CROSSTALK

News Bulletin of the TRW Amateur Radio Club

MEMBER ARRL CLUB NO.1658; MEMBER LAACARC
W6TRW REPEATER: 145.320/-.6 (PL 114.8 HZ)
UHF: 447.000/-5 (PL 100.0 HZ)

CALENDAR FOR LATE FEBRUARY AND MARCH, 1990

Every	Friday	Club breakfast at Cafeteria, Bldg. S	7 AM
Every	Wed.	Emergency Communications Team Check-in	Noon
Feb 24	Sat.	TRW/ARC Swapmeet: Marine & Aviation	7-11 AM
Feb 27	Tues.	Club Meeting: R3/EOC (Those who need escort, pse arrive R3 east lobby before noon)	Noon
Mar 6	Tues.	EBM at Pizza Hut, El Segundo & Oceangate	5:30 PM
Mar 16	Fri.	St.Patrick's Day Party, Shakey's Pizza, 5105 Torrance Blvd., west of Anza	5:30 PM
Mar 17	Sat.	Deadline for Crosstalk articles	6 PM
Mar 27	Tues.	Club Meeting: E2-1200	Noon
Mar 31	Sat.	TRW/ARC Swapmeet: Marine & Aviation	7-11 AM

HAM CALENDAR

Feb 23-Feb 25	CQWW 160M SSB Contest
Mar 03-Mar 04	ARRL DX SSB Contest
Mar 09-Mar 11	Japan Int. CW DX Contest
Mar 10-Mar 11	QCWA SSB Party
Mar 12 (Mon.)	RACES/DCS Training Meeting, Lomita Sheriff Station

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President's column ... February, 1990

Happy New Year! I hope that 1990 is going well for you thus far. I started the year off on a positive note by being elected president of our club. Great! I gladly accept the job, and hope to make 1990 a good year at W6TRW. With the approval of our EOC budget, and the success of the Microsat mission, we have certainly hit the ground running this year. Let me take a moment to introduce myself, then I'll describe what I would like to accomplish with our club in 1990.

Who is this guy??

I am Jeff Shields, N9CZA. I am 34, single, and live in an expensive one bedroom apartment in Torrance. I moved to LA from Indiana and joined TRW in August, 1987 and have worked since then as an MTS in the Micro Electronics Center. I received my Novice license (WN9CMU) at the age of 13, and upgraded to General (WB9CMU) a year later. I was inactive during my college years at Purdue, but became interested again during graduate school when my folks (WA9LFA and KA9NZG) bought me a 2m HT for Christmas - my first - a Wilson Mark 4. I renewed my license and became N9CZA.

I became a member of the TRW ARC in January, 1988. During 1988 I served as the Activities Chairman, then was Vice President during 1989. I have become a regular at the TRW ARC swap meet, where I help direct traffic and parking early in the morning, then "monitor the swap meet" after that (which means I wander around, shopping). Also during 1989 I was the project manager for our club's participation in the AMSAT Microsat project. This involved building three test aids for checking out the flight hardware, and upgrading the club's OSCAR station to serve as the West coast ground station after the launch.

Plans for 1990

Here are my thoughts on goals for the club in the coming year. None of this is carved in stone, and I am open to your comments and suggestions. What I've done is to simply list the goals first, then give some ideas on how to accomplish them.

(1) Provide a common focus for the club.
(2) Actively recruit new club members and bring new people into the hobby.
(3) Continue to promote the high tech aspects of ham radio.
(4) Promote open communications within the club.
(5) Have fun!

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(1) Provide a common focus for the club.

What I've observed over the past few years is that our club is composed of many small groups, each being interested in some particular aspect of ham radio. The groups don't always overlap, and people lose touch with one another and with other aspects of the hobby. One of the reasons that we are excited about the Emergency Operations Center project is that it can provide this common focus. No matter what your specialty in amateur radio, we are all concerned about surviving a major earthquake. It is our hope that this universal concern for emergency preparedness will help to unite the club in a common purpose.

(2) Actively recruit new club members and bring new people into the hobby.

We have several projects underway in this area. Bill Shanney KJ6GR has agreed to be training chairman for 1990, and he is in the process of putting together a new ham information packet, which will be available at future swap meets. This provides information on where to go in the Los Angeles area for classes, exams, etc. Bill Freyfogel N6VMS, the club librarian, has recently purchased an up to date copy of the ARRL license manuals and code tapes, which are available in the club shack. We also now have two morse code training programs installed on the club PC.

(3) Continue to promote the high tech aspects of ham radio.

The goal here is to provide club members with access to equipment and technology that they don't have at home. Several people in the club have gotten their start on packet or oscar at the club station, and after they were familiar with it they bought their own equipment for the home QTH. This year promises to be very interesting from a technical standpoint because, in addition to the satellite work, the club will be building an ATV station, a portable 2m repeater for emergency communications, an emergency communications van, and a portable packet station. We also plan to experiment with advanced packet, using TCP/IP, high speed data links, and PACSAT.

(4) Promote open communications within the club.

