



CROSSTALK

News Bulletin of the TRW Amateur Radio Club



Volume 98 Number 9

September 1998

Editor's Corner:

Thanks to the fine work that Jim Harrison K6OUE did while I was away, there was no interruption in the publication of the Crosstalk. In case you didn't know, Jim volunteered to take over the newsletter duties while I was away in Korea on company business, **Thank You Jim for a great job!** Well since the US does not have a reciprocal agreement with South Korea, I did not operate any Amateur Radio there, but I did bring my Icom IC-R10 Receiver with me and listened from time to time. Even though I am part Korean by heritage, I do not speak the language, so my listening was limited to the VOA, BBC english broadcasts on the SW bands. I did find a few interesting things; In the Chungcheung Province where I lived, the local Taxi Cab drivers were communicating on the Korean 2 Meter Amateur Band.... How did I know this, well while I was in a Cab one day, I noticed the radio that was being used was a Icom IC-2000, and the frequency on the display read "144.72" (sound familiar?). The driver was trying to call someone and changed frequencies, switching to 145.16. Due to the language barrier, I didn't bother to ask why.... Another interesting note, after arriving there, I noticed almost every car I saw had what appeared to be a Comet, or Diamond style antenna on it. At first I thought there must be a lot Amateur Radio activity there, but later found out that they were for PCS personal telephones which are very popular due to the very low monthly rates. By the time you read this issue, the August meeting/picnic will be a memory, I will report on this in the next issue.

DeVry Swapmeet returns!!!

Those of you die-hard Swapmeet goers can now attend one each weekend of every month again....

The DeVry Swapmeet now called the CAL POLY swap meet will be the THIRD Saturday of each month 7-11am in lots F8,F9 and F10..

The Address is CAL Poly Pomona at 3801 West Temple.

Amateur Radio License Restructuring

This is a very hot subject among the Amateur community, I'm enclosing a few articles in this issue on this subject.

Send in your thoughts!!

Email me your comments on this subject, I will publish them in the next issue.

duane.park@trw.com

Duane Park WA6EIK Crosstalk Editor

New ECT Coordinator

In case some of you didn't know, due to his heavy workload, Rick Ervin has stepped down from his position as ECT Coordinator. Rick stepped in for me when I could no longer fill this position and really put in a terrific effort in getting things accomplished. Thank You Rick for a job well done. Another brave person has volunteered to fill Rick's shoes, Willard Washburn, KE6PNP. Let's all give our 100% support to our new leader.

TRWARC Monthly Calendar of Events

First Tuesday of each month	5:30 pm	Executive Board Meeting, R4/2041 (All Club Members are invited)
Second Tuesday of each month	5:30pm	Club Meeting Round Table Pizza, (Redondo Bch. & Hawthorne)
Second Tuesday of each month	12:00 noon	Emergency Communications Team Meeting R3 Emergency Operations Center
Last Saturday of each month	7:00 am	TRW/ARC Swap Meet Marine and Aviation (Northeast Corner)
After the Swapmeet	12:00 noon	T-Hunt Swap Meet Parking Lot - 144.72 MHz

Weekly Events

Every Monday Night (Except the 1st & Holidays)	7:30 pm	Disaster Communication Systems (DCS) Net DCS Members: Check in on 2 Meter Repeater
Every Wednesday	12:00 noon	ECT Net on 2 meter Repeater All Amateurs Welcome
Every Thursday	7:00 pm	Space Hams Net on 2 meter Repeater with N6SHI and W6EKK
Every Mon, Wed, Fri	2:00 pm	TRW Retirees Net 7185 KHz
Every Friday Morning	7:30 am	TRW Amateur Radio Club Breakfast Building S Cafeteria - Everyone is invited Talk-in on 2 Meters

Other Events

Computer Fair Hours: 10:00 to 17:00

POMONA \$6.00 admission

Live Broadcasts: KFI-Jeff Levy "On Computers", KZLA, Y-107FM

September ????

Fairplex Exposition Complex Exit Highway 10 at Fairplex Drive.

Go north to McKinley Avenue, turn right. Turn left on White Avenue to Gate 14.

RESEDA \$3.00 admission

September 12 (Sat.)

Sherman Square Entertainment Center From the 101 Freeway take the Reseda offramp,

go north to Sherman Way and turn right. Go one block to Canby Street. 18430 Sherman Way.

