MTARA NEWS

President Lorna's KJ6GFS Message

Hello, MTARA members ~~

First of all, I would like to thank Vice President Chet (AE6CO) for chairing the regular MTARA Zoom meeting on April 5. I've been told that he did a great job. Thank you, Chet !

I was AWOL on a 12-day tour of Vietnam, conducted by Citslinc, a company associated with Chambers of Commerce and Rotary Clubs all over the US. The travel from North Vietnam (Hanoi) through Central Vietnam (Da Nang) and finally into South Vietnam (Ho Chi Minh City, aka Saigon) gave our 21-member busload an in-depth look at this friendly (unified) country, while providing 5-star hotel accommodations and great food, all at an **extremely** reasonable, all-inclusive price. No planning necessary on my part. While riding through the countryside, I observed dozens of communication towers, and wondered how many of them were associated with amateur radio. I'm taking the liberty of using this space to inform you of my trip, in hopes that some of you may ask me more about it, or about the 40 other areas of the world, that Citslinc travels to.

It will be interesting to hear from all of our members who participated in communications support for the Baker to Vegas Challenge Cup Run. This annual event offers individuals from all areas of law enforcement, from local to national, a chance to prove themselves on a most challenging foot relay race. Ham operators provided crucial safety communications for them.

Our next MTARA meeting will be on Tuesday, May 3, at 7 p.m. on Zoom.
Hopefully, we'll be able to meet again in person soon.

Seven Three, Everyone ~~ Lorna

Officers

- **President:**
Lorna Polley, KJ6GFS
- **Vice-President:**
Chet Olson, AE6CO
- **Treasurer:**
Nancy Karlson, K6CUB
- **Secretary/Newsletter**
Debbie Johnson, WB6LVC
- **Ed/Membership:**
Tracy Lenocker, WM6T
- **Past Presidents:**
John Snedden, KT7P
Vic Marquez, KK6WKI

The Rim of the World ARES group is an ARRL affiliated organization and part of the Mountain Top Amateur Radio Association

New FCC Fees Now In Effect!!

On March 23, 2022, the FCC announced that the application fees for Amateur Radio Applications would be $35.00 beginning April 19, 2022. This fee would apply to all new licensed applicants, rule waivers, modifications such as sequential call sign changes, renewals, and vanity calls. There will be no fee for future upgrades or administrative updates such as change of mailing or email addresses.

In an attempt to help applicants younger than 18, the ARRL approved the Youth Licensing Grant Program. This new program states that the ARRL will cover a one-time $35.00 application fee if the candidate tests with an ARRL VEC. They would also reduce the exam session fee to $5.00.

The payment of the new fee will not be the responsibility of the VEC and team. Candidates will continue to pay $15.00 at the time of their exam directly to the VEC. The additional $35.00 will be paid directly to the FCC using the CORES FRN Registration system. There will be no refund of the new fee should the application be dismissed.

For further information, go to www.arrl.org/fee-application-fee.

Monthly Club Meetings

Club meetings are held on the first Tuesday of each month. Meeting begin at 7:00 p.m. and last until approximately 9:00 p.m.

Our meetings are open to everyone; so bring a friend, and keep the hobby growing.

There is always a presentation that will pique your interest and add to your knowledge.

Until further notice, all meetings will be held on Zoom. When this changes you will be notified of the location.

See you on Zoom!

Membership

Membership in MTARA is open to any individual interested in learning more about Amateur Radio. An FCC issued license is not required, but is encouraged. Membership is on an annual basis, running for the calendar year. There are no prorated membership fees. Club fees are $20.00 for a single membership and $30.00 for a family membership. The necessary forms can be found on the club's home page @ MTARA.club. Current members only need to send in their dues to MTARA, PO Box 2441, Lake Arrowhead, Ca. New members will need to download and send in their forms and payment to the same address.

