



# RF



## ORANGE COUNTY AMATEUR RADIO CLUB, INC.

VOL. LII NO. 6

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

June 2011

### The Prez Sez.....

By Paul W6GMU



Welcome to the month of "Field Day", that is, June!! Our #1 Club activity of the year, Field Day allows us to test our mettle by creating an emergency communications setup from scratch, including electricity, and passing simulated emergency traffic (contacts with others) for a solid 24 hours



Plus, we get to have a great time doing it!! This exercise in Emergency Preparedness and teamwork shows us what we can do when we pull together, especially in case of a real emergency (as in recent news). All are welcome to visit us during this event and even operate a radio, with or without an Amateur Radio license...we'll show you how. Please check this edition's index and the OCARC website for more details. Help in set-up and tear-down will be very much appreciated! Have fun, All, and hope to see you there!  
73 de Paul W6GMU

### June Program

Our guest speaker for the June meeting is

**Dennis Kidder**  
**W6DQ**

Dennis has a great presentation on the construction of the Hong Kong airport. It should spark everyone's interest.

The next general meeting will be on:

**Friday, June 17th, 2011**  
**@ 7:00 PM**

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

In This Issue:	Page
The PREZ SEZ .....	1
June Meeting .....	1
CLUB INFORMATION .....	2
Field Day 2011 .....	3
May Board Meeting Notes.....	6
Apartment Antenna.....	8
May General Meeting Minutes ..	9
COAR DATV New Equipment ..	11
Heathkit Article of the Month ..	12
HAMCON Sept 2011 .....	18
OCARC Equipment List .....	19

**ORANGE COUNTY  
AMATEUR RADIO CLUB**  
[www.W6ZE.org](http://www.W6ZE.org)



**2011 Board of Directors:**

**President:**

Paul Gussow, W6GMU  
(714) 624-1717  
[W6GMU@w6ze.org](mailto:W6GMU@w6ze.org)

**Vice President:**

George Jacob, N6VNI  
(562) 544-7373  
[N6VNI@w6ze.org](mailto:N6VNI@w6ze.org)

**Secretary:**

Doug Britton, W6FKX  
(714) 969-0301  
[W6FKX@w6ze.org](mailto:W6FKX@w6ze.org)

**Treasurer:**

Ken Konechy, W6HHC  
(714) 744-0217  
[W6HHC@w6ze.org](mailto:W6HHC@w6ze.org)

**Membership:**

Jeff Hall, W6UX  
(949) 697-9279  
[W6UX@w6ze.org](mailto:W6UX@w6ze.org)

**Activities:**

Kristin Dankert, K6PEQ  
(714) 544-9846  
[K6PEQ@w6ze.org](mailto:K6PEQ@w6ze.org)

**Publicity:**

Steve Brody, N1AB  
(714) 974-0338  
[N1AB@w6ze.org](mailto:N1AB@w6ze.org)

**Technical:**

Bob Eckweiler, AF6C  
(714) 639-5074  
[AF6C@w6ze.org](mailto:AF6C@w6ze.org)

**Directors-At-Large:**

Dan Dankert, N6PEQ  
(714) 544-9846  
[N6PEQ@w6ze.org](mailto:N6PEQ@w6ze.org)

Larry Mallek, K6YUI  
(714) 533-0887  
[K6YUI@w6ze.org](mailto:K6YUI@w6ze.org)

**2011 Club Appointments:**

**W6ZE Club License Trustee:**

Bob Eckweiler, AF6C  
(714) 639-5074  
[AF6C@w6ze.org](mailto:AF6C@w6ze.org)

**Club Historian:**

Bob Evans, WB6IXN  
(714) 543-9111  
[WB6IXN@w6ze.org](mailto:WB6IXN@w6ze.org)

**RF Editor (rotating):**

Kris Jacob, KC6TOD  
[KC6TOD@w6ze.org](mailto:KC6TOD@w6ze.org)

**WEB Master:**

Ken Konechy, W6HHC  
(714) 744-0217  
[W6HHC@w6ze.org](mailto:W6HHC@w6ze.org)

**Assistant WEB Master:**

Bob Eckweiler, AF6C  
(714) 639-5074  
[AF6C@w6ze.org](mailto:AF6C@w6ze.org)

**ARRL Awards Appointee:**

Arnie Shatz, N6HC  
(714) 573-2965  
[N6HC@aol.com](mailto:N6HC@aol.com)

Larry Beilin, K6VDP  
(714) 557-7217  
[K6VDP@aol.com](mailto:K6VDP@aol.com)

**OCCARO Delegate:**

Kristine Jacob, KC6TOD  
(562) 619-8870  
[KC6TOD@W6ZE.org](mailto: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. & 4<sup>th</sup> 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 **OCCWN**  
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.

