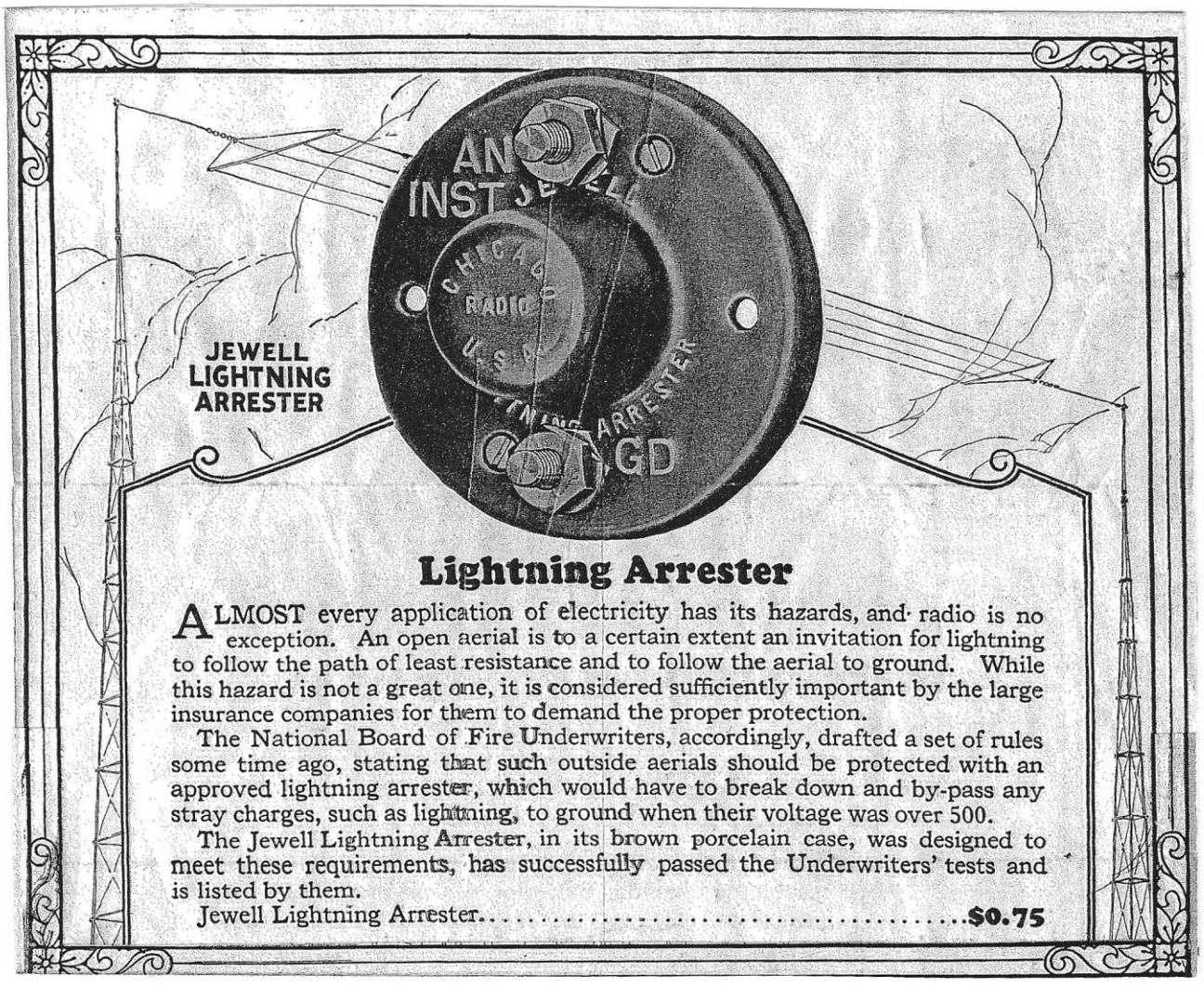
# 2016 PDF edition

# Old Familiar Strains

a newsletter for collectors of radio strain insulators and related items
Volume 5 No. 3 June 1998




## Lightning Arrester

ALMOST every application of electricity has its hazards, and radio is no exception. An open aerial is to a certain extent an invitation for lightning to follow the path of least resistance and to follow the aerial to ground. While this hazard is not a great one, it is considered sufficiently important by the large insurance companies for them to demand the proper protection.

The National Board of Fire Underwriters, accordingly, drafted a set of rules some time ago, stating that such outside aerials should be protected with an approved lightning arrester, which would have to break down and by-pass any stray charges, such as lightning, to ground when their voltage was over 500.

The Jewell Lightning Arrester, in its brown porcelain case, was designed to meet these requirements, has successfully passed the Underwriters' tests and is listed by them.

Jewell Lightning Arrester.....**$0.75**

Story on page 8

**Show Announcement** **August 8 - Portland, OR**

**(See page 15)**

# Editorial

We've added four names to the mailing list with this issue (see page 15).

**Gene Streagle**, has been interested in strains for quite a while. He and his wife had just been talking about getting a hold of me when I called him! Through a friend-of-a-friend, I learned about Gene's great new find, a Pyrex 7-½" strain with Navy markings (see the Pyrex Update on page 16). So I called him up to get the skinny. Gene not only shared the information on his insulator, but promptly joined us. Gene and his son work on the collection together. That strikes a chord with me as I recall digging strains and arresters out of my dad's workbench.

**Bob Stahr** introduced me to **Philip Drexler** a few weeks ago. Bob and Philip met at a recent show in the Twin Cities. Like many of us, Philip collects radio antenna lightning arresters. He and I have already swapped letters and calls and he helped out with the Jewell story in this issue.

It's wonderful to have all of you on board.

Congratulations are due **Carol McDougald** on a job well done with the new *Crown Jewels of the Wire* web site. If you haven't already seen it, a trip to **www.crownjewelsofthewire.com** is well worth your time. And thanks for the publicity, Carol....

