news letter of the South Jersey Radio Association. The SJRA was established on June 16, 1916 and has been meeting continuously since its inception. The club has been affiliated with the American Radio Relay League since 1920.

The SJRA meets each month on the fourth Wednesday, January through September; and usually the third Wednesday, October, November and December; in one of the Meeting Room of the Gibson House at 525 East Main Street, Marlton, NJ 08053. Visitors are always welcome at our general meetings. **“Our Meetings are Smoke Free”**

SJRA operates the K2AA Repeater (145.290 - PL 91.5) located in Medford, NJ and the K2AA DX Cluster (145.770) located in Mt. Laurel, NJ. The repeater and DX Cluster are open for use without restriction to all licensed amateur operators. The DX Cluster is also accessible on line (see www.sjra.org for information).

There are currently over 150 SJRA members active in most all aspects of amateur radio. Membership is by application and is subject to the approval of the Board of Directors. Club dues are currently \$30/yr. for memberships, \$22.50/yr for retired-person membership (62 plus 1 yr membership), and \$15/yr. for additional family members and student membership. Membership information is available on the K2AA Repeater or from Mary Von Lintig, KV2M, 856-772-6475

EMAIL: [sjra at sjra dot org](mailto:sjra@sjra.org) SJRA's web page www.sjra.org
 Mark O'Brien, K2AX, is the SJRA/ARRL VUCC card checker
 Joe Fisher, KC2TN, is the SJRA/ARRL WAS card checker

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Repeater: Joe Fisher, KC2TN
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Picnic: Debbie Pullaro, W9QWN
Ways & Means: Ray Golley, N3RG
Property: Jon Mac Millan, W2MC

Harmonics Staff:

Publisher/Editor: Ted Groke, W2TAG
 or Don Beaulieu, WA2DUE
Circulation: Mary VonLintig, KV2M;
 Jim Vecchiola, KR2T

 ★ **Harmonics** is now available on the WEB in pdf format at: ★
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 ★ **South Jersey ARRL Section News** is available on the WEB at: ★
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LOCAL WEEKLY NETS

Monday	K2AA, Medford	145.290 @ 8PM
Thursday	Various Locations	28.405 @ 8PM

Harmonics Deadline

Articles submitted for the next HARMONICS will be accepted until Monday, April 8, 2013. Email: [ted.w2tag at gmail dot com](mailto:ted.w2tag@gmail.com)

SWAP SHOP - For Sale/Wanted ads are free of charge and are accepted for Amateur Radio related items only. While ads are not restricted to SJRA members, there is only limited space available and members have priority for listings. No items will be accepted for inclusion in the Swap Shop from commercial vendors or traders. All ads must be submitted at least three weeks prior to the scheduled SJRA general meeting date.

GENERAL ADVERTISING - Limited commercial advertising is accepted on a space available basis. Annual advertising rates range from \$25/yr (Min 1/8 page) to \$200/yr (Full Page). Information is available from Ken Botterbrodt, K2WB.

Meeting Minutes

Membership Meeting of March 6, 2013

About 48 members and guests present.

Minutes - Approved as printed in this month's Harmonics

Treasurer Report - Ray, N3RG.

New Members - Mary KV2M- Paul, KF2Y, as a returning "new" member.

Historian - Mary, KV2M, had a DX Wheel, which is a cipher wheel made by electrovoice that identified callsign blocks and allowed the user to identify when the QSL was sent and when received.

Health & Welfare - Kathy KM2KME - Matt Merry, W2MAT, back from hospital (esophagus bleed - now stomach problems). Charley, N2CE, having issues with his legs. Lou's (N2HQL) sister passed away. Mark, K2AX, barn burned down, looking for help and two pressure washers for this Saturday

Programs - Kathy, KM2KME- no report

Correspondence - Ted, W2TAG- no correspondence.

