



# RF



## ORANGE COUNTY AMATEUR RADIO CLUB INC.

VOL. LXIV NO. 4

P.O. BOX 3454, TUSTIN, CA 92781

APRIL FOOLS' 2023

### The Prez Sez...

By Chip Margelli, K7JA



**I**t's Springtime at OCARC!  
Goodbye Endless Winter 2023!!

It has been many years since we've had such a long stretch of cold, rainy, and windy weather. The silver lining in all this, of course, is that everybody's station ground rods should be making better contact with Mother Earth than they have in some time. But really, enough is enough! I hope your antennas all survived it all in good order.

April is a fun and busy time for all of us in OCARC. Several in our midst have just concluded a big effort in conjunction with the Baker to Vegas race. Many of us are catching up on antenna projects that were put on "hold" because of all the foul weather. A number of us are similarly gearing up for Field Day (remember to coil the coax the right way!). And the excitement is building ahead of the International DX Convention in Visalia April 21-23 (or are you more excited about stopping by Superior Dairy in Hanford on the way home from the convention?).

Spring is always a time of renewal. Please be sure to complete the renewal of your membership by sending in your dues!

Good luck with your Spring station projects, and let's plan on seeing each other again at the April 28<sup>th</sup> meeting!

**73 de Chip, K7JA**  
**OCARC President**



### April General Meeting SPECIAL DATE APRIL 28<sup>th</sup>

**Endaf Buckley - N6UTC & Patrick Stoddard, WD9EWK Present:**

**"Satellite Rover & W.A.S."**

**7:00 PM at the  
American Red Cross  
Orange County Chapter  
600 Parkcenter Drive  
Santa Ana, CA  
Room 208**

**See Page 6 for details**

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#### Honorary Alien

QZXF 

### Monthly Events

#### Membership Meetings\*

Time: 7:00 PM  
Date: 3<sup>rd</sup> Friday of the Month  
Orange County Red Cross,  
600 N Parkcenter Dr, Santa Ana  
(Room 208)

#### Board Meetings

First Friday of each Month  
*Board will handle Club business  
now IN-PERSON.*

#### Club Nets (Listen for W6ZE)

**10M ~ 28.375 MHz SSB**  
Wed- 7:30 PM - 8:30 PM  
Net Control: Corey, KE6YHX  
**2M ~ 146.55 MHz Simplex FM**  
Wed- 8:30 PM - 9:00 PM  
Net Control: Corey, KE6YHX  
**75M ~ 3.883 MHz LSB**  
Tue @ 8:00 PM  
Net Control: Corey, KE6YHX

#### Associated Nets

**Catalina Amateur  
Repeater Association  
(CARA)**

**147.090 MHz (+600 kHz) No PL**  
Monday - Friday  
9:00AM & 9:00PM  
Prg. Director. Tom W6ETC  
COME JOIN US



### OCARC 2023 DUES:

*Membership period is:  
1 January to 31 December*

Individual New or Renewal: \$30  
Family New or Renewal: \$45  
Teen New or Renewal: \$15

*New Member Dues are prorated  
quarterly and includes a badge:*

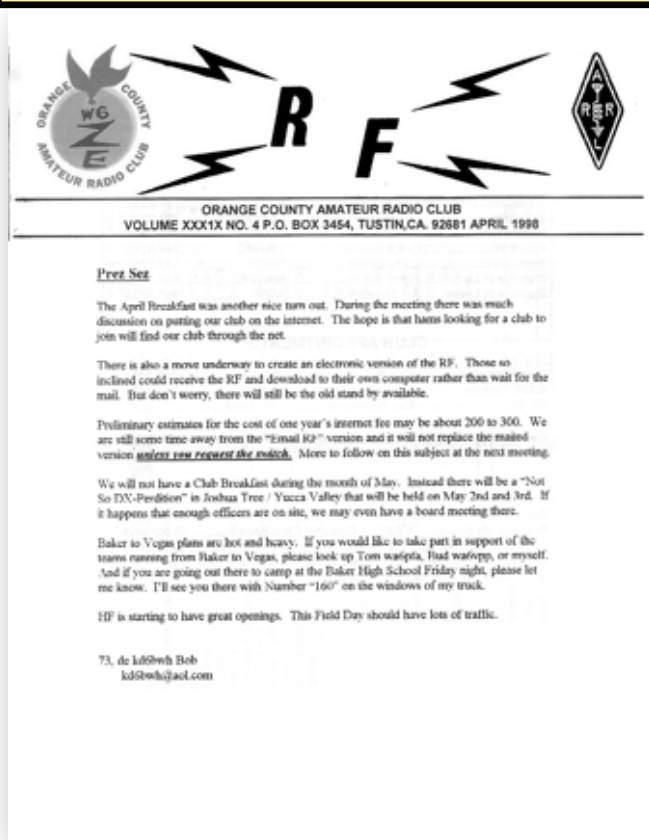
Additional Badges<sup>1</sup> \$3

Use one of our our interactive online  
forms to calculate current prices, join, re-  
new, or order badges:

[Online Forms / Dues & Badges](#)

<sup>1</sup> \$3 or less + mailing. See form.

## - 25 Years Ago in RF Newsletter - April 1998:



In April of 1998 the club was on the cusp of the information revolution . Then president *Bob Buss - KD6BWH* talked about “*putting our club on the internet*”, and announced “*There is also a move underway to create an electronic version of the RF.*” These are both features we enjoy without much thought today.

Officers in 1998 were:

President: *Bob Buss - KD6BWH*  
 V President: *Larry Hoffman - K6LDC*  
 Secretary: *Jim Winn - KE6UCH*  
 Treasurer: *Phil Andersen - N7PA*  
 Activities: *Steve Rasmussen - KE6NAH*  
 Membership: *John Dawson - WA6RND*  
 Publicity: *Ken Konechy - W6HHC*  
 Technical: *Larry Beilin - K6VDP*  
 Member at Large: *Frank Smith - WA6VKZ*  
 Member at Large: *Art Sheldon - K7ZE*

(*Silent Keys are shown in italics.*)

The club treasury had an April balance of \$1,875.59, not including a gift check Ken presented to the club from the wife of *Kei Yamachika - W6NGO* at the March general meeting. Also at the meeting, plans for Baker to Vegas race support was discussed by *Elmer Thomas - WA6PFA* and *Bud Barkhurst - WA6VPP*. Bob Eckweiler - AF6C reported the 10-10 number for W6ZE has been renewed (#30,000).

The 1999 ARRL Convention at the Queen Mary was announced. Chris - KJ6ZH attended the first planning meeting and submitted a request for the OCARC to sponsor the WOUFF HONG Ceremony. An event that turned out to be very successful for the club. In WA6VPP’s brother’s studio a professionally produced audio track was made for the ceremony. The track, with OCARC member voices, has been used in the ARRL ceremony by numerous clubs since.

The nets were active in March, with the ten meter net, under net control AF6C averaging just under 10 checkins per week; and the two meter net, under net control WB6IXN averaging just over 10 checkins per week. *Bob Evans’* Net Notes column filled just over 3 pages in the March RF. On the 3/25 10 meter net Art Sheldon then AD6B checked in using his new call K7ZE for the first time!

At the April 17th 1998 general meeting the guest speaker was Wayne OverBeck - N6NB who gave a slide presentation on “Measuring Antenna Gain , quads, Yagis and others.

The club was preparing for another “Not So DX-pedition” overseen by *Larry K6LDC*. This one was to Joshua Tree National Park, and was scheduled to happen on May 1st to the 3rd.

Check out some of our other [1998 RF Newsletters!](#)



# RadioActivity

## April 2023

### APRIL

- **ARRL Rookie Roundup SSB:** Sunday April 16, 1800 UTC through 2359 UTC.
- **10-10 International Spring Contest/Digital:** 0001 UTC Saturday April 29 through 2359 UTC Sunday April 30
- **Helvetia Contest:** 1300 UTC Saturday April 23 to 1259 UTC Sunday April 24

### MAY

- **7<sup>TH</sup> Call Area QSO Party:** 1300 UTC Saturday May 6 through 0700 UTC Sunday May 7
- **10-10 International Spring Contest/CW:** 0001 UTC Saturday May 6 through 2359 UTC Sunday May 7
- **\*CQ World Wide WPX Contest/CW:** 0000 UTC Saturday May 27 through 2359 UTC Sunday May 28

\* Indicates club entries are accepted

\*\* Indicates team entries are accepted

Note: When submitting logs for ARRL Contests indicate your club affiliation as "Orange County ARC"

### State QSO Parties:

- **Georgia QSO Party:** : 1800 UTC Saturday April 8 to 0359 UTC Sunday April 9 and 1400 to 2359 UTC Sunday April 9
- **New Mexico QSO Party:** 1400 UTC Saturday April 8 to 0200 UTC Sunday April 9
- **North Dakota QSO Party:** 1800 UTC Saturday April 15 to 1800 UTC Sunday April 16
- **Michigan QSO Party:** 1600 UTC Saturday April 15 to 0400 UTC Sunday April 16
- **Florida QSO Party:** 1600 UTC Saturday April 29 to 0159 UTC Sunday April 30 and 1200 to 2159 UTC Sunday May 1
- **Indiana QSO Party:** 1500 UTC Saturday May 6 to 0300 UTC Sunday May 7
- **Delaware QSO Party:** 1700 UTC Saturday May 6 to 2359 UTC Sunday May 7
- **New England QSO Party:** 2000 UTC May 6 Saturday to 0500 UTC Sunday May 7 and 1300 UTC to 2400 UTC Sunday May 8
- **Arkansas QSO Party:** 1400 UTC Saturday May 20 to 0200 UTC Sunday May 21

### Repeating Activities:

- **Phone Fry** Every Tuesday night at 0230Z to 0300Z
- **SKCC Weekend Sprintathon** (Straight Key CW) on the first weekend of the month after the 6<sup>TH</sup> of the month. 1200 Sat. to 2359Z Sunday.
- **SKCC Sprint** (Straight Key CW) 0000Z to 0200Z on the 4<sup>th</sup> Tuesday night (USA) of the month.
- **CWops** Every Wednesday 1300 UTC to 1400 UTC 1900 UTC to 2000 UTC and Thursday 0300 UTC to 0400 UTC
- **K1USN Slow Speed Test:** (CW, 20WPM Max.) Every Friday 2000 UTC to 2100 UTC Every Sunday night at 0000 UTC to 0100 UTC Monday

