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ORANGE COUNTY AMATEUR RADIO CLUB

P.O. BOX 95, ORANGE, CALIF. 92668

FEBRUARY'S PROGRAM

U.S. RADIO AMATEURS TOUR CHINA

For this month's meeting program Erv - W6GC will take us on a trip to 'BY' land with his fascinating slide show. As a guest of the National News Agency of China W6GC, along with Don Wallace - W6AM and two amateurs from the East Coast, toured The Peoples Republic of China. The show will include visits to Peking, Canton, Shanshi, and Nan King. Also included is a stop at The China All Sports Organization; the Chinese equivalent of our ARRL!

Whether you have a 'BY' QSL on the wall or not, you don't want to miss this slide show.

COMING IN MARCH

HIGH PERFORMANCE COMPUTER PROGRAMS FOR HAM RADIO

For our March meeting Wayne Overbeck - N6NB, author and noted antenna authority, will present a program on all new 'hi tech' computer programs for the ham shack. This, all new, program will include demonstrations on three or four of the popular models of home computers.

Wayne is the author of a new book on this subject that will be released later this year. We are the first group to see his presentation which he put together for the upcoming ARRL Convention.

If you own, or are planning on buying, a computer for the home or shack be sure to attend. Please feel free to bring along a friend. If you think you can't afford a computer you'll be surprised to hear that one computer Wayne may bring is the Timex/Sinclair that is currently on sale for about \$50!

MARCH 19th PIZZA BASH

1983 BOARD

President.....	W6IBR	Al Watts	531-6245
Vice President.....	KA6IIJ	Al Toering	730-1549
Secretary.....	W6HHC	Ken Konechy	541-6249
Treasurer.....	W6MIL	'Mac' Mac Innis	639-7384
Activities.....	WA&VKZ	Frank Smith	838-3271
Public Relations....	KA6GJI	Oscar Alonzo	531-4245
Membership.....	WB6LAR	Keith Southworth	893-7175
TVI.....	K6LJA	Ted Glick	542-1390
Member at Large.....	KA6HNY	Robin Hoff	731-4805
Member at Large.....	KD6XO	Bob Tegal	531-0926
Club Historian.....	WB6IXN	Bob Evans	543-9111
W6ZE Trustee.....	AF6C	Bob Eckweiler	639-5074
VIP Liaison.....	WA6RNA	Leonard Victor	892-1820

MINUTES OF JANUARY CLUB MEETING

- * All Officers were present except Keith WB6LAR.
- * Al W6IBR reported that plans for the 1983 ARRL convention are continuing. Currently, a balance of \$2500 is on hand. Fliers were distributed at the recent SAROC convention in Las Vegas.
- * A plea was made for a new full-time editor for GCARC RF paper.
- * The program was presented by Dr. Warren Bradley - KA6HNW, the Communications Chief of the 1984 Olympic Regatta. Dr. Bradley, of the Long Beach Yacht Club, described the organization that would tie communications together for the 64 boats involved in supporting the Olympics.
- * Fried - WA6WZO, the new Southwest Division Assistant Director, reported that Sandy Heyn - WA6WZN was elected the new Section Manager for Orange.
- * Robin - KA6HNY reported that the FCC had decided to proceed with a "NO CODE" ham radio license.
- * 38 people were present at the meeting.

de W6HHC

PIZZA BASH

A PIZZA BASH will be held at 7:00PM on Saturday March 19th at the Straw Hat Pizza on Red Hill (at Walnut), in Tustin. Everyone to buy their own food and drink. Be sure you don't miss the fun!!

PREZ SEZ

If the coming months of '83 are anything like the last months meetings, it looks like our club is becoming very active again. Let's keep it up by each member trying to get one ham to join our club during the year. Good programs are the backbone of any club and I know for a fact that Al - KA6IIJ, has some real "beauts" in store for us. I also pledge that the business part will be kept to an absolute minimum.

Even though it's cold and damp out it's not too soon to be thinking of Field Day. Your help and suggestions will be more than welcome. Let's show the clubs in California that the O.C.A.R.C. has a bunch of first class operators.

See you all at the meeting February 18th. As they say in the Alpha Beta commercial: "Tell a friend" and bring them.