BUENA PARK \$5.00 admission

September 13 (Sun.)

Sequoia Conference Center Take the Beach Blvd. exit off the 91 Freeway.

Go one block north to 7530 Orangethorpe.

All Shows Open to the Public 10:00 a.m. to 5:00 p.m.

Call for more information (408) 778-5200 or 800-800-5600 Fax# (408) 779-1374

Other Ham Swap meets:

Inland Empire ARC - 2nd Sat. ea. mo. 7:00 to 11:30 AM @ A.B. Miller High School, Walnut & Oleander in Fontana Talk-in 145.480 (-600 pl=77.0hz)

EI Cajon ARC - 1st Sat. ea. mo. 6:00 AM @ Santee Drive-in Theater, Woodside Ave. @ Hwy 67 in Santee Talk-in 146.52

NEW: CAL POLY swap meet – 3rd Sat. ea. mo. 7-11am in lots F8,F9 and F10 @ CAL Poly Pomona at 3801 West Temple. Talk-in TBD

A Note from Dave Nelson, AB6DU

As you know, I am now moving into the real work phase of the Tower #2 project. This tower will hold the 40 meter beam, and it opens space to put up large yagis for 6 meters, 2 meters, and 70 cm. It will also support wire antennas for the low bands, 80 and 160 meters. Interested members can call me at 310 813 9775 (work) or 310 212 3189 (home) for more information, or to get on the project email bulletins list, or to volunteer for the Saturday work parties.

This added capability will give the club station very good clout on all bands mentioned above. This will be important in any contesting, including VHF/UHF, and for the planned Special Event commemorating the launch of AXAF early next year.

The TRW ARC needs a few good men and women. As workloads peak up for some members, they find it difficult to keep supporting the club activities, so if you are one whose workload is on the decrease, please consider helping the club in the following areas. One impact on the club is that several active members are in the endtime activity of the AXAF Integration and Test, a high priority program for the company, but then they will be supporting the launch activities in Florida for several weeks or months after I&T is completed here. That leaves a few holes in our organization for the rest of the year. Consider some of the following opportunities for yourself:

BBS Repeater. Chris Wachs, WA2KDL, has been filling this role, and has developed and tuned the BBS packet rig to the present effectiveness. He will be spending more time with the AXAF project so can't be around much to continue this task. This assignment is very low key now. The software has been running smoothly and the intermittent glitches have disappeared since we installed the UPS for power, so this amounts to resetting the manual RESET button if any complaints arise. It only needs someone with badge access to building S and a voicemail or answering machine.

Technical Chairman. John Cheatham, KE6OHM, is out on long term disability for at least several more months. We certainly appreciated all the work John has put in repairing the repeater, shack equipment, and so forth over the years, and pray he will be back in top condition before long. In the meantime, this post is vacant. If you have technical interests, this is for you.

The Crosstalk reaches all members. This is the only communications item that does reach all members and it doesn't get there by magic. Every month, Steve Papa, Ko6vf, has been taking the pile of Crosstalks to be mailed, folded and stamped them, and mailed them out to the non-employee members that can't be reached on the internal TRW mail. Steve, everybody should be thanking you for this important job. This should take an hour every month at mailing time, so whoever has that amount to spare, please call our President, Rich Sauer, to pick up this one.

AXAF has taken another key member, our secretary, Pat Anderson, KB6YPI, who has served in the club executive board for several years now. We certainly will miss him at many activities and wish a speedy return from the AXAF launch, expected sometime early next year. This is a key post for the club, but as you see, finishing Pat's term is only a few months of 1998, beginning in September. Who can fill in for that 4 months?

Dave Nelson, AB6DU

September VHF QSO Party, by Jim Harrison K6OUE

The ARRL September VHF QSO Party will be held the weekend of Sept. 12 and 13. The contest will be from 11AM Saturday to 8PM Sunday local time. This is a contest for 6m and up, so it is really a VHF and UHF contest. This is the biggest VHF/UHF contest of the year and there are usually some good propagation conditions at this time of year. Just look at the QSO with Hawaii on 2m that Craig N6ED and Steve KF6KIC made last month! I won't be able to organize a TRW effort this time (I will be changing diapers) but if anyone else wants to, I would be glad to give them some pointers.