### OCARC Club Nets:

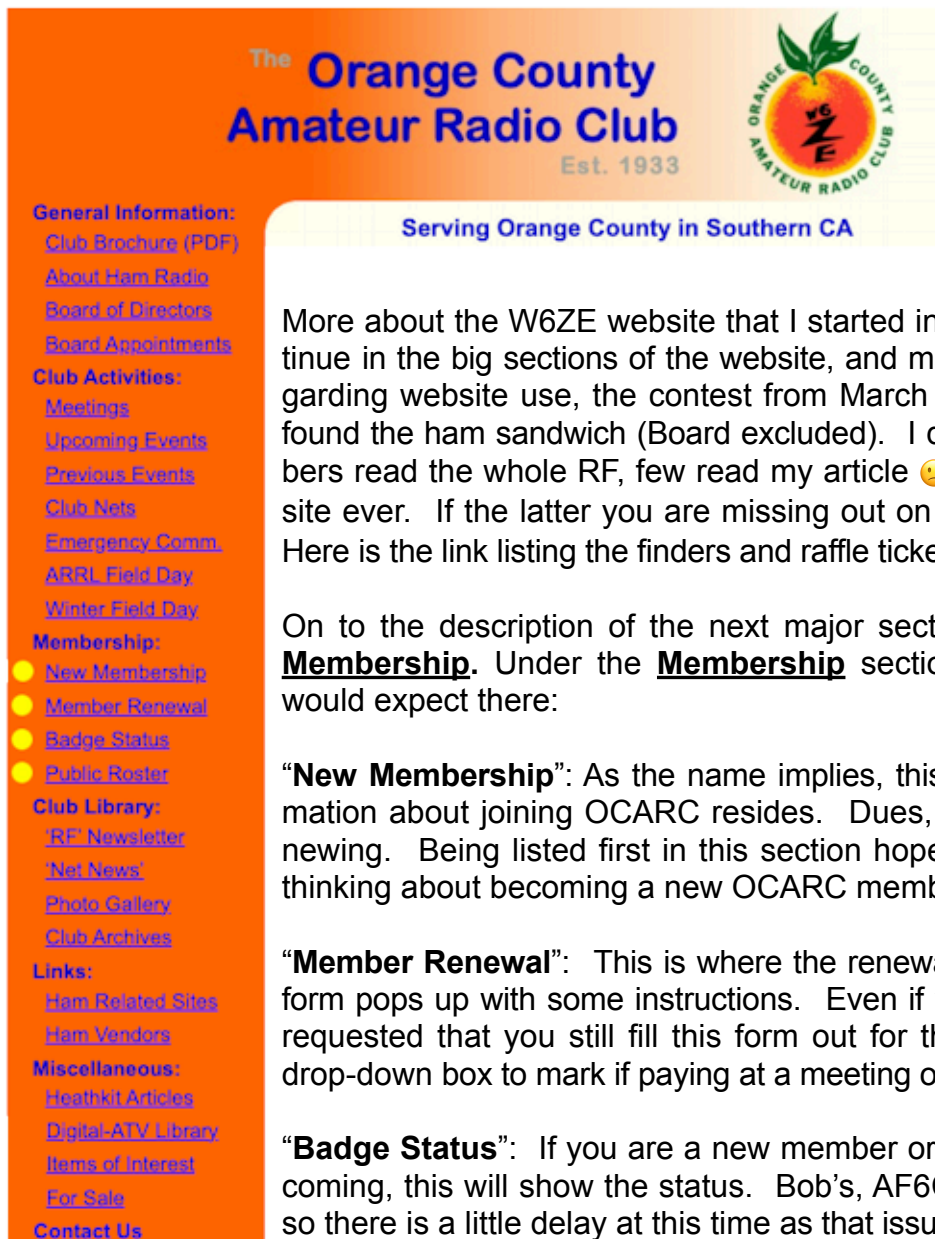
- **10 Meter Net:** Every Wednesday night at 7:30 pm to 8:30 pm Local Time. SSB 28.375 MHz
- **2 Meter Net:** Every Wednesday night at 8:30 pm to 9:30 pm Local Time. FM Simplex 146.55 MHz

### Other Nets:

- **Net-AT-9:** Wellness & Support Monday thru Friday 9:00 am and 9:00 pm Local Time 147.090 MHz (+600 MHz) No PL

Send an email to *Ron W6WG*, [w6wg@w6ze.org](mailto:w6wg@w6ze.org) to have your favorite activity or your recent RadioActivity listed in next month's column.





The Orange County Amateur Radio Club  
Est. 1933

Serving Orange County in Southern CA

**General Information:**  
[Club Brochure \(PDF\)](#)  
[About Ham Radio](#)  
[Board of Directors](#)  
[Board Appointments](#)

**Club Activities:**  
[Meetings](#)  
[Upcoming Events](#)  
[Previous Events](#)  
[Club Nets](#)  
[Emergency Comm.](#)  
[ARRL Field Day](#)  
[Winter Field Day](#)

**Membership:**  
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**Club Library:**  
[RF Newsletter](#)  
[Net News](#)  
[Photo Gallery](#)  
[Club Archives](#)

**Links:**  
[Ham Related Sites](#)  
[Ham Vendors](#)

**Miscellaneous:**  
[Heathkit Articles](#)  
[Digital-ATV Library](#)  
[Items of Interest](#)  
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## W6ZE.ORG Website Ramblings

Part 4 Dan - KI6X

More about the W6ZE website that I started in the January *RF*... We will continue in the big sections of the website, and maybe the less familiar ones. Regarding website use, the contest from March was poorly attended and only 2 found the ham sandwich (Board excluded). I do not know if it is that few members read the whole *RF*, few read my article 😞, or most do not go to the website ever. If the latter you are missing out on good information when needed. Here is the link listing the finders and raffle ticket winners: [Ham Sandwich Contest](#)

On to the description of the next major section of the [W6ZE.ORG](#) website: **Membership**. Under the **Membership** section are the pages you hopefully would expect there:

**“New Membership”**: As the name implies, this is the page where all the information about joining OCARC resides. Dues, badge info, forms for joining/renewing. Being listed first in this section hopefully makes it obvious for those thinking about becoming a new OCARC member.

**“Member Renewal”**: This is where the renewal form is found (obvious?). The form pops up with some instructions. Even if you pay at a meeting, it is highly requested that you still fill this form out for the membership VP. There is a drop-down box to mark if paying at a meeting or mailing a check or via PayPal.

**“Badge Status”**: If you are a new member or have a new appointment badge coming, this will show the status. Bob’s, AF6C, printer he uses for them died, so there is a little delay at this time as that issue is rectified! See the list there.

**“Public Roster”**: This page has the membership list. It indicates those that have renewed, joined recently, etc. List includes callsigns, city they live. and license class. If we were given permission on the application form, you can click on a member’s name and an email will get started to them. These email addresses are encoded so robots cannot harvest them but your fellow members can contact you, so it is appreciated.

That covers the complete **Membership** section of the main W6ZE webpage menu.

Let’s try the web game (find and click) again this month. On one of the pages under the **Membership** section you will find (not hard) a ham sandwich picture like seen here. Click on it, add your name/call to the email created and send. All entries received by April 30 will get listed and into a drawing for free raffle tickets (see details in link when found). Next issue we will cover the **Club Library** section in detail...KI6X



**APRIL PROGRAM**

Endaf Buckley, N6UTC &  
Patrick Stoddard, WD9EWK  
Present: **"Satellite Roving"**

**A**re your amateur radio operations limited by antenna restrictions in your area? Do you enjoy driving, exploring remote areas, working unexpectedly exotic contacts, working QRP?

Join us Friday, April 28 (yes, a week later than usual so as to not conflict with the Visalia DX Convention) and meet Endaf Buckley, N6UTC (formerly MW1BQO from Wales) and Patrick Stoddard, WD9EWK/VA7EWK, the "Satellite Rovers", and learn how to work satellites with portable gear.

Endaf has recently completed the WAS (Worked All States) award via satellite roving, and Patrick has worked satellites from 126 different grids in 26 US States and Washington DC, Canada, Mexico, and Australia. Patrick has also received 11 satellite VUCC awards from different locations (VHF/



Endaf Buckley, N6UTC (ex MW1BQO)

UHF Century Club for working 100 different grid squares). Both rovers are also active on HF, Endaf mostly using data modes and Patrick dabbling in all modes.

Videos covering contacts with the ISS and other exploits and various hints and kinks about satellite operations are available on the WD9EWK/VA7EWK site on YouTube, but we hope to see you at the meeting for personal interaction and the chance to ask questions about an area of the hobby that is gaining popularity.

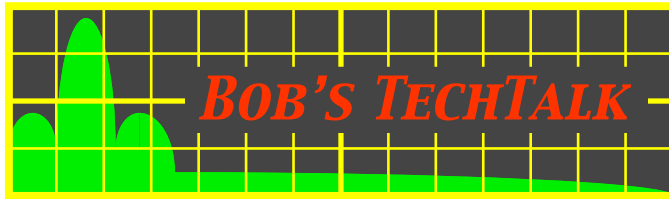
Remember, that's Friday, April 28, 7 PM at the American Red Cross, 600 Parkcenter Drive, Room 208, Santa Ana. The meeting will also be available on Zoom, with information for joining the meeting to be sent at a later date. We hope to see you there!

**Janet Margelli, KL7MF**  
**Vice-President, OCARC**



Patrick Stoddard, WD9EWK/VA7EWK





## Number 53: The FIELD STRENGTH METER:

(TechTalk #128)

by: Bob Eckweiler - AF6C

### INTRODUCTION:

At the February board meeting our Veep Janet – KL7MF brought up the subject of offering a club project that people can build. The club would purchase the parts and make up kits that those wishing to participate could buy and assemble. The kits could be assembled at home, or at a meeting or special gathering and checked out. Each participant would gain an inexpensive piece of equipment for their ham shack. We've done something similar in the past. Tim – N6TMT organized an event to build 2-meter, directional, tape measure, T-hunt antennas. Also, some years back a soldering class was conducted for club members. It was even repeated at Field Day for the Boy Scouts and club members.

One simple project I thought would be fun for the club to build is a Field Strength Meter. RF is all around us. It's in the shack, near the WiFi router and maybe in the kitchen, but you can't see it, hear it or, unless it's very strong, feel it. There is a simple device that can detect RF – a Field Strength Meter (FSM).

The most expensive part of the FSM is the meter which needs to be sensitive. A 100  $\mu\text{A}$  meter is perfect. So I went looking and found one in the range of \$5. It seemed to be a very good price and

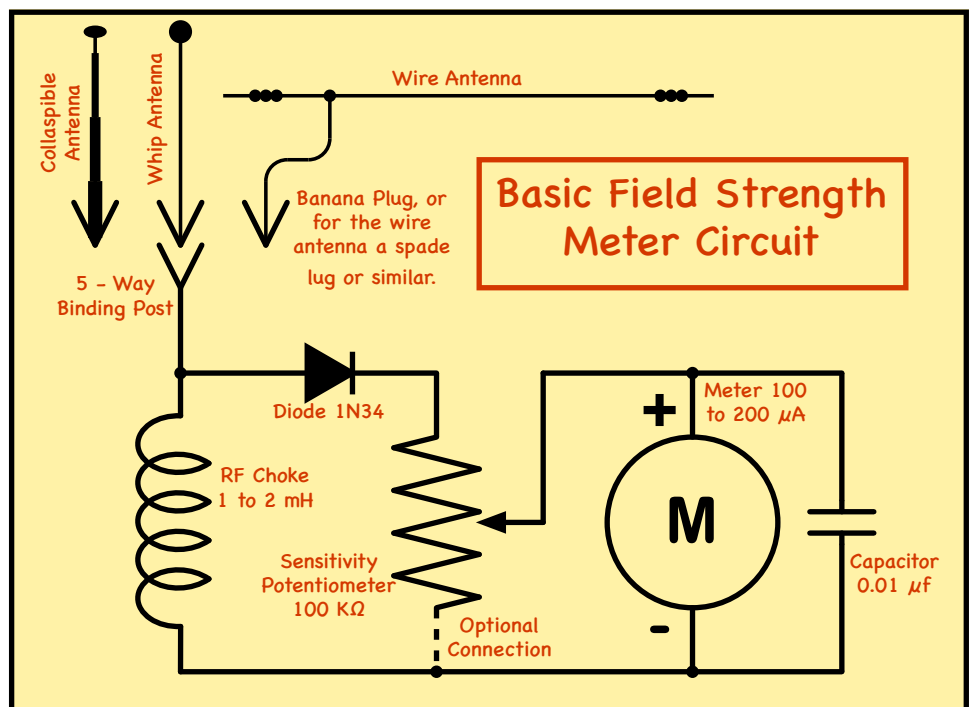
the meter's specifications were great for such a project. I bookmarked the page and started figuring the other parts we'd need: a diode, an RF choke, a capacitor, some wire and a small mini-box to put it in. I was on a roll and decided to order ten meters for a start. Back to the webpage and to my shock the cost of one meter was now over \$30. Since then I occasionally look for an inexpensive sensitive meter without finding one.

Pending finding a good source for meters, I thought it would be nice to discuss how a field strength meter works.

### THE BASIC FSM CIRCUIT:

**Figure 1** is a schematic of a simple field strength meter. It has minimal components:

- A diode that rectifies the weak RF field. It needs to be a sensitive diode such as a germanium signal diode or a more modern Schottky signal diode.
- A potentiometer to adjust the sensitivity of the instrument. 100K $\Omega$  is a standard size that will work well. The low end can either



**Figure 1:** The basic Field Strength Meter circuit. See text.

be connected or not connected to the negative meter terminal. When connected, the meter sensitivity can be cranked down to zero. When not connected the meter sensitivity can only be cranked down to the point where an RF signal on the antenna of about 10 volts can drive the meter to full scale. This assumes a 100  $\mu\text{A}$  meter with an internal resistance of 1.5  $\text{K}\Omega$ , a typical value.

