RF

ORANGE COUNTY AMATEUR RADIO CLUB, INC.

VOL. LI NO. 5 **P.O. BOX 3454, TUSTIN, CA 92781-3454** **May 2010**

The Prez Sez.....

By Kristin K6PEQ

PREZ SAYS:

We are getting closer to field day and things are starting to fall into place. I hope that all of you will be able to participate in one way or another in field day! One of the reasons I love our club is all of the different parts of the hobby that are enjoyed in our club from DX'ing to 2 Meters. I would like to encourage all of you again to bring a show and tell to the next meeting. We have had so many different items brought whether it is ham radio related or not.

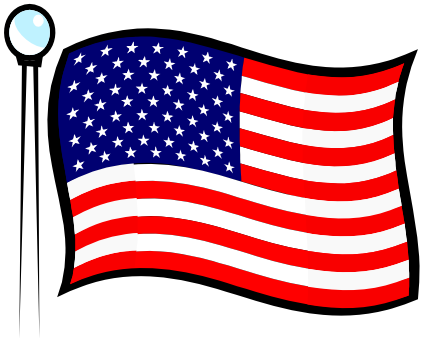
I hope you all have a great May and I will see you at the meeting!

73,

Kristin, K6PEQ

NEW BREAKFAST DATE

The Breakfast board meeting date has been moved to the Second Saturday of every month, so the next Board meeting will be held on June 12th, 2010.



Remember Memorial Day!

--- OCARC--- May 21st Meeting

The meeting for May 21st 7:00 p.m. will have Charles Basham N6DZW from Southern California Edison as our guest speaker.

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The next general meeting will be:

Friday, May 21st @ 7:00 PM

We will be meeting in Room 208
In the east Red Cross Building

ORANGE COUNTY AMATEUR RADIO CLUB
www.W6ZE.org

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Monthly Events:

General Meeting:
Third Friday of the month
at 7:00 PM
American Red Cross
601 N. Golden Circle Dr.
(Near Tustin Ave. & 4th St.)
Santa Ana, CA

Club Breakfast:
Second Saturday of every
month at 8:00 AM
Jagerhaus Restaurant
2525 E. Ball Road
(Ball exit off 57-Freeway)
Anaheim, CA

Club Nets (Listen for **W6ZE**):

28.375 ± MHz SSB
Wed- 7:30 PM - 8:30 PM
Bob AF6C, Net Control

146.55 MHz Simplex FM
Wed- 8:30 PM - 9:30 PM
Bob, WB6IXN, Net Control

145.400 MHz (-) PL 103.5 Hz
Thur – 8:00 PM – 9 PM
Nicholas AF6CF, Net Control

7.086 ± MHz CW **OCWN**
Sun- 9:00 AM – 10 AM
John WA6RND, Net Control

VISIT OUR WEB SITE

http://www.w6ze.org

for up-to-the-minute club information, the latest membership rosters, special activities, back issues of RF, links to ham-related sites, vendors and manufacturers, pictures of club events and much much more.

Club Dues:

Regular Members	...$20
Family Members*	...$10
Teenage Members	..$10
Club Badge**	…….$3

Dues run from Jan thru Dec and are prorated for new members.

*Additional members in the family of a regular member pay the family rate up to $30 per family.

**There is a $1.50 charge if you'd like to have your badge mailed to you.

2010 ARRL Southwestern Division Amateur Radio Convention

September 17, 18 & 19

San Diego, California

Four Points, By Sheraton Hotel San Diego
8110 Aero Drive, San Diego CA 92123 Phone: (858) 277-8888

http://www.sandarc.org/

Registration Form

Please list additional Attendees – ALL ATTENDEES MUST BE REGISTERED
No charge for Children 16 or under when Accompanied by a Registered Adult

How did you find out about the Convention?

☐ Radio ☐ Web search ☐ Ham Club ☐ News Paper ☐ Other _____

Call Sign: _____ **Last Name:** _____ **First Name:** _____

Address: _____ **City** _____

State: _____ **Zip Code:** _____ **E-mail:** _____

Kids / Adults Call Sign Name (please print)

____ _____ _____ _____

____ _____ _____ _____

____ _____ _____ _____

Early Bird Dated before May 31, 2010	**$15.00 @ _____ ea. = $_____**
Convention Pins Included (Limited Supplies)	
Pre Registration June 1, to Aug. 22, 2010	**$18.00 @ _____ ea. = $_____**
At Door Registration	**$20.00 @ _____ ea. = $_____**
Accompanied kids under 16 years Free	
DX Breakfast	**$23.00 @ _____ ea. = $_____**
Banquet Tickets Dinner ☐Beef ☐ Chicken ☐ Vegetable	**$43.00 @ _____ ea. = $_____**
Banquet Speaker: *To Be Announced*	
Convention Lunch	**$25.00 @ _____ ea. = $_____**
Lunch Speaker:	
2010 Convention Pins	**$ 5.00 @ _____ ea. = $_____**
2006 Convention Pins	**$ 3.00 @ _____ ea. = $_____**
2002 Convention Pins	**$ 3.00 @ _____ ea. = $_____**
QSL Card Checking	
Make Checks payable to:	

SANDARC Convention
C/O R. Boehme W2IRI
10340 Everell Pl.
Santee, CA 92071

Web Form ver 1.03

Staff Use Only

Registrtion	_____
Date	_____
Amount	_____
Check #	_____
# Pins given	_____
Receipt	_____
Signed up	_____
Other	_____
Other	_____

City of Orange Communications for the Baker-to-Vegas Race 2010

By Ken W6HHC

Since 1985, law-enforcement running teams (from around the world) have entered in a competitive foot-relay-race through the desert. This race, known as "Baker-to-Vegas" (and aka B2V), is a 120 mile long race, that starts outside Baker (CA), runs through the desert to Shoshone and finishes at the Hilton Hotel in Las Vegas, The B2V race is broken into 20 "legs" or stages. This year, more than 250 different law enforcement teams participated. The runners of the Orange Police Department have been supported for many years with communications by hams belonging to COAR (City of Orange Amateur Radio) RACES, the OCARC members, and Communications Volunteers from Cypress. This year, ten OCARC members helped the OPD running team by providing planning and communications over the entire race course.

