



HANK'S SWAP SHOP

Dave Willey KD6KWM PO Box 3514
Phone: 577-0558 Santa Rosa CA 95402
Noncommercial ham ads printed free. Please
call when item is sold. Ads run 2 months.

WANT: No frills CW bug. KC6IRQ George
874-2713.

BUTTERNUT BEAM for 10/12/15/17/20 mtrs,
compact size, can be turned w/TV rotor, fully
assy. New out of box, pick up only \$150.00.
PACKET READY XT computer, clean, 10 MHz,
enhanced keyboard, I/O card, 30 meg h/d,
Herculese mono video card. \$250.00.
KC6PJW Jim 795-2163.

HYGAIN 18AVT/WB-SS vertical HF antenna
covers 80/40/20/15/10 meters. \$75.00.
KC6WTO Sal 539-4661.

WANT: tube 6AH6. KD6POC Adam 573-
0277.

2 BATTERIES for Yeasu 470, brand new. One
is 7.5V 1000 mAh, the other 12V 600 MAH.
Both for \$110.00. KD6CJM Ron 527-7353.

FT-470 dual band HT 2M/440. Standard
accessories + alkaline battery case \$250.00.
LEADER LBO-505 dual trace oscilloscope,
good to 15 MHz. \$150.00. **WANT:**
CERAMIC KNIFE SWITCHES, HAM RADIO
mag. back issues. Have some dupes. Would
be willing to trade dupes for your extra
copies. KD6PJY Dean 544-8124.

BAYCOMM PACKET TNC w/ manual and
software. \$50.00. **COPPER J-POLE** antenna.
\$25.00. KD6TYL Lynn 526-3778.

WANT: 2M amp, 100 watts or better.
WANT: HF amp, 100 watts or better.
KENWOOD PC-1A phone patch. \$50.00.
KD6WIS Jim 584-3423.

WANT: Kenwood acces. speaker SP230 or
similar. KD6ZVG Donn 823-0541.

(Continued page 15)

PLEASE DO NOT DELAY
DATED MATERIAL:

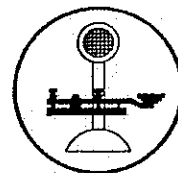


DUES ARE DUE!
JOHN BRECKENRIDGE
WB6FRZ
574 WILD OAK DR
WINDSOR, CA 95492

ADDRESS CORRECTION REQUESTED

Sonoma County Radio Amateurs, Inc.
PO Box 116
Santa Rosa, CA 95402

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SHORT SKIP



Sonoma County Radio Amateurs, Inc.

Club Station

W6LFJ

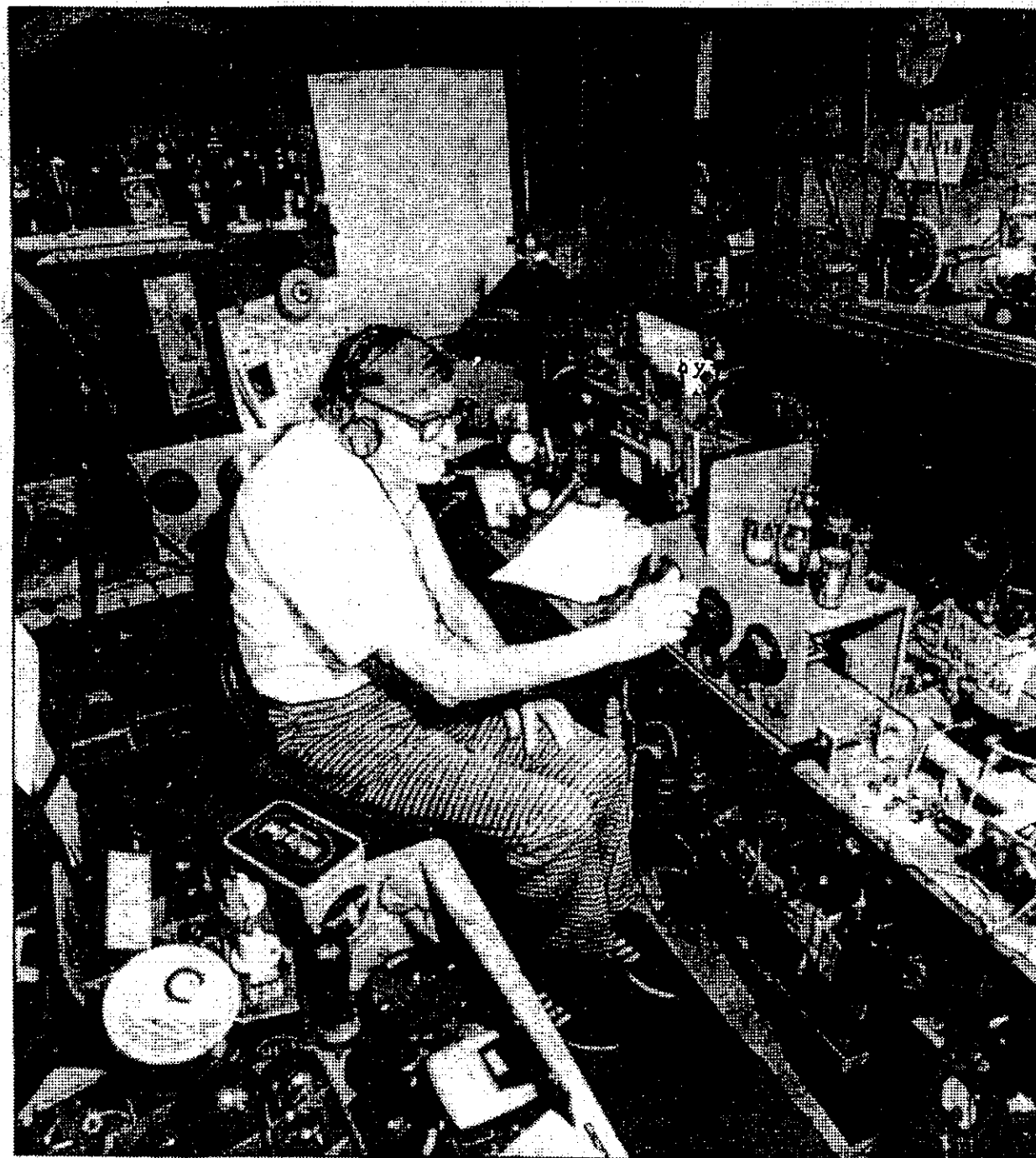
P.O. Box 116
Santa Rosa, CA 95402

Repeater Station

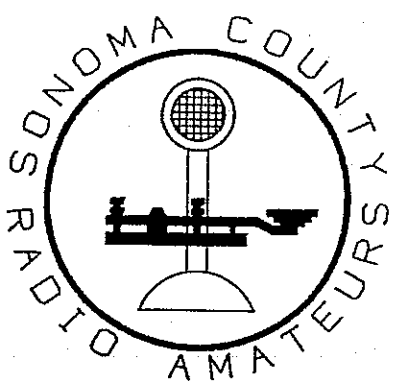
WB6PVS VOL 19 #3

MARCH 1994

HAM SHACK...1941 Style.....