Harmonics - Ted, W2TAG, deadline 11 March for March Harmonics

VE Testing Report - Al, N3AVT- Team Meeting 13 March (second Wednesday) - start VE testing on 10 April

Nets - John, WY2J, repeater working well. The 10 meter net has had more participation than the 2 meter net lately

AK2S (Don Corrington) from the Burlington County Radio Club presented

SJRA with the New Jersey Gavel for highest aggregate club score in the New Jersey QSO Party (28/29 July 2012). Bulk of winning is the result of K2WJL Joe Lameiras.

Contests - Jon, W2MC, Jan VHF - Rich, KV2R-6699; N2SCJ-1060; KF2Y-175; KC2THQ-?; WB2EOD-?; (about 100 Q's each). Nov Sweeps Phone - KV2R-69,536; K2WJL-39,816.

DX Report - Jack N2VW- Upcoming DXpeditions from 3B8/3B9 - Mauritius, 7P8CC Lesoto, and 9M4SLL Spratley Islands upcoming.

Repeater - Joe, KC2TN- working well

Club Stuff - Joe, KC2TN- see him for stuff.

Web Team - Ira, W2IRA- Presentation next month on the new web page and how to post stuff to it.

Field Day - Ken, K2WB- FD is 22/23 June 2013

Other Committees (if needed):

Hospitality: Jean KA2YKN- progress

Publicity: Debbie W9QWN- progress

Picnic: Debbie W9QWN- progress

Property: Jon W2MC- progress

Awards: Lou N2HQL-progress

Old Business - None

New Business - None

Program - the White Elephant Sale (!) Jon, W2MC, was the auctioneer - \$128 to the Club.

Motion to adjourn. General Meeting Minutes Thanks to Jon, W2MC.

Board Meeting of March 6, 2013

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(Ham Tech from page 1)

The input reference frequency f_{ϕ} is equal to the minimum frequency step size of the synthesizer. Since it may be in the kilohertz or less range it is usually produced by counting down the output of a 1 to 10 MHz range crystal oscillator with a binary counter. A 1 KHz step size synthesizer with a 1 KHz reference frequency could use a 4.096 MHz crystal oscillator counted down with a 12 stage binary counter ($NR = 212 = 4096$) to achieve a 1 KHz reference. This is usually a constant for any one synthesizer so the less complex binary counter is used with a rather odd ball crystal frequency.

The VCO or voltage controlled oscillator provides the variable frequency output of the synthesizer and the input to the divide by N variable ratio counter. This counter is programmed by the user such that the divided VCO frequency is always 1 KHz. Thus if the desired output frequency is 7.25 MHz the countdown ratio N is $7250 \text{ KHz} / 1 \text{ KHz} = 7250$. Under phase locked conditions the phase error signal out of the phase detector is a constant that may or may not be zero. This is the loop locked condition and the VCO frequency will be exactly 7.25 MHz with a reference signal of exactly 1 KHz and a countdown of 7250. Change the count to 7251 and the VCO will move to 7.251 MHz. What if the VCO moves to 7.251 MHz due to drift with the counter still set to 7250? The loop is out of lock and the output of the phase detector will change to a new voltage that will drive the VCO back to 7.250 MHz. Sounds great but keeping this servo system in lock is a lot easier than getting it to lock initially. If the difference between the initial unlocked frequency of the VCO and the desired locked frequency is large expressed as a percentage of the loop bandwidth, the system as shown in Figure 1 will never lock.

This maximum initial tuning error to achieve lock can be a very small value because the loop bandwidth must be a fraction of the reference frequency. There are numerous conflicting parameters in this simple system. We will explore some of them and the fixes developed.

The most serious problem was in the lock on time with large VCO designation errors and a phase only comparator. The lock time reaches infinity very quickly which means it will never lock. This was fixed many years ago by replacing the analog phase comparator with a digital frequency and phase detector. When the loop error is outside the lock range of the phase detector it switches to a frequency discriminator which drives the VCO back into the lock range, then switches back to a phase detector. Single chip units to do these functions have been available for many years.