The COAR RACES activities for the 2010 races began nine months before this year's race began. The COAR B2V communications project required the following five phases:

- Planning Sessions
- Equipment Testing Workshops
- Equipment Set-up for the Race
- Staffing and Operating the B2V event
- Post B2V Review Sessions

The City of Orange RACES plan was to set up five communications centers along the B2V race course in order to provide a "communications backbone" to support the mobile units used during the race.

- Ibex Pass, California
- Shoshone, California
- Pahrump, Nevada
- Sandy Valley Road, Nevada
- Las Vegas, Nevada

The race started on Saturday April 17 and finished Sunday morning. This year, the Orange PD running team finished with almost a "best ever" time and placed 41 out of more than 250 teams.

Fig 1 – Map of B2V Race that starts about 18 miles outside of Baker. Red DOTS are COAR Comm Centers.

Fig 2 – One of Several COAR Planning Meetings that were conducted before the B2V Race
(Photo by Ken W6HHC)

Fig 3 – Equipment-Testing Workshop for Radios to be used in Las Vegas are set-up at QTH of Sam W6RDS
(Photo by Rich KE6WWK)

Fig 4 – Cam-WV6V (2nd from right) set up a test bench for radios to be used at the Pahrump Comm Center in his garage.

(Photo by Ken W6HHC)

Fig 5 – This photo before the race shows some of OPD runners (Team #45), some of their support team, and some of the COAR RACES communications team (yellow shirts)

(Photo by Bobbie KG6MIF)

Fig 6 – Just before the race, members of COAR equip the "Follow Vehicle" with three radios and three sets of antennas. Two radios are for voice communications (144 and 440 MHz) and one radio is a 2M APRS beacon for tracking the runner.

(Photo by Quent W6RI)

Fig 7 – The OPD runner (Team #45) runs through the lonely desert, while the OPD follow-vehicle with COAR communicators is right behind. The follow-vehicle can provide water and fruit and energy bars as needed.

(Photo by Quent W6RI)

Fig 8 – Lee Valdez, the first OPD runner, finishing the first leg of 5.4 miles, is met by OPD catcher and an EMT at about 4:40 p.m. It was hot!

(Photo by Quent W6RI)

Fig 9 – The Las Vegas Communications Center was located in the Emerald Suits Hotel near the Finish Line. (L-R) are Robbie-Kb6CJZ and Dieter-N6ZKD.

(Photo by Sam W6RDS)

Don't Let Mother Nature Do this to your Ham Station

Ken W6HHC recently returned from a nice long vacation in Jamaica. No problems, mon!!

So then he tries to get onto the OCARC Wednesday evening net on 10 Meters. The signals seem weak. Net Control is only an S5....instead of way over S9. The other check-ins report difficulty hearing W6HHC transmissions well. Finally, a quick check of the SWR shows that it is SKY HIGH. What is going on with the 10M station??

An inspection of the Cushcraft HF antenna showed that the Jasmine bush in the back yard had sent vines to tightly wrap around the coax cable during the vacation. Don't mess with Mother Nature.

The Jasmine bush vines have wrapped tightly around the HF coax cable.

The coax cable at the base of the Cushcraft vertical is pulled as tight as a violin string

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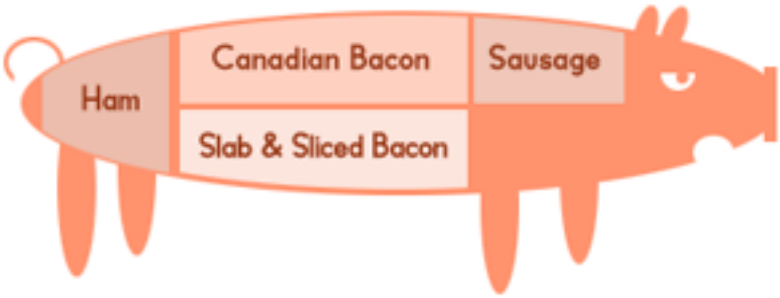
Interesting DATV Links

- Wikipedia on MPEG-2 – see **http://en.wikipedia.org/wiki/MPEG-2**
- British ATV Club - Digital Forum – see **www.BATC.org.UK/forum/**
- German portal for DATV streaming repeaters and downloads – see **www.D-ATV.net** (in German)
- AGAF D-ATV components (Boards) – see **www.datv-agaf.de** and **www.AGAF.de**
- Lechner DATV Boards - **http://lechner-cctv.de/d-atv-dvb.151.de.html?mwdSID=9agn7phuiu46fvm2ok3aueltf3**
- Complete ready-to-go DATV transmitters – see **www.d-atv.org/D-ATV-Modulator.pdf**
- SR-Systems D-ATV components (Boards) – see **www.SR-systems.de**
- DGØVE microwave amps, up-converters, down-converters – see **www.DG0VE.de**
- Kuhne Electronics (DB6NT) RF Amplifiers – see **www.Kuhne-Electronic.de**
- Orange County ARC newsletter entire series of DATV articles – see **www.W6ZE.org/DATV/**



Ham Cuisine

By Kristin, K6PEQ

Pork Loin Roast

Ingredients:

1 ½ Pound pork top loin roast
1 cup panko
¼ teaspoon salt
1/8 teaspoon black pepper
1 egg yolk beaten
2 tablespoons Dijon-style mustard
1 ½ teaspoon fresh thyme

Cooking Directions:

Heat oven to 350 degrees F.

