

# The HIARC Bulletin

June 2019 Edition

## The Official Bulletin of the Harris-Intersil Amateur Radio Club

**Club Meetings:** Second Thursday of each month at Meemaw's Barbecue on Babcock Street between Palm Bay Road and Port Malabar Road. Supper is at 6:00 PM, business is at 7:00 PM. Our programs start at 7:30 PM. Some of the members have allergies. We ask that you refrain from wearing fragrances if at all possible thanks.

**Club Station:** Building 15, Room 321. E-mail [Butch](mailto:Butch@hiarc.net) for access.

**HIARC Website:** <http://qsl.net/hiarc>

**Repeaters:** 145.47 Mc, tone 107.2 cycles, elevation 170 feet, Melbourne

**HIARC Web Site:** [www.qsl.net/hiarc](http://www.qsl.net/hiarc). Website administrator; Jim KC7SSW

**Officers:** President: Francis ("Butch"), WA4AQV

Treasurer: Bill WA4EMU

Secretary: None

Repeater Chairmen: Bud W4HXP

Program Chairman: None

Field Day Chairman: Bill WA4EMU

Sunshine Officer: Open

Club Jester: Ken N8KH

### **Membership:**

Dues are \$12.00 per year to:

Bill WA4EMU

**Annual Events:** Annual swap-fest at the October meeting. Field Day (always the fourth full weekend in June) at Grant Community Center Fairgrounds, Field Day web site link

<https://sites.google.com/site/hiarcfieldday2013/>

**Selected Hamfests:**

2019 Melbourne Hamfest, October 11, and 12, Melbourne Auditorium.

### **Ham Radio Lunches:**

- Every Friday, 10:30 AM till 12:30 PM or so, Golden Corral on Palm Bay Road in Palm Bay
- Every Friday, 9:00 AM till 11:00AM or so, Umpa's Diner, [1115 N Courtenay Pkwy, Merritt Island, FL 3295](#), (321) 454-3422
- 

### **President's Message**

The HIARC ARRL 2019 Field Day will be June 22 and 23 at The Grant Community Park / Seafood Festival Grounds in Grant, FL. All are invited. Flyer is pasted, here is a map link : <https://www.google.com/maps/@27.9290826,-80.5303419,164m/data=!3m1!1e3>. HIARC will be class 2A. Food and drinks provided. More information about Field Day: <http://www.arrl.org/files/file/Field-Day/2019/2019-Field-Day-Packet-Complete.pdf> . See amateur radio operators in action!

Our next monthly HIARC meeting is Thursday June 13. The meeting program will be completion of Noise and Interference by Ed Messer and an overview of the new eLoran navigation system the US Government is implementing. Lots of Meemaw's Barbecue food and door prizes as well.

73's

Butch WA4AQV

### **Field Day Announcement**

The 2019 hurricane season is here and amateur radio operators in Florida prepare as part of a national communications Field Day exercise, June 22-23, sponsored by the American Radio Relay League. Since 1933, amateur radio operators across North America have established temporary radio stations during Field Day to practice emergency communications skills and demonstrate Amateur Radio operations to the public. Over 35,000 people from thousands of locations participate in Field Day each year. Members of the Harris-Intersil Amateur Radio Club (HIARC) will be operating in the national Amateur Radio Field Day exercise at the Grant Seafood Festival grounds, 4580 1st Street, Grant, Florida. This event is open to the public and all are invited to attend.

Field Day provides the opportunity to practice for an emergency in a relaxed and FUN environment. The HIARC station will be operating from 2:00 PM Saturday, June 22 to 2:00 PM Sunday, June 23. Information displays will explain how to get an amateur radio license, setup a station and get on the air. Come on out and join us! We invite you to visit our location and learn about amateur radio. Checkout the website "<http://www.arrl.org/field-day-locator>" for directions to our FD site as well as others in our area.

For further information contact:

Bill WA4EMU  
HIARC Field Day Chairman

Francis WA4AQV  
HIARC General Chairman

## **New Florida Texting While Driving Law**

Here is the text of the newly enacted Florida Texting While Driving Law: [http://www.leg.state.fl.us/statutes/index.cfm?App\\_mode=Display\\_Statute&URL=0300-0399/0316/Sections/0316.305.html](http://www.leg.state.fl.us/statutes/index.cfm?App_mode=Display_Statute&URL=0300-0399/0316/Sections/0316.305.html). It does not seem to affect most types of amateur radio mobile operation.

Butch WA4AQV

## **Upcoming Skywarn Classes for East Central Florida**

A list of Skyward classes currently scheduled in East Central Florida is attached. Note that classes for Brevard County aren't scheduled until mid-August, a month before the peak of hurricane season.

73,  
Paul NØJAA  
HIARC BEARS/Skywarn Representative

Our Field Day Filters

## **Free Antenna Book**

Last month we featured a free link to the famous Antennas Theory And Design textbook by Constantine Balanis at Arizona State University: <https://archive.org/details/Antenna.Theory.Analysis.and.Design3rd.Edition/page/n7>

Professor Balanis also wrote a graduate text on electromagnetics. Here is free link to that: [https://zackrauen.com/PublicFiles/School/Textbooks/EE381\\_FieldsAndWaves.pdf](https://zackrauen.com/PublicFiles/School/Textbooks/EE381_FieldsAndWaves.pdf). Now you have the set.

