RF

ORANGE COUNTY AMATEUR RADIO CLUB, INC.

VOL. LIII NO. 01 **P.O. BOX 3454, TUSTIN, CA 92781-3454** **January 2012**

The Prez Sez.....

by Paul W6GMU

Here we are in a brand new year, so I'll take this opportunity to wish all of you a very happy and healthy New Year and welcome the new Board members! I'm looking forward to this year's upcoming club events, both the ones we typically enjoy and new ones we may try out for the very first time. There are so many potential fields of interest in Amateur Radio that I'm hoping to spice up the OCARC experience with a few of them. Innovative ideas should come from both the Board and the entire membership, so please consider trying to participate in this effort to expand our "field of view". New ideas need not be technical in nature, as social suggestions can liven things up as well.

Please enjoy our Club and each other. 73 to all de Paul W6GMU "The Prez"

OCARC

New 2012 Board Of Directors

(See page 2)

No December formal meetings

There were no Club meetings (other than the x-mas party) during December 2011, so there are no board meeting minutes in this issue of "RF".

Next Meeting

The next general OCARC meeting will be January 20th.

Our speaker will be ARRL section manager Carl Gardenias, WU6D who will talk about "What's new and happening in the Orange Section"

The next general meeting will be on:

Friday, Jan. 20th @ 7:00 PM

As usual, we will be meeting in the east Red Cross Building, Room 208. See you there!

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ORANGE COUNTY AMATEUR RADIO CLUB
www.W6ZE.org

2012 Board of Directors:

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OCCARO Delegate:
Kristine Jacob, KC6TOD
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KC6TOD@W6ZE.org

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

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.

2011 OCARC Christmas Party

The OCARC Christmas Party was held at the JaegerHaus Restaurant, 2525 E. Ball Road, Anaheim, CA. We had fifty-four guests present to enjoy the marvelous German family style meal. Everyone enjoyed dining together with so many friends and partaking of the marvelous food. A special thanks to Kristin K6PEQ for organizing the Prizes for the Ladies and to Dan N6PEQ for organizing the Opportunity Drawing Radio Prizes!!

It was a huge OCARC Gathering!
(Photo by Jim-N6DHZ)

Carl N8AE and Dee N8UZE were jointly awarded the “Good of the Club” award.

Looking over just a few of the colorful Baskets for the Ladies

A few OCARC members argue over who will win the Comet Antenna Analyzer

Dan won the Grand Prize, an Apple iPAD2. But, then just one microsecond later, Kristin K6PEQ had the iPAD2 in her arms

Vertex Standard
6125 Phyllis Drive, Cypress, California 90630
Tel (714) 827-7600 Fax (714) 827-8100

December 27, 2011

Dear Amateur, Marine and Air-band Valued Customers:

We would like to thank all of our valued customers for your continued support. In this letter, I am pleased to announce a recent corporate reorganization. After four years of joint venture with Motorola, we have decided to transfer the Vertex Standard LMR business to Motorola and focus on Amateur, Marine and Air-band business. The effective date for this reorganization will be January 1, 2012.

Our company name will once again be YAESU MUSEN; a name our business partners have been familiar with for over 50 years. We are delighted to bring you the legacy of trust, quality, and solid customer service that has always been associated with the YAESU MUSEN company name.

This reorganization will allow us to concentrate in Amateur, Marine and Air-band business, which will better leverage and align the strengths of our entire business operation. We believe that there is an exciting opportunity to evolve our organization to meet the needs of the Amateur Radio, Marine Equipment and Air band communication industries by continuing to provide specialized services and the highest quality products. We are excited to continue working hard to support your business.

Details of the new operation include:

- Our headquarter company name will change to YAESU MUSEN Co., Ltd and the US subsidiary will be YAESU USA Inc.
- Company is wholly-owned by Founder's family
- New Headquarter address and phone/fax number will be:
  Address: Tennouzu Park Side Building 2-5-8 Higashi-Shinagawa, Shinagawa-ku, Tokyo
  Phone Number: +81-3-6711-4151 Fax Number: +81-6711-4277
- No change in operation, sales organization, address and phone number of YAESU USA Inc.
- The new operation will be effective from January 1, 2012
- Our new Brand Logos will gradually begin to appear on our web site and printed materials

YAESU The radio

STANDARD HORIZON Nothing takes to water like Standard Horizon

Please note that there is no change in the existing Senior Management Team that will continue to support your business.

- Dennis Motschenbacher leads Amateur Sales Division.
- Jason Kennedy leads Marine and Air-band Sales Division.

Should you desire additional information, please feel free to contact them.

Thank you for your loyalty and support. We are glad that you will be there with us as the new operation unfolds. Our team of enthusiastic Design, Production, Sales, Customer Service, and Repair professionals look forward to servicing you long into the future.

Sincerely yours,

Jun Hasegawa
President/ CEO
VERTEX STANDARD CO., LTD.

A HISTORY of OCARC PRESIDENTS

by Ken Konechy W6HHC
with great assistance from our Club Historian, Bob Evans - WB6IXN

YEAR
2012 W6GMU Paul Gussow
2011 W6GMU Paul Gussow
2010 K6PEQ Kristin Dankert
2009 AF6CF Nicholas Haban
2008 N8WP Willie Peloquin
2007 K6PEQ Kristin Dankert
2006 N8WP Willie Peloquin
2005 W6HHC Ken Konechy
2004 N1AB Steve Brody
2003 KQ6JD Lowell Burnett
2002 KE6WIU Cory Terando
(now AE6GW)
2001 KD6BWH Bob Buss
(later KØBWH)
2000 K6LDC Larry Hoffman
1999 WA6VPP Bud Barkhurst
1998 KD6BWH Bob Buss
(later KØBWH)
1997 WA6VKZ Frank Smith
1996 AF6C Bob Eckweiler
1995 N6XTJ Jim Roberts
1994 KJ6ZH Chris Breller
1993 KC6TAM Jane Breller
1992 WA6VKZ Frank Smith
1991 W6HHC Ken Konechy
1990 KJ6ZH Chris Breller
1989 WA6VKZ Frank Smith
1988 W6HHC Ken Konechy