To this end, we are setting up a special account on the club BBS named "feedback", pasword "w6trw". If you have a comment, suggestion, constructive criticism, question, or whatever, feel free to log in under the feedback account and send anonymous e-mail to me. If you want to communicate in person, call me at the number listed on the back of the Crosstalk. In the absence of any feedback to the contrary, I will assume that things are ok. If not, it's up to you to let me know.

(5) Have fun!

This is supposed to be a hobby, for pete's sake! So, we plan to continue having door prizes at the club meetings, picnics during the summer months, our annual St. Patrick's Day bash, Field Day, the banquet in November, etc.

Well, anyway, enough for now. This promises to be an interesting and exciting year for the club. Big things are in the offing, so find an area that strikes your fancy and jump in!

73 de Jeff n9cza

TRW ARC News

Club meeting

Is at noon Tue 2/27 in the R3 EOC. If you are retired or are a non-TRW employee, please be sure to come a few minutes early to get signed in. After you enter the East lobby, take a right and follow the signs. Speaking of the club meeting, Bill Dews K6AWO will be handling the door prizes, as he is our new Activities Manager. Thanks Bill!

St. Patrick's Day bash coming soon

The annual TRW ARC St. Patrick's day party will take place on Fri. 3/16 at Shakey's Pizza, 5105 Torrance Blvd., Torrance (~~between Hawthorne and~~ west of Anza), from 5:30pm till ???? Talk in on the W6TRW 2m repeater, 145.32. Talk out will also be provided, if necessary!

2m repeater is back

The 2m repeater is back on the air and doing fine. Thanks to Chris WA2KDL for his efforts. The problem was traced to a cracked helical resonator in the receiver front end. Thanks also to Kathy and Lindsey Wachs (WA2KDL's XYL and 3 month old harmonic) for driving to Paramount to pick up the repeater from the repair shop. We appreciate it!

2m packet mystery solved

Recently, there has been a mysterious packet station that has appeared on the input of our 2m repeater. John Keller N6JLS, John Bohner KJ6AW, and Chris Wachs WA2KDL spent most of a Saturday tracking down the source of the interference. It turned out to be a birdie from a local packet node, and the owner has been contacted.

447 machine update

On Saturday Feb 16 Mike Aust WB6DJI and Bill Shrecengost KE6LB worked on the 447 machine and eliminated the hum that had been present on the output. If you have 440 capabilities, give it a try - it is an open machine. The output is 447 Mhz, input is 442 Mhz, PL 100 Hz.

40 meter quad fixed

Thanks to Phil Bergeron N6PB for risking life and limb to climb up the old tower on top of 65 and repair the 40m quad. Time had taken its toll on some of the support lines, and the antenna had fallen down. Works fine now.

Microsat update

It is now 4 weeks since the launch and, at this point, all 4 Microsats have been stabilized. From looking at the daytime solar cell charging currents, it appears that the four spacecraft have aligned themselves with the Earth's magnetic field. LUSAT was designed with its magnets pointing in the opposite direction of the other three satellites, and it has been confirmed that its orientation is opposite that of the other three.The new battery charging algorithm has been uploaded to PACSAT, WEBERSAT, and LUSAT and, after a few tweaks, appears to be working well. On Sat Feb 11 the TV camera on WEBERSAT was switched on for the first time, and it captured and digitized 12 pictures, one every 10 seconds for 2 minutes. W6TRW provided West coast ground support and communications between N4HY on the East coast, NK6K at W6TRW on the West coast, and Weber State in Ogden,Utah during this critical and historic operation. Everything went well, and the spacecraft is now sending a new picture each day for 12 days. For the engineering checkout, the horizon sensors (which insure that the spacecraft is pointing toward Earth) were not utilized, thus the pictures were taken at non-optimum orientations. Sometimes the camera was pointing at the sun, sometimes into deep space, etc. Nevertheless, the hardware and software appear to be working well, and spacecraft commanding for WEBERSAT will resume on Wed 2/21 after the 12'th picture has been transmitted. The S band ground stations are continuing with their preparations, and commanding of the DOVE satellite will begin soon.

EOC on the air

On Wed Feb 14, Bill Dews K6AWO and Jeff N9CZA put up a 2m antenna on top of R3 and put W6TRW on the air at the EOC. We plan to maintain a capability there 24 hours a day from now on. Also, don't forget the Wednesday noontime emergency net, which will be coordinated from the EOC from now on. If you are interested in helping with net control, please contact Rich N6CIZ or Randy W6ZWS.

FLASH! EOC equipment has begun to arrive!!

On Fri Feb 16 we received our first shipment of new ham radio gear for the Emergency Operations Center. There were two hf transceivers (one for R3 and one for the van), a 2m FM xcvr, a 35 Amp 12V power supply, headphones, mobile speakers, etc. It was like Christmas! And this is just the first of many such shipments, as we begin building the new ham shack in R3. If you'd like to join the fun, contact Jeff N9CZA, Rich N6CIZ, or Bill K6AWO.

Information on TRW/ARC Field Day in June may be obtained from Don, W6SQF, X28829, R8/1110.

MINUTES OF THE FEBRUARY 6, 1990 EBM MEETING
By Don Renkowitz, W6SQF

The meeting was called to order by our new President, Jeff, N9CZA. Present were: Greg, N6RRY, Bill, K6AWO, Dave, KF6IB, Rich, N6CIZ, Stan, W6EKK and myself, Don, W6SQF.