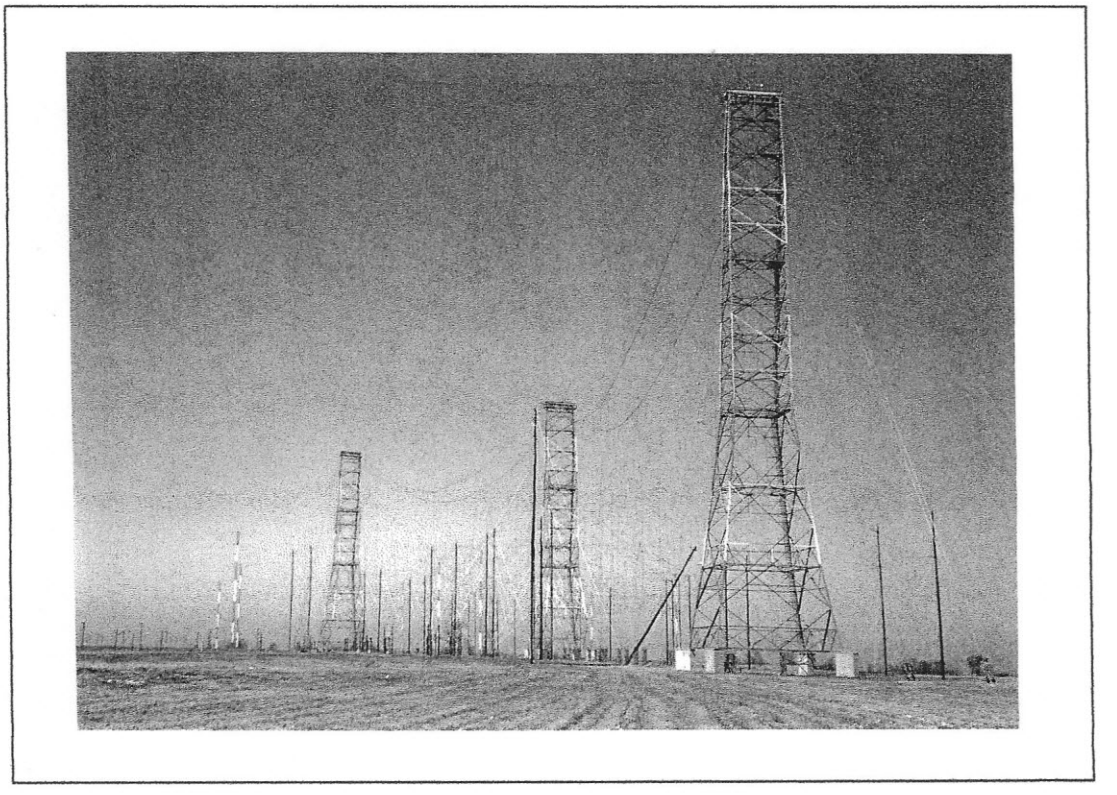
The next regular issue will be the Fall double issue which should be in the mail around October 1st. If your plans bring you to the Pacific Northwest this Summer, give me a call. **And don't forget the "Filling the Void Insulator Show," here in Portland on August 8th** (see page 15 for details).

I enjoy the fact that *Old Familiar Strains* is still a "small-time" newsletter. I read (and really appreciate) every bit of correspondence that comes my way. I've made a number of friends through this project and when you send a personal note, I feel like I'm getting to know you a little better. With only around 60 issues going out each time, I can usually guess by the return address who's writing.

I must confess that the least pleasant part of this task is handling the donations and renewals. I've made an effort to highlight the expiration dates on the mailing labels as gentle reminders, but I figure that there are any number of reasons why a person may lose interest in the newsletter and I don't want to bug anybody.

Still, I feel that we could do a better job of follow-up, so that people don't feel "dropped." If anyone is interested in helping out by coordinating a membership-retention/promotion effort, please let me know.

Finally it seems that "you can read it two ways." I apparently touched a raw nerve when I mentioned the on-line auctions in the last editorial. It was certainly not my intention to condone unethical practices or to imply a personal desire to perpetuate in them. To anyone I offended, I apologize.



# The Bethany Relay Station

by Dan Howard

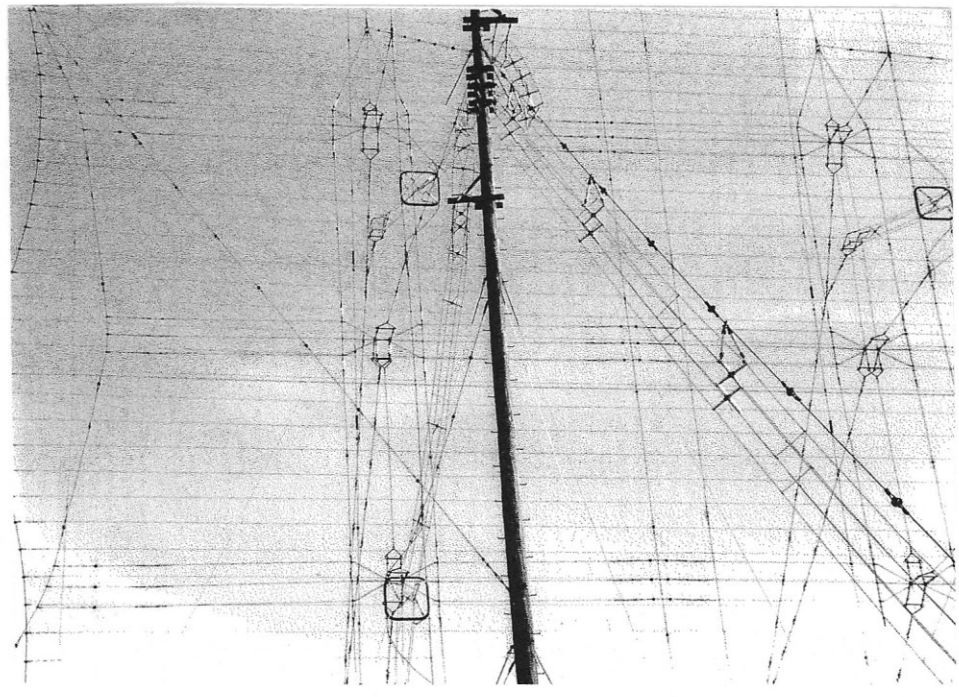
Over the Winter I had a "crash" course in history. **Bob Stahr** and I were talking one evening when he mentioned that a large midwest radio station was being dismantled. Bob thought that some unusual insulators might soon be available. However, he didn't offer a lot of details. A few days later I found out what Bob had been talking about when the afternoon mail brought a letter with news about the demise of the Bethany Relay Station.