YEAR
1987 N6JSV Jim Talcott
1986 WA6VKZ Frank Smith
1985 AF6C Bob Eckweiler
1984 KA6IMP Chris Breller
(now KJ6ZH)
1983 W6IBR Al Watts
1982 KA6HNY Robin Hoff
1981 WA6VKZ Frank Smith
1980 WA6FOW Ernie Prichard
1979 WB6IHZ Terry Mathers
1978 WA6LFF Jim Kingsbury
1977 WA6WZO Fried Heyn
1976 WB6PEX Martin Raymond
1975 WA6LHB Art Sheldon
(now K7ZE)
1974 W6HHC Ken Konechy
1973 WB6QNU Bob Eckweiler
(now AF6C)
1972 WA6FIT Ron Cade
(now W6ZQ)
1971 WB6CQR Billy Hall
(now N6EDY)
1970 WB6UDC Jack Hollander
(now N6UC)
1969 WA6ROF Jerry VerDuft
(now ADØA)
1968 W6COJ Dave Hollander
1967 WB6GPK Jim Hill
1966 WA6YWN Jack Shaw
1965 K6KTX Rolland Miller
1964 W6WRJ Ralph Alexander
(later W6RE)
1963 W6DEY Roy Maxson
1962 K6LJA Ted Glick
1961 K6IQ Roy Morriss
1960 K6TXS Charles(Ed)Edwards

YEAR
1959 W6BVI Ken Kesel
1958 W6BVI Ken Kesel
1957 - CLUB DISBANDED -
1956 W6HIL Bob Swenson
1955 W6BVI Ken Kesel
1954 W6UPP Marinus Conway
1953 Probably only informal
meetings, no officers?
1952 W6QZQ Horace Bates
1951 W6LDJ Sam(Mac) McNeal
1950 Probably only informal
meetings, no officers?
1949 W6CGF Chuck Lunder
1948 W6BWO Dale Bose
1947 W6ALO Tommy Gentges
1946 W6DEY Roy Maxson
1945 W6DEY Roy Maxson
1944 - **ALL OFF TO WAR!!**
1943 - **ALL OFF TO WAR!!**
1942 W6IBN Roy Cumpston
1941 W6BAM Shelley Trotter
1940 W6KLU Harold Christensen
1939 Probably only informal
meetings, no officers?
1938 W6NSA Les Gates
1938 W6ADT Noral Evans
1937 W6LYN Noral Evans
(later reissued as W6ADT)
1936 W6LYN Noral Evans
(later reissued as W6ADT)
1935 - CLUB DISBANDED!!
1934 W6IGO Earl Moore
1933 W6IGO Earl Moore

Heathkit of the Month #37:
by Bob Eckweiler, AF6C

Heathkit

Heathkit AM-2
Reflected Power Meter and SWR Bridge

Introduction:
In 1957 Heathkit released the AM-2 Reflected Power and SWR Bridge. This device began a line of Heathkit SWR bridges and, later, power meters. Besides stand-alone SWR bridges, the AM-2 circuit and its derivative were occasionally built into other Heathkit ham equipment models. In the fifties SWR became a simple way to monitor in situ one's antenna for changes and to assure a reasonable match exists between the antenna and feedline. SWR meters found their way into almost every ham shack, and many were Heathkit models. Prior to this style of SWR bridge, SWR measuring devices could only be used at low power and not left in-line during normal operation.

The Heathkit AM-2 SWR Bridge:
The AM-2 measures 7-3/8" W x 4-1/8" H x 4-5/8" D and weighs about 1-1/2 lbs. In 1961 it sold for $15.95. The front panel includes a calibrated 100 µA meter; a **FUNCTION** switch to the left of the meter that selects **FORWARD** or **REFLECTED** relative power and a 50K linear **SENSITIVITY** potentiometer to the right of the meter that adjusts the sensitivity between **MINIMUM** and **MAXIMUM**. Operation is similar to the typical SWR bridge: Power is sent through the meter and, with the **FUNCTION** set to **FORWARD**, the needle is adjusted with the **SENSITIVITY** control to the **SET** mark at the right edge of the meter scale; then, without moving the **SENSITIVITY** control, the **FUNCTION** switch is changed to **REFLECTED** and the meter scale is read. The meter has two scales, **STANDING WAVE RATIO** and **PERCENT REFLECTED POWER**. Both only go to mid-scale, which represents an SWR of 3.0 : 1 and 25% reflected power. The second half of the meter is marked red to indicate excessive SWR.

Figure 1: Heathkit AM-2
Reflected Power and S.W.R. Bridge

The AM-2 is specified for use with power greater than 1 KW. It was originally specified to operate from 160 to 2 meters. On 160 meters a fair amount of power is needed to get full deflection in the forward direction. On 2-meters the meter performance was evidently poor and the later AM-2 SWR meters are only rated to 6-meters. The kit came with two sets of terminating resistors so you could wire the meter for either 50Ω or 75Ω coaxial cable. In the early units the load resistors were identical for forward and reverse power, either 150Ω or 100Ω for 50Ω or 75Ω coaxial line.

The AM-2 remained in production until 1962 when it was replaced by the HM-11.

The Heathkit HM-11 SWR Bridge:
The changes between the AM-2 and HM-11 were purely cosmetic, switching from a silver and dark gray paint scheme of the DX-20/35/40 series to the gray and green motif of the DX-60 / TX-1 families. The circuit was unchanged. The size also remained effectively unchanged, though the specified size changed slightly. The HM-11 is specified for operation from 160 through 6-meters.