TREASURER'S REPORT

Our ending March Balance was

$12,439.27

73, Nancy N6CUB

Local Weekly Nets

	Repeater	Time	Activity	Purpose
Monday	MTARA—2	7:00 p.m.	Weekly Check-In	MTARA News
Monday	144.330 MHz	8:00 p.m.	"Gordo Net"	Simplex Readiness
Tuesday	MTARA—5	7:00 p.m.	"Debbie Net"	Educational Topics
Wednes-day	HF	7:30 p.m. First Wednesday	7.223 MHz	Band(s) Status
Friday	MTARA—5	5:00 p.m.	YL Happy Hour	It's Friday
Daily	CBARC	7:00 a.m.	Tech. Net	Elmer Sessions

Upcoming Calendar 0f Events

- May 20-22—Dayton Hamvention, Xenia, Ohio

- May 21-22—-Lake Arrowhead Art and Wine Festival

- June 25—Field Day at the Masonic Temple in Twin Peaks

- July 3 (Sunday) - Arrowhead Lake Association 4th of July Fireworks

- August 5—Mountain Top Days Parade

- August 6—Tour de Big Bear

- August 19-20 (Friday and Saturday) - Kodiak 100

- October 8—Big Bear Gran Fondo

Baker to Vegas Challenge Cup Relay Race

A Personal Report   by WB6LVC

On April 7th, Gary and I set off with two vehicles packed to the roof with radios, antennas, tripods, tables, a pop-up, etc. and 12 sandbags (filled by us!) to participate in the Baker to Vegas Relay Race as communication volunteers The race had not been held for over 2 years due to the pandemic shutdown, so there was great anticipation from all of the participants.

Before I share our own experience from the event, let me share a bit about how the event got started. Back in 1978, the LAPD Metro Division's "Death Valley Relay" started. It had a 7-year stint of participants running through the "Devil's Graveyard". When this event ended, The Challenge Cup/Baker to Vegas Relay was developed by Los Angeles Police Officers Chuck Foote and Larry Moore. Foote, General Manager of the Los Angeles Police Revolver and Athletic Club (LAPRAAC) and Moore, LAPD Athletic Director drove the current course and developed the name for the race and its format. There have been course changes throughout the years based on road construction, weather, and location of the ending/Awards Ceremony in Vegas. Now in its 35+ year, the race continues its main purpose which is to help law enforcement officers maintain top physical fitness levels, build camaraderie and teamwork. Today it is the largest law enforcement event of its kind in the world. Teams from Canada, Germany, Japan, Australia, and all across the United States have taken part in this yearly event.

Now back to our own personal story. Leaving on Thursday worked to our advantage as there was less traffic. We arrived in Henderson, three and a half hours after leaving Rancho Cucamonga and checked into our hotel. The rest of our team left on Friday, and it took them well over 6 hours. And they weren't going as far as we were; they stayed in Pahrump. Wow-what a difference a day makes, as they say in the old song! My nephew had moved to Henderson about two years ago, so we spent the evening with him and his wife, touring the area and marveling at the expansion of the town. It was a good thing we choose to visit them before the race because we had no energy or motivation after that night for any other activities.

On Friday, we went to scout out our location and plan how best to set up the Communication Base in Stage 18. (Each location that the runners pass through has a "Stage Number" and communication team.) Locations vary; they can be in a parking lot, out in the middle of nowhere, near a community or at major crossroads of an intersection. We were on a dirt lot, near a major intersection. (I may have neglected to tell you that the participants run on a major highway. Traffic is **NOT** stopped for them except where they cross major locations/intersections.) None of the Support Items were at the site yet. But from a few ZOOM meetings and emails, we knew, in general, what was to be at our location and were it would be placed. We were checking to see what problems could occur, trying to anticipate any issues the site would present later on in the event.

The course begins 25 miles north of Baker, CA on Highway 127 to Shoshone, CA; then northeast on Highway 178, across the Stateline into Nevada on Highway 372 to Pahrump, NV. Then southeast on Highway 160 to the finish line inside the Rio Hotel in Las Vegas. Runners/Teams take off from the Start beginning at 8:00 AM with each following group leaving hourly until 4:00 PM. The relay race takes about 8 hours, barring any emergencies or weather-related issues. Volunteers had to be at their stages starting at 6:30 AM on Saturday with the final stage beginning their shift at 7:30 AM on Sunday.

