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### EDITOR'S CORNER

It seems that interest in the newsletter is declining, as only two letters have arrived since I received my printed copy of *HSN 13*. If this situation continues, *HSN* will likely fold by the end of the year. Had Al Quaglieri not written a long letter about Hammarlund receivers and related topics, it would have been very difficult to scrape together enough material for this issue. Thanks Al!

By the time I finished editing Al's excellent article and added my "Part 2," it was obvious that this was developing into an "all Hammarlund" issue. Between Al and me, we covered most Hammarlund receivers produced since WWII, but our knowledge of WWII and pre-war Hammarlund receivers is rather limited, primarily only what we have read in *QST*. If any of our subscribers currently uses or has previously used some of the WWII or pre-war Hammarlund receivers, we would very much like to hear from you, even if you are familiar with only one receiver. Be sure to include such things as all tuning ranges, selectivity band widths, where you get tubes, and especially your personal experiences using the receiver. Similar surveys and discussions of Hallicrafters and National receivers would be very timely and appropriate for *HSN*.

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## SHORT CONTRIBUTIONS

RECTIFIER MODS: If you own a hollow state receiver whose rectifier tube has been replaced with a plug-in solid state rectifier, you may wish to examine the power supply closely. A previous owner of my SP-600 replaced the 5R4 with a solid state plug-in and a 20 ohm 25 watt surge resistor. I am the unlucky guy who was using the set when the modification failed, causing a melt-down of one of the massive filter chokes. I almost had to call the EPA to clean up the gooey PCB's that leaked out. Needless to say, the original 5R4 tube is back in the SP-600 power supply. Hollow state forever! (Al Quaglieri)

SPEAKERS: I have tried the large, "late model" Hammarlund matching speaker with the HQ-100A, HQ-150, and HQ-180A, and my experiences have been uniformly bad: audio quality is poor, and the speaker causes all sorts of feedback problems. The best speaker I have found for use with these receivers is a Radio Shack # 40-1227A Indoor/Outdoor Speaker (8 ohms, 10 watts). It is not especially pretty, but it has good audio quality, and almost no feedback problems. It is about six years old, so it may have been discontinued. However, I would expect that Radio Shack currently sells something similar. (Dallas Lankford)

HEADPHONES: In my opinion, headphones are essential for DX-ing. Unfortunately, most headphones nowadays are 8 ohms (or thereabouts), while most hollow state receivers headphone outputs are rated at 2000 ohms nominally. For example, the HQ-180(A) manual states that you can use 8 ohm phones, which is true. But what it does not say is that audio quality will be poor: there will be objectionable hum. The solution is to mount a small audio transformer in a small metal enclosure, attach the inputs and outputs to standard 0.25 inch headphone jacks, purchase an extension cable with standard male headphone plugs on both ends from Radio Shack, and you are in business. I use a Calectro 4 watt transformer, part # D1-740, and use the 8 ohm secondary and 1000 ohm primary. There is a slight impedance mismatch at the primary, but it does not effect performance. Different transformers may be used, provided their power rating is adequate. One watt or more should work, but I like to under-rate components. (Dallas Lankford)

180 MANUAL SUPPLEMENT: I have written a nine page HQ-180 Series Manual Supplement which I'll send you for \$2 and a SASE. It is written for all HQ-180 series receivers, A and non-A models alike. My supplement provides a quick summary of some of the more useful manual information, and additional information not in any of the manuals. For example, the two short contributions immediately above are variants of two items in my supplement. (Dallas Lankford)

## HAMMARLUND COMMENTS

Al Quaglieri

There seems to be a shroud of mystery surrounding SP-600's, which is odd considering their proliferation on the surplus market. Here is some information you may find helpful.

The first "Super Pro" I know of is the SP-400X, made in the late 1940's, but an ad for it says, "... covers a new and wider range of frequencies ..." so there may be an earlier version. The SP-400X tunes 0.54-30 mHz, and has continuously variable selectivity. The net price in 1947 was \$342, with the speaker an additional \$5.25.