Other conflicts have required changes to the basic design of the synthesizer with two of them shown in Figure 2 below.

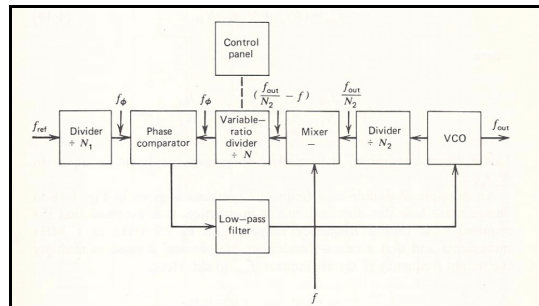


Figure 2 - Phase Locked Loop Synthesizer with Provisions for VCO Scaling and Offset.

The reference frequency divider or pre-scaler is shown here as divide by N1 and a second N2 pre-scaler is added after the VCO

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(Ham Tech from page 4)

to handle large percentage bandwidth synthesizers. The mixer shown in the VCO path is used to provide frequency offset where a very high output frequency with a narrow percentage tuning range is encountered. This mixer port is also a convenient insertion point for the output of a second PLL synthesizer. The second loop or synthesizer is often employed to fix the conflict between loop bandwidth and reference frequency or step size of a single loop design.

The output frequency of the single loop design of Fig. 2 is: $F_{out} = (NF\phi + F)$
 $N2 \& F\phi = F_{ref} / N1$ where the smallest tuning step is $N2 F\phi$ and thus high values of $N2$ are not desired.

The phase noise of the VCO is the dominant noise source in this synthesizer, however this can be reduced by the closed loop gain of the loop if the loop bandwidth encloses the VCO spectral noise. This requires a high loop reference frequency which yields a large tuning step size. We fix this problem by building a second fine tuning step synthesizer that fills in the frequencies of the large step. The second synthesizer signal is inserted into the first synthesizer loop at the offset mixer input.

This two loop design yields a high performance design with a reasonable number of piece parts mainly due to the fact that many are included in a few integrated circuits. This made the synthesizers for Ham transceivers affordable and brought crystal stabilities to VFO flexibility.

Next month - We conclude this three part series on Oscillators and Synthesizers

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(Meeting Minutes from page 3)

All board members were in attendance except Debbie, W9QWN, and Ted, W2TAG. Minutes of the February meeting were approved as printed motion N2HQL/W2MC.

Membership by Mary, KV2M: Robert Petty, KC2HEN, second by Kathy, KM2KME, accepted. No Correspondence sent. Received a note requesting that N2EZ (SK) be removed from mailing list.

Ray, N3RG, gave the treasurer's report: 79 current members. Accepted, motion N2HQL/KR2T.

Contests- Jon, W2MC, showed the gavel awarded as the top agg. club in NJQSO contest.

Jon, W2MC, read the list of scores for the Jan VHF contest.

Picnic- Progress
 H& W,- Progress

Programs- Kathy, KM2KME: March- Website by Ira, W2IRA; April- Hilltop to Hilltop communications in 1840: May- Storm Team! with their latest robot. Club elections will also be held.

June- Field Day/installation of new officers.

VE report by Al, N3AVT- tests printed; room set-up started; team meeting March 13; first test April 10. Postings to be put on Website, and listed. Need insurance cert and some supplies. We need to make sure the no-fee aspect is mentioned.

Homebrew show & tell- Al, N3AVT- no apparent interest.

Web Team, by IRA, W2IRA- need to consider adding some new modules, especially members section.

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SOUTH JERSEY RADIO ASSOCIATION LEAPS INTO THE PAST, PRESENT, AND FUTURE

HAPPY LEAP YEAR 2012 - Part 6

Happy New Year 2013 to All. Even though 2013 is not a leap year, I will continue to write about all the exciting people, places, and things that took place in our great radio club during all her leap years. This may not be a leap year, but the South Jersey Radio Association continues to leap forward. We are now a year closer to that magic century mark - 100 years. Happy 100th Anniversary in advance SJRA.

