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It Appears By Spears

I would like to start by apologize for there being no Scope last month. Sometimes life gets in the way.

In this issue on Page 10 we have an article by John about the replacement of the packet repeater. We owe a lot to John who works diligently to keep our equipment running.

Michele, Thompson, W5NYV provided some amazing pictures of our tower and site following our recent snow storm. You would never guess we live in Southern California based on those picture. What amazes me the most is that almost everything kept right on work despite the snow and cold.

As always I am looking for articles, photos etc. for the Scope.

Keith Spears, KM6CXW
Editor

Tower Trailer Work Party on March 9th

As announced at last month's club meeting, the work to refurbish the PARC trailer continues this month.

A work party will be hosted by WB6IQS (John) at his QTH this coming Saturday March 9th. Hours are (weather permitting) 10:00 AM - 2:00 PM (PST). John's QTH address is 703 Mimosa Avenue, Vista

The work is light sanding of the metal frame and trailer floor. It will be done with manual tools and powered equipment. This will be easy to do for any able bodied ham radio operator.

We ask that our Club's members consider volunteering a few hours of the leisure time to help refurbish this equipment. Getting it refurbished will permit the trailer's use for Club remote operating events and to use as storage equipment which will lower monthly equipment storage expenses.

As with all Club activities, attendees will earn point awards that may lead to winning prizes at the annual club picnic.

Thanks for your cooperation in this important activity.

73 de NN3V
Charlie

Board Members and Committee Chairs

Board of Directors

President	Joe Peterson, K6JPE	(619) 630-8283
Vice President	Charlie Ristorcelli, NN3V	(619) 368-7617
Treasurer	Tom Ellett, W0NI	(858) 546-1148
Secretary	Tony Zuppero, K5TZ	
Director 1	John Kuivinen, WB6IQS	(760) 727-3876
Director 2	Greg Gibbs, K16RXX	(760) 583-9668
Membership Chair	Glen Christensen, A16RR	(858) 735-1144
Repeater Technical Chair	Mark Raptis, KF6WTN	
Scope Editor	Keith Spears, KM6CXW	(858) 472-8442 Text Welcome

Non Voting Members

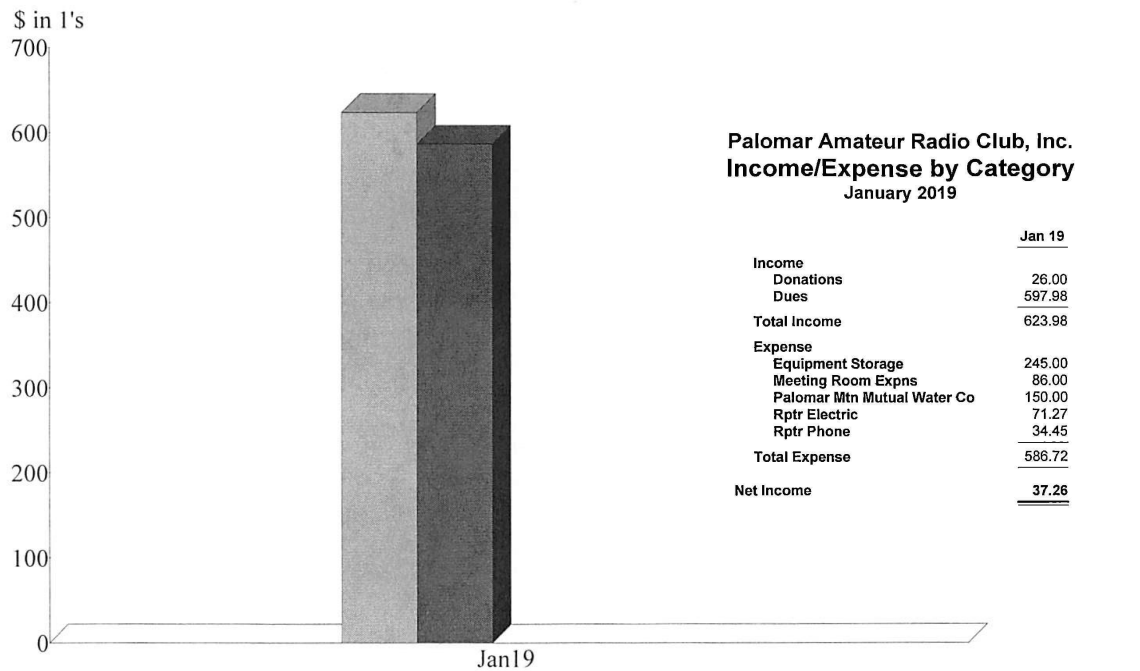
Repeater Site Chair	Mark Raptis, KF6WTN	(Acting)
Webmaster	Guido Sansonia, NO6I	(760)-224-6824
Trustee	Michelle Thompson, W5NYV	mountain.michelle@gmail.com

