CROSSTALK

News Bulletin of the TRW Amateur Radio Club

Volume 98 Number 1 January 1998

HAPPY NEW YEAR!!

Editor's Corner:

I hope all of you had a Happy New Year.

December was my last month as ECT Coordinator, due to work commitments, I was not able to put my 100% into both positions. I was fortunate enough to have Rick Ervin, KD6OZD volunteer as the new ECT Coordinator. I will continue as Crosstalk Editor and will do my best to provide the members with a quality newsletter. As always, I encourage all of you to submit articles like the ATV article in this issue submitted to me by Greg Shreve and Jim Harrison.

And now for some HOT news;

1988 Executive Board Election results

President = Rich Sauer, N6CIZ

Vice President = Elizabeth Kunkee, KS4IS

Treasurer = Steve Lambert, KF6KIC

Secretary = Pat Anderson, KB6YPI

Some other changes to the Executive Board;

Activities Chairman/Asst Swapmeet	**Greg Martens**	**N6RRY**
Emergency Comm. Coordinator	**Rick Ervin**	**KD6OZD**
Membership Chairperson	**Dave Nelson**	**AB6DU**
Past President	**Bob Briggs**	**KD6WYQ**
SEA Representative	**Nina Whiddon**	**KN6FL**

Thanks to the approximately 40 Club members who voted (wow).

Congratulations to everyone, and again Thanks to all of the previous officers that served on the Executive Board. Let's all stand behind the new Executive Board and have a super year....

TRWARC Monthly Calendar of Events

First Tuesday of each month	5:30 pm	**Executive Board Meeting** (All Club Members are invited)
Second Tuesday of each month	5:30 pm	**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

Reoccurring 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 Night (Schedule permitting)	6:30 pm	**TRW Amateur Radio Club Net** The Bob and ? Show - Check In on 2 Meter Repeater
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 (previously The Computer Marketplace Computer Shows) ***Hours: 10:00 to 17:00***

POMONA $8 admission
Live Broadcasts: KFI-Jeff Levy "On Computers", KZLA, Y-107FM
January 10 & 11, 1998 (Sat. & Sun.)
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 admission
January 31, 1998 (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 admission
February 1, 1998 (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. @ A.B. Miller High School, Walnut & Olenander in **Fontana**
Talk-in 145.480 (-600 pl=77.0hz)
El Cajon ARC - 1st Sat. ea. mo. @ Santee Drive-in Theater, Woodside Ave. @ Hwy 67 in **Santee**

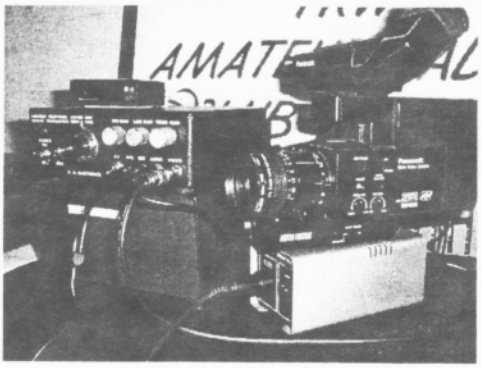
MISSING IN ACTION

I have been told that a 440 amplifier, and a 1.2ghz SWR/PWR meter is still missing from one of the club shacks..... If you have seen them, or know who is using them, please return them to the S Shack ASAP. The normal policy to borrow a piece of equipment is to contact the shackmasters (Dave Nelson Bldg. S, & Duane Park or Rick Ervin for Bldg. R3).

Amateur Television at W6TRW

Jim Harrison K6OUE, Greg Shreve KE6YEX

Introduction to ATV



When most hams hear the term amateur television (ATV) they immediately think of slow scan television (SSTV). Slow scan television is a method that was devised to send still images over the HF bands. A single image is scanned and sent slowly with audio tones, much like a FAX. Modern SSTV images are full color and are usually displayed on a computer screen. This method allows an image to be sent over a voice bandwidth channel, but it is very slow. It takes about a minute to send a single image and no voice can be sent while this is occurring. The club does not currently have an SSTV capability, though nowdays it can be done easily with just a sound card in a PC and some software.

When the term ATV is used today it usually refers to fast scan television. This is full motion video just like we are used to seeing on our TV sets at home. In fact, amateurs use the same NTSC video standard that the commercial broadcasters use. This means that everyone already has most of the equipment needed for fast scan ATV. A regular television set is a video demodulator and display device. And most people now own a camcorder which can be used as a color video camera. ATV is full color and includes an audio subcarrier just like broadcast TV.