The first item of business was approval of the staff officers. Those approved were:

Activities Manager.....Bill Dews, K6AWO
Emergency Coordinator.....Rich Sauer, N6CIZ
Field Day Chairman.....Don Renkowitz, W6SQF
LAACARC Delegate.....Jeff Shields, N9CZA (Acting)
Librarian.....Bill Freyfogal, N6VMS
Membership Chairman.....Rich Sauer, N6CIZ (Acting)
SEA Council Representative...Paul Herbert, KG6CR
Swapmeet Manager.....Frank Cartier, WA6RAY
Technical Chairman.....Chris Wachs, WA2KDL
Training Chairman.....Bill Shanney, KJ6GR
Trustee.....Phil Bergeron, N6PB
Crosstalk Editor.....George Lee, W6IOW (Acting)

The second item of business was the most difficult problem that the Board had to deal with. As was explained in the Crosstalk previously, SEA has imposed a ratio of 25% non-TRW employee members to TRW employee and retired members. As of February 1st, Rich has received approximately 80 employee applications and 31 non-employee apps.

This left the Board with the difficult decision of who to accept and who to reject for membership. In order to be as fair as possible under the circumstances, the total list of 31 names was reviewed and past participation of each applicant in club activities was considered. Using this criteria, 20 names were selected. Those not selected will receive refunds of the dues paid and complementary subscriptions to Crosstalk for this year.

It should be stated that club membership is not a requirement to participate in club activities such as Field Day, swapmeet, meetings, repeater use, etc. Once again, the Board does not enjoy having to make these decisions, but we must abide by SEA's bylaws.

A motion was approved to permit a subscription to Crosstalk for one year for $5.00. This way non-members can continue to receive the newsletter and keep up with club activities.

Motions were made and approved to purchase new firmware revisions for the 2 meter repeater controller and a new tape cassette deck to be used in the club shack.

EMERGENCY COMMUNICATIONS NEWS
By Rich Sauer, N6CIZ

The Emergency Communications Planning Committee continues to meet every Tuesday at the EOC in Building R3. Please feel free to stop by at noon and get involved. As stated last month, we've got several exciting activities going on. Here's a rundown:

EOC/ECC: This stands for Emergency Operations Center (where the company will coordinate disaster recovery activites and Emergency Communications Center where the TRW/ARC will handle radio traffic in the event of a disaster.

The EOC will have a two meter voice radio, packet and ATV receive capability. Equipment is on order. K6AWO and N9CZA have started antenna installation. Dave, KF6IB, has put together an ambitious plan for the ECC including multimode HF, VHF, UHF, ATV, packet and OSCAR capabilities. The latest system diagram shows 13 antennas slated for the roof of R3! The ECC has been painted and carpeted. We waiting for furniture and equipment to arrive.

EMERGENCY COMMUNICATIONS VAN: The company provided van has had some minor mechanical work done (like four new tires, a tuneup, and a new master cylinder) and sports a bright new paint job. At the next club meeting we'll announce the winner of our van logo contest, then we'll be putting the new logo on the side of the van.

Greg, N6RRY's plans call for an interior conversion (including ceiling, paneling, carpeting and captain's chairs) and the installation of a ton of radio gear (all bands, all modes) in a custom console and, of course, related antennas.

REPEATERS: Chris, WA2KDL, is working on hardening the E2 repeater site, linking 2 meters to the 447.000 and, along with Jim, K7JAJ, is putting together another backup repeater.

OTHER STUFF: We're still working on getting those property passes for handhelds. It's just a matter of time, so hang in there. Randy, W6ZWS, is doing a great job with the Wednesday checkins. Thanks to all of you who check in every week.

We still have a long way to go in getting everything up and running. Although lots of equipment is on order, we still have to identify more and then get it all on the air. Stop by the EOC and lend a hand. 73's for now.

CQ: Reviews ICOM R-9000 receiver: 0.1Mhz to ~2Ghz, high stability, 1000 tubable memories, & built-in CRT!
An Ultimate Quagi Antenna: If you have some real estate, you may want to try this high-gain inexpensive antenna out for DX!

73: Reviews IC-765 using a new chip, the Direct Digital Synthesizer.
Reviews IC-725, a very practical mobile transceiver.
Reviews Alinco DR-570T 2M/70cm mobile xcvr, a very good unit.
Reviews MFJ 941D Versa Tuner II, a 300 pep unit with 4:1 balun.
Reviews AEA MX-6S, a 6M SSB/CW HT, ~2w pep.
Reviews AEA new MM-3, the Morse Machine, successor to MorseMatic keyers.

CQ FIELD DAY, CQ FIELD DAY de W6TRW

Without question, the high point of the TRW/ARC activity year is Field Day. The last weekend in June represents the culmination of months of planning and expectation and brings together the coordination and operating expertise of the club. For those who have not participated, let me describe the events.

On Friday evening before the big day, a work party begins the assault on the attic in Building 65 to remove the paraphernalia to an awaiting trailer to be transported to the site. The site in years past (and I expect this year) is a beautiful piece of real estate, known as Friendship Park, located on a grassy hillside in San Pedro overlooking L.A. Harbor.