The HM-11 was produced until the end of 1965 when it was replaced by the HM-15.

The Heathkit HM-15 SWR Bridge Meter:
The HM-15 SWR meter is another redesign of packaging, this time to match the SB series of ham equipment with its wrinkled gray and green design. This SWR bridge is in a low long cabinet with the meter on the left, the **FUNCTION** switch in the middle and the **SENSITIVITY** control on the right. The circuit was also slightly changed; the terminating resistor values are different and no longer symmetrical.

Figure 2: Heathkit HM-15
Reflected Power and S.W.R. Bridge

The HM-15 sold for $14.95 in 1969. It was in production from 1965 until 1970. At that time Heathkit replaced the SWR bridge as a product with a wattmeter line that provided both forward and reflected power as well as SWR readings. The first of these RF power meters was the HM-102 for HF followed shortly by the HM-2102 for VHF.

Heathkit SWR bridges were also built into some more extensive kits, such as the SB-200/201 1-KW amplifier and the SB-630 station console. These use one of the two circuits used in the SWR bridges mentioned above.

The Monimatch Circuit:
The Heathkit SWR bridges are based on the *Monimatch*[1] and *Monimatch Mark II*[2] circuits made famous by Lew McCoy - W1ICP. Lew's design came from an article entitled *A Reflectometer for the H-F Band*[3] by O. Norgorden.

The circuit consists of a short length of transmission line with two wires parallel to the center conductor of the transmission line. It is imperative that the lines be only a fraction of a wavelength for proper performance. In the original Monimatch the pickup wires are in series, with a common terminating resistor. In the later Monimatch Mark II version the pickup wires are in parallel and use separate terminating resistors, allowing the transmission line section to be half the length.

When power travels along the transmission line to the antenna it travels in the forward direction, however power reflected at the antenna travels in the reverse direction. The two pickup wires are oriented 180° to each other. One end is terminated with a fixed resistor while the other end is terminated with a crystal detector circuit. Power is coupled between the transmission line and the pickup rod both capacitively and inductively. If the termination is correct a balance is created and the voltage from the crystal detector will respond only to the current flowing in one direction. Since the two circuits are in opposite directions, one responds to forward power and the other to reflected power. A switch selects which signal is sent to the meter. The meter readings are frequency sensitive so the potentiometer allows the user to keep the forward reading on the set mark as frequency is changed.

The schematic of the HM 15 is shown in Figure 3. The only change between it and the circuits in the older AM-2 and HM-11 is the values of the two terminating resistors. In the original AM-2 and the HM-11 the terminating resistors R1 and R2 are 150Ω for 52Ω cable and 100Ω for 75Ω cable. In the later HM-15 new diodes are used and the terminating resistor values are changed to 56Ω for R1, the forward terminator, and 100Ω for R2, the reflected terminator, when wiring the SWR bridge for 52Ω coaxial cable. when wiring the bridge for 75 Ω coaxial cable the values are changed to 33Ω for R1, the forward terminator, and 75Ω for R2, the reflected terminator.

It is interesting to note that the manuals for the earlier kits (AM-2 and HM-11) have the input and output connectors mismatched on their

schematics. This was corrected in the HM-15 manual.

The Heathkit AM-1 Antenna Impedance Meter:
You may wonder about the AM-1 that preceded the AM-2. It is an Antenna Impedance Meter. (Figure 4) This device, which sold for $14.50 in 1956, measures antenna impedance and SWR by a bridge circuit that is usually excited by a grid dip meter such as the Heathkit GD-1. Measurements take patience and need to be done near the antenna feedpoint, making the AM-2 SWR bridge a much more convenient instrument than its predecessor.

Comments:
I built an AM-2 back in 1959 to monitor SWR and help me prune my 40 meter dipole that ran from the house to a pole in the back yard; it