Committee Chairs

Boy Scouts	Michael Palugod	mpalugod@yahoo.com
Digital ATV	Michelle Thompson, W5NYV	mountain.michelle@gmail.com
Echo Link	Bernie Lafreniere N6FN	N6FN@niftyaccessories.com
HF Remote	HF Remote SIG	hfremote@palomararc.org
Mesh Networking	Michelle Thompson, W5NYV	mountain.michelle@gmail.com
Operating Day		

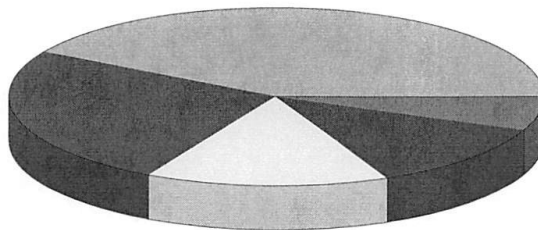
SD Microwave Group Liaison Kerry Banke N6IZW kbanke@sbcglobal.net

Income and Expense by Month
January 2019



Expense Summary
January 2019

Equipment Storage	\$245.00
Palomar Mtn Mutual Water Co	150.00
Meeting Room Expns	86.00
Rptr Electric	71.27
Rptr Phone	34.45
Total	\$586.72



By Account

March Program

Mark Raptis, KF6WTN will be giving a presentation on PARC's repeater system. Come learn all about our repeaters and all that is required to keep them running. This presentation is part of the board's continuing effort to present technical subjects that are requested by the members.



73 de NN3V
Charlie

For Sale

HP 2764 power supply. Maximum 60VDC variable at 15 Amperes continuous, 900 Watt, Rack Mount Power Supply: Electronically regulated, current limited. Dual meters. With service manual. 120 VAC operation. \$75, Very Heavy, Works OK.

Heathkit bench style 300 Watt Regulated Power Supply: Model IP-2760, 10 - 16 VDC, 25 Amperes. Dual meters, "Battery Eliminator". \$50, works OK.

Prices negotiable. See WB6IQS@cox.net. 760-727-3876.

Scholarship Committee Report

Thanks to the incredible work by Gayle KG60, Michelle W5NYV, and Charlie NN3V we have funded a scholarship with ARRL Foundation under the Palomar Amateur Radio Club name! We will have further information on how your interested family and friends may apply, what the requirements are, and how the decision is made in the coming months. The first scholarship will be available for the 2018-2019 school year! We are still pushing for some additional funds to create a second scholarship, but that will be for the 2019-2020 school year. Keep an eye out for further information later in the year, and remember us when you're preparing your tax write-offs for 2019!

Upcoming Events

March 6th	7:30	PARC Meeting	Pine Ave. Community Center
March 13th	7:00	PARC Board Meeting	Poway Fire Station #3
April 3	7:30	PARC Meeting	Pine Ave. Community Center
April 10	7:00	PARC Board Meeting	Poway Fire Station #3
April 12-14	All Day	International. DX Convention	Visalia, CA

Repeater Status

This list includes W6NWX repeaters operated by PARC and other repeaters open to use by PARC members. All W6NWX repeaters are located on Palomar Mountain and are open to all amateurs.