1980

Our leaders for 1980 were:

President, Edward Ramming, AB2Y

Vice President, Bruce Eichmann, WA2NBM

Treasurer, Franklin J. Widmann, WA2VYA

Recording Secretary, Walt Schmidt, W2EA
Corresponding Sec., Frances Widmann, WA2NBE

Directors:

John Colacci, AB2Z

Samuel DeDonatis, WB2BWL

Richard Frombach, AB2X

Ruben E. Kafenbaum, WA2NBL

Edwin T. Kephart, W2SPV

Daniel E. Kerman, WA2KOK

Joseph W. MacMillan, W2FGY

We scored 212,174 points during the January VHF contest with 23 members submitting entries.

Sixty-nine members and nine visitors attended the January Membership Meeting.

Ed Ramming, W2BAY was elected to the ARRL A1 Operators Club.

As of 29 February the checkbook balance was \$504.68.

Walt Schmidt, W2EA, was appointed assistant director of the Atlantic Division - ARRL.

Joe, W2WJL's record books were selling like hot cakes or should I say like pile ups on a rare DX entity? W2WJL, now K2 Wonderful Joe Lamerias also became the Club License custodian.

Bruce, WA2NBM, announced that 16 of 18 students in his class qualified for the Novice Class license.

Ed Braddock, lifetime member and former president of SJRA moved to MA.

The May program was a demonstration of slow scan TV. There were seventy-two members and nine visitors at that meeting.

Field Day was held in Medford and the Field Day chairman was John Colacci, AB2Z. We made 4,076 QSOs and scored 12,458 points and captured first place in the 9A category.

Our club bagged 520,273 points in the ARRL DX Contest.

1984 (George Orwell wrote a book about that year)

Our leaders for 1984 were:

President, Rawlins Eastwick, N2AWC

Vice President, Mark Kernagis, KA2MSM

Treasurer, Gary Piccoli, KA2MVV

Corresponding Sec., Frances Widmann, WA2NBE

Recording Secretary, Edwin T. Kephart, W2SPV

Directors:

Sam DeDonatis, WB2BWL

Art Gagnon, K2JLA

Ruben Kafenbaum, WA2NBL

George J. Primavera, WA2RCB

Edward Ramming, AB2Y

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(Past, Present, and Future from page 6)
 Frank L. Widmann, WA2VYA
 Arnold Wilson, N2EZ

Dick Baier, WA2HEB, ARRL Southern New Jersey Section Manager commented on the quality and excellence of Harmonics saying that it is the best club bulletin that he receives.

The January Membership Meeting was a question and answer session conducted by Miles Brown (Brownie), W2PAU, and Fred Holler, W2EKB.

A question was asked "Why did you become an amateur radio operator." Here are the answers from two of our members:

John Colacci, AB2Z, "They said I could work with project models. I thought they meant models like Brooke Shields."

Miles Brown, W2PAU, "I had to. The FCC said my CB linear was getting into all the local church PA systems and the Fire Department was complaining that I was a big 10-4 on their frequencies."

That sense of humor is ever present with SJRA.

Membership chairman Sam DeDonatis, WB2BWL, was awarded the Navy Achievement Metal for outstanding professional achievement in both Military and Civilian duties.

Our Field Day chairman was Frank, WA2VYA. We were 12A and took first place in that division with 498,669 CW points and 366,531 SSB points for a grand total of 865,200 big ones. Amor, N2FY, was the one man show at the 160 meters. He added 58 QSOs i.e., 32 CW and 26 SSB. Amor's wedding anniversary and birthday fall on Field Day weekend. Our (KV2R and KV2M) wedding anniversary also is in

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21 Things To Do After You Get Your Ham Radio License

Dan, KB6NU, cwgeek at kb6nu dot com

Once you've acquired a radio, the next step is to get on the air. You're now an amateur radio operator, not an amateur radio listener.