The Foreign Information Service was created in 1941 to compete with the German and Japanese propaganda broadcasts. Plans called for establishing broadcast transmitters to disseminate "accurate" news and information world-wide.

Historically, many broadcasting stations oriented toward Europe, had been located along the Atlantic seaboard. However, German submarine activity on the East Coast caused many to worry that transmitting sites near the shore could be vulnerable to attack. In the June, 1996, *OFS* we discussed the fate of a German U-boat, U-853. Although the mission of the vessel was apparently to prey on shipping, the sub was sunk within just a few miles of RCA's Radio Central station on Long Island (*OFS* 4/97 pg. 8-9).

So, the government began looking for "safe" inland transmitter sites. In 1943, the search lead to a rural area north of Cincinnati, OH. The 625 acre site in Butler County was selected for its relatively high altitude and

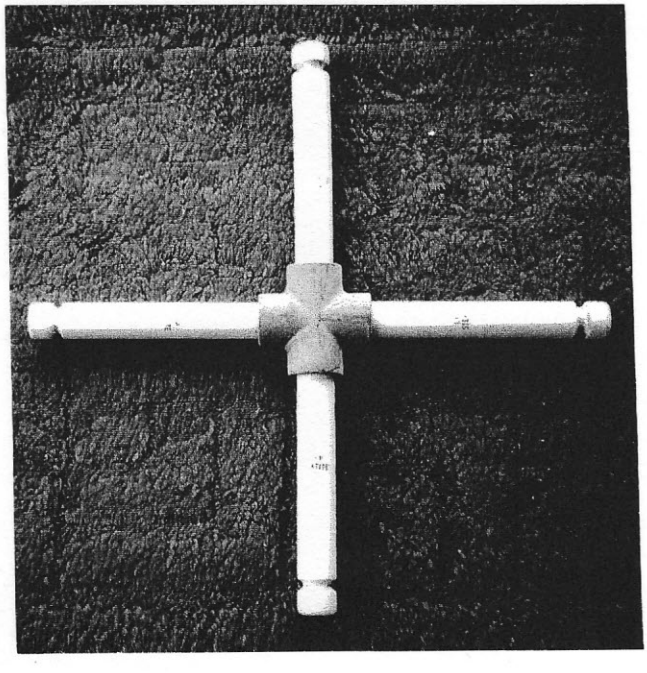
flat terrain. The Crosley Broadcasting Corporation was commissioned to build the station and completed it in July, 1944. The Bethany Relay Station was named for the nearby Bethany Telephone Exchange.



Broadcasting continued throughout the war. Later, the station was used to compete with Cold War broadcasts as part of the Voice of America system. Although the 250 kilowatt station could be heard in Europe, in later years it was used primarily for broadcasts to Africa, Central, and South America.

In the 90's shrinking budgets and operational changes necessitated closing the station. It last broadcasted on September 14, 1995.

In order to "get the signal out," a total of 14 rhombic (diamond-shaped) wire antennas were strung on poles around the property. A huge Sterba curtain antenna rising nearly 300 feet in the air was the centerpiece of the site (see Figures 1 and 2). Antenna switching was all done by hand and the antennas were fed by 300 ohm open-wire feed lines.



The cross-shaped insulator shown in Figure 3 is an example of the type used to maintain the wire spacing in the feed lines. A metal center holds together four steatite "arms." Like pin insulators, each arm has a "side groove" and tie wires hold the conductors. The spreader insulator shown in this picture was manufactured by Lapp.

At the time of its construction, the station was located in a relatively rural area. Many were not really aware of its existence until Interstate 75 was opened nearby in 1960. Today, the area surrounding the station

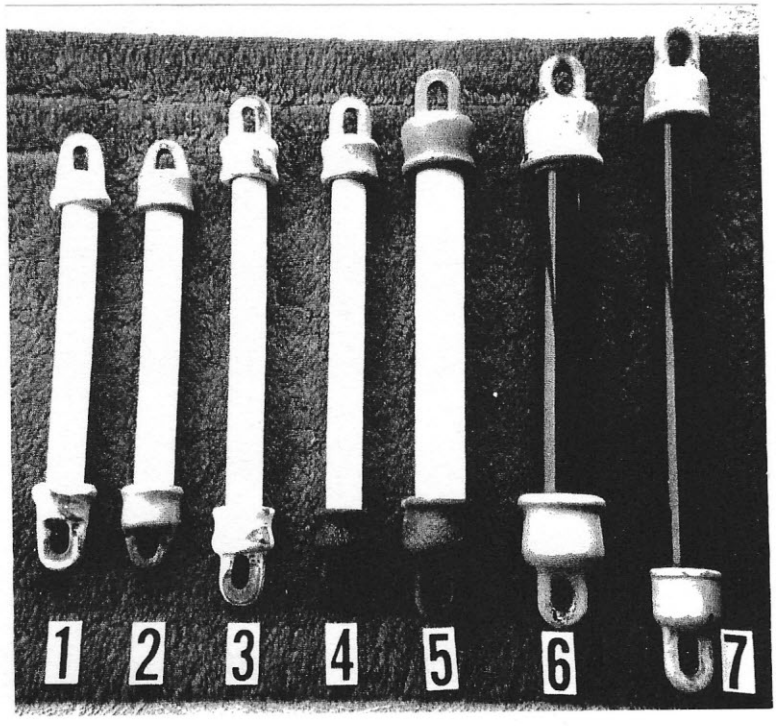
is highly-developed and the nearly one square mile of real estate is much in demand. Plans call for parceling the land. Some will be used for retail. Ball fields and a golf course are planned. And a regional campus of Miami University will occupy a portion of the site.