Place panko on large plate and set aside. Pat surface of pork dry with paper towels; sprinkle with salt and pepper. Combine egg yolk, mustard and thyme in pie plate. Roll pork roast in mustard mixture, spreading mixture evenly on surface. Then roll mustard-coated roast in panko, patting panko on roast to evenly cover. Place roast on rack in shallow roasting pan. Roast, uncovered, in heated oven for 1 hour or until an instant-read thermometer inserted near center reads 155 degrees F. Loosely cover pork with foil. Let rest for 5 minutes.

Transfer pork roast to carving board. Cut half of the pork roast into 1/2-inch-thick slices to serve. Cool remaining piece of roast at room temperature for up to 1 hour. Loosely cover and refrigerate.

***Serves 4 with leftovers for sandwiches.

Serving Suggestions:

Serve with a salad and a nice white wine!

TechTalk 85

Digital-ATV – Understanding the latency of a MPEG-2 transmission

by Ken Konechy W6HHC
& Hans Hass DC8UE

As already discussed in the earlier OCARC TechTalk83 article, there will be a signal delay (called latency) between the camera and the receiving display during a DATV transmission.

During an analog and uncompressed ATV-broadcast, the pictures of the video camera can be transmitted and then received immediately (really "real-time", no delays). When transmitting Digital-ATV signals, you will see that the received television picture shows a delay on the displayed signal compared with an analog transmission. This TechTalk will try to explain the reason for this DATV delay time.

Analog Video Signal Preparations

When you plan digital (compressed) video broadcasting, the picture signal first has to run through a complicated digitalization process to prepare it for MPEG-2 compression. If the camera delivers an analog composite signal (CCVS) as a source signal, this must be disassembled in the first treatment step into the components. This will generate the component signals Y (brightness signal), R-Y (colour difference signal "red minus brightness") and B-Y (colour difference signal "blue minus Y"). Then these signals have to be Analog-to-Digital converted and transferred into a digital data stream resulting in a bit-rate of 216 Mbit/sec.

These 216 Mbit/sec bit data-rate occurs during the video digitizing process with 8-bit resolution. The 5MHz analog Y-signal will be Analog-to-Digital converted with a sampling rate of 13.5 MHz and generates therefore 13.5 x 8 = 108 Mbps for the brightness signal. The colour difference signals R-Y and B-Y will be digitized with half of the luminance sampling frequency of 6.75 MHz and produce 6.75 x 8 = 54 Mbps per colour component signal.

Hence, the whole digitized video signal includes a data-bit-rate of 108 Mbps (Y) + 54 Mbps (R-Y) + 54 Mbps (B-Y), producing a total data-bit rate of 216 Mbps. In a professional TV studio, using a 10-bit digitization (after CCIR 601), the data-rate will increase to 270 Mbps.

For the input to an MPEG-2 encoder, a conversion must be done, depending on the incoming input signal. There are several input signals possible, like CCVS, Y/C, Y/U/V, or CCIR601 (parallel digital). These must be converted into a component signal with the chosen video resolution D1, HD1 or SIF. In a software solution the signal must be put into the memory in a first step.

Then a processor can calculate the source format and afterwards the converted picture must be read out of memory again. Already these two process steps creates some delays, because simply transferring the picture to the memory consumes time and therefore adds a small amount of delay. In addition to this comes the time required for the calculation and the signal transport. A hardware solution would be quicker, but is neither so flexible nor adaptable and is more expensive.

MPEG-2 Compression

The MPEG-2 compression uses the fact, that a television picture contains enough redundancy from frame-to-frame, to make a permanent repetition of the whole picture content unnecessary. In order to compress, the MPEG encoder generates three different kinds of encoded picture frames:

I-Frame

This type of video frame contains all the necessary information to display a whole picture frame (low JPEG-like compression).

B-Frame

This type of compressed video frame contains only information to describe the changes from the I-Frame and the P-Frame.

P-Frame

This type of compressed frame contains only changes since the preceding I-Frame or preceding P-Frame.

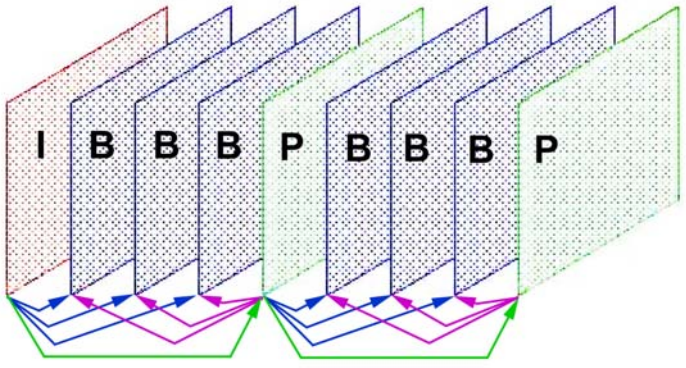


Figure 1 – A Sequence of Compressed Frames (using GOP Mode called IBBBP)

green arrow: forward prediction of P-Frames
blue arrow: forward prediction of B-Frames
red arrow: backward prediction of B-Frames

B-frames obtain much compression by comparing differences to I-frames and P-frames. The I frame only uses "run-length" compression, similar to JPEG compression. Some details on the compression of a B-frame based on comparing pixel differences between a preceding I-frame and a following P-frame are shown in **Fig 2.**

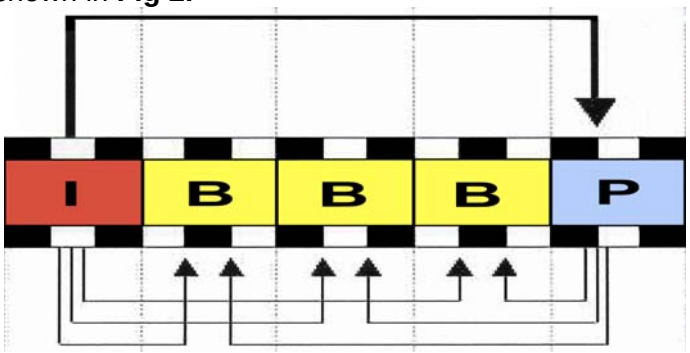


Figure 2 - Details of prediction order of I, B and P frames

The receiver can generate an entire picture frame by using only the I-frame information. To reconstruct a complete picture frame from a B-frame, information from both the I-frame and the following P-frame must be obtained and processed. To guarantee that there are no observed delays between frames while actually viewing the video, the frames are not sent in continuous order. Therefore the P-frame follows immediately after the I-frame. In this way the P-frame will be already available, when the receiver needs it to decode the incoming B-frames.