- A capacitor that filters the rectified signal and turns it into DC that the meter can measure. A simple disc ceramic capacitor between 0.005  $\mu\text{F}$  and 0.05  $\mu\text{F}$  should work fine. A good common value is 0.01  $\mu\text{F}$ . The voltage rating need not be more than 100 V.
- A meter that is sensitive. 100  $\mu\text{A}$  or 150  $\mu\text{A}$ . 200  $\mu\text{A}$  is useable The meter should preferably small (2 to 3 inches square or round). The size is only important if it's being housed in a small "Minibox".
- And an RF choke. This is not a resonant circuit. The choke only prevents RF from passing while allowing DC to pass. A value between 1 and 2.5 mH would work well. This all important part provides a DC return path that goes through the meter, allowing current to pass.
- An antenna connector, a banana jack or a five-way binding post.
- A suitable antenna:
  - A multiple section extendible antenna with a banana plug on the end to mate with the 5-way binding post.
  - A spring wire whip antenna topped with a protective safety bead; again using a banana plug to mate with the banana 5-way binding post.
  - An external basic wire antenna connected either directly to the 5-way binding post or terminated with a banana plug or a spade lug,

Other items such as a knob for the potentiometer, some sort of "Minibox" like cabinet, cabinet feet etc. need to be thought about too.

Notice that the FSM uses no batteries. It actually uses the transmitted energy to power the meter reading. No worries about leaking batteries or having the battery die in the middle of a measurement.

#### **FIELD STRENGTH METER USES:**

The basic FSM measures "relative" signal strength. You might locate it at a specific position and orientation and adjust the meter, while transmitting, to some arbitrary low level on the meter. Then make the desired transmitter adjustments and (hopefully watch the relative meter reading increase. The FSM can be used outside to measure the pattern from a mobile antenna and even a beam as it is rotated.

Just sitting in your shack, where it will spend most of its time, it provides a good indication that you're putting out RF. Set it so that at key down, or on voice peaks, your meter hits half-scale, and you can easily notice any drop in output.

#### **FSM BELLS AND WHISTLES:**

Of course there are Field Strength Meters on the commercial market that have added features. One such feature is a broadband RF amplifier to increase the sensitivity, as well as bandpass filters, high-pass filters (often necessary if you are situated near an AM broadcast transmitter.) If there is an amplifier or the filters are active, then batteries, or other power source is needed.

#### **CONCLUSION:**

The search continues for an inexpensive meter to develop a club project, if there is interest. Is there a simple project you can suggest for the club?

73, from AF6C





## ? PUZZLER ?

### The Three Bags of Resistors Puzzle:

Bob is working on a project in the lab that requires lots of 2-watt 5% resistors of two values: 470 K $\Omega$  (yellow violet yellow gold bands) and 1 Meg  $\Omega$  (brown black green gold bands). He needs 150 of each.

Bob goes to the electronics store to pickup his order. The guy behind the parts counter hands him three brown paper bags. Each bag has a tag on it. The tags read:

- 100 ea. 470 K $\Omega$  2-watt 5% resistors.
- 100 ea. 1 Meg  $\Omega$  2-watt 5% resistors.
- 50 ea. 470 K $\Omega$  2-watt 5% resistors and 50 ea. 1 Meg  $\Omega$  2-watt 5% resistors.

After Bob pays and is about to leave, he is warned that since it is April Fools' Day, the guy who filled his order had some fun and made sure each bag had the wrong tag tied to it.

When Bob gets home he decides to change the tags so they are on the correct bags. He makes a puzzle of it. Here are the rules he sets for himself.

1. He can not look into the bags.
2. He can remove only one resistor from a bag at a time, look at its value, and put it back in the bag.
3. He can repeat Step 2 as many times as he needs until he is able to put the correct tag on each of the bags.

**The question is: How many times does Bob have to perform Step 2?**

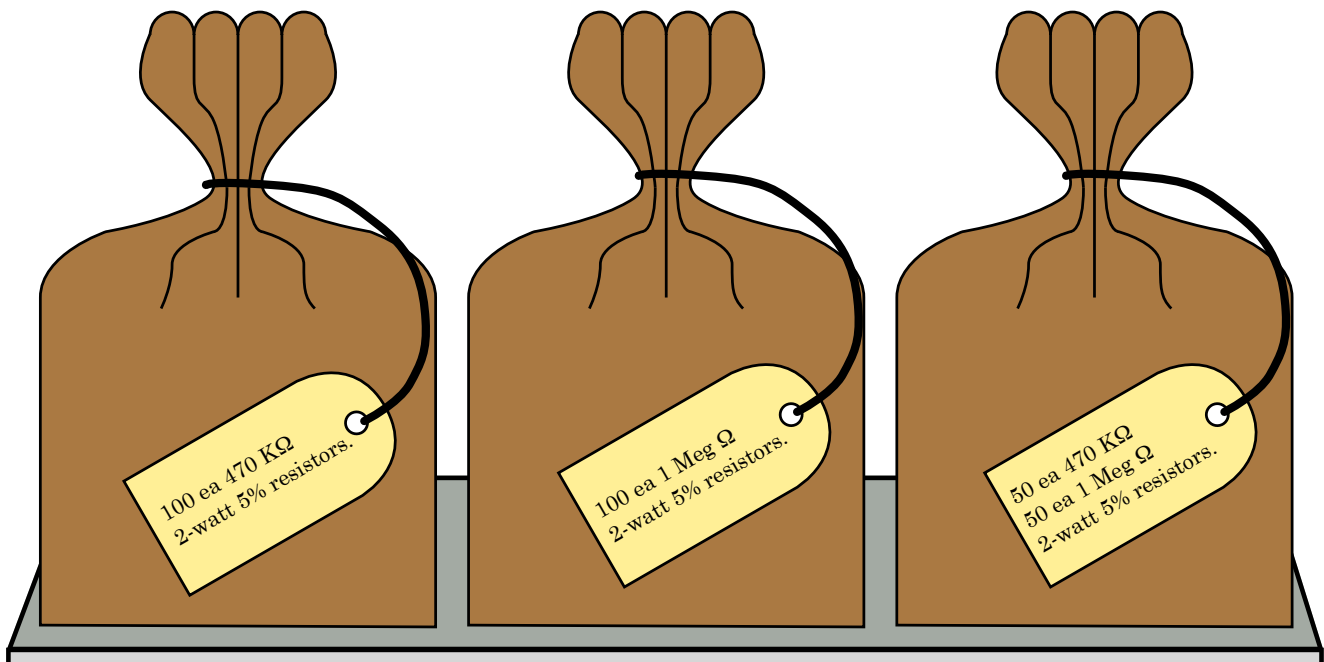
(Send your answer to: [puzzler@w6ze.org](mailto:puzzler@w6ze.org))

73, from AF6C



## ? ANSWER ?

### NEXT MONTH



## A Portable HF Antenna

By Nicholas AF6CF

Some time ago, I decided to create a Portable HF antenna with the following features:

- 1) **Small portable size**
- 2) **Easy to assemble**
- 3) **Inexpensive**
- 4) **Multi-Band (80 to 6)**
- 5) **Made with readily available materials**

This antenna was to be as lightweight and efficient as possible. The result should fit into a small (24") tripod carry bag. Made with PVC pipe, fittings and speaker wire. Tools used are a PVC pipe cutter and a drill.

Materials needed:

- 1) 2 -- 10' Schedule 40 1/2" pipe
- 2) 7 -- 1/2" End Caps
- 3) 1 -- 5 way 1/2" cross
- 4) 1 -- 1/2" Tee
- 5) 1 -- 1/2" Plug
- 6) 6 -- 1/2" Couplings
- 7) 4 -- 8-32 3/4" screws and nuts
- 8) 4 -- 8-32 wing nuts
- 9) 50' of 18 AWG stranded wire

Also you will need:

- 1) -- Male and female disconnects
- 2) -- SO239 chassis socket
- 3) -- BNC connectors M/F
- 4) -- Whip antenna or piano wire
- 5) -- Solder and pipe glue.

### Construction:

Solder a 4 inch wire to the center conductor of the SO239 chassis connector.  
Attach a 7 inch wire to the ground side of the SO239. Solder four short wires (about 1") to its end. These are to be the radial attachments. Drill a hole in the PVC tee about the middle,



pass the short wire and crimp a male disconnect.

Then mount the connector to the 1/2" plug, passing the center wire thru the plug to the hole in the tee. Glue the plug to the tee.

The ground wire goes down a 6" pipe with the four short wires soldered to it.

Then drill four holes on the single side of the five way cross and pass the wires thru them. Glue the five way to the pipe and glue the tee to it. If you don't have a five way you can use a standard cross (4 ways) and bolt a cap to one of the sides.

Crimp four female disconnects to these wires. See picture for assembly.



Cut eight 23 inch sections of ½” pipe, four for the horizontal supports, two for the middle sections and two for the top sections. Prepare the four horizontal supports by drilling four end caps at their tops and securing a 24” wire to the 8-32 screws. You can either solder the wires to the screw heads (difficult) or crimp an eye terminal to the wire (easier).

Pass the screw thru the end cap and secure with a nut.

Then drill a hole about ¾ inches from one of the pipe ends and pass the wire from the other side of the pipe and thru the end hole. Crimp a male disconnect to it and glue the end cap in place. Do this four times.

These four pipes will be the horizontal support members for the antenna.

**Only apply glue when indicated**, so you will be able to easily assemble and take down the antenna in the field.



Drill the wire holes so the wire will pass tightly thru them. I used green wires for the ground sides and the coax center, but the colors are irrelevant. Just use the wire you have.

The two middle sections have just a hole about one inch from each end and a wire with a male disconnect on one end and a female in the other.



Think of these as extensions.

The top section will have a cap and either a BNC, a banana jack or an SO239 connector.



You can make just one section, depending on how versatile you want it to be. I made two tops, as I plan to use two different "whips".

Solder a wire to the connector of your choice and mount it to an end cap. You can solder both the center and ground of the BNC or SO239.

Then pass the wire inside a pipe section and out a side hole. Glue the end cap in place and crimp a female disconnect to it.

Then get a telescopic antenna whip and attach a BNC connector to it. Mine is 41" extended and collapses to 7 inches total.

The coils are generally the most difficult part to make. However, they don't need to look or be perfect to work well.

Cut a 3-1/2" inch and a 6-1/2" inch section of pipe. Drill holes 3/4" from each end, drilling all the way from one side to another. Pass the wire thru both holes, leaving about 1-1/2" inches out to crimp the disconnect.

Then wind 20 turns on the short pipe and 43 turns on the long one using glue and scotch tape to keep the windings in place. The number of turns is not critical; just fill the space between the two holes with wire. Crimp a female disconnect to one end and a male disconnect to the other.

Do NOT glue the couplers to the coils. They will be used to join the parts together when assembling the antenna to operate. The coils (if used) should go in the middle; this is a center-loaded vertical antenna. Depending on the band, you may use one or two or no coils.

For the radials, cut a couple of wires to 19 feet and crimp an open (spade) terminal on one side and a ring terminal on the other side. The open terminal will connect to the wing nut and the ring side allows you to add wire or tie a string.

You can make more radials, but I have found that two are enough.

Below is a picture of my "Kit". You can see the four horizontal members in the foreground, then the two top ones, the two middle sections and then the whip, coils and main coax connector. The next object is a #17 Spider Antenna element that has a PL259 connector



and a ferrite ring to vary its “electrical length”.

This is an extra element that I had laying around. It's not necessary to get one.

When assembled, the antenna is self-supporting, not needing any guy wires. If there is a strong wind, you can place sandbags, bricks or any other weights on the horizontal pipes to add stability.

### Setup and operation:

To setup the antenna, start by attaching the four horizontal radial members to the main coax connector. Then insert the first middle section, one of the coils and the next middle section





using the couplers as needed. Pay attention to which side goes where (male to female disconnect). Attach the top section with the whip antenna. Plug in all the disconnects, making sure that they fit (male to female).

Attach the radial wires to wing nuts. Extend the wires on the ground. The antenna is now ready to operate.

The only drawback now is that at this point you will not know the resonant frequency of the antenna, so you will need some means of measurement.

If you don't own an antenna analyzer, borrow one. Ask your Club members.

Connect the antenna analyzer and determine the resonant frequency, swapping the coils,

making the whip longer or shorter, adding and removing sections, etc.

Once you have done this for all bands, write down each configuration for each band and return the analyzer to its owner.

Now you can easily setup the antenna in the field. You may have to use an antenna tuner for some frequencies, if you didn't find an exact match.

Also, on the lower frequencies, like 40 or 80 meters, the bandwidth is narrower so a tuner might be necessary.

If you have any questions, you can email [af6cf@w6ze.org](mailto:af6cf@w6ze.org) or talk to me personally at one of the OCARC meetings.