If your first radio is a VHF transceiver, the first thing to do is to find the repeaters in your area. One way to do this is to use the K1IW Amateur Repeater and Broadcast Transmitters Database (<http://rptr.amateur-radio.net/>). Simply fill in the form, and it will give you a list of repeaters near you. When I asked for 2m repeaters within 10 miles of Ann Arbor, MI, I got the following list:

Location	Frequency	PL (Hz)	Callsign	Sponsor
Ann Arbor, MI	145.23	100.0	W8UM	U of M ARC
Ann Arbor MI	146.96	100.0	W8PG W	Arrow ARC
Ypsilanti MI	146.92	100.0	K8RUR	I-94 ARC

What this chart is telling me is that to communicate with other amateur radio operators using the W8UM repeater, I need to set the frequency of my transceiver to 145.23 MHz and enable the CTCSS tone and set that frequency to 100.0 Hz.

Once you've set your transceiver up properly, you should first listen to see if other amateurs are currently using the repeater. If no one is using the repeater, you can try to start a contact with someone, by

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Not a State Territories

Part 1 - Guam

Guam was discovered by Magellan on 6 March 1521 during a Spanish expedition. Guam was controlled by Spain until 1898 when it was surrendered to the United States during the Spanish-American War and became a territory of the United States. On 8 December 1941 the Japanese captured Guam and Japan occupied the island for two and a half years. The United States recaptured Guam on 21 July 1944, a date commemorated each year as Liberation Day.

The name Guam comes from the ancient Chamorro word 'Guahan' meaning 'we have'. The official name is The Territory of Guam. The island is located in the Western Pacific Ocean and is 30 miles long and between 8 and 11 miles wide. It is divided into 19 municipalities called villages.

Here is some interesting stuff about Guam and some of its National symbols:

Bird - Marianas Rose Crown Fruit Dove

Calling code - 1-671

Currency - United States dollar

Flower - Bougainvillea spectabilis (Puti Tai Nobiu)

Internet - TLD.gu

Language - English and Chamorro.

Motto - Where America's Day begins

National holidays - Discovery Day. The first Monday in March and Liberation Day on 21 July

Newspaper - Pacific Daily Times

Official National Anthem - Star Spangled Banner

Official Territorial Anthem of Guam - Stand Ye Guamanians (Fanohge Chamorro)

Time Zone - Chamorro Standard Time (UTC+10)

Tree - Ifil

The annual rainfall is 110 inches. That would be about 82 feet of snow. Ugh.

The native people are called Chamorros.

Guam has 16 radio broadcast stations.

There are four airports.

Attention all K-Mart Shoppers. The world's largest K-Mart is on the Island of Guam.

Guam is the 179th most populous country. (Bet you always wanted to know that)

The front (head) side of the Guam quarter features the regular front with George Washington. The back (tail) side shows an outline of the island, a sailing vessel called the Flying Proa and a Latte. A flying proa is a type of canoe with a sail. It can change directions without turning around by shifting the sails. A Latte is a large goblet shaped stone used to hold important buildings up. The inscriptions read 'Guam', 'Guaham I Tano Man Chamorro' (translation 'Guam - Land of the Chamorro'), 'E Pluribus Unum', and the date.

Unfortunately, I do not have any contacts with the Territory of Guam.

73 from the State of New Jersey, the QTH of SJRA, the oldest continually operating radio club in the United States and the best.

Mary, KV2M

**List Your "For Sale"
Ham Stuff in the SJRA
Harmonics**

Email Ted, W2TAG, with your listing, ted.w2tag at gmail dot com

President's Message

Ken – K2WB

Our White Elephant sale was very successful. Many thanks to all that have come out to help out the Donations.