The government contracted with the Collins Electric Company to remove the antennas and towers. Although the company used hydraulic cranes to salvage the smaller towers, the towers supporting the curtain antenna were too large to dismantle safely and economically.

Instead, the contractor used gravity to bring the two 290-foot towers down. Workers first cut through the legs of the towers, trusting the tension in the outboard guy wires to balance the load of the antenna. Then, on December 2nd, 1997 workers cut through the guy wires. As planned, the weight of the antenna caused the towers to fall toward each other in a spectacular, but sad, display. Plans called for having the site cleared of debris and ready for subdividing by February, 1998.

I understand that the contractor planned to sell some of the smaller towers intact. Material from the larger towers was destined to be sold for scrap. Aside from the handful of insulators that were salvaged (with permission), the fate of the thousands of other antenna insulators that littered the site is unknown (Figure 4).

All of the salvaged strains were high-quality Lapp steatite insulators. (For more information on this type of insulator see the December, 1997 *OFS*). As you can see from



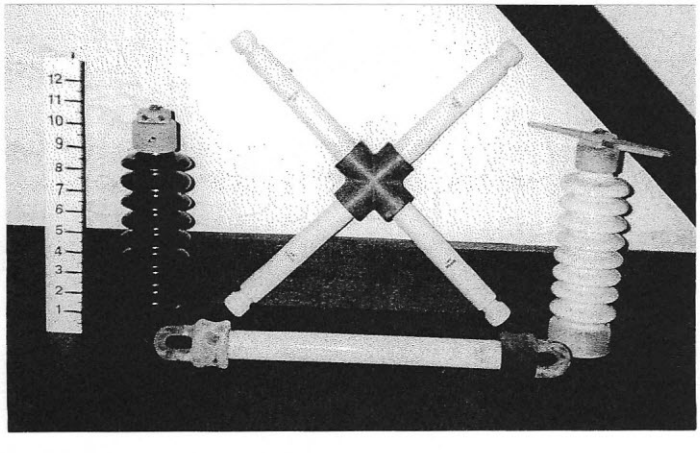

Legend to Figure 5:

1. White 1-1/4" x 15-3/4" brass end caps
2. White 1-5/16" x 15-1/2" alum. end caps
3. White 1-1/4" x 18-1/2" brass end caps
4. White 1-1/4" x 18-1/2" brass/iron caps
5. White 1-11/16" x 20-1/4" brass/iron caps
6. Brown 1-3/4" x 20-3/4" brass end caps
7. Brown 1-1/2" x 24" brass end caps

Figure 5, both white and brown glazed insulators were used. One unusual feature is that some insulators (numbers 4 & 5 in the photo) sport end caps made of two different metals!

Several sources for this article were found on the internet. For more information, I would encourage you to look them up. The Jim Hawkins site is especially interesting because it includes the personal story of a person that used to manage the station.

Very special thanks to Dennis & R. Lee Stewart.



**Sources:**

Photos courtesy of Dennis & R. Lee Stewart

"The Ohio VOA Antennas Come Down," *The ARRL Letter Online* Vol. 16 No. 49 http://www.arrl.org/arrlletter/97/971219/#voa

Shewalter, Virginia, "A History of Union Township Butler County Ohio" as quoted in *Union Township Community News,* West Chester, OH 12/97.

Thomas, David, "VOA towers go down with a crash," *The Cincinnati Enquirer* 12/3/97 http://enquirer.com/edit...7/12/03/loc_voadown.html

"VOA at Bethany Ohio," http://www.exit109.com/~jimh/voaohio.html

Young, Eric C., "VOA towers crash down" (original source unknown)

# Jewell Electrical Instrument Company

by Dan Howard

This month's cover shows the Jewell lightning arrester.

Jewell Electrical Instrument Company was founded around the turn of the century. Ads place them at either 1640 or 1650 Walnut St. in Chicago (1:11). Over the years they made a variety of electrical instruments including radio accessory items. Jewell brand panel and test meters were very popular in the early days of radio.

The company sold at least one model of radio lightning arrester as well. The Jewell arrester is interesting both for it's round shape and it's large size (3-1/8' in diameter). It is similar in design to earlier models of arresters used in telephone service (more on that later) and has less in common with the familiar "battleships" that many companies sold for radio work.

Apparently many of the arresters were sold, as today they are fairly common. My files contain ads for the arrester dating from the end of 1922 through mid 1926.

**Whatever happened to Jewell?**

According to Alan Douglas, Jewell ran afoul of RCA's patent attorneys in the early 1930's. Reportedly, after resolving those matters, the company was sold to Weston, another well-known manufacturer of test equipment. Equipment dating from the early 1930's has been found bearing both company's names.

Currently, a company by the name of Jewell Electrical Instruments is doing business in New Hampshire, but according to their home page, this company was not founded until 1936. Interestingly, they also manufacture analog and digital test equipment and related items. I can only speculate that if there is a connection between the two campanies, it is probably in name only.

**Who Made Jewell's Arresters?**

Most likely, Jewell never owned a porcelain factory. So who made the company's porcelain lightning arresters?

Jack Tod's response to a letter in the February, 1978, issue of *Crown Jewels* provides some answers Like some examples reported by our readers, the author's arrester bore a recess-embossed Square-D marking on the underside.

Jack identified the porcelain maker as Square-D Manufacturing Company of Peru, IL. However, he incorrectly named the seller of the arrester as Chicago Radio Laboratory based on the words "Chicago radio USA" on the top of the unit.

According to Tod's book, Square-D commenced manufacturing private label specialty electrical porcelain in 1925 after acquiring an idle porcelain plant in Peru, IL (2:94). The factory had formerly been the home of Peru Electric Manufacturing Company. Porcelain lightning arrester castings would have been a typical product for a custom job shop. Jewell probably purchased finished castings from Square-D and did the final assembly and packaging.

