

TRANSMITTERS

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All Star—The Original “Progress as you Prosper” Transmitter

By Steve Marquie, W8TOW

Our guest author this month is Steve, W8TOW, from East Lansing, MI. Steve is well known in the vintage radio community for his restoration and use of 1930/40s equipment. In this month's installment, Steve relates how he came across an “All Star” transmitter. The All Star was one of the early “foundation kits” offered by Thordarson and other manufacturers of the day in an effort to entice hams to use the sponsoring company's parts. Steve maintains a website about his station and work at www.w8tow.com—bjh

In this day and age technology changes monthly, sometimes daily. That can be reflected in the designs of commercially built ham transmitters. But in previous eras, most ham operators built their gear rather than waiting for the next innovation to be advertised by the big manufacturers.

Certainly, back in the heart of the depression, only a few rich guys could enjoy a “store-bought” rig. The home-built construction style of choice was breadboard assembly.

For me, one of the favorite aspects of the radio hobby has been collecting pre-World-War-II gear. Opportunities to find this equipment are far and few between. But in the past ten years, I've been fortunate enough to acquire several of these rare gems.

Back when many of my collected artifacts were built, the photos in *Radio* and *QST*, particularly in the ads or the stories about the crack DXers and contesters of the day, showed images of beautiful shacks. Hallicrafters, National and RME receivers graced the desks while 6-foot black-wrinkle rack transmitters stood nearby.

Such rigs were not the norm, but for those of us who enjoy the historical element of the radio hobby, those shacks are educational time capsules. Almost nowhere but in these old photos can we find such information.

Three years ago I received a phone call from a local ham that was in need of a “good tube receiver” and he heard I was the guy to call. I discovered that the gentleman had been a World War II Ace, piloting a P47 Thunderbolt, and we immediately struck up a friendship.

Searching around my storeroom, I pulled out a Hallicrafters SX-25 and gave it a good check-up. I phoned him and he agreed that the SX-25 was something he would enjoy using. Arriving at his QTH, I discovered he was vision-impaired and in need of help setting up the gear.

I ran an antenna for him, set up the receiver, and made sure that he was familiar with its operation. When he asked about payment, I decided that, whatever the SX-25 might be worth, it didn't matter. I told him his service to our country was more than payment enough.

A couple of weeks later he called and asked if I could come over. He said that the SX-25 was doing great but he had something for me. “By the way,” he said, “Bring your truck.” Well, I drove over and he instructed me to back up to the basement entrance.



From 40 to 500 Watts Nothing Discarded

Efficient performance is assured if you use the STANDARD parts recommended by the proven prominent manufacturers listed. These parts have been built into a complete unit that has withstood repeated tests for general performance. You save with the smallest unit of 40 watts, either C.W. or phone, and expand to a 500-watt C.W. transmitter or a 400-watt plate audio-visual phone. No units are discarded as overrated power or going to phone operation.

Various Combinations

For C.W. operation, start with a 40-watt unit and low voltage power supply. The addition of speech amplifier, screen and plate modulation, gives a peak power of 160 watts. To increase power, add high-power R.F. amplifier and high-voltage power supply. This gives the 400-watt C.W. transmitter. The same high-powered R.F. amplifier and high-voltage power

supply, with the addition of the 200-watt modulator, gives a 400-watt plate modulated phone, with peak power of 160 watts.

40-Watt Transmitter

Input, 40 watts to final stage. No modulation required. Operates on 20, 40, 80 and 160-meter bands. Same 40-watt unit also acts as exciter for amplifier having input of 250 watts. Tubes for delivery unit—47 crystal unit 602 in amplifier. Two crystals will give operation on all four bands. Switching arrangement controls meter in plate circuit of any of these stages.

Seven Leading Manufacturers Make Standard Parts for

ALL-STAR TRANSMITTERS
THORDARSON ELEC. MFG. CO., 922 W. Huron St., Chicago, Ill.
HAMMARLUND MFG. CO., 424 W. 33rd St., New York
CORVALL DUBLIER CORP., 4377 Irving Ave., New York
TRIPLITT ELECTRICAL INSTRUMENT CO., 8140 N. Ave.
OMITE MFG. CO., 4822 West Fitzgerald St., Chicago, Ill.
S. F. JOHNSON CO., Waukegan, Ill.
CROWN RADIO TUBE CO., 1249 Genoa St., Chicago, Ill.



Unit at top and inset, 40-watt All-Star Transmitter. Panel, 400-watt phone transmitter complete.

★ BUILD YOUR OWN ★

ALL-STAR

TRANSMITTER

See Your Jobber for STANDARD parts for ALL-STAR Transmitters, or write to any of the sponsor-manufacturers listed, or write direct to ALL-STAR HEADQUARTERS, 222 W. Adams St., Chicago.

Ad for the All-Star from a 1936 issue of *Radio*.

Motioning me down the stairs, he told me that there was a transmitter in a rack down there. He wanted me to take it home. I hesitated and asked if he was sure—but he insisted that I restore it and get it on the air. I thanked him and about an hour later, I was at home unloading this bit of history.

Now let me tell you about this transmitter. At first, I thought it was homebrew. It had open-deck construction—but with matching meters, knobs and transformers. The symmetry of the meters and knobs was perfect which from my experience is rare in a home-built rig. Now I have several homebrew transmitters whose builders painstakingly considered the front panel layout, but this one seemed different.

Let me describe it. There are seven individual decks, all with inter-connecting wiring harnesses and no visible extra holes. All transformers were matching Thordarson; each knob was a Crowe brand and every condenser was Hammarlund. Was this some unique kit rig, I wondered?