Amidst organized chaos, the antennas sprout, like Jack's beanstalk, coaxed by teams of would-be circus roustabouts pushing and pulling - sometimes in the same direction. Tents are pitched, motor homes and RV's are parked. The mighty TRW 50 KW generator roars to life and the stage is set for the next day's events.

Saturday morning brings about considerable scurrying to hook up all of the antennas and stations and finalize the installations for the coming event. At the stroke of noon, a 24 hour marathon of calling, reporting and logging begins (watch those dupes!). There are times when you fight into pileups and times when you are the recipient of the pileup (these are the most fun). There are also quiet times, mostly at night, when there is time for ragchewing and getting to know your team partner.

Meals are provided in the Mess Tent, with someone's YL or XYL serving up the chow. It's amazing that even simple fare tastes better outdoors. In the past we had N6JLS' famous Sunday breakfast of pancakes and sausage. I can't promise John this year, but I'm sure we'll find a worthy substitute.

Sunday morning is the last chance to rack up points before the noon hour. Shortly after 12 comes the big packup and cleanup, with the crew returning the gear to Building 65 to await another campaign.

In the past, we have had seven stations operating HF, VHF, UHF, CW, SSB and FM along with packet and OSCAR. If you can't find an activity that interests you in this assortment, you're not a ham. TRW's Field Day performance has achieved national prominence and, despite the absence of some key people last year, we still scored in the top five stations nationwide in our class (7-A).

If any or all of the above have piqued your interest, give me a call and tell me how you want to participate. We need everyone from antenna installers to operators (especially CW ops), dupers (not to be confused with dummies - dupers are the guys who keep track of who you already contacted and usually alternate with operators - we have enough dummies!), and night operators. Night ops can be with their families all day and still participate. We also need help with meals and the Sunday teardown. There's a job for everyone. Join the fun.

73, CU there, Don W6SQF

W6TRW Serves as Microsat West Coast Ground Station

Something has definitely been going on in TRW's building 65 lately. For the past six months the level of activity at the amateur radio club has seen a steady increase. The receptionists and security guards have come to recognize several club members by sight and, when they see them coming, automatically begin reaching for the key to the ham shack. The custodians report a dramatic increase in the ammount of junk food remnants left in the trash cans, and the night watchman reports hearing unusual sounds and frequent bursts of demoniacal laughter issuing from the vicinity of the radio club. Several people have been observed working on the roof on the weekends and they seem to have constructed an antenna array that not only moves right and left, it moves ... upward!

(1) CPU prototype packaging

All this began back in March,1989, when AMSAT's Harold Price NK6K contacted friend and TRW ARC member Chris Wachs WA2KDL, and asked if the club would be interested in helping with the Microsat project. A prototype of the flight cpu had been built in wire wrap form (see page 40 of May,1989 QST) and it was necessary to package the system in a more permanent form (the boards were originally mounted on a piece of plexiglass). It was also necessary to design and build an RS-232 interface board for the cpu. Harold planned to hand carry the prototype cpu to a Microsat meeting in Boulder,Colorado and, since the final package had to fit under an airline seat, there were some size and weight constraints. Of course it had to be sturdy, and cost is always a factor, but the main constraint was that it had to be done quickly - in a week and a half. Finally, since this was the world's only copy of the Microsat cpu and was being used for spacecraft hardware and software development, the packaging of the delicate wire wrapped boards had to be done right the first time. We agreed to do it, and the TRW ARC Microsat team was formed. Initially the team consisted of Rich Sauer N6CIZ, Jeff Shields N9CZA, and Chris Wachs WA2KDL. The interface board and cpu packaging were completed on schedule, and everything worked well. We had passed the initiation test!

(2A) Test aid construction

Our next project was to build three test aids for checking out the Microsat flight hardware. There were two types: a spacecraft simulator (used to test the cpu board), and a cpu simulator (used to test the spacecraft boards). These were breakout boxes that could be used to simulate the digital signals that, for example, the cpu would see from the spacecraft over the bus. The spacecraft simulator was given first priority and, after the design had been approved by AMSAT, the team set about gathering the parts, doing the metal work, wiring, and testing the simulator. By this time, Irv Zipper WA6ZOU and Carmine Gentile had joined the team. Irv built the circuit boards that are the heart of the simulators and Carmine helped with the wiring harnesses. The spacecraft simulator was delivered on schedule to Harold Price in mid June, along with some professional looking schematic drawings made by Rich Sauer N6CIZ. It was subsequently used in San Diego to test and debug the first production Microsat cpu board. The other two test aids, the cpu simulators, were then built by the group and delivered on schedule in mid August, and subsequently used during the spacecraft integration and thermal-vac testing in Boulder,Colorado in early September. All three test aids, which came to be known as the "TRW buffer boxes", were later shipped by AMSAT to Korou, French Guyana and used during the final spacecraft integration and testing at the launch site. For this effort, the TRW ARC was presented with a plaque at the AMSAT Space Symposium in November,1989.

