

THE SX-42 AND SX-62

TWO HALLICRAFTERS FAVORITES

John Bryant and James Goodwin

In the closing days of WWII, the major American manufacturers of communications gear faced a very real dilemma. As the War ended, it was obvious that the US government would find itself far over stocked with serious communications gear. This equipment was sure to flood the post-War market at very low prices. The dilemma was especially difficult for Bill Halligan's Hallicrafters Company; this Chicago firm had risen to prominence in the 1930's by offering a full line of low and mid-priced receivers as well as top of the line receivers. If the Hallicrafters philosophy were continued after the War, why should anyone buy a new mid-priced Hallicrafters receiver for \$130 when an 8-tube BC-348 was almost universally available at war surplus outlets for \$50?

INDUSTRIAL DESIGN AND RAYMOND LOEWY

One of Mr. Halligan's responses to this dilemma was to retain professional consultants to do the "styling" or "industrial design" of the entire Hallicrafters post-War line. Mr. Halligan himself had long been interested in the appearance of his products. He extolled the idea of styling in the late '30s, wanting to "bring the radios in from the garage." In retrospect, it is rather obvious that Hallicrafters receivers, almost from the beginning, were designed with more attention to appearance than were those of competing lines. However, although most consumer radios were being designed by industrial designers in the late pre-War period, it does not appear that Hallicrafters or any other communications gear manufacturer retained an industrial designer in the pre-War period. The distinctly Art Deco look of the Double-Diversity (DD-1) Hallicrafters receiver, the SX-23, the SX-28 and others were all achieved by engineering designers who were obviously influenced by the design trends of the consumer products of the day.¹

Industrial design had developed in the Depression years as a consulting profession for consumer products. These designers, at first drawn from the ranks of artists and architects, became responsible for applying the principles of visual design, new materials and production processes and the principles of the field that we now call ergonomics to the external configuration of mass-produced products. In the 1930's industrial designers had been responsible for the streamlined look of everything from locomotives and autos to children's bicycles. They also introduced the European Art Deco style to American products as diverse as silverware, table radios and skyscrapers.

Mr. Halligan retained the industrial design firm headed by Raymond Loewy to design the cabinets and front panels of the entire post-War line, making Hallicrafters the first communications gear manufacturer to retain professional industrial designers.² Raymond Loewy was one of the most famous industrial designers of both the pre and post-War periods. After WWII, he operated a national practice with offices in New York, and Chicago. Loewy was responsible for the design of many products for leading American manufacturer including Coca-Cola, Greyhound, Mobil Oil and many others. The Chicago office had been opened to serve long-time Loewy client the Studebaker Car Company. The Chicago Loewy office was eventually responsible for the classic Studebaker lines of the early 1950's and for the Studebaker Avante sport coupe. Fritz Wagner, head of the Loewy Chicago office, was personally responsible for the Hallicrafters account in the early years of their association with Hallicrafters.

THE POST-WAR LINE

Again, in retrospect, it is easy to see that the re-emergence of Hallicrafters radios in 1946 was a very carefully thought out styling, design and public relations blitz. ..The new post-war line initially consisted of one low-priced "entry" receiver (Model S-38), one medium priced receiver (Model S-40), and one top-of-the-line receiver (Model SX-42). Hallicrafters maintained an advertising presence throughout WWII in QST and elsewhere with patriotic ads highlighting Hallicrafters contributions to the war effort. These changed in January 1946 to full-page ads promising a whole new chapter in radio communications and noting that "log books are opening all over the world." In February 1946 double-page ads introduced the Hallicrafters new Model S-40.

