TRW W6TRW AMATEUR RADIO CLUB

CROSSTALK

TRW SEA

A Publication of the TRW Amateur Radio Club

AUGUST 1994 CALENDAR

Every Monday: DCS Net on 145.32 Repeater at 7:30 PM

Every Wednesday: Emergency Communications Team Net on 145.32 Repeater at Noon

Every Thursday: Club Net on 145.32 Repeater at 7 PM, Club news, etc.

Every Friday: Club Breakfast in Bldg S cafeteria, 7-8 AM

Aug 2: Executive Board Meeting, E2/1200, 5:30 PM

Aug 6-7: ARRL UHF Contest

Aug 9: Emergency Communications Team Meeting, R3/1413, Noon

Aug 9: Club Meeting at Petrelli's, 230 N Aviation Blvd, M.B., 5:30 PM, Bill Shanney, KJ6GR, will speak about HF QRP operating

Aug 19: Technical Chairman's Meeting, Bldg S Shack, Noon

Aug 26-28: ARRL Southwestern Division Convention, San Diego

Aug 27: Swap Meet, Parking lot, NW corner of Aviation & Marine, 7-11:30 AM, T-HUNT at Noon

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EDITORS NOTES: The deadline for CROSSTALK submissions is the executive board meeting on the first Tuesday of each month. If you have something and will be later than that please call and I will try to accommodate you.

VE TESTING: An updated list of local VE test locations and dates can be found on KB6AXK-1, 145.690 packet. There are VE test locations in the L.A. area almost every weekend. If someone prints a clean copy for me I'll be happy to publish it in *CROSSTALK*.

NEW CLUB SHACK: Now that Field Day is over we will begin setting up the new Building S shack. We need lots of help so please call Phil Bergeron and volunteer a little time. Ray Enriquez will be installing the conduit from the roof for the antenna feedlines. John Shepherd will be obtaining a permit for the tower since facilities won't do it for us.

FIELD DAY: This year we had great band conditions, plenty of good operators from TRW and XEROX, a 40 meter beam for SSB, good food and lots of fun. John Shepherd did his usual outstanding job. We don't know our score yet but from everything I heard from the operators it should be good. With the 1994 rule changes we should do very well this year.

Six meter Sporadic E opened to the East coast on Saturday. Ten meters surprised me by being open all day, it must have been the quiet geomagnetic field for a few days before FD that kept the MUF high. Fifteen and twenty meters were above normal too. The 40 meter beam on a 40 foot tower provided more SSB QSOs than I can remember and 40 CW was good as usual. There was some concern about being able to keep 7 stations active when we started due to the low solar flux but we were wrong.

There was talk of needing a crank-up tower for the 40 meter beam and I agree. Jason, KC6FNO and I helped put it up and it was not easy. I hope we have money in the treasury for a few towers. We also need to come up with a better 80 meter antenna, if we only had a site with a couple of 90 ft pine trees. I hope to have a complete rundown on Field Day for the next *CROSSTALK*.

For Sale:

- Ten Tec Argonaut II QRP Transceiver, 5 watts out on all bands 160-10 meters, general coverage receiver. $1000 firm. Excellent condition.
- Cushcraft D4 40/20/15/10 meter Rotary Dipole. Good Cond. $150.
- Kent Iambic Paddle Key. Excellent Cond. $50.

Call Bill Shanney, KJ6GR (310) 542-9899 evenings after 6 PM.

Wanted:

220MHz, or 2 mtr/220MHz dual band, mobile radio, with a synthesized tuner, PL tones, a few memories, and >5 watts. Call Rob Vance, N6WVI, at (310) 814-2638 during the day, (310) 498-8772 after 6:30 PM, or on QuickMail.

Newcomers Equipment Guide: HF Accessories

by Bill Shanney, KJ6GR

Modern transceivers come equipped with features that provide good performance under most operating conditions. It's a good idea to operate with your new rig for a few months before investing in fancy accessories that your operating style does not require. During this time make notes about conditions that you found difficult(I put mine right in my log). If you start seeing the same problem showing up frequently then you should look into alternative solutions.

The most common problem encountered on today's crowded HF bands is interference. It may be caused by atmospheric or local noise (QRN) or other signals (QRM). Let's deal with the latter first. Modern transceivers with narrow IF filters permit operation at very close frequencies. IF shift and partial band tuning controls help reject stations above or below your frequency by moving the IF filter center or cutoff frequency. An external audio filter provides the same functions plus some.