Al - W6IBR

MINUTES OF THE FEBRUARY BOARD MEETING

- * Meeting was called to order by Al - W6IBR at 3:30PM. Attendees: Al - W6IBR; Al - KA6IIJ; Frank - WA6VKZ; Oscar - KA6GJI; Keith - WB6LAR; and Bob - AF6C.
- * Frank - WA6VKZ will write a letter to MCAS (H) Santa Ana to see about using the MARS station site for Field Day. Other sites were also discussed. Frank recommended running only three simultaneous transmitters this year. (Class 3A). 15 meters and 20 meters full-time, and a transmitter for the rest of the bands including VHF. There will also be a solar powered novice tent.
- * Frank - WA6VKZ will be the food chairman for Field Day. A suggestion was made to charge members \$3 to \$5 for food. Bob - AF6C suggested that, in lieu of a food charge, an optional \$5 donation be asked from each Field Day participant for the generator fund.
- * Generators for Field Day were discussed. Keith - WB6LAR is looking into borrowing a 7KVA diesel generator that may be available. Al - W6IBR will invite local congressmen to our Field Day.
- * Oscar - KA6GJI will check into using free radio and cable TV spots to announce upcoming events and meetings.
- * A special drawing will be held at the next meeting. Only recent net participants will be eligible for the drawing.
- * Upcoming events are being planned for:
 - Sat 18 March..... Pizza Bash, Straw Hat on Red Hill, Tustin.
 - Sun 22 May..... Picnic, Yorba Park, La Palma (near Imperial).
 - Sun 21 August.... Beach Party, Doheny State Beach, Dana Point.

de AF6C for W6HHC.

SHORTS...

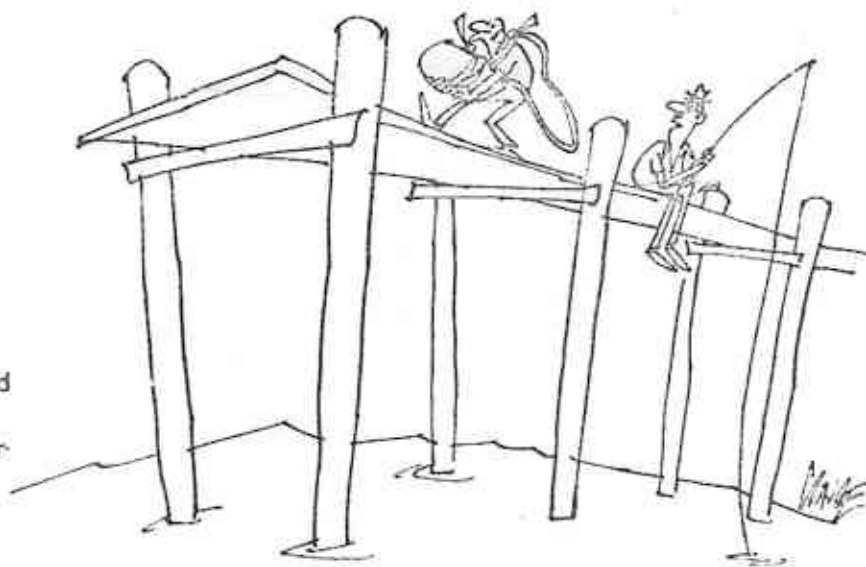
- o At the Southwestern Division Ham Convention, which will be held over Labor Day weekend, September 3rd and 4th, 1983, in Anaheim, California, there will be two-way traffic facilities during the hours of the show. Visiting hams from out of the Southern California area will be able to send messages to their home states, and also receive messages from them.

The joint ARES, RACES, and NTS booth will have a station set up to send and receive traffic on the SCN/V which meets daily on WD6AWP/R, (145.045/145.645 MHz). This traffic will interface with SCN/1, also on a daily basis at 0300 hours on 3598 KHz (80 meters).

If you wish to contact a friend who is attending the convention, your traffic is encouraged.

Ralph Swanson - WB6JBI
DEC - Orange Section

- o Mac - W6MIL has had his name spelled every way but correctly in the issues of RF and even the rosters! So in an effort to correct this let me set the record straight. His name is Stewart MacInnis, but we can call him 'Mac'!
- o Capt. Carl Rogers who was stationed at El Toro and was a member of the club is now located on the East Coast. He called to say he was on the air and will be listening for us on Saturdays at 2:15 PM our local time. The frequency he'll be near is 21.375 MHz. Carl's call is N6FYG.



"Missed Heard eh!"

- o The official date of the club board meetings is the first Sunday after the first Saturday of each month. This sounds complicated but just means that it will always be the day after the club breakfast. Another way to remember it is: The first Sunday of the month, except if the Sunday is the 1st! (Then it's on the 8th). Confused... well twist Al's arm to call you the weekend before the meeting so you won't forget. Al is the president... and Al is the vice-president!

SOLID STATE RECTIFIER SUBSTITUTE

If you have been a "ham" for a while, or frequent the swap meets and auctions you probably have some tube type equipment around the shack. Older tube equipment uses a rectifier tube such as a 5Y3, 5V4, or 5U4 in the power supply. By replacing this tube with solid state diodes you will reduce power consumption and heat, and extend equipment life.