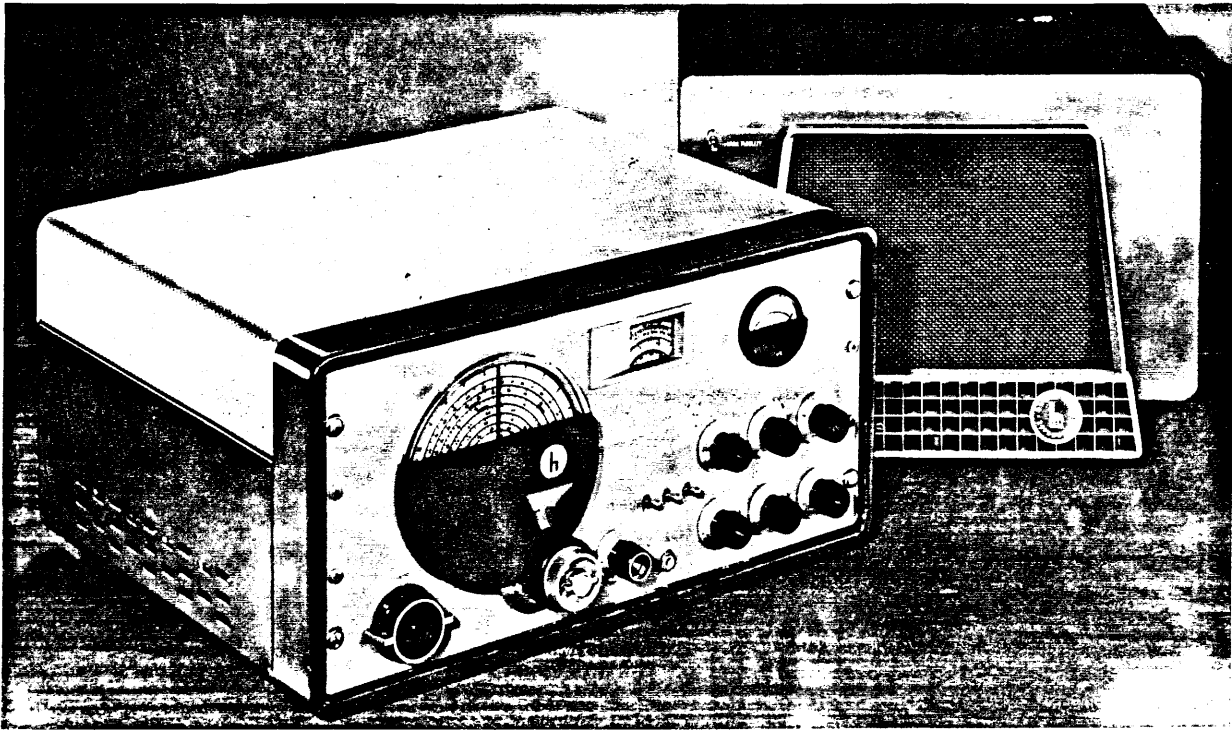
"New design, new utility in a great new communications receiver...handsomely designed, expertly engineered, Hallicrafters points the way...Look at the sheer beauty of the S-40, listen to the amazing performance...Beneath the sleek exterior of the S-40 is a beautifully engineered chassis..."

The jet black exterior of the S-40, with beautiful glowing green dials was a complete departure on styling from all previous communications gear. It was sleek, businesslike, but distinctly un-military. The massive ad campaign introducing the S-40 continued through May 1946. In June, Hallicrafters introduced the S-38 with an ad campaign equal to the S-40. The S-38 ad also carried a letter from Mr. Halligan in which he stated, "for Hallicrafters, the introduction of the S-38 and S-40 is only a beginning." The ad campaign was repeated in July 1946. In August and September 1946, Hallicrafters continued double page ads, showing both the S-38 and S-40.

INTRODUCTION OF THE SX-42

The Hallicrafters double full page ads in October and November 1946 carried an artist's rendition of the new SX-42 and was headlined "The First 100 Sets Are the Hardest". Ad copy went on to discuss the unprecedented frequency range (.54 to 110 MHz) of the receiver and stated that "The first 100 sets were now in the hands of radio technicians, engineers and amateurs all over the world" for evaluation. The artist's rendition was quite accurate.

The December 1946 QST magazine was the venue for the introduction of Hallicrafters new top-of-the-line receiver, the SX-42. In an eight-page (!) ad Hallicrafters discussed the features of the SX-42 in loving detail. As if an 8-page presence in a single issue were not enough, virtually all main Hallicrafters dealers each purchased SX-42 ads in that same issue. All of these ads were identical except for size and city name. There were 78 (!) quarter page SX-42 ads, 15 half page ads and 5 full page ads in this December 1946 QST. Fully 40 pages of the 150-page QST issue were covered with photos of the new SX-42! The SX-42 was well and truly introduced!



A UNIQUE RECEIVER

The SX-42 was a truly unique receiver; its attributes probably reflected Mr. Bill Halligan's own view of and interest in radio more closely than any other Hallicrafters radio. The comparative failure of the SX-42 in the marketplace must have been a great disappointment to him.