Audio filters range from basic bandpass filters with variable bandwidths to sophisticated DSP units which are also capable of notching out multiple carriers from a SSB voice signal. Explain your problem to an experienced amateur or read about the performance of available audio filters in QST and CQ product reviews before shopping. Prices range from about $70 for a basic unit to $350 for a fancy DSP filter.

Audio filters can also be used to reduce noise. The amount of noise power is directly proportional to bandwidth. This can be a big help on CW on the lower frequency bands. DSP filters can provide very narrow bandwidths as well as noise cancellation and signal peaking functions. Their performance keeps getting better but keep in mind that they will only help you copy a signal that is barely readable not one buried in noise and that performance varies with the type of noise present. I use a bandpass audio filter all the time on 80 and 160 meters since lowering the noise level also reduces operator fatigue.

Antenna tuners are another useful, sometimes mandatory accessory. Many of the newer transceivers have built in antenna tuners. These units work well for VSWRs up to around 3:1. Their performance is limited due to the small size required to package them inside the transceiver chassis. Internal tuners are only in the circuit during transmit which means that even if they can tune out high VSWR the receive signal will be reduced in strength. When using commercial antennas, simple verticals or dipoles over their design bands the internal tuners are usually fine. If you plan to use a G5RV or other type multi-band dipole an external tuner will be required. There are many excellent tuners on the market ranging in price from $100 to $700. If your rig doesn't have a SWR meter built in be sure to get a tuner with one, I prefer the dual needle types where one needle shows forward power and the other VSWR.

If you are planning to feed your antenna with balanced feed line (i.e. ladder line or twin lead) you will also need a good quality current balun. I've had good luck with baluns from Radio Works and Jerry Sevick, W2FMI designs available from Amidon. I always use a high power current balun to avoid core saturation which results in loss of RF power that heats the core. Baluns are designed for specific purposes so make sure you get the right one for the job.

If you plan to operate CW sooner or later you will want to consider replacing your hand key with a keyer or keyboard. If you have trouble sending with a key but can type consider a keyboard. Many TNCs available for packet operation have a morse keyboard mode but this may mean turning off your packet mailbox while you operate CW. MFJ and AEA sell keyboard keyers that are full featured. If you are a good typist make sure there is adequate buffer memory so you can type ahead.

I recommend trying several keyers and paddles before buying. Operators with different keying styles and hand sizes often prefer different keys or paddles. Keyers have slightly different timing and require getting used to. Make sure the keyer has a weight control or other means to vary the length of the dots and dashes to compensate for transceiver T/R switching time if you plan to operate full break in (QSK). Memories are a must if you plan to work contests. Some keyers have built in morse learning aids like QSO simulators and code practice generators.

There are many other accessories available such as headphones, speakers, equalized microphones and headsets. They are all useful for DXing, contesting, etc. Try them first at a friend's station before you spend your money on something that will simply collect dust in your shack.

There's More to VHF/UHF than Repeaters

by Bill Shanney, KJ6GR

The favorite mode of operation on the VHF/UHF bands is FM voice using repeaters, the low cost and small size of today's Handi Talkies undoubtedly contribute to the popularity of this activity. Hams who limit themselves to FM are missing out on some of the most exciting operating in this part of the spectrum. The so called weak signal modes, SSB and CW, permit long distance contacts via ionospheric skip, meteors, moon bounce and amateur satellites. In this article I'll briefly describe weak signal mode activity on the 6M, 2M and 70 cm bands.

Six meters is a very popular band here in Southern California. Calling CQ on the SSB calling frequency of 50.125 MHz will usually bring a response. Considerate operators move up to a clear frequency once contact is established to leave the calling frequency clear. Most SSB operation takes place between 50.125 and 50.2 MHz. CW operation occurs on or below 50.1 MHz. The range from 50.1 to 50.125 MHz is reserved for DXing (i.e.: contacting foreign stations). A lot of older 6 meter gear was AM and some hams keep this mode alive around 50.4 MHz. AM is usually a late night activity to prevent prime time TVI.

Two meters is also a popular SSB band. SSB contacts are usually initiated on the 144.2 MHz calling frequency. This band is also used for satellite up and down links. Oscar 13 is very popular with SSB being the mode of choice. There is some CW activity and there's lots of good DX on this satellite. The 70 centimeter band has some SSB activity around 432.1 MHz and is also used for satellite up and down links.