As **Fig 4** shows, the video frame sequence of the exit of the encoder is changed compared with the encoder exit sequence is changed from the encoder's "natural" camera-based frame sequence. The signal at the output of the encoder must be delayed until the necessary information is available and has been calculated.

To create the "broadcast order" sequence shown in **Fig 4**, the encoder must wait with the transmission, until the next P-Frame is digitized and the difference information is calculated. Because a frame (using NTSC) lasts 33 ms, an essential time factor delay is created by the waiting. In **Fig 4**, the wait is a minimum of four frame-periods, plus other processing delays. The absolute duration of the delay depends on the GOP (Group of Pictures) number of the pictures between two I-Frames (called the GOP Number) and the frame type sequence. In MPEG-2, a GOP Number of 12 is typical for ham radio transmissions.

Group of Picture (GOP) Settings

However, other orders of B-and P-frames can be also transmitted and for that reason the delay times inside the encoder can change. The term for the sequence of I, B, and P frames used is called the GOP Mode. A sample of different GOP Modes that can be used are:

- I mode
- IP mode
- IBBP mode (see example in Fig 5)
- IBBBP mode (see example in Fig 1)

Fig 1 showed an example of the encoded frames produced by the IBBBP GOP Mode. **Fig 5** shows the sequence of encoded frames produced by the GOP

1	2	3	4	5	6	7	8	9	10	11	12	13
I	B	B	B	P	B	B	B	P	B	B	B	I

Figure 3 - Encoder camera-based sequence of compressed frames

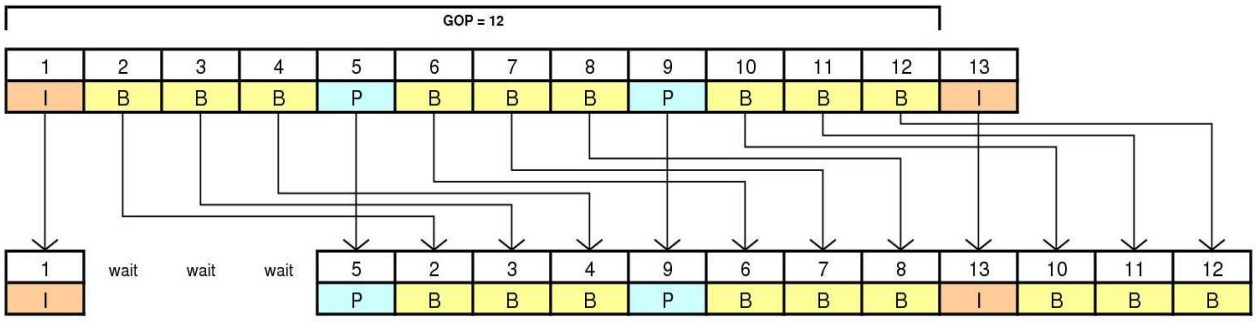


Figure 4 - Encoder exit frame sequence in broadcasting order

Mode, IBBP. Typically, the GOP mode of IBBP is the default setting used in SR-System DATV boards.

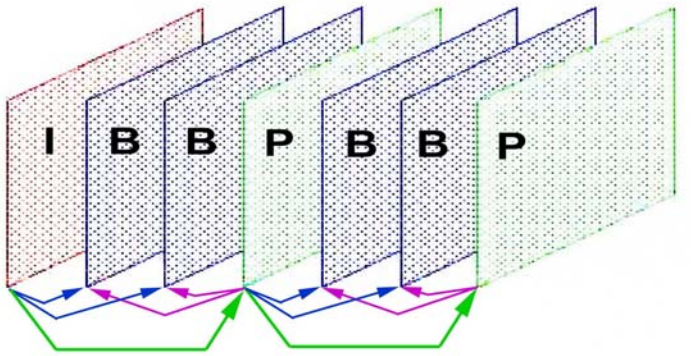


Figure 5 - Sequence of Encoded Frames using GOP Mode IBBP

The minimum delay originates if exclusively I-frames (that is: I-frame only) are transmitted. Unfortunately, only a very low compression is available with this GOP mode and the needed RF bandwidth increases considerably. As Stefan DG8FAC of SR-Systems explains: “if you enable the GOP Mode "I", then you will have the lowest delay…but you create a payload net-data-bit-rate of around 10Mbps in D1 resolution (at least four times larger data rate and therefore wider RF bandwidth than with the IBBP mode)”!! Because the B-frames contain the smallest amount of data (greatest amount of compression), a large number of B-frames reduces the bandwidth considerably, however, raises also the waiting period up to the next P-frame. Next, the separation of the signals in the I- and Q-portion and then the calculation of the error protection (FEC) require two more processing steps. The final QPSK modulation then runs very fast.

Especially with professional broadcast-encoder, there are different operation modes available. You can choose between "low delay", "very low delay", "normal" and different "seamless modes". While in the "low-delay" operation mode no B-frames are processed, the speed is very fast, at the expenses of the data rate and image quality. In the "seamless"-modes a free of interruption change of the data rates is possible, indeed, only by the evaluation of several successive I-Frames and therefore the transmission can delay around several seconds. Merely in the "normal" mode, the delay depends to the necessary minimum by the frame order.

