



RF



ORANGE COUNTY AMATEUR RADIO CLUB, INC.

VOL. LVIII NO. 08

P.O. BOX 3454, TUSTIN, CA 92781-3454

August 2017

The Prez Sez.....

by Tim N6GP



Pessimistic hams would say that the month of August are the "dog days of summer" on the radio bands. Other "gloom and doomers" might pile on, and say that we are in the "dog years" of the 11-year sunspot cycle. Conditions might be a challenge for us on the bands, but there are exciting things going on in Amateur Radio this month.

The solar eclipse on the 21st of this month is a rare occasion to witness a cool astronomical event, and is a good opportunity for scientific study for us hams. The eclipse will peak in Orange County at 61% of the sun obscured at 10:22 AM PDT. Our very own Greg W6ATB will be travelling to his brother's QTH (OCARC Member Dave K6RSJ) in Redmond Oregon, to see the total eclipse (1 minute), and to do some radio experiments. Stay tuned in Sept RF for his report.

Other hams are will be studying the eclipse. Dr. Bob McGwier N4HY along with students at Virginia Tech have built an HF RADAR to make soundings of the ionosphere at 3, 4, 5 and 6 MHz. Along with that, the Hamsci group has sponsored a Solar Eclipse QSO Party from 1400z to 2200z in order to collect data to study. Here is your chance to get on the air, and contribute to science! See August QST or

<http://www.hamsci.org/seqp-rules> for details.

The other HUGE news is the July 11 release of WSJT-X version 1.8.0 rc1, which includes the new mode called **FT8**. **FT8** has taken over the bands like wildfire. Take a listen to 14074 kHz on 20m! It is 4 times faster than JT65, but there is about a 6 dB penalty for that speed. I think **FT8** will bring a revolution to 6 meter digital, VHF Contests, and probably digital on Field Day. See K1JT's announcement on page 28.

This month we will have Don Hill KE6BXT and Joe Ayers, AE6XE update us on the rapidly changing Amateur Mesh Networks and AREDN. I look forward to seeing what new capabilities they have.

Tim Goeppinger N6GP
President OCARC

Next General Meeting

The next OCARC General Meeting will be about:

Orange County Broadband-HamNet Update

Ham Radio Mesh networking continues to grow in Southern California. Don Hill, KE6BXT and Joe Ayers, AE6XE will update us on broadband ham mesh network activity and growth since their last update.

The next General Meeting will be on:

**Friday, August 18, 2017
@ 7:00 PM**

ENTER from the WEST SIDE entrance of the Red Cross Building, Room 208
Take elevator to the 2nd Floor. See you there!

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Monthly Events:

General Meeting:

Third Friday of the month
at 7:00 PM held at:
American Red Cross
600 Parkcenter Drive
Santa Ana, CA
(Near Tustin Ave. & 4th St.)

Club Breakfast (Board Mtg):

Normally First Saturday of month at 8am
Marie Callender's Restaurant
1821 North Grand Ave
Santa Ana, CA
(Between 17th & Santa Clara)

Club Nets (Listen for W6ZE):

28.375 ± MHz SSB
Wed- 7:30 PM - 8:30 PM
Bob AF6C, Net Control
Alt: Corey, KE6YHX, Net Control

146.55 MHz Simplex FM
Wed- 8:30 PM - 9:30 PM
Corey, KE6YHX, Net Control

7.086 ± MHz CW **OCWN**
Sun- 9:00 AM – 10 AM
Ann K6OIO, Net Control



Club Dues for 2017:

Regular/New Members* - - - - - \$30
Family renewal/Join**- - - - - \$45
New Member Join Jul-Sept*** - - \$15
Replacement Badge**** - - - - - \$ 3

* New members Jan-March, w/badge.

** Two members or more, w/badge.

*** New members July-Sept, w/badge.

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

Mesh Networks for Amateur Radio

Bio - Don Hill KE6BXT



Don Hill, KE6BXT received his Technician Ham license 2001 and upgraded to Extra in 2007.

He is best known for his active involvement in Amateur Television (ATV). He served as President of the *Amateur Television Network* for five years, has appeared on HamNation multiple times talking about ATV and has been the United States hub for the Digital Amateur Television QSO Party that is held each year with Australia.

His interest in MESH networking for Amateur Radio was kindled after reading the July 2013 article in QST magazine that highlighted how Broadband-Hamnet could be used to set up video links using a Ham Radio IP network.

Don was the first Ham between San Diego and Los Angeles to start experimenting with Broadband-Hamnet and together with Joe (AE6XE) has been working hard to make other Hams aware of this mode of Ham Radio.

Don is the founder of the ***Orange County Mesh Organization*** and the webmaster of <http://ocmesh.org>.

- KE6BXT

Bio - Joe Ayers AE6XE



Joe Ayers, AE6XE has been a Ham Radio enthusiast since 1975.

His career has been in Product Development and is currently working for Schneider Electric helping to create digital control systems to automate Industrial Plants.

His interest in MESH networking started in 2013 and today he is a member of the AREDN Development team working to add features to the firmware that make the mesh networking possible.

- AE6XE

Reprinted courtesy of:

Orange County Mesh Organization
<http://ocmesh.org>

Gave a good Digital-ATV Presentation to JPL Ham Club in Pasadena

by

Ken W6HHC and Robbie KB6CJZ

On July 14, Robbie KB6CJZ and Ken W6HHC provided a one-hour slide show with a show-and-tell session about the current advances in Digital-ATV to the JPL ARC in Pasadena, CA. Can you imagine, these hams are all part of the "flight communications systems" section of JPL for space probes and Mars-landers, etc....so they really know communications. So, I really had to "be on my toes" when talking about capabilities of RF communications used by DATV. For example: they completely understand that when the antenna gain gets impacted...you could narrow the RF bandwidth (slow down the data rate) to compensate for the loss of antenna gain. So, when I talked about improved DATV S/N reception using Reduced Bandwidth DATV (RB-DATV) ...every head was nodding. Josh KB3UUS of JPL explained to us that some signals are as weak as around -160 dBm and JPL sometimes reduces the RF bandwidth down to 10 KHz to receive the incoming data stream from space. Josh went on to explain that the "closer" spacecraft at Mars and Jupiter are usually around -130 to -140 dBm.

2017 JPL DATV Presentation Pasadena, CA

Current Advances in Digital-ATV

by

Ken Konechy W6HHC

W6HHC@ARRL.net

Robbie Robinson KB6CJZ

KB6CJZ@ARRL.net



The presentation covers DATV protocols, digital modulation technologies, current exciter equipment, MiniTiouner analyzer, and useful URLs

They said they learned a lot about concepts of DVB-S and DVB-T protocols and the overview of DATV excitors (including the Portsdown Project) and MiniTioune analyzer and appreciated the list of URLs to get started in DATV. Hopefully, we stirred up some interest in DATV at JPL ARC. The presentation PowerPoint and PDF files are available for download at www.W6ZE.org/DATV/

Robbie and I received a two-hour private tour of the Mission Control Center room and the JPL Museum which has models of all their space vehicles (some full size). Very cool...and we did not have to elbow through any overwhelming crowds of competing visitors that occurs during a JPL Open House event.

MORSE CODE ON MARS

An interesting artifact that we saw was: the tires of the Mars Rovers in the museum have an imbedded Morse-code pattern with the letters “J – P – L”.



The full-size Mars Rover model exhibits Morse Code for J – P – L embedded on tires

The purpose of the embedded tire patterns is to allow JPL to visually inspect the tire marks in the Martian dust with the Rover cameras and look for a mal-functioning wheel...perhaps “dragging along” instead of correctly rotating.

MISSION CONTRL CENTER

The Mission Control Center at JPL allows the Center to collect data from all of their spacecraft simultaneously if required.