At this QTH two 1950's vintage Collins 51J4 receivers are used for SWL'ing and as standby "ham" receivers. The 51J4 uses 85 watts and has a 5V4 for the power rectifier tube. Fifteen of the 85 watts (almost 18%) are wasted as heat in the rectifier filament, dissipation in the rectifier plates and in filament transformer core losses. When the rectifier tube is replaced by silicon diodes these losses drop to just a few tenths of one watt! The result is the receiver runs cooler and the power bill runs smaller.

The modification is easy, requiring only removing the rectifier tube and plugging in the solid state substitute. Substitutes are available commercially, but it's cheaper to design and build your own. The substitutes built for the 51J4 rectifier tube were built into bases salvaged from old octal vacuum tubes. Unused octal tube bases are available from ETCO and others. Seven and nine pin miniature tube bases can also be found in various parts catalogues. To salvage a base from an old glass octal tube, wrap the tube in cloth and gently break the envelope. Use needle nose pliers to carefully remove the remaining glass, and side cutters to remove the tube elements. The brown cement inside the tube can be chipped out. Carefully unsolder the wires going into the base pins. On most octal rectifier tubes note that the pins adjacent to the plate pins are missing. This reduces the chance of arcing. The 5R4, 5U4, 5V4, 5AU4, 5AW4, 5V3, and 5Y3 rectifier tubes have their plates connected to pins 4 & 6. Pins 3, 5, & 7 are missing. You should remove pins similarly.

Figure 1 shows a base diagram of the 5V4 tube and its solid state

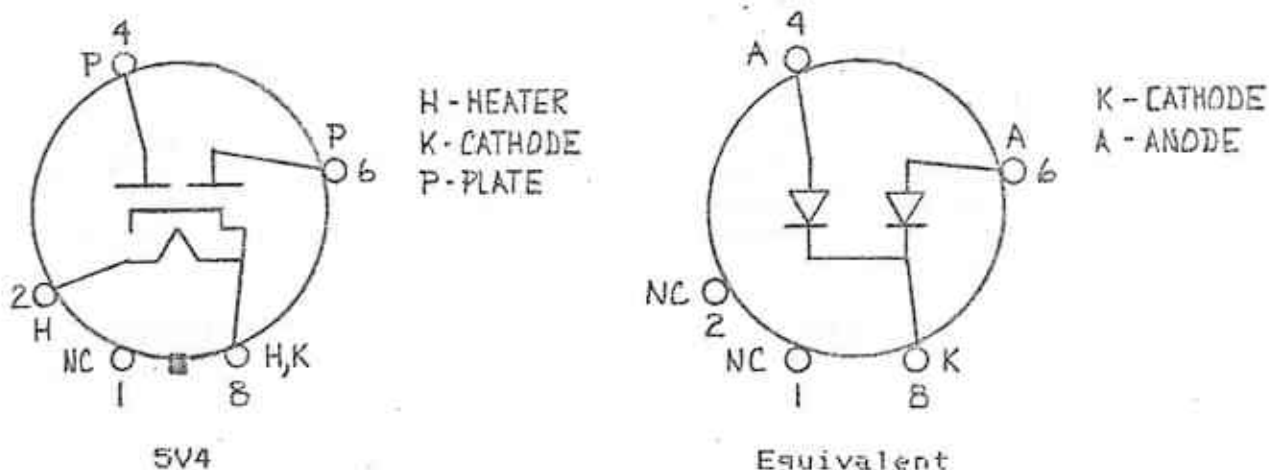


Fig. 1

equivalent. The diodes chosen must handle the current and voltage of the equipment it is used in. Silicon diodes of the 1N4001 series have an average current rating of 1 amp, far higher than the 100 to 200 MA ratings of the tubes mentioned.

Continued

Solid state cont.

Silicon diodes must not only handle the average current, but also the surge current that occurs when power is turned on. At turn on the power supply filter capacitor is uncharged and momentarily acts as a short circuit. Current flows from the transformer secondary through one of the diodes to ground. This current is limited only by the transformer secondary resistance. (This assumes a capacitor input filter circuit). A typical transformer may have 350 VRMS and 70 ohms in each H.V. secondary leg. Over 7 amps can surge through the diode at turn on with such a transformer. ($1.414 \times 350V / 70 \text{ ohms} = 7.07A$). If the rectifier filter circuit has a choke input the choke resistance also acts to reduce the surge current. Silicon diodes are more easily damaged by excessive surge current than tubes. The 1N4001 series diodes are rated at 30 amps surge for one cycle. Though no surge problem exist in the case above, it should always be checked. In lower voltage and higher current power supplies it often is a big problem.

The diodes must not only be able to handle the current but also the circuit voltage. When the diode is forward biased (ie. conducting) the voltage across it is on the order of a volt. However when it is reverse biased (ie. cutoff) the voltage reaches full peak secondary. A transformer with a 350 VRMS secondary per leg will put almost 1 KV across the diode. ($2 \times 1.414 \times 350V = 990V$). The 1N4000 series diodes are rated for peak reverse voltages (PRV) between 50V for the 1N4001 and 1000V for the 1N4007. Higher voltage diodes are available but cost more and are harder to find.