There are several versions of the SP-600. The SP-600JL and SP-600JLX have six bands: 100-200 kHz, 200-400 kHz, 1.35-3.45 mHz, 3.45-7.4 mHz, 7.4-14.8 mHz, and 14.8-29.7 mHz. The JL does not have the frequency control unit (another name for a crystal tuned channel selector with six positions), while the JLX does. The SP-600J and SP-600JX are similar, but cover 0.54-54 mHz in six bands, with continuous bandspread tuning throughout: 0.54-1.35, 1.35-3.45, 3.45-7.4, 7.4-14.8, 14.8-29.7, and 29.7-54.0 mHz. It takes many turns of the bandspread dial to get from one end of a given tuning range to another, and all tuning is through a single big knob. The other big knob is BAND SELECT.

The general design of the SP-600 is similar to the SP-400, but with "modern" miniature tubes. Another difference is that instead of continuously variable selectivity, the SP-600 has six band widths: 13, 8, 3, 1.3, 0.5 and 0.2 kHz. The wider three band widths are LC derived; the narrower three use a crystal filter which has a front panel phasing control.

The SP-600 was still being advertised in *QST* as late as May 1969. Also shown in that ad is an SPC-10 SSB converter with a tunable 60 db notch filter, seven step selectivity, selectable AVC, and many other features. A friend of mine has one of these connected to his SP-600JX, and he praises it up and down. [The SPC-10 is very similar to the Hammarlund HC-10 converter, which is essentially the 455 and 60 kHz IF strip and audio circuitry of an HQ-180. The main differences between the two are that the SPC-10 has an S-meter and 600 ohm audio line output, while the HC-10 does not. I have an HC-10 which I can assure you works well with an R-390(A). See *HSN 11* for a more detailed description and user comments about the HC-10. Ed.]

There is a designation on my SP-600 schematic for selecting between normal operation and diversity reception. So there is some method of connecting two SP-600's together for diversity reception, but I have no other information in that regard.

A few years ago I replaced all the electrolytics, and have just re-tubed and aligned my SP-600JX. It still blows away almost every other receiver I have tried on the BCB and tropical bands, and holds its own nicely up to about 16 meters. The 29.7-54 mHz band is pretty much a throw-away, although I can hear many business band mobiles and pagers via FM slope detection. There is little 6 meter activity here, so I can't tell you how it behaves at the top end. I use a crystal frequency standard which is adequate for finding frequencies, but I must admit that a digital readout would be nice.

There is an interesting and useful article "Souping up the Super Pro" by John R. Leary, W9HWN in the January 1979 issue of *CQ*. John offered additional modification information to anyone who sent him a SASE. Perhaps the offer is still valid. His address is 438 Hamilton, Fortville, IN 46040.

I knew a real whiz named Dave Schneider who owned five or six of these monsters, maybe more now. Dave was a satellite communications systems design engineer, and was working on some kind of phase-lock loop for the SP-600. I would like to get in touch with him again, but I have lost contact with Dave since he moved from Valencia, CA about four years ago.

Not mentioned in Dallas' Hammarlund survey are the HQ-145A general coverage receiver [Yep, I accidentally deleted the HQ-145A from my survey, although it was included in the original *DXN* article. The HQ-145A is a newer (1961) HQ-145, sans rectifier tube, with solid state silicon rectifiers. Ed.], the HQ-110 (ham-band-only) and HQ-110VHF (ham-band-only covering 160-2 meters). There was also a bizarre general coverage receiver with a built in CB transmitter. [Now that you mention it, I recall that strange receiver. What was its model number? Ed.] I am also interested in the mysterious HQ-215, even though it is solid state. [I also did not include the HQ-170 and HQ-170A or their VHF variants. The HQ-170 series is a ham-band-only version of the HQ-180(A) which covers 160-10 meters, and the VHF version includes an internal factory installed converter which extends coverage to 6 and 2 meters. I owned an HQ-170AC-VHF briefly, but it was no better than an HQ-180(A) on the HF ham bands, so I sold it to a local ham who was doing some VHF AM experiments. I have been told the HQ-215 was Hammarlund's unsuccessful attempt to develop a solid state version of the Collins 75S-3. A recent issue of *Ham Trader Yellow Sheets* had an HQ-215 offered for sale at \$135. Ed.]