The view from the visitors-gallery allows seeing all the displays at the Mission Control Center

JPL gathers data from and can send “control commands” to any of the spacecraft that are active, using radio telescopes at three locations on Earth. The clusters of radio-telescopes for the Deep Space Network are located at Goldstone, CA and Madrid, Spain and Canberra, Australia are all separated by 120 degrees of longitude so that they can be pointed to any spacecraft location at any time of the day. A NASA web URL to show the current activities of these radio telescopes can be found at:

<https://eyes.nasa.gov/dsn/dsn.html>



REMINDER

W6ZE is on Facebook. Look us up under W6ZE – Orange County Amateur Radio Club. Come post a country heard on the air, look for advice on an antenna issue or just see what is coming up or new in our club. If there is something you would like added to the page, let Kristin know at k6peq@w6ze.org. We look forward to seeing you on the air and online!

6 Months of Contesting

August

- 12-13 Down Under – Remembrance Day Contest for Amateurs in VK, ZL & P2 to commemorate the Amateurs who died during WWII

September

- 9-10 EME – 23 GHz & Up
9-11 September VHF
16-17 10 GHz & Up – Round 2

October

- 7-8 California QSO Party

November

- 4-5 EME – 50 to 1296 MHz
4-6 November Sweepstakes – CW
18-20 November Sweepstakes - Phone

December

- 1-31 Spend time with friends and family on and off the radio

January

- 1 Straight key night
6 Kid's Day
6-7 RTTY Round Up
20-22 January VHF Contest

Heathkit of the Month #77: by Bob Eckweiler, AF6C



AUDIO HI-FI EQUIPMENT

Heathkit BC-1A BROADCAST TUNER

Introduction:

In 1956 Heathkit had about a half-dozen Hi-Fi amplifiers in their stable. Many could be purchased bundled with the WA-P2 Monaural Preamplifier, or the preamplifier could be purchased separately. Heath was producing their third Hi-Fi FM tuner, the FM-3. The FM-3 and the later FM-3A matched the new styling of the WA-P2, a gold color low-height design, some with the vacuum tubes mounted horizontally. Both of the units measured 12-1/2" wide by 3-1/2 high by 6" deep.

While FM provided many advantages over AM for transmitting high-fidelity music, AM was still the favored mode of many teens and young adults due to the numerous AM rock-and-roll stations, and the large number of **All-American Five** radios in existence (See sidebar). A lot of effort was made by AM broadcasters to improve the AM fidelity to compete with the growing FM market.

Heathkit took advantage of the AM Hi-Fi trend by producing the Hi-Fi BC-1 AM Broadcast Tuner. This model was followed a year later by the BC-1A (Figure 1). Figure 2 shows an ad for the original BC-1 that appeared in the Summer 1956 Heathkit catalog. The BC-1 and BC-1A continued in the styling of the WA-P2 and FM-3 kits, with the same gold paint, low-height design and physical dimensions. The BC-1 sold for \$24.50 over its year lifetime. The 1957 BC-1A sold for \$25.95 and remained in production into 1960. In 1959 the FM-3A was replaced by the newly styled and more sensitive FM-4;



Fig. 1: BC-1A AM Broadcast (Hi-Fi) Tuner

shortly afterwards the AJ-20, with the same new styling replaced the BC-1A. The updated styling consisted of a black and gold front panel with vinyl covering on top and sides of the cabinet. The new cabinet was open in the rear and was about an inch taller to allow the tubes to be mounted vertically.

Hi-Fi AM:

The typical "*All-American five*" tube AC/DC radio of the fifties had a bandwidth of about 10 kc*, that is 5 kc on either side of the carrier. Thus, the highest audio component that can be received is somewhat less than 5 kc. AM stations were spaced 10 kc apart. Stations in physical proximity to each other were spaced 20 kc, 30 kc or more apart to cutdown interference. However, as nighttime propagation allows signals to travel much farther, interference from stations 10 kc apart can occur. The limited bandwidth of the 5-tube AC/DC radio helps eliminate interference from stations nearby in frequency, but if the bandwidth approaches 20 kc (10 kc on either side of the carrier) both carriers can be received resulting in an annoying 10 kc beat note or whistle emanating from the speaker.

Some AM stations were licensed allowing them to transmit at up to 30 kc bandwidth when AM

° Why kc Instead of kHz?

A good question. I try to write using the nomenclature used in the Heathkit manual. Hertz (Hz) replaced cycles per second (cps) in the early 1960s. Here is a quick reference:

cps	= cycles [per second]	= Hz	= Hertz
kc	= kilocycles [per second]	= kHz	= kilohertz
mc	= megacycles [per second]	= mHz	= megahertz



Heathkit Model BC-1 AM Tuner Kit—This AM tuner circuit is unusual in that it has been designed especially for use with high fidelity systems. It features broad band-width, while still maintaining good sensitivity and selectivity, and it uses a special voltage-doubler detector employing crystal diodes for minimum signal distortion. The audio response of the BC-1 is ± 1 db from 20 cps to 2 kc, with 5 db of pre-emphasis at 10 kc to compensate for station rolloff above 5 kc. It covers the standard broadcast band from 550 to 1600 kc. The IF bandwidth is 20 kc. It features a 6 db signal-to-noise ratio at 2.5 microvolts. A 10 kc whistle filter is employed to suppress the heterodyne between adjacent AM stations. RF and IF coils are pre-aligned for simplified construction. Only three minor trimmer adjustments necessary. Two outputs are provided, one fixed, and one variable, and two antenna inputs are available for low impedance, low noise external loop, (furnished with kit), or for high impedance long wire. Power supply is built in. Physical dimensions and color styling match Heathkit WA-P2 and FM-3.

\$24⁵⁰ MODEL BC-1
(with cabinet)
Shpg. Wt. 8 Lbs.

BROADBAND AM TUNER KIT

Fig. 2: BC-1 AM Broadcast (Hi-Fi) Tuner from the 1956 Heathkit Summer catalog

hi- fidelity was under development, though 20 kc was the practical limit.

Heathkit's HI-Fi AM:

The BC-1(A) offered some innovative features in its day, and Heathkit commented heavily about specifications, AM high-fidelity theory and circuit description in the manual. The BC-1(A) is capable of a -3dB bandwidth of over 9 kc. This is a lot higher response than one would normally hear on a simple desktop AM radio. That makes the BC-1(A) sound reasonably good on your hi-fi system when listening to a wide-band AM transmitter. The problem of stations 10 kc away, which might not be heard in the daytime, causing interference at night when propagation expands was also addressed. The GC-1(A) solves the problem for weak adjacent stations by using a 10 kc filter that sharply eliminates the beat note or "whistle" an adjacent carrier would cause, when receiving the desired station. However, should the interfering station be strong enough that its sideband interferes severely with the sideband of the station being listened to, then annoying interference will be heard. Heathkit provided an extra resistor that could be installed to reduce the bandwidth if interference is too severe. In-

The All American Five AC/DC Radio

In the 50s most US households had an All-American Five AC-DC radio. They came in many forms, but the circuit was pretty much identical with an optional pilot lamp the major circuit difference. The *Five* in the name refers to the use of five vacuum tubes. The radios came with plastic, or sometimes, wood cases as the chassis could be at 120 VAC depending on how the non-polarized plug was inserted in the wall. Thus, no bare metal showed.

Early on, these radios used the same five octal tube lineup, but soon switched to the more compact miniature 7-pin tubes:

TUBE FUNCTION	OCTAL	7-PIN
Mixer-Oscillator.	12SA7	12BE6
IF amplifier	12SK7	12BA6
Diode Detector/AVC/1st audio amp	12SQ7	12AV6
Audio Output Amplifier	50L6	50C5
Rectifier.	35Z5	35W4

The first two digits of the tube number is the filament voltage. The filaments are all rated at 150 mA and are wired in series for 121 VAC $\pm 10\%$, easily in the range of the typical 110 to 120 VAC power line voltage. B+ voltage was derived directly from rectifying the AC line voltage, producing about 150 VDC of B+.

stalling it reduces the bandwidth and fidelity for the AM received signal. The later AJ-20 also offers this feature, but it is selected by moving a slide-switch instead of removing the cabinet, warming-up the soldering iron and adding another component - one probably misplaced by this time.