Butch WA4AQV

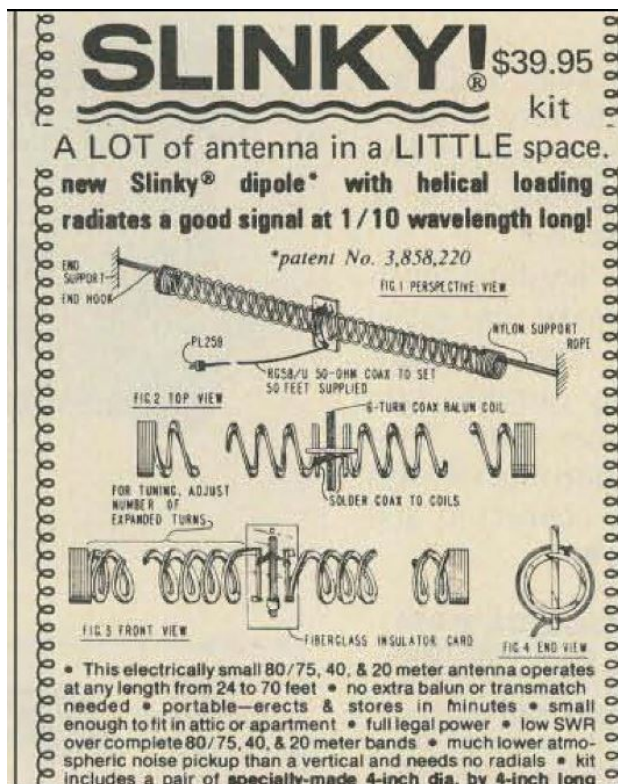
## **The Slinky Dipole Antenna**

The Slinky Dipole is a reduced size HF dipole antenna using you guessed, two slinky springs on a taught rope. The Slinky springs make inexpensive loading coils in the 40 to 100 microhenry range. Attached is a 1976 ad for Slinky antenna in 73 Magazine (remember 73 Magazine?). Usually there are some Slinky Dipoles for sale on the internet and of course you can make your own.

Bare steel is 40 times less conductive than copper plated steel so copper plated or brass springs may have less conductor loss although longer Slinky antennas steel is fine.

The first stretchable spring antenna seems to have been by Franklyn McKenzie with his April 20, 1926 "Stretchable Spring Dipole" Patent. Link to see: <https://pdfpiw.uspto.gov/.piw?Docid=01581133&homeurl=http%3A%2F%2Fpatft.uspto.gov%2Fnetacgi%2Fnph-Parser%3Fsect2%3DPTO1%2526Sect2%3DHITOFF%2526p%3D1%2526u%3D%25252Fne-tahtml%25252FPTO%25252Fsearch-bool.html%2526r%3D1%2526f%3DG%2526l%3D50%2526d%3DPALL%2526S1%3D1581133.PN.%2526OS%3DPN%2F1581133%2526RS%3DPN%2F1581133&PageNum=&Rtype=&SectionNum=&idkey=NONE&Input=View+first+page>

The Slinky dipole design is impressive for simplicity and ease of manufacture. A US patent application was filed on a Spring On A Rope version in November 1973. The US patent issued to the inventor, Sidney Arnow. No word on his call letters. Here is a link to view the patent: <https://pdfpiw.uspto.gov/.piw?PageNum=0&docid=03858220&ID-Key=EF0480A7B12E%0D%0A&HomeUrl=http%3A%2F%2Fpatft.uspto.gov%2Fnetacgi%2Fnph-Parser%3Fsect1%3DPTO2%2526Sect2%3DHITOFF%2526u%3D%25252Fne-tahtml%25252FPTO%25252Fsearch-adv.htm%2526r%3D1%2526p%3D1%2526f%3DG%2526l%3D50%2526d%3DPALL%2526S1%3D3858220.PN.%2526OS%3DPN%2F3858220%2526RS%3DPN%2F3858220>. Clearly in 1973 Sidney Arnow added the rope, the method of tuning, the compressed spring pitch on the ends, the balun and other features. The Slinky itself was invented in 1940 <https://en.wikipedia.org/wiki/Slinky>.



There are many possible variations regards tuning. In the Arnow patent the Slinky turns are bunched up near the ends of the dipole. This was a good approach for broad tuning range and to pull the current further out on the dipole arms for better efficiency. Doing otherwise, by say forming a constant winding pitch helix out from the antenna center creates the competing factors of 1) compressing the coil increases coil inductance to reduce frequency and 2) compressing coil shape decreases the antenna length to raise frequency, so the constant winding pitch approach may have a limited tuning range. Of course jumper wires and coil taps can be used as well.

In 1974 there was a slinky dipole article in QST attached. Tuning of this version is by drooping end wires.

**Inexpensive 24 GHz Amateur Radio**



Cheap 24GHz Doppler Radars can form the basis for amateur microwave communications. Here is a technical explanation <https://www.YouTube.com/watch?reload=9&v=5vqSX40seqA>

The radar units mentioned could be used for communications in exactly the same way a Gunn-plexers were used in the past: with an audio modulated power supply, providing you know the approximate IF frequency needed and have a tunable WBFM receiver for an IF.

73,  
Ken N8KH

PS The unit in the video was at 23.9 GHz, below the amateur band. It would probably be possible to move it higher in frequency using a knife to trim the oscillator feedback filter.



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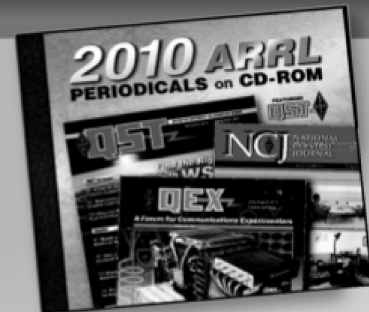
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Issue: Oct 1974

Article: Apartment Dwellers' Slinky Jr. Ant.

Author: Arthur Peterson, W7CZB

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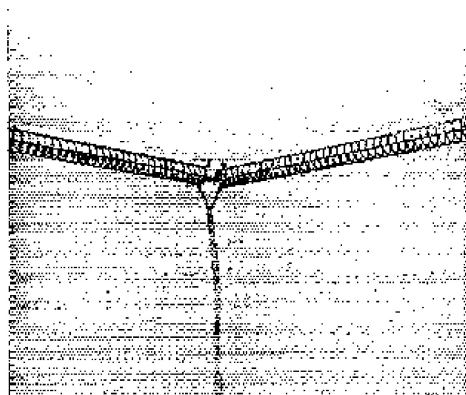
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- 2001 Ed., ARRL Order No. 8632, \$19.95



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• *Beginner and Novice*

## Apartment Dwellers' Slinky Jr. ant.

BY ARTHUR J. PETERSON,\* W7CZB

*We receive many, many requests from Novices, and old timers for that matter, for small-size, apartment-dweller antennas. As W7CZB points out, it is difficult to find a limited-space antenna that does a reasonable job. We think he has found the right system — at least it works well for him and it might for you.*

**T**HE SEARCH for an ultra-compact, high-frequency antenna which tunes more easily and radiates more efficiently than the current crop goes on and on. Amateurs living in dense urban environments, especially apartments and condominiums, where conventional antennas simply cannot be erected, keep searching for the ideal miniature antenna.

Ingenious amateurs have developed many compact antennas over the years and have published construction details for the benefit of their colleagues. Each antenna this writer has tested performed with a degree of satisfaction, but the ultimate — or even the near ultimate — seems to be as elusive as ever.