(2B) Microsat ground station construction

While the first test aid was under construction, Harold asked if we might also be interested in using the club's Oscar station as the West coast ground station for the Microsat launch. Bob McGwier N4HY would serve as the East coast ground station, Weber State College was building a ground station for Webersat at their site in Ogden,Utah, and the Uosat's would be controlled from the ground station at the University of Surrey. It is advantageous to have ground stations on both coasts of the US, to provide backup during critical operations and to speed up the software upload process. TRW ARC, the thought went, could utilize its financial and manpower resources to upgrade the club's Oscar station for Microsat use, which would allow Harold and the other West coast Microsat team members to focus on the computer hardware/software development. (It probably didn't hurt that the club station was only 10 minutes from Harold's house!)

A proposal was presented by Jeff N9CZA at the April,1989 TRW ARC Executive Board Meeting, and the board approved a $2K budget for Oscar station enhancements. (It probably didn't hurt that the original TRW ARC Microsat team of N6CIZ, N9CZA, and WA2KDL were also the President, Vice President, and Treasurer of the club!) The other board members were also very enthusiastic about the project, as the club had been a long time supporter of AMSAT and had been involved in past Oscar projects (for example, an earlier generation of TRW ARC members built Oscar-4 back in 1965). Our committment to AMSAT was to provide ground support at W6TRW during the first several weeks after launch, sponsoring Harold Price NK6K and Skip Hansen WB6YMH, and assisting with the engineering checkout of the spacecraft and initial software uploading. The plan was that, after launch, Harold and Skip would concentrate on the spacecraft hardware and software issues, while the club took care of the satellite communications system. After the engineering check out and spacecraft stabilization had been completed, another ground station would be commissioned on the West coast, and then W6TRW would return to fun mode. And, of course, we would still be available if needed.

The next several months were spent acquiring, building, and integrating the equipment for the ground station. The club purchased a 440 Mhz all mode transceiver, hardware/software for automatically tracking the antennas and tuning the radios with the club's PC, a TAPR PSK modem, and GaAsFET preamps for 2m and 440 Mhz. The schedule at that point indicated a launch in late October or early November - about 6 months away. Jeff N9CZA agreed to be the project manager for the TRW ARC Microsat team and the station slowly began to take shape.

At the heart of any Oscar station is the antenna system, and quite a lot of time has been devoted to the one at W6TRW. The current generation of antennas, 22 elements on 2m and 40 elements on 440 Mhz, were built by Jeff N9CZA and Terry Thompson KB6CUT and installed at the time of the Oscar-13 launch in the summer of 1988. Several other club members helped at the antenna raising party: Phil Bergeron N6PB, Greg Martens N6RRY, Steve O'Neal N6CRR, Don Renkowitz W6SQF, and Chris Wachs WA2KDL. Chris WA2KDL and Jeff N9CZA spent most of a weekend in August,1989 "on the roof", mounting the GaAsFET preamps and installing a reinforced fiberglass boom. After the automated antenna tracking hardware/software was installed, the antennas were carefully aligned and found to track well with Oscars 9-13.

As an aside, one thing that is required for accurate antenna tracking is to know the lattitude/longitude of your location. We have determined the location of the W6TRW club shack very precisely by using the Global Positioning System (working at an aerospace company has its advantages!).

Another critical item of a Microsat station is the PSK modem. The spacecraft use AX.25 packet protocol, with Manchester encoded FSK on the 2m uplink and BPSK on the 440 Mhz downlink. TAPR offers a modem that connects to the external modem header of a TNC, providing both Manchester modulation and PSK demodulation. At the time it was only available in kit form, and so John Keller N6JLS built a TAPR PSK modem for the club station and Jeff N9CZA built a second TAPR PSK modem which is on loan to the club. The initial alignment of the modems is somewhat involved, but was made easier by a weekend loan of some commercial quality test equipment, arranged by Chris WA2KDL and Bobbie Love. (As an afterthought, in nearly four weeks of continuous operation since the launch, both modems have performed flawlessly.)

Work on the W6TRW ground station was completed in early October,1989, a month ahead of the scheduled launch date of November 9. Due to a problem with the Arianne launch vehicle, however, the lift off was postponed until mid-January. So, in the meantime, some enhancements were made at W6TRW. Bill Shanney KJ6GR and Terry Thompson KB6CUT loaned the club their 440 transceivers, which provided the capability of receiving all 4 microsats at once. Frank Cartier WA6RAY also made his 440 transceiver available, if needed. Dave Williams KF6IB built a much needed set of shelves for the Oscar station, and Larry Zendle designed an audio distribution box, which splits the receiver audio into a modem, tape recorder, speaker, headphones, etc. - all with proper level control and impedance matching. Larry, Irv Zipper WA6ZOU, and Greg Martens N6RRY then built audio distribution boxes for the ground station.

PSK tests were performed through Oscar-13, and the intention was to use FO-12 to test the PSK modems further, under simulated Microsat conditions. However, in late November FO-12 became a silent key (silent transponder?) and was no longer available for on the air testing. Fortunately, Jack Mathias W9FMW made available a cassette tape of FO-12 transmissions, which was obtained through AMSAT and used at W6TRW to test our PSK modems. Also, Chris WA2KDL built a "Microsat simulator" out of a spare 440 Mhz/10m transverter and the club's hf rig. By transmitting through the transverter and receiving on the Oscar station, a PSK loopback test could be performed to test the modems and their AFC circuits, and to optimize the passband characteristics of the 440 receiver for PSK reception.