The BC-1(A) has no amplifier or headphone output so it can't be used stand-alone. It does offer two separate outputs, one controlled by a the front panel volume control and one that has a fixed output so as not to compete with the volume control on the preamplifier or amplifier. The fixed output is higher in impedance than the volume controlled one which is driven by a cathode follower. This means you may use much longer leads from the volume controlled output than the fixed output. These outputs are at line level for connecting to the input of a hi-fi amplifier.

Assembly:

The kit is assembled using point-to-point wiring; there is no printed circuit board. Five tube sockets, the three-section tuning capacitor, two IF transformers, solder terminal strips and lugs and rubber grommets are installed on the vertical chassis. Four delicate coils will be mounted as they get wired.

After a short soldering tutorial is given in the manual, wiring begins. The wiring is done in sections; first the filament wiring is completed, except for the pilot lamps. Next the RF amplifier is wired, leaving connections that go to points off the chassis unconnected. The B+ distribution wiring is then completed, followed by the oscillator-mixer stage, and the IF amplifier stage. Finally the detector, with its crystal diodes, the audio cathode follower and whistle filter are wired. After each of these sections is completed, the manual instructs the builder to

"Clean out clippings and solder splashes, and carefully check for short circuits and defective connections."

The power transformer is mounted to the left end-bracket and the bracket to the chassis. The right-end bracket mounts to the chassis next. The bracket to chassis mounting is through soft rubber grommets for vibration isolation. The power transformer leads are connected to the chassis. The front dial-plate is then mounted along with the volume control. Connectors are mounted to the ventilated rear panel and this assembly is attached and wired.

The tuning dial-drive is assembled and mounted to the dial-plate and the tuning dial is strung so the tuning capacitor turns when the dial-drive is turned, and the dial pointer moves along the bottom edge of the dial-plate. Then the pilot lamp sockets are installed.

The BC-1 and BC-1A both have dual antenna inputs. One allows the attachment of a long-wire antenna, and the other a loop antenna. Heathkit supplied the parts and cable to build a shielded broadcast loop antenna that gives optimal performance for the AM tuner (see Figure 3). This loop can be mounted on the wall behind the radio. If mounted as a circle it measures a vast 3'10" in diameter, and if mounted as a stadium (as shown in figure 3) some of its typical measurements are given in table I. The

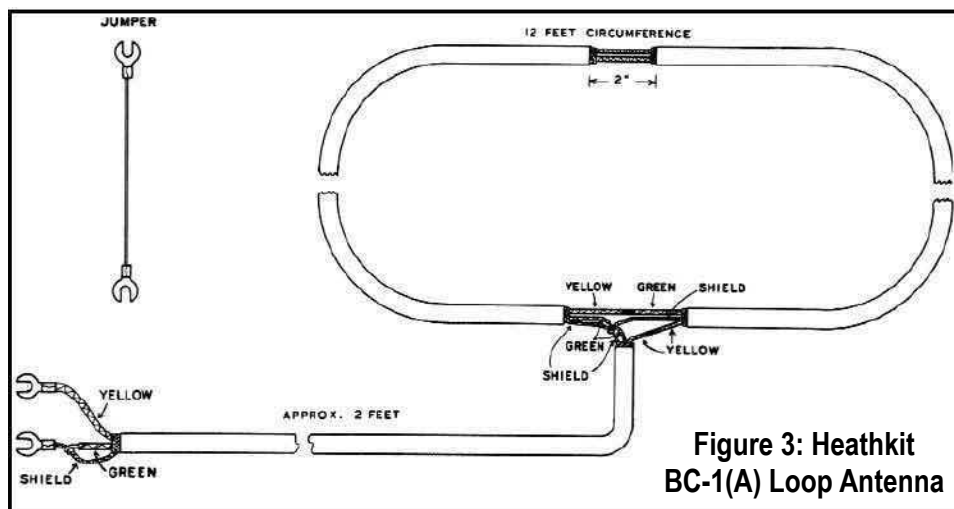


Figure 3: Heathkit BC-1(A) Loop Antenna

Width	Height
3' 10"	3' 10"
4' 0"	3' 6"
4' 4"	3' 1"
4' 6"	2' 8"
4' 9"	2' 2"
5' 0"	1' 9"
5' 4"	1' 4"
Measurements rounded to nearest inch,	
Table 1: Loop Measurements	

audio cable for the connection between the tuner and the preamp is assembled next.

Initial resistance checks are then made, the tubes and lamps are installed, and with the loop antenna attached, power on checkout is performed, followed by alignment. And finally the front panel, trim, fragile dial plate and knobs are installed along with the cabinet shell and ventilated bottom plate.

Alignment:

Heath states that satisfactory alignment may be accomplished without test equipment. The IF transformers and other coils come from the factory pre-calibrated. Alignment of the trimmer capacitors can be done without need of any test equipment as long as there is a local broadcast station near 1400 kc. Alignment involves adjusting the oscillator trimmer until the broadcast station is tuned in at its proper dial frequency; then the mixer and antenna trimmers are adjusted for the clearest signal. This will get the tuner reasonably well aligned.

The “whistle filter” also must be aligned for maximum performance. It is accomplished by tuning between two close-by signals near the high end of the AM band so you hear the 10 kc beat-note between the two AM carriers. The filter coil is then adjusted for minimum whistle.

If a signal generator and VTVM are available, the manual gives instructions for a full RF

alignment, including IF stages. If an audio signal generator is also available the “whistle filter” can be more accurately aligned.

Circuit Description:

The BC-1(A) uses a single-conversion superheterodyne circuit. It has five tubes including a the rectifier tube; one of the tubes is dual-section. Two crystal diodes are used for the detector. The tube lineup is shown in Table II. Since the superheterodyne circuit has been discussed before, only the more exotic aspects of the circuitry will be discussed.

RF Amplifier:

Unusual in AM radios, the BC-1(A) utilizes an RF amplifier before the mixer. The amplifier is gang-tuned along with the oscillator and mixer sections by a three-section variable capacitor. The top of the amplifier’s input coil is capacitively coupled to the long-wire antenna input. A low impedance winding on the coil is designed to match the external loop antenna. The RF stage produces added gain and decoupling between the antenna and mixer circuits. Some added selectivity is also a benefit. The gain of this stage is controlled by the AVC (Automatic Volume Control) voltage derived from the detector circuit.

Mixer / Oscillator:

This is a standard AM mixer oscillator circuit with the oscillator tracking 455 kc above the received frequency. The gain of the mixer is also controlled by the AVC voltage.

IF Amplifier:

The heterodyned 455 kc signal from the mixer is coupled through the first IF transformer. This transformer is different than ones used on standard AM radios. It is wide-band due to the primary and secondary windings being over-coupled. This produces a bandwidth about twice that of a normally coupled IF transformer with very steep skirts. It also produces a response that is double peaked (Figure 4A) which would result in linearity problems across the wanted bandwidth unless compensated for. This compensation is provided by the output IF

ID #	Part #	Description	Purpose
V1	6BA6	Pentode	RF Amplifier
V2	6BE6	Heptode (Pentagrid)	Mixer - Oscillator
V3	6BA6	Pentode	IF Amplifier
V4A	½ 12AU7	Triode	“Whistle Filter - 10 kc”
V4B	½ 12AU7	Triode	Cathode Follower
V5	6X4	Dual Diode	Full-Wave Power Rectifier
M1	HD2257	Crystal Diode (56-4)	Voltage Doubling Detector
M2	HD2257	Crystal Diode (56-4)	Voltage Doubling Detector
Table 2: Tube and Diode Lineup			

transformer which has a more peaked gain and thus fills in the valley making the response along the top flatter (Figure 4B).