A few compact antennas and some of their many variations which this writer has tested in mobile homes and apartment dwellings are mobile whips, window sill semiverticals, short (end and center-fed) random-length wires, and grounded systems. Each antenna had one or more adverse characteristics. The whips had a narrow range at the lower frequencies; the window sill antennas were aesthetically unacceptable; the random lengths presented many voltage loops to the transmitter; and the grounded systems did not perform well unless a short connection to a good earth ground was available.

Probably the most general adverse characteristic was the one of difficulty in tuning the antennas to a load which would be acceptable to the transmitter. This meant changing bands was a major and time-consuming task, and often tricky.

Utilizing an Ultimate Transmatch described in the July, 1970 QST and the 1972 Handbook greatly improved the operating convenience and operating efficiency of the antennas tested because it provided a rapid return to exact predetermined

band settings. This feature always assured a proper load for the transmitter.

### *The Adjustable Miniature Dipole*

The appearance of the "Slinky Jr." coil spring in toy shops offers the basis for an inexpensive, compact, resonant, and easily adjustable indoor antenna. These 1-3/4-inch diameter (copper plated) coils are available in 72-turn lengths for about fifty cents. Double lengths are available from the manufacturer. (See the list of Fig. 1.) A multiband center-fed dipole can be made up with six single-length coils. Three coils, soldered together and strung out on 3/4-inch diameter, ten-foot long wooden dowel, forms one of the two antenna segments. These two lumped-inductance segments will resonate initially near, if not in, the 80-meter band. Fine tuning or changing bands is simply a matter of adding short stubs for 80 meters and shorting turns from the ends of these coils for the higher frequency bands. See Fig. 1. A Transmatch is utilized by this writer as a convenient, although not necessary, accessory for tuning the system precisely *after approximate antenna resonance is attained* by shorting coil turns.

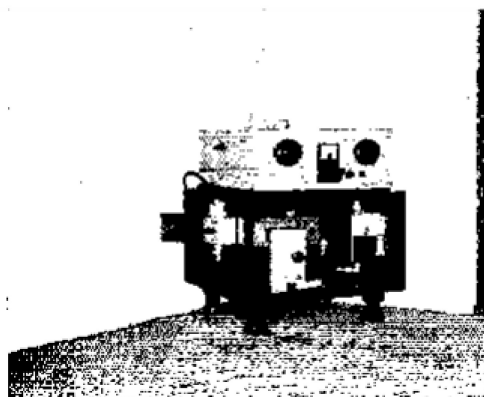
A typical installation is shown in the photos. The system is fitted into a 10 x 11-foot den. Probably the most important mechanical feature is that the antenna segments can be easily installed and removed without marring or damaging room structure. They can be reached from a standing position for tuning adjustments or with the use of a foot stool for short persons. If the wooden dowels and the coil springs are decoratively painted, the installation should be as acceptable aesthetically as it is functionally.

### *Warning*

Dangerously high rf voltages can appear at the outer ends of this antenna. If the operating gear is

\* 3230 80th Ave, SE, Apt. 6, Mercer Island, WA 98040.

The accessory console used by the author adds to the pleasure of tuning and operating this antenna system. All essential accessories are conveniently packaged in one module which can be moved about without having to cope with a wearisome disassembly and reassembly procedure normally followed. The legs are removable for table top placement if so desired. Ample space is provided for storing other test equipment.



near one of these extremities, or if children frequent the shack, the free-hanging tuning jumpers connected to the antenna should be secured beyond normal reach as a safety precaution.

### Tuning

Resonating this antenna to an approximate frequency is a simple matter with a grid-dip meter. Short the feed point of the antenna together so that the coils are one continuous circuit. Couple the grid-dip meter to the center of the antenna and then short out the antenna ends until you get a grid-dip indication at the desired frequency, indicating resonance.

In the installation described here, the feed line is 300-ohm TV twin line. This works well with the Transmatch. However, 50-ohm coax line could be used. If coax is used, insert an SWR indicator in the line and then adjust the antenna electrical length for the lowest indicated SWR.

### Performance

This antenna installation is located on the third (top) floor of a wooden frame apartment building and away from major wire concentrations and

metal ducting insofar as possible. Its primary purpose is to provide reliable 240-mile weekly 80-meter phone contacts between two low-powered transceivers — which it does. Operation on the 40- and 20-meter bands is also satisfactory.

Operating as a resonant doublet, the antenna is not difficult to prime for an SWR of unity on the 40-meter band. On the 80/20-meter bands SWR values are higher, ranging from approximately 2:1 to 4:1.

When the overall installation is tuned to half-wave resonance as a doublet, it will also perform well as a grounded "T" with the feeders tied together. The vertical lead-in wire will then become the radiator where maximum current is concentrated and the coil segments will act as a capacitance loaded top hat. It must be remembered, however, that a short connection to a good earth ground is essential for the success of this mode of operation.

For a final and important thought — the successful performance of any compact antenna using low power depends primarily upon the skill of the operator in choosing best times for wave propagation and least QRM. **QST**

Ⓐ Two 3/4-inch by 10-foot wooden dowels. Available at most lumber yards for approximately \$1.00 each.

Ⓑ Three Slinky Jr. coils soldered together, six required to make the complete dipole. Manufactured by James Industries, Hollidaysburg, PA 16648. Cost, approximately 50 cents each at toy stores.

Ⓒ Six 1-inch vinyl covered cup hangers (hooks), three per antenna segment.

Ⓓ Four alligator clips to facilitate antenna installation and removal.

Ⓔ 300-ohm TV twin line.

Ⓕ Two 33-inch tuning stubs for 80 meters, also used for jumpers on the 20-meter band.

Ⓖ Two 115-inch tuning jumpers for the 40-meter band. This also may be an 82-inch extension to the 80/20-meter band stubs and jumpers.

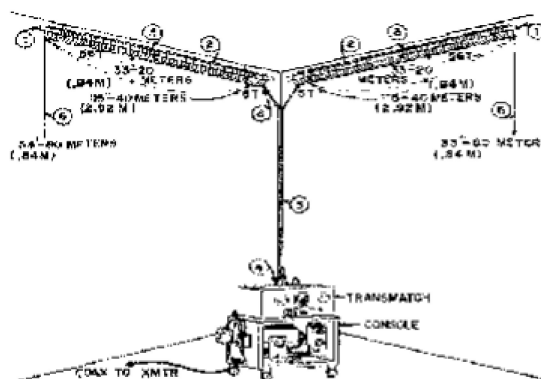


Fig. 1 — This drawing shows the installation of the Slinky Jr. Antenna.