Frequency	TX	Tone	Call sign	Remarks
52.680	-	107.2	W6NWX	Back on the air
146.730	-	107.2	W6NWX	System Fusion enabled. See Note 1
147.075	+	107.2	W6NWX	System Fusion enabled. See Note 1
147.130	+	107.2	W6NWX	System Fusion enabled. See Note 1
447.000	-	107.2	W6NWX	FM only for EchoLink Call Sign W6NWX
224.900	-	107.2	WD6HFR	Convair/220 ARC
224.380	-	107.2	KK6KD	HARS Hispanic Amateur Radio Society Open
224.940	-	107.2	KK6KD	HARS: Sharp Chula Vista Hospital, Open
145.260	-	107.2	KK6KD	HARS: San Diego Open
147.945	-	107.2	KK6KD	HARS: System Fusion Mt. Miguel Open
448.460	-	151.4	KK6KD	HARS: Mt. Miguel, San Diego Open
145.460	-	110.9	XE2DXA	HARS: Tijuana, Mexico Open
146.970	-	107.2	KA3AJM	Vista-Sponsored by MetroNET
146.175	+	107.2	N6FQ	Fallbrook ARC; linked to 445.600
445.600	-	107.2	N6FQ	Fallbrook ARC; linked to 146.175
145.050	s	N/A	W6NWX-1	Packet node; linked to metro 9600 net 1
146.700	-	N/A	W6NWX-3	Packet duplex repeater; Duplex 3

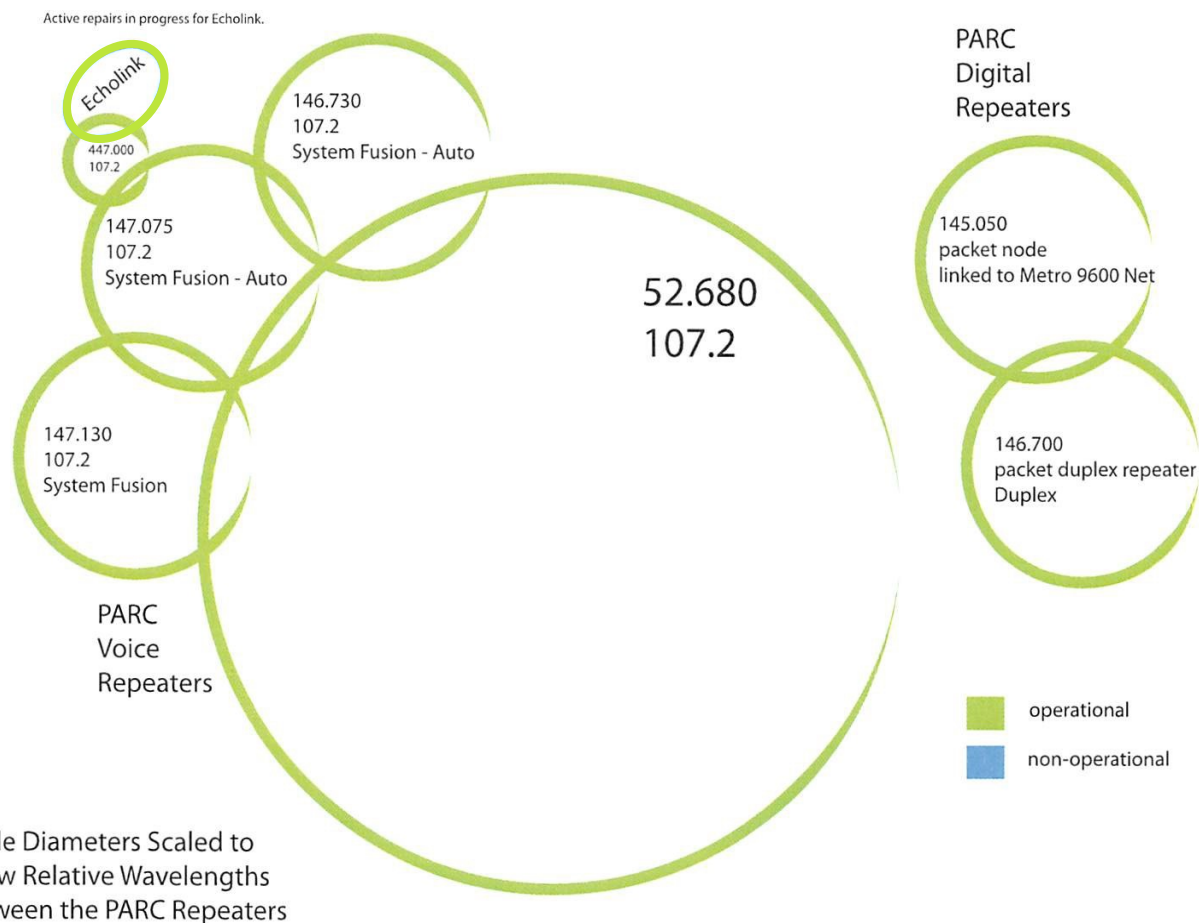
PARC operates an armature fast-scan television repeater. It's currently off the air. Currently there are not links to other ATV sites.