Fig 4: AM-1 from a 1956 Heathkit Catalog

HEATHKIT

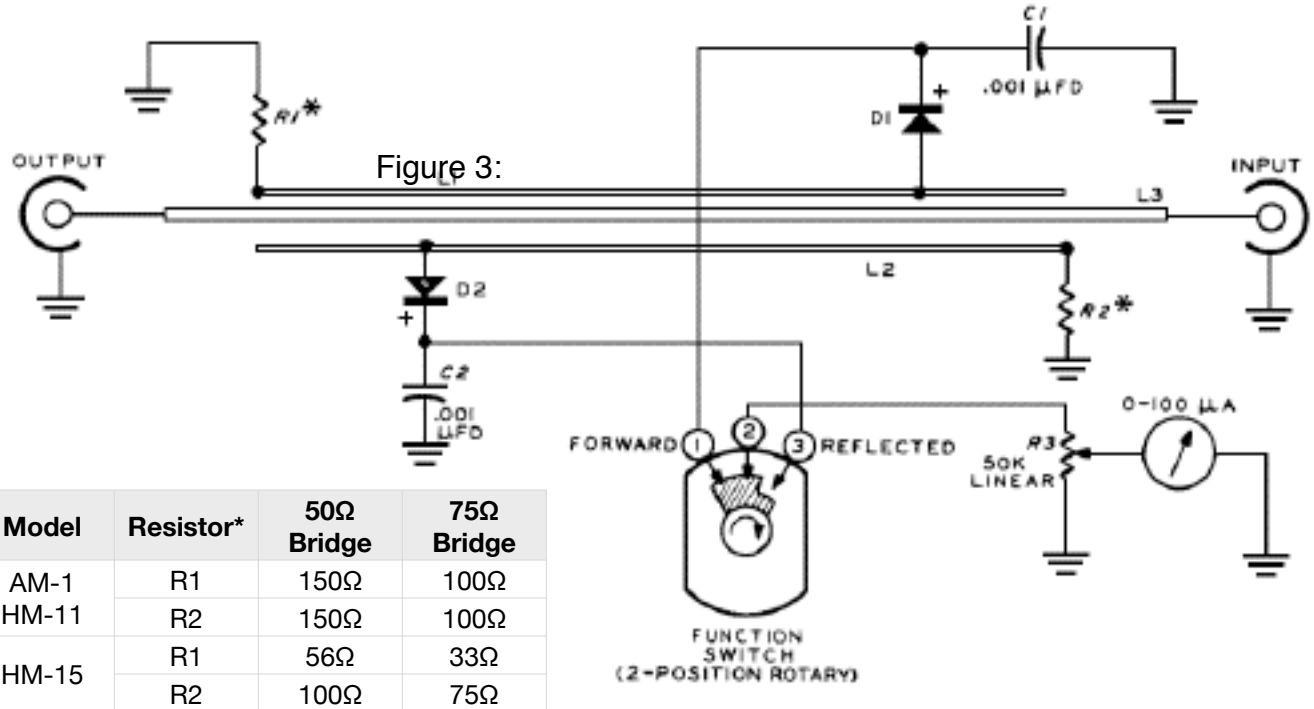


Figure 3:

Model	Resistor*	50Ω Bridge	75Ω Bridge
AM-1 HM-11	R1	150Ω	100Ω
	R2	150Ω	100Ω
HM-15	R1	56Ω	33Ω
	R2	100Ω	75Ω

Figure 3:
SCHEMATIC OF THE HEATHKIT REFLECTED POWER METER AND SWR BRIDGE MODEL HM-15

Advertisement for the AM-2 from a 1961 Heathkit Catalog

was up only 15 feet or so! The AM-2 did a good and reliable job for many years. I finally sold it in the late seventies at our radio club auction after obtaining a newer, non-Heathkit, SWR meter that was later replaced with a Bird wattmeter.

Notes:

1. Lew. McCoy, The Monimatch", QST October 1956, pp 11-14.

2 Lew. McCoy, The Monimatch Mark II", QST February 1957, pp 39, 39.

3. O Norgorden, "Reflectometer for H-F Band", September 1949, NTIS Report #NRL-3538.

73, from AF6C

Due to the workload as the new club treasurer and assistant webmaster, as well as family concerns, I will not be able to turn out a Heathkit of the month every month. However, I am planning at to cover at least two of the larger ham kits this year. I do hope to continue with an article every other month or so for the next few months.

73, Bob

Remember, if you are getting rid of any old Heathkit Manuals or Catalogs, please pass them along to me for my research.

Thanks - AF6C

TechTalk97

Looking at the DigiLite Digital-ATV XMTR Project

by Ken Konechy W6HHC

For several years, hams have recognized that the cost to buy ham-grade MPEG2 encoders boards and Digital-ATV exciter boards is too expensive. A ham-grade set of MPEG-2-and-DVB-S boards from Germany cost about US$1,000. The cost of commercial-grade digital-TV boards is even higher. This high cost is known to prevent many hams from "trying Digital-ATV". A group of hams in Europe with the backing of the British Amateur Television Club (BATC), have succeeded in designing a DVB-S board, called DigiLite, that will lower the cost of DATV considerably.

System Block Diagram for DigiLite

A system block diagram for a Digital-ATV DVB-S transmitter using the DigiLite board is shown below in **Fig 1**. The analog output of a video camera is sent to an MPEG2 encoder unit (made by Hauppauge) to compress the video stream. The video file is stored on a PC and a Windows-based PC does much of the "heavy lifting" to provide real time processing of the Program Stream from the MPEG2 Encoder into a Transport Stream to be used with the DVB-S protocol.

The Transport Stream on the PC is output via USB2 to the DigiLite project board where the 16-bit dsPIC33 microprocessor manipulates the data and sends an I-stream and a Q-stream to a QPSK (Quadrature Phase Shift Keying) modulator. The operating frequency for the DATV transmitter is determined by a stand-alone commercially available Local Oscillator (L.O.) board that is connected to the DigiLite board by a short piece of coax. The Local Oscillator can be chosen for 70 cm band or for the 23 cm band.

The RF output level from the DigiLite board is very low, usually around -15 dBm to -10 dBm. So the typical DATV station will probably follow the DigiLite RF output with about three stages of RF amplifiers to get up to a normal transmitter power level. The DigiLite Project team also recommends using an interdigital band-pass filter.

The DigiLite Board

To obtain a DATV exciter you actually need three separate boards:

- USB2 Daughter-Board (commercially available)
- An assembled DigiLite board
- Local Oscillator Board (commercially available)

The basic structure of the three boards related to the basic DigiLite DVB-S exciter can be see in the Block Diagram in **Fig02** on the next page. The main DigiLite board is designed to provide all of