AB4C Xtu



BBS EDITORS: Pete Sourek KC6UXM, and Allan Chapman W6MEO
AUDIO TAPING: John Breckenridge WB6FRZ, Laurel Meyer KC6FKX, Bob Phillips N6RMW

Activities Committee:
Pub. Service: Maris Mappus KI6QY 664-1978
Pub. Relatns: Steve Carniglia KK6VY 579-9608
QSL Mgr: Bill Splaine N6GHG 431-8636
TVI/RFI: Al Bloom N1AL 538-7115
Antennas: Joe Senft KM6TN 578-5824
John KM6LI, Shep NH6ZY, N1AL
Awards: Steve Lund WA8LLY 823-4544
VEC Exams: Dave New AA6YX-829-6608
N1AL WX3K WW6D WB6FRZ
AB6OL K6UXO AA6UY KC7VS
KK6VY KK6XT WA8LLY
Education: Steve Carniglia KK6VY 579-9608
N1AL WB6FRZ KC6RHA KK6VY
WB6TMY K6XZ K6ZWB KC7VS
Refreshmnts at meetings: Bob Olsten WD6DPE
Raffle at meetings: Lynn Dickerson KD6TYL
Membership lottery: Pat Reynolds KD6TYJ
RACES RO: Jim Pelmulder N6PTM 823-7947
ARRL Liaison: Alan Bloom N1AL 538-7115
Badge Chair: Fred Leoni N6YEU 431-8202
Packet BBS: John WX3K and Jim KC6PJW

Repeater Control Op's:
WB6PER Jim 526-2972 N6PTM Jim 823-7947
WD6CKP Hoppy 542-6750 N6VUC Merl 584-3898
KD6CJQ Kelly 837-9434

SHORT SKIP ADVERTISING RATES:

Business cards: \$10

\$11 First 1/4 Column
\$3 Additional 1/4 Columns
(\$32 Full Page, 1 side)

Pre-printed inserts: \$32/sheet

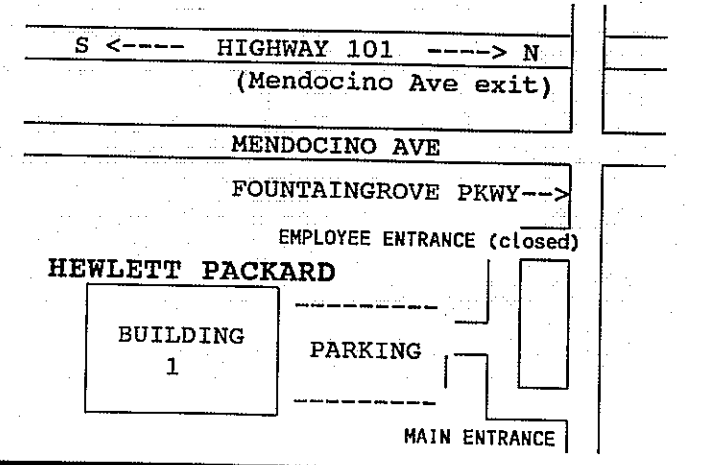
Guaranteed circulation: 200/month
AD DEADLINE: 10th of previous month

OFFICERS FOR 1994			
PRESIDENT:	Merlyn Pfeiff	N6VUC	584-3898
VICE PRESIDENT:	R. L. Caron	KK6GP	875-2601
SECRETARY:	Alan Bloom	N1AL	538-7115
TREASURER:	Mike Michlig	KN6JQ	526-9655
MEMBERS-AT-LARGE:	Kelly Cureton	KD6CJQ	837-9434
	Marie Mappus	KI6QY	664-1978
REPEATER CHAIRMAN:	Jim Rutherford	WB6PER	526-2972
ACTIVITIES CHAIR:	Mike Knope	KD6LYU	762-3236
SHORT SKIP STAFF:			
EDITOR:	Alan Bloom	N1AL (e)	538-7115
	1578 Los Alamos Rd, Santa Rosa, CA 95409	(d)	577-3981
CIRCULATION MGR:	June Linnehan	KD6LSU	
HAM NEWS:	R.L. Caron	KK6GP	875-2601

Club Meetings:
7:30 PM, 1st Wednesday each month at the Hewlett Packard plant in Santa Rosa. (See map below.) All are welcome.

Next Meeting: March 2, 1994
Program: Earthquake Preparedness by Darlene Lamont KD6CGK

ARE YOU NOT AN SCRA MEMBER?
If so, then this is a complimentary copy. Our club is involved with almost every area of Amateur Radio: Repeaters (13/73), Field Day, license classes (Novice through Extra), volunteer exams, RACES, DX programs, packet radio, hidden xmtr hunts -- you name it. We invite you to attend our next monthly meeting (see below) or check into the Tuesday night SCARS net on the 146.13/73 repeater at 7PM. You will hear the latest Amateur Radio Newsline broadcasts, announcements of SCRA activities and a Swap Shop. Membership in SCRA is open to anyone interested in Amateur Radio. If you would like to join, there is a membership application on page 11. Hope we can have an "eyeball" QSO with you at the next meeting! 73 ...



Hank's Swap Shop (Continued from p 16)

HIGH PWR 6-position coax type N switch. (2 switches ganged together). \$50.00. KD6ZZD Mike 545-7520.

AEA ISOPOLE 144, used. \$30.00.
AEA ISOLOOP old model w/cable & controller. \$175.00. N6GHG Bill 431-8636.

WANT: ICOM IC-3AT HT. **TRADE:** brand new MFJ-1702B for older 1702B. (Older model can be modified to accept "N" connectors.)
WANT: marine radio for possible conversion to ham bands. N6ONZ Gary 584-3425.

ICOM IC-229H, 2 meter mobile, 50W, with standard accessories. Real good shape. \$350.00. W6CPE Don 795-1269.

PANASONIC KX-P1124 printer for packet. \$85.00. W6MEO Allan 538-4935.

HR-2600 multi-mode 10 meter mobile. \$150.
NCG 15 METER mobile, new in box. \$150. 2
MOTOROLA MX300S HT w/ant, no batteries. each for \$75.00. WD6EVL Gary 823-9324. ■

Application for Membership in SCRA

Name _____ Callsign _____ Lic. Class _____

Addr. _____ Phone Nr _____ () New Mbr

_____ ZIP _____ Date _____ () Renewal

Dues: \$12/year, \$18/year family. New members also pay a \$6/person initiation fee. Dues for new members *only* are pro-rated \$1 (\$1.50 family) per month, starting at renewal time, March 1.

I WOULD LIKE TO PARTICIPATE IN:

- () Public Service Events
- () RACES or ARES Emergency services
- () Field day, other operating events
- () Helping with SCRA Flea Market
- () Acting as club Net Control Station
- () Helping with *Short Skip* newsletter
- () Taking a Novice class
- () Teaching a Novice class
- () Taking an upgrade class
- () Teaching an upgrade class
- () Other _____

Badge (New Members only)

Fill in this section exactly as you want it to appear on your badge.