- ATV in: 915 MHz WBFM audio subcarrier 5.8 MHz
- ATV in 2441.5 MHz WBFM, audio subcarrier 6.0 MHz
- Intercom: 146.415 MHz NBFM simplex (tone 79.7). Currently not working.
- ATV out: 1241.25 MHz VSB, NTSC Standard

The PARC repeater site on Palomar Mountain is located at 5560 feet above mean sea level and 2132 above mean terrain. It covers most of San Diego County and beyond into Mexico and out to sea, and is shielded from the North.

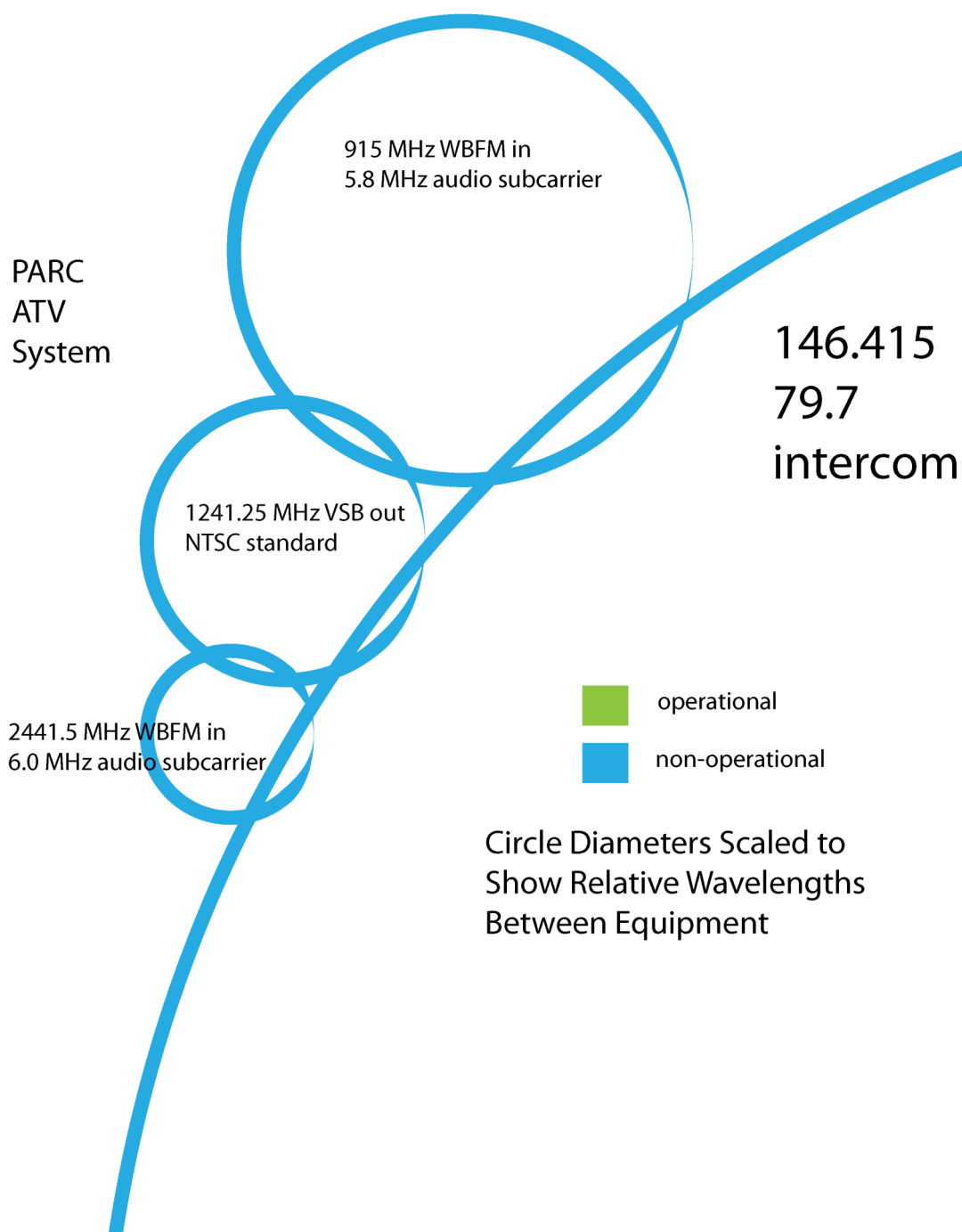
Note 1: All Fusion enabled repeaters require a CTCSS tone of 107.2 Hz to access the repeater and also transmit a 107.2 Hz tone. Since the repeater output has a 107.2 tone you can enable CTCSS receive tone squelch on your transceiver which will eliminate interference from spurious noise and other repeaters. Control operators have the capability of setting the Fusion Repeaters to FM only operation. Consequently if you can't bring up the repeater in C4FM digital mode, try using normal FM mode. When in FM mode all Fusion repeaters have a 3 minute maximum transmit time, after which the repeater will cut off transmission until after the received signal drops. To prevent timing out the repeater after someone finishes talking, wait until you hear the courtesy beep which indicates that the 3 minute time has been reset. If a transmit timeout happens the repeater will provide a voice message indicating that the maximum transmit time has been exceeded.