The following parameters and settings will have effect to the encoder delay:

- what kind of the input signal
- choice of the video-resolution
- GOP Mode (mix of frame types)
- GOP Number

The mix of frame types and GOP (Group Of Pictures) are the determining factors which are responsible for the delay from something about half a second inside the MPEG-2 encoder.

SetTopBox Decoder Delays

The delay on the receiver side (SetTopBox, aka STB,) is not so serious. Because the picture sequence will be received for the decoder already in suitable order, therefore the decoding can begin immediately with the treatment. However, good receivers will first store first the picture and display it only delayed. This has several reasons. So received and corrupted picture parts (usually done at the “pixel block” level….groupings of 8x8 pixels) can be replaced by suitable parts of the following picture and an apparently undisturbed picture will be generated. Stefan DG8FAC of SR-Systems has tested many STB receivers and reports that standard STBs exhibit around 7-14 frames of delay. In NTSC, this equates to a latency ranging from about 0.25 seconds to almost 0.5 seconds, in typical STB receivers.

During a digital (packetized) transmission the picture packets and sound packets will not arrive at the same time on the receiver site. To ensure, nevertheless, a lip-synchronous presentation, all packages will get so-called "timestamps” during the encoding process. In the receiver this information will be evaluated and the video output will be controlled and steered by the "presentation timestamp". Therefore, the output of the signals must be held back until all signals are available together.

If the video signal is transmitted with other resolution than the desired television standard, a format conversion must be done on the video output side. The video resolution conversion (e.g. from SIF to D1 or from 16:9 to 4:3) requires again a signal processing and calculating, which produces one more delay.

If the signal will be displayed e.g. on a PC screen, then another set of digitizing and conversion of the pixel numbers into the format of the desired display is necessary. If yet also an adaptation to the picture refresh frequency of the monitor becomes necessary (e.g., from 50 to 60 or 75 hertz), then this video resolution adaption requires some necessary interpolation processing and again adds considerable delay time.

Finally, one will discover that the transmission of TV signals using the MPEG-2 standard allows a reduction of the RF bandwidth compared with an analog transmission, however, this narrow bandwidth is bought dearly by a significant increase of the latency time. The important factor that creates latency is not the digitization, but rather is the signal compression (that is: the reduction of net-data-bit-rate needed).

So it will be necessary during digital MPEG-2 broadcasts, to choose whether a low-latency and wider bandwidth scenario is desired…or a larger-latency and narrow bandwidth is desired. This choice determines the parameter settings of the MPEG-2 compression process. Narrow bandwidth DATV transmissions can not be achieved without incurring any delays.

Avoiding Additional Repeater MPEG Latency

When implementing a DATV, normally an additional set of MPEG delays can be incurred at the repeater site itself. Here is a list of the location of MPEG delays in a "normal" DATV transmission through a DATV repeater:

1) Transmitting DATV home station – MPEG Encoder
2) Repeater site STB Receiver – MPEG Decoder
3) Repeater site re-Encoding for Transmitter – MPEG Encoder
4) Receiving DATV home station STB – MPEG Decoder

SR-Systems offers an interesting DATV product called a NIM Tuner board (see **Fig 6**). The NIM Tuner can be tuned to the typical DATV microwave frequencies (for example 1.2 GHz and 2.4 GHz) and outputs the Transport Stream (TS) directly in a ribbon cable that can be connected directly to the TS input-connector of a DATV exciter. The ribbon connector on the right hand side in **Fig 6** is the TS output signal. This approach avoids the performing the MPEG-2 Decode step and the re-encode step at a DATV repeater location. See **Fig 7** that compares the delays between using a STB at the repeater and using a NIM tuner at a repeater – side-by-side.

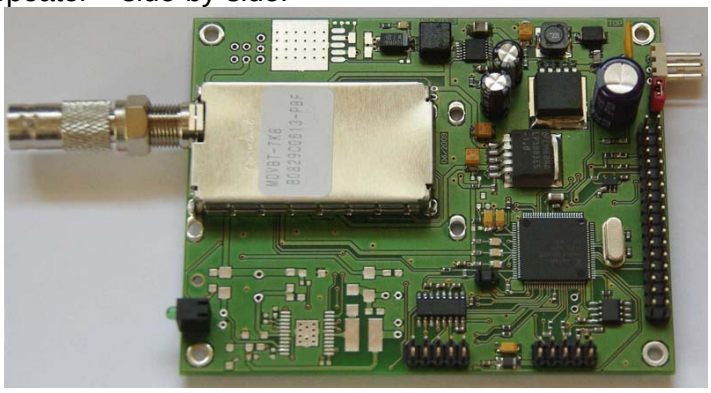


Figure 6 – NIM Tuner board with Transport Stream (TS) output.