73 DE AF6CF



Heathkit of the Month #116:  
by Bob Eckweiler, AF6C



## AMATEUR RADIO - SWL

Heathkit HD-1234  
Antenna Coax Switch

Heathkit SA-1480  
Antenna Remote Coax Switch

### Introduction:

In 1973 Heathkit came out with their first coax switch, the **HD-1234**. This switch was designed to be used in the shack and provides a way to switch one radio between four antennas, or one antenna between four radios, manually.

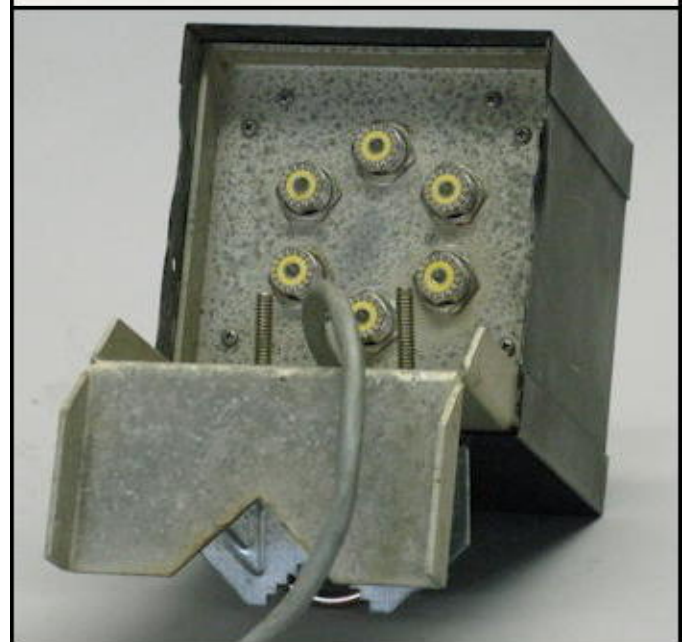
Six years later in the fall of 1979, with the HD-1234 still in production and selling well, Heathkit came out with the **SA-1480** Remote Coax Switch, see **Figure 1**. This switch could be located outside, in a convenient place and remotely switched from a small control unit in the ham shack. The operator could select any one of five antennas.

These switches were handy for those using multiple antennas. One position could be used to switch to a dummy load such as the Heathkit HN-31 "Cantenna". Both feature automatically grounding the unused antennas, and an additional position where all the antennas are grounded; helpful in areas with prevalent lightning activity.



Here is a link to the index of Heathkit of the Month (HotM) articles:

[http://www.w6ze.org/Heathkit/Heathkit\\_Index.html](http://www.w6ze.org/Heathkit/Heathkit_Index.html)



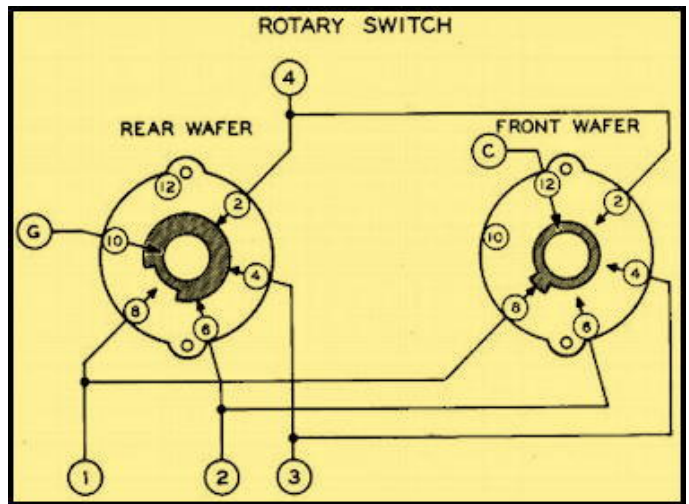
**Figure 1:** The two parts of the SA-1480 Switch  
TOP - The SA-1480 Antenna Switch Controller  
BOTTOM: The SA-1480 Remote Antenna Switch designed to be installed outdoors on a tower or other convenient location.

### The HD-1234 Manual Antenna Switch:

First introduced in late 1973 for \$11.95 the HD-1234 (**Figure 2**) remained in production into 1991; almost until the end of Heath Company as we knew it. By 1990 the HD-1234 was selling for \$29.95, but in the Winter 1991 catalog it was on closeout sale for \$24.95.



**Figure 2:** The HD-1234 Manual Antenna Switch with its five female UHF connectors and a ground post. Knob is not the one supplied by Heathkit.

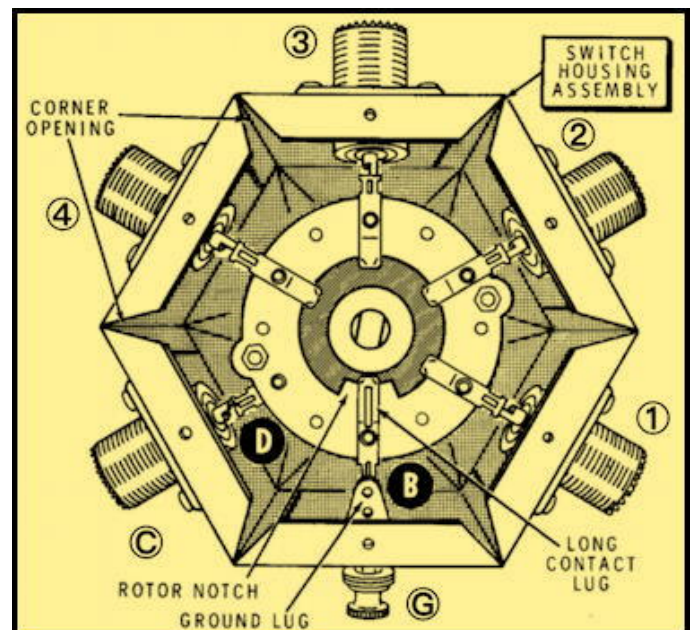


**Figure 3:** Simple schematic of the HD-1234. The switch is shown in the position to select antenna 1.

The hexagonal shaped switch, similar to the B&W 550, has an SO-239 UHF connector on five of its six side surfaces; the sixth surface has a ground post consisting of a knurled nut on a 6-32 machine screw. The actual switch is a single ceramic wafer, indexed at 60°, having 6 positions for a full 360° rotation; there is no stop. The positions and associated connectors are marked: 1, 2, 3, 4, C, and G. Positions 1, 2, 3 and 4 connect the common (C) connector to antennas 1 through 4 respectively, and the three unselected antennas are connected to the ground post (G). In the C and G positions all four antennas are connected to the ground post (G) and the common connector (C) is open.

antenna connections are connected to the ground post. The hexagonal layout, along with the single two-sided wafer, provides very short leads. This keeps the SWR and losses low. (1.1:1 to 250 MHz). It can handle 1 KW or 2 KW PEP.

The HD-1234 schematic is shown in **Figure 3** (from the Heathkit Manual). The ceramic switch wafer has a front and rear switching section. The front section connects the common (C) connector to the selected antenna (positions 1 to 4); in the (C) and (G) positions it is open. The rear section connects the ground (G) post to all of the antenna connectors (positions 1 to 4) except for the selected connection. In the (C) or (G) position all four



**Figure 4:** Rear inside drawing of the HD-1234. The switch is shown in the ⓐGround position.



**The SA-1480 Remote Antenna Switch:**

The SA-1480 (**Figure 1**) was first introduced in the Fall 1979 (#846) catalog. It was announced on the front cover along with two other kits (**Figure 5**). The initial ad in the catalog is shown in **Figure 6**. The introductory price was \$84.95 from the factory and \$89.95 at a Heathkit store.

The SA-1480 Remote Antenna Switch consists of two parts: the controller, which is located in the ham shack and the remote switch which could be located on a tower or other convenient place where it allows the shortest coax runs. The switch was designed to be located outdoors and is weather resistant. An eight conductor cable connects the switch to the controller. Heath sold the cable separately in three convenient lengths:

Part #	Length	Ship Wt.	Price *
IDA-1290-1	50 ft	2 lbs	\$7.95
IDA-1290-2	100 ft	4 lbs	\$13.95
IDA-1290-3	150 ft	6 lbs	\$18.95

\* 1973 Factory & Heathkit Store Prices.

**The SA-1480 Specifications:**

Specifications, taken from the manual, are shown in **Table I**. No line wattage or current was specified, but current draw is minimal when not switching.

**The SA-1480 Controller Circuit:**

The schematic for the SA-1480 controller is shown in **Figure 7**. The controller circuit is



**Figure 5:** SA-1480 Announcement on the front cover of the Fall 1979 Heathkit Catalog.

SA-1480 Specifications	
Loss at 100 MHz:	< 0.2 db
VSWR: < 30 MHz:	1.05 : 1
< 150 MHz:	1.20 : 1
Impedance:	50 - 70Ω
Power Handling Capability:	2 KW PEP
Temperature range:	- 40° F to 177° F - 40° C to 80° C
Number of Ports:	5
Power Requirements:	120 / 240 VAC 50 / 60 Hz
Fuse (wired for 120V):	3/16 A 250V S.B.
(wired for 240V):	3/32 A 250V S.B.

**Table I**

## Amateur Antennas and Accessories

**New Heathkit Remote Coax Switch makes antenna changing a snap!**

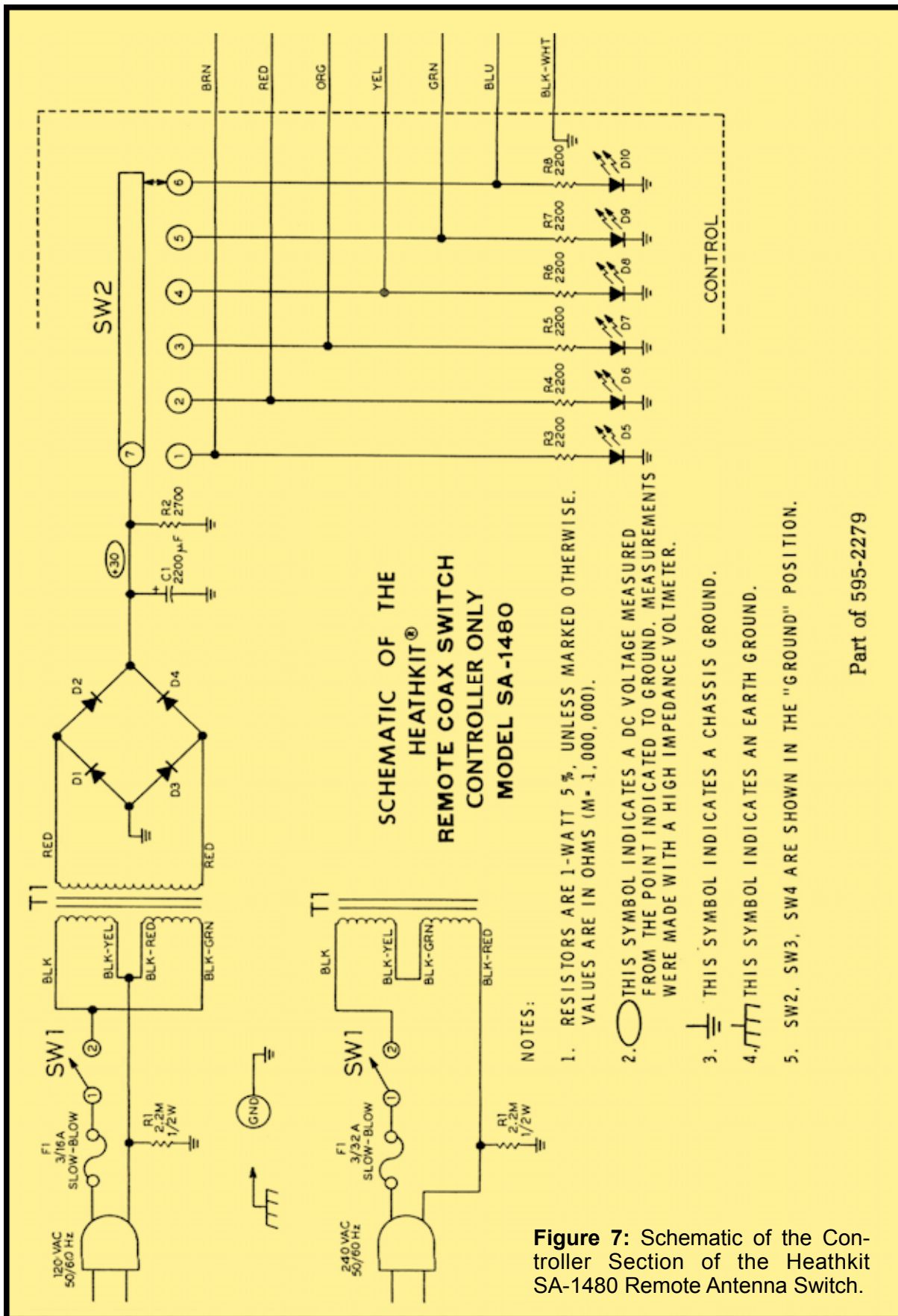
**\$89<sup>95</sup>** • Saves on expensive coax feedline  
• Handles full legal power  
• Erasable front panel label

New bargain-priced Remote Coax Switch replaces five coax feedlines from the shack to your antennas. Silver-plated contacts give this easy-to-build kit low SWR. A shielded switch box further lowers SWR and protects from the elements. Special ground position

for lightning protection. 1.05:1 SWR below 30 MHz; 1.20:1 SWR below 150 MHz. Includes U-bolt for mast mounting.