Callsign _____

First Name _____

City _____

Jim Pelmulder
N6PTM

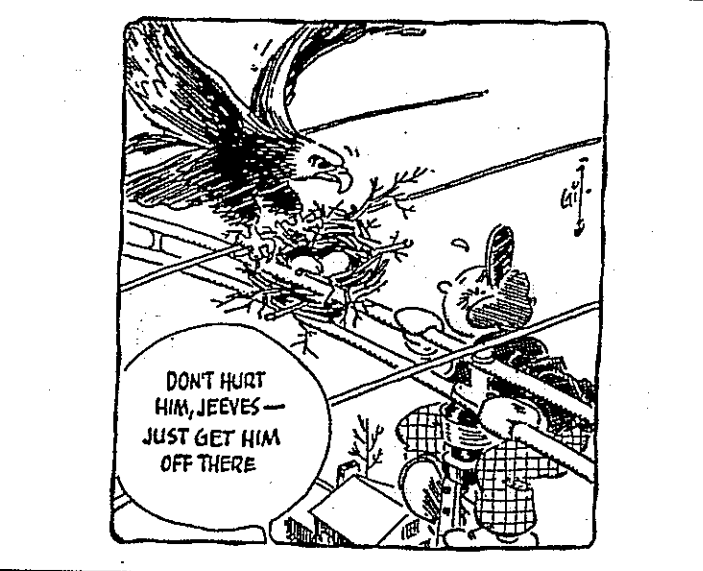
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Rich, WA9WVB, Mgr.
I-880 at 23rd Ave. ramp

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(800) 854-6046
Tom, KB6SK, Mgr.
Hwy. 163 & Claremont Mesa

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510 Lawrence Expwy. #102
(408) 736-9496
(800) 854-6046
Tom, KB6LUC, Mgr.
Lawrence Expwy.
So. from Hwy. 101

VAN NUYS, CA 91411
6265 Sepulveda Blvd.
(818) 988-2212
(800) 854-6046
Jon, KB6ZBL, Mgr.
San Diego Fwy.
at Victory Blvd.

Bob Ferrero W6RJ
President/Owner

PORTLAND, OR 97223
11705 S.W. Pacific Hwy.
(503) 598-0555
(800) 854-6046
Earl, KE7DA, Mgr.
Tigard-99W exit
from Hwy. 5 & 217

DENVER, CO 80231
8400 E. Iliff Ave., #9
(303) 745-7373
(800) 444-9476
Joe, KD0GA, Mgr.

PHOENIX, AZ 85015
1702 W. Camelback Rd.
(602) 242-3515
(800) 444-9476
Gary, WB7SLY, Mgr.
East of Highway 17

ATLANTA, GA 30340
6071 Buford Highway
(404) 263-0700
(800) 444-7927
Mark, KJ4VQ, Mgr.
Doraville, 1 mi.
no. of I-285

WOODBRIIDGE, VA 22191
14803 Build America Dr.
(703) 643-1053
(800) 444-4799
Curtis, WB4KZL, Mgr.
Exit 54, I-95, South to US 1

SALEM, NH 03079
224 N. Broadway
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AZ, CA, CO, GA, VA residents add sales tax.
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2M/440 Dual Band
40 Mem Channels
DSQ, Dual Display
CTCSS Enc/Dec Built-in
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2M/440MHz

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82 Mem, Dual in-band Rx
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HF Transceiver 6M

TS-50S - World's smallest HF transceiver
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SSB, CW, AM, FM,
12V Gen. Cov. RX, 6.4 lbs., 7.16 x 2.4 x 9.32"
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Optional external ant. tuners available (TS-50S only)
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HANDHELDS

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2M/440/1.2 Tri-Band

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IC-W21AT, 2M/440

IC-21A, 2 meter

IC-24AT, Duo Band

IC-2SRA, 2M + Wide Rx

IC-2GXAT, 2M

IC-T21A, 2M

ALINCO

DR-600T

2M/440 FM Transceiver

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Detachable/Removable Head
Keyboard freq. entry from microphone!
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FT-990

100W HF Gen Cov Transceiver
DDS, QSK • 500Hz CW Filter included
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KENWOOD

HANDHELDS

TH-28A

2M/2.5W DTSS
240 Mem.
w/optional mem. unit
UHF RX

TH-22AT

Ultra Compact
2M HT, 5W optional
40 memories
Encode Built-In

ICOM

IC-737

HF Transceiver

12V 100W w/auto Ant. Tuner
Built-in Gen Cov. RX, 101 Mem.
DDS, QSK, Passband tuning
Priced So Low, We Can't Print It!
Call For Your Low Discounted Price!



Disaster Survival

Wednesday March 2, SCRA meeting.

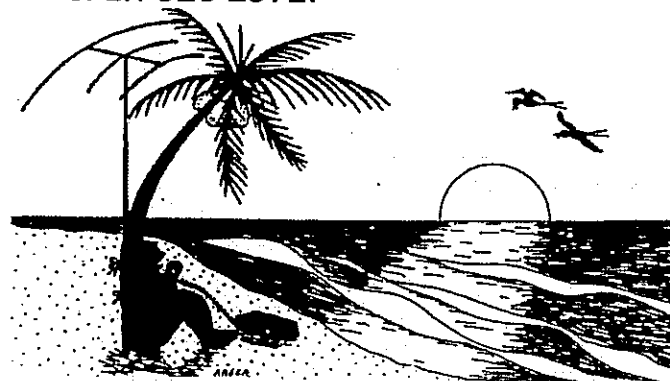
Step 1: Home and family preparedness.

Step 2: Emergency response teams.

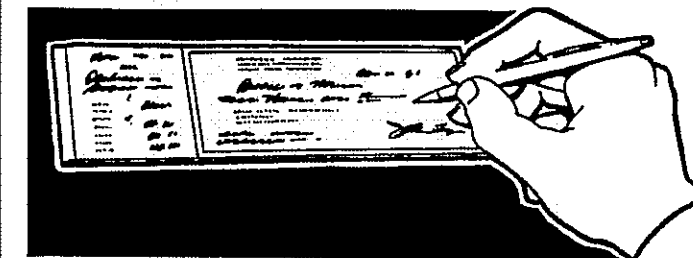
Come and hear Darlene KD6CGK discuss how to prepare for a disaster, at work, at school and at home.

SCRA Campout

We've set the date for the SCRA club campout: May 21/22. Location is Sugarloaf park, off highway 12 east of Santa Rosa. Both RV and tent camping will be available (reservations required) for those spending the night, or you can just come for the food. We're thinking about a moonlight dinner Saturday night and a brunch on Sunday. It will probably be some kind of potluck — Stay tuned for further information. Please RSVP Kathy Mahan 823-4980 or Jim Rutherford WB6PER 526-2972.



Dues are Due!



Check your mailing label: If it says "dues are due," then our records show you haven't paid yet. Please send your check to SCRA, POB 116, Santa Rosa, CA 95402. If you prefer to pay at a meeting, please wait until after the meeting is over so the Treasurer can enjoy the break along with everyone else.

Also, if your address, callsign or license class has changed, let us know so N1AL can update the roster. The application on page 11 is ideal for the purpose.