The most remarkable characteristic of the SX-42 is its continuous frequency coverage from .54 to 110 MHz. This coverage may have come about as an attempt to compete with the Hallicrafters SX-28 and other top-of-the-line receivers which would be on the war surplus market. Mr. Halligan and his designers could well have seen an FM-broadcast reception capability as one answer to the problem.

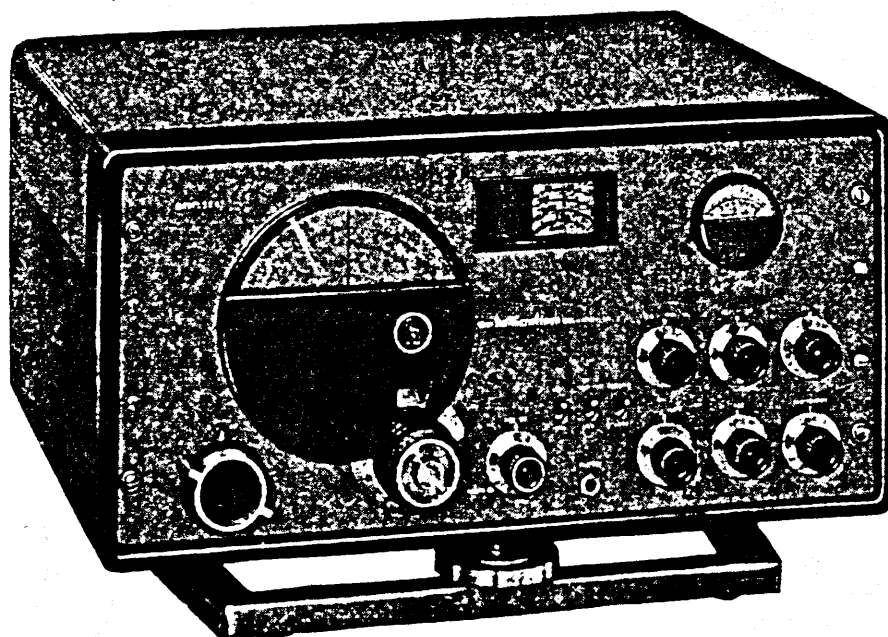
There is reason to believe the idea of the wide-spectrum SX-42 was conceived before 1945, during a period when the radio manufacturing industry regarded FM as the coming force in post-war domestic broadcasting and was even postulating the disappearance of most local AM broadcasting stations.³ The photograph on the cover of the SX-42 owners manual shows an apparent prototype dial with a logging scale and *four* bands, rather than the *six* of the actual production model. The top band of the prototype appears to cover a range reaching well up beyond 30 MHz but not as far as 100 MHz. This dial layout suggests that the prototype was developed before January 1945 when the Federal

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hallicrafters SX-42

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MODEL B-42 \$7.50

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Communications Commission ordered FM stations to move from their 42-50 MHz band to 88-108 MHz. If this supposition is true, the Hallicrafters designers would have then been faced either eliminating the FM capability or adding bands and spectrum up to the new much higher FM broadcast band. For whatever reason, the spectrum coverage of the SX-42 and its SX-62 clone was the widest offered by any single commercial set until the introduction of the ICOM R-9000 in the late 1980's!

The second most notable feature of the SX-42 is its tuning scheme. Main Tuning, Bandspread and Dial Lock Knobs are all mounted concentrically on a single shaft. The Dial Lock knob is the inner-most bow-tie shaped knob. When tuning, the operator turns the main dial with the outer knob, locks it and unlocks the inner Bandspread knob with a half turn of the locking knob and completes final tuning with the Bandspread knob and dial. We do not know whether this unique tuning system was developed by Hallicrafters or the Loewy designers. In any case, this knob scheme was not well received by radio amateurs; it was never repeated in any known receiver design.