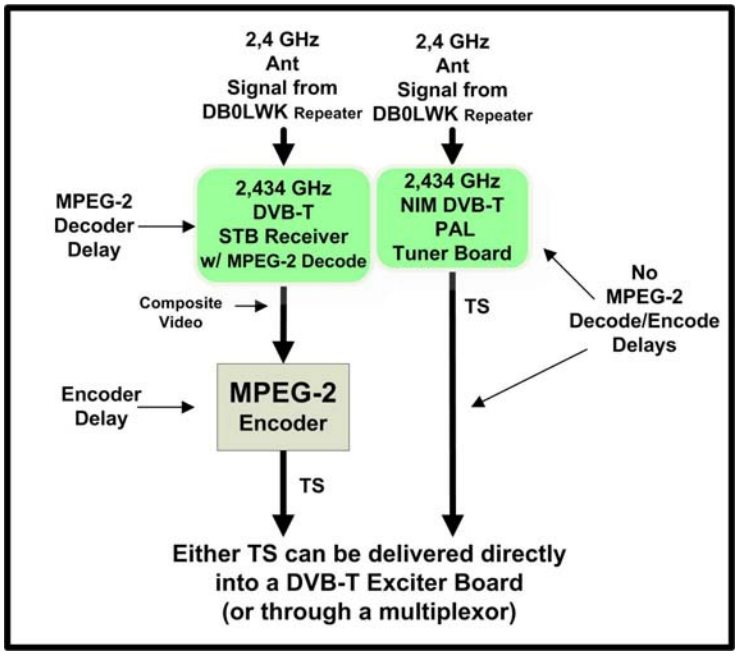


Figure 7 - Comparing NIM Tuner with STB. NIM avoids any Decode/Encode delays being added.

Conclusion

It is our hope that the reader can now appreciate the processing and complexities involved with the MPEG-2 aspect of DATV. You should now also be able to recognize the purpose/function of some of the variable parameters used for MPEG-2 and the impact that can occur for various setting values…and why DATV narrow bandwidths incur latency.

(See Interesting DATV links on page 6)

Heathkit of the Month

by Bob Eckweiler, AF6C

Heathkit Cantenna Dummy RF Load

Mid-1959 found this author completing his first ham transmitter kit, a Heathkit DX-40. To check out the finished kit required a dummy load which was quickly built. It was a standard 50's era bakelite lamp socket connected to a short length of standard zip cord*. The zip cord was separated into two leads that had an alligator clip on one lead and a banana plug on the other. Screwed into the lamp socket was a 60 watt 120VAC light-bulb, just like the one you'd use in your living-room lamp. When the transmitter was keyed the lamp lit brightly. The bulb was a crude dummy load: the SWR was not close to 1:1; the device radiated more RF than a true load; and the load varied as the bulb warmed up. Still the 6146 tube class C output stage, with its pi-network, easily loaded up fully and lit the lamp brightly.

Soon after that though, SSB transmitters with a linear Class AB output amplifier became the norm, and today solid-state transmitters with broadband output stages are typical. Both of these require an accurate 50 ohm dummy load for good results. Thus the light bulb dummy load has long been relegated to the junk box.

All you need for a good dummy load is a 50Ω resistor that can handle the required power. This sounds simple but it isn't; the resistor has to have a very low reactive component, especially at higher frequencies. This eliminates a majority of high power resistors that are wire-wound and have a highly inductive component. Low power dummy loads may be built using standard carbon or film resistors. Beyond that an expensive, hard-to-find, high-power non-inductive resistor is required.

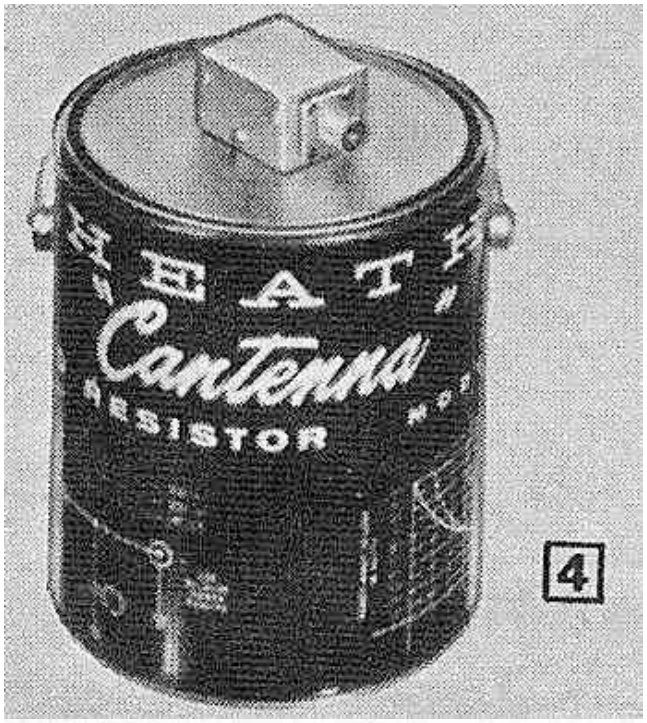
The Heathkit HN-31 Cantenna:

In 1961 Heathkit, using its quantity buying power, introduced the HN-31 Cantenna dummy load. The Cantenna was well received by the ham community because of its low price and high performance. It can handle a full kilowatt for up to 9-10 minutes, depending upon the cooling oil used. The SWR remains under 1.5: 1 at frequencies up to 450 MHz. When originally introduced the Cantenna was priced at $9.95.

Older Heathkit HN-31 'Cantenna' from the March 1965 Heathkit Factory Catalog. Note the lack of graphics on the can.

The name Cantenna is very apropos as the dummy load is built into a one-gallon paint can. All components mount on the lid of the can. Visible is a small metal mini-box that holds an SO-239 UHF connector and an RCA phono connector. The UHF connector is the input and the RCA jack provides a DC voltage output relative to the input power/frequency for indication purposes . A simple circuit inside the little box taps a small part of the input power and rectifies it to provide this DC voltage. Also on the lid of the paint can is a small relief valve that opens should the oil get too hot and release vapor. Early Cantenna cans came painted a solid black, according to pictures in the early catalogs. Later white lettering was added to the can, including a graph of allowed power input vs. time and a schematic.

The high power non-inductive resistor that is the actual dummy load is mounted underneath the lid and projects down into the can. An open aluminum tube surrounds the resistor and acts in a coaxial configuration that reduces stray reactance and helps maintain a 50Ω impedance at frequencies well into the UHF range.



4 "Cantenna" dummy load
1 kW max. input; 1.5-300 MHz w/SWR 1.5:1 or less. Oil not incl.
Kit HN-31, Shpg. wt. 3 lbs. 14.95

Later Heathkit HN-31
Note the graphics on the can.