As the launch date approached, several people brought additional equipment to the club for ground station use. Rich Sauer N6CIZ brought a 35mm camera, a camcorder, and an oscilloscope, Irv Zipper WA6ZOU brought his PC-XT, Larry Zendle and Jeff N9CZA brought their cassette decks to record telemetry, Chris WA2KDL brought a 2m power amplifier, and Terry Thompson KB6CUT moved heaven and earth to borrow a spectrum analyzer. Meanwhile, Chris WA2KDL took care of the paperwork to get all of this stuff past TRW security (a story within itself).

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*** Next month, in Part 2, we will cover launch weekend, the first month *
*** of spacecraft operations, and some closing thoughts on it all. *
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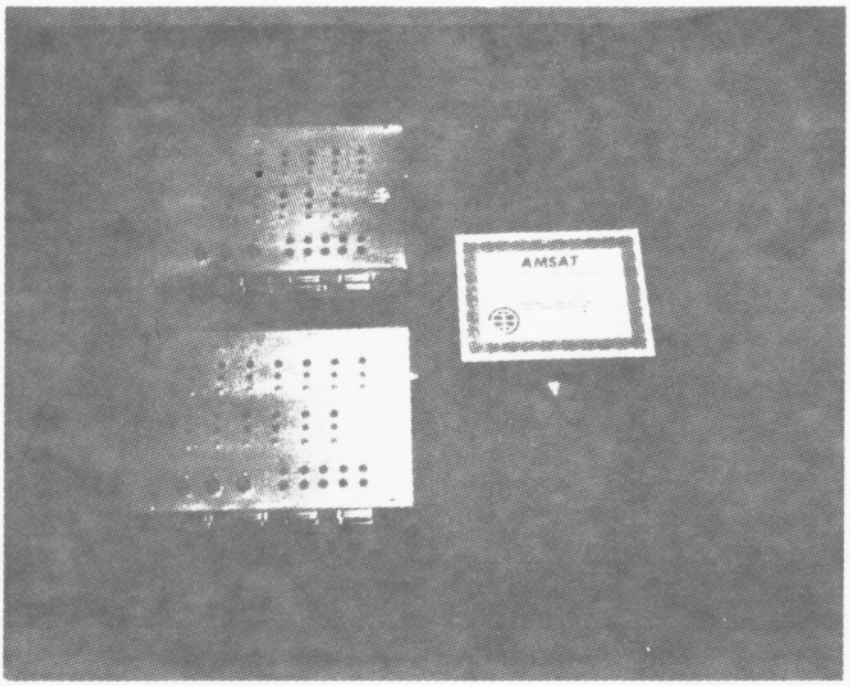
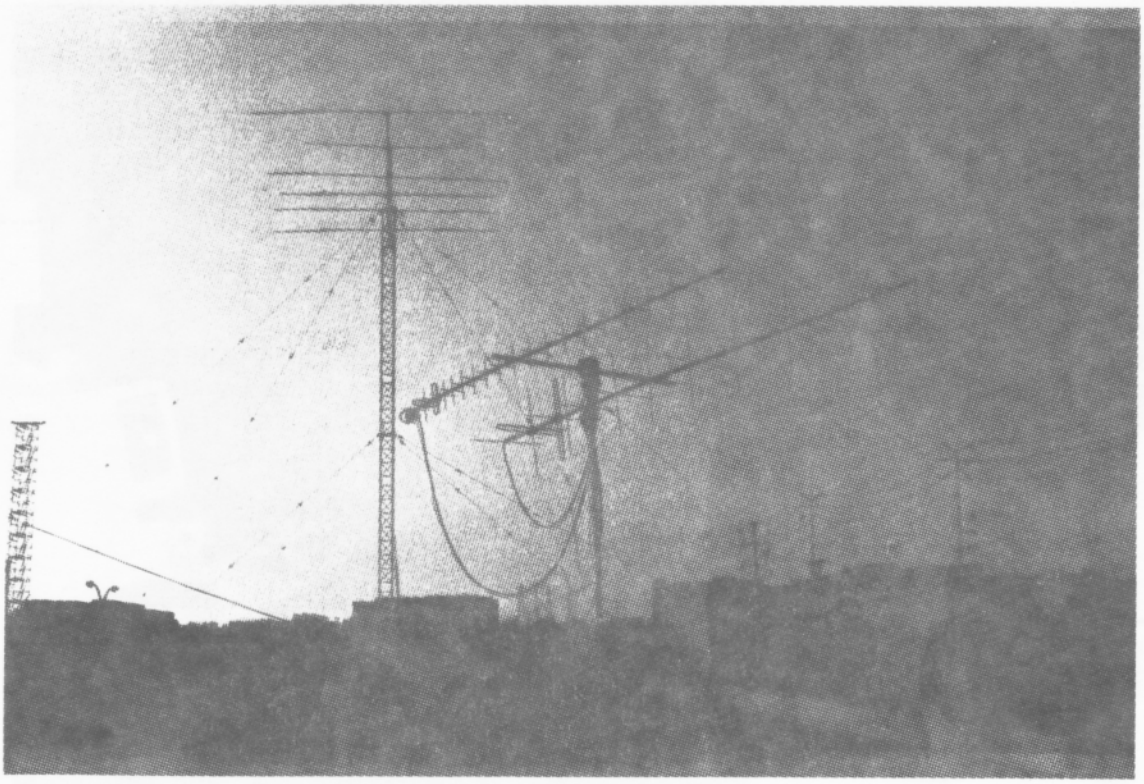
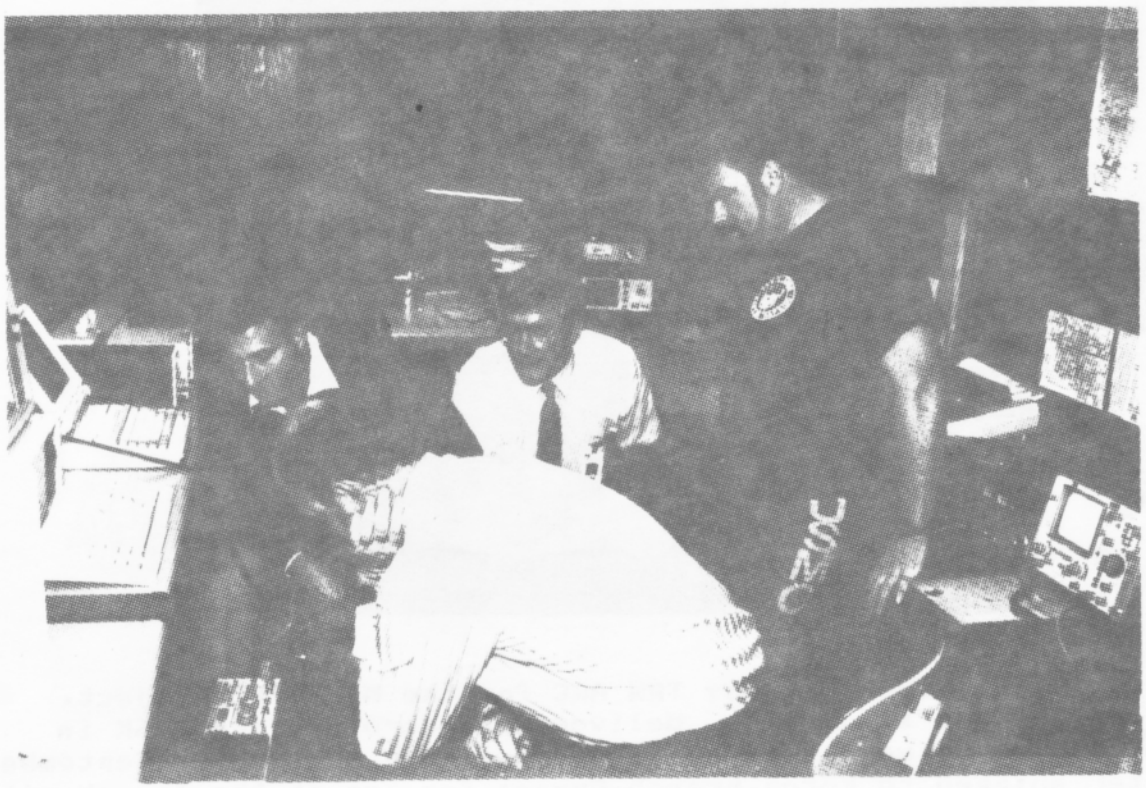
73 de Jeff n9cza



