TWO BRITISH BOXES

LOWE'S HF-225 & HF-150 RECEIVERS

Elton Byington, N2KXT

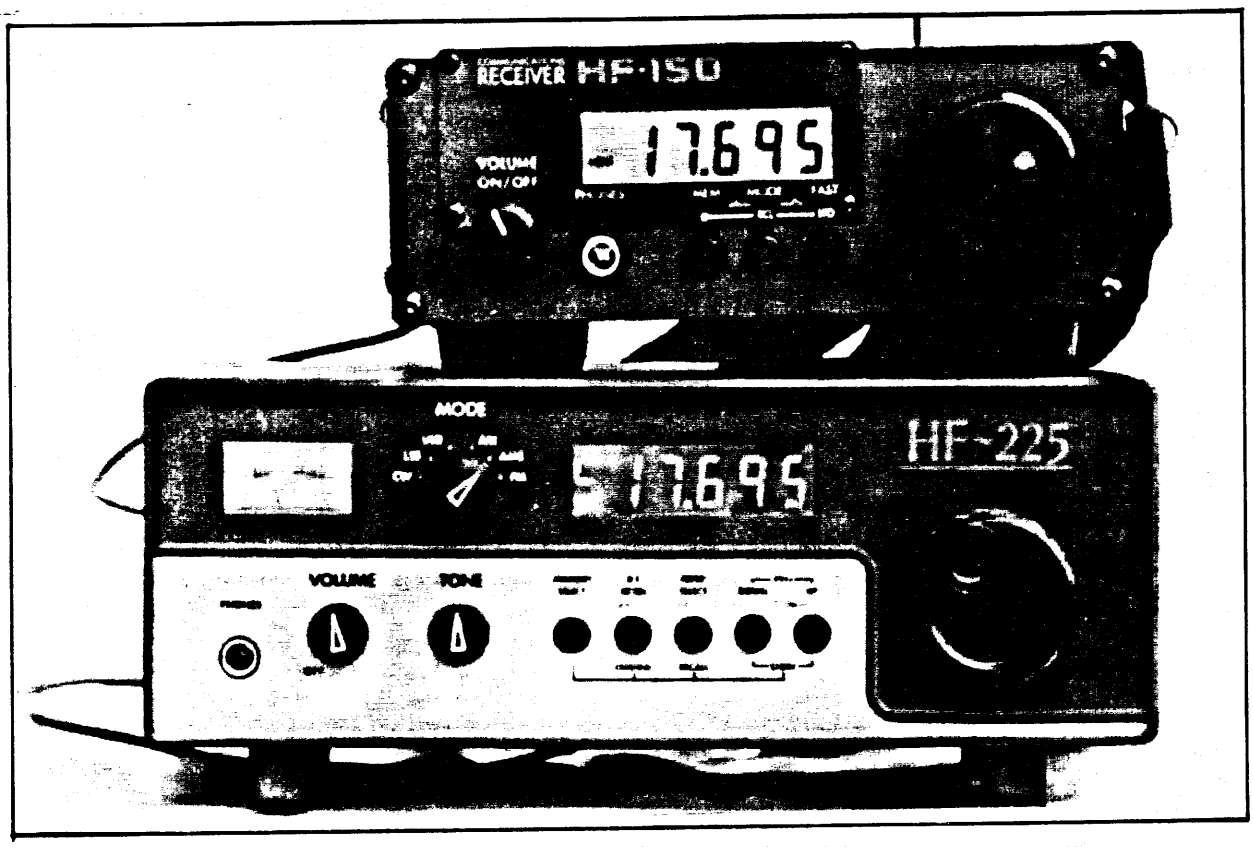
Lowe Electronics, Ltd., a major shortwave retailer in the United Kingdom, manufactures two very interesting general coverage receivers, primarily for the European market. Lowe recently appointed two distributors in the United States, so the receivers no longer need be ordered directly from the factory in England.

My HF-225 was delivered in March, 1991. I was so impressed with the receiver's performance that I ordered Lowe's latest radio, the HF-150, soon after it was announced.

I can state categorically: ***the Lowe receivers are the best sounding shortwave radios I have ever heard.***

Lowe receivers are not for everyone, but if you suspect a shortwave broadcast could sound better than it does on your radio, you're probably right.

Unless you already ***own*** a Lowe.



WANTED: AN EAR OPENER

The object of shortwave listening and DXing is to hear distant radio stations, ones that can't be picked up on the radio you carry to the ballpark. The quality of that reception is what separates a great receiver from a mediocre one.