**Come Out to FIELD DAY and  
Have Some FUN!!!!****June 25-26, 2011****Walter Knott Education Center  
7300 La Palma Ave.  
Buena Park, CA 90620****FD Co-Chairmen**

- Jeff W6UX & Doug W6FKX

**Band Captains**

- |            |               |                          |
|------------|---------------|--------------------------|
| • 10M/80M  | PH/CW/Digital | Carl N8AE & Dee N8UZE    |
| • 15M      | PH/CW         | Jeff W6UX                |
| • 20M      | PH            | Bob AF6C & Ken W6HHC     |
| • 20M      | CW            | Paul W6GMU               |
| • 40M      | PH            | Tim K6GEP                |
| • VHF/UHF* | PH/CW         | Robbie KB6CJZ            |
| • GOTA     | PH/CW/Digital | Steve N1AB & Brett W6BAC |

\* Solar powered station!

**Schedule of Events****FRIDAY, June 24<sup>th</sup>**

- 11:00 a.m. FD volunteers may begin arriving @ Walter Knott Education Center  
01:00 p.m. Antenna Raising party (don't miss this super fun event!)  
06:00 p.m. Dinner served (BBQ tri-tips and salad)

**SATURDAY, June 25<sup>th</sup>**

- 11:00 a.m. ARRL FIELD DAY Begins  
12:00 p.m. Lunch (sub sandwiches)  
06:00 p.m. Dinner (pizza)

**SUNDAY, June 26<sup>th</sup>**

- 08:00 a.m. Breakfast served (egg McMuffins, OJ, coffee)  
11:00 a.m. ARRL FIELD DAY Ends  
11:15 a.m. Club photos  
11:30 a.m. Antenna Lowering party and site cleanup (also a super fun event!)

**Food**

**\$20** buys you all meals, but we must have a complete headcount before Field Day! **If you haven't already reserved your meals, you must contact Doug W6FKX (W6FKX@W6ZE.org) no later than JUNE 19<sup>th</sup>.** Indicate which meals you plan to eat (or 'all' if applicable).

- Club will provide cold-iced water bottles
- Every FD participant should plan on bringing his own iced-tea, sodas, or Gatorade.

See you there!

...de Jeff W6UX ([W6UX@W6ZE.org](mailto:W6UX@W6ZE.org))

...de Doug W6FKX ([W6FKX@W6ZE.org](mailto:W6FKX@W6ZE.org))

## OCARC FIELD DAY SITE AT WALTER KNOTT SCHOOL

**NORTH**

(This is La Palma Avenue)



**Knott's Berry Farm Park ↓**

**SOUTH**





### **OCARC Board Meeting Minutes for May 14, 2011**

The OCARC Board meeting was held at the JägerHaus Restaurant, 2525 East Ball Road, Anaheim, and called to order by Paul Gassow W6GMU (President) at 8:15AM Saturday, May 14, 2011. Roll was called by Doug Britton W6FKX (Secretary), there were a total of 7 directors and 7 visitors – Arthur Burke KJ6NHH (new club member, welcome Arthur!) , Brett Collingwood W6BAC, Nicholas Haban AF6CF, Kristine Jacob KC6TOD, Dianne Konechy, Brian Putz KI6LSJ and Robby Robinson KB6CJZ. There was a quorum with the directors' present.

#### **DIRECTOR REPORTS:**

- Vice President George Jacob N6VNI – busy working as the Vendor Coordinator for the upcoming 2011 HAMCOM. George reported that all he will be picking up the keys to the gate at the Walter Knott school field day site on the 15<sup>th</sup> and he has confirmed that no other occupants or activities will be going on during OCARC Field Day activities. George reported that the clubs monthly general meeting presentations are set up through the October auction. This month's meeting would be given by individuals from the Civil Air Patrol, June's meeting Dennis Kidder will be speaking about the construction of the Hong Kong Airport, August Phil Paser from HRO will give a presentation on APRS, September's meeting will be presented by Bill Shultz on remote HF operations.
- Treasurer Ken Konechy W6HHC – reported on the club's YTD cash flow through 5/14/2011. Ken also reported that the ARRL announced a change in the insurance carrier offered for clubs to use, Ken reported that we could stay with our current insurance carrier (Marsh) or obtain coverage from the new carrier with rates negotiated by the ARRL (likely to \$100 less per year).
- Secretary Doug Britton W6FKX – no report this month.
- Activities Kristin Dankert K6PEQ – Kristin reminded the board of the upcoming club barbeque to be held at the Dankerts house on the 28<sup>th</sup>. Reported that the portables-in-the-park was held in April and all went well.
- Membership Jeff Hall W6UX – membership roster current, and introduced us to the new club member Arthur Burke in attendance. Jeff reported that 20 members were in arrears on membership dues.
- Publicity Steve Brody N1AB – absent, no report.
- Technical Bob Eckweiler AF6C – absent, no report.

- Directors-at-large – Dan Dankert N6PEQ – no report.  
Larry Mallek K6YUI – no report.

#### OLD BUSINESS:

- **RF Newsletter “Rotating” Editors – thank you to all who volunteer!**
  - May – Doug W6FKX
  - June – Kris KC6TOD
  - July – Paul W6GMU
- **Field Day Update** – Jeff W6UX reported that all the band captain positions had been filled, and that the FD meeting with band captains and all interested would follow immediately after the adjournment of the board meeting.
- **OCARC equipment inventory** – to be continued, a suggestion was made that a club Email be sent requesting members to report if and what club equipment they may be storing.
- **Portables – in – the – park** – Jeff W6UX and Nicholas AF6CF reported 2 to 3 stations were operating at the event; the next event is planned for August or September.
- **Drive – in mobile amateur event** – not scheduled as yet.