But that's not the whole story. The arresters in my collection *do not* carry the Square-D marking. And, Jewell started advertising

arresters in the early 1920's while, according to Tod, Square-D probably didn't manufacture electrical porcelain before 1925.

So, who made Jewell's arresters prior to 1925? If Tod wasn't certain that Peru had suspended operations in 1920 (2:91), I would like to believe that they did the work and sold the tooling, along with the plant, to Square-D. However, I think that Peru was out of business before the arrester was first made. More likely, Jewell contracted with one or more other specialty porcelain manufacturers, whose names may never be known.

**How does it work?**

The Jewell lightning arrester uses an air gap between two carbon elements to provide protection from lightning (3). Figure 1 shows a cutaway drawing of a carbon block lightning arrester. In theory, surges of high voltage (over 500 to 600 volts) will ionize the air between the carbon elements, allowing the electrical current to pass harmlessly to ground (4:216). In ordinary service, the air would provide sufficient insulation to allow the antenna to function normally.

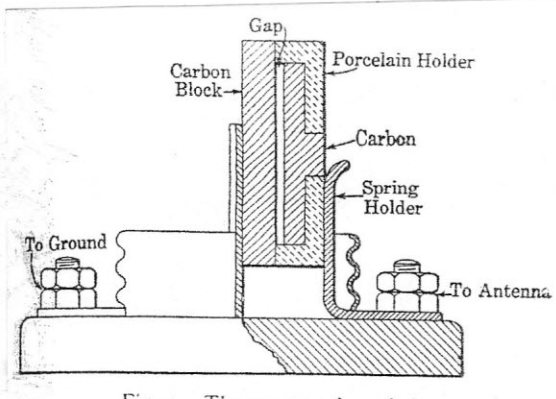



Fig. 5. The construction of the protective device shown above

**Why is it round?**

I believe that the arrester is round because its design was a copied from carbon block telephone lightning arresters. When the Jewell arrester was introduced, carbon block arresters had already been used for years to protect telephone and railway signaling circuits. There is one striking difference in the design however. Carbon block arresters had a common failing. Carbon dust has a tendency to build up in the gap and can create a short circuit. Similar arresters from Western Electric and other sources had removable covers to allow cleaning and the replacement of parts, if necessary. In contrast, the Jewell arresters were permanently potted. This leaves me wondering how the carbon dust problem was addressed.

**Sources:**


1. *The Radio Trade Directory* Vol. 1 No. 1 (New York: McGraw-Hill Company Inc.) November, 1924.
2. Tod, Jack, *A History of the Electrical Porcelain Industry in the United States* (Phoenix: Jack Tod) 1977.
3. Jewell Ad, *QST* December, 1922 pg. 164.
4. Allen, G.Y. "Protection of the Receiving Antenna." *Radio Broadcast* Vol. 1 No. 3 July, 1922.


**Other works consulted:**


Jewell new web site http://www.teamjewell.com/page40.html

*Crown Jewels of the Wire* 2/78 pp. 27-28 Letter to Jack Tod and reply.

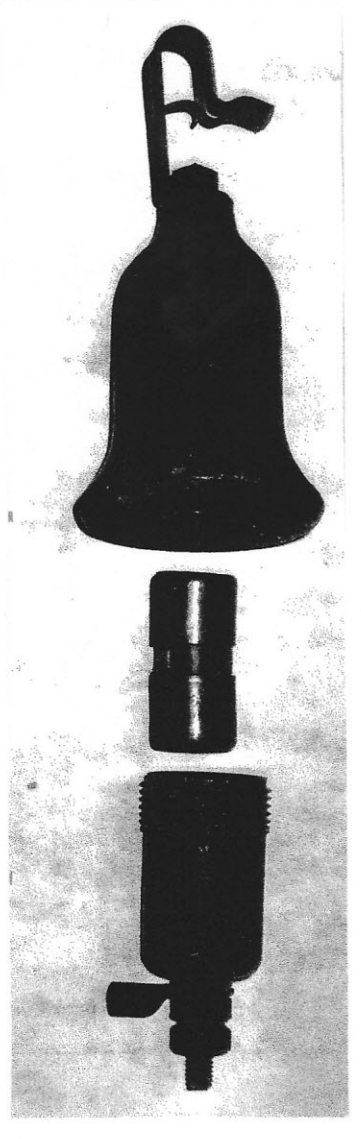


Thanks to Alan Douglas, Bill Jewell, and **Philip Drexler**.

## The Brach Vacuum Gap

The October, 1995, issue featured the products of L.S. Brach. Recently, **Don Hutchinson** shared this photo of his Brach vacuum gap lightning arrester (the "long skirt" version of Type 223). The interior view of the arrester gives a new perspective.

Until I saw the picture, I didn't know that the unit was fitted with a replaceable "fuse." Unlike an electrical fuse which "blows" only once, the vacuum gap fuse is more like a spark plug, allowing sparks from static or lightning to jump to ground over and over.



## Show Report

**NVRS/PSARA Spring Swap** May 9, 1998, Hillsboro, OR (reported by Dan Howard)

I had planned to go to this year's show mainly for the camaraderie. So, I wasn't too disappointed when my first few "sales" on Friday afternoon were free items that I was just happy to give away.

Later, my "generosity" seemed to come back around when a friend unexpectedly gave me a handful of strain insulators, including a new carnival-finish porcelain and a new glass strain. Saturday brought an old fashioned wire cage antenna (I'm still trying to find room to hang it up) and some neat Lapp porcelain insulators with large cast-on aluminum corona shields.

I found two new arresters at the show. The first was a Western Electric carbon block style. The other, an expensive current production Alpha Delta unit was "barely-used" at a fraction of the new price (and I talked him into throwing in a couple of strains, too).

On Friday evening a nice couple came and showed me a pair of glass strains that they had brought... commons (and $9.00 each)! My interest was piqued, however, when they said that they were still digging for "the blue one." Well I didn't loose a whole lot of sleep over it, but I did go back to their table Saturday morning with visions of cobalt glass dancing in my head. Of course, it turned out to be a badly chipped blue porcelain Fedco (still too much at $3.00).