Most of the qualities that make up a great receiver can easily be quantified: sensitivity, selectivity, unwanted signal rejection, stability, tuning accuracy. These goals are met by virtually all modern table top receivers, and by a large number of portables.

But there's a common failing that afflicts almost all these receivers: they sound bad. The manufacturers of these radios go to great lengths to make their products as sensitive and selective as possible, but when it comes to the audio section, they drop the ball.

What's the use of hearing a distant station if you can't understand what's being said? What good comes from hearing a station if the very act of listening is so fatiguing you have to tune out before you get that elusive ID?

The folks at Lowe Electronics heard their retail customers complaining about how lousy shortwave radio sounds and they decided to prove a point: there's no reason why a shortwave radio **must** sound bad.

The result of their efforts is the HF-225 and its siblings, the commercial HF-235 and the tiny HF-150, introduced this year. All three receivers deliver superb audio which makes shortwave listening a real pleasure.

LITTLE BOXES, BIG FEATURES

The Lowe HF-225 is a double conversion superheterodyne receiver that provides AM, SSB, and CW reception from 30 kHz to 29.999 MHz in 7.8 hertz steps. Selectivity is supplied by ceramic filters in bandwidths of 10, 8.8, 5.9, and 2.2 kHz. There's a 200 Hz audio filter, centered on 800 Hz, for CW reception. Frequency readout is only to the nearest kilohertz. There are two VFOs and 30 memories in the receiver to store favorite frequencies. Modes are not stored. A noise blanker is included which does a decent job of removing ignition noise. It's always on and it's not adjustable.

Lowe offers two options for the HF-225 which I feel are essential: an external keypad for easy tuning and a PLL synchronous detector for AM. The "AMS" detector has drawbacks, but its benefits far outweigh its shortcomings. The same board is used for narrow-band FM reception. When the AMS mode is in use the 10 kHz bandwidth becomes 12 kHz, suitable only for local broadcasts or the clearest shortwave signals.

The HF-225 is housed in an aluminum box measuring 10 x 7 x 4.25 inches, and it's built like a tank. This radio can stand a lot of handling, especially when fitted with the optional leather carrying case. It can be fitted with an optional NiCd battery pack and a whip antenna and impedance-matching amplifier for portable operation. The radio is powered from an external 12-volt power pack.

HF-150

The lower-priced HF-150 is also a double conversion set and has two IF filters, nominally 6.5 and 2.6 kHz. Unlike the filters in its big brother, however, the ones in the HF-150 are selected by mode, so you cannot "open up" the selectivity when in SSB. This is not a big problem because the set's PLL synchronous detector will lock on the weakest of signals and it allows selection of filter width. The HF-150 has no noise blanker.

The "AMS" detector in the HF-150 is much better than in the older radio. For one thing, it allows selection of upper or lower sideband. It also hangs onto the carrier for dear life! The radio will lock onto the weakest carriers, too. It's also standard equipment. The external keypad costs extra, but it's worth it.

The HF-150 is only about half the size of its big brother, measuring just 7.25 x 3.125 x 6.25 inches. Its case is made of heavy-gauge extruded aluminum, so the receiver will take a lot of banging around. The HF-150 is powered by 8 penlight batteries and a new set of alkalines only lasts about 5 or 6 hours, because of the heavy current drawn by the set. An AC adaptor is supplied with the radio.

A TOUR AROUND

The HF-225's front panel is simple and uncluttered, with only four knobs (volume, tone, mode, and tuning) and five pushbuttons which serve multiple purposes. The frequency display is in the center and there's a small S-meter in the upper left corner. The frequency display and the S-meter are illuminated by three green LEDs which are on whenever the radio's on. The light they give is adequate while not being intrusive in a dark room. There's also a 1/4-inch jack for monaural or stereo headphones.

The set's rear panel contains an SO-259 coax connector for a 50 ohm antenna, compression type connectors for a high impedance antenna, a three-position antenna selection switch (Lo-Z, Hi-Z, Whip), a squelch control for NBFM, a center-positive concentric socket for the power supply, and 1/8-inch jacks for the keypad, an external speaker and a recorder. There's also a mysterious hole marked "AUX," which appears to serve no purpose.

HF-150

The HF-150's front panel, like the radio itself, is very compact. There's the same frequency display and tuning knob as on the other receiver, but is has only three pushbuttons, a volume control, and a headphone jack. The display isn't lighted and there's no S-meter or tone control.

One important control has been banished to the back of the HF-150: the 20 dB attenuator. Since the new set doesn't have RF bandpass filters like its older sibling, it can easily be overloaded by strong SW and MW signals.