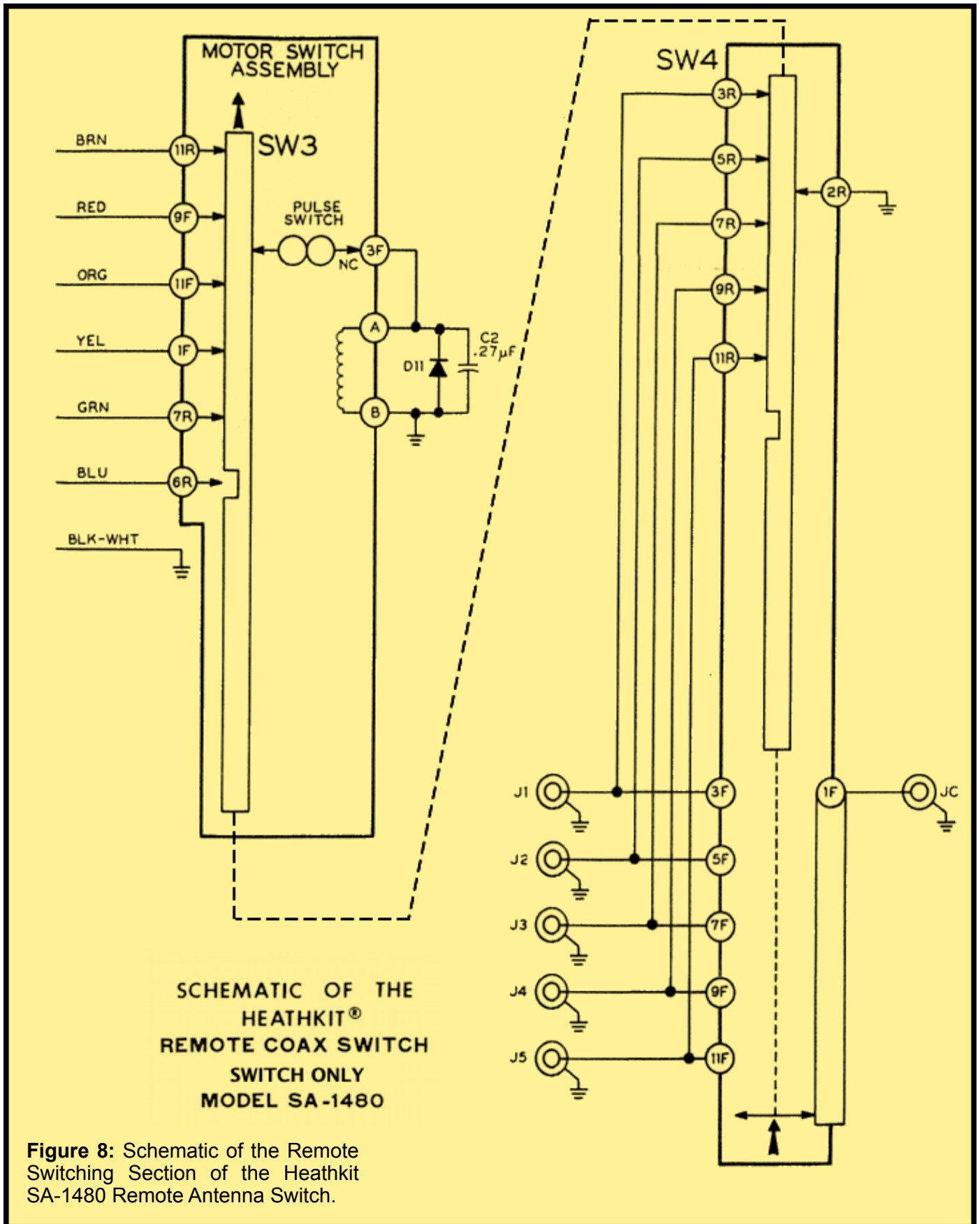
Kit SA-1480, Shpg. wt. 8 lbs. ....	89.95
IDA-1290-1, 50-ft. 8-wire coax, 2 lbs. ....	7.95
IDA-1290-2, 100-ft. 8-wire coax, 4 lbs. ....	13.95
IDA-1290-3, 150-ft. 8-wire coax, 6 lbs. ....	18.95

**Figure 6:** Ad on page 21 of the Fall 1979 Retail catalog (#846R) The factory introductory price was \$84.95. If you purchased one from one of the Heathkit Retail stores, the price was \$5 higher (\$89.95).



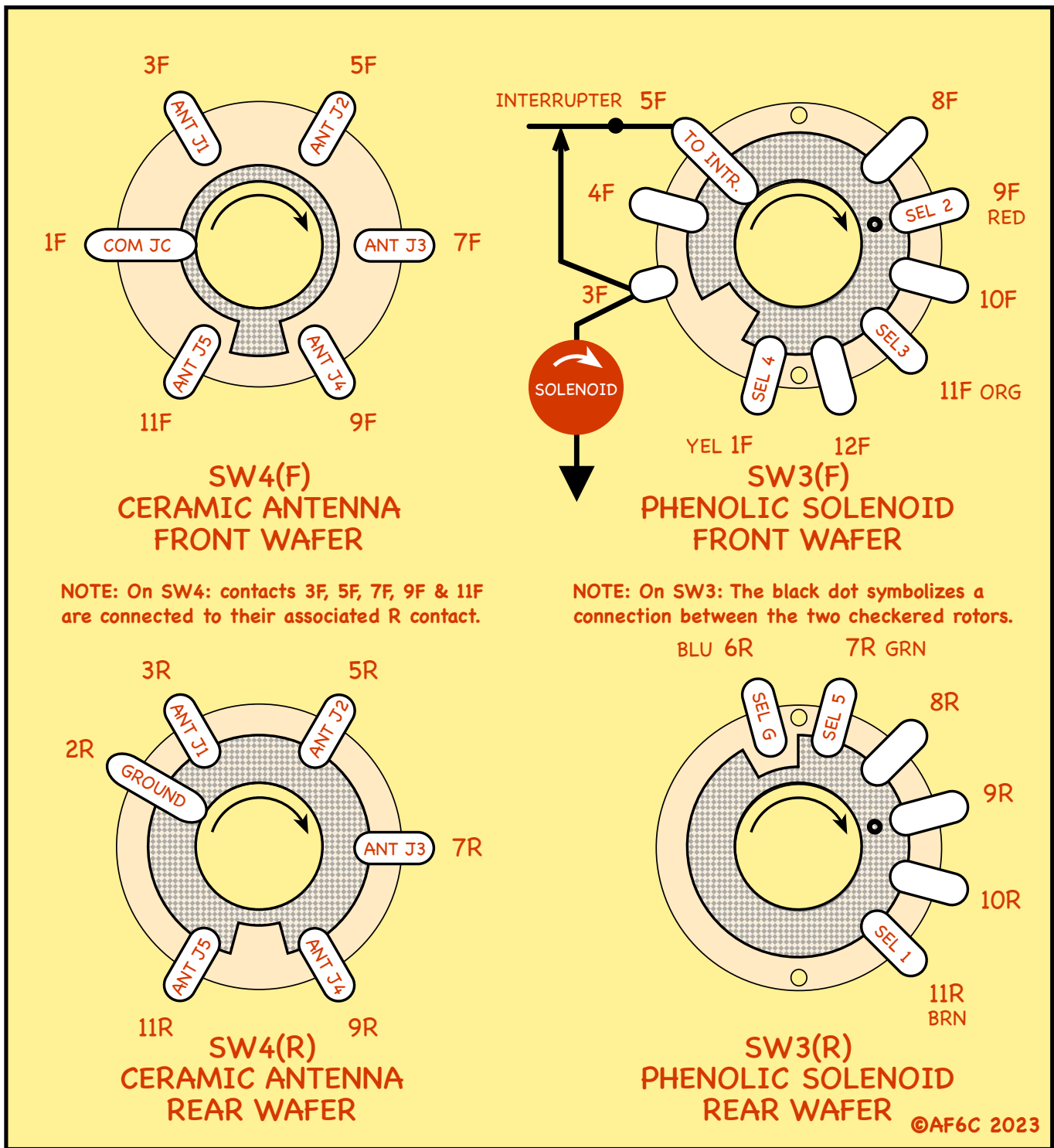
Part of 595-2279

Figure 7: Schematic of the Controller Section of the Heathkit SA-1480 Remote Antenna Switch.



SCHMATIC OF THE  
HEATHKIT®  
REMOTE COAX SWITCH  
SWITCH ONLY  
MODEL SA-1480

Figure 8: Schematic of the Remote Switching Section of the Heathkit SA-1480 Remote Antenna Switch.



**Figure 9:** This drawing shows the two double-sided switch wafers driven by the rotary solenoid. On the left is the ceramic antenna switching wafer which connects the common connector JC to one of the five antenna connectors J1 - J5, and at the same time connects all the unused antennas to ground (SW4). On the right is the phenolic wafer that makes the solenoid keep stepping until the correct antenna is selected (SW5). A sixth signal from the controller selects "GND" which grounds all five antennas and disconnects the common input. The rear wafers appear as seen from the from side of the wafer. The black dot on the phenolic wafer indicates that the two rotors (checkered) are connected together. Switches are shown in the "GND" position.

very basic. Transformer T1 has a dual primary so it can be used with 120 or 240 volt power. The line cord has a polarized 2-prong plug. The hot side of the AC line has a fuse and power switch (SW1) in series before the transformer primary. The neutral side goes directly to the transformer primary. There is a 2.2 MΩ resistor (R1) between the neutral side and chassis ground. A guess is that it is there to bleed off any static charge accumulating from wind on the outdoor switch? Surprisingly there are no RF bypassing capacitors anywhere in either the controller or the switch itself.

The secondary of T1 is 20 VAC at ¾A. It is full-wave rectified by D1 – D4 and filtered by C1, producing about 30 VDC at low load. R2 acts as a bleeder and provides an 11 mA load. The voltage goes to a six-position rotary switch on the front of the controller (SW2). With the unit turned on, one of six LED lamps (D5 to D10) light depending on the position of the switch. Each LED has a 2.2 KΩ series resistor (R3 – R8) that limits the current through the LED to about 13 mA when powered. Five are green LEDs, and the one marked GND is red.

The eight-conductor cable (#22 AWG) connects to the controller via a six-position screw-type terminal strip on the rear of the cabinet. One of the mounting screws for the terminal strip has an extended bolt with an extra nut and washers to create a seventh terminal that is ground. When the controller power is on, +30 V appears on one of the six rear terminals, 1 through 6. Terminal 7 is the ground connection, and the black and white wires of the cable are paralleled to reduce any voltage drop. The other end of this cable connects to the remote switch. **Table II** shows the cable wiring.