So now we have reached Saturday - "Race Day." We were assigned an overnight shift; we were to activate our stage at 10:30 PM and work until 7:30 the next morning. Gary figured we would go to our Stage around 6:00 PM to begin setting up tables, the popup, chairs, lights, the generator and much more while we still had light. We were working with our West End Amateur Radio Group that offers the on-line classes and testing sessions. Due to conflicts with pre-scheduled calendar activities, health issues and travel needs, our group was exceedingly small. AND, this year, a new person was coordinating the race. The two main individuals who had coordinated the race previously had left the group. Needless to say, it was a bit chaotic and disorganized. Example-at 9:30 PM, the night before the race, Gary received a phone call informing him that we would not be allowed to use our speaker to announce incoming runners. The neighbors had complained the last time and said that if we tried to use it, we might be arrested! WHAT?! So, I ordered a child's easel with white board, and then next morning, we went to Michael's and picked it up. This was placed on a table where one of us would write the numbers of the team coming in. Since not everyone paid attention to what we were doing, we shouted out the number(s) in a very loud voice. Just one example of the unexpected turns a race like this can take.   Since we realized that there could be more changes, and on advice from some other folks, we went out at 3 PM to begin set up. We finished all of the work around 8:00 PM. I grabbed a quick nap in the back seat of my car, but Gary never had a chance to even get 20 winks. The life of a Ham is not an easy one, sometimes.

The runners started coming through around 11:30-11:45 PM. After that, it was nonstop.

This year, the race was put on "Pause" due to elevated temperature issues on the California side. Over 30+ runners had heat exhaustion and needed to be treated on site or transported to a facility. Some runners needed to be Medevac'd via helicopter to a local hospital. This paused the race for 30 minutes. No one was seriously injured or died. A very scary 30 minutes, to be sure!

We had to log the numbers relayed to us from MILE OUT on our log sheet. Then re-enter the numbers when they arrived through the chute. When the final runner was reported in and passed through our stage, we began to tear down our site. At that point, we did not care how the items

were stored, except for the radio equipment, and we just gathered it all up and shoved it in the car and the Jeep wherever it would fit! The last runner came through around 7:00 AM and we were out of there by 9:00. We arrived back at our hotel and "crashed," We slept from 10:00 AM until 1:30 PM. When we woke up, we looked at each other and said, "Is it still Sunday?" We slept on and off for the rest of the day. On Monday we packed up our remaining items and departed for home around 11:00 AM. This time the trip took twice as long due to weather conditions. The winds had picked up and dust was flying across the roads, at times making it difficult to see. By the way, I forgot to mention that this same condition started the day before, all during the race. Thank goodness for those 12 sandbags or we would have lost antennas, and other supplies!! As it was, when we got home, it took the rest of the week to clean all the equipment. Gary had to dismantle his **Go Box** and clean every nook and cranny to get out all of the dust and then reassemble it.

Needless to say, this was quite the adventure, especially for me.
I must comment on some of the people we encountered and worked with. The RV Support group was simply great. They even invited us to their Potluck BBQ before the race. A student for the San Bernardino County classes that Gary and Dave Bremer had recently conducted, joined our team. She really wanted to get her feet wet; we think it was more like her knees as she worked nonstop at the official timer station. Best of all, she got her new call sign a few days before the event. Her husband worked right alongside all of us, putting up numbers on the white board, taking notes and making sure no numbers were missed.

So, there you have…an overview of what this type of event entails. Will I do it again? Let's wait another year and you can ask me for a final answer when it's closer to Baker to Vegas time, again.

Ponder the Pool   by AA6GJ

Ponder the Pool is my column for the MTARA Newsletter. Every month I pick a point to ponder (a question) from one of the three FCC question pools and try to explain it more and review the concepts because,

"If you don't use it, you lose it!"

In this "Ponder the Pool" I am going to ponder a question from the General Class pool.