SCRA Membership Packets

Everyone is supposed to receive a 24-page membership information packet (including autopatch codes) when they join SCRA. We know some people have been missed, especially in the last few months since we ran out.

A new corrected edition is being printed up and will be mailed to all those who have joined recently. If you don't have a copy, and don't receive one in the mail by the March club meeting, then either pick one up at the meeting or leave a message on Al N1AL's answering machine. 538-7115.

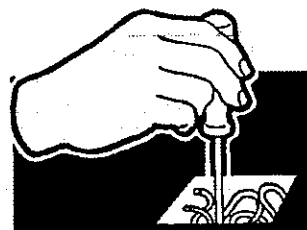
The corrected pages will be also printed in the April *Short Skip* so everyone can update their old copies.

BUGS BUGS

On the front cover of the February issue, that was James KD6GSF in the lower left next to KB6PTA. Also, the fellow with his face in the shade in the upper left photo is Matthew KD6KVH, not KD6KVO.

HOME BREW CONTEST

APRIL MEETING!



All club members are invited to bring in their "pride and joy" projects for the annual SCRA Homebrew Contest, which will take place at our April meeting.

Here's your chance to see what your fellow hams have built up in their shacks and workshops, and to show others what kind of activities interest you.

This is a good time to find other club members with interests similar to yours. For this to work, though, you need to bring in *your* project.

You don't have to be building the next Space Shuttle to participate! Antennas, computer software, mechanical items, modified or improved gear, kits; in fact everything related to amateur radio is encouraged.

Photographs, printer listings, and QSL cards are all good to bring in, especially if your tower project is too big to move!

Remember, a clever weekend project often has more interest to other club members than a very specialized long-term effort, and it has just as good a chance in the contest.

So look around your station -- I bet there's something right now up on the shelf that would appeal to others. Bring it to the meeting! ■



Repeater News

We're making progress on the battery backup system for the 146.73 repeater. A work party on February 12 of WB6PER, N6VUC, WD6CKP and Mike Eber got the batteries mounted, the power supply updated and other maintenance performed. ■

1994 SCRA Budget

Activities:	
SCRAPS Picnic	(175.00)
Fox hunt	(50.00)
Camp Out	(175.00)
Christmas Party	0.00
TOTAL	(400.00)
Field Day	(550.00)
Refreshments at meetings	0.00
Dues and Initiations	3350.00
Flea Market	900.00
Raffle at meetings	550.00
Badges	(240.00)
Miscellaneous:	
Insurance	(310.00)
Trophies/awards	(250.00)
Donations	(400.00)
Other	(50.00)
TOTAL	(1010.00)
Repeater Expense:	
Phone bill	(240.00)
Maint. & Upgrade	(1500.00)
TOTAL	(1740.00)
Short Skip Newsletter:	
Income from ads	1100.00
Expenses	(1800.00)
TOTAL	(700.00)
Training and Education	
Amateur Radio Newline:	(200.00)
Phone expense	(150.00)
Donation	(100.00)
TOTAL	(250.00)
Membership Supplies	(0.00)
Officers' Expenses	(50.00)
Packet BBS	(45.00)
Volunteer Exams	(50.00)
ARRL Memberships	50.00
TOTAL INCOME	5950.00
TOTAL EXPENSES	(6335.00)
NET	(385.00)

We Need Teachers!

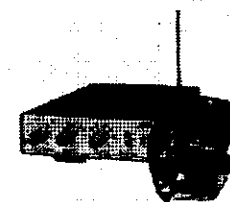
We need teachers and assistants to teach license classes. This is not brain surgery, folks. We have all the ARRL instructor guides and classroom materials plus lots of advice from previous instructors. If you think you'd like to give it a try, please call Steve Carniglia KK6VY at 579-9608. ■

HSC ELECTRONIC SUPPLY

GOODIES FOR THE RADIO AMATEUR:

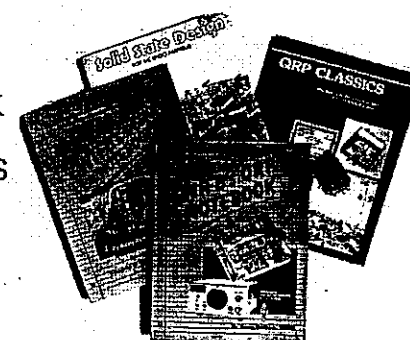
RAMSEY KITS:

- 2 Meter Synthesized FM Transceiver
- 2 Meter 30 Watt Amplifier
- All-mode HF receivers
- QRP CW Transmitters
- Etc...



ARRL BOOKS:

- ARRL Handbook
- License Manuals
- Antenna Books
- Etc...



POPULAR BRANDS:

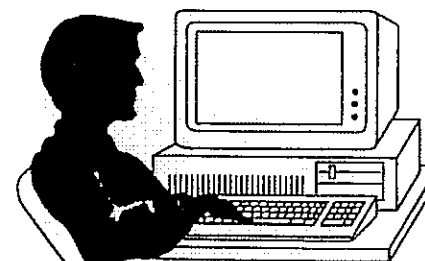
- MFJ
- Ameco
- Larsen
- Antenna Specialists
- Sangean
- Etc...

NECESSITIES:

- Code keys
- Wire Antennas
- Surplus Electronics
- Tools, parts, Etc...

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Board Meeting Minutes

February 9, 1994

The meeting was called to order by President Merle Pfeiff N6VUC, at 5:35pm in the meeting room at the Northbay Savings Bank. Other officers present were Secretary Al Bloom N1AL, Treasurer Mike Michlig KN6JQ, Activities Chairman Mike Knope KD6LYU, Repeater Chairman Jim Rutherford WB6PER and Members-at-Large Kelley Cureton KD6CJQ and Marie Mappus KI6QY. Also present were SCRA members James Cureton KD6GSF, Dave Willey KD6KWM, Jim Pelmulder N6PTM, Joe Senft KM6TN, Fred Leoni N6YEU, and Rick Reiner K6ZWB.

SWAP SHOP: N6VUC has received complaints that the Tuesday night net runs too long. Merl would like to keep it to less than 30 minutes. One way would be to reduce the length of the Swap Shop. After considerable discussion, the consensus was to try out the following procedures: Move Swap Shop to the end of the net; no out-of-county listings; list SCRA member items first, then other Sonoma county listings up to a 10 minute maximum. There being no objections, the above was passed as a motion. m/s KD6CJQ/WB6PER

Dave KD6KWM noted that because of new job commitments, he will have to resign as Swap Shop Editor. A replacement will be solicited on the net.

The **REPEATER DISCUSSION** led by WB6PER at the last meeting was well-received. Jim has edited it into a 45-minute talk which he will record on tape for distribution to interested members.

FIELD DAY is June 25/26. Mike KD6LYU volunteered to be Chairman. We need to decide on a site soon.

BOOKKEEPING by the Treasurer would be greatly facilitated by a computer spreadsheet program. The board authorized \$40 to buy a copy of Quicken. m/s N1AL/WB6PER

The **CAMPOUT** will be some evening with a full moon in April or May. WB6PER would also like to get a group together to do the June ARRL VHF contest. A 6 meter radio is needed.