However, there is a price to pay for having full motion video, and that price is bandwidth. Whereas SSTV can be sent over a bandwidth of about 2 KHz, fast scan TV requires 6 MHz. This is using the same vestigial side band AM modulation format that the commercial broadcasters use. Some amateurs are using FM video modulation which requires 8 to 11 MHz of bandwidth. So just one AM ATV repeater will use up at least 12 MHz of bandwidth -- 6 in and 6 out. This is why fast scan ATV is only done on UHF and above; there just isn't enough space on the lower ham bands.

Another consequence of the high bandwidth is reduced signal to noise ratio. The ATV signal is 3000 times the bandwidth of an SSB voice signal, and 400 times the bandwidth of FM voice. This means the signal power is spread over 3000 or 400 times as much spectrum. Or another way to look at it, is that the noise power is 3000 or 400 times as much as for voice. So we need a lot more effective transmit power for our ATV signal. The way the ATVers make up for this is with high gain antennas (and generally, direct line of sight). Remember, the commercial TV broadcasters are transmitting hundreds of kilowatts and you still usually need a directional TV antenna on the roof to get a really good picture. What is amazing is that viewable ATV signals can be transmitted to repeaters at distances of 50 miles or more with only 10 watts.

The Southern California band plan for 70 cm has two frequencies set aside for ATV, 426.25 MHz for simplex ATV, and 434 MHz for ATV repeater inputs. Note that there is no ATV repeater output in the 70 cm band. This is because we have already used up 12 MHz of the band. So the ATV repeater outputs are put in other UHF ham bands, one at 33 cm and three at 23 cm. This has an advantage; since the ATV repeaters are crossband, you can see your own return signal while you are transmitting and see how good your own signal is. Listed below are the ATV repeaters in Southern California that we can get to from TRW.

Location	Call Sign	Input	Output	Distance
Mt. Wilson	K6KMN	434 MHz	1241.25 Mhz	29 miles
Santiago Peak	WA6SVT	434	1253.25	51
Loop Canyon	WA6ZVE	434	1277.25	36
Little San Gorgonio	WQ6I	434	1277.25	88
Blue Ridge	WB6VVV	434	919.25	50
Oat Mountain	NU6X	434	919.25	33

The Mt. Wilson repeater has a net every Monday night at 7:30. The Santiago Peak repeater has a net every Tuesday night at 8:00. The Santiago Peak repeater is part of the amateur TV network (ATN) that is linked to Las Vegas. Note that the repeaters all have the same input frequency; this is another good reason to have a high gain, very directional 440 antenna so that you don't interfere too much with the other repeater inputs. All Southern California ATV is vertically polarized to minimize interference with weak signal users.

There are also 2 meter voice frequencies set aside for coordination of ATV transmissions. Even though there is an audio subcarrier on the ATV signal, sometimes it is very handy to have a 2 meter frequency to talk on while two people are trying to get in contact over ATV. 144.390 is set aside for simplex ATV coordination, and 146.430 is set aside for ATV repeater coordination. The 146.430 frequency with a PL of 100 Hz is summed into the audio of some of the ATV repeaters, this allows people who only have ATV receive capability to talk to other ATVers that they are watching. It also provides the capability for a full duplex link with video/audio one way and audio-only the other way, which turns out to provide a very natural way to interact on ATV. Listen in on these frequencies with your 2 meter rig and you might hear some ATV activity.

The ATV community is surprisingly small considering the number of amateurs in Southern California. The Santiago Peak ATV repeater is the most active, with people on most evenings. The Mt. Wilson repeater continuously broadcasts NASA Select TV whenever there is a space shuttle up, otherwise the repeater is rarely used. The other repeaters also have very little traffic, and simplex ATV is rarely seen. Our goal is to get some more ATV activity going in Southern California. It is not really that difficult or expensive a mode to operate.

For more information about ATV, check out the following web sites:

The Amateur TV Network	www.ladas.com/ATN/
Southern California ATV	www.qsl.net/wb6izg/
Amateur TV Quarterly	www.stevens.com/atvq/

The ATV Station at W6TRW

The club previously had an ATV capability, but it had not been set up since the shack moved to Building S. We simply used the equipment that was already there, adding a couple new items. So we owe a lot to the club pioneers who first experimented with ATV.