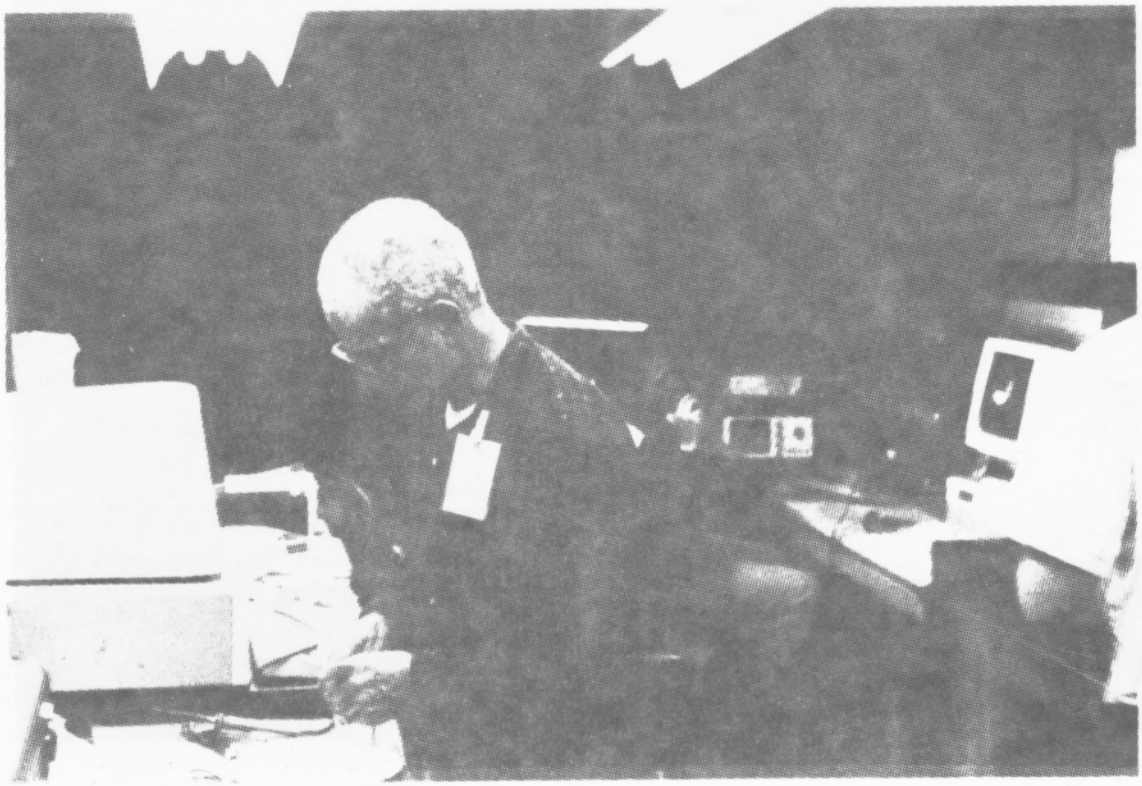
Two of the test aids built by TRW ARC for the Microsat project. These are the cpu simulators, delivered to Harold Price NK6K in August,1989. They were used during thermal-vac testing in September and later shipped to Korou,French Guyana for use at the launch site.