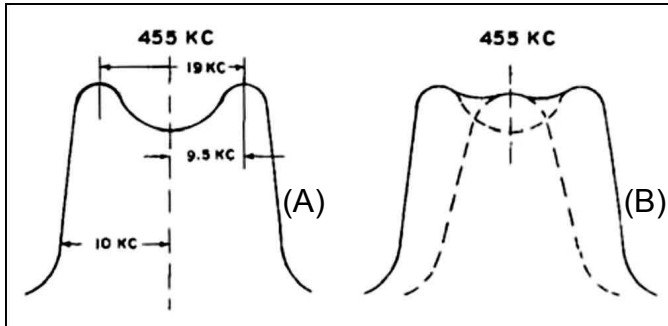


Figure 4: IF Response from BC-1(A) Manual

Crystal Detector:

Radios in the *All-American Five* class use a diode section of the audio tube to half-wave detect the AM modulation. The BC-1(A) instead uses a full-wave voltage (and frequency) doubling circuit. This circuit is very similar to the voltage doubling circuits used in many power supplies (except the power handled and capacitance needed are magnitudes lower). Just like the 60 cps power frequency gets doubled to 120 cps in such a circuit, the carrier frequency is doubled to 910 kc. The higher carrier frequency makes it easier to filter out without affecting the higher audio frequencies. The detector diodes are arranged so the output is a negative DC voltage with the high fidelity AM riding atop.

AVC:

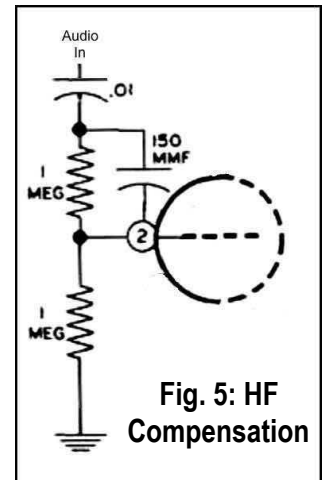
The negative voltage from the detector is coupled through a 2.2 M Ω resistor and filtered by a 0.01 μ F capacitor to the grid of the IF stage. Similarly, this AVC voltage is coupled to the grid of the mixer stage by 3.3 M Ω and 0.05 μ F. The signal to the mixer grid is also fed to the RF amplifier by an additional 1 M Ω and 0.01 μ F network. The stronger the signal carrier the more negative this voltage is which lowers the gain of the three stages, helping keep the volume the same independent of signal strength.

“Whistle Filter” and HF Compensation:

The audio detector is AC coupled to the “whistle filter” through a compensating circuit com-

posed of two 1 M Ω resistors and a 150 pF capacitor (See figure 5). At low frequencies, the reactance of the capacitor is high with respect to the parallel 1 M Ω resistor, and the two 1 M Ω resistors create a voltage divider of 2 (-3 dB). However at about 1 kc the reactance of 150 equals approximately 1 M Ω and the gain increases by about -1.8 dB, and at 5 kc and 10 kc this gain is -0.7 and -0.4 dB respectively. Thus the higher frequencies are boosted. This helps correct for the broadcast station rolloff at higher audio frequencies.

The first section of the 12AU7 is a bridge-tee notch filter. It has a very sharp notch at 10 kc removing or reducing any 10 kc whistle resulting from the beating of an adjacent carrier with the desired signal's carrier. Output from the filter is isolated by a 0.05 μ F capacitor and appears at the **FIXED**



OUTPUT RCA jack on the rear panel. Audio from the whistle filter is also connected to the second section of the 12AU7 through the volume control. This 12AU7 section is wired as a cathode-follower, producing a low impedance output that is connected to the **VARIABLE OUTPUT** connector RCA jack. The BC-1A schematic is shown in Figure 6.

BC-1 – BC-1A Differences:

Whenever Heathkit updates a kit, people become curious as to what changes were actually made. Thanks to Chuck Penson, author of two excellent Heathkit books: *Heathkit Test Equipment Products* and *Heathkit: A Guide to the Amateur Radio Products*, I obtained the manual for the BC-1 to compare to my BC-1A** manual. I spent some time looking for the differences. The most significant and major difference is that the BC-1A adds a second pilot light, pilot lamp socket and mounting hardware to better illuminate the glass frequency scale.

This requires a new metal dial plate. Electronically the two tuner circuits remain identical to the last detail. Other differences are that four fasteners were changed from 6-32 x 3/8" bolts with lock washers and nuts to #6 sheetmetal screws. This probably was not a cost savings move as much as done to eliminate the need to put nuts and lock washers on in tight spaces. Other new parts include an improved shaft bushing for the tuning control and a new siding dial pointer (Different color?). The other change also involves the dial illumination, two lengths of 3/8" sleeving were provided to cover part of the two pilot lamps to remove direct glare from the filaments. Heathkit offered an upgrade kit, the C-BC-1 for \$2.95. It *"Converts the BC-1 to include major features of BC-1A"*.

BC-1A Operation:

There is not too much to installing and operating the BC-1A other than the antenna. Though the BC-1(A) includes input for a long-wire antenna, it recommends the supplied loop be used. Getting the loop antenna oriented correctly for best reception as well as looking somewhat aesthetically pleasing, probably posed a serious problem for many families.

Other than the antenna, one must only provide AC power to the tuner, and connect the included cable, that was built during construction of the kit, between the tuner and your preamplifier, or directly to an amplifier that has a preamp built in. It may be connected either to a **TUNER** or **AUX** input. Use of the variable or fixed output depends on the preferences of the user and how their hi-fi is set up.

The Leftover 27 K Ω Resistor:

When finished with your BC-1 or BC-1A kit you will discover you have part left over, a 27 K Ω 1/2 watt resistor part #1-23. On page 36 of the 40-page manual the reason for this resistor is explained. It is installed across the primary of the first IF transformer if you find yourself in a location where adjacent channel interference is a problem. Such a location might be near a powerful AM station or worse, near more than

one of them. The wide bandwidth of the BC-1(A) makes it more susceptible to interference from strong adjacent stations. If this problem becomes serious the 27 K Ω resistor may be installed across the primary of the first IF transformer loading it and reducing its bandwidth. This should eliminate the adjacent channel interference at the cost of fidelity in the tuner.

Interestingly, the AJ-20 and AJ-21 AM Hi-Fi tuners that followed the BC-1A has this resistor wired into the kit, and it can be switched in or out with a front panel switch at the listener's discretion.

Conclusion:

I have to admit I've never owned, nor do I ever remember seeing in real life, a BC-1 or BC-1A tuner. However, I've been looking for a hi-fi AM tuner to accompany my AJ-14 and AA-14 stereo that sit on the ham shack bookshelf. While I prefer a solid-state tuner, I'm currently researching other Heathkits too (Heathkit never built a solid-state AM-only tuner). However it's on the back burner with a bunch of other tasks needing to be accomplished. Still it would be nice to be able to listen to AM radio now and then in the ham shack when the bands die.