The third unique characteristic of the SX-42 is the very strong commitment to the shortwave and FM *Listener* throughout the design and documentation of the receiver. The owner's manual begins with a letter from Mr. Halligan which stresses using the SX-42 for "all wave world-wide reception" and noting that the manual is broken into two sections: a non-technical set of instructions and a second section of technical discussions "for the advanced amateur." The attention to the non-hobbyist user is also seen in the color-coding of the non-tuning controls. Red dots on the knobs show the normal settings for AM reception. Green dots show the setting for FM reception. The needs of the all-wave listener were also addressed throughout the circuitry: special wide selectivity settings, "high fidelity" audio circuit design, unusual tone controls (including "bass boost"), and a full 8 watts of audio power developed from 2 6V6 tubes in push-pull. The circuitry provides an essentially flat audio response from 50 to 15,000 cps.

Like most top-of-the-line tube receivers, both the SX-42 and the succeeding SX-62 are enormous by modern standards. The front panels measure 20 inches by 10 inches and the (interchangeable) cabinets are 16.5 inches deep. Each weighs in at a backbreaking, 60 pounds, as well!

The matching R-42 and R-45 (rack mount) speakers were also designed for the audiophile. The 8" speaker (large magnet) is enclosed in a ported "bass reflex" enclosure; a two-position switch on the enclosure offers "Communications" and "High Fidelity" settings. The audio qualities of the SX-42 are excellent, even by today's standards. Listening to classical music on FM with the SX-42 driving either the R-42 or a modern stereo speaker enclosure is a wonderful experience.

CIRCUITRY (SX-42, SX-62)

The receiver covers the range of 550 kHz to 108 MHz in six bands: 550 - 1600 kHz, 1.6 - 5 MHz, 5 - 15 MHz, 15 - 30 MHz, 27 - 55 MHz and 55 - 108 MHz. The circuitry for the first four bands has an intermediate frequency of 455 kHz and provides AM and CW reception. Bands five and six have an i.f. of 10.7 MHz for reception of wide-band AM, CW and FM signals. All i.f. signals pass through three transformer cans, each containing two tuned circuits in parallel, one for each i.f. frequency. The SX-42 is basically the communications receiver type that had evolved before World War II, with the addition of the FM circuit introduced by Edwin H. Armstrong in 1933.

The first SX-42 s that appeared at the end of 1946 had the following 15-tube complement: two 6AG5 r.f. amps., 7F8 converter, 6SK7 1st i.f., 6SG7 2nd i.f., 6H6 low i.f. AM detector/noise limiter, 7H7 1st FM limiter, 7H7 2nd FM limiter/ high i.f. AM detector, 6H6 FM discriminator, 7A4 b.f.o./FM meter amp., 6SL7 a.f. inverter, two 6V6 a.f. output, VR150 voltage regulator, and 5U4G rectifier. In the latter part of 1947, the first 7H7 was made a 3rd i.f. amplifier and the second 7H7 became the single FM limiter and AM detector. After the first production run of the SX-62, the Loktal 7H7 s and 7A4 were replaced by their octal counterparts, 6SG7 s and a 6J5. The SX-62/A/B has a 6C4 in the 500 kHz calibrator circuit.

The circuitry underwent no fundamental changes during the almost two decades the SX-42 and SX-62/A/B were on the market. During the first few years a number of successive small improvements were made for the signal path in the final i.f./detector area. The re-design for the SX-62 brought in the 500 kHz calibrator and took out the ganged bandspread capacitors, front-panel crystal phasing control and the combined S-meter/FM tuning meter. The only modification in the audio section over the years was the change of the original output impedances of 500 and 5000 ohms to 3.2, 8 and 500 ohms in the SX-62A.

The components that failed the test of time were the tubular paper capacitors in the early receivers. Any such set surviving today either will have had these replaced or will need to have the work done. Many small economies were effected in the early receivers to help hold the line on costs. One false economy was the failure to provide a fuse in the primary of the power supply. A fuse was included in the design of the SX-62A when capacitor failures in the earlier sets were seen to be causing damage.

Selectivity and sensitivity figures obtained on James Goodwin's SX-42 are:

Selectivity of the three L-C filters at -6dB: 6, 7 and 13 kHz, with -60dB/-6dB shape factors averaging 3.5. Selectivity of the three crystal filters at -6dB: widths within the range of 50 to 1500 Hz (each filter's width being set by an internal trimmer), and at -60dB, widths of about 7 to 9 kHz.