MY CONFIGURATION

My HF-225 sits on my bedside table and gets more use than all my other receivers combined. The radio is fed by a 35-foot indoor antenna on the ground floor of a frame house that has aluminum siding. There's a 50kW mediumwave transmitter (WQXR-1560 kHz) less than a quarter mile from my home. Those are the facts of DX life at my home, and I must live with them.

I can switch in a Palomar P-408 preselector or a Palomar BCB loop antenna, if need be. The preselector is very rarely used, but it comes in handy for extremely weak stations, like VNG on 16 MHz or AIR, Aligarh, on 7412 kHz. These stations can be received "barefoot," but the preamp gives a little better signal to noise ratio. It also gives better front end selectivity for rejection of my high-powered neighbor.

The preselector is essential with the HF-150 at my location, because it contains a highpass filter that suppresses the MW band. For MW reception on either radio, an external loop antenna is ideal.

The output of the HF-225 feeds a Realistic Minimus-7 loudspeaker and an inexpensive stereo tape deck for recording Media Network and other interesting stuff.

PERFORMANCE

When hooked up as listed above, the HF-225 really cooks, especially in the tropical bands, where its extremely low noise level makes the signals jump out of the speaker. It's also a joy to use on mediumwave, because its sensitivity is undiminished in that region.

One thing you notice immediately is that there is **no "chuffing"** on these receivers as with many other digital radios, including the Drake R8. If you tune rapidly you'll hear a sort of raspy whine, but the level is so low as to be almost imperceptible.

Hard as it is for me to believe, I think the HF-150 is even hotter than the HF-225. Lowe gives the sensitivity as 1.8 microvolts (10 dB s+n/n, AM carrier, 60 percent modulation) from 50 kHz to 500 kHz, and 0.8 microvolts above that, which includes the MW band. This seems an astounding figure, but it seems to be true!

A real test of a receiver's selectivity is how it copes with the 49 meter band at night and the HF-225 is surprising in that regard. I usually use the 5.9 kHz filter (which displays as "4") and tune around in the straight AM mode. If a station is being crowded from one side or the other, I can tune off-center in the opposite direction and generally eliminate the interference. As long as the station's carrier remains within the radio's passband, the audio distortion stays quite low. If the QRM is still too strident, the 2.2 kHz filter can be switched in, yet the audio remains quite listenable.

The HF-225's superb tone control has so much latitude that it's almost as good as having passband tuning. Its effect is hard to describe, but it's a definite plus when trying to dig through the QRM, especially when a station's audio is muffled.

The HF-150's two IF filters don't allow the latitude of control enjoyed when using the older receiver, but they are quite good, nonetheless. I've had little trouble separating 49 meter band signals with the new set, and the radio's AMS detector often makes listening somewhat easier.

For really tough cases, you can switch to USB or LSB and tune the station in ECSS. The HF-225's unusually small (7.8 Hz) tuning steps make it a snap to zero-beat a carrier. And, since all bandwidths are available in any mode, you can open up the passband to obtain the best overall audio.

But where the HF-225 really shines is when tuned to a signal that's in the open. There, you can turn on the AMS detector, sit back, and listen for hours on end. The detector will occasionally lose its lock on the incoming carrier, but that rarely results in the kind of "bending" of the audio so often heard on the Drake R8 as the Drake's PLL hunts around trying to regain the carrier. **The HF-150 sounds just as good as its big brother, and in some cases better!**

In "Proceedings 1989" John Bryant remarked on how the Kiwa Electronics Multiband AM Pickup (MAP) made normally mushy-sounding Indonesian broadcasters seem to leap out at him. He attributed this to the MAP's superior handling of transients and sibilances. He should hear this radio! I often listen to Radio New Zealand International late at night, with the HF-225 in the AMS mode. The audio is so clear I can hear the scratches on their records. This detector is a revelation when listening to stations in the tropical bands and on mediumwaves. The only fault I can find with the HF-225's synchronous detector is that it doesn't allow you to select sidebands.

That's the biggest advantage of the HF-150: selectable sidebands. I asked Lowe's John Thorpe if they planned to make a similar detector as an option for the HF-225, but he said it couldn't be done. John says they've "run out of switching options" on the older radio.

I say, take out the little used FM mode and give us a sideband selector!

(Speaking of FM reception, the HF-225 was the only receiver I own that produced listenable results during RFPI's misguided attempt to utilize NBFM in the 41 meter band. Neither the Drake R8 nor the JRC NRD-525 could match the Lowe's performance.)