73, from AF6C

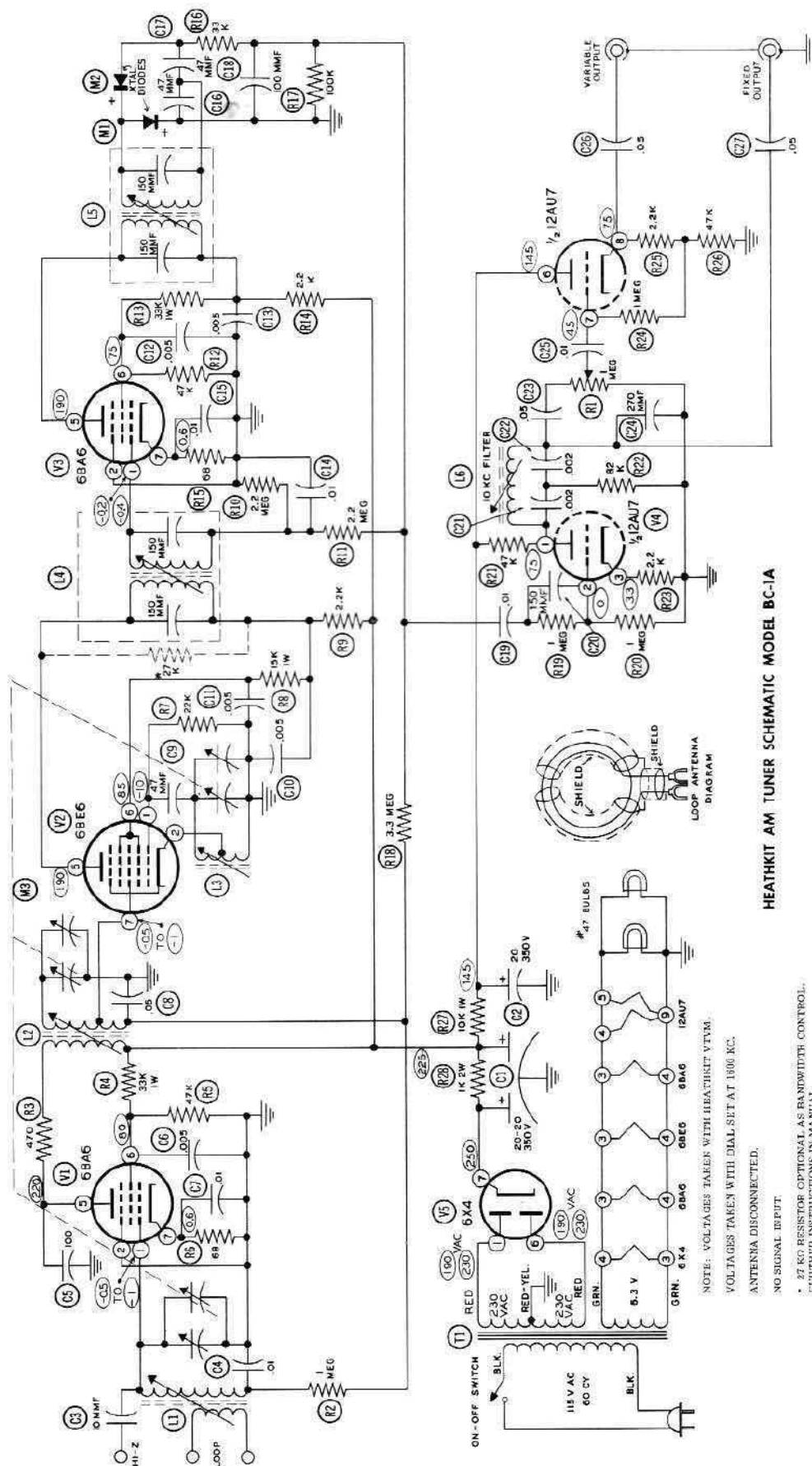


This article is Copyright 2017 R. Eckweiler and The OCARC Inc.

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

Thanks - AF6C

** I'd especially like to thank Patrick Diederich - AL7EW who passed along the BC-1A manual I used in writing this article, along with bunch of other manuals. Perhaps some will also be the start of future articles.



SUBMIT AN ARTICLE

You don't need to write like William "Bill" Shakespeare in order to write an article for the RF newsletter. In fact, we prefer articles without the "Thy", "Whilst", "tis", and "Oft".



Do you have an idea for a newsletter article? Maybe you have acquired a new piece of equipment, designed or constructed a new antenna, took a trip focused around ham radio, want to share an amateur radio related experience or discuss a technical topic. Why not write an article for the monthly RF newsletter? The article can be short or long, simple or elaborate, and can even include pictures!

The RF newsletter relies on articles from our members. So why not give it a try? Write an article and send it to the newsletter editor. It's fun, and at the same time, your contribution helps support the club and hobby!

If you want you can also try your hand as the newsletter editor. We have a rotating editor monthly and would love to have someone new give it a try. There is a template and it is easy and fun! It can even be done in Australia! 😊

Ham Recipe From Down Under

Ham & Cheese Mini Cob

When you don't want to spend too much time in the kitchen and would rather be at the beach or chasing kangaroos or holding cuddly koalas.

INGREDIENTS:

4 small cob-style bread rolls
100g Primo English Ham
130g coarsely grated pizza cheese
4 eggs
1 tbs. pouring cream
Chopped fresh parsley or snipped chives, to serve



DIRECTIONS:

- Step 1

Preheat oven to 180C/160C fan-forced. Line an oven tray with non-stick baking paper. Cut a quarter from the top of each bread roll and reserve. Scoop out some of the bread centre of each roll to create a cavity.

- Step 2

Lay 2 slices of ham in each, overlapping to create a cup. Scatter 1/4 cup of cheese inside each of the rolls. Place rolls on prepared tray. Carefully break an egg into each, being careful not to spill over the sides. Drizzle 1 teaspoon of cream over each egg. Scatter another 1/3 cup of cheese over the tops. Cover loosely with foil to secure. Bake for 25 minutes.

- Step 3

Remove the stuffed rolls from the oven. Place the bread lids on the tray cut-side up next to the rolls. Sprinkle the remaining cheese around the edge of the rolls and over the lids. Replace foil on the rolls. Bake for a further 10-15 minutes or until the cheese has melted and eggs are just set but still soft. Scatter with parsley or snipped chives. Serve with the cheesy lids.



UPCOMING EVENTS

AUGUST 18, 2017 MEETING

Ham Radio Mesh networking is a rapidly developing interest (now called broadband/ham-network) . Don Hill, KE6BXT and Joe Ayers, AE6XE have reported in the past on Southern California Mesh networking. They will bring us up to date on the latest activity and growth of the broadband ham network here in Orange County.

SEPTEMBER 15, 2017 MEETING

Michael Rickey, AF6FB will speak on both the PAPA repeater system and D-Star equipment and technology. Michael is very active on the PAPA repeaters using DMR, D-Star, as well as analog modes. He also hosts an amateur radio blog at <http://www.af6fb.net>

OCTOBER 20, 2017 MEETING

This will be the annual OCARC auction night with Chip Margelli, K7RA returning as auctioneer. Members are invited to empty garages and offer those treasured boat anchors for sale. Even valuable working equipment is welcomed for sale. This is your chance to buy a bargain addition for your shack.

NOVEMBER 17, 2017 MEETING

Doug Millar, K6JEY, will speak on "Test Equipment & Measurements for Amateur Radio". Doug will bring an accurate voltage source. He asks that members bring a personal meter to the meeting and he volunteers to calibrate member's voltmeters at the meeting.

DECEMBER 09, 2017 CHRISTMAS DINNER

Plans are to return to Mimi's for our dinner. Details to be announced when firm.

JANUARY 12, 2018 MEETING

Lito de los Reyes, W16Y will make a presentation on the All Star network. Lito previously presented a very interesting show and tell on the All Star system and will expand upon its growth and advantages.

FEBRUARY 16, 2018 MEETING

To be announced.

MARCH 16, MEETING

Tim Duffy, K3LR, from DX Engineering will present via Skype. The topic will be an introduction to the amazing Multi Multi K3LR contest station.