AM sensitivity with a 6 kHz bandwidth: an average of .75 microvolt over the range of 1.6 to 30 MHz, and 4 microvolt on the broadcast band. With a modern 4 kHz filter inserted, the preceding figures are reduced to about .55 microvolt and 2.7 microvolt. (10 dB signal + noise / noise, 400 Hz tone, 30% modulation)

USING THE SX-42

John Bryant: I never use my restored SX-42 as a serious DX receiver. It lacks pass-band tuning and a notch filter. Further, its narrowest L-C IF filter has very broad filter skirts while the broadest crystal filter is a bit too narrow for my DXing tastes. If my SX-42 were fitted with a couple of KIWA filters and an outboard digital read out, it would be a credible DX receiver, but it would still lack both passband and notch. I use the SX-42 as the program listening receiver in my shack and it is running more than any of my DXing radios. I am lucky enough to have the matching R-42 speaker and really enjoy listening to Afro-Pop or the music of the Andes with the IF wide open and the mode switch in the "high fidelity" position. The audio is wonderful!

When James Goodwin restored my '42, he installed a KIWA 4 kHz filter.⁶ Since both the 10.7 MHz and 455 kHz IF signals flow down the same signal path, James took the trouble to make the filter switchable so that I could switch the filter out and listen to FM normally. This also allowed me to evaluate the performance of the SX-42 both stock and modified. In truth, the rather pedestrian stock IF filters of the '42 are adequate for about 75% of my program listening. However, the rest of the time I can really improve the signal/noise ratio, or remove a pesky heterodyne with the very steep-sided KIWA filter while still getting a fairly wide-spectrum audio.

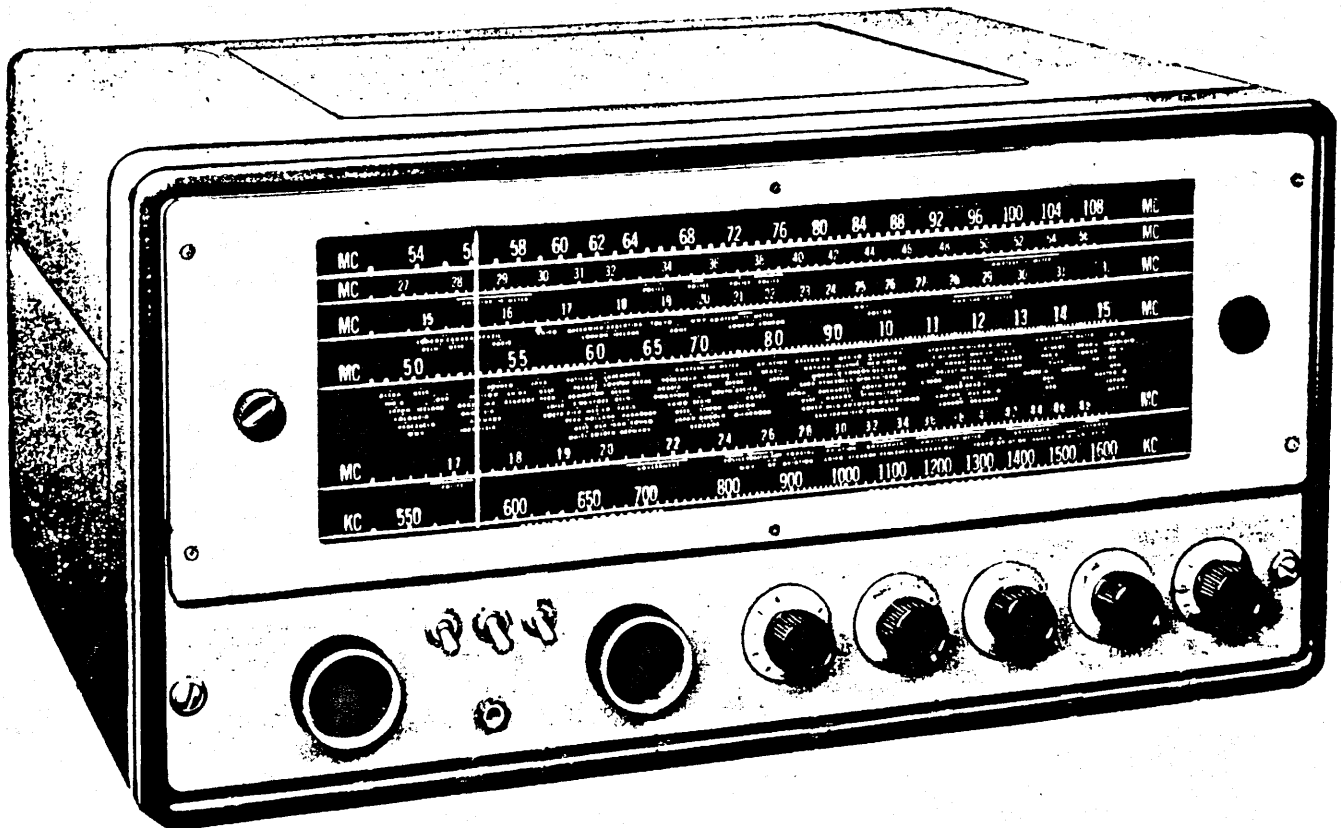
What I like most about the SX-42: I absolutely love the quality of the audio and I like the tuning system. The concentric knobs are both handy and fun to use. The flywheel-backed main tuning knob and brass gearing makes tuning sensual and the design of the index line (actually a 3-D blade) makes it easy to tune the main deal very accurately. I like the looks of the SX-42. It's very nice to have such a beautifully designed radio in the shack.