#### NEW Business

- **Orange County Fair – OCARC participation** – Kristin reported that the club’s dates are finalized; Wednesday July 20, Saturday with WARA (sorry Kristin, correct me if I’m wrong) July 23, and Sunday August 7.

#### GOOD OF THE CLUB – Nothing to report

Motion made to adjourn meeting by Dan N6PEQ, seconded by Larry K6YUI and unanimously approved.

Meeting adjourned 9:00AM

Respectfully submitted:

*Doug Britton W6FKX*, OCARC Secretary



**2M and 10M antennas  
for an  
Apartment Porch**

When OCARC member Dee-N8UZE moved into an apartment in Tustin, she found that her indoor 2M and 10 M antennas had a tough time being heard on the OCARC Wednesday night Nets. Luckily, husband Carl-N8AE came to the rescue with the 2M vertical antenna shown below – “planted” on their second-story porch....and a Radio Shack “ham stick – like” Antron 10M antenna (leaning on the porch railing)

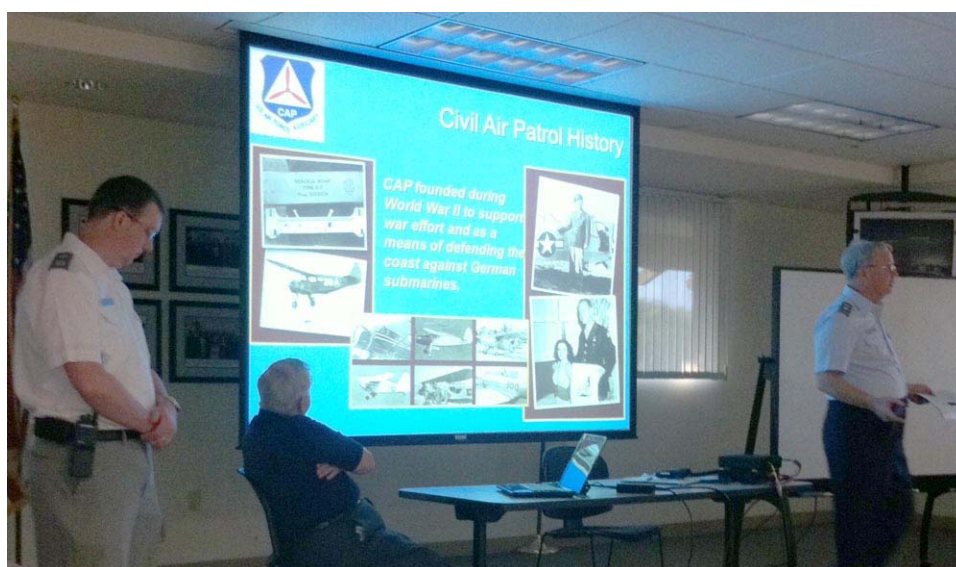




## OCARC General Meeting Minutes May 20, 2011

The OCARC March General Meeting was held at the Red Cross complex in Santa Ana, called to order by OCARC President Paul Gussow W6GMU at 6:55 pm on Friday evening, May 20<sup>th</sup>, 2011. There were a total of 43 members and visitors present. Seven club officers were present for a quorum.

Paul W6GMU opened the meeting with the Pledge of Allegiance. George N6VNI introduced our speakers for the evening; 3 gentlemen, William Phinizy K6WHP (on the right in the photo), John Freichs N6VCW (on the left in the photo), and Captain Harris (seated in the photo) from the Civil Air Patrol – United States Air Force Auxiliary.



The program began with Bill Phinizy K6WHP operating as the Net Control Station for the CAP weekly "Wing Net" live, checking in several groups. Following the brief net check-in with no traffic, Bill continued the evenings program with a review of the Civil Air Patrol's history which began just a few days before the attack on Pearl Harbor. Its primary purpose was to support the war efforts using civilian aircraft to patrol the coasts for submarines. Of interest was that the patrol has been credited with sinking or seriously damaging 2 enemy submarines during WWII. Following the war, the Civil Air Patrols roll switched to one of primarily supporting the Air Force's search and rescue, a roll in which it continues today. Bill mentioned that the CAP performs 85% of the federal inland search and rescue operations directed by the Air Force Rescue Coordination Center at Langley Air Force Base, Va. Today the patrol has 56,000 members, approximately 535 aircraft in its fleet, and is headquartered at Maxwell AFB, Alabama.

In addition to its support in search and rescue efforts, the Civil Air Patrols purpose is one of continuing and fostering aerospace appreciation and knowledge among its members and young people identified as cadets. The patrol's out-

reach programs strive to educate the public through its numerous workshops held throughout the nation.

Bill called for amateur radio operators to consider volunteering for CAP. The expertise hams could bring to the communications branch of CAP includes communication, technical and emergency operation skills. In addition, similar to the skills needed during search and rescue operations where operators locate activated distress radio beacons or Emergency Locator Transmitters, amateur radio operators can bring their experience in T Hunting or Fox Hunting (transmitter hunting) and support a CAP Urban Direction Finding teams.