Well, I guess I achieved my goals. The free johnny balls are gone. And, as planned, I got to enjoy the company of good friends.

# High Power in Hawaii - Locke to the Rescue

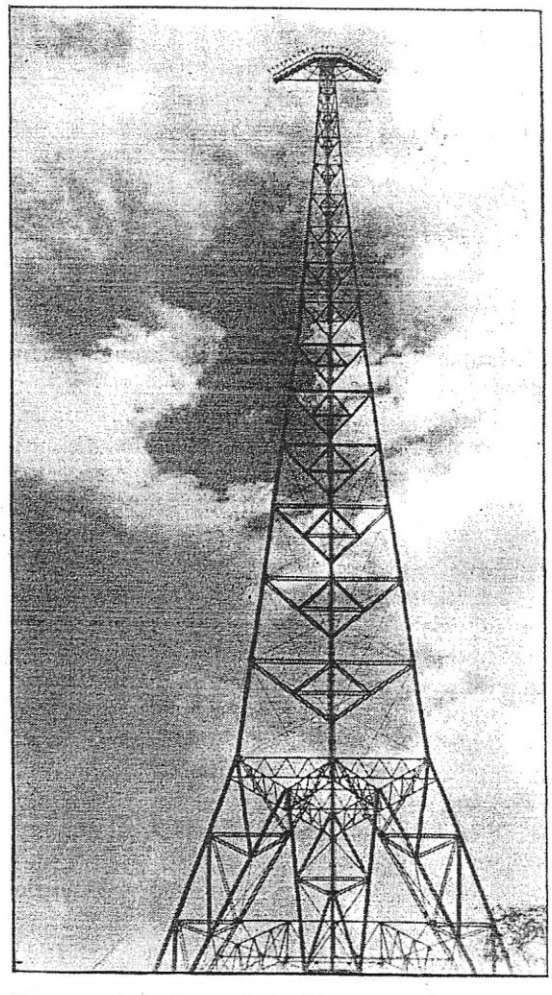
by Dan Howard

As a result of our country's colonial activities at the turn of the century, maintaining communication with forces around the Pacific became essential. Navy ships patrolling the Pacific Ocean were often out of range of the powerful radio broadcasting stations in Panama and San Francisco. And diplomats and others stationed overseas were often out of communication with Washington.

One solution to the communication problem would have been to lay telegraph cable across the ocean. Instead, the Navy envisioned a chain of radio broadcasting stations spanning the Pacific. So, plans were developed for a network of overlapping high and medium powered stations. Strategic sites were selected from Puerto Rico to Alaska and on Hawaii, Samoa, and Guam. Coverage overlapped so that if one station couldn't reach another directly due to weather or static[1], an intermediary might be able to relay messages. Under ideal conditions, a message might follow a route "directly" from Arlington, Virginia (Washington D.C.) to the Pacific Coast, thence to Hawaii, and finally to Cavite in the Philippines.

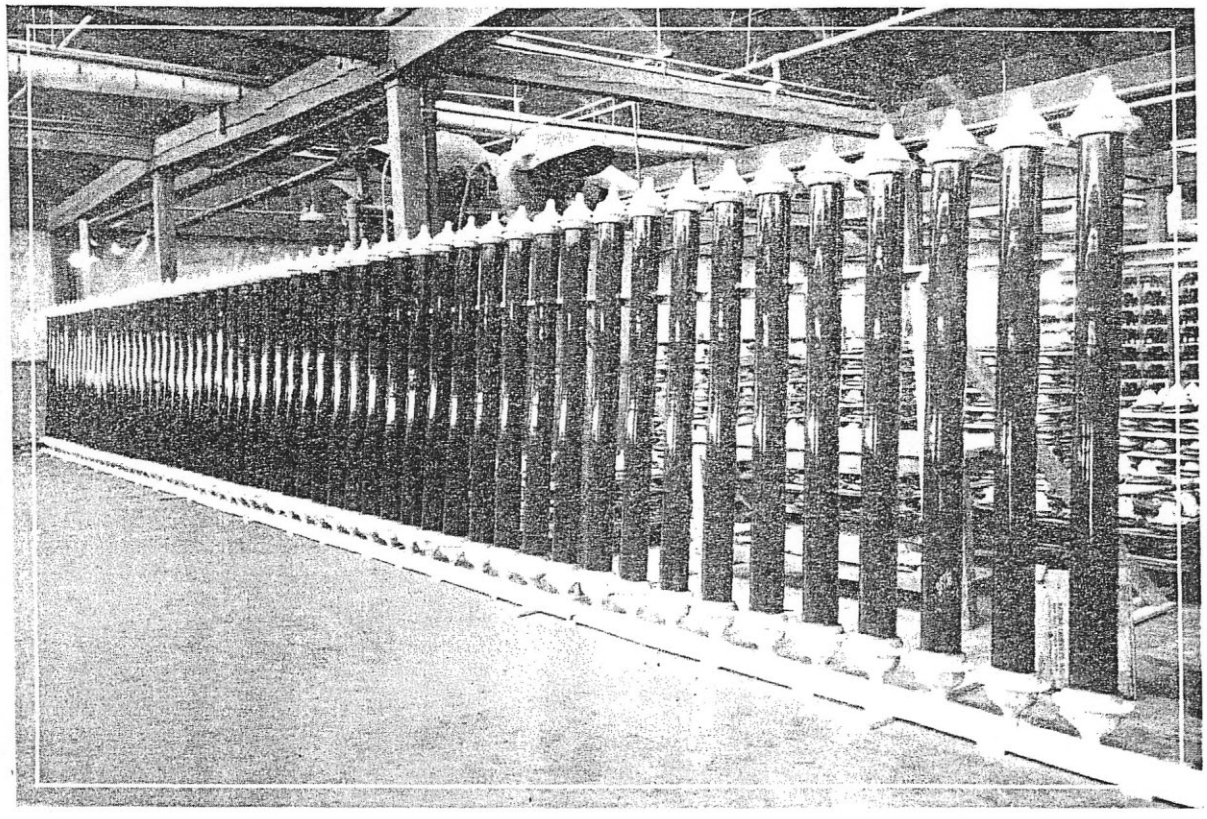
For the installation at San Diego, the Navy ordered a 200 kilowatt arc transmitter from the Federal Telegraph Co.. And they specified 350 kilowatt arc transmitters for Pearl Harbor and Cavite! Power output on these levels was unprecedented and when the people at Federal were asked to build them they were "horrified" (1:222).