CNTRLR		WIRE	SW.
TERM	LEAD FUNCTION	COLOR	TERM
1	ANTENNA #1	BRN	1
2	ANTENNA #2	RED	2
3	ANTENNA #3	ORG	3
4	ANTENNA #4	YEL	4
5	ANTENNA #5	GRN	5
6	ALL ANTENNAS GROUNDED	BLU	6
7	COMMON LEADS BETWEEN CONTROLLER AND SWITCH (THE WIRES ARE PARALLELED)	BLK	7
		WHI	

**SA-1480 CABLE & TERMINAL TABLE**  
**TABLE II**

**The SA-1480 Remote Switch Circuit:**

A schematic of the remote switch circuit is shown in **Figure 8**. The heart of the remote switch is a Ledex solenoid driven switch. This switch has a built-in phenolic motor switch wafer (SW3 in Figure 8) and an extended shaft that rotates the antenna switch wafer (SW4). When power (nominally 28 VDC) is applied to the rotary solenoid it turns the shaft, through a pawl, rotating it 30°. When power is removed the solenoid returns to its resting position, but due to the action of the pawl, the shaft remains where it is. Thus each time power is applied, the switch turns an additional 30°. The switch only turns clockwise as viewed from the armature end. Built into the Ledex switch is a set of interrupter contacts, designated “pulse switch” on the **Figure 8** schematic. These contacts can be wired to interrupt the current to the solenoid as it reaches the end of its travel. When in series with the solenoid coil this interrupter will cause the switch to rotate continually in 30° steps until power is removed elsewhere. The switch has no stops, so

each twelve 30°-rotations turns the switch a full clockwise rotation, 360°.

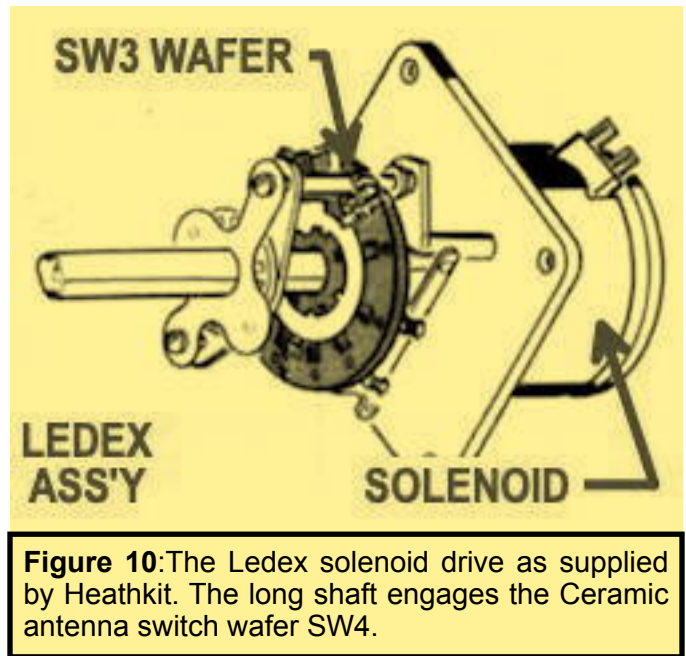
When power is applied to one of the six control wires, the switch will turn clockwise until it reaches a point on the switch wafer that opens the circuit. Once there, the switch will remain in that position even if the controller is turned off. Each of the five antenna switch positions on the ceramic antenna switch are 60° apart. However when in the GND position, which grounds all the antennas and opens the common antenna connection, the ceramic antenna switch is at a 30° position between antenna 4 and 5 positions.

**Figure 9** shows the layout of the two switch wafers SW3 and SW4. This drawing represents the most likely representation of the switch based on information that was able to be obtained without having the mechanism in-hand. In **Figure 9** the switch wafers are shown in the GND position. Phenolic switch wafer SW3 is part of the Ledex drive. Since SW4 must be able to handle high power RF, it utilizes a ceramic wafer.

Both wafers have a front and rear switch section. The rear section is shown as if the viewer is looking through the front side of the switch, allowing the switch contacts to align front to back. The front side of the wafers is the side facing the solenoid.

With the controller turned on and its switch set so the red GND LED is lit, the controller is placing 30 VDC on the blue wire of the cable going to the remote unit. That wire connects to SW3 terminal 6R. Since the remote switch is already in the in the ground position there is no contact with terminal 6R and the switch remains where it is.

However when the controller switch is moved to, say, the antenna one position, the 30 VDC



**Figure 10:** The Ledex solenoid drive as supplied by Heathkit. The long shaft engages the Ceramic antenna switch wafer SW4.

is no longer on the blue wire, but instead it is now on the brown wire which connects to SW3 terminal 11R. This places the voltage on the rear switch rotor. Since on SW3 the two rotors are connected together (as the black dot near the terminals 9F and 9R symbolize) the voltage also appears on the front rotor and terminal 5F. This voltage is connected through the normally closed contacts of the interrupter to the solenoid, causing the solenoid to activate and move the switch 30° clockwise. When the solenoid reaches the end of its travel the interrupter opens causing the solenoid to return to its resting position. However though the switch has moved 30° the connection between terminal 11R and the rotor remains and so the solenoid operates again, moving the switch another 30°. This happens a total of five times (150° total) until the notch in the rotor aligns with terminal 11R, removing the voltage from the rotor.

While the switch is stepping, all the LEDs on the controller light except for the position the switch is currently passing over.

Each time the interrupter opens the circuit a large counter EMF is created by the collaps-

ing magnetic field of the solenoid coil. A diode D11 is placed across the coil to shunt this spike. C2 is also across the coil to reduce RF noise as the motor steps.

The actual antenna switch wafer SW4 is also turned by the extended shaft of the solenoid. When in the ground position, as drawn in **Figure 9**, the common jack JC is open and all five antennas are grounded. However, after moving 150° as explained above, JC is connected to the J1 via SW4F while the ground is removed from J1 by SW4R, while the remaining 4 antennas are still connected to ground.

Accessing the other four antennas works similarly. Since the antenna switch is indexed by 60° the solenoid must operate twice to move to the next antenna position. However the ground position for the antennas is located at a 30° position half way between antenna 4 and 5.

While the controller supplies an unregulated 30 volts, the extra voltage drops a few volts due to the long feed cable and the heavy current draw of the solenoid.

#### **An SA-1480 Weakness:**

In Chuck Penson's book [Heathkit - A Guide to the Amateur Radio Products - Third Edition](#) he mentions the following warning in the section that discusses the SA-1480:

**NOTE: Do not rotate the selector knob to a different antenna position without first placing the POWER switch to "ON". To do so may stall the switching motor.**

The note could not be found in the author's SA-1480 manual [595-2279-01] and it seemed that if you do have the switch set wrong, the motor wouldn't stall; the power supply would start putting out 30 volts and the motor would just step to the new position. Chuck and I swapped a few emails and he sent the the page (37) from the [...-02] manual in

which the note was added. The question now is why? Of course! The power supply in the SA-1480 is marginal. When it's been on for a ½ second or even less, the 2,200 µF filter capacitor has mostly charged up. When the solenoid is then operated the filter capacitor provides the needed extra current to step the solenoid.

However, if the selector knob has been moved to another position with the power off, the load of the solenoid is immediately impressed upon the starting up power supply. The coil resistance of the solenoid is low. Current flow is controlled more by inductance as the voltage builds up than by the DC resistance. The DC resistance only comes fully into play when the voltage reaches near maximum; and the current stops increasing. By that time the solenoid has rotated enough to open the interrupter. However, with the heavy load on at startup the voltage never rises to a high enough voltage to fully operate the solenoid, and the large filter capacitor will only charge up to a low voltage. Thus the solenoid stalls.

#### **The HD-1481 Remote Antenna Switch:**

In the fall 1984 Heathkit catalog #866 a new antenna switch was introduced, the HD-1481. Like the SA-1480, the new HD-1481 is comprised of an in-shack controller and a weather resistant remote switching unit. Instead of five antennas it is limited to four, and it does not ground the unselected antennas. What it does do is use the feed-line also as the control cable to select the desired antenna. Thus the long run of 8-conductor cable is not needed. The HD-1481 will be discussed in detail in an upcoming HotM article.

#### **Heathkit Antenna Switches in 1984:**

In the same catalog that introduces the HD-1481 all three antenna switches are shown on facing pages 36 and 37. At the time



**FIGURE 10:** This partial photo is from the Fall 1984 Heathkit Catalog. It shows the control box for the new HD-1481 antenna switch (4), the soon to be discontinued SA-1480 control box with remote antenna switch (10) and the HD-1234 manual antenna switch (14). All three products were sold simultaneously for a few months in late 1984.

the HD-1234 was selling for \$19.95, the SA-1480 was selling for \$99.95 (The IDA-1290-1, -2, -3 cables were selling for \$9.95, \$16.95 and \$23.95 respectively) and the just introduced HD-1481 Remote Antenna Switch was introduced at \$89.95. (See **Figure 10**). By the time the Christmas 1984 catalog came out the same two pages had an almost identical layout as the previous catalog. However the SA-1480 was no longer listed. Added to the listing Heathkit introduced a new GRA-72 Long-wire SWL antenna for \$9.95. The HD-1234 and HD-1481 were still shown, and the HD-1481 was still marked as “new”. These two antenna switches lasted almost to when Heath closed its doors.

#### Comments:

I got interested in the SA-1480 when it was discussed on one of the Heathkit forums. In the sixties and seventies I worked with Scanivalves doing wind tunnel instrumenta-

tion. The common Scanivalves we used were driven by a Ledex rotary solenoid. It was basically a 6 pole 48 position pneumatic switch.

If anyone has access to the remote part of the SA-1480 and can confirm or correct my **Figure 9** drawing of the SW3 wafer I'd appreciate it.

It's good to see the bands opening up with the current sunspot cycle. Time to dust off the old SB radios and give them some use.

73, from AF6C



*Remember, if you are getting rid of any old Heathkit Manuals or Catalogs, please pass them along to me for my research.*

This article is Copyright 2023 R. Eckweiler, AF6C and The OCARC Inc.

*Thanks - AF6C*



# Maker Faire Orange County

## The Official Call for Makers is ON:

Maker Faire Orange County 2023 is happening at the Orange County Fair Grounds in Costa Mesa, CA on Saturday October 21, 2023. Wayne Yoshida, our March guest speaker, suggests the club setup a booth at the faire to promote ham radio, our club, and recruit new members. Wayne's booth will demo microwave gear and possibly some QRP rigs. He suggests our booth "supplements and complements" his presentation.

More information on the Maker Faire - Orange County can be found at:

<https://oc.makerfaire.com>

## WEBSITE CONTEST ! WEBSITE NEWS

Here's your chance to score some raffle tickets. Dan - KI6X, in his *Web Ramblings* (page 5 this month) explains the contest and its rules.

### Why This Contest ?:

One of the largest resource the OCARC offers to its members is our website. Yet few take advantage of it. This contest hopefully will get members to explore our website and find what it has to offer. Spoiler Alert: You won't find any "cat playing the piano videos".

Last month only three people reported finding the icon. We'd like to see a ten-fold increase this month. Otherwise the contest will likely be dropped.

The club has about six-months to prepare our exhibit so now is a good time to start thinking of ideas. "Show and Tell" booths are free unless the booth is selling products, which entails a \$150 vendor's fee. Setup of the booth will be on Friday from noon till 8PM and the event runs from 10 AM till 6 PM Saturday.

Even if you are not participating in a booth, plan to come to the event and enjoy the exhibits. I'm told the admission price is quite reasonable. Let's make this a fun club event and at the same time support one of our guest speakers.



Just a few club members have put a lot of time and effort designing and building the website. There are a lot of features that would be fun to add, but not if the club members pay no attention to the website and its contents.

Our website uses no cookies. In the future we may use a new feature of HTML5 called Web Storage; it allows data to be stored between sessions. The data is stored locally on your computer, private to you and not externally available. This will allow you to customize features such as the clock position. It will also allow partial auto-filling of forms, such as the renewal form.

It's your website. Please take an interest, and enjoy what it offers.

73, from AF6C



## CHIP's BAND SCAN K7JA

We now are entering the "late Spring fun times" on the HF bands, where the increased solar radiation onto the northern polar regions results in extensive openings "over the top" into eastern Europe on 20 and 17 meters well into the night. Fifteen meters will also open over the top starting around 8:00PM every night beginning the first week of May, with big signals from the Middle East and western Asia.

Of late, the higher HF bands (15/12/10 meters) have been very good during the daylight hours, and 6 meters has been opening daily to South America and the South Pacific.

The ever-increasing solar cycle means that low power and modest antennas like a dipole or vertical will bring you lots of DX. These evening openings on 20 and 15 will be a lot of fun, so turn that radio on and make some noise!

The WPX CW Contest at the end of May should be a huge blast in the early evening, as this contest is very popular in Europe. Enjoy!