Flipping through the *Transmitter-Exciters & Power Amplifiers* (Moore, 1996) one evening, I found a fuzzy photo that almost caused me to spill my gin and tonic! There she was, the 400 watt, plate-modulated All-Star transmitter. It was made in 1936 as a joint effort by Thordarson, Hammarlund, Cornell-Dubilier, Triplett, Ohmite, Johnson and Crowe. Thus began my quest to learn all I could about the rig and to pursue the challenge of getting it back on the air.

The *ARRL and Radio Handbooks* of the 1930s are great sources of information about the building techniques of the time. As already mentioned, the typical ham transmitter of the mid-1930s was a breadboard job. The choice of tubes was limited—the rig might have used a couple of 210s or perhaps a 211. The big modulation transformers needed for AM operation were scarce and expensive.

Marine, RCA, Collins and Gross were among the companies offering complete transmitters, assembled and ready to operate. Their advertisements graced the pages of the ham magazines. But few could hope to buy such expensive gear in those days? The only alternative would be to build your own copy.

Now to fabricate your own rig required lots of tools, time and expertise—not to mention the cost of the parts. But an ad appearing in the pages of a 1936 *Radio and QST* magazine offered a way to build a 400-watt rig in stages. The “All Star” was probably the first “progress as you prosper” transmitter. It precedes the next such offering by over a year (Humes, 1937).

So, what is the All-Star kit, how did it impact



The All-Star exciter removed from the rack and sitting on author's workbench.

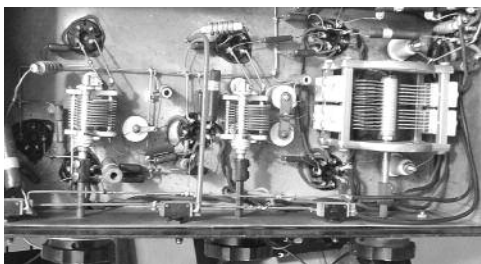
amateur radio and when will it be back on the air? The rig begins with just a 40-watt exciter and a power supply. Not much to talk about by post-war standards, but in those days young hams could rack up lots of QSOs with 40 watts.

The All-Star kit arrived as a box of parts, a schematic and a photo. It was not quite a Viking Ranger or a Heathkit by any stretch of the imagination, but by following the instructions closely, the novice or old pro could complete the project in a week or so. The end result was a 40-watt crystal-controlled CW rig running a 47 oscillator, an 802 buffer and a pair of 802s in push-pull as drivers. The power supply was a combination filament, low voltage and medium voltage source for the exciter.

Restoring those two decks was an easy task, requiring minimal parts replacement and a little cleaning. A single resistor in the exciter had gone “high” and in the power supply I found the contacts on the “push-to-talk” relay were in need of alignment. I spent a day cleaning the decks and bringing the stages up one at a time.

The coils that came with the rig were for 160 meters and there was a suitable Bliley crystal on 1994 kc. Once I was satisfied with the DC voltage and the wiring harness I began by bringing up only the filaments. A 30-minute “burn-in” convinced me it was time to ignite the oscillator!

As you see from the photo, a single milliamperemeter is used for the deck and individual switches are provided for each stage. The proper procedure is to toggle each switch as you



A peek under the chassis of the exciter.

tune-up the stages one at a time! The medium voltage DC source on the deck is supplied via a dedicated transformer. This allowed me to wire it directly to a Variac.

I reduced the AC source and applied approximately 50% of the B+ to the pair of 802s. With

the output of the exciter link-coupled to a dummy load, I was pleased to see 15 watts! Slowly increasing the B+, she delivered a good 25 watts on 1994 kc. I was in business. The All-Star would live again.

In the next installment I will share my next step toward getting the transmitter fully on the air: rebuilding the modulator and its power supply. This unit will ultimately become the speech amplifier for the 400 watt high power rig! Until then, 73 Steve, W8TOW.

REFERENCES

- Advertisement, "Announcing the All-Star Transmitter," *Radio*, March, 1936, p. 77.
 Humes, C., "Progress As You Prosper," *Radio*, June, 1937, pp. 63-69.
 Moore, R. S., *Transmitters—Exciters & Power Amplifiers 1930-1980*, Key Largo: RSM Communications, 1996.

RADIO RAMBLINGS, *continued from page 31*

superstition in the area, an idea occurred with the object that they should do the shivering, not me.

There was a pile of used fluorescent lighting tubes waiting for garbage collection. I took a bunch of them out to the transmitter site and set them on end in the dirt at each tower. The field intensity at the towers is such that a fluorescent tube will glow, dead or alive, and brighter with

one end grounded.

With the fluorescent tubes parked around the towers made a ghostly scene in the setting sun. Nothing happened that night, and it seems nothing had been planned, rumor notwithstanding. These young fry did not incline to my own propensities at their age!

Next Time

How can a studio program monitor signal be provided from a transmitter which is 50 miles away and which provides a signal level at the studio of less than 10 $\mu\text{V}/\text{meter}$? Adding to the difficulty, there is another transmitter three miles away with 1200 $\mu\text{V}/\text{meter}$ field strength, and the two transmitters are only 40 kHz apart.

We'll also discuss how control and supervisory functions can be provided for a transmitter that is connected to the studio by just a single one-way microwave link.

I can be reached at the addresses given at the head of the column. If you have comments or questions, drop me a note. I will reply.

—W.L.



A frequency monitor similar to the one discussed.