It is unfortunate that we don't hear more hams during these contests, when we know that there are thousands of people in Southern California with handhelds and mobile rigs that could be on the air. Lets get on the air and hand out some points, even if you are not interested in sending in a contest entry. The contesters will be grateful for any contact. The FM simplex frequencies that the contesters will be on are 146.55, 223.5, 446.0, and 1294.5 MHz. The SSB calling frequencies are 50.125, 144.2, 432.1, and 1296.1 MHz.

I know that many hams think that contests are silly, and I was one of them. And many hams are just not interested in contesting. However, there is a very important reason for contests, besides the fact that they are fun: it is one of the few ways that the ARRL can get a written record of ham activity. This can be very important when the ARRL is countering proposals by industry to take over some the amateur frequencies. And the frequencies that private industry most covets are in the VHF and UHF bands. Normally the ARRL and the FCC have no way of knowing how much activity is out there, and how many hams are actually active on the air. When you send in a contest log or application for an award the ARRL then has a complete written record of what frequencies were used and which hams are really active. So get on the air during the contest and let the FCC know that we are using our bands. Even if you don't submit a contest entry, you will probably end up on someone else's log sheet and then the ARRL will see that you are an active ham.

The complete rules for the contest, along with log sheets and entry forms in PDF format, are available on the ARRL web site at <http://www.arrl.org/contests/>. A station can be a single operator, a multi-operator, or a rover. The required QSO exchange is just your call sign and your grid square location. Each 6m and 2m QSO counts one point, each 220 and 440 MHz QSO counts two points, each 902 and 1296 MHz QSO counts three points, and any QSO on 2.4 GHz or above counts four points. You then multiply all of your QSO points times the number of different grids that you contacted on each band.

Grid squares are also described on the ARRL web site. Grid square DM03 is the area between 33 and 34 degrees latitude and 118 to 120 degrees longitude, so it is everything south of Santa Monica and downtown LA and west of Beach Blvd. in Orange County, so it includes the entire South Bay and Long Beach. Grid square DM04 is the area between 34 and 35 degrees latitude, so it is everything north of DM03 up to Santa Maria, and west of the 605 Fwy. Grid square DM13 is the area between 33 and 34 degrees latitude and 116 to 118 degrees longitude, so is Orange County east of Beach Blvd. and south to Oceanside and Escondido. Grid square DM14 is the area north of Orange County and east of the 605 Freeway.

NEW SATELLITES GET OSCAR DESIGNATIONS

(Reprinted from the ARRL Letter Vol. 17 #33)

Amateurs radio's two newest satellites, TMSAT-1 and TechSat-1B, are reported doing very well after a month in space. The two birds were launched jointly in late July from Russia's Baikonur Cosmodrome. At this point, neither satellite is ready for general use. The two spacecraft continue to undergo initial loading of flight software.

Both satellites also have received OSCAR designations from AMSAT. TMSAT has been dubbed TMSAT-OSCAR-31 (TO-31), while the Gurwin TechSat 1B will be known as Gurwin-OSCAR-32 (GO-32). The assignment of consecutive OSCAR numbers to new Amateur Radio spacecraft is a tradition that dates from the launch of the very first Amateur Radio Satellite--OSCAR 1. In order for an OSCAR number to be assigned, the satellite must successfully achieve orbit and one or more transmitters must be successfully activated in the Amateur Radio bands. Then, the builders/owners of the satellite must formally request that a consecutive OSCAR number be assigned to their satellite.

TMSAT, the first Thai microsat, was constructed by Thai engineers in cooperation with engineers at the University of Surrey in the UK. It's primarily designed along the lines of a low-earth-orbiting communications satellite, similar to those in the Iridium constellation. The TMSAT control station in Bangkok is HSOAM.

Chris Jackson, G7UPN/ZL2TPO, reports that TMSAT commissioning has proceeded slowly for a variety of reasons. Jackson says ground control stations have been operating the downlink transmitter mainly over Bangkok and Surrey. The satellite is also performing a number of new tasks that have not previously been used before, and this is taking some time to get fully operational in orbit.

Shlomo Menuhin, 4X1AS reports TechSat-1B is also responding well to ground control commands. Menuhin said the satellite recently took its first picture from space, centered over the French Riviera near San Tropez. The satellite contains an ultraviolet spectro-radiometer, a charged particles detector, and a superconductivity experiment, among other experiments.