What I like least about the SX-42: The S-meter is beautiful but just a bit too small for my bifocaled eyes. Also, apparently to reinforce the "clean look" the Loewy designers talked the engineers into placing the 'band-tuned' indications (5-15 MHz, etc.) on the 1/4" wide horizontal EDGE of the band switch knob itself! This is very difficult to read, even in a well lit shack and was a bad design decision.

James Goodwin: I've used my 1946 SX-42 almost daily since I got it third-hand 37 years ago. The i.f. section was up-dated to an SX-62A's 30 years ago, and today it has Kiwa filters with actual bandwidths of 4.5, 3.5 and 2.5 kHz. I've added an outboard digital read-out. The receiver has been run concurrently over the years with a total of 25 other receivers. The 42 is near the back of the pack for oscillator stability, but, with comparable i.f. filters, the sensitivity is about equal to the best tube receivers and is better than that of most solid-state models with broadband front ends. The receiver has one main use. Since I'm interested in all s.w. bands and transmission modes, there are a lot of frequencies to check at times like the dawn-enhancement hour. A receiver with good sensitivity and frequency agility is needed. Because the SX-42 has three s.w. bands rather than the five of other good tube models, I can band hop with it more quickly, and with greater freedom of frequency choice than what the memories of a modern receiver can provide.

SIC TRANSIT GLORIA

It is not possible to determine at this point just why the SX-42 was dropped from the Hallicrafters line after only two years. Retail price was probably not the issue. The competing National HRO-5TA-1 and Hammarlund SPC-400 were each selling at \$300 each, while the SX-42 was priced at \$275 (almost \$2000 in 1994 US dollars). Most likely, several factors contributed to the receiver's lack of success with both radio amateurs and all-wave listeners. For the ham, a comparison of the SX-42 with the much less expensive surplus SX-28, showed both had about the same selectivity and sensitivity, but the 28 had features that were downgraded or eliminated in the new receiver. These included elimination of the 28's antenna trimmer, a less capable noise limiter, reduced shielding of the tuning capacitors, a cutback in temperature-compensating capacitors which lead to increased warm-up drift and a number of other more subtle economies. These sacrifices were probably made to maintain a ceiling on receiver price while adding the new FM and alternate i.f. circuitry. For the all-wave listener, the SX-42 was an excellent product, but, it still looked and operated like a traditional ham receiver rather than like a radio for the home. Whatever the cause, the SX-42 passed into history with the end of the 1948 model year.



THE SX-62

Like the SX-42, the SX-62 appears to be an outgrowth of Bill Halligan's conviction that there was a significant market for a very expensive "high fidelity" all-wave listener's radio similar to the Scotts and McMurdo-Silvers of the 1930's. Since so much of the circuitry of the SX-42 was devoted to the needs of high fidelity AM and FM reception, deciding to develop a true listeners-only all-wave receiver based on the SX-42 chassis must have been very easy.