## East Central Florida SKYWARN Training National Weather Service Melbourne, FL

*Serving Brevard, Indian River, Lake, Martin, St. Lucie,  
Seminole, Okeechobee, Orange, Osceola and Volusia Counties.*

The following schedule reflects the dates, times and locations of upcoming SKYWARN spotter classes and other hazardous weather presentations. This schedule will be modified regularly as new talks are added. Most of the talks are open to the public and all interested parties are encouraged to attend (any exceptions will be noted below). The presentations generally last two hours in length and are free. Please pre-register via the link(s) below if you would like to attend. Weather Spotter registration will be completed at the class. A National Weather Service meteorologist will discuss various aspects of severe weather, storm spotting, and severe weather safety. At least one SKYWARN spotter class is taught within each county every year - with two or more classes typically conducted within most counties. Please direct any questions about SKYWARN training classes and other hazardous weather presentations within [east central Florida](mailto:scott.spratt@noaa.gov) to [scott.spratt@noaa.gov](mailto:scott.spratt@noaa.gov)

**Schedule updated May 9, 2019**

Date 2019	City (County)	Class Time	Class Type	Location Additional Details
Monday May 13	Winter Park (Orange)	700-900 pm	Basic	Orange County Emergency Operations Center 6590 Amory Court, Winter Park <a href="https://skywarn-winter-park-basic-051319.eventbrite.com">https://skywarn-winter-park-basic-051319.eventbrite.com</a>
Saturday July 13	Tavares (Lake)	930-1130 am	Basic	Lake County Emergency Operations Center 425 W. Alfred Street, Tavares <a href="https://skywarn-tavares-basic-071319.eventbrite.com">https://skywarn-tavares-basic-071319.eventbrite.com</a>
Saturday July 13	Tavares (Lake)	1230-230 pm	Advanced	Lake County Emergency Operations Center 425 W. Alfred Street, Tavares <a href="https://skywarn-tavares-advanced-071319.eventbrite.com">https://skywarn-tavares-advanced-071319.eventbrite.com</a>
Friday July 19	Ft. Pierce (St. Lucie)	10am-noon	Basic	St. Lucie County Emergency Operations Center 15305 Midway Road, Ft. Pierce <a href="https://skywarn-fort-pierce-basic-071919.eventbrite.com">https://skywarn-fort-pierce-basic-071919.eventbrite.com</a>
Friday July 19	Ft. Pierce (St. Lucie)	100-300 pm	Advanced	St. Lucie County Emergency Operations Center 15305 Midway Road, Ft. Pierce <a href="https://skywarn-fort-pierce-advanced-071919.eventbrite.com">https://skywarn-fort-pierce-advanced-071919.eventbrite.com</a>
Saturday August 24	Rockledge (Brevard)	900-1100 am	Basic	Brevard County Emergency Operations Center 1746 Cedar Street, Rockledge <a href="https://skywarn-rockledge-basic-082419.eventbrite.com">https://skywarn-rockledge-basic-082419.eventbrite.com</a>
Saturday August 24	Rockledge (Brevard)	Noon-200 pm	Advanced	Brevard County Emergency Operations Center 1746 Cedar Street, Rockledge <a href="https://skywarn-rockledge-advanced-082419.eventbrite.com">https://skywarn-rockledge-advanced-082419.eventbrite.com</a>
Tuesday October 22	Port St. Lucie (St. Lucie)	10am-noon	Basic	Port St. Lucie Community Center, Room A 2195 Southeast Airoso Boulevard, Port St. Lucie <a href="https://skywarn-PSL-basic-102219.eventbrite.com">https://skywarn-PSL-basic-102219.eventbrite.com</a>
Tuesday November 5	Port St. Lucie (St. Lucie)	10am-noon	Advanced	Port St. Lucie Community Center, Room A 2195 Southeast Airoso Boulevard, Port St. Lucie <a href="https://skywarn-PSL-advanced-110519.eventbrite.com">https://skywarn-PSL-advanced-110519.eventbrite.com</a>



See below for outreach events (i.e. safety expo's, etc.).

Several times each year, opportunities exist for presentations on other weather topics, including **Florida Weather Hazards, Fire Weather, Lightning, Marine Weather, and Hurricanes**. NWS staff members also participate in many annual **safety/education expos/fairs**, often partnering with local government agencies. These talks and expos/fairs are open to the public. Please direct any questions concerning these events (or requests for NWS participation) to [scott.spratt@noaa.gov](mailto:scott.spratt@noaa.gov)