Reported Repeater Status



Thanks to Michelle Thompson, W5NYV for the repeater status graphics.

Reported ATV Status



Membership Report

You can check the status of your membership 24/7 at Member List or go to the club's website and navigate to Join and click on "here" at the top of the page. Enter your call sign into the box and click the "Look up my membership status

now" button. To renew your membership or extend your membership, fill in the form on the Join page. Make sure you select the correct value from each of the drop-down menus (Type of Membership, How many years, I'm an ARRL Member,

Newsletter option and License Class). If you want to receive an email when your membership is coming due for renewal, please make sure that I have a valid email address for you. To do that, please send an email to MembershipChair@palomararc.org.



Check the status of your membership 24/7 at [Member List](#). If you don't find your name and callsign on that page, then your dues have lapsed. If you have questions, send email to MembershipChair@palomararc.org.

Donate to PARC by Shopping at Amazon

As publicized earlier this year, PARC is now a not-for-profit charity, and funds donated to PARC are deductible for income tax purpose if you itemize. PARC also announced

that in cooperation with Amazon, it is now possible to shop on Amazon at NO cost increase, and have Amazon distribute a percentage donation to PARC.

This is done by shopping on www.smile.Amazon.com. If you choose to avail yourself of this opportunity, when shopping on www.smile.amazon.com,



Polo Shirts

We're ordering Polo shirts! Some of you already have orders in with me from the last meeting, please be ready to pre-pay for them so we can get the order placed ASAP! We need

20 shirts to get the price I've been quoted. If we end up with 30+ then the price goes down and I'll have a little change for those who have pre-paid once your shirts come in! Base price: \$21.00 includes printing on the front, PARC logo on one

side and your name/callsign over the pocket. Add \$2.00 for 2XL, \$3.50 for 3XL, or \$5.00 for 4XL. Add \$5.00 if you also want the logo printed large on the back.

73 de K6JPE



Replacement Simplex Packet Repeater Construction and Test Report

Background:

The existing 145.050 simplex packet repeater has been down for some months. A replacement repeater has been in the works but due to issues with setting up the new SCOM 7330 controller, vacations and weather it has not been possible to replace it.



The original 145.050 simplex packet repeater consists of an old 1970s Motorola Micor mobile radio, MFJ 1270 TNC and 3 pass-only cavities. A DB-25 data port also connects to a Motorola Mitrek 440 MHz radio that operates as a “backbone” high speed 9600 baud data connection. I have rebuilt the Micor radio several times over the years with new electrolytic capacitors and replaced damaged transistors but the time has come to replace it with a more modern design.

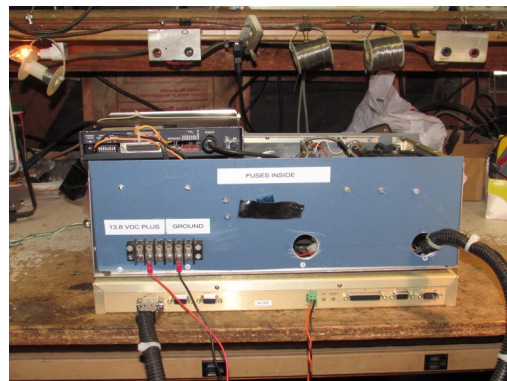
The original Micor radio requires a cabinet about 3' tall X 10" deep and 21" wide. It is a two person operation to move it about. The new replacement repeater will only be about 10" tall and weigh much less.