At each station, these high-powered transmitters fed large "flat top" antennas comprised of 11 parallel wires. Under the theory that "higher is better," the antennas were strung between self-supporting steel towers up to 600 feet tall (see Figure 1).



Upper section of one of the Navy's standard 600-foot self-supporting towers extending high up into the clouds. Note that the large antenna insulators are barely visible

[1] At this time "Summer static" noise could be devastating to radio communications. Later the use of other systems of communication (especially FM) mitigated the effects of static and made reliable radio communications a routine matter.



*A shipment of heavy duty insulators for installation in Hawaii and the Philippines.*

The support towers were typically placed 1,000 feet apart and were designed to withstand an antenna pull at the top of 20,000 pounds.

If you've been keeping score, then you have some idea of the kinds of strains that the insulators at these installations would be under. 350 kilowatts! 20,000 pounds of tensile strength! The engineers of the day determined that no insulator, then existing, would be up to the task. In fact, Federal's engineers specified chains of interlocked porcelain insulators each approximately 15 feet long and at a total cost almost equal to the cost of the transmitter! (1:225)

Looking for a more reasonable alternative, the Navy contacted the Locke Insulator Company to design a practical insulator for the purpose. And boy did they succeed!

Figure 2 is from the Locke catalog and shows 6' porcelain insulators (without corona shields) "ready to ship to Hawaii and the Philippines." Figure 3 shows an insulator being installed atop one of the 600' towers at Pearl Harbor. These insulators were 72" long by 2-1/2" in diameter. With the corona shield, each insulator weighed about 50 pounds.

When in use, the insulators were often "accessorized" with corona shields and rain shields. The corona shield, shown on page 14, is used to spread the electrical "strain" over a larger surface area to minimize ionization and arcing. The rain shield, also shown on page 14, is used to deflect rain water which might otherwise create a leakage path on the surface of the insulator.

The station at Pearl Harbor first went on the air on October 1, 1917 and the station at Cavite in The Philippines on December, 19th of that year. And the Locke insulators were a success. For eighty years now, Locke's basic design has continued in wide use for military and broadcast purposes.

**Sources:**


1. Howeth, L.S. Captain USN *History of Communications-Electronics in the United States Navy* (Washington: U.S. Government Printing Office) 1963.

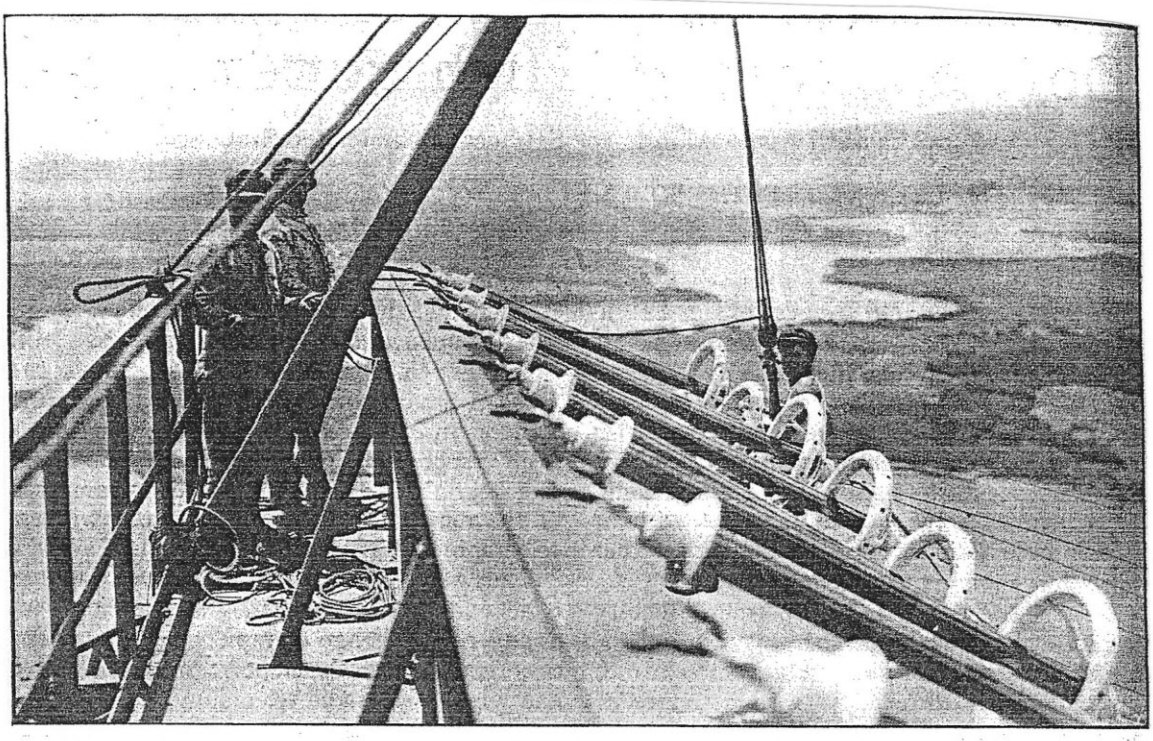

**Other Works Consulted:**


Hooper, Stanford C. Commander, USN "Developments in High-Power Radio" *Radio Broadcast* Vol. 1 No. 5 September, 1922 pp. 399-406.