Date 2019	City (County)	Time	Topic	Location Additional Details

<http://www.weather.gov/mlb>



# **The 2019 HIARC Field Day Co-site Interference Filters**

**By**

**Ken N8KH**



## Band Pass Filter PB-F200, 14MHz (20m), 200Watts ICAS

SKU: PB-F200-14

### Typical specifications\*:

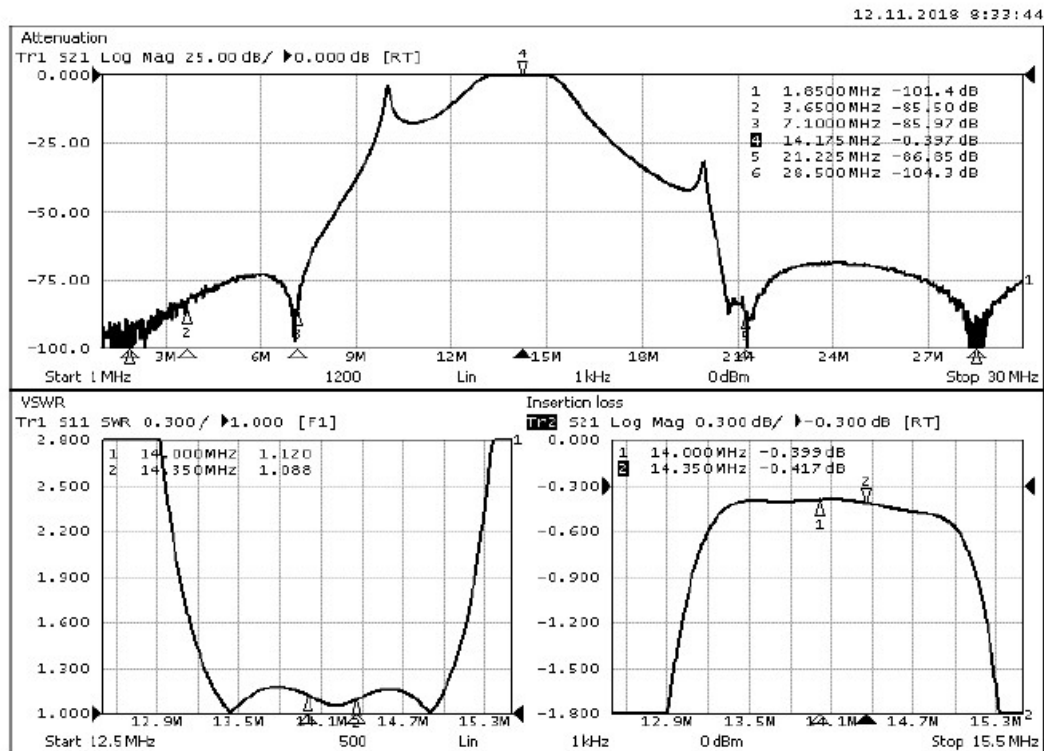
• Impedance:	50 Ohm
• Power rating:	200W ICAS**, max VSWR 1,5:1
• Insertion loss:	≤0,5db
• Return loss:	≥20db
• VSWR:	≤1,2:1
• Connector:	SO-239 (UHF female)
• Dimensions (L x W x H) mm/inches:	195 x 90 x 65 mm / 7,7" x 3,6" x 2,6"
• Net weight, kg/lbs.:	≤0,5 kg / 1,1 lbs

\* Subject to change without prior notice

\*\* Intermittent Commercial and Amateur Service, (CW - 50% Duty cycle)

Measured: adjacent bands attenuation (S21), VSWR and Insertion loss (S11).

Serial number #1118-630:



QC:

18 April, 2019

Page 1 of 1



LowBandSystems

Tel.: 007 918 557 45 07 (WhatsApp, Viber)

E-mail: ra6lbs@gmail.com

Volgodonsk, 347382, Russian Federation

[www.lowbandsystems.com](http://www.lowbandsystems.com)

## CATALOG DEPARTMENT

Receive

Transmit

Band Pass Filters

Di-, Tri-, Quad-, PentaPlexers

Remote Control Equipment

POWER TUBES

&gt; Band Pass Filters &gt; 200W PerfoBox &gt;

## BAND PASS FILTER «PERFO BOX-200», ICAS, 14 MHZ

SKU: PB-F200-14

Availability: Order

110 Eur add to compare

1 ORDERS ONLY



Point to ZOOM



Band pass Filters «Perfo Box - 200Watts»

Frequency range (MHz): 1400 1410 1420 1430 1440 1450 1460 1470 1480 1490 1500

Frequency (MHz)	Insertion loss (dB)	Return loss (dB)	VSWR
1400	0.5	20	1.2
1410	0.5	20	1.2
1420	0.5	20	1.2
1430	0.5	20	1.2
1440	0.5	20	1.2
1450	0.5	20	1.2
1460	0.5	20	1.2
1470	0.5	20	1.2
1480	0.5	20	1.2
1490	0.5	20	1.2
1500	0.5	20	1.2

## Detailed data sheet of «Perfo Box-200» filter series

## Typical specifications:

Impedance:	50 Ohm
Power rating:	200W
Insertion loss:	≤0,5dB
Return loss:	≥20dB
VSWR:	≤1,2:1
Connector:	SO-239
Dimensions (L x W x H) mm/inches:	195 x 90 x 65 mm / 7,7" x 3,6" x 2,6"
Net weight, kg/lbs.:	≤0,5 kg / 1,1 lbs

For the newsletter ...

Last year, before Field Day, I purchased a set of HF bandpass filters to help avoid co-site interference at the HIARC Field Day. Over the last week or so, I was attempting to measure them to make sure they are still performing well.

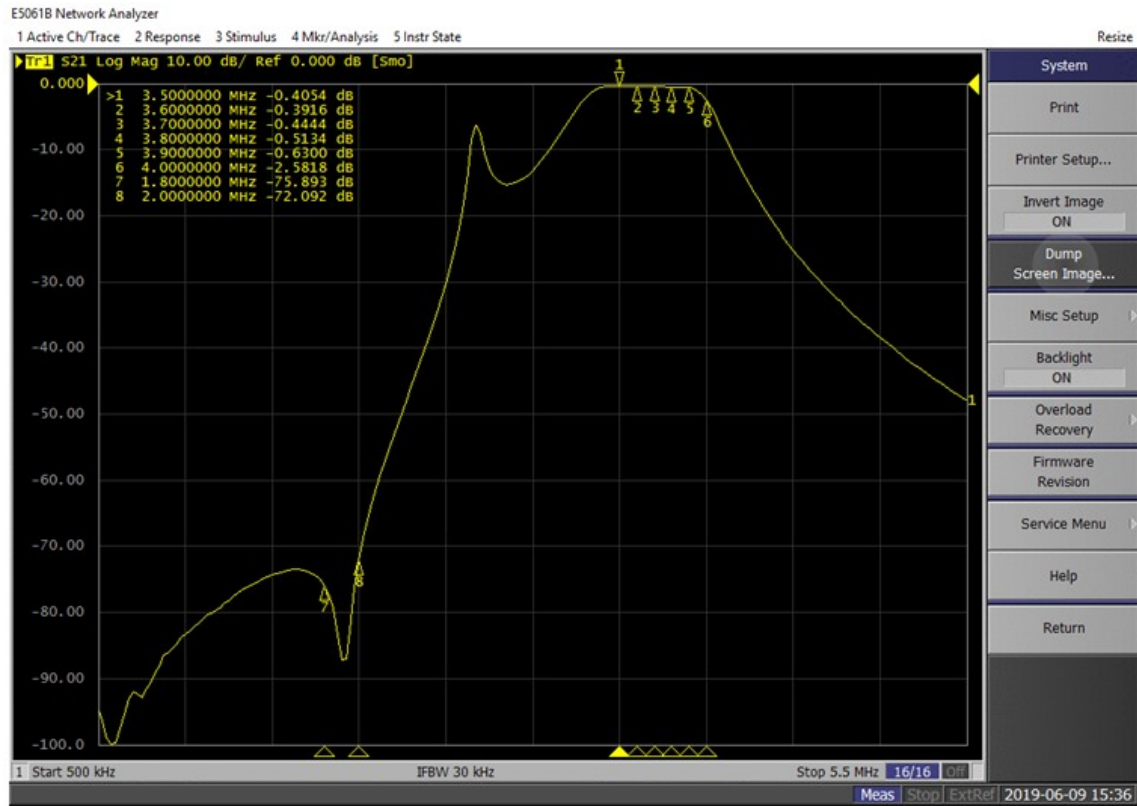
I didn't have the proper RF adapters, so I borrowed a male-SMA to female-UHF from AF4Z. This necessitated the following string of adapters to mate with the male-SMA cables from the network analyzer: female-SMA to female-SMA, male-SMA to female-UHF, male-UHF to male-UHF, and then into the filter's female-UHF. The same string of 3 adapters in the opposite direction was required for the other side of the filter.