AGC on the Lowe receivers switches automatically by reception mode, and its time constants are a good compromise between slow and fast. A static burst will deafen the radio momentarily, but recovery is fast enough so you don't miss anything. It's also slow enough to avoid the "pumping" heard when you tune SSB with most portables. The AGC cannot be defeated and there is no manual RF gain control.

I usually listen to the ANARC SWL Net with the HF-225 and I can hear all but the weakest stations. A good antenna would do wonders!

PERFORMANCE AS PORTABLES

With the optional whip installed, the HF-225 performs fairly well, except on mediumwave or when near a powerful radio transmitter.

I'd never really had the chance to use the HF-225 as a portable until the Winter SWL Festival in Kulpsville, Penna., last March. I was quite surprised and delighted to find the little radio pulling in stations just as well as a new Sony ICF-SW77, using just the whip antenna and its associated impedance-matching amplifier. The little box drew quite a crowd when I turned it on at the end of the hall near the hospitality suite!

The radio performs dismally if you try to use the whip antenna without turning on the amplifier, and in a high-RF environment the whip amplifier overloads badly.

But the HF-225 really shines when you hook up a random wire antenna. In that regard -- as well as in the realm of audio -- the HF-225 behaves like the best tube-type radios, most of which were notoriously dead when using short antennas.

After the Kulpsville meeting I phoned John Thorpe, designer of the HF-225, and asked him about the whip's amplifier. Thorpe said he could understand my difficulty at home, what with that RF factory down the block, and said he'd had like reports from others in similar receiving situations. Thorpe said there was no plan afoot for redesigning the amplifier, however.

This radio should be a good candidate for a DXpedition, where it could be coupled to an antenna that would do it justice. I'd **LOVE** to hook this thing up to a beverage!

The HF-150 is a far better portable receiver than its older brother. Besides being considerably smaller, the radio's built-in whip amplifier is far less susceptible to intermodulation and overload than the earlier version, offered as an option for the HF-225.

About the only drawback I can find is that the radio is somewhat microphonic, so a thump on the bottom of the cabinet can produce a "ping" in the audio. High audio levels can also cause feedback if you're using the internal speaker. The manual warns about this and suggests using an external loudspeaker or headphones because of it.

The microphonics are traceable to the receiver's mixer stages, which are operated near their optimum design points. Transistor-ring mixers of the type used in the HF-150 are notorious for being sensitive to vibration, but the "ringing" isn't detrimental to the set's operation.

The HF-150's lack of RF input filters can cause problems when the set is operated near a powerful radio transmitter. Use of the attenuator helps considerably, but the set really needs a MW input filter when used in an urban area, I think.

Neither of the Lowe receivers works well on MW frequencies in an urban area unless you use a tuned loop antenna. With a loop, active or passive, they are among the most sensitive receivers available.

WHAT I MISS

Among the other receivers I use daily are a Drake R8, a JRC NRD-525 with Kiwa MAP, a Drake R-4B, and a National HRO-50T1. Each of these radios has features I really like; none is perfect. Of the features I enjoy using on these other sets the only ones I'd add to the HF-225 are passband tuning, a tunable notch filter, and selectable sidebands for synchronous AM reception.

The only feature I **really** miss is passband tuning.

On the HF-150 I miss the S-meter and the tone control.

HOW THEY HANDLE

If you bought an HF-225 and didn't buy the optional keypad, you're missing a lot. Without the keypad, the radio's cumbersome to tune. You must use UP and DOWN buttons to select the MHz range (although the receiver tunes continuously, it does **not** wrap around from 29999 to 30 kHz), then zero in with the fairly small (1 5/8-inch diameter) tuning knob.

The tuning steps depend on your choice of mode, too. If you have the radio set to the AMS mode, the receiver tunes only 1.6 kHz per revolution of the tuning knob. In other modes, the steps vary according to how fast you turn the knob. The slow-tuning rate in AM is 9 kHz per revolution, for SSB and CW, it's 1.6 kHz.

One advantage of the glacial tuning rate in AMS mode is when you are tuning around hunting for hets in the tropical bands. **You'll never miss a het with this radio.** And, once you've found one, you'll usually get usable audio out of it. Tuning in AMS produces a heterodyne that descends in frequency as you near the carrier. Once you're within locking range (about 100 Hz each side of the carrier), the detector locks on and an "L" appears in the display.

The "mode" switch also selects a default bandwidth for each position. Switching to AM or AMS switches in the 8.8 kHz filter (which shows up in the display as "7"); the default for CW or SSB is 2.2 kHz. You can change these bandwidths and they become "sticky," so that when you return to that mode, your chosen bandwidth returns. Trouble here is that they revert to the factory defaults when you switch the receiver off.