Cooling Oil:

To provide cooling for the resistor, the can is filled with oil that can freely circulate through the open aluminum tube and remove heat from the resistor. The oil was not provided by Heath as part of the kit. Either transformer oil or mineral oil may be used. Motor oil is verboten since its vaporizing temperature is low, and excess vapors would be emitted. Heath sold transformer oil in gallon plastic bottles at its retail stores for use in the Cantenna. It is important that the oil be filled to the right level so oil can circulate up the tube surrounding the resistor as the oil near the resistor heats the oil in its proximity.

In the late '60s many transformer oils were found to contain PCBs which was identified to be a significant carcinogen. It created a panic on the order of the 1950's cranberry scare. Heathkit announced that the oil they sold in their stores was PCB free. If you buy a used Cantenna, you might want to get assurance that the transformer oil is not PCB based.

The oil also creates another problem. A paint can full of oil is not something one finds agreeable in the house. If tipped, oil can leak from the relief valve. My observation is that a little oil somehow always manages to escape no matter what. Thus Cantenna Dummy loads are often placed away from the living areas of the house.

With transformer oil the Cantenna is rated at 1KW for just under ten minutes and 200 watts continuous. If mineral oil is used instead the 1KW rating is just a minute or two but the continuous rating remains at 200 watts. A de-rating curve is provided showing power vs. time. It is also printed on the can of the later HN-31 and its successor - the HN-31A

I purchased a Cantenna HN-31 over the week between Christmas and New Years in 1968 at the local Heathkit store on Ball Rd. in Anaheim. The price at the retail store was usually higher than from the factory, so it cost me a whopping $12.50 plus 63¢ tax.

Heathkit produced the HN-31 from 1961 to 1983. In their March 1965 mail order catalog it cost $9.95. In the winter 1983 mail order catalog it cost $24.95.

The HN-31A Updated Cantenna:

In late 1983 Heathkit discontinued the HN-31 and introduced the HN-31A. This dummy load is a step backwards from the original. The can sports a new red, black and white paint scheme spelling out specifications. The graph of power vs. time is still on the can, but is physically smaller (the dissipation remains the same). Gone

is the mini-box on top of the can lid with the monitor jack and its associated circuitry. Instead of the box, the coaxial connector mounts directly on the lid of the can and the only other electronic component is the resistor. The coaxial shielding around the resistor is still present so the device still boasts an SWR < 1.5:1 up to 450 MHz and the power capability is still the same. Heath probably made this change due to the increased cost of parts. The aluminum box and the porcelain feed-through between the box and resistor in the can are gone, removing two of the more expensive parts. The RF monitoring option is not something many people use.

The Later Heathkit Cantenna HN-31A

The HN-31-A stopped production in 1991 as the Heathkit period was drawing to a close. In late 1983 it cost $24.95. Near the end of production the price increased to $26.95. But, in the fall of 1984 and again in the Winter of 1991 its price was reduced to $19.95.

The Heathkit HM-2102 Dummy Load and Wattmeter:

Heathkit produced another dummy load, the HM-2103. This unit was manufactured between 1973 and 1975. It is a "dry" unit that can handle a kilowatt and includes a wattmeter. It is rated at 1 KW for a couple of minutes or 175 watts continuous. The SWR is specified at 1.2: 1 over the HF bands (1.8 - 30 MHz). The built-in wattmeter has two ranges: 0 - 200 watts and 0 - 1,000 watts; wattmeter accuracy is ±10% of full scale.

The HM2102 sold for $59.95 during its two year production run..

Author's Comments:

Heathkit Cantenna Dummy loads can still be found on eBay and at swap-meets. the RF monitoring available on the original Cantenna is not a reason to favor it over the later 'A' version unless you foresee a need for it. If you are looking for one at a swap-meet., take along a trusted VOM and check the resistance between the Center of the UHF connector and ground. It should be within 20%, and preferably within 10% of 50Ω. If not, the resistor in the dummy load may have been over-heated. As stated above, you should be assured the oil in the Cantenna is not PCB based. If the dummy load is empty of oil, be sure to carefully clean it before refilling it with a good mineral or transformer oil.

** For those unfamiliar with the term zip cord, it is the standard two wire power cord that has been used on lamps and small electrical devices for years.*

de AF6C

Mark Your Calendars:

- The next general meeting will be held May 21st. Charles Basham - N6DZW of Southern California Edison will speak on electrical safety for the radio amateur.
- The next Breakfast and Board Meeting is on June 12th. All members and visitors are welcome.
- **Field Day is coming!** June 25th (set-up) through 27th; mark your calendar now.

OCARC

Board Meeting Minutes

4-10-2010

The ORARC Board meeting was held at the JagerHaus Restaurant, 2525 East Ball Road, Anaheim, at 8:14AM Saturday, April 10, 2010. There were a total of 7 directors and 3 visitors –George N6VNI, Hank W6HTW and Steve N1AB. There was a quorum with the directors' present.