Sporadic E or E skip propagation permits single hop contacts out to 1500 miles and occasionally multiple hop contacts. This is the primary propagation mode for ionospheric skip contacts on 6 meters. During high sunspot years 6-meter F2 propagation does occur but not regularly like on the HF bands. Sporadic E is also present on 2 meters but it only occurs 2% of the time. Sporadic E is caused by ionized clouds at E-layer heights (i.e. ~ 70 miles). It provides signal reflection between limited areas depending on the size and location of the cloud. The time and duration of these openings is variable hence the term "sporadic". During the recent June VHF and Field Day contests Sporadic E openings occurred both morning and early evenings and provided a great deal of excitement. Contacts can be made using simple antennas and low power to the midwest and occasionally the East cost. Sporadic E peaks in June/July with a secondary peak in December/January and is still present during low sunspot years.

Locally we are all familiar with Tropospheric Ducting. A temperature inversion caused duct often exists between the South Bay and San Diego causing interference between their repeater and the W6TRW repeater. Tropo contacts on 6 meters through 70 cm are very common. Tropo ducting between Southern California and Hawaii causes some real excitement on 2 meters, listen for the Hawaii beacon (listed in the ARRL Repeater Directory) whenever a temperature inversion weather condition exists during the summer months. Tropo contacts are possible on FM but longer distances are covered on SSB/CW.

Meteor scatter is another exciting propagation mode. When a meteor travels through the Earth's atmosphere it leaves an ionized trail which can reflect signals in the 50 to 450 MHz range. Six and two meters are the best bands for this meteor scatter since higher frequency reflections are weak. Two meters is the most popular band for this activity. Meteor scatter exists most of the time but is best during one of the large Meteor Showers. Try pointing your antenna east on August 10-14 (Perseids shower) between 6 and 9 a.m. and listening around the popular calling frequencies for activity in this mode.

Earth-Moon-Earth (EME) or Moon-bounce is another activity on the VHF/UHF bands that is gaining in popularity. High gain antennas or arrays of antennas along with high transmit powers are required for most EME work. You may be able to make a contact with one of the EME Super Stations when conditions are right even with a modest setup. Two meters is the most popular EME band. Read the VHF columns in the Ham magazines to find the optimum dates and times.

ICOM, Kenwood and Yaesu each make all the mode VHF/UHF radios. Table I summarizes currently available units. There are older models out there but they don't show up on the used market as often as HF rigs and when they do they command top dollar. Some of the older 6 meter gear was not well filtered, ask a knowledgeable friend before you buy or risk TVI problems. Transverters are also available which convert an HF band (usually 10 meters) up to a VHF/UHF band. This is a low cost way to go for those who already have an HF rig.

These bands really come alive during the VHF/UHF contests and Field Day. Antennas are small and inexpensive. A 6 meter beam up 20 ft. is equivalent to a 20 meter beam up 80 feet so you don't need a big tower either. A TV rotor is all that is required to turn a modest VHF/UHF antenna farm. If you are looking for something new, try the weak signal modes. Mount your beams for Horizontal polarization and get ready for some fun.

References:

1 - Neubeck, Ken, WB2AMU, "The Mysterious 6-Meter Band," QST, December, 1992.

2 - Neubeck, Ken, WB2AMU, "Getting Started on the Magic Band," QST, March 1994.

3 - Neubeck, Ken, WB2AMU, Six Meters, A Guide to the Magic Band, Worldradio Books, Sacramento, CA, 1994

4 - The ARRL Handbook for Radio Amateurs (any recent edition)

5 - The ARRL Repeater Directory, contains VHF/UHF band plans and beacon listings.

6 - Pocock, Emil, W3EP, Beyond the Line of Sight, ARRL, Newington, CT, 1992. (A History of VHF/UHF Propagation)

Table I.
Currently Manufactured VHF/UHF All Mode Transceivers

	Band				
Model	6M	2M	70 cm	Other	Notes
ICOM					
IC-736	X			HF	
IC-970		X	X	23 cm*	satellite op.
IC-820		X	X		satellite op.
IC-275		X			
IC-475			X		
IC-575	X			10M	
Kenwood					
TS-690	X			HF	
TS-60	X				
TS-790		X	X	23 cm*	satellite op.
Yaesu					
FT-650	X			12, 10M	
FT-290R		X			
FT-690R	X				
FT-790R			X		
FT-736R	*	X	X	1.25m*	satellite op.
				23 cm*	

* Optional