Images from both satellites and access to additional information are available via the AMSAT Web site, <http://www.amsat.org>. Both satellites are expected to be available for general amateur use shortly.--thanks to AMSAT News Service

AMERICAN RADIO RELAY LEAGUE PROPOSES SIMPLIFIED LICENSE STRUCTURE

(Reprinted from the ARRL Letter Vol. 17 #29)

The ARRL has proposed a simplified Amateur Radio license structure featuring four license classes and reduced Morse code requirements for full HF access. In approving the plan July 18, the ARRL Board of Directors said the hobby no longer needed six license classes. In their discussions, Board members emphasized that the objective was to rationalize and simplify the amateur licensing structure without reducing the requirements for any class of license.

Among its recommendations, the plan would eliminate the current Novice and Tech Plus class licenses and merge those operating privileges into a new license class equivalent to the current General ticket. The plan would replace the present named license classes with Class A, B, C, and D tickets, revise written examination requirements and content, and set 12 WPM as the highest Morse code test requirement. Most of the spectrum freed up by the elimination of the current Novice CW bands would be "refarmed" into expanded HF phone segments. Some would remain available for digital and CW, however. Announcement of the Board's plan generated a tumult of opinions pro and con within the Amateur Radio community. Comments received at League Headquarters have ranged from angry opposition to enthusiastic support, but by the end of the week in which the plan was announced, most Board members reported receiving somewhat more comments in favor than opposed.

The League has forwarded details of the plan in a letter to the FCC but will not petition for a rulemaking as it awaits public release of the Commission's own ham radio restructuring plans (see related story below). In its letter, the ARRL asked the FCC to "consider this restructuring plan as a means of modernizing and simplifying amateur radio licensing, and a means of making Amateur Radio available to more people."

Before the July meeting, the ARRL Board had twice voted down motions to consider changing the licensing structure. This time, the impending FCC rulemaking provided the impetus for the Board to issue its own plan, in time to stimulate debate on the topic and possibly serve as a counterpoint to the anticipated FCC proposals.

ARRL Board approval of the plan followed extensive discussion and debate during its recent three-day meeting. "The debate was, at times, contentious, and the result was not unanimous," said ARRL President Rod Stafford, W6ROD. The vote to approve the plan was 9 to 6. Most of those in the minority were not opposed to simplifying the licensing structure, however, and there was sentiment for even fewer license classes.

"Some Board members preferred greater simplification; others were uncomfortable with some of the changes being proposed," Stafford observed.

"However, every Board member, without exception, left the meeting knowing that each of his or her colleagues did what they believe is best for the future of Amateur Radio."

In developing its plan, the Board tied proposed reductions in Morse code requirements to corresponding increases in written examination standards. On the other hand, Board members were adamant that simplifying the structure should not come at the expense of privileges amateurs already have earned. This was the rationale to recommend granting the new entry-level Class C HF license to present Novice and Technician Plus licensees, who already have earned entry-level HF operating privileges.

Charts depicting the proposed operating privileges and licensing structure and the text of the League's letter to the FCC are available on the ARRLWeb site at <http://www.arrl.org>. Members may comment on the ARRL plan via the Web or via e-mail to restrux@arrl.org.

Here are the highlights of the ARRL Board's restructuring plan:

* The Class D license, equivalent to the current Technician class, would be the entry level ticket to Amateur Radio. Operating privileges and the written examination would remain at the same level as Technician, but the exam would be more consistent with Class D operating privileges.

* The Class C would supplant the Novice as the entry level to HF. Under the League plan, all General, Tech Plus, and Novice licensees would become Class C licensees. The Class C ticket would convey current General privileges, but would offer bigger HF phone bands. Class C licensees would have access to another 50 kHz on 75 and 15 meters and another 25 kHz on 40 meters. To upgrade from Class D to Class C, an amateur would pass a written examination on the operational and technical qualifications required for HF operation plus a 5 WPM Morse code test.

* All amateurs now licensed as Advanced would become Class B. The Class B would convey the privileges of the present Advanced license, but with additional phone privileges. The Class B ticket would offer an additional 50 kHz on 75 and 15 meters and another 25 kHz on 40 meters. To upgrade from Class C to Class B, an amateur must pass a more advanced written examination--similar in difficulty to the present Element 4A--and a 12 WPM Morse code exam.