PUBLIC SERVICE: KI6QY reports no events in March. So far there are three events in April and one in May. We have 48 volunteers signed up and could use about that many more.

EDUCATION: K6ZWB had six students in his first antenna class last night plus a couple more who couldn't make the first class. We may need more classroom facilities.

ANTENNAS: Joe Senft KM6TN has had a preliminary meeting with Santa Rosa City Attorney Bruce Leavitt to discuss the re-working of the city ordinance on antennas. Mr. Leavitt seems very willing to work with us.

An idea for the next **FOX HUNT:** KD6KWM suggested a balloon digipeater.

BADGES: In future, Badge Chairman N6YEU would like to get checks written in advance for our badge supplier. Fred plans to mail out unclaimed badges to clear our backlog.

SECRETARY'S ITEMS: N1AL asked for any last-minute updates or corrections for the next reprinting of the membership packet. Correspondence included a thank-you letter from Toys for Tots and two letters requesting information about the club. John WB6FRZ has suggested that we use the SCRA Information Hotline to help connect new members needing assistance with experienced "Elmers" willing to help.

N6YEU asked about the possibility of voice ID on the repeater. The controller has the capability, but some people are annoyed by voice ID since you can't talk over it.

The meeting was adjourned at 6:59pm. m/s N1AL/K6ZWB

"Hank's Swap Shop" Changes

Hello to everyone. This is Dave KD6KWM. I've been running the SCRA "Hank's Swap Shop." We will need someone to take over the Swap Shop due to a job change for me starting March 1st. Any SCRA member who would like to get first crack at a lot of nice ham gear each week, give President Merl N6VUC a call or send a packet message to N6VUC@WX3K.#NORCA.USA.NA.

To reduce the length of the Swap Shop, the board has come up with the following guidelines, effective immediately:

The swap will be moved to the end of the net.

There will be a time limit of 10 minutes.

Only SCRA members and other hams within Sonoma County may list items.

SCRA members' items will be listed first. If there is any time left over, non-member hams that live within Sonoma County will have their items read.

73 Dave KD6KWM@WX3K.#NORCA.USA.NA

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CHARLES J. TARR
Attorney at Law

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(707) 778-1114

Packet Bulletin Boards

Jim Andrews KC6PJW



There are two Packet Bulletin Board systems in the county: WX3K on 145.09 and KC6PJW on 145.73. Both systems use standard 1200 baud access. Simply connect to WX3K or KC6PJW — If you are a new user, the system will ask some basic questions (what's your name, etc.) and log you in.

If you cannot access either system directly, you can connect via a node on Sonoma Mt. called SONOMA: First connect to SONOMA, then type "C WX3K" or "C KC6PJW". Even though WX3K is on 145.09, the SONOMA node links to the BBS on another frequency. For other commands on the node, type a "?" for help. While going through the node can sometimes make it easier, please try to set up your packet system so that you can access one of the boards directly (less impact on the frequencies needed to operate).

These systems are full-service packet bulletin boards, with automatic message and bulletin forwarding. Many hams outside of the US use packet also, and CQ's are sent from time to time, to make new friends. Bulletins include satellite tracking data, for-sale items, ARRL bulletins and much more. You can also communicate with your other ham friends who are on packet, all around the world!

Both bulletin boards include callsign databases (US and Canada) accessed by the CB or QTH commands. The QTH command will even let you look up a person by name, in case you forgot their call. The CB command will tell you if the system knows their home BBS. A *home BBS* is the one you call "home": where you want messages for you sent. You should pick one home BBS, as "hopping" around can confuse the message-forwarding system.

The bulletin boards have other features as well: Satellite tracking, files for downloading, all kinds of things to do! For basic help, type a "?" while on the system. For help on all of the commands, type "? h". There is even a user manual online that you can download (mail the sysop, and he'll tell you how).

If you can't get into KC6PJW, WX3K or SONOMA node, then try the KJ6FY-1 BBS on 144.93 in Benecia. If you live up north (towards Willits) try the K7WWA BBS on 145.79. If you can't connect to K7WWA direct, try the node MENDO (it works the same as SONOMA above). Users of the 145.13 voice repeater can give you help if you need it.

The county RACES mailboxes have ports on 144.91 and 223.66 MHz. Just connect to JAKBB (Mt. Jackson) or SONBB (Sonoma Mt.) on either frequency. While not full-service auto-forwarding BBS's, they are useful for disseminating local RACES information, both in normal times and during emergencies.



1991 Field Day packet station. KC6PJW and WA6SEU's son Shane. (Photo: KB6PTA)

2 Meter Packet Band Plan:

144.91	Keyboard to Keyboard
144.93	Local Area Networks (BBS)
144.95	DX Packet Cluster
144.97	Local Area Networks (BBS)
144.99	Local Area Networks (BBS)
145.01	Keyboard to Keyboard
145.03	Keyboard to Keyboard
145.05	Keyboard to Keyboard
145.07	Local Area Networks (BBS)
145.09	Local Area Networks (BBS)
145.71	9600 bps
145.73	Local Area Networks (BBS)
145.75	TCP/IP
145.77	DX Packet Cluster
145.79	Local Area Networks (BBS)
146.58	DX Packet Cluster

New Members & Corrections



JOE BERKMAN
2017 VISTA LN
PETALUMA, CA 94954
763-2637

CHRIS BOTKA KE6EAP
2145 RIESLING WAY
SANTA ROSA, CA 95403
544-5770

JIM DURKIN
2486 RIO LINDO
HEALDSBURG, CA 95448
433-9606

LEE DIBBLE KE6EAQ
1116 ST HELENA AVE
SANTA ROSA, CA 95404
544-1675

MICHAEL MILLER KD6ATT
POB 462
PENNGROVE, CA 94951

ANTHONY NEUNG KE6EIO
2625 NEOTOMAS AVE
SANTA ROSA, CA 95405

MARK FERNANDEZ KE6BNP
2621 NEOTOMAS AVE
SANTA ROSA, CA 95405
544-4267

ROBERT ORCHARD KE6EUV
1108 BIRCH DR
PETALUMA, CA 94952
763-2144

PAUL E HEATER KE6DCR
5540 EL ENCANTO DR
SANTA ROSA, CA 95409
539-8525

ED EARLE NH6GL
105 AIRPORT BLVD E.
SANTA ROSA, CA 95403
544-0361

JOHN H WARD KE6DEN
POB 209
DEER PARK, CA 94576
963-4443

JIM T HALL W6GYY
3325 DOWNING PL
CONCORD, CA 94518

MASON KELSEY KE6DEO
2055 SIERRA RD #93
CONCORD, CA 94518
510-827-3787

MIKE MICHIG KN6JQ
2373 MORNINGSIDE CIR
SANTA ROSA, CA 95405
526-9655

NINA KELSEY KE6DER
31 KELLY LN
PETALUMA, CA 94952
763-2544

MARC HELFMAN KF6LN
POB 1178
KENWOOD, CA 95452
833-5261

JOAN CALKINS KE6DRQ
617 G ST
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762-2348