Power Supply:

12 VDC radio power is supplied by a Meanwell DC-DC converter that operates from our 48 VDC main battery power. Our 48 VDC battery is charged by AC mains power and originally had 1300 AHr (Ampere Hours) capacity. The 48 VDC battery consists of twenty-four two volt batteries in series. Each battery is approximately 2.5' tall X 18" deep X 12" wide. The batteries came from ATT / Pacific Bell and were originally to be used as a battery backup system for the land line telephones.

Consider that a typical car battery is a nominal 12 VDC and may have 90 AHrs capacity. This equates to 1080 WHrs (Watt Hours) capacity vs. our backup system of 62,400 WHrs. We estimate that during an emergency we can operate for several weeks before the batteries must be re-charged, even at high usage rates.

The batteries are getting old and have a rated life of 20 years. We have been using them for



Packet Repeater Replacement-Continued



about 20 years and they show no signs of degradation. Eventually they will have to be replaced but the AHr capacity curves show that they should be good for many years to come. Battery failure problems typically are over-charging thus losing water from the cells and shorting plates in the cells due to contamination in the bottoms of the cells. We are watching them very carefully to avoid these issues.

Replacement Radios:

Replacements for the old Micor mobile are Midland programmable 2 meter radios model 70-1342B. They operate at either 9

Watts or 35 Watts transmitter power output, have a sensitive receiver that is well shielded to outside interference and have worked well for other ham repeater projects. Repeater-BUILDER web site shows that these radios are well regarded for ham radio repeater projects. They were made in the early 1990s but are the last of the standard 5 KHz deviation FM radios. Later radio designs are of the Trunking or digitally encrypted variety and used frequency hopping technology that is incompatible with common ham radio usage.

These radios are physically much smaller than the Micors and use SMT (Surface Mount Technology). They are easy to mount into 19" standard rack panels as they are complete dash board mounted radios using a local microphone and 8 Ohm speaker. SMT capacitors are less susceptible to aging problems.

Older Motorola Micor mobiles were made to be trunk mounted and had a long multi-conductor control cable about 3/4" in diameter that ran to a control head under the dash board. The control head required numerous connections for volume, squelch, channel selection, loud speaker and microphone signals. The Micors were also power hogs requiring several amperes of continuous power during receive. Transmitter RF power transistors of the 1970s were inefficient requiring more stages of amplification and much larger heat sinks for the same power output. Custom crystals were required for each receive and transmit channel. While custom crystals were commonly made in earlier times (International Crystal, Sentry Crystal, etc.) today they are nearly impossible



Packet Repeater Replacement-Continued

to order as they are generally obsolete.

Programming:

Midland radios use a custom program and programming cable to interface to an older Windows laptop computer. I have a working Windows 98 laptop computer that will operate the Midland program correctly but I have found that a Windows XP computer will also work. The serial data cable is used to setup receiver / transmitter frequencies, PL (Private Line / CTCSS tones) and sets the number of the channel and power levels. Even if power is removed the radios remember the channel data via programmable memory so no internal battery backup is required.

Radio Modifications:

The “B” model radios were originally rated to operate from 148-165 MHz. To operate reliably in the ham radio frequencies (145 MHz) they require that the PLL (Phase Locked Loop) tuning slugs be retuned for the lower frequency band. Cuts and jumps are also required to the receiver’s “discriminator” and COS (Carrier Operated Squelch) signal. The Motorola dual conversion receiver IC (MC3361P) has a commonly used 1st I.F. (Intermediate Frequency) of 10.7 MHz and a 2nd I.F. of 455 KHz. A separate PLL controls the transmitter and receiver functions.

Midland 70-1342A models operated from 136 – 148 MHz. They were originally available in the 1990s but now are very rare. The 70-1342B models cost about \$20 plus shipping on EBay. They are available from surplus radio stores or a company that is cleaning out their older models. They can also be purchased from forest service, school districts and other government agencies. I have found that purchased “as-is” they have a 50% failure rate. They are generally simple to repair by swapping front panel parts or internal assemblies between radios.