The Hammarlund Corp. still lives, sort of. Its remaining assets were bought by Pax Manufacturing Corp., 100 East Montauk Highway, Lindenhurst, NY 11757, phone (516) 957-7200. Send inquiries to Peter or David Kjeldsen for price quotes. The deal, according to Peter, is that he, David, and their brother Robert jointly own Cardwell Capacitors, and their two sisters own Pax Mfg. Corp. which is in a building next door to Cardwell.

Although the two companies are technically separate, the three brothers operate both businesses. In 1971 Cardwell purchased the variable capacitor division of Hammarlund from Electronics Assistance Corp., its parent company. About five years later, Pax purchased the remainder of Hammarlund's assets. Peter told me that Hammarlund was purchased mainly for its military spare parts inventory, but many parts are still available for the HQ and SP series. Although quite a few electrical components are no longer available, Pax does seem to be well stocked with mechanical and metal parts, such as cabinets and faceplates. Also available are six *unused* SP-600VLF units which represent the last remaining unsold receivers of the once mighty Hammarlund line. The Pax warehouse covers about 20,000 square feet of floor area. In addition to Hammarlund parts, the warehouse contains Gonset, Dumont and RadioMarine parts and manuals. Peter mentioned that he has the last HQ-215 off the production line sitting on his desk, and although it is an attractive receiver, it never worked properly. I asked him what he meant, and he said it was just a poor design.

If you have been looking for Hammarlund parts or manuals, Pax Mfg. Corp. may have them. But be prepared to pay premium prices. The parts prices I was quoted were on the inflated side. On the other hand, remember that Pax normally does business with the U. S. government, e.g., \$10 for a capacitor is a bargain. I'd definitely query Steve Bohac, R. D. #4, Box 750-A, Branchville, NJ 07826, or A. Wayne Cordell [See my article below for his address. Ed.] first, and only contact Pax when all else fails.

## A SURVEY OF HAMMARLUND RECEIVERS, Part 2

Dallas Lankford

One way to obtain a Hammarlund receiver is through the periodic Wanted/For Sale column which appears now and then in *DX News*. There are many BCB DX-ers who still use Hammarlund receivers regularly, and occasionally they "retire" from the hobby and sell some of their equipment in the process. *DX News* is published by the National Radio Club, and orders or inquiries should be sent to the Publications Center, P. O. Box 118, Poquonock, CT 06064. A subscription is \$21 per year (30 issues) for new members. Another source for Hammarlund receivers is the Ham Trader Yellow Sheets, P. O. Box 2057, Glen Ellyn, IL 60138. A subscription is \$10 per year (24 issues), or \$2 for a potential subscriber mini-subscription (4 issues). The current ham magazines, such as *QST*, *CQ*, *73*, and *Ham Radio*, seldom have Hammarlund receivers in their for sale ads. Also, Al tells me that Fair Radio usually seems to have SP-600's in stock.

Prices are variable, depending upon the cosmetic appearance, electrical and mechanical condition of the receiver, and other factors. Nevertheless, here are some numbers based on my observations over the last five years or so — HQ-100(A): \$100-125; HQ-145(A): \$100-150; HQ-150: \$100-175; HQ-160: \$100-175; HQ-180: \$100-225; HQ-180A: \$135-300; HQ-200: \$325; SP-600J(X): \$150-250. The HQ-200 price I have quoted here is outrageously high, but it is typical because few HQ-200's were made, and it is considered a collector's item. In terms of what you get, it is hardly worth more than about \$125-150. Older Hammarlund receivers, such as the HQ-120, HQ-129, and HQ-140 are still occasionally seen in the \$50-150 range, but are becoming rare.

There are several ways to improve the less expensive models. Since all have a 455 kHz IF at some point, all can be fitted with a 455 kHz mechanical filter. Chuck Hutton (*DX News* IDX Editor) has modified his HQ-129X with two Collins 2.1 kHz mechanical filters and reports that it outperforms his R-390A. Mechanical filters are not cheap (\$25-150 or more), but installing one or two mechanical filters in most of the Hammarlund receivers is probably the easiest way to get a state of the art receiver for the BCB or tropical bands. The center frequency of Hammarlund crystal filters is generally not exactly 455 kHz, but typically 2 to 4 kHz lower. This means that if you add a mechanical filter to one of the Hammarlund receivers with a crystal filter, then the crystal filter may not be used unless you change the crystal. My article "180 + Collins F455FA40 mechanical filter = super