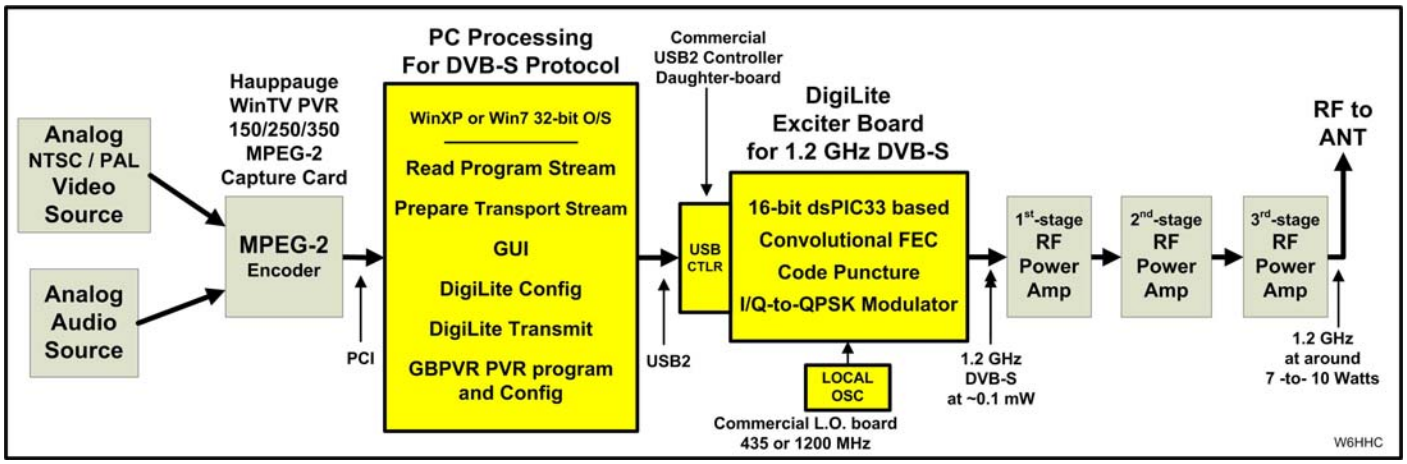


Fig 01 – System Block Diagram of DigiLite Project DVB-S Digital-ATV Transmitter

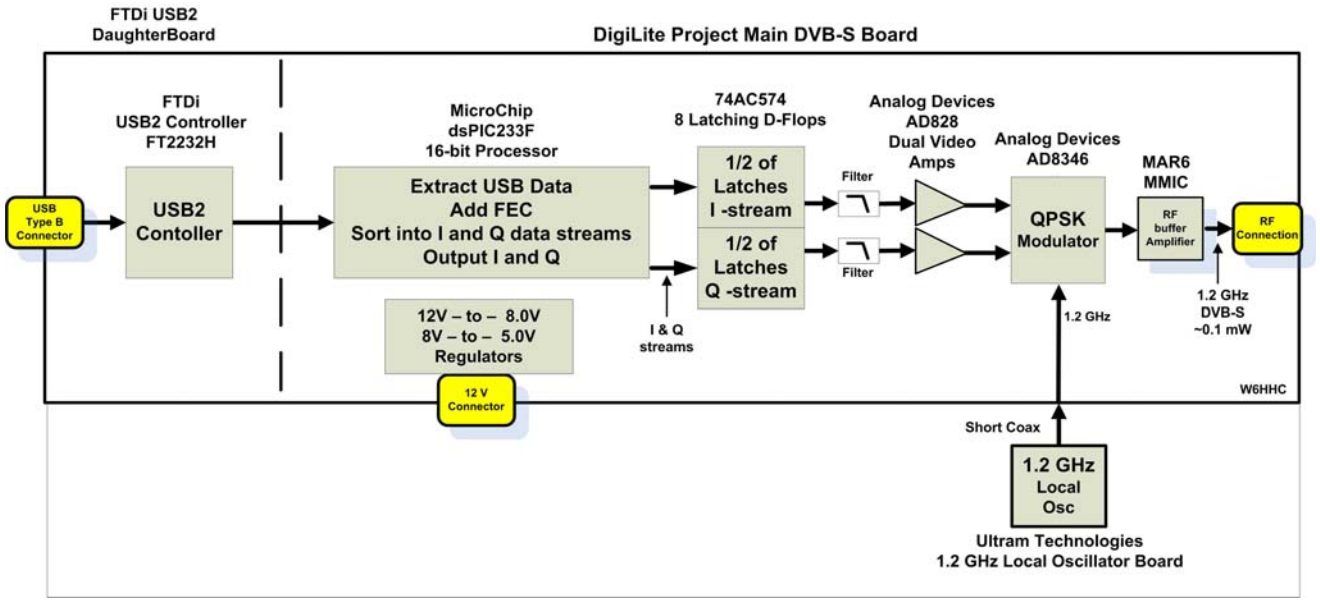


Fig 02 – Block Diagram of DigiLite Project 3-Board DVB-S Digital-ATV Exciter

DigiLite board. In **Fig03**, you can notice that the USB2 controller daughter-board plugs nicely onto the main DigiLite board using a pair of dual-inline connectors (in upper-left corner).

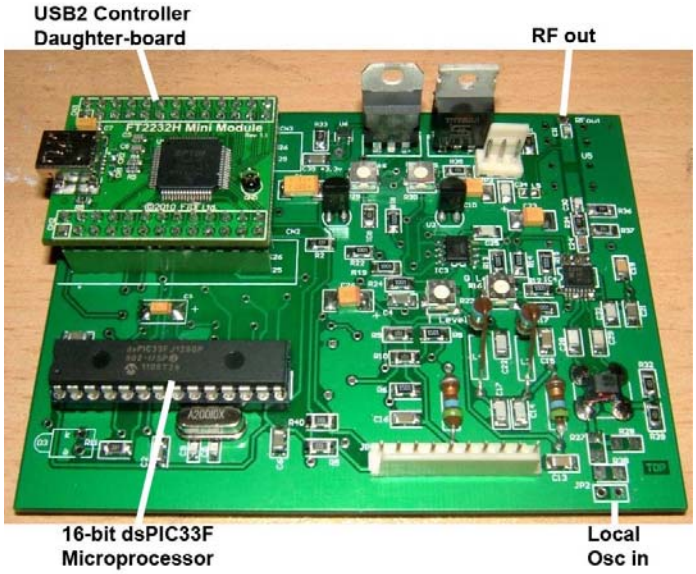


Figure 03 – Main DigiLite Board (Ver 5.6) with USB-daughter-board Plugged-in
(Photo courtesy of Tony MØATV)

The dsPIC33F microprocessor is for digital signaling processing and is well suited for the design. The Nyquist filters can be seen in the Block Diagram, **Fig02**. My understanding is that these filters are used for anti-aliasing (I am sure someone will correct me if I am wrong).