We are starting to form the SJRA 100th anniversary committee. Yes it is only 3 short years away, but I think it requires a lot of planning, fund raising to have a party that no-one will forget. If you are interested in helping please contact me.

Field Day will be here before we know it. Time to start thinking what you can do for the SJRA at field day, we are a team and it requires many talents to keep the SJRA #1 in the 6A category. Contact me and be part of the team! This is our only club event and THE SJRA NEEDS YOU.

Ray N3RG has been getting a large number of Membership Renewals; we have 110 members and hopefully more to come. If you had not done so it is time, otherwise you will not be receiving harmonics. Please send in your SJRA membership renewal as soon as you can, act now so you don't get missed in the next roster. We have members on 3 continents. Emma san JA9AA, Yokohara san JM1VCY, and Alan EI8EM. Not to mention the 90 that live in North American.

Try to support our nets. It is a good way to meet other members of the club. Check in today.



Monthly Puzzle

Don – WA2DUE, wa2due at arrl dot net

Last months puzzles were:

A communication tower is seen mounted on top of a hill. From a mile away the base of the tower is 16 degrees from horizontal and the top of the tower is 27 degrees from horizontal. Approximately how tall is the tower and how high is the hill? For this puzzle consider the earth to be flat.

Answer: Consider this problem as one of a right triangle with the adjacent side being 1 mile. The tangent of 27 degrees is the ratio of the height of the tower plus the height of the hill divided by 5280 feet. Multiplying the tangent of 27 degrees by 5280 feet gives us 2690 feet. Then the height of the hill is equal to the tangent of 16 times 5280 feet which gives us 1514 feet. And the tower is found to be approximately 1176 feet by subtraction.

The keys 'A' below and above middle 'C' on the piano keyboard are 220 and 440 Hertz respectively. They form a geometric series whose first term is 220 and the thirteenth term is 440. Find the frequency of the fourth term (middle 'C') carried out to the second decimal place.

Answer: The standard form of a geometric series is $t_n = t_1 R^{(n-1)}$ where t_1 is the first term and t_n is the n th term and R is the common ratio. First we must solve for the common ratio. From the equation $440 = 220R^{(13-1)}$ we divided both sides by 220 and we now have $2 = R^{12}$ next we take the logarithm of both sides and we have $\log 2 = 12 \log R$. Dividing both sides by 12 we get $(\log 2)/12 = \log R$. Taking the anti

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(Ham Tech from page 5)

with a look at a piece of real 21st century magic, the Direct Digital Synthesizer or DDS. While the two loop PLL synthesizer can do a lot with little it cannot do fast frequency switching with small step sizes. The DDS can switch between transmit and local oscillator frequencies with fine step sizes at 60 wpm keying, real QSK.

(Monthly Puzzle from page 9)

log of both sides we find $R = 1.059$. Finally to find the frequency of middle 'C' we form the equation $'C' = 220 \text{ times } (1.059)^3$ which equals to 261.63 Hertz.

Richard, KV2R was the first to submit his solutions. Fred, W2EKB and Howard, KC2SNV also worked the puzzles. Thank you all.

For this month let us consider the following:

The speed of a 12 volt motor is controlled by a variable resistor. At the lowest speed the motor draws 0.02 Amperes and at its highest speed draws 1.2 Amperes. What is the ohmic range of this variable resistor? To provide a 75 percent safety factor what should the resistor wattage be?

A coal burning electric utility is required by law to remove 85 percent of the smoke stack pollutants. The costs for this is given by the equation $C = (80,000p)/(100-p)$ where C is the cost in dollars and p is the percentage of removal. If the law was changed to 90 percent what would be the additional cost to the utility?

Please send solutions or comments to wa2due at arrl dot net.

(Past, Present, and Future from page 7)

the Field Day time slot, and I cannot think of a better way to spend our "I do" Day than working with wonderful K2AA folks.