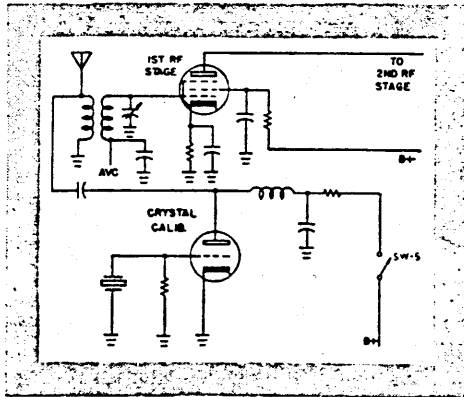
The SX-62 was introduced in 1948 as "the world's finest receiver for the all-wave listener...will outperform any other broadcast receiver on any frequency, standard broadcast, shortwave or FM..." (See ad copy below). The evidence indicates that Halligan and Hallicrafters had finally found the niche market that they had been seeking with the SX-42. The SX-62 was produced in both the US and Canada more or less continuously from 1948 through 1965, the longest run of any Hallicrafters model.⁴ The price rose from \$269 at introduction to \$525 in its final model year. That equates to \$1565 and \$2340 in 1994 dollars. Throughout most of those years, the SX-62 was the most expensive radio in the Hallicrafters catalog.

Hallicrafters engineers simply removed the band spread capacitor and added a 500 kHz crystal calibrator circuit based on a single 6C4. Otherwise, the tube compliment and general circuitry of the first run of SX-62's was identical to that of the now abandoned SX-42.⁵

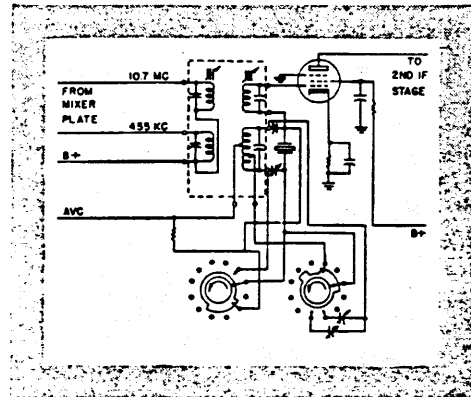
FRONT PANEL DESIGN

The front panel, dial face and dial mechanism designed by Loewy's office for the SX-62 were the largest and most useful all-wave dials ever produced. Like the SX-42, the main tuning knob drove a very heavy flywheel as well as the tuning capacitor, enabling quick frequency changes. The large dial pointer itself could be adjusted plus or minus about 1/2" independent of tuning capacitor position by using the small Pointer Reset knob. With this pointer reset capability and the crystal calibrator, it is easy to maintain the dial so accurately that any international broadcast may be found quite quickly. Beyond the usefulness of the massive slide rule dial, the overall design of the dial, the front panel and the cabinet are such that the SX-62 was and is at home in the Board Room or the Living Room. The SX-62 is a classic of

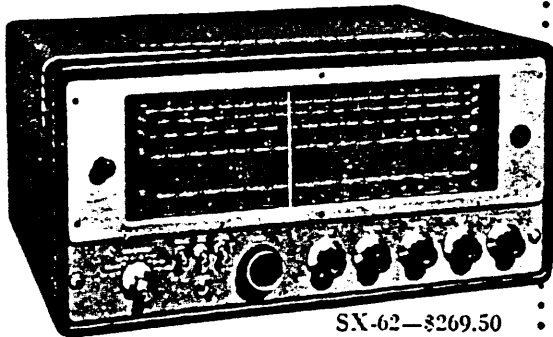
Two Reasons Why The SX-62 Tops Other Broadcast Receivers



CALIBRATION OSCILLATOR for determining exact frequency at any time. A flip of toggle switch SW-5 feeds a 500 kc unmodulated signal into the antenna coil; amplified harmonics appear at 500 kc intervals on all bands up to 32 Mc. Just zero beat the tuning gang with the nearest harmonic and use the "Reset" control to correct the dial pointer.



SIX POSITION SELECTIVITY control. Here's that extra bit of flexibility no experienced listener would be without. The three sharpest positions use the Xtal bridge circuit above. The other three positions effect necessary changes by varying the coupling in later IF coils not shown. 10.7 Mc IF is used on two highest bands.



SX-62—\$269.50

BEFORE YOU BUY—or let an SWL friend buy—see and try the SX-62. There is no other set in the world like it. None with such frequency range—540 kc to 110 Mc, such ease of tuning—over 150 stations marked on the dial, or such flexibility of control. Truly, a radio that is all radio! Other features include temperature compensated oscillator with voltage regulator, two RF and 3 IF stages, 14 tubes plus rectifier and regulator.

the hallicrafters co.