My only surprise was when I looked for the expected RF output SMA coax connector. I couldn't find it?? I had to follow the signal flow and the component flow to find it. The RF output connection is a solder-pad in the upper-right corner of **Fig03**.

The board shown in **Fig03** is version 5.6 in a series of design/layout improvements made by the project team. The current DigiLite layout is Version 5.7. I expect more versions will follow as improvements (maybe new features?) continue to be made.

Software for DigiLite

The DigiLite project board is designed to run on a WinXP or Win7 computer. In addition to loading a number of drivers onto the PC, the following programs are used to send the video stream to the board and control the signal settings.

- **GBPVR Program** – the main freeware program for controlling the video-capture files.
- **GBPVR Config** – this utility allows entering the required settings for the PVR program
- **DigiLite Transmit** – this is the main program that looks for the video capture .MPG file (while it is still being written to disk) converts it to a Transport Stream format for DVB-S protocol and ships the data out the USB port to the DigiLite hardware board. The keyboard ESC key toggles the hardware board between XMT and OFF
- **DigiLite Config** – this utility configures the settings for the DVB-S transmission, such as the Symbol Rate (SR), selecting the TS name, and configuring the FEC settings.

The DigiLite firmware for the dsPIC33F microprocessor can be obtained already installed on the chip (from BATC) or the firmware and/or updates can be loaded onto the DigiLite board from the PC using a free utility software.

"Some assembly required"

The DigiLite main board is sold as a blank Printed Circuit Board (PCB) although it is pre-tinned (not sure if "tinned" is the correct word to use?). The main electronic components need to be purchased by the ham mainly from electronic distributors similar to DigiKey and Mouser. I do not believe that there is anyone selling a "kit full of parts" for the DigiLite board, yet.

Most of the parts are SMT (Surface Mount Technology) that do require dexterity and soldering experience. The hams in Europe who have bought out the first lot of boards (over 100) have shown that this design is capable of being assembled by many hams. (I may personally be disqualified...I have a tendency to use tweezers to shoot SMT capacitors across the room!)

The Nyquist filter inductor values for L1, L2, L3, L4 and the associated capacitors for these filters need to be selected differently for 70 cm operation when compared to the 23 cm operation.

As a final assembly note, the commercially available Local Oscillator board does require a little modification in order to be used. The on-board RF amplifier chip has to be removed to prevent overdriving the DigiLite QPSK modulator. The DigiLite forum discussion threads (see URL link at the end of the article) explain that L.O. overdrive can result in "transmitter noise" in the transmitted signal spectrum.

Where DigiLite Parts are sold

The BATC Shop is currently selling parts that are used with the DigiLite project construction. (see URL next page) Currently being sold are:

- DigiLite blank PCB
- Preprogrammed dsPIC33F µprocessor
- USB2 daughter board (preprogrammed)
- VCO boards (437 MHz or 1249 MHz)
- T1 Balun

History of the Design

The DigiLite project is the result of an evolution of hams trying to provide a low-cost Digital-ATV transmitter. Credit for the earliest development goes back several years to a group of French amateurs including Jean-François Fourcadier F4DAY. The earliest project name was "Poor Mans DATV". The URL link of Rob MØDTS contains discussion and URLs back to the original project and his own successes with the early design. The current DigiLite board design is based on the serialiser board of Brian G4EWJ and the modulator board of Malcolm GØUHY. Much of the project software was developed by Brian G4EWJ. A group of motivated and skilled hams from the Bournemouth Amateur TV Group, including Dave G8AJN, took on the phase to combine the earlier separate boards into a single board, now called DigiLite.

Conclusion

The DigiLite Project team is to be congratulated on providing a great service to hams who want to "try Digital-ATV" without breaking their bank account.

The board works and produces good DVB-S protocol signals (see **Fig04**) that are capable of being received on the low cost Free-To-Air (FTA) Set-Top-Boxes (STB) to provide the foundation for a low cost DATV station.

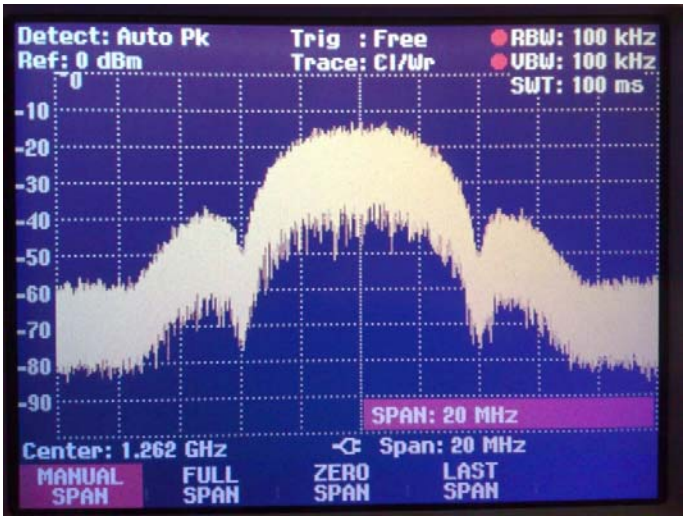


Figure 04 – An Spectrum Analyzer example of 1.2 GHz signal from DigiLite board for QPSK
(Photo courtesy of Malcolm GØUHY)

I can see this project expanding the ranks of hams using DATV, especially analog-ATVers moving to digital technology.

For more details, an excellent series of articles on the DigiLite Project can be found in issue 235 of the BATC magazine called CQ-TV. The magazine can be purchased as an on-line download. I find CQ-TV magazine well worth the PDF yearly price.