Locke Insulator Corporation "*Insulators for the Modern Broadcasting Station*" ca. 1920. (Courtesy of **Elton Gish**)

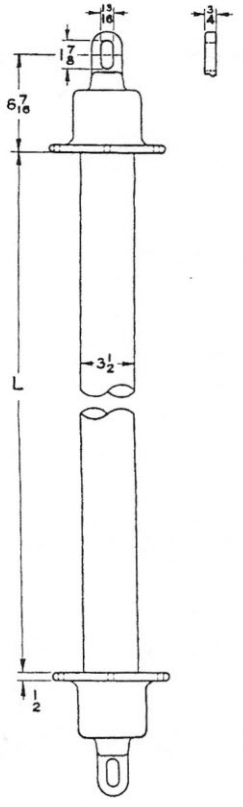

**Photo Credits:**

Figure 1: Radio Broadcast 9/22 pg. 401.
Figure 2: Locke Catalog ca. 1920. pg. 22.
Figure 3: Radio Broadcast 9/22 pg. 400.
Figure 4: Locke Catalog ca. 1920 pg. 17.



Riggers replacing a defective insulator in the Navy's Pearl Harbor high power radio station antenna

# RADIO INSULATORS

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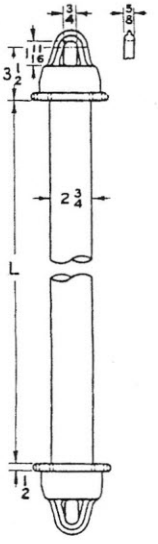


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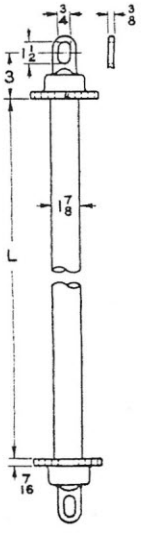


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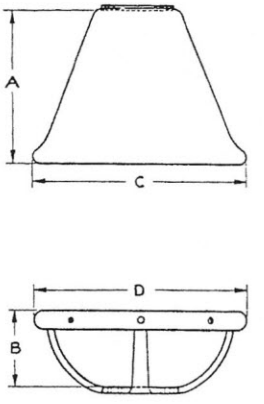



Rain Shield and Corona Shield

## ANTENNA INSULATORS

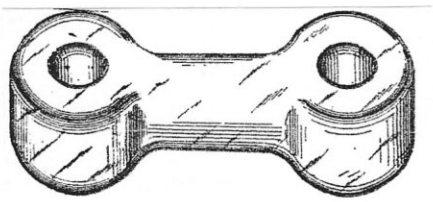
| Insulator No. | Porcelain Diameter | Mech. Str., Lbs. | Attachments | Shield Dimensions in Inches | | | | Net Weight, Lbs. |
|---|---|---|---|---|---|---|---|---|
| | | | | A | C | B | D | |
| 25043 | 3 1/2 | 15,000 | None | 16 | 6 5/8 | 25 | 22 | 12.1 + .48 per inch of L |
| 25044 | 3 1/2 | 15,000 | Corona Shield | | | | | 19.77 + .48 per inch of L |
| 25045 | 3 1/2 | 15,000 | Corona Shield Both Ends | | | | | 27.44 + .48 per inch of L |
| 25046 | 3 1/2 | 15,000 | Corona Shield & Rain Shield | | | | | 27.82 + .48 per inch of L |
| 25040 | 2 3/4 | 12,000 | None | 10 | 5 1/8 | 14 | 14 | 8.7 + .55 per inch of L |
| 25041 | 2 3/4 | 12,000 | Corona Shield | | | | | 14.5 + .55 per inch of L |
| 25042 | 2 3/4 | 12,000 | Corona Shield Both Ends | | | | | 20.25 + .55 per inch of L |
| 25034 | 2 3/4 | 12,000 | Corona Shield & Rain Shield | | | | | 16.75 + .55 per inch of L |
| 25036 | 1 7/8 | 7,000 | None | 10 | 5 1/8 | 14 | 14 | 4.8 + .235 per inch of L |
| 25037 | 1 7/8 | 7,000 | Corona Shield | | | | | 10.6 + .235 per inch of L |
| 25038 | 1 7/8 | 7,000 | Corona Shield Both Ends | | | | | 16.35 + .235 per inch of L |
| 25039 | 1 7/8 | 7,000 | Corona Shield & Rain Shield | | | | | 12.85 + .235 per inch of L |

# Pyrex Update

## Pyrex Dog Bone

A few weeks ago, **Jim Singleton** alerted me to another unusual Pyrex insulator. After noting an unusual glass dogbone insulator on the cover of the *W1FB Antenna Notebook*, Jim wrote to the ARRL to inquire about it. Jim learned that the insulator is indeed a Corning product.

The insulator's overall appearance is similar to the patent drawing shown below. It sure would be nice to know how many more of these are out there.



This morning, I found a used copy of the W1FB book. In addition to the glass insulator, two styles of porcelain strains are shown on the cover.

Unfortunately, I don't find the *W1FB Antenna Notebook* listed among the league's current publications. But, if you can find a used copy at a hamfest, the cover photo alone is probably worth an investment of a dollar or two. And, like Jim and me, you can at least own a photo of this interesting Pyrex item.

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## Style 6

**Bob Streagle** is the proud owner of another new Pyrex strain. He has a 7-1/2" amatuer transmitting insulator with saddleways which probably dates from World War II. What makes it a little unusual is the markings. Bob's is the first 7-1/2" we've documented with Navy markings. I've called it Style 6.

Corning's manufacturer's code "CBI" is marked on the end along with the part number "61014A. "

This part number is shared with other military strains of the same size. We'll cover this number system in greater depth in a future issue.

If you have other Pyrex strains with unusual markings, please let me know.

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## Carnival Glass?

Finally, I've been in contact with a gentleman who owns a Pyrex 7-1/2" strain with a "carnival" finish. This item was displayed in the combined display at the NIA National Show last July.

The current owner bought it from an estate where it had apparently been in storage for many years. This alone should dispel some worries that it might be a modern "fake." It would be nice if we could authenticate the carnival finish through records or advertisements. For right now, it raises intriguing possibilities.