180" describes one method of adding a mechanical filter to the HQ-180(A). It should still be available from the National Radio Club through their reprints service, or I'll send you a copy for \$1 plus a SASE. Another way to improve the performance of Hammarlund receivers, except the HQ-180(A), is to add a Hammarlund HC-10 converter. The HC-10 is the 455 and 60 kHz IF, detector, and audio of an HQ-180(A), and originally came with an adaptor which plugs into the last IF tube socket of any receiver with a 455-500 kHz IF (provided the last IF tube socket is a miniature type). If the adaptor method is not suitable, the HC-10 manual also describes how to connect it to any receiver with a 455-500 kHz IF.

How do Hammarlund receivers compare to other older tube type receivers? In my opinion, very well. The Hallicrafters SX-100 and updated SX-122A are close in performance to the HQ-180(A), but the less expensive Hallicrafters receivers do not have comparable selectivity to their Hammarlund counterparts. For example, the SX-110 and its older equivalent SX-99 have a two position crystal filter which is no match for the Hammarlund five position crystal filter. Also, the top of the line SX-100 and SX-122A do not have 455 kHz IF's, so adding mechanical filters or attaching an HC-10 to them is out of the question. National receivers are used so infrequently by BCB DX-ers and I know so little about them that I am not able to make any knowledgeable comparisons with them. The only receivers that may significantly outperform the Hammarlunds are the Collins. The most frequently used Collins general coverage receivers are the R-388 and R-390A. Neither of them is significantly better than most Hammarlunds in the selectivity department. Their advantages are mainly better dynamic range, better shielding, and digital tuning. However, the Collins receivers are more difficult maintain to repair.

In a short survey article it is impossible to cover all aspects of Hammarlund receivers well. A good source of information about receivers is *The N. R. C. Receiver Reference Manual*, Volume II, which contains, among other things, reviews of the SPR-4, R-388, R-390A, SX-122A, a capsule review of Hammarlund receivers, and articles about modifying older tube type receivers, such as the HQ-150. The National Radio Club may also still sell reprints of my article, "HQ-180 series receivers," or you may order it directly from me for \$1 plus a SASE. Beyond this, *CQ* and *QST* have reviewed most receivers at one time or another, and both frequently included advertisements which are good sources of information. The following is a list of references I have come across: "The Hammarlund HQ-129X," *QST*, June 1946, pp. 24-25 & 108; "The HQ-150 receiver," *QST*, Dec. 1956, pp. 26-27; "The HQ-100," *QST*, Jan. 1957, pp. 34-36, also *CQ*, Jan. 1958, pp. 46-47; "The Hammarlund HQ-160," *QST*, Oct. 1958, pp. 45-47, also *CQ*, Mar. 1959, pp. 52-53; "The Hammarlund HQ-145 receiver," *QST*, June 1959, pp. 44-46; "The Hammarlund HQ-180 receiver," *QST*, June 1960, pp. 42-43, also *CQ*, Apr. 1960, pp. 59; "Feedback: HQ-180 frequency-conversion system," *QST*, July 1960, pp. 45; "HQ-100A," *QST*, Dec. 1961, pp. 60; "HQ-145X," *QST*, Dec. 1961, pp. 60-61; "Hum reduction in the HQ-129X," *QST*, Nov. 1950, pp. 106; "HQ-129X receiver improvements," *QST*, May 1959, pp. 38-40; "HQ-120X," *QST*, Dec. 1941, pp. 65; "Full-range selectivity with 455-kc. quartz crystal filters," *QST*, Dec. 1938, pp. 33-36 & 56-62. This last article is by D. K. Oram, the Hammarlund engineer who probably designed the original Hammarlund crystal filter. Subsequent Hammarlund crystal filter designs are really not much different from the original. My notes indicate that older issues of *QST* contain a wealth of information about early Hammarlund receivers. For example, the 1938 June (pp. 68), July (pp. 78), and Oct. (pp. 119) issues of *QST* contain interesting information about the Hammarlund "Super Pro," the first of the famous SP series. And the Dec. 1941 issue contains ads for the SP-210X (15-560 meters tuning range) and SP-210SX (7.5-240 meters tuning range), which sold then for \$279. I also like *A Flick Of The Switch, 1930-1950*, by Morgan E. McMahon, published by Vintage Radio, and still in print, for example, in paperback from Fair Radio for about \$10. This book contains many pictures of old receivers, including the first Hammarlund receiver, the Comet Pro (1932, 8 tubes, 14-200 meters), two models

of the "Super Pro," and one model of the New Series 200 Super Pro. I would presume that these older Hammarlund receivers are rare indeed, but occasionally they are found for sale. For example, the June 1986 issue of *Antique Radio Classified* offered a Comet Pro, with 10 coils, 1932 model, for \$100.