Bill ended the presentation with contact information of local CAP squadrons. If you are interested in volunteering contact:

[www.squadron68.org](http://www.squadron68.org) (Costa Mesa) or <http://sq40.cawg.cap.gov> (Fullerton) or <http://sq150.cawg.cap.gov> (Long Beach).

And thanks Ken W6HHC for providing the photo!

**SHOW & TELL** – None presented.

Remember if you have something for the Show and Tell bring it to the next meeting!

**Field Day 2011** – Jeff Hall W6UX and Doug Britton W6FKX gave a brief update on the status of OCARC Field Day, requesting operators, and set-up and tear down assistance. A sign-up sheet was passed around for participants to indicate what meals during FD they would be attending.

**GOOD of THE CLUB** – None presented.

Just a reminder that the ORARC Board Meetings will now be held on the second Saturday of each month at 8:15 AM at the Jagerhaus Restaurant, 2525 East Ball Road Anaheim. Visitors are welcome.

A motion to adjourn meeting at 8:58 pm was made by Steve Brody (N1AB), and seconded by Ken Konechy (W6HHC).

Respectfully submitted by:  
Doug Britton W6FKX  
OCARC Secretary

## **COAR RACES**

### **obtains new**

### **Digital-ATV equipment**

The COAR RACES group in the city of Orange are very fortunate to obtain funding to obtain new Digital-ATV equipment to create a portable field station. This new equipment will allow COAR to have a "ready to go" DATV station to send video from out in the field back to the EOC (Emergency Operations Center) located at the Orange Police Department building.



**COAR Member KB6CJZ measures SWR on new DATV 1.2 GHz "Elephant Gun" Yagi**

COAR RACES has been in the process of changing over from analog-ATV field video to digital-ATV video for about one year... Mainly by borrowing the DATV equipment from the home station of Ken W6HHC. Currently, "field testing" of the new equipment and then training workshops on DATV equipment for the COAR RACES members are planned over the next few months.

The digital-ATV video quality from the field is much improved over the older analog-ATV technology. This improvement is because DATV technology uses Forward-Error-Correction (FEC) to overcome the "ghosts" and weak-signal conditions caused by elevated-freeways, buildings in the downtown area and the hills on the outskirts.

**Heathkit of the Month: #30**  
**by Bob Eckweiler, AF6C**



**Heathkit Amateur Radio SB-Line - Overview**

**Introduction:**

By the mid sixties single sideband had all but replaced AM as the preferred voice mode on the HF bands. The Heathkit RX-1 Mohawk receiver (See HOM #14, March 2009 RF) was a capable SSB receiver for the day, but the matching AM/CW Apache TX-1 (See HOM #17, July 2009 RF) required the SB-10 adapter to operate on SSB. Thus in 1963 Heathkit started introducing the SB-line. This line continued into the mid 1980s and even longer if you include some later amplifiers and non-kit radios that have the SB designation.

The SB-line can be split into three groups; the early SB-line, which contains the bulk of the products; the late SB-line which is the SB-104, and SB-104A transceivers and their matching accessories; and some miscellaneous equipment that is not related to either of these lines, but has the SB designation (For example the SB-10 mentioned above.)

Unlike other *Heathkit of the Month* columns, this month's column will be an overview of the line and not an in-depth discussion of a particular piece of equipment. Some of these items will be discussed individually in future articles.

**The Heathkit Early SB-Line:**

In the early sixties Collins Radio was selling a high performance amateur station that consists of a separate receiver and transmitter that can operate on one frequency using the receiver VFO or on split frequencies with each unit using its own VFO. This Collins "S-Line", as the set is known, evolved through several updates to become the 75S-3B receiver and the 32S-3 transmitter. A 30L-1 linear amplifier was also

sold, as was a 51B-4 station console. The S-Line was the deluxe station of its time. And even today it commands a high price and is highly sought after. The Collins S-Line didn't go unnoticed by the hams at Heath and appears to have had a major influence on the design of the Heathkit SB-300 and SB-400.

There were some significant differences between the Collins and Heathkit lines as well as many similarities. Two major differences involve the transmitter power supply and the type of filters used. Heathkit managed to fit the transmitter power supply into the transmitter case, while the Collins transmitter has an external power supply that fits inside the external speaker case. Heathkit also uses the less expensive crystal filters instead of the sharper mechanical filters, a Collins product of renown.

The early Heathkit SB-line is styled in a two-tone paint scheme of grey and green. The case is grey and the front panel is green with white lettering. The knobs are dark green with silver inserts and a silver skirt. When used, meters are black faced with white lettering, and the meter trim is dark green. The meters are often backlit.



**Figure 1: The SB-101 HF Transceiver**

Frequency stability of the SB-line is comparable with quality radios of the same era. This is due to the use of a pre-built and pre-calibrated LMO (Linear Master Oscillator) in the tube radios and its solid-state equivalent in the transistor receivers. The LMO tunes from 5,500 down to 5,000 KHz as the radio is tuned from



the low to high end of any of the eight or nine bands. Each band is 500 KHz wide so ten-meters requires four bands to cover 28.0 - 29.7 MHz. All oscillators except the LMO are crystal controlled making them very stable.