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SANTA ROSA, CA 95402
523-4488

SKY KELSEY KE6DYG
31 KELLY LN
PETALUMA, CA 94952
763-2544

JIM RUTHERFORD WB6PER
POB 222
KENWOOD, CA 95452
526-2972

ROBERT BURWELL K6UKK
5050 REDWOOD HWY
SANTA ROSA, CA 95403
579-2501

ED DAVIS WB6WZD
855 ACACIA LANE
SANTA ROSA, CA 95409
539-2583

JERRY RICKSECKER AB6VN
509 KELLER ST
PETALUMA, CA 94952
763-2069

JIM STRICKLAND KN6XC
617 GREENVIEW DR
SANTA ROSA, CA 95403
525-1110

STEVE CARNIGLIA KK6VY
2774 CANTERBURY DR
SANTA ROSA, CA 95405
573-3507

ED ERRINGER AB6YV
1574 ANNA WAY
PETALUMA, CA 94954
763-9413

STEVE COREY N6WMW
1055 W. COLLEGE #207
SANTA ROSA, CA 95401
542-8429

DAVE NEW AA6YX
96 BLOOMFIELD RD
SEBASTOPOL, CA 95472
829-6608

We now have 307 members. We'll publish an updated roster in the May issue.

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RENEW YOUR ARRL MEMBERSHIP THROUGH THE CLUB AND THE CLUB GETS TO KEEP \$2 (no expense to you). Make out your check to SCRA, and send it with your ARRL renewal form to SCRA, PO Box 116, Santa Rosa, CA 95402 or give it to the Treasurer.

SCRA MINUTES

FEBRUARY 2, 1994



The meeting was called to order by President Merl Pfeiff N6VUC at 7:32 PM. Other officers present were Vice President R.L. Caron KK6GP, Secretary Al Bloom N1AL, Treasurer Mike Michlig KN6JQ, Repeater Chairman Jim Rutherford WB6PER, Member-at-Large Kelly Cureton KD6CJQ.

VISITORS: We had 14 visitors among the 96 people who attended the meeting.

Our **DX VISITOR** for the evening was Jean DeClercq ON5SK who filled us in about amateur radio in Belgium. The 5000 hams in ON-land belong to either VVRA, the Flemish society, or to UBRC, the French/German group.

UPGRADES: Congrats to Fred N6YEU for passing his Extra.

The **MINUTES** were approved as published in *Short Skip* m/s K6ZWB/KD6WYF. The **TREASURER'S REPORT** will be given next month after Mike gets caught up from his recent trip. So that the Treasurer can participate in the break, dues should be sent in by mail or handed in after the meeting.

RACES: N6PTM announced an ARES/RACES training drill Saturday April 23 to train operators and to test facilities. The scenario will be an earthquake (surprise!) Check into the Monday night RACES nets for more info.

PUBLIC SERVICE: Marie KI6QY is in LA assisting with earthquake communications. She needs volunteers for the following events: April 10: Super Cities Walk (14 operators needed), April 30: Wine Country Century and Cycling Classic (20 and 9 volunteers, respectively).

EDUCATION: Rick K6ZWB's antenna class starts Feb 8 at the Spinal Cord Injury Network bldg.

THE VE EXAM at the Rohnert Park Hewlett-Packard plant drew 24 applicants who took 28 exam elements, according to VE Coordinator Dave AA6YX. The result was 10 new licenses or upgrades.

ACTIVITIES: The new Activities Chairman for 1994 is Mike Knope KD6LYU. Our Raffle Chairman is Lynn Dickerson KD6TYL. The 10 meter net is doing well — We had 12 check-ins last night.

BADGES: If you have never picked up your SCRA badge since joining the club, please see Badge Chairman Fred N6YEU.

We still need someone to help Bob WD6DPE with picking up **COFFEE AND DONUTS**.

NET CONTROL STATION for February will be Mark KE6BNP.

A **CLUB CAMPOUT** is contemplated for April or May, with Jim WB6PER and Kathy KC6UXJ doing the planning.

The **HOME BREW CONTEST** is coming up in April.

DISASTER SURVIVAL is the subject of the March meeting by Darlene KD6GCK.

An **ARRL ELMER AWARD** was presented to Dave New AA6YX by a happy recent licensee who benefited by a home visit by the VE team.

PROGRAM: Repeater Chairman Jim Rutherford WB6PER led a very interesting discussion about how to operate on the repeater, both to keep the FCC happy and to ensure good operating practices. Jim passed out lists of Northern California simplex frequencies and copies of the new section 97.113 (the "thou shalt not" section) of the FCC rules.

The **RAFFLE** prizes were thanks to HSC and Ardco. The **LOTTERY:** would have been won by Ron KD6RUZ, had he been present.

The meeting adjourned at 9:54 PM. m/s WD6CKP/KD6GCD
Respectfully submitted by Al Bloom N1AL, Secretary.

THE BIRTH OF THIRTY-THREE

Bart Pooper, W1HNE

Clara had her ticket.
She also had a rig.
Because she was just starting
It wasn't very big.
She slowly tuned the crystal,
And watched the meter drop.
Then tapped the key a couple times
To be sure it wouldn't stop.
Now everything was ready.
She called a short CQ
And received an answer
On thirty-six sixty-two.
They chewed the fat 'bout stuff and things,
'Bout dresses, work and dates.
They finally called it QRT
The girl sent eighty-eights.
Clara thought it mighty funny,
Whether it be Miss or Mrs,
To end a perfect QSO
By sending "love and kisses."
It sounds too sentimental;
Just a little too much "goo"
To be sending "love and kisses"
To a girl the same as you.
For an entire week she pondered;
Wouldn't even touch the rig.
She pushed her slide rule by the hour,
Employing "logs" and "trig."
She added and subtracted.
What could the answer be?
To reach a happy medium,
Twixt eighty-eight and seventy-three.
Clara finally looked up from her work
All smiles and not forlorn.
Twas July in Nineteen-forty
That THIRTY-THREE was born.
There's no real definition
But its meaning is known well.
It's how a YL says good evening
To another friend YL.

The "33" signature has been in use since 1940, when YLRL (Young Ladies' Radio League) adopted it. It means "Love sealed with friendship between one YL and another YL." Thanks to *Worldradio* magazine and Betty AG6C.

Harry has a good setup here. He has no tuner, but Harry adjusted his antenna for good low SWR at the frequency that allows operation over the entire band. The radio matches into the antenna system with no problem. The SWR increases toward the band edges, but with a simple dipole, it *should*! If it doesn't, suspect trouble.

So, Who Can You Believe?

Last December marks my 19th year as an amateur radio operator. That doesn't mean I know very much; all it means is that I've been licensed for awhile. There is a LOT of misinformation about antennas and antenna systems that continues to be handed down from ham generation to ham generation. You new hams can learn a lot from "old timers." But be mindful that myths have been around for a long time and some of us "old timers" never did get it right. It took me years to find out that reflected power in a low loss transmission line is not wasted, is not dissipated, does NOT come back down the line and burn out the final amplifier. I learned that in a low-loss system, most of that *reflected* power *is* transmitted by the antenna. It might have to jump back and forth a bit, but those reflected signals are radiated!