Many exact replacement parts for Hammarlund receivers are available from Hammarlund Mfg. Co., Division of Pax Mfg. Corp., see Al's article above for their address and more details. I generally agree with Al's comments that Pax's prices are high, in my experience as much as five times the price of equivalent quality components which you can find at any good electronics supply store. Also, the last time I checked, Pax did not have many crucial parts, such as power transformers, multi-section high voltage electrolytics, meters, 24 hour clock-timers, and some specialized coils and transformers. Another source of exact replacement parts for Hammarlund equipment is Blue Ridge Communications and Electronics, 770 New Stock Road, Weaverville, NC 28787 (704) 645-7070. I cannot guarantee the correctness of the phone number which was accurate as of March 1985, but my efforts to get information by phone were unsuccessful anyway. According to my notes, Blue Ridge Communications is owned or operated by Wayne Cordell, and I still see his ads occasionally in *QST*. I wrote them in March 1985, including a SASE, and received a five page list of parts. Again, many crucial parts are not available from them. For example, only two parts were available from the list of eight parts I wanted. And prices were high: \$15 each for a used 60 kHz BFO oscillator coil and a 60 kHz IF transformer. At those prices, you are better off buying a second Hammarlund receiver and using it for spare parts. Some items are reasonably priced, such as original Hammarlund factory manuals for \$12.50 each, shipped prepaid in the U. S. A. — HQ-100, HQ-120, HQ-145A, HC-10, HK1-B, PRO-310, RDF-10, CB-6, HX-50, HX-500, HXL-1, and SP-400SX Super Pro manuals only, name plates and labels for \$3 each shipped prepaid — HQ-100 stick-on, HQ-110 stick-on, VHF stick-on, MR-50X stick-on, MR-60X stick-on, HQ-145A, HQ-170, HQ-170A, HQ-180, HQ-180A, HX-50, HX-50A, HX-500, Hammarlund (small for CB-23), CB-23, Hammarlund (large for HQ-180 or HQ-180A), and several other name plates, and a small selection of literature and brochures, including a Hammarlund Facilities Booklet which includes photos and a description of the Mars Hill plant for \$12.50. Blue Ridge Communications also offers a receiver alignment service for selected models at \$18.50 per hour — HQ-100A (3 hours), HQ-100A (3 hours), HQ-140 (4 hours), HQ-145A (3 hours), HQ-150 (4 hours), HQ-160 (4 hours), HQ-170(A) (4 hours), HQ-180(A) (4 hours), and SP-600 (6 hours). Another potential source of Hammarlund service and repair is C. Os-teen, Box 152, Mars Hill, NC 28754 who has advertised in *QST* in the past, but I have no other information about him. [Al also suggests that if all else fails regarding power transformer replacement, try: Peter W. Dahl Co., 5869 Waycross, El Paso, TX 79924, or for custom wound coils, chokes, and transformers: Caddell Coil Co., Poultney, VT. Can anyone supply us with the complete address of the latter? Ed.]

## PUBLISHER'S CORNER

Hi, folks. Look on page 1 — Dallas is serious. We need contributions from all you hollow-staters out there if we're to continue our high standards. We *could* publish garbage, but we won't. Please send us your tired, your poor, your contributions!! AND NOW THE USUAL. All articles and information shared through this newsletter may be reprinted only with permission of the author. The publishing committee assumes no responsibility for the accuracy or safety of untested modifications or the reliability of suppliers of services, parts, or equipment mentioned in *HSN*. Prices quoted below the masthead apply to U.S.A., Canada, and Mexico — double all quoted prices for other areas. Checks must be payable to Chris Hansen and must be in U.S. funds payable in U.S. clearing house format. Write for an information sheet — it's available for a SASE.

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