The shape of the filters was correct, but I was measuring an insertion loss of approximately 30 dB. I spent a considerable amount of time trying to figure out how I had misconfigured the network analyzer. I finally figured out what was going on when I started loosening this long string of adapters; all of a sudden the insertion loss vanished. So, I learned the following lessons:

- Don't use UHF connectors
- Don't use a long string of adapters; use the minimum possible
- Don't over-tighten connectors

Even though I had only tightened the UHF adapters finger-tight, that was apparently too much.

So, the end result is that the filters have been measured, and they all perform very well, with the exception of the 3.5 MHz filter near the top end of the band. Above 3.9 MHz, the insertion loss rises unacceptably high. So I have placed a sticker on the bottom of the filter indicating that you should only operate between 3.5 and 3.9 MHz with that filter.



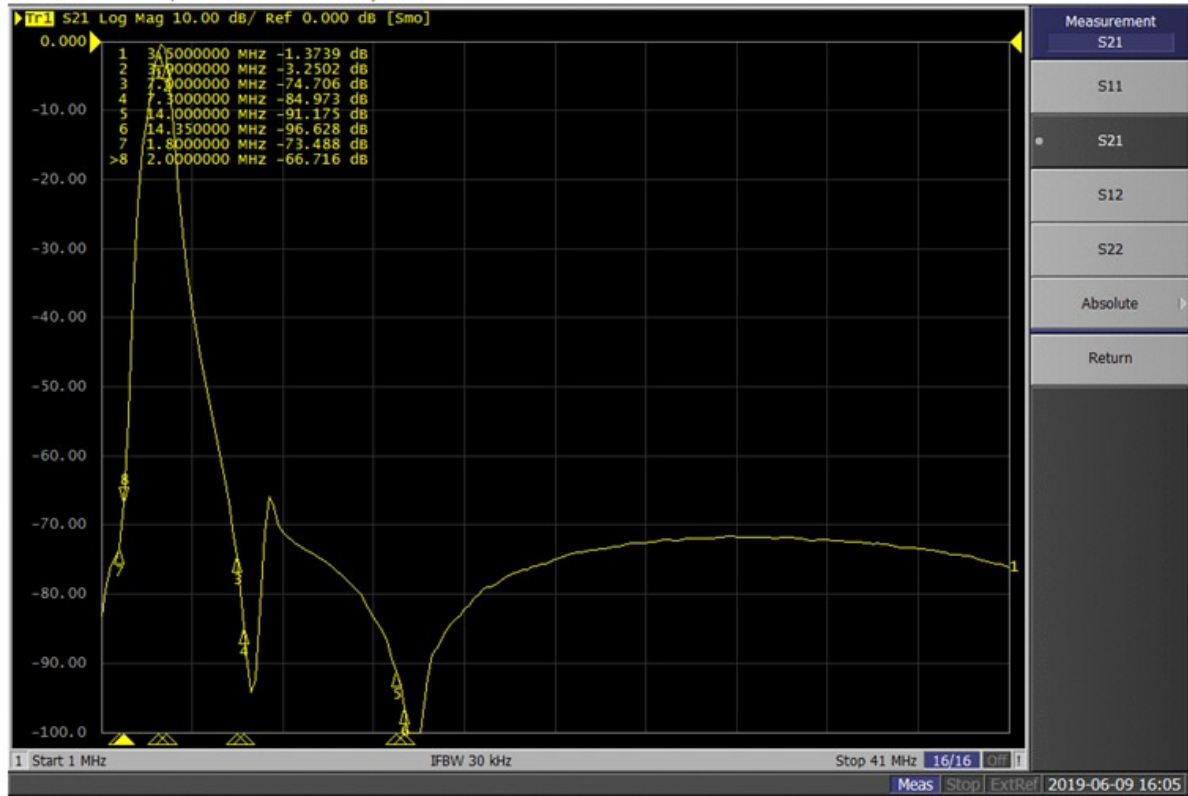
Notice the very deep notch on the 160m band in the 80m filter.

Here is another look at the 80m filter. Notice the deep notches on 7 and 14 MHz.