The W6TRW antenna farm at building 65. In the foreground are the Oscar antennas, 40 elements on 440 Mhz and 22 elements on 2m. Just below the rotor are the GaAsFET preamps. In the background is a 10-15-20m beam, and to the photographer's left is a 40m quad and an 80m inverted vee.



Friday night, 1/19/90 at W6TRW. Terry Thompson KB6CUT (foreground) checks our transmitter signal on a spectrum analyzer as (left to right) Larry Zendle, Jeff Shields N9CZA, and Greg Martens N6RRY look on.



Irv Zipper WA6ZOU puts the finishing touches on a cable for his audio distribution box. Irv also built the "TRW buffer box" circuit boards. In the background, Larry Zendle is operating the main W6TRW Oscar station.

Chris Wachs WA2KDL at the expanded W6TRW Oscar station. The radios were on loan from Bill Shanney KJ6GR and Terry Thompson KB6CUT. On top of the radios are (l to r) N6RRY and WA6ZOU's audio boxes, and N9CZA's PSK modem.

Rich Sauer N6CIZ served as the club cameraman on launch weekend, taking 35mm photos and video. Shown here are (cw from left) WA2KDL, Courtney Duncan N5BF, Terry Price (Harold's XYL), N6CIZ, and Skip Hansen WB6YMH.

Correspondence from Bob Bloom, W6YUY

You mentioned that there were 5 antenna articles in the Sept. issue of 73 but you hadn't noted that the Duobander for 12 & 17 meters on page 20 designed and written by W6YUY, an Associate Member of the TRW Radio Club.

Some trevia that may or may not be of interest:
W6YUY may be the most senior seller at the TRW Swapmeet, not necessarily by age (73 years) but having attended the Swapmeet consistantly since the very first, some 12 to 15 years ago.

The first Swapmeet took place on the lot now occupied by the building just to the right of the entrance along side Aviation Blvd. On that day, there were between eight and ten sellers and between 35 to 50 buyers and lookers.W6YUY's present spot is J-2 which is located just to the right as you enter the sellers' lot.

Have been writing technical articles for both 73 and Ham Radio since Dec. 1970. The feature article Dec. 73 (was it in Dec. 73 in 73 mag? - Editor) (was) an All Band Solid State Hybrid Side-band Exciter; 45 articles for 73, all told, 8 for HR and 1 for CQ in 1951.

Am an active member of Amsat and ARES. Presently working on a Communications Van for ARES. When we finish, it is proposed to have communications facility for 40M thru 1.2Ghz. Will include Fast-Scan TV, Packet and 3 police and 3 fire dept. freq.

W6YUY has been a ham operator for a few years including having several call signs. Was on the air Dec. 7, 1941 getting all hams to QRT.(it happened to be my first wedding anniversary too.) Spent 3 years in England on the staff of Gen. Jimmy Doolittle as a Signal Corps Officer detached to the Eighth Air Force. Was in-charge- of DF over the English Channel with the British Air Sea Rescur Group.

See you this coming Swapmeet. W6YUY, Bob.

(Editor's note: Thank you. Bob, for taking time out to write us. It is very nice to hear from associate member like you, an old timer indeed. We appreciate your long support to our Swapmeet thruout the years (some 10 yrs!). We hope that you have met personally some of your old friends there from various repeaters in the area. Thru swapmeets, it is our hope that they may help some people out there to get into ham radio, building their projects with the inexpensive parts, and thus forming a pool of skilled operators and electronic technicians for the society and the country in case of emergency.

From you letter, we know that you had fought courageously for us during WWII. Occasionally we see your articles in the ham mag, and the last one I could recall now was building the Transverters for your TS-940! Keep up the good work, Bob es 73)