For receiving ATV we have a 24 element, 6 foot long, 16.2 dBd gain, 1200 MHz loop yagi mounted on a rotator on the roof of Bldg. S. Right below it is mounted our new 1200 MHz preamplifier with a bandpass filter. The club had a 1200 MHz video downconverter, but it did not seem to be working too well. We discovered that we could use the ICOM IC-1275A all-mode 23 cm transceiver that is already in the shack as a downconverter. It has a wideband IF output on the back that comes out at 133.63 MHz. This is very close to the frequency of cable TV channel 16. So we connected the IF output to the TV's antenna/cable input, tuned the TV to cable channel 16, and we get the ATV picture and sound. We do not have 900 MHz (33 cm) receive capability.

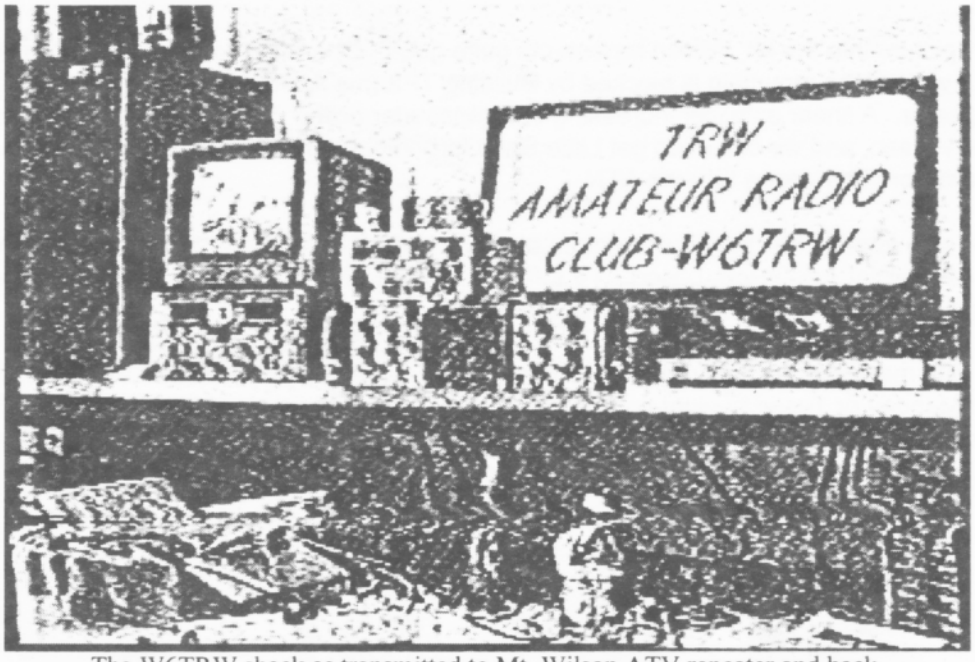
For transmitting ATV, we have a 16 element, 10.5 foot, 14.2 dBd gain, 440 MHz yagi mounted on the same mast as the 1200 MHz antenna. Our transmitter is a PC Electronics TC70-10 which can transmit 10 watts on either 426.25 or 434 MHz (crystal controlled). It is also capable of receiving 70 cm video for simplex operation.

Our picture into the Mt. Wilson repeater is quite good. Operation with Santiago Peak is noisy because our view of the mountain is blocked by Building TF2 (the AXAF high bay), plus further distance from the repeater. A linear amplifier increasing our transmitter power may overcome this. Loop Canyon comes in very clean, and we can even get Little San Gorgonio, though it is pretty noisy. We have even seen a picture from Las Vegas thru the ATN.