As the 145.050 packet radio is simplex (only receiving or transmitting at any given moment) it is much simpler to interface it to an antenna and to operate the MFJ 1270B TNC (Terminal Node Controller). The MFJ 1270B is a standard off-the-shelf item except for a replacement control program PROM (Programmable Read Only Memory). A replacement PROM allows the Winlink program to operate and to send / receive 9600 baud data to the high speed “backbone” 440 MHz radio. I wanted to make any modifications as easy as possible during the construction so I used a 12 position screw terminal



Packet Repeater Replacement-Continued

barrier strip for power, audio and COS signals.

A local microphone allows testing of the transmitter. The local loudspeaker allows monitoring of the channel. Normally the local / remote switch is set to remote for data signals and the volume control is turned all the way down. A local squelch control on the front panel sets the receiver's noise squelch gate.

SCOM 7330 Controller:

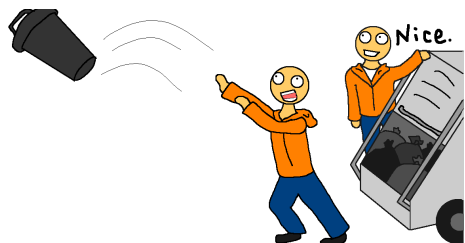
A DB-9 data connector sends audio and control signals to the SCOM 7330 controller. The SCOM 7330 controls the identifier PTT (transmitter's Push to Talk) keying, CW identification audio and remote control on/off functions. In a common SCOM 7330 audio repeater application the controller would route audio from several different sources, encode the PL signal and set the repeater's TX audio level. As the MFJ 1270B TNC is in control of most of these functions, the standard control SCOM 7330 program has been "dumbed down" and simplified. The system is a dual control with the MFJ 1270B TNC handling all of the normal packet data functions and the SCOM 7330 handling remote control and CW identification.

Identification is made only at the end of a packet transmission or during the normal FCC mandatory repeater identification intervals. Remote control functions include remote on/off control, forced ID (for testing) and varying the TOT (time out timer) duration.

Photos showing the basic construction have the Midland radio on the left side of the rack mounted cabinet, TNC lashed up on the top and power connector at the rear of the cabinet. Internal connectors are minimal with a small microphone audio amplifier circuit board to interface the controller / TNC audio to the microphone input, a temperature sensing fan for cooling and a squelch level inverter required to flip the polarity of the receiver's COS signal.

We are also replacing the packet 146.700 / .100 duplex repeater using similar radios and 19" rack mount construction. The club's third SCOM 7330 controller will be used for both packet repeaters. This duplex packet project will be described at a later date.

John Kuivinen, WB6IQS
Vista, CA



Free Trash Cans!

The club has eleven 32 Gallon plastic trash cans with lids that we are willing to give away to a new home.. If you would like one, please let Joe know.

IDXC

70th International DX Convention April 12-14, 2019 Visalia, California

The 70th International DX Convention sponsored by the Northern California DX Club will be held again at the beautiful Visalia Conference Center in downtown Visalia, California from April 12-14, 2019.