All the radios feature the same tuning dial. The frequency is indicated by a slide rule and dial. The slide rule is marked 0 - 5, and the cursor moves one slide rule division for each turn of the dial, which is marked 0 - 100. A 4+ : 1 vernier drive between the tuning knob and the dial allows easy tuning. The frequency is read by adding the MHz from the band switch, the proper 100 KHz from the slide rule and the proper KHz from the dial. This is very straightforward except on the two segments in the 10 meter band (28.5 to 29.0 and 29.5 to 30.0) where you must interpret the slide rule marks as 5 - 10.

The receivers include a 100 KHz crystal oscillator, and the dial cursor is adjustable so you can zero beat the calibration signal at the closest of the 100 KHz spots on the dial and then set the cursor mark right over the zero. The solid-state receivers also include 25 KHz spots for additional calibration points. This might seem primitive today, but you can read out accurately down to less than 200 Hz which was outstanding in the days before digital readouts were common.

Assembling the dial mechanism requires a lot of patience when building the kit to get it to work smoothly. If done right, the dial feels like velvet. I've come across a lot of SB Heathkits where this is not the case. Fortunately you can still go in there and do a readjustment. Alignment of the LMO to the chassis needs to be perfect and the position of the dial parts with respect to each other also needs to be perfect. The manual tells you how to do it. If you are buying a used Heathkit, be sure to check the dial. If it isn't physically broken you should be able to get it working smoothly with a little care.

Figure 2 shows the old, but still operational SB-301 and SB-401 built by the author in 1969. Note that the SB-301 receiver is on the right since the author is left-handed and tunes with the right hand.



**Figure 2: SB-401 Transmitter (left) and SB-301 Receiver (right).**

### Heathkit Early SB-Line Transmitters, Receivers and Transceivers:

Heathkit manufactured twelve different receivers, transmitters and transceivers over the life of the series. They are:

SB-100	HF Transceiver
SB-101	HF Transceiver
SB-102	HF Transceiver
SB-110	VHF (6-Meter) Transceiver
SB-110A	VHF (6-Meter) Transceiver
SB-300	HF Ham Receiver
SB-301	HF Ham Receiver
SB-303	HF Ham Receiver (solid-state)
SB-310	HF SWL Receiver
SB-313	HF SWL Receiver (solid-state)
SB-400	HF Ham Transmitter
SB-401	HF Ham Transmitter

The SB-300 receiver was the initial SB kit offered, followed closely by the SB-400 transmitter. These appeared in late 1963 and early 1964 respectively. They covered 80 through 10 meters SSB and CW (no WARC bands back then). The SB-400 runs 180 watts input. The SB-300 and SB-400 got to be known as the "Heathkit Twins" and also as "the poor man's Collins" not long after they were introduced.

In 1966 the SB-300 receiver was replaced by the SB-301, and the SB-400 transmitter was replaced by the SB-401. The SB-401 continued in production throughout the remainder of the early SB-line until 1976, but the SB-301 was replaced in late 1970 by the SB-303, a solid-



state receiver. The SB-303 case is a different width than the other radios, measuring 14-7/8" W x 6-5/8" H x 13-3/8" D.

In 1965, after the SB-300/SB-400 twins became popular, the SB-100 transceiver was released. It is styled and performs similarly to the twins but is in one package with just one VFO and requires an external power supply, either the HP-23 AC power supply (See HOM #26, February 2011 RF) or the HP-13 mobile DC power supply.

The SB-100 was updated to the SB-101 in 1967, and to the SB-102 in 1970. Like the SB-401 the SB-102 remained in production until around 1976.

The SB-110 also came on the scene in 1965. It is a 180 watt SSB, 150 watt CW six-meter transceiver that looks similar to the SB-100. In 1969 it was upgraded to the SB-110A and was discontinued in the early seventies. This VHF SSB/CW transceiver covered the lower 2 MHz of the six-meter band.

The SB-301 and SB-303 ham radio receivers also had SWL (shortwave listener) counterparts designated the SB-310 and the SB-313. These were spitting images of their sisters except they covered the major SWL bands instead of the ham bands. They also came with a wider AM crystal filter instead of the SSB filter supplied with the SB-301 and SB-303.

All the SB-3xx receivers came with one filter and space for two additional optional filters.

#### **Heathkit Early SB-Line Amplifiers:**

Heathkit made two RF linear amplifiers, each with a derivative, to meet FCC rule changes:

SB-200	HF 80-10M 1,200W PEP Amplifier
SB-201	HF 80-15M 1,200W PEP Amplifier
SB-220	HF 80-10M 2,000W PEP Amplifier
SB-221	HF 80-15M 2,000W PEP Amplifier

These linear amplifiers matched the early SB-line. The SB-200 uses a pair of 572B triodes and runs 1,200 watts PEP on SSB and 1000 watts on CW; the SB-220 uses a pair of 3-500Z

tubes and runs 2,000 watts PEP on SSB and 1,000 watts on CW. Both amplifiers have their power supply built-in and both can run off of 120 VAC or 240 VAC with a wiring change.