If you don't believe me, it's okay, I understand. With the disinformation I have heard over the years, I could hardly accept some of these ideas myself. We condition ourselves through repetition and constant bombardment of the wrong information until we accept it as "fact" without even considering its validity based on scientific principles.

Conclusions

An SWR meter can be a handy tool for the average amateur radio operator. But many of us have not learned enough about antennas, feedlines, and reflected signals to determine if a particular SWR reading is good or bad. And then when we *really* determine that it's bad, we haven't learned how to correct the situation. The point is *not* "to have a low SWR reading." The point is "to have an efficient antenna system; one that radiates well." And many times it is also important to have a flexible system that covers more than one band.

Finally, I want to offer you a solid basis on which to build your antenna knowledge, as well as dispel some of the stuff you may have

believed was true for years. I refer you to further study using the book "Reflections, Transmission Lines and Antennas," by M. Walter Maxwell, W2DU. Please, please get a copy of it, if you are at all interested in how RF acts in a mismatched transmission line. It's all in there. The book is published by the ARRL, it's \$20 plus change, and you won't be sorry. And no, I don't get a commission out of recommending it.

Everything Walter says is based upon well-established facts of physics and electrical engineering. But much of it is readable enough so that even thick-skulled dolts like myself can understand. For you brainy ones, there is plenty in there to keep you interested.

Experiment, keep learning, and have fun. For me, that's part of what amateur radio is all about.

Best Regards, John Breckenridge WB6FRZ

COMING EVENTS:

SCARS NET: 146.73 MHz Tuesdays at 7 PM.
NEWHAM HOTLINE: 1-800-326-3942
SCRA INFO HOTLINE: (707) 579-9608
VE EXAMS: (408) 984-8353/255-9000

MARCH:

- 2- SCRA meeting 7/7:30 PM - 1992 DUES PAYABLE!
- 5-6 - ARRL DX Contest, Phone
- 6 - Livermore Flea Mart 510-447-3857
- 7 - RACES etc. Net 7:30 PM
- 12 - Foothill College Flea Market
- 17 - CDF/VIP Meeting 7:30 PM
- 19- Deadline for April Short Skip
- 21 - RACES etc. Net 7:30 PM
- 26-27 - CQ Worldwide Prefix Contest, Phone

APRIL:

- 4 - RACES etc. Net 7:30 PM
- 6 - SCRA meeting 7/7:30 PM
- 10 - Super Cities Walk (multiple Sclerosis)
- 15-17 - Int'l DX Conv., Visalia 818-784-2590
- 16 - Deadline for May Short Skip
- 18 - RACES etc. Net 7:30 PM
- 21 - CDF/VIP Meeting 7:30 PM
- 23 - ARES/RACES emergency drill
- 30 - Wine Country Century bike ride
- 30 - Wine Country Cycling Classic
- Apr 29 - May 1 - Dayton Hamvention
- Apr 29 - May 1 - West Coast VHF Conference
- Bob Hastings K6HPE 714-990-9203

A Mini Primer on SWR Measurements

By John Breckenridge, WB6FRZ

Acknowledgements: I wish to recognize the thoughtful review of this article by Al Bloom, N1AL, truly one of Sonoma County Radio Amateurs guiding lights. I also credit M. Walter Maxwell, W2DU, the author of "Reflections, Transmission Lines and Antennas," the book that inspired this article.

Introduction

I have long noticed that many new-time and old-time amateur radio operators alike hold the idea of low SWR (standing wave ratio) for antenna systems very near and dear to their hearts. High SWR has been blamed as being the cause of TVI, poor transmitted signals, burned finals and antenna system problems. Low SWR has been the most sought-after and trusted measurement among hams for antenna system adjustment and monitoring. So let's consider what SWR measurements are, why we make them in the first place, and how we can best interpret the readings we measure.

What Is SWR and What is It Used For?

SWR stands for standing wave ratio. SWR is computed from the ratio between an RF signal going in the forward direction (toward antenna) and the RF signal going in the reverse, or reflected direction (toward transmitter) on a transmission line. Any discontinuity or impedance mismatch along the line or at the ends of the line will cause a portion (at least) of the RF signal to reverse direction. The SWR meter detects the magnitude of that reflected signal in relation to the magnitude of the forward signal. From that information, certain conclusions are then drawn about the quality of the antenna or antenna system. These conclusions rest solely with YOU, the operator.

You will also hear the term VSWR, which stands for voltage standing wave ratio. SWR and VSWR are the same thing.

Let's do a little math, very little math, to clarify this ratio.

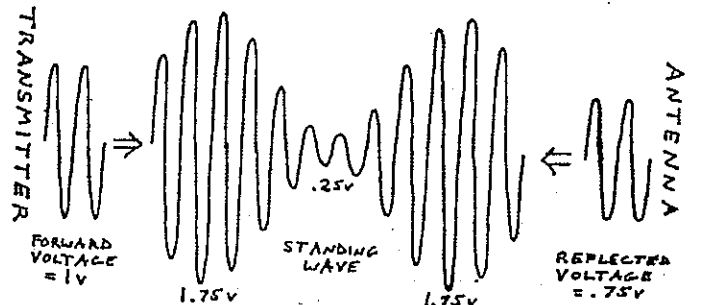
We know that

VSWR = (Forward Voltage + Reflected Voltage) / (Forward Voltage - Reflected Voltage)

If Forward Voltage is 20 volts and Reflected Voltage is 0 volts, then we get:

VSWR = (20 + 0) / (20 - 0) = 20 / 20 = 1

That 1 is the *first* number in the ratio. The *second* number, after the colon (:), is *always* 1. So, our answer is a VSWR (or SWR) of 1:1, pronounced "one to one."



An example of high SWR. Here the forward voltage is 1V and the reflected voltage is .75V for an SWR of (1+.75)/(1-.75) = 1.75/.25 = 7:1 SWR.

How is SWR Measured?

Whatever we use to measure SWR must somehow measure the forward and reflected signals and mathematically manipulate the values. The result may be shown directly in SWR on a meter, or as a swept value of return loss or SWR on an analyzer, usually a *very* expensive piece of test equipment.

The most common and cheapest way to measure SWR is with an SWR bridge (SWR meter). Inside there are diodes and other circuitry that allow a meter needle to move. As you might imagine, these meters do not necessarily give the most accurate readings. However, for all but the purist, these simple and relatively cheap meters do a reasonable job for amateur radio work, although uncertainties are magnified at VHF and above.

What Does a Low or High SWR Mean?

As you read the explanations given here, try not to make any judgements or jump to conclusions about the meanings.

A low SWR refers to a large forward RF signal and a small reflected signal. Since the reflected voltage can never be less than zero, the very lowest value possible is 1, or 1:1.

A high SWR refers to a large reflected signal. For example, a meter reading of 9.5 indicates an SWR of 9.5 to 1.