For the most current Upcoming event information go to: <http://www.w6ze.org/Events.html>

OCARC BOARD MEETING MINUTES 2017-08-05

The April OCARC Board meeting was held at the Marie Callender's Restaurant at 1821 N. Grand Ave in Santa Ana on August 5, 2017. Meeting Called to Order: 8:05 am

Roll Call:

Pres.: Tim N6GP, Present	Vice Pres. Jim AF6N, Present
Sec.: Ron W6FPS, Present	Membership: Bob AF6C, Present
Tech.: Clem W0MEC, Absent	Treasurer: Ken W6HHC, Present
Activities: Tim N6TMT, Present	Publicity, Dan N6PEQ, Present
Directors at Large: Greg W6ATB, Absent	Nicholas AF6CF, Present

Members Present: Greg KG6PTL

Guest: Frank N1CAN

DIRECTOR REPORTS:

- ☐ **Vice President** – Jim AF6N reported Corey KE6YHX and Vijay KM6IZO helped him setup a skype link as a practice run for the upcoming DX Engineering presentation at an OCARC General Meeting. Nicolas AF6Cf suggested that we use amplified speakers due to the size of the room.
- ☐ **Secretary** – Ron W6FPS- No Report.
- ☐ **Membership** – Bob AF6C reported the current membership is now 83 members.
- ☐ **Technical** – No Report.
- ☐ **Treasurers Report** – Ken W6HHC. Ken reported that the website fee has increased by a few dollars per month. All other treasury related items are "normal". See YTD Cash Flow report on page 24.
- ☐ **Activities** – Tim N6TMT reported the club earned \$115.00 from the raffling off a Bioenno battery.
- ☐ **Publicity** – Dan N6PEQ will be putting flyers at HRO to promote the October Auction.
- ☐ **Directors at Large** – Nicholas AF6CF purchased a \$50.00 antenna launcher to put up wire antennas in trees in his backyard. He said in practice runs it worked very well.

OLD BUSINESS:

- ☐ **Newsletter Editors**
August-Kristin K6PEQ, September-Greg W6ATB, Tim N6GP will ask Corey KE6YHX about being the October RF Editor.
- ☐ **Entertainment** – Guest speakers are as follows, August – Don Hill KE6BXT Mesh/AREDN, September – Michael Rickey PAPA System/D-Star. October – Auction, November – Doug K6JEY Test Equipment.
- ☐ **Field Day** – The Board voted to reimburse Bob AF6C for his missing bottle of Penetrox and Robbie KB6CIZ for his two missing 25' coax sections that they brought to Field Day.
- ☐ **Repeater** – Bob AF6C reported that the owner of a possible repeater for OCARC use was not interested in our using for weekly club nets.
- ☐ **Kilowatt Battery** – Nicholas AF6CF will work on solar charge controller and improving the ventilation of the box.
- ☐ **VE Testing** – On hold until we can find a leader for a VE Testing group.
- ☐ **Christmas Banquet** – The location (Mimi's) and Date (December 8) has been finalized. A tentative budget of \$750.00 was approved by the Board.
- ☐ **OCARC Picnic and Foxhunt**– The date will be the first weekend in October and the location is yet to be determined. The Jeffery Open Space Park was suggested as a possible location.
- ☐ **W6ZE** – Bob AF6C has completed renewal of the club W6ZE license. Bob will remain the trustee for one more year which will complete 40 years of trusteeship for Bob.
- ☐ **SK Equipment** – Nicolas AF6CF and Tom W6ETC will follow up with Cherie Ericson who is the daughter of a Silent Key, Robert Hill K6COE. She is looking for help in disposing of her late father's ham equipment.

OCARC BOARD MEETING MINUTES 2017-08-05 Continued...

NEW BUSINESS:

- ☐ **Bank Transfer** – The club will soon open a “Simple Business” checking account at Wells Fargo. All checks written in 2017 will be from the credit union account and starting January 2018, all checks will be written on the Wells Fargo Account.

GOOD of the CLUB:

- ☐ **Emergency Communications on Website** – AF6C suggested that we need to have a volunteer to update the website page about “Emergency Communications”. The current info is out-dated.
- ☐ **Club Picnic** – Plans are being made for a club picnic to be held on the first weekend of October. The picnic date will coincide with the California QSO Party.
- ☐ **Promotional Items** – Nicolas AF6CF will research pens imprinted with club info. Bob AF6C will check on club business cards.
- ☐ **Election Committee** – Tim N6GP will propose the setting up of a club election committee at the September Board Meeting.
- ☐ **RFI on Santiago Peak** – Ken W6HHC reported that an ATV repeater on Santiago Peak operating on 2.4 GHz is receiving interference from business systems (on a nearby tower) also using 2.4 GHz with 1 Watt and a 17 dBi antenna, which appears to be totally legal. Contact Ken if you have any questions.

Meeting Adjourned 9:59 am

Submitted by *Ron Mudry W6FPS, Secretary*

OCARC Secretary



First Twelve Q Codes Listed in the 1912 International Radiotelegraph Convention Regulations

Code	Question	Answer or Notice
QRA	What ship or coast station is that?	This is ____.
QRB	What is your distance?	My distance is ____.
QRC	What is your true bearing?	My true bearing is ____ degrees.
QRD	Where are you bound for?	I am bound for ____.
QRF	Where are you bound from?	I am bound from ____.
QRG	What line do you belong to?	I belong to the ____ Line.
QRH	What is your wavelength in meters?	My wavelength is ____ meters.
QRJ	How many words have you to send?	I have ____ words to send.
QRK	How do you receive me?	I am receiving (1–5). <i>I is unreadable and 5 is perfect.</i>
QRL	Are you busy?	I am busy.
QRM	Are you being interfered with?	I am being interfered with.
QRN	Are the atmospherics strong?	Atmospherics (noise) are very strong.

**OCARC
GENERAL MEETING MINUTES
2017-07-21**

The OCARC General meeting was held at the Red Cross Complex in Santa Ana on July 21, 2017. We had 19 members and seven guests sign the attendance log. Unfortunately, about a third of the attendees did not sign in. It is important that get everyone to sign in. A guest today may become a future member. Meeting Started at 7:05 pm

Club Officers: There was a quorum with all officers present with the exception of Clem W0MEC and Dan N6PEQ.

Program:

Jim AF6N introduced this month's speaker Wayne Spring W6IRD. Wayne presentation was on the refurbishing of old ham equipment. Restoration is truly a passion of Wayne's. Wayne's name is known worldwide for his ability to bring radios destined for the junk pile back to life and made to look as good as new. On display were several of his past projects and a sample of what some rigs look like prior to restoration.



Wayne W6IRD shows photos of many restoration projects he has enjoyed



Wayne W6IRD brought a restored Hallicrafters Model SX-42 receiver.

One very nice example of Wayne's work was a Hallicrafters Model SX-4G see picture above. Wayne is fortunate to have assembled a workshop where he can fabricate hard to find pieces from scratch. Wayne answered many questions from the audience and shared many of methods and techniques he uses. In the time allotted we only scratched the surface on what Wayne knows about the subject of restoration.

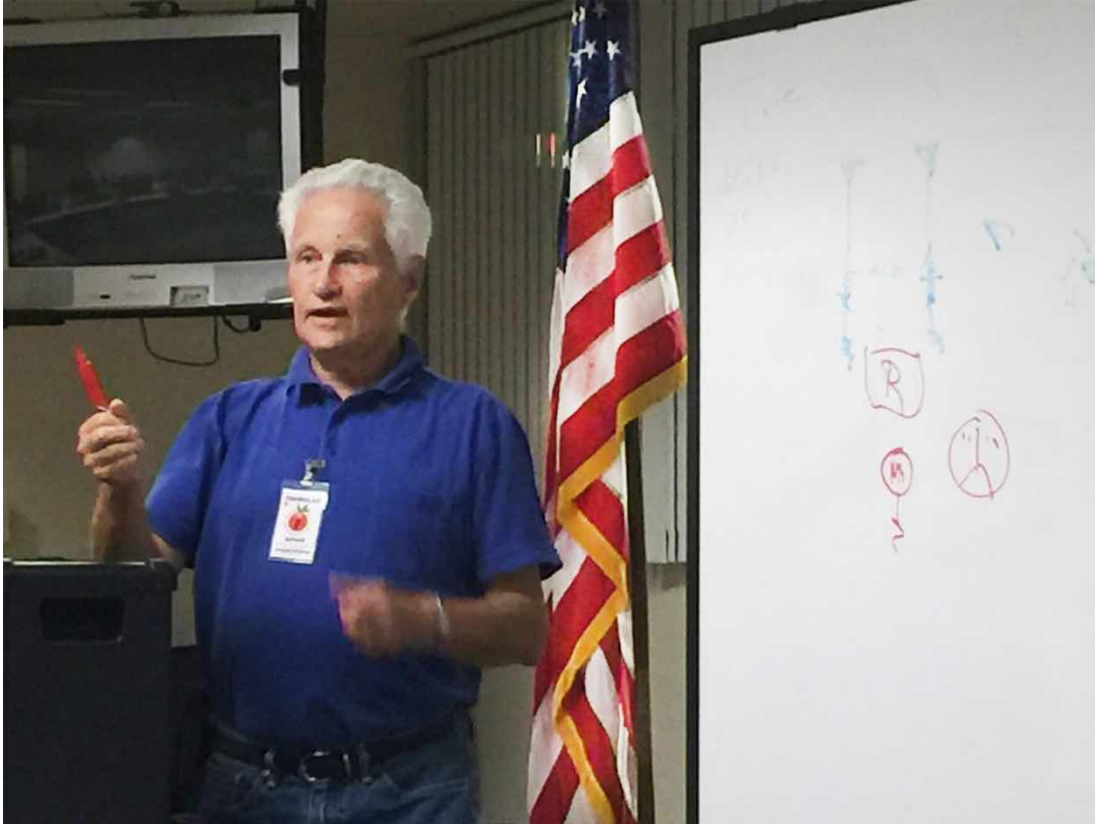
Editor's note: The cover photo of the November 2007 edition of Electric Radio shows Wayne and his wife Sharon K6IRD in front of some vintage equipment. An article titled "The Best in the West" on page 45 is about Wayne and Sharon.