- - See Related URLs on next page - -

Interesting DATV Links

- British ATV Club – select from about 25 streaming repeaters – see **www.BATC.TV/**
- British ATV Club – Digital-ATV Forum – see **www.BATC.org.UK/forum/**
- British ATV Club – DigiLite Project Forum – see **www.BATC.org.UK/forum/**
- BATC Store – purchase PCBs and parts for DigiLite Project – see **www.BATC.org.uk/shop/**
- Rob-MØDTS D-ATV site including details of F4DAY-design
  www.M0DTS.co.uk/datv.htm
- DigiLite Project for DATV (derivative of the "Poor Man's DATV")
  www.G8AJN.tv/dlindex.html
- DigiLite-ZL Project, experimental DVB-S modulator using FPGA
  www.idesignz.org/DigiLiteZL/DigiLiteZL.htm
- DATVexpress Project - a Lower Cost Approach to Digital-ATV Transmitter
  www.TAPR.org/pub_dcc30.html
- Orange County ARC newsletter entire series of DATV articles – see **www.W6ZE.org/DATV/**
- Yahoo Group for Digital ATV - see **groups.yahoo.com/group/DigitalATV/**

January Puzzler:

The Twelve Billard Balls
(Suggested by Bruce - KC6DLA)

You have 12 numbered billiard balls, each identical in size. One of the balls is either slightly heavier or slightly lighter than the others, but not so much that you can distinguish it by hefting.

You have a balance scale, each side of which will hold UP TO six balls. The scale indicates whether the ball(s) placed on the left side are: **a)** heavier, **b)** lighter, or **c)** equal in weight to the ball(s) on the right side.

Using only three weightings, determine which ball is the odd one AND whether it is heavier or lighter than the others. How do you do it?

Send your solution by **Feb 1ST** to:

puzzler@w6ze.org

First ten correct answers will be acknowledged. Answers from all readers will be accepted.

Bonus Puzzler: Spot and ID the Cyclops (not a Club member) in this Holiday Party picture.

? ? ? P U Z Z L E R ? ? ?

December RF Puzzler Answer:

The correct answers are:

1: The 508,369th light is ON.

2: One thousand of the one million lights are on.

3: 1,998 lights are off between the second to last light that is on (#998,001) and the last light that is on (#1,000,000).

4: An easy test to see if a particular light is off or on is whether the number of the light is a "Perfect Square"; That is: The square root of the number is an integer.

Explanation:

To solve the problem, all you need to know is the number of times the chain is pulled. If that number is EVEN then the light is OFF; and if that number is ODD then the light is ON.

So which people pull the chain on a specific light? Person #1 pulls every light, and we know that every person pulls the light corresponding to his or her number (i.e. the 35th person pull light #35). Other people who pull a specific light are those whose number divide evenly into the light's number. These numbers are just the FACTORS of the light's number. (You learned this in fourth grade!)

Let's look at the 24th light. Obviously it is pulled by person #1 and person #24. What other pairs of persons, when multiplied together equal 24? Here they all are:

For 24: [1, 24], [2, 12], [3, 8], and [4, 6]

Or: [1, 2, 3, 4, 6, 8, 12, 24] (8 factors - EVEN).

Notice that FACTORS are always in pairs! There is always an even number of factors since they consist of two integers that multiplied together give the number of the light.

Now let's look at the factors for light #100. Its factors are:

[1, 100], [2, 50], [4, 25], [5, 20], [10, 10]

OR: [1, 2, 4, 5, 10, 20, 25, 50, 100]

(9 factors - ODD).

Why does 100 have an odd number of factors. It is because of the [10, 10] pair of factors. The tenth person only pulls the light once so in the end the light remains on. Thus every light that has a pair of factors that contain the same number will be on at the end. Table 1 shows the first several, and last two:

These numbers (numbers that are the square of an integer) are called "Perfect sSquares".

Since 508,369 is a perfect square [713, 713] the corresponding light is ON.

1 = [1, 1]
4 = [2, 2]
9 = [3, 3]
16 = [4, 4]
36 = [6, 6]
49 = [7, 7]
64 = [8, 8]
81 = [9, 9]
100 = [10, 10]
121 = [11, 11]
• • • = [• • • , • • •]
• • • = [• • • , • • •]
998,001 = [999, 999]
1,000,000 = [1000, 1000]

Since the one-millionth light is a perfect square of 1,000, there are exactly 1,000 lights on at the end.

Finally, the penultimate light that is on is the perfect square of 999 or 998,001. And the number of lights off between it and the last (1,000,000th) light that is on is:

= 1,000,000 - 998,001 - 1

= 1,998.

Our winners for the December Puzzler, in the order received, are:

1. KC6DLA - Bruce Creager
2. KE6YHX - Corey Miller
3. WA6WZO - Fried
4. none
5. none

Follow the Rat.

An official ARRL Sanctioned Event

visit our forum posting for up to the minute details on all the exciting ham radio at our 3rd annual event!