Question No. G8B10
G8B10 – What is the relationship between transmitted symbol rate and bandwidth?
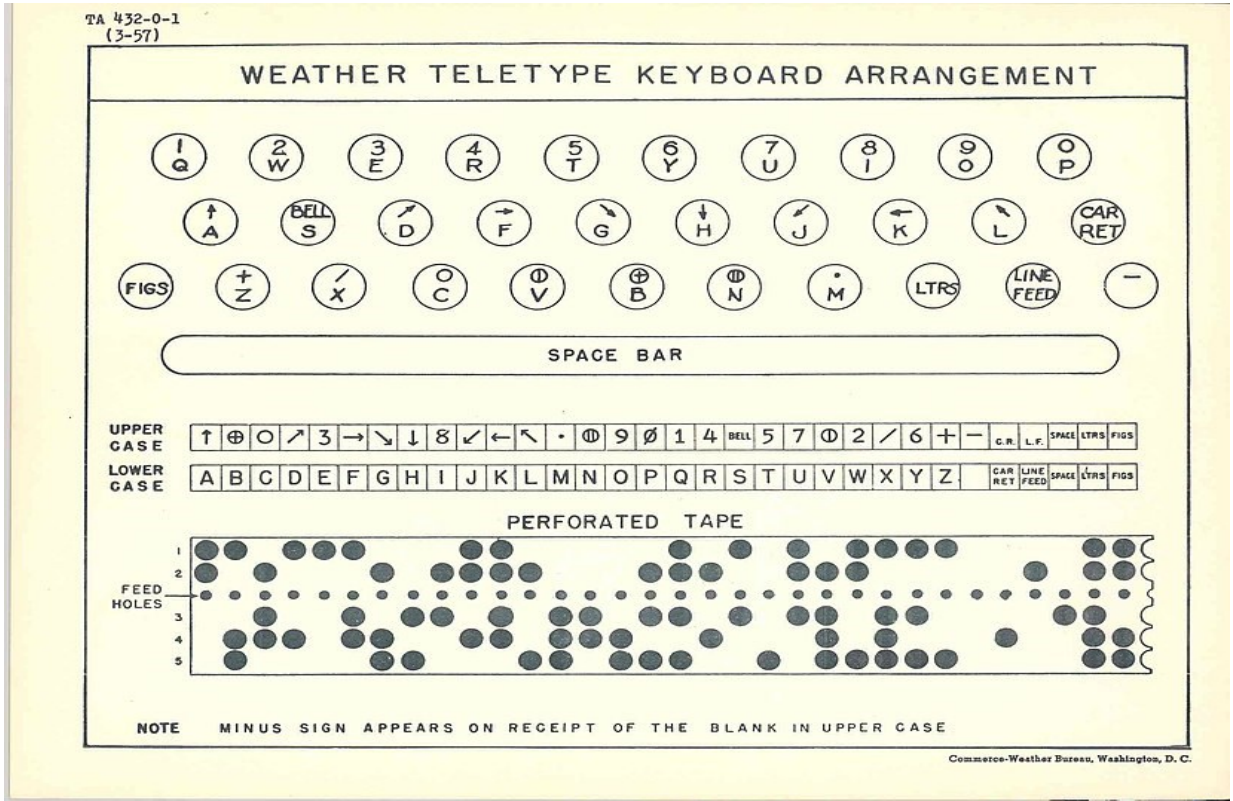
Wow! That's a goodie!
Let's start with a concept we have discussed in past "Ponders": **bandwidth**. Bandwidth, as you may recall, is the amount of radio spectrum our signal occupies. Voice frequencies are about 300 to 3,000 Hz. In the HF band we learned that the maximum bandwidth for Single Sideband (SSB) voice or digital signals is 3,000 Hz. (3 kHz.) either upper sideband or lower sideband. Amplitude Modulation (AM) with a carrier frequency is double sideband and occupies 6,000 Hz. (6 kHz.). In the VHF/UHF bands we learned that the bandwidth for voice or digital signals is between 10 and 15 kHz. Notice that in the HF band you have a narrower bandwidth, and on the VHF/UHF band we have more bandwidth. Keep that in mind because we will come back to it later.

Now, the next thing we have to think about is **symbol rate**. First of all, what the heck is a symbol? Oh, I forgot to tell you that we are talking about "digital communications" like RTTY (Radioteletype), FT8, PSK 31, and so on. So, instead of voice, we are transmitting bursts of digital information.

Let's first talk about a symbol. What is a symbol?
A symbol can be described as either a pulse (in digital baseband transmission) or a "tone" (in passband transmission using modems) representing an integer number of bits.

A theoretical definition of a symbol is a waveform, a state, or a significant condition of the communication channel that persists for a fixed period of time. A sending device places symbols on the channel at a fixed and known symbol rate and the receiving device has the job of detecting the sequence of symbols in order to reconstruct the transmitted data. There may be a direct correspondence between a symbol and a small unit of data (for example, each symbol may encode one or several binary digits or 'bits') or the data may be represented by the transitions between symbols or even by a sequence of many symbols. Wow, That's a mouthful!

TA 432-0-1
(3-57)

WEATHER TELETYPE KEYBOARD ARRANGEMENT

NOTE   MINUS SIGN APPEARS ON RECEIPT OF THE BLANK IN UPPER CASE

Commerce-Weather Bureau, Washington, D. C.