Incidentally, you may note that there are not many numbers on the meter after about 3 or 5. That's because SWR values get very large very quickly. It is difficult to tell the difference between an SWR of 9.5 and 35, for example.

Low SWR is Good and High SWR is Bad, Right?



Wrong, wrong, wrong. That's like saying cold water is good and warm water is bad. To a penguin, this is probably true. But to a person who fell through a hole in an ice-covered pond, it is false.

Like water temperature preference, the interpretation of good, bad, or indifferent SWR depends upon the situation! Sorry, folks; there just ain't any quick and simple answers here. Ask a few hams and I think you will hear statements like: "A good SWR reading means my antenna is working properly," or "A bad SWR reading means there's a problem with my coax or antenna." It's a shame that these simplistic, well-intentioned, widely-accepted viewpoints are passed on from one ham radio generation to the next.

Now that I have your attention, let's consider some situations of good high SWR and bad low SWR.

Examples of Good High SWR and Bad Low SWR

Suzie Hamm has been a ham for years. Her old antenna system, fed with 23 year-old coax cable, has *never* given her any problems! In fact, her SWR meter always shows a very low SWR. "If it ain't broken, don't fix it," I've heard Suzie say. The problem is that Suzie's coax has become so lossy over time that her antenna could be disconnected and she would *still* get an SWR reading of 1.5 to 1! But how could this be? Remember, the SWR meter is stupid, it can't interpret what is *causing* it to read the way it does. The SWR is low

because the lossy coax cable absorbs the forward RF energy going to the antenna, and also absorbs any reflected power (if there is any left to be reflected) from the antenna going back toward the transmitter. *Of course* the SWR is low! The solution to Suzie's situation would be for her to periodically measure the power at each end of her coax cable with a dummy load attached. Without changing the transmitter power, the difference in the readings is the amount of power lost through the coax. *Low SWR does not guarantee a better signal.*

Baluns are wonderfully magical devices; they make everything okay. In fact, some hams have been able to reduce the SWR of their dipole antennas by simply inserting a 1 to 1 balun at the antenna terminals. The SWR doesn't rise at the band edges like it did when the balun wasn't there! *OOPS*, a red light should go on here, but normally hams will just be pleasantly surprised at the quality of that balun and brag about it to their buddies. What they should be doing is throwing the balun in the trash and replacing it with one that works. Here's what is happening: The balun was made of a ferrite core that saturated when power was applied. The core material provided significant power loss, turning that precious RF into heat before it even got to the antenna! *Low SWR does not guarantee a better signal.*

Consider a ground-mounted HF quarter-wave vertical antenna system with 12 radials. Its input resistance is determined by adding its radiation resistance and ground loss resistance. Radiation resistance for this antenna is close to 32 ohms and ground loss resistance is on the order of 20 ohms. 32 plus 20 gets you 52 ohms, and your SWR meter shows a perfect match using 52-ohm coax. So that means an optimum vertical has 12 radials? Nope, because the power "radiated" by that 20 ohms of ground loss resistance is lost warming the worms in the ground! Add 25 more radials to the system and the SWR at resonance will rise because ground losses decrease. The SWR may now show 1.4 to 1, but the worms get colder because your vertical is a more efficient radiator! *Low SWR does not guarantee a better signal.*

Let's take the above example one step further. Let's say you don't like radials so you decide to install only four of them onto your vertical. Your radiation resistance is still about 32

ohms. But now your ground losses are also on the order of 32 ohms, giving you about 64 ohms for input impedance. That equates to an SWR of about 1.3 to 1 at resonance. The SWR is still "acceptable" to your rig, so you move off frequency and find a wonderful thing! The SWR seems quite "flat" across the band; it doesn't rise as you might expect - it's a miracle! You always suspected that you didn't need all those nasty radials, anyway. Nope, sorry. What has happened is that the ground losses are so high now that they hold the off-resonant SWR to a lower value than would be normal if you had a *decent* radial system. You are really making the worms uncomfortably warm now because *half* your power is *heating the ground*. *Low SWR does not guarantee a better signal.*

Joe Hamm is testing a new Yagi beam antenna. It seems like no matter what Joe does to the antenna, the SWR is 3 to 1 or more. Joe tries changing the length of the coax because he read somewhere that doing that tunes the antenna. And guess what, the SWR drops to 1.2 to 1! Obviously Joe has confirmed that the length of the coax tunes the antenna, right? Wrong. Joe had a problem before, and still has a problem, although his SWR meter suggests that he fixed it. The problem is that the RF is squirting out of the end of the coax and flowing on the *outside* of the coaxial braid. What this does besides allowing the coax to radiate and make for totally bogus SWR readings is seriously affect the front-to-back ratio of Joe's beam. The beam no longer shoots its energy properly in the desired direction. This is not good. To correct all of this, it is very important to have a well-engineered balun just ahead of the beam's gamma matching network. If for some reason the balun is not taking care of the problem, then ferrite beads can be placed over the outside of the coax at the connection to the antenna to "choke off" any stray RF that wants to misbehave. *Low SWR does not guarantee a better signal.*

Fred Frequency has a multiband HF antenna system and feeds it with 100 feet of Belden 9913 coax cable. The other end of the coax is connected to a tuner, SWR bridge, and then to a transceiver. Fred operates 80 through 10 meters with this setup. Fred adjusts the tuner for an SWR reading that shows a good match to the rig. But wait, you say. For various bands, isn't there still a very high SWR (mismatch) between the output of the tuner

and the system? Yes, but that *doesn't matter*. I will explain why. Yes, it's true that coaxial cable losses increase as the SWR increases. From the ARRL handbook, an SWR of 7 to 1 between the tuner and the line creates 1.3 dB of reflection loss in the line. The ham in contact with Fred will see a difference of a quarter of an S unit due to the TINY losses in Fred's cable from a 7 to 1 SWR. When was the last time you heard the signal strength difference of a quarter of an S unit? *High SWR does not mean a worse signal.*

Now let's look at situations showing what most of us are used to seeing, good low SWR and bad High SWR.

Examples of Good Low SWR and Bad High SWR

Juan Deebee has a 20-meter station with transceiver, SWR meter, and coax cable to a beam at 145 feet (oh, that I were Juan). Anyway, when installed, his beam showed these SWR readings:

Frequency	SWR
14.01 MHz	2.3
14.15 MHz	1.2
14.34 MHz	2.1

This is a reasonable characteristic and is an indication that things are as they should be. But two years after it was installed, the SWR at 14.15 MHz increased to 3.4. This high SWR is bad and is an indication of trouble. Now I'm glad I'm not Juan, because he will probably need to climb that 145 foot tower to find the trouble! Of course, he will check the coaxial connectors that are in the shack first. If he's smart, he will rent a helicopter to work on the beam.

Harry Hamm (Suzie's brother-in-law by a previous marriage and Joe's older nephew) is installing a tuned 40-meter dipole. His transceiver connects to an SWR meter, then to 75 feet of RG-58U coaxial cable to the center of the dipole. Harry has the following SWR readings:

Frequency	SWR
7.01 MHz	1.9
7.18 MHz	1.0
7.29 MHz	1.7