The SB-200 started production in 1964, while the SB-220 started production in 1970. Both were down-graded in 1978 because the FCC, observing that amateur radio amplifiers were finding their way onto the CB band, required that 10 meter capability be removed from new production amplifiers. Heathkit responded with the SB-201 and SB-221 which removed the ten meter capability. These amplifiers continued in production until 1983. They work with most HF radios and are still popular amplifiers.

#### **Heathkit Early SB-Line Transverter:**

Between 1969 and 1971 Heathkit offered a two-meter transverter kit.

SB-500      Two-meter Transverter

The SB-500 allows the SB series radios to operate on 2-meter SSB and CW. It is designed for an IF of 50 - 52 MHz for use with the 6 meter SB-110 series or 28 - 30 MHz for use with the HF SB series of twins and transceivers. Modifications are required to operate on the upper two MHz of two meters.

#### **Heathkit Early SB-Line Accessory Devices:**

Heathkit made numerous supporting items for the early SB-line that come in their own cabinet and add to the functionality of the line. They appear in the same green - gray style as the rest of the family. They are:

SB-600 Matching Speaker  
SB-610 Monitor Scope  
SB-620      Panadapter (Spectrum Analyzer)  
SB-630 Station Console  
SB-640 Remote VFO  
SB-650 Digital Frequency Display

These accessories, with the exception of the SB-650, each fit in the same size accessory cabinet (10" W x 10-1/2" D x 6-5/8" H) The dimensions exclude knobs and feet.

The SB-600 is a matching speaker. It is a simple kit and has room and mounting holes to in-

stall an HP-23 series AC power supply inside it when using the speaker with one of the SB-100 series transceivers.

The SB-610 is a monitor oscilloscope that allows you to look at your transmitted signal, the received signal and the linearity of your power amplifier.

The SB-620 is a spectrum analyzer that lets you view a segment of the band you are on for nearby signals. It can also be used as a stand-alone spectrum analyzer.

The SB-630 is a station console that includes a (mechanical) 24-hour digital clock, a 10 minute timer, an SWR bridge and a hybrid phone patch, all housed in one cabinet.

The SB-640 is a remote VFO housing a Heathkit LMO with power supply for use with the SB-100, SB-101 and SB-102 transceivers to allow split frequency operation.

The SB-650 is a digital readout that displays the operating frequency on six Nixie tube displays. It is housed in a smaller case (10" W x 10-1/4" D x 4" H)

#### **Heathkit Early SB-Line Accessories:**

Heathkit also made various accessories for the early SB-line. Some were modification kits for certain pieces of equipment. They are:

SBA-100-1 Mobile Mount

SBA-300-3 6-meter converter

SBA-300-4 2-meter converter

SBA-310-3 Mod Kit for the SB-310

SBA-401-1 Crystal Pack for SB-401

SBM-102-1 Mod Kit for SB-100/101/ early 102

The SBA-100-1 is an inexpensive mobile mount for the SB-100 through SB-102 transceivers.

The SBA-300-3 is a six-meter converter that covers 50-52 MHz as supplied.

The SBA-300-4 is a two-meter converter that covers 144- 146 MHz as supplied.

Both converters mount simultaneously on the rear of the SB-301 and may be selected by a front panel control that switches the antenna and turns on power to the selected converter.

The SB-310-3 is a modification kit that converts the SWL receiver's 26.9 – 27.4 citizen's band to the 21.3 – 21.8 SWL band (and part of the 15 meter ham band). Evidently a lot of people were turned off listening to eleven meters.

The SBA-401-1 is a package of crystals that allows the SB-401 to operate independently of the Heathkit SB-301 receiver. Normally the BFO and heterodyne frequencies are generated in the receiver and used by the transmitter.

The SBM-102-1 is a modification kit for the SB-100, SB-101 and early SB-102 (SN below 5446). It modifies the driver stage to cancel the Miller effect that causes the driver tuning to be different between receive and transmit. All owners of these radios should install this kit to improve receiver sensitivity and transmitter drive. While the kit is no longer available from Heathkit, the parts are common and easily available, and the seven page Heathkit instruction manual can be found on the web.

#### **Heathkit Early SB-Line Crystal Filters:**

Heathkit made numerous crystal filters for the early SB-line. The filters for the SB-100, SB-300 and SB-400 are physically larger than the later units. The later filters are narrower, but the mounting and terminals are reported to be the same so you should be able to use the smaller filter in an older radio but not the other way around without modification. Watch out for the later CW filter that is used in the late SB-line as it has a slightly different center frequency. Here is a list of known early SB-line filters and the equipment they work in.