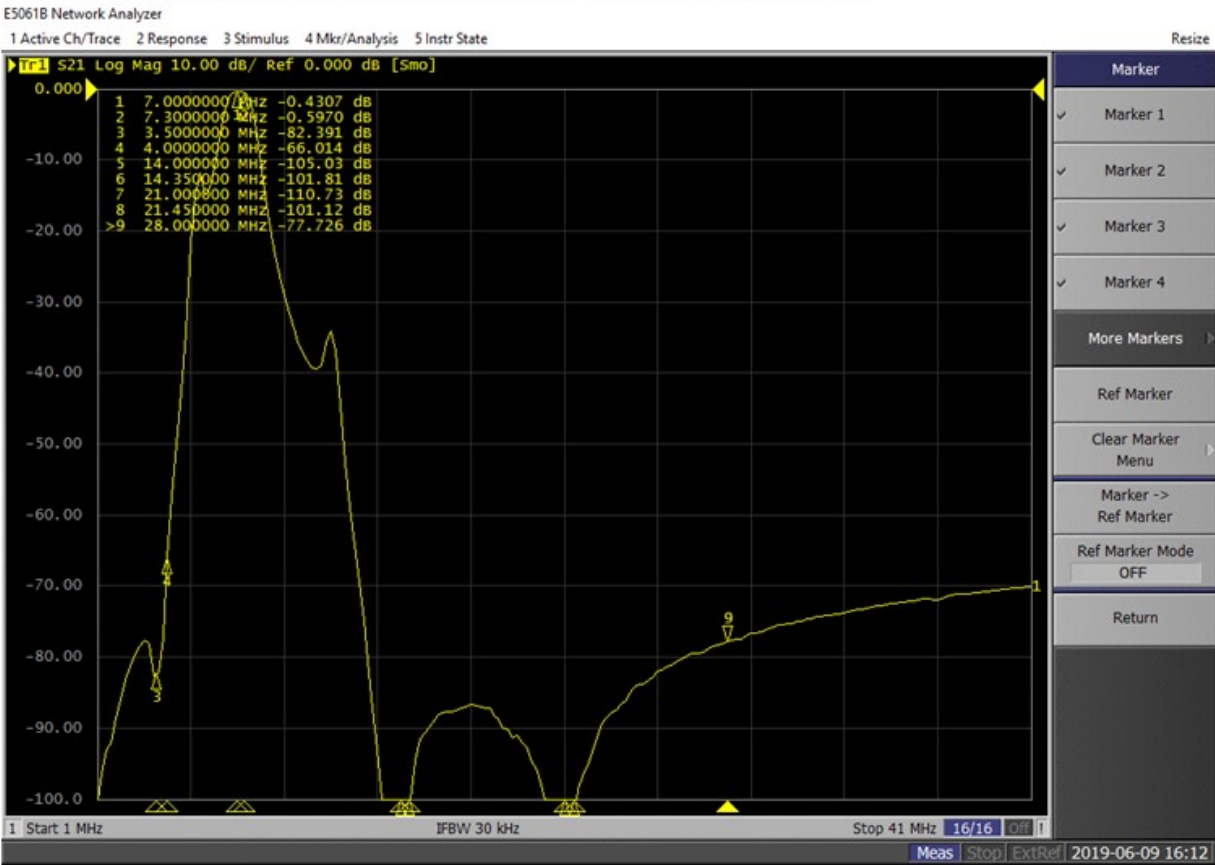
ES061B Network Analyzer

1 Active Ch/Trace 2 Response 3 Stimulus 4 Mkr/Analysis 5 Instr State

Resize

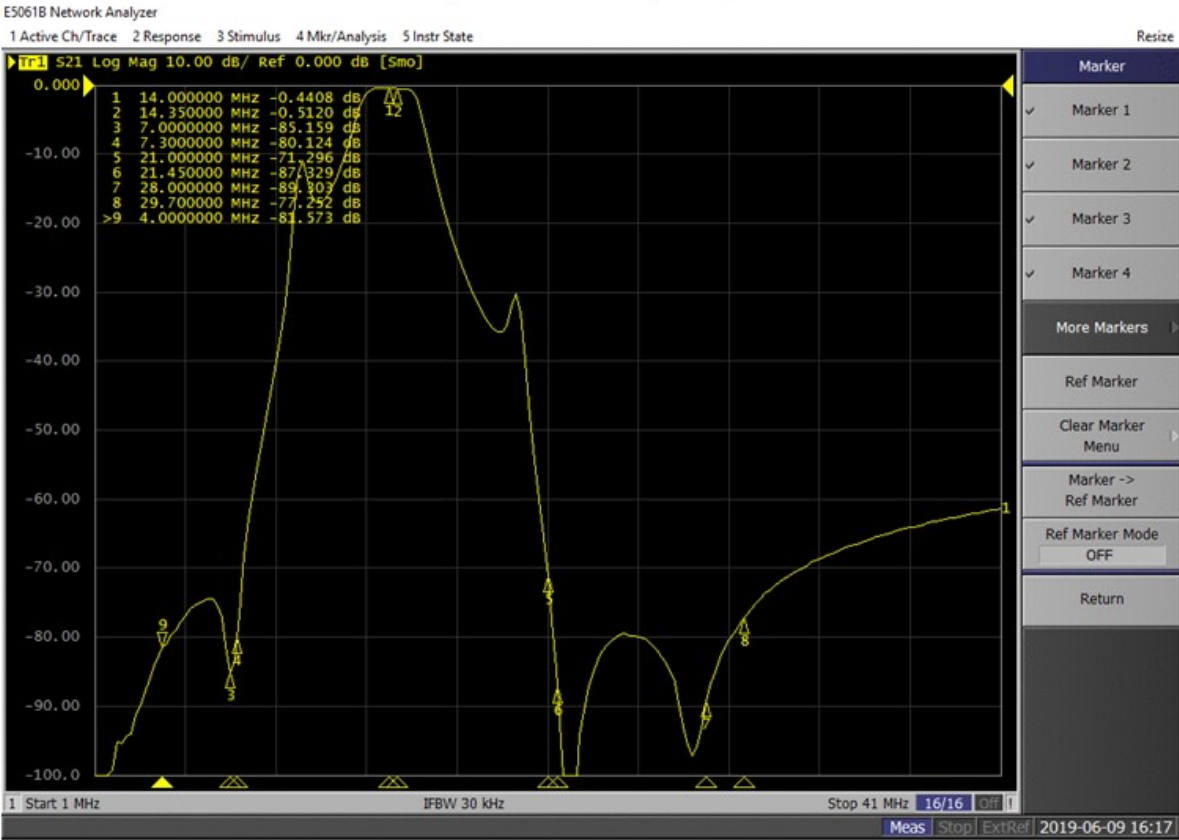


Here is the 40m filter. Notice the deep notches on 80m, 20m, and 15m.