The June Membership meeting featured NORAD. Tom Grady, Staff Specialist for NJ Bell made the presentation using a direct telephone hookup with Major Chuck Wood of NORAD.

Our P.O. Box was reclaimed by the Post Office. All mail now went to Frances Widmann, WA2NBE.

Bruce Eichmann, WA2NBM, (now W2BE) participated in the Arts and Crafts Show at the Deptford Mall. I just love my 'SJRA Bruce Badge'.

In October we got a new P.O. Box. It is the one we have at the present time i.e., P.O. Box 1026, Haddonfield, NJ 08033. Our P.O. Box is almost 30 years old.

During the year of 1984 we added 17 new members.

Soon we will be 100 years old. Our past and present really give us bragging rights. Let's all try to see that these bragging rights continue until our 100th year and for many, many years after that. We did it before. We can and will do it again

73 and I am History- Mary, KV2M

(Meeting Minutes from page 5)

Old Business- Nominating Committee formed, they are working on a slate.

New/Old- We need to start organizing for the 100th anniversary, Some ideas were mentioned but there is no chairperson at this point.

Minutes by N2HQL.

SJRA Jackets, Shirts, Hats

Order NOW - Next order going in soon!



Spring Jacket is \$44 (S,M,L,XL), Fall Jacket is \$55 (S,M,L,XL),
 Shirts are \$27 (S,M,L,XL), Hats are \$25 (one size fits all)
 Name & Call Sign embroidery included....Larger sizes slightly more!
 Email Joe, KC2TN, with orders or additional info:
 kc2tn at comcast dot net

(21 Things from page 7)

simply saying your callsign followed by "listening" or "monitoring." For example, I would say, "KB6NU listening." If another amateur radio operator is listening, and wants to talk to me, he or she will replay with his or her callsign, and then we'll start our contact.

If there are already operators using the repeater, listen to their conversation, noting how long they speak before letting the other operator take a turn, how often they identify, and even what they are talking about. If you don't think that they would mind if you joined their conversation, say your callsign immediately after one of them has stopped transmitting. They'll break for you and let you join the conversation.

It really is just that easy. Most hams are welcoming and great people to talk to. By getting on the air frequently, you'll get to know a lot of great people and have many interesting conversations. Sure, you'll run

into the occasional grouch, but don't let them ruin your enjoyment of amateur radio.

Operating on the shortwave, of HF, bands is a little different than operating on the VHF bands. A complete description of those differences is beyond the scope of this book, but you'll find a lot of good information in the The ARRL Operating Manual for Radio Amateurs (see below).

The basic principles apply, though. Listen first to see if there are other amateur radio operators on the air that you can contact, and if not, give out a call inviting other operators to contact you. Then, once you have established contact, have an interesting contact with the other radio amateur.

Over the years, I've met many amateurs who studied hard to get their license, but then didn't get on the air for months, or even years. Don't let that happen to you. Amateur radio is a contact sport. Get a radio and get on the air!

March Meeting
Fourth Wednesday

March 27, 2013

“Our Meetings are Smoke Free”

The meeting commences promptly at **7:30PM** in the first floor Meeting Room of the Gibson House on Main Street, Marlton, NJ 08053. Guests are always welcome.

Program For March:

This month our meeting will be updating you on our club website with Ira Weinstein, W2IRA, and Team. This will be informative to you regarding club news and great articles etc. I hope everyone takes a minute to go to check out this site! Bring any questions or ideas you might have to the meeting. See You There!!

March 2013 Health and Welfare:

Happy Birthday to the following:

24 - Ira Weinstein, W2IRA; 24 - Chris Cannatella, KC2GNQ; 27 - Albert Kaiser, W3LEQ;
28 - Tony Canuso, N2ATB; 30 - Howard Bates KC2SNK.

Our Club Condolences to Lou and Jean Priestley on the passing of Lou's sister.

First Class Mail

South Jersey Radio Association
PO Box 1026
Haddonfield, NJ 08033