Part #(s)	Bandwidth @ 6dB/60dB Kit(s) using filter
404-200 SSB	2.1/5 KHz
SB-100/300/400	(Supplied)
404-201 AM	3.5/14 KHz
SB-100/300	(Optional)

404-202 CW 0.4/2.5 KHz  
 SB-100/300 (Optional)  
 SBA-310-2 SSB 2.1/5 KHz  
 (404-283) SB-101/102/301/303/401 (Supplied)  
 SB-310/313 (Optional)  
 SBA-301-2 CW 0.4/5 KHz  
 (404-284) SB-101/102/301/303 (Optional)  
 SB-310/313 (Optional)  
 SBA-301-1 AM 3.75/10 KHz  
 (404-285) SB-301 (Narrow band Optional)  
 404-314 AM 5/15 KHz  
 SB-310/313 (Supplied)  
 SB-301/303 (Wide-band Optional)  
 SBA-310-1 SSB 2.1/7 KHz  
 (404-328) SB-310 Optional

### **Heathkit Late SB-Line:**

In 1974 Heathkit added a later series to the SB-line. With this series Heathkit left vacuum tubes behind and went all solid state except for the a CRT and a linear final tube.

SB-104 HF Solid-state Transceiver  
 SB-104A HF Solid-state Transceiver

Heath continued production on the early SB-line's SB-303 and SB-401, as well as the SB-201 and SB-221 for a time after the late SB series introduction. The new series is based on a new transceiver, the SB-104. In 1977, as the older series continued being phased out the SB-104 got an update to the SB-104A and remained in production until around 1982. The new SB series continues the green and gray color scheme. Added are two black stripes on the green front panel, thick along the top and thin on the bottom. A meter and a digital readout are in the top strip. The meter labeling and digital readout are lit red and stand out sharply in contrast.

The SB-104 & the SB-401A "solid-state, no-tune" transceivers run 100 watts out on the 80 - 10 meter bands (no WARC bands) and are the first SB series radios to have a digital readout built in. They requires 13.8 VDC power.

### **Heathkit Late SB-Line Linear Amplifier:**

Heathkit manufactured a linear in the late SB-line style from 1974 to 1978:



**Figure 3: The Later SB-Line**

**Clockwise from the top:** SB-104 HF Transceiver; SB-230 Linear; SB-614 Station Monitor; SB-634 Station Console; SB-644 Remote VFO; SB-604 with HP-1144 AC Power Supply.

SB-230 1,200 W PEP Linear Amplifier

The SB-230 linear amplifier runs 1KW on CW and 1,200 watts PEP on SSB. It uses an Eimac 8873 ceramic tetrode tube that uses conduction cooling instead of a fan.

### Heathkit Late SB-Line Accessory Devices:

Like the earlier SB series, the later SB series has a host of supporting accessory devices:

SB-604 Matching Speaker  
SB-614 Monitor Scope  
SB-634 Station Console  
SB-644 Remote VFO  
SB-644A Remote VFO

The SB-104 is the matching speaker for the SB-104/A. The AC power supply for the transceiver (HP-1144/PS-1144) is designed to fit internally to the speaker.

The SB-614 is a solid-state signal monitor for viewing the quality of your signal and the linearity of your amplifier.

The SB-634 is a station console that includes an SWR/power meter, a hybrid phone patch, an electronic digital clock and a ten-minute timer.

The SB-644/644A are remote VFO's that allow the SB-104/104A to operate split frequency.

### Late SB-Line Accessories:

Heathkit manufactured a couple of accessories for their SB-104/SB-401A line:

SBA-104-1 Noise Blanker  
SBA-104-2 Mobile Mount

The SBA-104-1 is an internal noise blanker. It is a step up from the earlier noise remedies provided on the SB-line. The SB-300 and SB-303 have no noise control circuitry. The SB-301 includes a simple diode noise limiter of little value. The SBA-104-1 is an effective noise blanker for pulse type noise. Many were bought for use in other receivers including the Collins 75S series receivers.

The SBA-104-2 is a mobile mount for the SB-104/A transceiver.

### Heathkit Late SB-Line Crystal Filters:

Only one optional filter was manufactured.

Part #(s)	Bandwidth @ 6dB/60dB Kit(s) using filter
-----------	--

404-283 SSB 2.1/5 KHz	SB-104/104A (Supplied)
-----------------------	------------------------

SBA-104-3 CW 0.4/ 2 KHz	(404-548) SB-104/104A (Optional)
-------------------------	----------------------------------

The SBA-104-3 is the optional CW crystal filter for the SB-104/SB-401A. Note that while the SSB filter supplied with the SB-104 and SB-104A are the same part used in the early SB-line, this CW filter cannot be used in the earlier SB-line since the late SB-line uses a different CW BFO crystal and a different filter center frequency.

### Miscellaneous Non-SB-Line Products:

Heathkit made a few kits with the SB prefix that do not fit into the two lines. They are the:

**SB-10 (1959 - 1964):** The SB-10 is a phasing HF SSB adapter for the TX-1 Apache. It also works with a modified DX-100 and DX-100B.

**SB-1000 (1987 - 1992):** Heathkit made a linear amplifier that uses a single 3-500Z tube and runs 1,200 watts PEP. This amplifier uses the later dark and light brown paint scheme that matches the later SS-9000 transceiver.

**SB-1400 (1988 - 1991):** This transceiver is not even a kit; it is a Yaesu FT-747GX in Heathkit livery.

73, from AF6C



A special thanks to reader Art Coates (call?) for a manual that will help me with updating the Heath GH-17A article.