73, from Chip – K7JA



### COME JOIN US

**9 AM & 9 PM Monday – Friday on CARA Repeaters:  
2M: 147.090 MHz(+0.600 MHz No PL and  
1.25M: 224.430 MHz (-1.600 MHz) PL 110.9 repeaters.**

**Also available on EchoLink node \*CATALINA\***

**NEW MEMBER Q&A****By Bill Malecki, KN6SMP**

The OCARC New Member Q&A is a new feature to help introduce our newer members, learn about how they got interested in amateur radio, why they joined OCARC and what their interests are as an amateur operator. –Bill KN6SMP

**T**his month I had the pleasure of meeting another one of our new OCARC members, Jeff Smith, WA6TKR. I've done my best to paraphrase our conversation into a Q&A format. Any mistakes are my fault, not Jeff's. Ok then, let's all meet Jeff.

**C**an you tell us something about yourself?

I'm originally from Portland, Oregon. In 1968, at age 23, my wife and I moved to Southern California with the company I was working for, Van Waters and Rogers, a industrial chemical company, as a sales agent. Thereafter, my family and I relocated from Los Angeles to Orange County and bought a home here. I currently live in Orange. My wife passed about 3 years ago, after 54 years of marriage.

**H**ow did you originally become interested in amateur radio?

When I was a boy, I was fascinated by radio. In my neighborhood I saw that a neighbor had an antenna so I knocked on his door and was able to see all of his equipment. Then I got busy with high school and work and forgot about ham radio. Later, I was living in Poway, in north San Diego County, and became aware of the Poway Amateur Radio Club. I passed the Novice exam, then the General and Advanced all within one year with a 13

WPM code requirement. As I really had no interest in CW, and did not attempt to upgrade to Amateur Extra, as that required a 20 WPM permanent code requirement I do recall someone who is very helpful to me at that time K6CD Joseph Saugier, and to help others, remember his call sign, he referred to himself as "K-6 chicken dinner." My first "radio" was a pair if radios: a Hallicrafter Receiver and a Hallicrafter Transmitter.

**W**hat have been some of your recent amateur radio interests and activities?

My primary amateur radio interest and activity is rag chewing. I enjoy getting on HF, particularly 10 meters, and hearing who I can contact. That's the adventure of ham radio for me, to meet and speak with a fellow operators from another state or country. I enjoy spending time on the air, to get to know them.

**O**n what equipment and antennas are you presently operating?

I am currently operating an Icom 7300 with a vertical HF antenna, as well as an end-fed half wave antenna. Although I have a couple of VHF/UHF handheld radios, I don't participate in VHF/UHF on a regular basis. I am unfamiliar with the various digital modes and prefer QSO's to making a bunch of digital "contacts."

**W**hat future amateur radio activities are you looking at?

I am interested in operating outdoors, perhaps in a park and making contacts using a portable KF transceiver and antenna.

**H**ow do you anticipate that your membership with Orange County Amateur Radio Club will enhance your knowledge and enjoyment of amateur radio?

Although amateur radio contacts are between individuals, I am looking forward to the social aspect of being a member of a club and getting to know fellow amateur radio operators. I'm not as much interested in the technical aspects, so much as I am in communicating with my fellow ham radio operators.



**OCARC BOARD MEETING MINUTES for APRIL 8th, 2023**  
(Special date due to the Baker to Vegas Race Support)

The OCARC Board meeting was held at The Streamliner Lounge, 186 N. Atchison St., Orange, and called to order by President Chip Margelli K7JA at 8:34 am. Nine Board Members were in attendance.

Treasurer report –presented a current Cash Flow with renewals coming in.

Activities report – AJ is working with Nicholas on a social gathering event. Fewer Ham Radio participated in Baker 2 Vegas. Most teams switch instead to cell phones.

Membership – Roster online, 91 members paid.

Newsletter: April – Bob Eckweiler AF6C. May – Tom - W6ETC. Jun - ?

Programs: April –Endaf Buckley, N6UTC & Patrick Stoddard WD9EWK (Satellite Rover and WAS). May – Dennis Kidder, W6DQ (Can anyone hear me?)

Summer Field Day Plans – A planning meeting is scheduled for April 26<sup>th</sup> at 7 PM at A.J.'s home.

Future Zoom Meeting Plans – Zoom will continue for the general meetings because there

are members with health issues, etc... that limit them coming in person.

Ideas for increasing traffic on the website. Dan KI6X is running a prize of raffle tickets for finding items that will be hidden on various pages on W6ZE.org website. See Dan's RF column for information on what to be looking for online. Next meetings for prizes will be in June and September. Chip has "VHF Propagation" books for prizes.

**New business**

Proposal to move \$5,000 into Wells Fargo CD @ 4%. Motion Passed.

Consideration of commemorative items for 90<sup>th</sup> anniversary –Magnetic stickers.

**Good of the Club**

Request for Nicholas to bring Seismometer for Show and Tell again.

Discussion of using bar code tracking method for next auction.

Adjournment occurred around 9:54 am.

**Submitted by Tim- W6TMT**

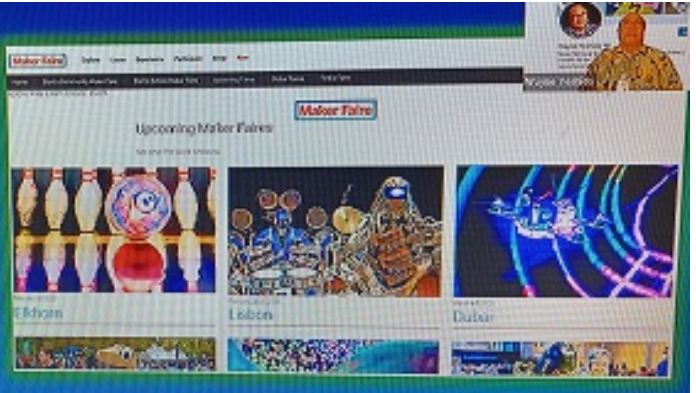


## OCARC GENERAL MEETING MINUTES for March 17th, 2023

President Chip K7JA started the meeting on time and proceeded with introductions for those members and guests in attendance. Since it was St. Paddy's Day there was a sea of green in attendance.

Janet KL7MF introduced this month's speaker -Wayne Yoshida – KH6WZ who spoke about Maker Faire and presenting Amateur Radio topics to a younger audience. It was a very enjoyable talk.

Plan, Prep, Post,  
Publicize



After a short break we had a business meeting. **Next meeting is April 28<sup>th</sup>.** [A special date -- ed.] Plans are being made for Summer Field Day.

Vice President report from Janet KL7MF let us know about some of the upcoming speakers.

Treasurer Tim N6GP was out so AJ KN6WNO, as acting treasurer, reported we are solvent. Activities Dir. Nicholas AF6CF stated that he is working on having an additional club event outside of the normal meetings and Field Day events. Also, he had a Show

Membership Corey KE6YHX reports that we have 76 members paid up.

Tech Dir. Bob AF6C placed a Jean Shepherd K2ORS SK (WOR – NYC) recording on the home webpage. <https://www.w6ze.org/FpTheaterContent/Heising - Modulation 19650129 Jean Shepherd.mp3>

It is a very entertaining talk and well worth a listen.

Arnie N6HC encouraged everyone who can make it out to Dennis Kidder's presentation at our May General Meeting to do so.

Ask the Elmer – A new member asked about getting on HF bands for the first time. Various suggestions were commented on regarding this including a visit to HRO in Anaheim, the <https://www.w6ze.org> website, About Ham page on the ARRL.org website as well as the possibility of reaching out and talking more about it both inside and out of the club meeting with individual members.

Meeting adjourned at 8:45 PM

**Submitted by Tim- W6TMT**





**A**pril 18th is World Amateur Radio Day (WARD). There are a few people I've met over the years who believe that is exactly where hams belong, but WARD is not an April Fool's Day roast; it really exists. In the early days of radio, hams were given the "wasteland" frequencies of "200 Meters and down (That is everything above 1.5 MHz!) there they quickly discovered propagation and easy long range communications. Business concerns quickly moved to take over the ham band (There was only one ham band at the time, but it was huge!)



de QZXF

On April 18th, 1925 (98 years ago *and eight years before OCARC was founded*) radio amateurs worldwide met in Paris to protect the hobby. At that meeting the U.S. was represented by ARRL co-founder Hiram Percy Maxim. The IARU (International Amateur Radio Union) was founded during that gathering in Paris, and Maxim became their first President.

The IARU is the worldwide federation of national amateur radio organizations. It has over 160 member organizations and a recent

member accepted into the society is the Sudan Amateur Radio Union.

WARD is being celebrated with an operating event running April 11th through April 25th. More information can be found here:

<https://www.iaru.org/events/world-amateur-radio-day-2/>.

The theme of this year's operating event is HS4A in reference to the United Nations Human Security for All campaign. More information may be found at :

<https://hs4a.iaru.org>.

This event is already on when you get this so rush into the shack and turn on the rig.

**O**n a separate note, the ARRL has released the 2023 Field Day logo on their website. I'm sure they will be offering products, and tee-shirts. I occasionally buy them and am usually pleased. Maybe the club should look into a group purchase if members are interested? I have yet to see what they have to offer this year. Enjoy The Hobby!

73, from AF6C



# Work FM Satellites with your HT!

*Most hams already have nearly all the equipment to work FM voice satellites.  
This guide offers a quick start for successfully making contacts!*

All cited resources are available to you at one Web site:

[work-sat.com](http://work-sat.com)

**If you have 2-meter and 440 capabilities (either "split frequencies" in one HT, or two radios), you can work FM voice satellites!**

You need to know **WHEN** and **WHERE** the satellites will be passing over your location. There are several commercial computer programs<sup>[1]</sup> that will tell you. In the home office, I use **MacDoppler** or **GPredict**. Outside, I'll use **GoSatWatch** on my iPhone and/or **AMSAT Droid FREE** on an Android device. For Windows systems, **Nova** and **SatPC32** are marvelous. But there are free-of-charge info sources online, too, at ...

[heavens-above.com](http://heavens-above.com) -or- [amsat.org](http://amsat.org) -or- [N2YO.com](http://N2YO.com)

Log in to these sites, plug in your grid square, and you will have access to accurate satellite pass information.

The one "absolute" for success is to **open up your Squelch**. We are talking about "weak signals" from hundreds of miles away - so don't expect the satellites to be strong enough to break squelch like your local repeater does. Sure, it's a little noisy - but that's part of the process: That noise is an aid in locating the satellites! When the frequency starts exhibiting **quieting**, that's a sign that you are **capturing** the satellites' signals.

Improve your HT's stock antenna (most are rated at **NEGATIVE 6db** - or worse!). The **Smiley 270A**<sup>[2]</sup> is a good performer for 2M reception (like the ISS' SSTV projects), and is available in Male SMA, Female SMA, and Male BNC models. But for best success, you need more **GAIN**, so using an **Arrow Satellite Antenna**<sup>[3]</sup> or **Elk Log Periodic** is much better. If you prefer to home-brew your antennas<sup>[4]</sup>, go to the [work-sat.com](http://work-sat.com) Web site's **ANTENNAS** page for construction article links: You can get in to the world of high gain operations for as little as \$15!

For SO-50, set up your radio to tune for the **Doppler effect** on the 440 downlink. Start listening **above** the center frequency - you will **acquire** the satellite sooner and clearer. When the downlink gets scratchy or fuzzy, tune down 5KHz at a time, and reception may be clearer. Only transmit when you can **clearly** hear the satellite. Follow the signal down in frequency as the pass continues. See the frequency chart on the last page.

Some satellites - like AO-92 - are a little different, with their **440 uplinks** (which may require minor Doppler adjustment) and **2M downlinks**. See the frequency charts at the end of this document.

**If using a whip antenna, don't hold it upright.** Held in a vertical position, your transmitted signal is hitting land-based receivers. Most of our satellites are not land-based (grin). You need to tilt your HT's antenna about the same amount as the satellites **ELEVATION**. Get it perpendicular to the orbit's path! You will quickly get the hang of it - and hear the difference. Again, you will have much better results with a modest beam or Yagi antenna.

Ideally, we should be working the FM voice satellites in **full-duplex** mode, where we can simultaneously listen to the downlink as we are transmitting. Although this method is preferred, it is not mandatory: Carefully monitor the downlink, and wait for a break in the conversations to key your mic and announce yourself. You might find it helpful to record your sessions for later review: Even if you do not make a contact during a pass, a recording can help you recognize the callsigns and voices of other operators. Pocket recorders or Smartphone apps are great for this. And if working full-duplex, use an ear-piece or headset to monitor the downlink to avoid acoustic feedback.