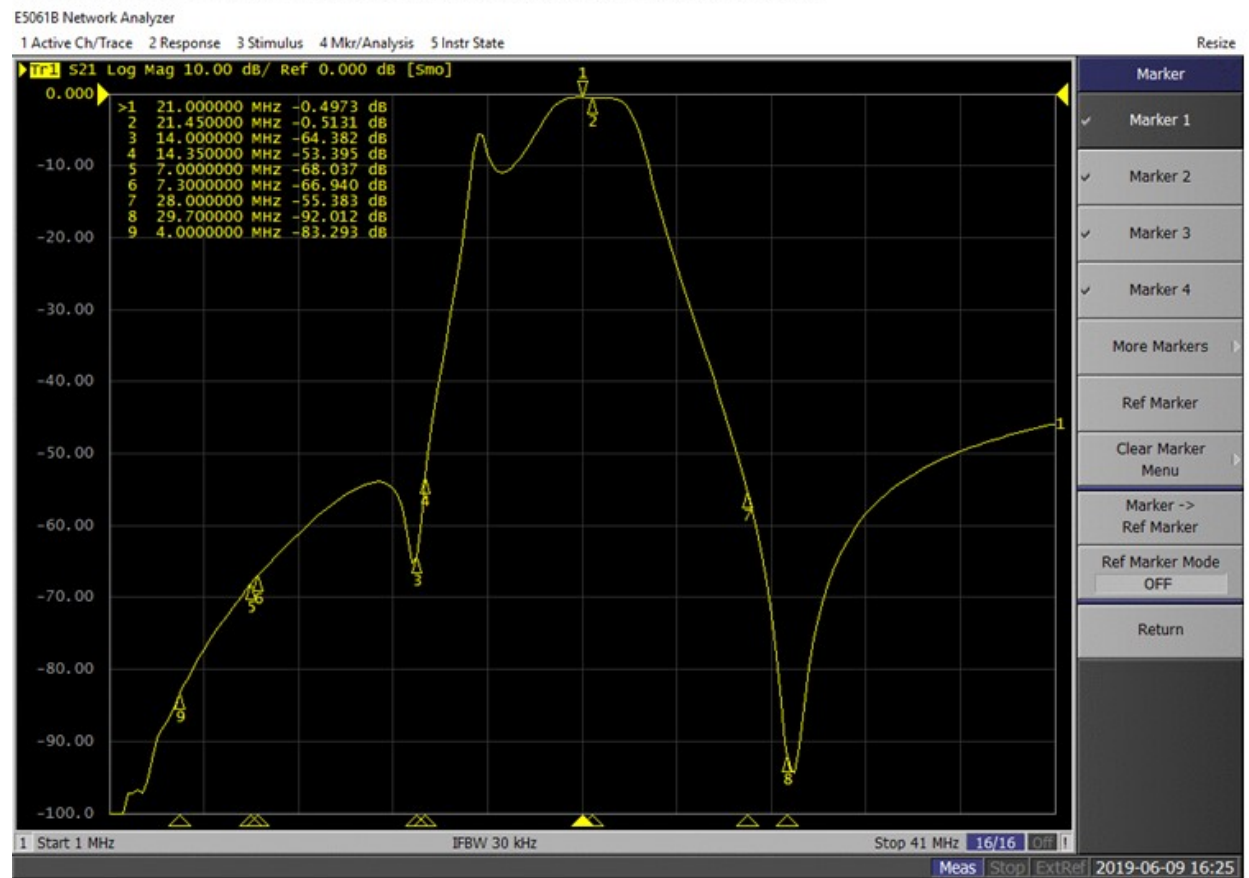




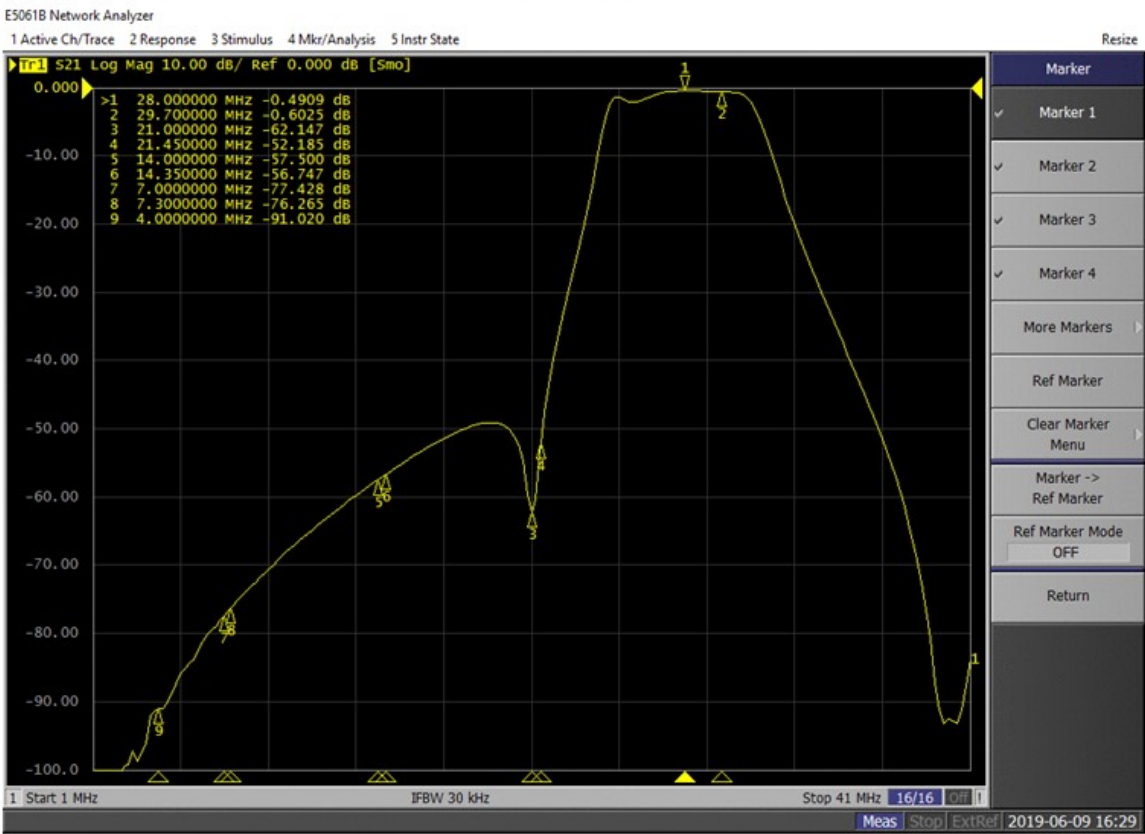
Here is the 20m filter. Notice the deep notches on 40m, 15m, and 10m.



Here is the 15m filter. Notice the deep notches on 20m and 10m.



And finally the 10m filter. It shows a deep notch on 15m.



So the filters perform well, except for the higher insertion loss at the top end of 75m phone, above 3.9 MHz. So this year, please operate on 75m below 3.9 MHz. And please remember to never transmit on the wrong band, because you'll let the smoke out of those notch filters that make the filters perform so well.

73,  
Ken N8KH