DIRECTOR REPORTS:

- Vice President Paul W6GMU has speakers for the remainder of the year
- Treasurer Ken W6HHC –Balance on hand $5987.00.
- Kristine –KC6TOD – sent Thank You letter to the Karagozian family for Silent Key Donation Ed K6JGN. Larry K6VDP has coordinated the equipment.
- Dan – N6PEQ - CW class will be held in June or July
- Nicholas AF6CF noted the large group participating in Baker to Vegas

OLD BUSINESS:

- **RF Newsletter " Rotating" Editors – thank you to all who volunteer!**
  - May – Kristine KC6TOD
  - June – Ken W6HHC
  - July - Paul W6GMU
  - August – Kristin K6PEQ
  - September – Bob AF6C
- **2010 Field Day Plans –**
  - Location has been confirmed thanks to George N6VNI, he did the leg work, coordinated with the school district – two days before Field Day he will pick up the keys to the restrooms. We are all set to go starting at 11:00am on Friday, June 25th.
  - Publicity for Field Day will have a press release, Ken to send information to Robbie,
  - Organization of Band Captains – we are looking for additional volunteers
    - GOTA – Steve N1AB with the help of Phil KI6VEN
    - 20 Meter phone – Ken W6HHC
    - 20 Meter CW – Paul W6GMU
    - 40 Meter Phone – Doug W6FKX
    - 75/15M Ph -50% commitment by the Catalina Repeater group
    - 2M (and 6M… maybe UHF) Robbie KB6CJZ
    - Looking for additional team captains

  .The Chuck Wagon will be volunteers – sandwiches and pizza, beverages refilled, etc. Very simple. (See inset with up to date Field Day plans)

- **Eyeball Cards** – Project in process - Robbie KB6CJZ and Nicolas AF6CF to work on card. Move to May to discuss.

NEW Business

- Cheryl is sending a dozen mugs that can be given as thank you's for speakers, etc.
- Great raffle prizes for the April meeting, to be run by Bob AF6C and Loran AF6PS.

Motion made to adjourn meeting by Dan N6PEQ and seconded by Paul W6GMU.

Meeting adjourned 8:40 AM

Respectfully submitted:

Kristine Jacob

KC6TOD

Secretary

- t in process - Robbie KB6CJZ and

Attention Members!!!

Do you know a fellow ham that would be interested in joining OCARC? Do you have a friend that is curious about ham radio and wants to learn more about our hobby? Why not invite him or her to one of our exciting monthly meetings?!?! The meetings are fun, informative and entertaining. And don't forget about the raffle prizes too. So bring a visitor to one of our meetings, and help **your** club expand!

Make sure to inform your friends of our club's website, which is always kept up to date. Information on club meetings, activities and our newsletter archive make it a worthwhile site to surf! http://www.w6ze.org

2010 ARRL CONTEST SCHEDULE

June	12 - 15	ARRL June VHF QSO Party
	19 – 20	ARRL Kids Day
	26 – 27	ARRL Field Day
July	10- 12	IARU HF World Championships
August	7 - 9	ARRL UHF Contest
	21 - 23	ARRL 10 GHz and Up Contest
September	11 - 14	ARRL September VHF QSO Party
	18 - 20	ARRL 10 GHz and Up Contest
November	6 - 9	ARRL November Sweepstakes (CW)
	20 - 23	ARRL November Sweepstakes (Phone)
December	3 - 6	ARRL 160 Meter Contest
	11 - 13	ARRL 10 Meter Contest

Planning continues for OCARC Field Day 2010

The planning continues for the OCARC Field Day 2010. We need a few good hams to fill in some organizing leadership positions. We need lots of members to plan to come out, help, and have fun.

1) FD Co-Chairmen

Ken W6HHC and Doug W6FKX are co-chairmen for FD

2) Band Captains confirmed

So far, the following people have volunteered as Band Captains

- 20M PH – Ken W6HHC
- 20M CW – Paul W6GMU
- 40M PH – Doug W6FKX
- 2M and UHF – Robbie KB6CJC

3) Looking for Band Captains

It would be really great if someone would be willing to organize:

- 40M CW
- GOTA
- Any other band is welcome (10M, 160M etc.)

4) Organize Food

This year the number of operators may not be as large as last year. We are looking for one or two people to get together to help OCARC organize food. We have lots of possibilities ....cook, buy McDonalds or Pizza or Subways, use a caterer????? We just need a couple people to help us organize for food.

5) Need Motor home/Camper to use as Band "Shelter"

We can use at least two people to bring their motor homes or campers to Field Day to allow band-captains to operate their rigs. Can you help??

6) Field Day Site

George N6VNI has obtained permission allowing OCARC to use Walter Knott Elementary School field in Buena Park this year for FD.

7) Field Day Set-up Plans

- Set-up is planned to begin at 1 PM on Friday afternoon
- Tear-down will begin at 11 AM Sunday morning.

Let us know if you can help the OCARC Field Day planning efforts.....
...de Ken W6HHC **W6HHC@W6ZE.org**
...de Doug W6FKX **W6FKX@W6ZE.org**

OCARC FIELD DAY SITE AT WALTER KNOTT SCHOOL

NORTH

OCARC
General Meeting Minutes
4-16-2010

The OCARC April General Meeting was held at the Red Cross complex in Santa Ana at 7:00 pm.

The meeting was called to order at 7:05 PM by Technical Director Bob - AF6C. A short introduction and the Pledge of Allegiance followed. Due to the conflicting Baker to Vegas race that many members were supporting and the Annual DX Convention in Visalia, CA that many other members were attending. In attendance at the meeting were 15 club members and guests and two board officers.

The meeting program was a presentation of the ARRL video titled: ***The Story of the Queen Mary and W6RO.*** Tom - KI6GOA of the Red Cross set up the AV equipment so the video could be displayed on the "big screen". Following the video a short discussion of the Queen Mary was held which mentioned among other things, the ARRL conventions held aboard in the past.

Members and visitors were introduced and a short break was held. Lee Evans made coffee in the breakroom.

Following the break, an informal discussion was held since the only officers present were Loran - AF6PS, Membership Director. and Bob - AF6C Technical Director. The discussion focused on Field Day and the need for a few people to organize the food and champion the GOTA station.

The meeting was adjourned at 8:15 PM and Loran conducted the raffle. The grand prize winner was Ken - W6KOS.

Respectfully submitted by,
Bob Eckweiler - AF6C
Acting Secretary,Treasurer, DAL and Emcee.

Thank you Bob for taking the notes… Kris Jacob KC6TOD