Let's take this concept apart a little bit. We'll look at the second form of digital communications, the first being CW (Morse Code). The second form of digital communication is Radioteletype (RTTY). RTTY utilizes the Baudot Code.

The Baudot code, invented in 1870 and patented in 1874 by J. Baudot, is a five-bit binary code. Originally used in wireless telegraphy as a replacement for Morse Code, it was adopted as an official international code by the CCITT (Comité Consultatif International Téléphonique et Télégraphique: International Consultative Committee for Telephony and Telegraphy) and is now known as CCITT-1. The word *Baud*, a unit of transmission speed equal to one physical bit per second, is named after Monsieur Baudot and his code.

If you count the columns of holes punched in the paper tape (above), you will find that there are 32 columns. Note: There is one column that is blank where column 27 would be. That counts, too.

Naturally, a 5-bit code only allows 32 different symbols, which is not even enough for letters and digits. The Baudot code includes two 30-symbol character sets, and two *Shift* symbols, the shift symbols are used to shift between the two character sets, thereby allowing for 60 different symbols.

It was very common for Baudot code to be used in conjunction with a paper tape punch and reader; teletype machines often had an integral paper tape unit. The tape was punched with five holes (or absences of holes) across its width to indicate the zeros and ones of each character's code. A smaller sixth hole was punched between the

third and fourth bits for purely mechanical reasons: it allowed the paper to be pulled through the punch (and later the reader) very cheaply using a small, toothed wheel. This is what RTTY sounds like. Click on RTTY.

Character Shift		Binary Code
		BIT
Letter	Figure	4 3 2 1 0
A	–	1 1 0 0 0
B	?	1 0 0 1 1
C	:	0 1 1 1 0
D	$	1 0 0 1 0
E	3	1 0 0 0 0
F	!	1 0 1 1 0
G	&	0 1 0 1 1
H	#	0 0 1 0 1
I	8	0 1 1 0 0
J	'	1 1 0 1 0
K	(	1 1 1 1 0
L	)	0 1 0 0 1
M	.	0 0 1 1 1
N	,	0 0 1 1 0
O	9	0 0 0 1 1
P	0	0 1 1 0 1
Q	1	1 1 1 0 1
R	4	0 1 0 1 0
S	BEL	1 0 1 0 0
T	5	0 0 0 0 1
U	7	1 1 1 0 0
V	;	0 1 1 1 1
W	2	1 1 0 0 1
X	/	1 0 1 1 1
Y	6	1 0 1 0 1
Z	"	1 0 0 0 1
Figure Shift		1 1 1 1 1
Letter Shift		1 1 0 1 1
Space		0 0 1 0 0
Line Feed		0 1 0 0 0
Null		0 0 0 0 0

Bitrate = 5s   Symbol Rate = S

0 1 | 1 0 1 0 1 | 1 1 1 0 1 | 0 1 0 0 1

S   S   S   S
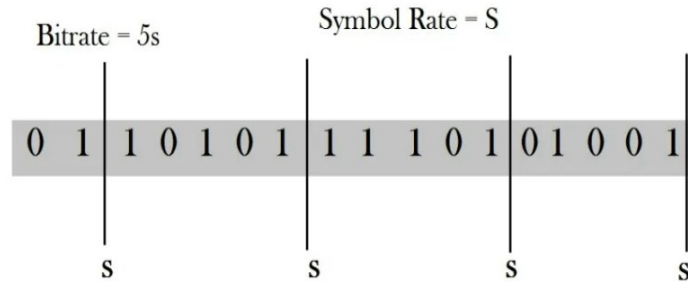
As shown in the figure above and the table left, each one of those holes in the punch tape equal a five-bit binary code of 1's and 0's. Referring to the figure above, Symbol Rate is represented by the Letter S while Bitrate is represented as 5s or 5 times S. We can see in the above figure that each Symbol Rate contains 5 Bits. Each symbols contains a fixed number of bits. Thus, the symbol rate is defined by the number of symbols per second. The Baud/Symbol Rate for common RTTY is 45.45 Baud for 60 Words per Minute. This gets a whole lot more complicated as we add more bits and higher speeds.

So, get to it, Johnson, how does Symbol Rate relate to Bandwidth. Well, there's a formula for that. Aha!!! I knew there would be math! Here it is:

Bandwidth = Baud rate + (1.2 X frequency shift)

Where:
Baud Rate is the same as Symbol Rate
Frequency Shift is 170 Hz.