Using a 1000 PRV diode at 990V leaves little safety margin. Power line fluctuations and transients will quickly destroy the diode. A solution is to series diodes for higher PRV capability. Theoretically two 1000 PRV diodes in series have twice the capability of one diode. In practice this is not necessarily true. When back biased, diodes in series each act as a resistor and the voltage across each diode is in proportion to its resistance. If one diode has a higher leakage resistance than the rest of the diodes it will receive a higher share of the total voltage. Leakage resistance for the 1N4001 series diodes varies between 20 and 1000 Meg ohms. the resistance varies significantly with temperature and manufacturing runs. Turn-off time also affects the voltage distribution across the diodes. Each time cutoff occurs, the diode that turns off first sees the full back voltage momentarily. Adding resistors and capacitors across each diode, as mentioned in the ARRL Handbook, swamps out the leakage resistance and switching time so each diode performs almost identically. Unfortunately, that performance is quite poor compared to the original diode performance.

A trick to connecting common rectifier diodes directly in series is to use diodes that all come from the same manufacturers run. They tend to be more closely matched in characteristics than diodes of different manufacturers, or even different runs of the same manufacturer. A reputable dealer will usually be able to supply diodes in this fashion. Another trick is to count the first diode at its full PRV, and each additional diode at half its PRV. Therefore, two 1000 PRV diodes in series would be rated at 1500 PRV, and three at 2000 PRV.

Using two 1N4007 (1000 PRV) diodes, in series, in each leg of the sub-

Continued

Solid state cont.

stitute rectifier an adequate safety factor above the 990 PRV requirement is achieved. Be sure to series enough diodes to meet the PRV requirements for each particular item a solid state rectifier substitute is designed for.

Once the diodes are wired into the tube base and checked out, pot the inside of the tube base. Any non-conducting auto body filler will work. The authors favorite is REN, a two part epoxy filler. Clean all the excess filler from the outside of the tube base, while still soft, using alcohol. When the potting has fully dried, smooth the top using emery paper. This is most easily accomplished by placing the paper, grit side up, on a flat surface and rubbing the top of the tube base across it.

Install the solid state substitute rectifier into the equipment. Button up and notice how much cooler that equipment runs.

de AF6C

A NOTE FROM THE EDITOR

The club is still looking for a full-time editor for the "RF" paper. I took on the duties for this month, and hope to have passed along some ideas on how I'd like to see our club paper look each month. It is important to have a good paper to pass information to the members.

Next months issue of "RF" will be edited by Al Watts - W6IBR. As always, the editor needs help from the rest of the club members. You can do your share by contributing a small article once and a while. The subject can be anything that will be of interest to the members.

Please set all inputs for "RF" into Al - W6IBR by March 7th.

Bob Eckweiler - AF6C
Editor for FEB. 1983

'Ham' lacking Morse Code proposed

Bracing itself for controversy, the Federal Communications Commission proposed Thursday to create a new type of amateur, or "ham," radio license that could be obtained without the recipient knowing Morse Code.

The mere discussion of the idea has provoked outrage among the amateur community in the past. But it was described by a top FCC official Thursday as a needed step to attract more young people into the amateur radio service.

"I certainly expect controversy, no question," said James C. McKinney, the chief of the FCC's private radio bureau.



"I can't wait for the no code ham license. I'm all thumbs when it comes to learning the code too!!"

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FIRST CLASS

ORANGE CO. AMATEUR RADIO CLUB
PO BOX 95
ORANGE, CA. 92668

MEETING INFO

7:30 PM Sharp

Upcoming Dates:

February 18th
March 18th
April 15th (IRS day, ugh!)
(3rd Friday of each month)

Meeting Location:

Mercury Savings & Loan
1095 Irvine Blvd.
Tustin, Ca.
(1 Block East of Newport Ave.)

NET INFO

15 Meter SSB Net, each Wednesday @ 2000 Hours PST on 21.375 MHz.
2 Meter FM Net, every Wednesday @ 2100 Hours PST on 146.55 MHz
simplex. Listen for W6ZE Net Control.

Anyone interested in becoming Net Control for a CW (5-15 WPM)
net contact Bob, AF6C. Net should be keyed for Novices.

BREAKFAST INFO

8:00 AM

The Club Breakfast is held the first Saturday of each month at:
The Cook Book Restaurant, 17th & Yorba in Santa Ana, just east
of the Newport Fwy. (Southeast corner behind the Union station).

Upcoming Dates: March 5th
April 2nd

de AF6C

February 1983