*Remember if you come across any old Heathkit Manuals or Catalogs that you do not need, please pass them along to me.*

*Thanks - AF6C*

# HAMCON 2011

## ARRL Southwest Division Amateur Radio Convention

### September 9, 10, & 11, 2011

#### Marriott Torrance South Bay

3635 Fashion Way, Torrance, CA 90503 1-800-228-9290 Hotel Reservation Code: HAMCON

## REGISTRATION FORM

**ALL ATTENDEES MUST BE REGISTERED** - Please list all additional attendees

No Charge for Children under 16 when Accompanied by a Registered Adult

Call Sign: \_\_\_\_\_ Last Name: \_\_\_\_\_ First Name: \_\_\_\_\_

Address: \_\_\_\_\_ City: \_\_\_\_\_

State: \_\_\_\_\_ ZipCode: \_\_\_\_\_ Email: \_\_\_\_\_

**ADDITIONAL ATTENDEES (all adults must pay admission)**

NAME (PLEASE PRINT) CALLSIGN CHILD ADULT


#### REGISTRATION OPTIONS Price Qty Total

EARLY BIRD ( Postmarked/Submitted by June 30, 2011) \$15.00 \_\_\_\_\_ @\$15.00 = \$ \_\_\_\_\_

PRE-REGISTRATION ( Postmarked/Submitted by Aug. 1, 2011) \$18.00 \_\_\_\_\_ @\$18.00 = \$ \_\_\_\_\_

ON-SITE REGISTRATION \$20.00 \_\_\_\_\_ @\$20.00 = \$ \_\_\_\_\_

Convention Pins (While Supplies Last) \$ 5.00 \_\_\_\_\_ @\$ 5.00 = \$ \_\_\_\_\_

Breakfast Tickets \$25.00 \_\_\_\_\_ @\$25.00 = \$ \_\_\_\_\_

Luncheon Tickets \$30.00 \_\_\_\_\_ @\$30.00 = \$ \_\_\_\_\_

Banquet Tickets \$45.00 \_\_\_\_\_ @\$45.00 = \$ \_\_\_\_\_

Excursion (Bus Tour from Hotel to The Getty Museum) \$30.00 \_\_\_\_\_ @\$30.00 = \$ \_\_\_\_\_

Convention Pin Included

\_\_\_\_\_ Beef \_\_\_\_\_ Chicken \_\_\_\_\_ Vegetarian

Mail / Make Checks Payable To:

HAMCON, INC.

P.O. Box 333

Pomona, CA 91768

For Information Updates Visit

**HAMCONINC.ORG**

**STAFF USE ONLY**

Date Received: \_\_\_\_\_ # Adults Registered \_\_\_\_\_

# Children Registered \_\_\_\_\_ # Pins Ordered \_\_\_\_\_

Check # \_\_\_\_\_ Receipt # \_\_\_\_\_

Comments: \_\_\_\_\_

Seating is limited - Reserve your seat now! **TOTAL: \$** \_\_\_\_\_



**OCARC – List of Equipment as of June 2011**

<b>Description</b>	<b>Acquired</b>	<b>Cost</b>	<b>Where located</b>
Generator 5 KW - Honda - on wheels	Jun-00	\$1,217	Bob Eckweiler - AF6C
(old) Generator 4 KW - Briggs & Stratton - on trailer	May-88	\$589	Ken Konechy - W6HHC <b>Need new storage location</b>
FD Power Cables 1ea - 100-ft 12 AWG cable with 2 receptacles, 1 ea 100-ft 10 AWG cable 5ea - 50-ft cables, 5 extension-cord outlet-boxes, 2-ea short splitter" with 2 outlets	1ea - generator adapter cord"		Ken Konechy - W6HHC
FD Guy ropes and Alum Tower pins		Donated	Doug Britten - W6FKX
Stakes for Guy Ropes		Donated	Ken Konechy - W6HHC
50 ft Aluminum (stack) Tower by Universal w/ Machined base	Jun-06	\$900	Larry Hoffman - K6LDC
50 ft Aluminum (stack) Tower by Universal w/ bolted base	Jun-08	\$1,300	Larry Hoffman - K6LDC
3 each 40-ft push-up mast (military - in boxes with guy ropes)	Mar-05	Donated	Nicholas Haban - AF6CF
Military 24-ft tilt-up mast (in box with guy ropes and base)	Mar-05	Donated	Nicholas Haban - AF6CF
24-ft yellow plastic push-up	Mar-05	Donated	Ken Konechy - W6HHC
3-element Force-12 20M light-weight beam		Donated	Ken Konechy - W6HHC
5-element Hygain 15M beam		Donated	Ken Konechy - W6HHC
3-element 10M beam		Donated	Ken Konechy - W6HHC
ARRL Flag	Aug-02	\$53	???
American Flag			???
OCARC Banner		Donated	Dan Dankert - N6PEQ
60-Cup Coffee pot			Ken Konechy - W6HHC
ICE Filters – 10M, 15M, 20M, 40M, 80M			Bob Eckweiler - AF6C
Wooden Podium		Donated	Dan Dankert - N6PEQ
Laminating machine	Jan-02	\$54	Bob Eckweiler - AF6C