If you listened to the audio segment above, you heard the tones "warble" back and forth.
The standard **mark** and **space** tones are **2125 Hz. and 2295 Hz.** respectively.
These **frequency** tones are also referred to as "high" tones. Although most Amateurs use these standard tones, it's possible to operate **RTTY** using other **frequency** tones. This is fine as long as you maintain the standard **170 Hz. shift** (2295-2125 = 170 Hz.).

So, for Standard Amateur Radio Radioteletype our bandwidth would be:
BW = Baud Rate + (1.2 X Frequency Shift)
249.45 = 45.45 + (1.2 X 170) or about **250 Hertz Wide**

Using the above equation, <u>9600</u> Baud ASCII Code with a shift of 4800 Hz., the bandwidth would be 15,360 Hz. Or **15.36 kHz. Wide**

Remember:
160 to 12 meters, the maximum Baud rate is 300 Baud.
10 meters is 1200 Baud.
6 and 2 meters is 19,600 (19.6 kBd) Baud.
1.25 meter and 70 cm is 56.000 (56 kBd) Baud.
33 cm and higher it is not specified.
(Baud rate is the same as Symbol Rate)

Wow! We finally made it to the end! That is why the official answer to this question is:
G8B10 – Higher symbol rates require wider bandwidth.

That's *Ponder the Pool* for another month. I hope it was helpful.
Stay tuned, next month we will come up with another question to ponder. 73 – Gary
If you have any questions or comments, drop me an email at AA6GJ@arrl.net.
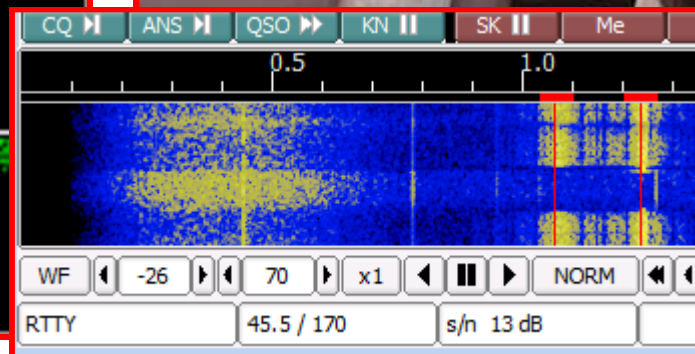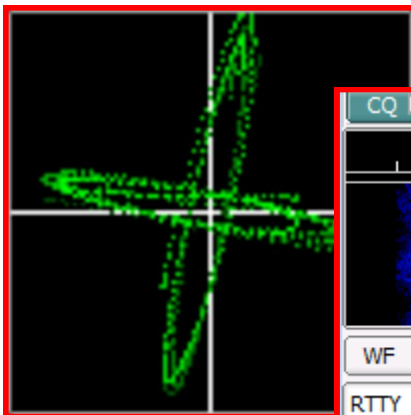
Mountain Top Amateur Radio Association

The Amateur's Code
by Paul M. Segal, W9EEA (1928)

The Radio Amateur is:

CONSIDERATE never knowingly operating in such a way as to lessen the pleasure of others.

LOYAL offering loyalty, encouragement and support to other amateurs, local clubs and the American Radio Relay League, through which Amateur Radio in the United States is represented nationally and internationally.

PROGRESSIVE with knowledge abreast of science, a well built and efficient station, and operation beyond reproach.

FRIENDLY with slow and patient operation when requested, friendly advice and counsel to the beginner, kindly assistance, co-operation and consideration for the interests of others. These are the hallmarks of the amateur spirit.

BALANCED Radio is an avocation, never interfering with duties owed to family, job, school or community.

MTARA Shirts, Jackets, and More

Classic Images is closing on July 1st

Be sure to order soon!

We have many items available with our club logo.

The information for ordering is as follows:

- Name Tags—Harlan Technologies, Name Tags by Gene (715) 340-1299, www.hampubs.com

- Mouse Pads—Check with Jodi, WA6JL

- Polo Shirts—Port Authority K420P Dark Green, L420 Dark Green, K100LS Dark Green. To order, contact Mary at Classic Images, (909) 338-2281, Tuesday through Friday. She will take your information and Callsign to be embroidered on the shirt. When completed, order must be picked at the business located at 23723 Rocky Dell Drive, Crestline, CA 92325