* All amateurs presently licensed as Amateur Extra Class would become Class A. The Class A ticket would convey the full privileges of the present Amateur Extra Class but, once again, with expanded phone subbands. Class A licensees would get an additional 50 kHz on 75 and 15 meters and another 25 kHz on 40 meters. To upgrade from Class B to Class A, an amateur would be required to pass the most difficult written examination in the sequence. The Advanced written test is considered the most difficult in the current exam sequence. Consistent with the practice in many other countries, no Morse code examination beyond 12 words per minute would be required for a Class A ticket.

Adoption of the simplification plan culminated some 30 months of work by the Board and embraced input from thousands of ARRL members, nonmembers, and prospective hams. The Board debated a wide variety of options including more and fewer license classes, higher and lower qualification levels, and different privileges.

THE OTHER SHOE: HAMS AWAIT FCC'S "STREAMLINING" PLAN

Nearly lost in the maelstrom of discussion over the ARRL Board's plan to restructure Amateur Radio licensing is the fact that the FCC soon plans to make its own "streamlining" proposals public. Release of the FCC proposals could come within the next few weeks.

At a national meeting of Volunteer Examiner Coordinators July 9, FCC Wireless Telecommunications Bureau chief D'wana Terry hinted at what hams can expect from the FCC. "Some things will probably be concrete proposals; other things will be discussion topics," she told the gathering. But Terry

said none of the FCC's proposals should be considered "carved in stone," and she urged hams to comment constructively. "We want to do things that make sense," she said.

Terry said the changes could include action on outstanding petitions for rulemaking "to the extent that they fit into the biennial review" of Part 97. "We are trying to clear out our backlog," she said.

She encouraged hams to not just complain but to tell the Commission what will work and offer solid suggestions. "What we try to do is give it our best shot," she said. "We don't always get it right."

Terry said the FCC's proposals on changes to Part 97 would be out "sometime this year--I can't say when."

VECs said they had been hoping for more of a "heads up" on the FCC's plans for Part 97. ARRL-VEC Manager Bart Jahnke, W9JJ, suggested to Terry that the FCC offer a longer-than-normal period for amateurs to comment. Also at the session, W5YI-VEC Fred Maia, W5YI, expressed concerns that something must be done to reverse the downward trends in licensing and upgrading.

FCC officials also discussed progress to implement the Universal Licensing System (ULS). The ULS, which would move the application process into the electronic arena, is expected to come on-line by next spring.

August 7th, 1998 *(Reprinted from the ARRL Letter Vol. 17 #31)*

FCC's "STREAMLINING" PROPOSAL DUE OUT SOON!

The ARRL has learned that the FCC very likely will release its anxiously awaited "streamlined" Part 97 Amateur Service proposals sometime during the week of August 10. The document, part of the Commission's 1998 Biennial Regulatory Review, was adopted July 29, but it's undergoing some last-minute tweaking prior to public release. Editorial fine tuning like this following FCC adoption of a document is part of the normal process and not considered unusual.

Details of the FCC's license restructuring or Morse code testing proposals still are not available. The Notice of Proposed Rulemaking (NPRM) will carry WT Docket No. 98-143. It's expected that the FCC will use the NPRM to respond to some outstanding amateur rules-related petitions, including RM-9196, which proposed changes in the administration of CW tests to handicapped individuals. The ARRL will release details of the NPRM via a W1AW bulletin and on the ARRLWeb (<http://www.arrl.org>) as soon as the information is available. It's expected that the FCC will post the complete set of proposals on its Web site, <http://www.fcc.gov>.

Word is that the FCC will provide an extended period--something longer than the typical 30 days--for the amateur community to voice its comments on the proposals, and additional time also will be provided for reply comments. The ARRL released its own Amateur Radio licensing restructuring plan last month.

New battery technology

(Reprinted from Newslite issue #1088)

A new battery technology being developed for military use holds the promise of longer operating times for all sorts of equipment including portable ham radio gear. Engineers at the Air Force Research Laboratory's Space Vehicles Directorate are reported to be very excited about their successful sodium-sulfur battery tests performed on last November's space shuttle mission. This, according to a press release from the Air Force Materiel Command at Kirtland Air Force Base in Albuquerque, New Mexico as reported in the International Space Report News Digest. The new battery weighs half as much and generates nearly three times the specific power of nickel-hydrogen technology, or 150 watt hours per kilogram of battery weight.