**OCARC
GENERAL MEETING MINUTES
2017-07-21 Continued...**

Intermission was taken from 7:55 pm to 8:20 pm

Show and Tell:

- Nicholas AF6CF spoke about a project he is working on, the "Time Differential of Arrival" method of fox hunting. He plans to build a working model, time permitting, that he will demonstrate at a future OCARC meet.



**Nicholas AF6CF explains his concepts for a
"Time Differential of Arrival" (TDOA) method of fox hunting**

- Tim N6GP discussed a new digital mode "FT8" that is now being heard on the ham bands and becoming very popular in a very short time. Google FT8 and listen for it around 14.074 Mhz.

Announcement:

- Bioenno Power has donated eight of their 12 ampour batteries to the club. The Batteries with charging units will be raffled at upcoming general meetings.
- Field Day results are looking promising with higher scores than last year. The RF article about Field Day was applauded by all. Thank you, Tom W6ETC for July RF editing.

Ask the Elmer:

- Wardy N6SKE asked about putting a vertical antenna on a metal roof. Wayne W6IRD, Ken W6HHC, Bob AF6C and Nicolas AF6CF made suggestion on his installation.

**OCARC
GENERAL MEETING MINUTES
2017-07-21 Continued...**

GOOD of the CLUB:

- Tom W6ETC asked anyone interested in attending an upcoming ARES Seminar in Corona Contact him for more information.

Bioenno Power Battery:

Erick KK6CKK held the winning ticket for the 12 V 12 amphour LiFePO4 (Lithium Iron Phosphate) Battery w/ charger.

•



Visitor Erick KK6CKK won the drawing for the Bioenno Battery and charger

Club Picnic and California QSO Party:

- Ron W6FPS asked if there was any interest in doing a combination Club Picnic and California QSO operation during the first week of October. One possible location would be the Jeffery Open Space Park in Irvine.

Meeting Adjourned at 9:07 pm

Submitted by *Ron Mudry W6FPS*
OCARC Secretary



HAMCON 2017

ARRL Southwestern Division Convention

September 15-17, 2017

Torrance Marriott Redondo Beach Hotel
3635 Fashion Way
Torrance, CA 90503



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"Ham Radio for Everyone" is our theme with much to see and do at HAMCON 2017

- Full range of talks by experts on radio equipment, operating techniques, public service, DXing, technical subjects, and much more
- 10,300 sq. ft. Vendor/Exhibit Hall with 63 booth spaces
- Distinguished speakers at Saturday lunch and dinner, and Sunday breakfast
- Extensive prize drawings
- W1AW/6 Special Event station
- ARRL Forums, Ham License test sessions
- Young ham forum
- Sunday swap meet
- Discount hotel room rates (available through the Marriott link on our website)
- With more to come . . .

AND FOR THE FIRST TIME EVER

Special Friday Afternoon tour of the Battleship Iowa

- Includes Catered Buffet Dinner in the Officer's Wardroom
- Tour the Radio Room (not open to the general public) and operate the ship's NI6BB amateur station
- Bus transportation to and from the Marriott Hotel included
- Limited to 80 guests, so register early

For complete convention details, registration and hotel bookings log onto:

WWW.HAMCONINC.ORG

OCARC Cash Flow

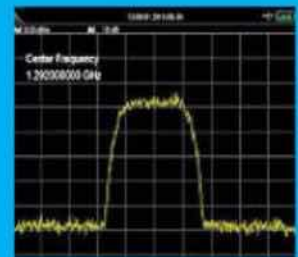
1/1/2017 through 8/5/2017

Category	1/1/2017- 8/5/2017
INFLOWS	
ARRL Membership Income	95.00
Badge Income	5.00
Dues, Family	90.00
Dues, Family (PayPal)	206.03
Dues, Future (PayPal)	57.66
Dues, Membership	742.50
Dues, Membership (PayPal)	763.87
Field Day Food Income	345.00
Opportunity Drawing -Monthly	115.00
Refreshments Income	54.00
Sale Of Equipment	870.00
TOTAL INFLOWS	3,344.06
OUTFLOWS	
ARRL Membership Expense	93.00
Bank Svc Chg	35.00
Field Day - Flowers	53.88
Field Day - Gas	39.59
Field Day Equipment	114.00
Field Day Food Reimbursement	525.00
Field Day Rental	51.72
OCARC Historian	27.45
Opportunity Drawing - Monthly	142.17
PO Box Rental	64.00
Refreshments Expense	118.85
Storage Locker	544.00
Supplies	46.62
Trifold Brochure Printing	231.12
Web Site Hosting	140.91
TOTAL OUTFLOWS	2,227.31
OVERALL TOTAL	1,116.75



Digital Amateur TeleVision Exciter/Transmitter

Now available from



DATV-Express

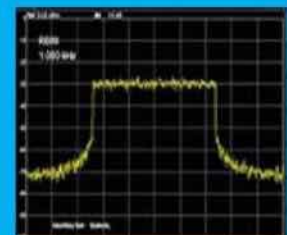


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- Can operate all ham bands from 70 MHz-to-2450 MHz
- RF output level up to 10 dBm (min) all bands (DVB-S)
- Software Defined Radio (SDR) architecture allows many variations of IQ modulations
- "Software-Defined" allows new features to be added over the next few years, without changing the hardware board
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- Requires PC running Windows or Ubuntu Linux (see User Guide)
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Register on the web site
 to be able to see
 the PURCHASE page



BLAST FROM THE PAST – Article from the RF 25 Years Ago!

RF

August, 1992

EARTHQUAKE INFO!

by Nancy Bucher, N6XQR

The W6FXN repeater on 145.460, long known as the "Earthquake Repeater" has not been operational for several weeks now. The repeater was suffering audio problems before it came down completely and straight answers about its future location and capabilities are impossible to come by. Temporary arrangements were made with another club repeater but those arrangements do not appear to be working out too well for the weekly Wednesday night net. The 145.460 frequency has now been overrun by the Spanish speaking stations.

That's the bad news -- but there is certainly good news to share. Most of the active seismic folks

can still be found! They have moved to 147.705 (down - PL of 114.8 for the Oat Mountain repeater location). There is a second repeater in the system and it works best if you completely let the carrier drop before keying up.

Most evenings these hams can be found trading their numbers and discussing the day's earthquake activity. Club members who can be found there include Dorothy, N6ZNC - frequent Net Control for the "QuakeReportingNet," -- Bob, WB6IXN, who is doing ongoing research on the possible effect of lunar gravity on probability of seismic events -- Bob, KD6BWH, who provides the daily OCRA numbers (Orange County Register Animals - a count of lost dog and cat ads and found dog and cat ads). Much sharing of information in-

cluding epicenters and magnitude, well levels, and other measurements are regularly given out. Just come up on frequency and call Dorothy, N6ZNC.