Knowing your grid square - and having a grid square map - is a quick way of identifying locations of operators you will hear. The **ARRL** and **Icom America** have grid square maps: Icom's is free and available at many ham radio stores<sup>[5]</sup>.

It just takes a little preparation and planning for working FM voice satellites. Not every pass is workable with an HT - don't go after the sub-10-degree elevation passes as you start "working the birds." Choose your passes wisely: Working higher elevation passes will give you much better results.

When you clearly hear others, listen for a break in the action, key your mic and use the ITU-approved phonetics<sup>[6]</sup> to announce your callsign, grid square, and - **optionally** - operation mode:

**"KILO SIX LIMA CHARLIE SIERRA, DELTA MIKE ONE THREE, HANDHELD."**

**Have questions? Join our [groups.io](#) message group!**

Clint Bradford, K6LCS

[work-sat.com](#)

[k6lcs@ham-sat.info](mailto:k6lcs@ham-sat.info)

(909) 999-SATS (7287)

**Updated January 6, 2023**





## Work-Sat.com

"Your Web site took me from zero knowledge to getting an HT and an Arrow. And just four months later, I have qualified for VUCC on the FM birds. A great site for the beginner on the birds. You un-mystify them."

"I love the site and I greatly appreciate the information you have provided to get me going! Yours is a no-nonsense approach to working satellites ... "

"Simplicity ... the idea of working sats "sounds complicated" but that's really not the case. You keep the language simple, illustrations simple, and concept simple ... give folks the idea that any ham can do this (which they can) with the right equipment ... if they follow the directions you provide."

K6LCS gave a fantastic presentation on amateur satellites. It was most informative and entertaining. Clint's passion for the subject was evident, and I would imagine that the club members individually and/or in a group will be eager to try satellite contact in the near future.

**Clint Bradford, K6LCS**  
[k6lcs@ham-sat.info](mailto:k6lcs@ham-sat.info)

Jurupa Valley CA US DM13fx  
 (909) 999-SATS [7287]



## Notes

[1] - Links to several satellite pass data programs - as well as free online resources - available on the **TRACKING** page at [work-sat.com](http://work-sat.com).

[2] - Be careful using longer whip antennas on HTs: Their mass places stress on your HT's antenna connector. The Smiley 270A (which out-performs antennas 2X its price!) has a protective coil at its base, and is available at **Ham Radio Outlet** - [hamradio.com](http://hamradio.com) - or from **Smiley's Web site** at [htantennas.com](http://htantennas.com) .

[3] [4] - **Arrow's Model 146/437-10WBP** is a dual-band cross-Yagi design, with a diplexer built into the boom's handle. Links to the Arrow - as well as the **Elk** and build-'em-yourself antennas - on the **ANTENNAS** page at [work-sat.com](http://work-sat.com) .

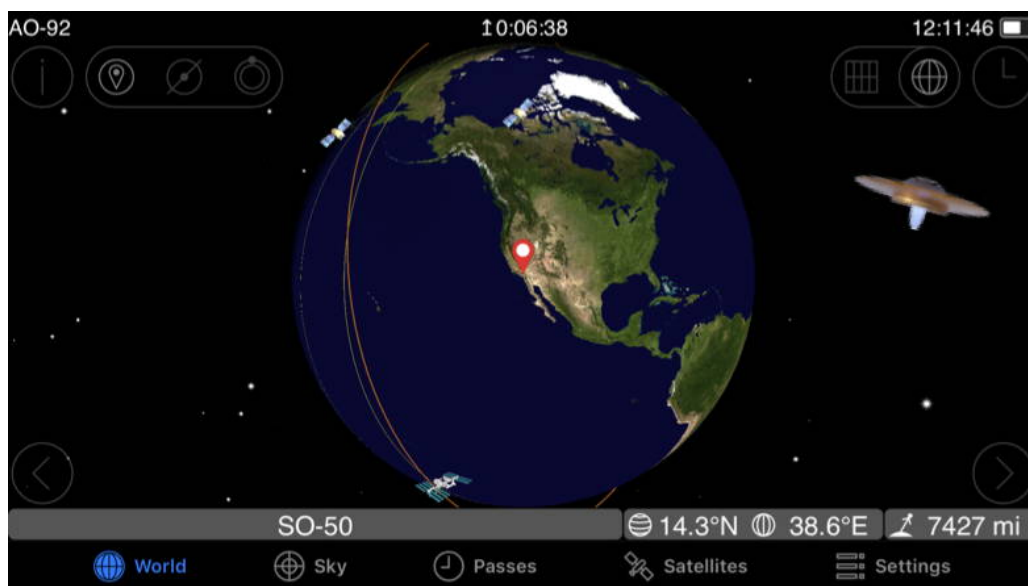
[5] - A .pdf copy of Icom's grid square map is available on the **SHACK AIDS** page at [work-sat.com](http://work-sat.com) .

[6] - Download the ARRL's Handy Ops Guide from the **SHACK AIDS** page at - you guessed it - [work-sat.com](http://work-sat.com) .



A – Alpha	J – Juliet	S – Sierra
B – Bravo	K – Kilo	T – Tango
C – Charlie	L – Lima	U – Uniform
D – Delta	M – Mike	V – Victor
E – Echo	N – November	W – Whiskey
F – Foxtrot	O – Oscar	X – X-Ray
G – Golf	P – Papa	Y – Yankee
H – Hotel	Q – Quebec	Z – Zulu
I – India	R – Romeo	

The International Telecommunications Union  
Standard Phonetic Alphabet



## Frequencies for SO-50, AO-91, PO-101, and the ISS

(Updated 01/06/2023)

### SO-50

Channel #	Alpha	TX Freq	TX Tone	RX Freq	RX Tone
501	50 +2	145.850	67.0	436.805	None
502	50 +1	145.850	67.0	436.800	None
503	50 74	145.850	74.4	436.795	None
<b>504</b>	<b>SO-50</b>	<b>145.850</b>	<b>67.0</b>	<b>436.795</b>	<b>None</b>
505	50 -1	145.850	67.0	436.790	None
506	50 -2	145.850	67.0	436.785	None

### AO-91 - ONLY when in Sunlight!

911	AOS 2	435.240	67.0	145.960	None
912	AOS 1	435.245	67.0	145.960	None
<b>913</b>	<b>AO-91</b>	<b>435.250</b>	<b>67.0</b>	<b>145.960</b>	<b>None</b>
914	LOS 1	435.255	67.0	145.960	None
915	LOS 2	435.260	67.0	145.960	None

PO-101 / Diwata-2	AMSAT's AO-27
Ops Schedule: <a href="https://twitter.com/Diwata2PH">https://twitter.com/Diwata2PH</a>	Active for ~4 mins. AOS/LOS mid-latitudes of the Northern Hemisphere.
Downlink 145.900, Uplink 437.500 141.3	Downlink 436.795, Uplink 145.850 67.0

### ISS Frequencies

FM Voice - ITU Region 1		FM Voice - ITU Regions 2/3	
<i>Europe, Middle East, Africa, North Asia</i>		<i>N./S. America, Caribbean, Australia, S. Asia</i>	
<b>145.800 downlink</b>	<b>145.200 uplink</b>	<b>145.800 downlink</b>	<b>144.490 uplink</b>
<b>FM SSTV downlink 145.800</b>	<b>AX.25 1200-baud packet 145.825</b>		
<b>ISS Crossband Repeater</b>		<b>UPLINK: 145.99 - 67.0 CTCSS</b>	
<b>Accommodate for the Doppler phenomenon on the 437.800 DOWNLINK:</b>			
437.810	437.805	<b>437.800</b>	437.795
AOS		MID	LOS

Clint Bradford K6LCS [work-sat.com](http://work-sat.com) (909) 999-SATS



Everyone who knows me knows there isn't a more honest person on the face of the earth. What I'm about to relate to you may seem impossible, but I stand on my reputation! I thought I'd put my story down while it is still fresh, and while I'm waiting for my 5-Band DXCC from the ARRL. There is some worry that they won't accept my contacts from LotU [Logbook of the Universe - ed.] But I'm sure they will see it my way.

This all started at dawn on the first of this month. I was

just getting ready to enter my car when this bright light encircled me. I slowly rose off the ground towards a UFO. Anticipating being probed I had mixed apprehension. Strapped to my belt was my three handhelds and a LiFePo4 battery. I cursed the manufacturers for making their products so light. My weight was no challenge to the beam.

In the next minute I found myself face-to-face with an ET. Describing him in scientific terms: He looked just like me but completely different. He spoke in a monosyllabic language that I quickly mastered. It turned out he was curious about the hobby Ham Radio. Just the day before, I had decided to get my license. I studied for a few minutes in the morning and proceeded to the FCC office. They told me they didn't give ham tests, but since I was such a special person they'd make an exception. Thirty minutes

later I had passed all the tests they could throw at me. I even stunned them by pointing out errors in some of the questions. They said they were so glad I came in and helped straighten out their testing that they gave me a call on the spot WHØPER. I even walked away with a GROL license.

I explained ham radio to QZXF (Z is the only vowel in their language). He got all excited and that's when I realized his ship would help me make 5-band DXCC. Eyeing his instrumentation I saw the galactic navigator computer and knew with my technical abilities I could turn it into a 5-band FT-8 radio. He was concerned about the NZVN part in the computer which he'd need to get home safely. I promised him it would be put aside and kept safe.

Soon it was time to start my quest. QZFX beamed me down to an unpopulated area of the US, and I set up the FT-8 radio on automatic and beamed back up. The US on five bands in seconds! I entered

5 QSOs into LotU and we headed for Canada for the second country. Then we learned how

to beam the radio down without me, which was great as

beam- ing takes a lot out of you. Continuing west to keep in daylight, we made six complete orbits of the planet and finally had 110 countries; a few extras for assurance. I even worked Bouvet Is. For this one I beamed down and took a photo of myself on the island. Approaching dusk near the Canadian US border we decided to call it a day. Suddenly at angels 60, we encountered a US fighter plane. We saw him fire a missile and we held on. There was a loud boom and my perfect life passed before me. But we were okay. The fighter shot down a balloon that was drifting near us.

I said farewell to QZXF and was beamed right to my front door. What a trip. Next I want to try WAS - Worked All Stars. As I patted my pants I knew QZXF would be back soon, because I found, safely in my pocket the NZVN part.

73, WHØPER 

## TREASURER'S REPORT OCARC Cash Flow - Year To Date

1/1/2023 through 3/31/2023

Category	1/1/2023 3/31/2013
<b>INFLOWS</b>	
Badge Income (PayPal)	\$3.00
Donations - FD	30.00
Dues, Membership (PayPal) 2023	1,230.00
Dues Membership 2023	510.00
Opportunity Drawing - Monthly	235.00
<b>TOTAL INFLOWS</b>	<b>\$2,008.00</b>
<b>OUTFLOWS</b>	
Flowers Expense (WFD)	\$30.00
Guest Speaker Meal _ Exp	107.03
Opportunity Drawing - Monthly Exp	157.38
PayPal Fees	66.31
Propane Tank	61.30
Secretary of State	5.00
WFD - Propane For Generator	47.39
WFD - Rental - Tent	150.00
ZOOM Subscription (Refund)	-44.97
<b>TOTAL OUTFLOWS</b>	<b>\$636.44</b>
<b>OVERALL TOTAL</b>	<b>\$1,371.56</b>

Tim - N6GP



**APRIL GENERAL MEETING**  
to be held  
**ONE WEEK LATE**  
**APRIL 28th, 2023**

The April General meeting has been moved to April 28th, the fourth Friday of April instead of the normal third Friday (April 21st.). This is due to a conflict with the International DX Convention held in Visalia, CA each year.

Since many active members of the club are regular attendees of this event, including our current president and vice president, the board decided to hold the meeting a week later.

April is a busy month. The club also has a team attending to OPD communications at the Baker to Vegas race in early April. Thus the board

meeting has also been moved from April 1st to the 8th to accommodate them. Actually some may worry about the results of holding a club board meeting on April Fools' Day.



The **ORANGE COUNTY AMATEUR RADIO CLUB, INC.**

RF - VOLUME 64 ISSUE 4 - APRIL 2023

P.O. BOX 3454

TUSTIN, CA 92781-3454



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