Palm Springs Hamfest

Palm Springs Hamfest 2012

SATURDAY JAN. 28 2012

Special Event Station WD6RAT

Gates open to the public : 9:30 AM to 4:30 PM

on 14.251 and 7.251
from 0300z - 1200z

Admission Fee only $2.00

QSL Desert Rats Club P.O. Box 1167 Palm Springs CA

Vendor List:

Information, Demonstrations and talks from:

YAESU DX Store

Ham Radio Outlet

Buds Engraving

Alpine Antennas

Byonics RF Stuff

ARRL

Gordon West W5YI

Clint Bradford AMSAT

2012 ARRL Southwestern Division Convention

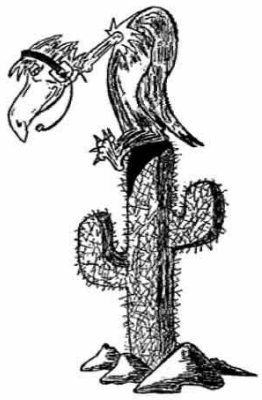
8th Annual

Yuma Hamfest

& Emergency Preparedness Show

Yuma, Arizona

Feb. 17 & 18, 2012



Yuma County Fairgrounds
2520 East 32nd Street, Yuma, Arizona

www.yumahamfest.org

Check the Website for Additional Information
and a Current Schedule of Activities and Seminars

Gates Open for Camping Thursday, 2 pm Vendor Setup Friday, 7 am - Noon	Event Hours Friday, Noon - 5 pm Saturday, 8 am - 5 pm	Buzzard BBQ & Grand Prize Drawing Saturday Night 6:00 - 8:00 pm

Vendors & Exhibitors
Consignment Sales
License Testing
Hourly Door Prizes
Incredible Grand Prizes
Buzzard BBQ Dinner
Antenna Clinic
Tailgating (Swap Meet)
Full Seminar Schedule
DXCC Card Checking
Hospitality Area
On-site RV Camping
Transmitter Hunt
ARRL Speaker

Hamfest Talk-In Frequency: 146.840 (–) PL 88.5 Hz

Email Contact: ***info@yumahamfest.org***

Presented by the Yuma Amateur Radio Hamfest Organization (YARHO)

We are proud to have the Amateur Radio Council of Arizona (ARCA) as a sponsor of our event.

The Yuma Hamfest is an American Radio Relay League (ARRL) sanctioned event.

PROPOSED MINOR AMENDMENT to OCARC BYLAWS

Proposed by Ken W6HHC

Proposed change #1 – document significant officer duty

ARTICLE VI DUTIES OF OFFICERS – insert a new item 5 in section D, TREASURER

5. The IRS requires all 501(c)7 Non-profit Corporations to file an online FORM 990-N questionnaire yearly; after the close of the fiscal year and before the following May 15. The treasurer shall go to the www.IRS.gov internet site and submit a FORM 990-N (e-Postcard) or later form using

ID "OCARC EIN number + 02"

Proposed change #2 – document significant officer duty

ARTICLE VI DUTIES OF OFFICERS – insert a new item 6 in section D, TREASURER

6. The State of California requires all 501(c)7 Non-profit Corporations to file a Statement of Corporation, FORM SI-100 (or later form), every two years (during even years). The treasurer shall file a FORM SI-100, with an appropriate check for the state fee, before August 01 of even-numbered years.

Proposed change #3 – clarify requirements for amendments

Detailed requirements for amending the BYLAWS should be located in one Article, not scattered.

ARTICLE IV Directors – modify section B, as shown below

B. The number of Directors of the Corporation shall be ten (10) until changed by an amendment to the Articles of Incorporation and a change to the Bylaws (See Article IX). ~~To reduce the number of Directors to less than ten shall require the written consent or affirmative vote of at least 80% of the members.~~

ARTICLE IX AMENDMENTS – Label existing text in a Section A and add a new section B, as shown below

A. These bylaws may be amended at a regular club meeting by a two-thirds affirmative vote of the members present provided that the proposed amendment has been presented as a motion and read to the club at two consecutive regular club meetings.

B. To reduce the number of Directors to less than ten shall require an amendment obtaining a written consent or affirmative vote of at least 80% of the members.

OCARC Financial Report for 2011

12/31/2011

INCOME

ARRL Membership Income	$115.00
Auction In	$1,140.35
Badge Income	$41.00
BADGE MAILING	$2.00
Christmas Dinner Ticket Sales	$1,456.00
Donations - FD	$555.00
Dues, Family	$307.50
Dues, Future	$390.00
Dues, Membership	$1,090.00
Interest	$3.84
Opportunity Drawing - Holiday	$1,081.00
Opportunity Drawing -Monthly	$1,108.00
TOTAL INCOME	**$7,289.69**

OUTFLOWS

ARRL Membership Expense	$98.00
Auction Expense	$6.45
Auction Payout	$323.87
Awards and Plaques	$75.71
Christmas Dinner 2011	$1,299.24
Donations - OC FAIR	$100.00
Dues - OCCARO	$20.00
Field Day Equipment	$432.99
Field Day Food	$973.03
Field Day Other	$55.32
Field Day Rental - Tent	$58.72
Field Day Rental - U-Haul	$340.49
Flowers Expense	$63.51
Insurance (2011 ins was paid in 2010)	$0.00
Opportunity Drawing - Monthly	$1,498.60
Opportunity Drwg - Christmas Radio	$919.82
Opportunity Drwg - Christmas Women's	$211.18
PO Box Rental	$42.00
Printing	$32.86
Supplies	$101.32
Web Site Hosting	$143.88
Accounting adjustment	$7.10
TOTAL OUTFLOWS	**$6,804.09**

NET CHANGE **$485.60**

Cash - Beginning Balance: 2011-01-01

Checking Account	$2,840.68
Savings Account	$3,796.20
Deposit for Jaegerhaus	$200.00
Outstanding checks	-$970.88
Total Beginning Balance:	**$5,866.00**

Cash - Ending Balance: 2011-12-31

Checking Account	$4,165.36
Savings Account	$2,300.04
Deposit for Jaegerhaus	$200.00
Outstanding checks	-$313.80
Total Ending Net Balance:	**$6,351.60**

Total Beginning Balance:	**$5,866.00**
Total Ending Net Balance:	**$6,351.60**
Net Change for the Year	**$485.60**

Audit Acceptance:

Doug Britton **W6FKX**

Nicholas Haban **AF6CF**

Ken Konechy **W6HHC**, Outgoing Treasurer

Date signed: **2012/January/05**