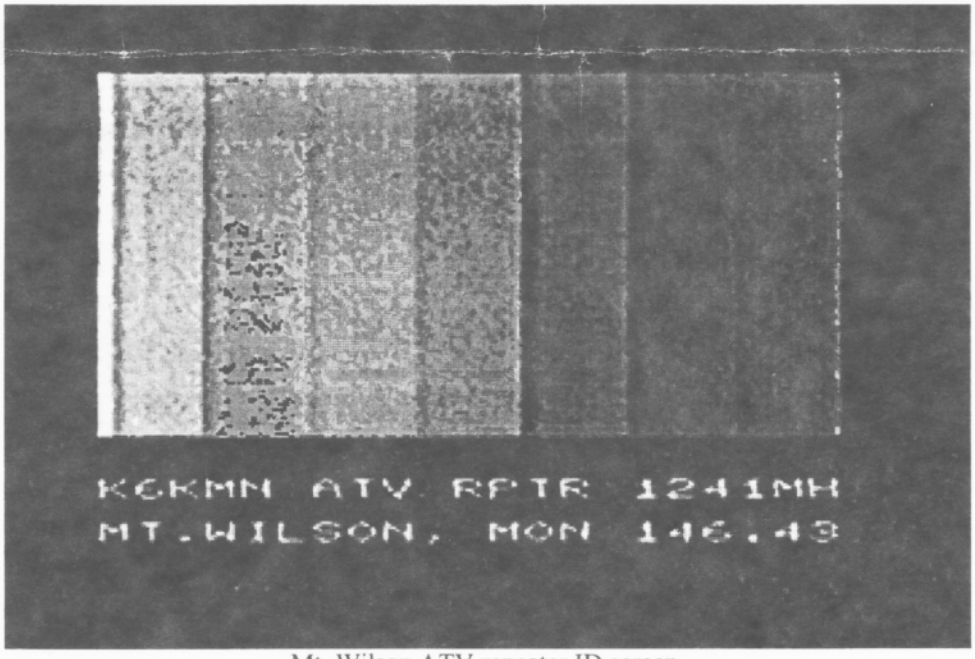
The club already has the equipment for portable 440 MHz ATV operation as well as nearly everything needed for mobile van-based ATV to/from the repeaters and Bldg. S. The next step is to re-install this equipment back to ready-to-run condition.

All club members are welcome to use the ATV equipment, it only requires a technician license. Come in on Monday or Tuesday night and check into the ATV nets; we would like to have W6TRW check in often. There is a list of instructions posted in the shack for turning on the ATV station and using it. Really, all there is to it is turning on about 5 switches and you are ready to play ATV.

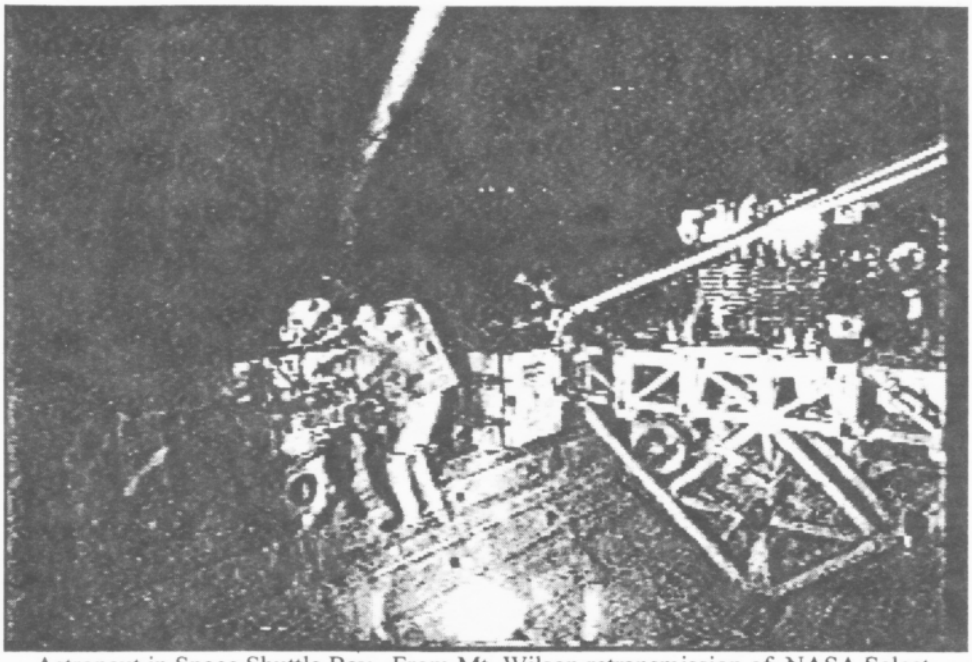
The pictures below were all received in the W6TRW shack from local ATV repeaters.