Morse Code disappearing from the high seas

(Reprinted from Newslite issue #1093)

Morse code will disappear from the high seas as of March 1st, 1999. This is the date when all passenger ships and cargo ships over 300 gross tons will no longer be permitted to use Morse code for distress calls.

The International Maritime Organization says that Morse is being phased out because its many drawbacks. These include the need of years of training and practice for operators to use it. The IMO says that if something happened to the radio operator it is unlikely that anyone else on board a ship would be able to use the telegraphy equipment. The International Maritime Organization says other reasons for the phase out of terrestrial CW include reception problems, uncertainty about the accuracy of message being received using Morse and the airwave congestion that came with the development of radio on land.

The sodium-sulfur costs half as much as nickel-hydrogen and is more reliable due to simpler design.

New Japanese Prime Minister is a ham

(Reprinted from Newslite issue #1094)

On the international scene, a ham radio operator will soon be the Prime Minister of Japan. On July 24th, Foreign Minister, Keizo Obuchi, J11KIT, was elected as a president of the Liberal Democratic Party. As the new LDP leader, Obuchi will be elected Prime Minister of Japan in a special parliamentary session taking place as this newscast goes to air on July 30th.

Obuchi, is a member of the Japan Amateur Radio League and a very good friend of JARL president Shozo Hara, JA1AN.

Wired magazine reports that the use of the Morse code in Maritime communications will be taken by a network of geostationary communications satellites.

Two are positioned over the Atlantic Ocean and one each over the Indian Ocean and the Pacific Ocean.

Only the North and South poles, where shipping is infrequent, are uncovered. There, terrestrial voice channels will be used.

Also, larger cargo ships and passenger liners will be required to carry satellite emergency position indicating radio beacon transmitters. Using these in conjunction with orbital search and rescue satellites can bring aid a lot more quickly to a stricken vessel than listening in the noise for an SOS signal in Morse code.

What does this mean for ham radio? It means that those amateurs who search the airwaves listening for CW distress calls will no longer be needed.

This, as the monitoring for such traffic is automated and tied to satellites in Earth orbit.

TRW AMATEUR RADIO CLUB

ELECTED OFFICERS

President	Rich Sauer	N6CIZ	R9 / 2873	(310) 813-5869
Vice President	Elizabeth Kunkee	KS4IS	D1 / 1024	(310) 813-0524
Secretary	OPEN			
Treasurer	Steve Lambert	KF6KIC	R6 / 2529	(310) 812-5019

APPOINTED STAFF

447 Repeater Autopatch	Duane Park	WA6EIK	M2N / 1368B	(310) 813-4219
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Librarian	Steve Papa	KO6VF	O2 / 1715	(310) 812-5305
Membership Chairperson	Dave Nelson	AB6DU	R8 / 2144	(310) 813-9775
Past President	Bob Briggs	KD6WYQ	M7 / 2939	(310) 813-2622
Publicity Chairperson	Dave Nelson	AB6DU	R8 / 2144	(310) 813-9775
QSL Manager	Bryan DeAro	KN6OW	120 / 1020B	(310) 812-4789
S.P. Packet/Internet Sysop	Chris Wachs	WA2KDL	R7A / 2100	(310) 813-1506
SEA Representative	Nina Whiddon	KN6FL	O1 / 2020	(310) 813-9351
Swap Meet Manager	Rich Sauer	N6CIZ	R9 / 2873	(310) 813-5869
Technical Chairperson	John Cheatham	KE6OJM	R9 / 2477	(310) 813-5903
Training Chairperson	Bryan DeAro	KN6OW	120 / 1020B	(310) 812-4789
Trustee of W6TRW License	Elizabeth Kunkee	KS4IS	D1 / 1024	(310) 813-0524

TRW/ARC Hotline (Club Answering Machine)	(310) 813-8569
W6TRW 2 Meter Repeater (Open Repeater)	145.32 (-600) PL 114.8Hz
W6TRW UHF Repeater (Open Repeater / Closed Autopatch)	447.00 (-5 MHz) PL 100 Hz
W6TRW-3 Packet Radio Internet Gateway and BBS (1200 Baud Port)	146.745 (-600)
W6TRW Internet Home Page	http://w6trw.sp.trw.com/w6trw/

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FIRST CLASS

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