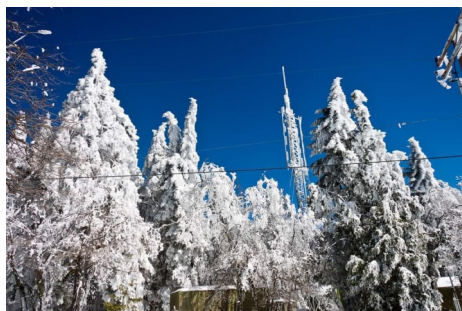
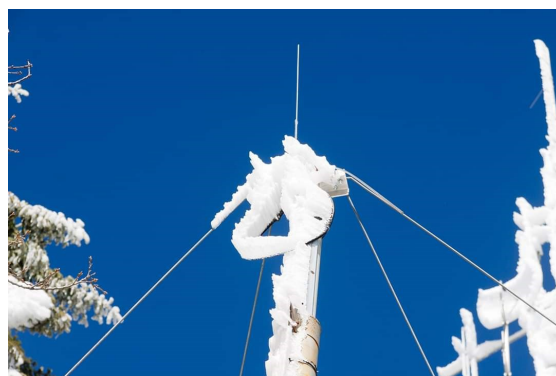
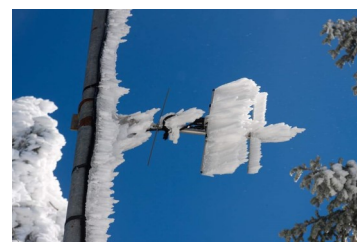
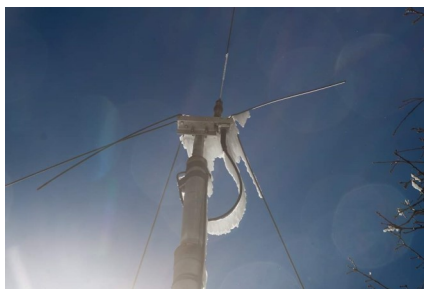
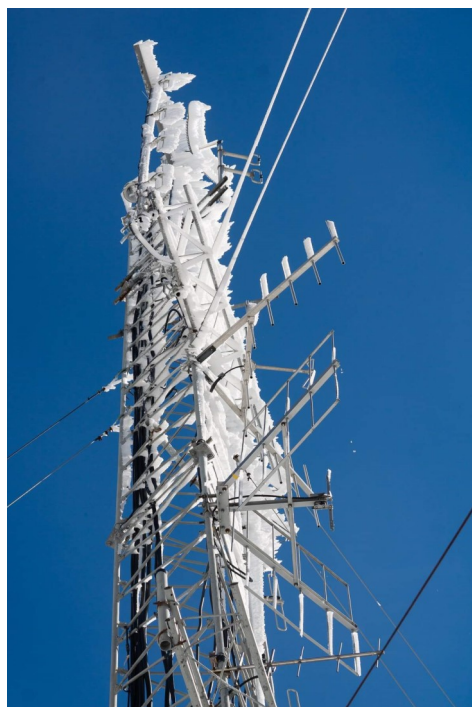
If you're a DXer or interested in any aspect of Ham radio, then IDXC is the place to be. Top DX operators (and testers) from around the world will be there. You'll match those familiar callsigns with new faces, and shake hands with the person you have had a sched with for the past 10 years but never met.

Convention is a full 2.5 Days: Friday (April 12); Saturday (April 13); 1/2 day Sunday (April 14)

- Onsite Registration begins on Thursday afternoon, April 11, 2019 at 3:00 PM local time
- Full day of training on Friday, April 12: Contest Academy
- Full Seminar Track on Friday, April 12; Two Seminar Tracks on Saturday, April 13
- Contest Forum, DX Forum, YL Forum, QSL Card Checking
- 15-20 DX & Technical Seminars
- Large Exhibit Hall - where you can comfortably talk to the people who design and sell ham radio equipment
- Great Raffle Prizes
- Friday Evening Dinner Options: TopBand, IOTA, and Contesting
- Infor at <http://www.dxconvention.com/index.html>



Winter on the Mountain Top By Michele Thompson, W5NYV



SCOPE
PUBLISHED BY THE
PALOMAR AMATEUR RADIO
CLUB

EDITOR
KEITH SPEARS
KM6CXW

Editorial Policy

The Scope welcomes and encourages members to submit articles, photos, stories, equipment reviews and any other items of interest to ham radio.

The Palomar Amateur Radio Club reserves the right to edit all submissions for content and length.

Please submit documents in MS Word format and photos as JPEG or GIF. Flyers may be submitted in PDF.

All submissions need to be received by the 20th of the month.

Send submissions to:

scope@palomararc.org



Palomar Amateur Radio Club

The Back page is a place for humor. If you have a joke, cartoon or just a fun story about ham radio, please share it with me. Please remember

Here are some Irish Toasts for St. Patrick's Day

"Here's to a long life and a merry one. A quick death and an easy one. A pretty girl and an honest one. A cold pint-- and another one!"

"May the winds of fortune sail you, May you sail a gentle sea. May it always be the other guy who says, 'this drink's on me.'"

"When we drink, we get drunk. When we get drunk, we fall asleep. When we fall asleep, we commit no sin. When we commit no sin, we go to heaven. So, let's all get drunk, and go to heaven!"

"In all this world, why I do think There are five reasons why we drink: Good friends, good wine, lest we be dry and any other reason why."

"It is better to spend money like there's no tomorrow than to spend tonight like there's no money!"

"May you always have a clean shirt, a clear conscience, and enough coins in your pocket to buy a pint!"