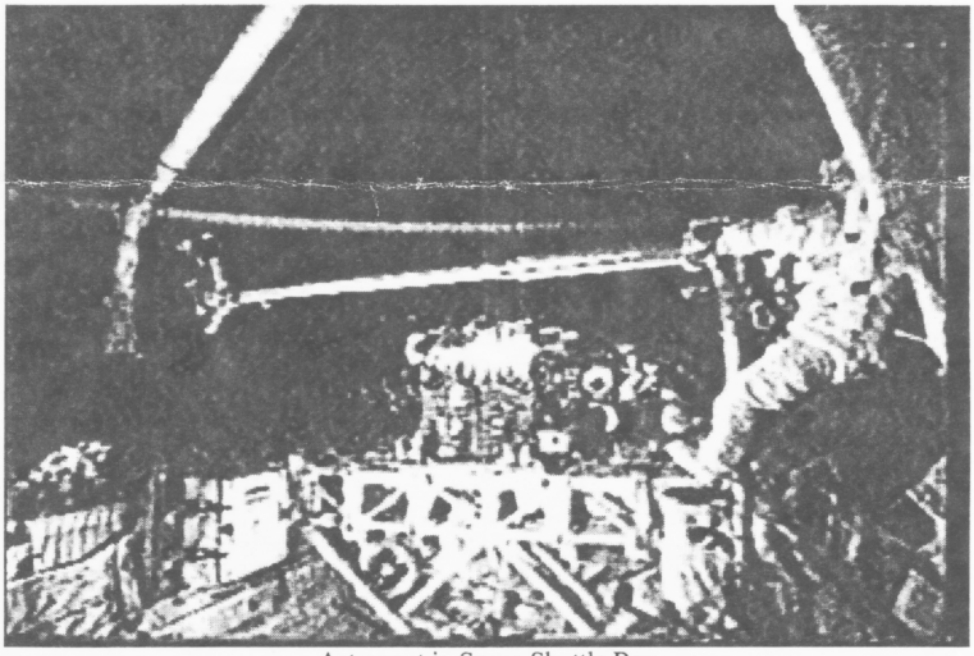
The W6TRW shack as transmitted to Mt. Wilson ATV repeater and back.



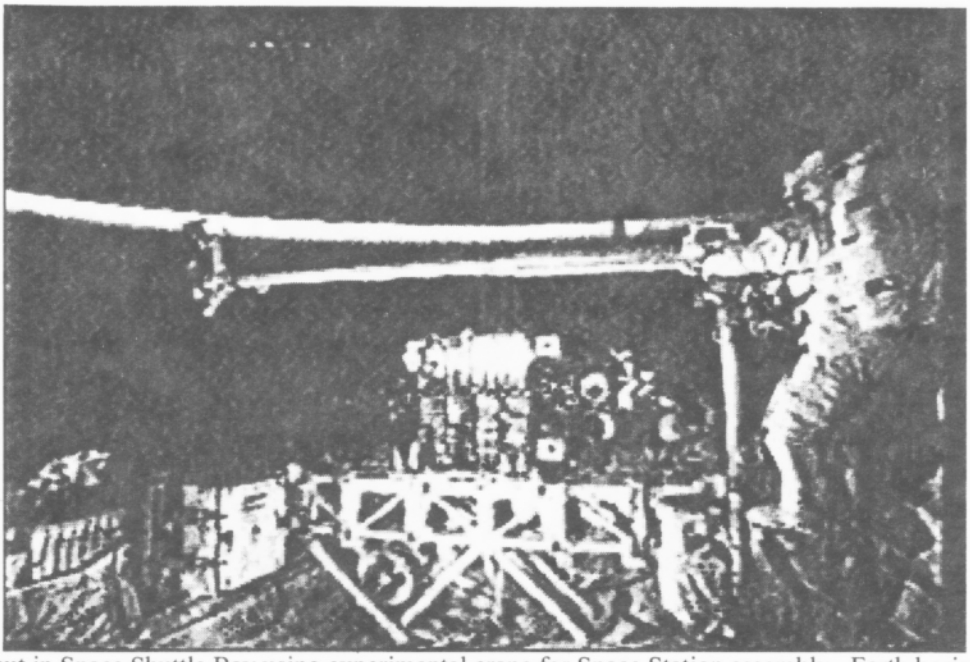
Mt. Wilson ATV repeater ID screen.



Astronaut in Space Shuttle Bay. From Mt. Wilson retransmission of NASA Select.



Astronaut in Space Shuttle Bay



Astronaut in Space Shuttle Bay using experimental crane for Space Station assembly. Earth horizon is in background.

Santiago Peak ATV repeater ID screen.