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1950's understated elegance. The dial itself is over 15" long, spreading the spectrum out over almost 8 feet of dial. The dial is also quite romantic for the radio aficionado, as many of the locations listed on the dial are either spelled archaically (e.g. Djakarta) or no longer exist (Belgian Congo, etc.)

Although the SX-62 has no band spread or incremental tuning, it is quite easy to tune. The mechanical design of the dial is "geared down" so that it requires quite a few turns of the tuning knob to tune across the huge dial. This allows easy fine tuning with the main (only) tuning knob. Movement across the dial is aided by a large flywheel.

IN USE TODAY

John Bryant: Since I spend at least as much time program listening as I do DXing, I find great pleasure in owning what I believe to be the finest all-wave receiver ever built. I have used the SX-62 as my bench receiver for a year or so and have found it very enjoyable. With the proper antenna, I can listen to the local TV broadcasts on channel 2-6 as well as FM, MW and of course SWBC. Although I own an R-42 speaker, I found that one of my old large stereo speaker enclosures matched the high fidelity of the SX-62 very well. The SX-62 sounds wonderful whether on FM classical stations or listening to some of the music aired on HCJB.

Recently, I built a coffee table-height speaker enclosure with the same footprint as the SX-62. The SX-62 now sits atop its speaker enclosure in my office. It has generated numerous conversations about radio, geography and such; I'm also the only guy around our office who can choose to listen to the 5:00 PM news from London, or from National Public Radio or from Channel 4!

The only weakness of the SX-62 that I have noticed is the L-C IF filtering discussed the SX-42. Although I could install a KIWA filter, I have never found that selectivity weakness to be a real problem in program listening. I use my SX-62 almost every day and I enjoy it very much.

SHOULD YOU OWN EITHER ONE?

With the exception of some specialized CW applications, the SX-42 is not really a DX receiver by modern standards. If you want a tube era DX machine to compete with the best of the solid state crowd, an SP-600 or an R-390A aided by a Hammarlund HC-10 is a good bet. So, too, is the still popular Hammarlund HQ-180-A. However, if you would like to own a truly unique piece of major league radio history, or if you would like to use a communications receiver for program listening, an SX-42 may be in your future. Be prepared to look for one. Since they were only produced for two years, SX-42s are fairly rare. Currently they are selling for \$200-\$500 based on condition.

The SX-62 was never intended as a DX receiver. It remains today just what it was advertised to be in 1948: the finest all-wave receiver ever made. SX-62's are currently fairly common on the vintage receiver market, though they bring similar prices to the rarer SX-42's.

If you have serious interest in either of the magnificent tube radios, you should move quickly. Prices are going up rather rapidly.

AUTHOR'S END NOTES

¹Interview with Mr. Robert Samuelson as in "The Hallicrafters SX-28" fine tuning's *Proceedings*, 1992-93.

²National retained industrial designers to style their 1947 line, the HRO-7, NC-57, NC-173, etc. Hammarlund most probably never retained professional industrial designers.

³Empire of the Air by Tom Lewis, Edward Burlingame Books, an imprint of Harper Collins, 1991. A history of radio in the U.S. viewed from the perspectives of the careers of Lee De Forest, David Sarnoff and Edwin Howard Armstrong.

⁴*Communications Receivers* 2nd ed., Moore. Raymond Moore lists production as SX-62 1948-51 (price \$269), SX-62A 1955-63 (Price \$350), SX-62B 1965 (Price \$525) indicates that the tube compliment of all SX-62's was the same as that of the SX-42. This is not correct. The Hallicrafters owner's manual labeled 'SX-62, 2nd Run' lists the more modern tube compliment (elimination of the loctal 7H7's) that Moore shows only with the SX-62A/B.

⁵ibid. Note: Raymond Moore indicates that the tube compliment of all SX-62's was the same as that of the SX-42. This is not correct. The Hallicrafters owner's manual labeled 'SX-62, 2nd Run' lists the more modern tube compliment (elimination of the loctal 7H7's).

⁶"The KIWA I.F. Filter Module" by James Goodwin, fine tuning's *Proceedings* 1992-93 or KIWA Electronics, 912 S. 14th Ave., Yakima, WA, 98902 Phone 1-800-398-1146 or 1-509-453-KIWA.