If you have a computer with a modem, you might be interested in a new BBS run by Jerry, N6UME and Dorothy, N6ZNC called the PSN (Public Siesmic Network). This BBS is part of a 3-node (and growing) BBS system endorsed by the USGS and is available to both hams and non-hams. It has just come on line and contains many very interesting files available for down load, including current seismic activity in California and programs that will let you view seismic tracings on your computer. Just call (818) 797-0536 (supports up to 2400 baud, set up is N-8-1). There are also files that give specs for a hardware interface from a siesmometer to a computer. Weekly Cal-Tech and northern California seismic reports are also available.

1992 CLUB BOARD of DIRECTORS

President	Frank Smith	WA6VKZ	838-3180
Vice President	Bob Eckweiler	AF6C	639-5074
Secretary	Jane Breller	KC6TAM	310/866-2077
Treasurer	Carmine Fiorello	AB6KE	837-5133
Activities	Bob Schnabel	KM6TL	776-8486
Membership	Bob Buss	KD6BWH	534-2995
Public Relations	Cindy Hughes	KC6OPI	971-3448
T.V.I. Chairman ...	Clark Turner	WA3JPG	856-2131
Member at Large ..	Ken Konechy	W6HHC	744-0217
Member at Large ..	Mike Abreu	K6KAA	832-8503

CLUB APPOINTMENTS

Club Historian	Bob Evans	WB6IXN	543-9111
W6ZE Trustee	Bob Eckweiler	AF6C	639-5074
RF Editor	Nancy Bucher	N6XQR	537-8728
Refreshments	Cindy Hughes	KC6OPI	971-3448

Amateur Radio Installations

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Ham Radio Word Search

K H H U W E J F O E Z F H M X F O M U J
 R N T R A I B N G W N J A R H N T I V E
 V C A P L H F N X D U W M M D L B G Y Z
 O O F Q J Z A P X E I K X Z N R W S R Q
 A N A U O R M I B C Z Y A T P Q N O B J
 F T B V O G G W P D T R E I F I L P M A
 W E N D R P H P U G K Q D X K R M E Z M
 Z S N T A O H Y R L P F O C I A S R O W
 G T G L G U M X T C E K C N A D C A L V
 V I I Y N T S X G N W Z N M R I C T A C
 D N N I A W T P R U U W X T B O G O Y B
 A G A P K V P Q D C C O O M M D P R H Y
 Z B P U J W X M M P S S C Q F M I I S G
 J R D O S Z A N S R Q Y S Z I Z A F P E
 V X H C P T A H H S M D E U N I H H P J
 Z Q V O K E R E G O Z I S G I F D V U R
 W F G S N K Y A U Y D B Z T X P Q Z X F
 C D Y Z D C E I L I D I U Z X Y H S R I
 D Z T G P Z Q S A I N D H L U A C M K E
 O S Q H D O V Y Y X A X F J C L V E Z S

RADIO
 CLUB
 CONTESTING
 AUSTRALIA
 VHF
 UHF
 AMPLIFIER
 QSO
 CQ
 DX
 KANGAROO
 HAM
 OPERATOR
 ORANGE
 COUNTY

Some say the first three words you see best describe you....what do you think???

"Life is like a puzzle. Never waste time trying to place people where they don't fit." Picturequotes.com

"To reject the word, is to reject the human search." – Max Lemer

"If you're not having fun, you're doing it wrong." – Alex Bogusky

FT8 Weak Signal Digital Mode Is Taking Off

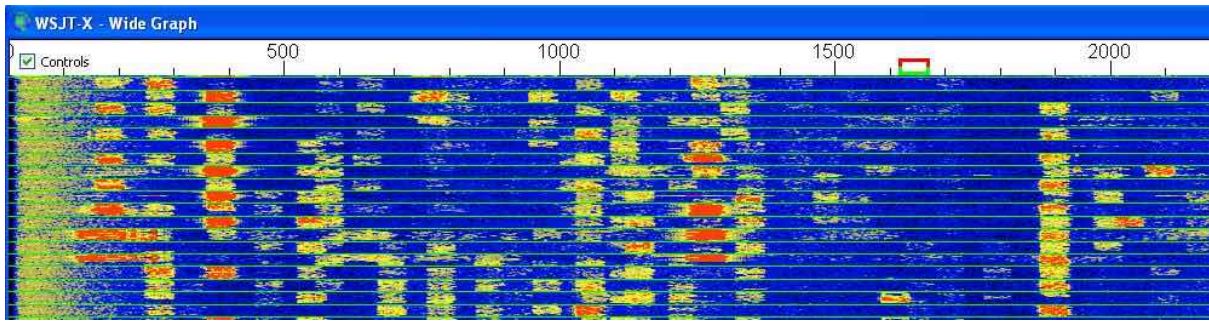


Figure 1. FT8 Waterfall from 20m showing many QSOs happening at once

[Press Release from Joe Taylor K1JT in the WSJT Development Yahoo Group:]

Dear WSJT-X Beta-Test Colleagues,

Steve (K9AN) and I have developed a potential new mode for WSJT-X. We're calling the mode "FT8" (Franke-Taylor design, 8-FSK modulation).

FT8 is designed for situations like multi-hop Es where signals may be weak and fading, openings may be short, and you want fast completion of reliable, confirmable QSOs.

Important characteristics of FT8:

- T/R sequence length: 15 s
- Message length: 75 bits + 12-bit CRC
- FEC code: LDPC(174,87)
- Modulation: 8-FSK, keying rate = tone spacing = 5.86 Hz
- Waveform: Continuous phase, constant envelope
- Occupied bandwidth: 47 Hz
- Synchronization: three 7×7 Costas arrays (start, middle, end of Tx)
- Transmission duration: $79 \times 2048 / 12000 = 13.48$ s
- Decoding threshold: -20 dB (perhaps -24 dB with AP decoding, TBD)
- Operational behavior: similar to HF usage of JT9, JT65
- Multi-decoder: finds and decodes all FT8 signals in passband
- Auto-sequencing after manual start of QSO

Comparison with slow modes JT9, JT65, QRA64: FT8 is a few dB less sensitive but allows completion of QSOs four times faster. Bandwidth is greater than JT9, but about 1/4 of JT65A and less than 1/2 QRA64.

Comparison with fast modes JT9E-H: FT8 is significantly more sensitive, has much smaller bandwidth, uses the vertical waterfall, and offers

FT8 Weak Signal Digital Mode Is Taking Off

*Still to come, not yet implemented: * We plan to implement signal subtraction, two-pass decoding, and use of “a priori” (already known) information as it accumulates during a QSO.

Three extra bits are available in the message payload, with uses yet to be defined. We have in mind special message formats that might be used in contests, and the like. Your considered suggestions for use of these bits are very welcome!

K1JT, K9AN, and G4WJS have conducted on-the-air tests of FT8 with excellent results. We're now at a stage where tests under a wider range of conditions are desirable. If you can build WSJT-X from source code revision r7750 or later, and would like to help, please do so and report your results to us! Pre-built installation packages will be made available after further testing is completed.

Suggestions for FT8 setup and examples of use can be found in a screen shot posted here: <http://physics.princeton.edu/pulsar/k1jt/ft8.png>

We look forward to receiving your feedback.

Hi all,

It will help to have some initial frequency coordination among those testing the new FT8 mode in WSJT-X v1.7.1.

To help get things started, we suggest using the following frequencies:

Band MHz

160	1.841
80	3.579
40	7.079
30	10.141
20	14.074
17	18.105
15	21.079
12	24.920
10	28.079
6	50.313

Most of these suggestions follow a simple guideline: add 3 kHz to the commonly used JT65 dial frequency.