The bandwidths are chosen with a single pushbutton in a carousel arrangement. But, since the "mode" switch is rotary, this arrangement isn't nearly as annoying as it is on the Drake R8. The button itself is also bigger and there's plenty of room around it.

The multi-purpose pushbuttons also allow you to switch in a 20 dB attenuator, switch VFOs or duplicate their contents, and lock the radio's tuning.

On the HF-150, the modes and bandwidths are selected by pushbuttons in a (gasp!) carousel arrangement. Press the MODE button and the display changes to show the mode in use. You can then press the right or left buttons to move from mode to mode:

LSb **<->** ***USb*** **<->** ***An*** **<->** ***A*** **<->** ***ASd*** **<->** ***ASF*** **<->** ***ASL*** **<->** ***ASu*** **<->** ***LSb***
<----- Narrow Filter ----> <-------- Wide Filter --------> <----- Narrow Filter ----->

Unlike the Drake R8, however, this carousel moves in both directions.

The AM (A), synchronous double-sideband (ASd) and "HiFi" (ASF) modes all use the wider filter; the remaining modes utilize the narrower filter. The ASd mode is similar to that found on the HF-225 and is best for "normal" listening. The ASL and ASu modes produce very pleasant audio, even though they utilise the narrow filter. Their rejection of the unwanted sideband is quite adequate, although I haven't measured it.

When a signal is in the clear, however, switching to the "HiFi" ASF mode yields wonderful results. This mode uses the same, wide IF filter as ASd, but changes the BFO injection frequency to recover more high-frequency information. Lowe rates the audio frequency response in ASF mode at 20 Hz to 5.5 kHz, about as good as AM radio gets.

Moving from band to band on the HF-150 is easier than on the older receiver, too. A press of the FAST button causes the radio to tune in 100 kHz steps, during which the two rightmost digits in the display are blanked. If you're tuned to Athens on 9395 kHz and decide to see how London's doing on 12095 kHz, press the FAST button and whip the dial around to 12.0, then press FAST again. Voila! 12.095 MHz. The rightmost digits are preserved when you QSY in this way.

Both sets employ variable-increment rate (VIR) tuning, so that rapid turning of the tuning knob can cause you to overshoot your target frequency. Slow and steady tuning prevents this, of course.

Rapid tuning of the HF-150 also causes the radio to switch from synchronous mode to straight, envelope-detected AM. After you settle on a new frequency for a few seconds, the synchronous detector kicks back in again. This can prove a little disconcerting at times, because the radio's likely to emit a loud heterodyne whistle until the new station is properly tuned. Even so, I like Lowe's method better than the one used in the Drake R8, where you must re-engage the synchronous detector after retuning.

MEMORIES

The HF-225 has 30 memories that store only frequencies, its little brother, the HF-150, is more precocious, having 60 memories that store the receiver's mode as well as the frequency. Frequencies are stored to the full resolution of the receivers (7.8 Hz), so if you tune a UTE, then store the frequency, the radio will return to that precise frequency when the memory is recalled. The two radios handle their memories in different ways, however.

The HF-225 has two memory modes, called "channel" and "preview." In "channel" mode, the radio works like the Drake R8: as you rotate the tuning knob, the radio tunes each memory in rapid succession. This is ideal for checking for the best frequency of several parallels. It's like having 30 crystal-controlled single-channel receivers.

As memories are selected, the display shows the number of the memory, followed a second later by the frequency it contains.

In "preview" mode, the memories are selected in the same way as before, however the receiver is **not** tuned to the stored frequencies until the RECALL button is pressed. Pressing RECALL transfers the memory's contents to the VFO.

Storing frequencies requires you to press two buttons simultaneously.

If the optional keypad is installed, it can be used to access only the first 10 memories. This is a bit of a pain, but was fixed in the HF-150.

The HF-150 has only one memory mode, called "preview," and it works like the "preview" mode on the HF-225: you must press the RECALL button to tune the set to the stored frequency. However, the keypad is much more useful on the newer set: punching in any number between 1 and 60 and pressing the pound sign (#) will tune the radio to the frequency and mode stored in that memory.

Unlike its older brother, the HF-150 requires you to press only one button to store the radio's settings in a memory.

THAT FABLED KEYPAD

It's the size of a pack of cigarettes, weighs only a couple of ounces and connects to the radio with a 2-foot piece of wire that has a miniplug on the end. It resembles a telephone DTMF pad but it uses pulses rather than tones.

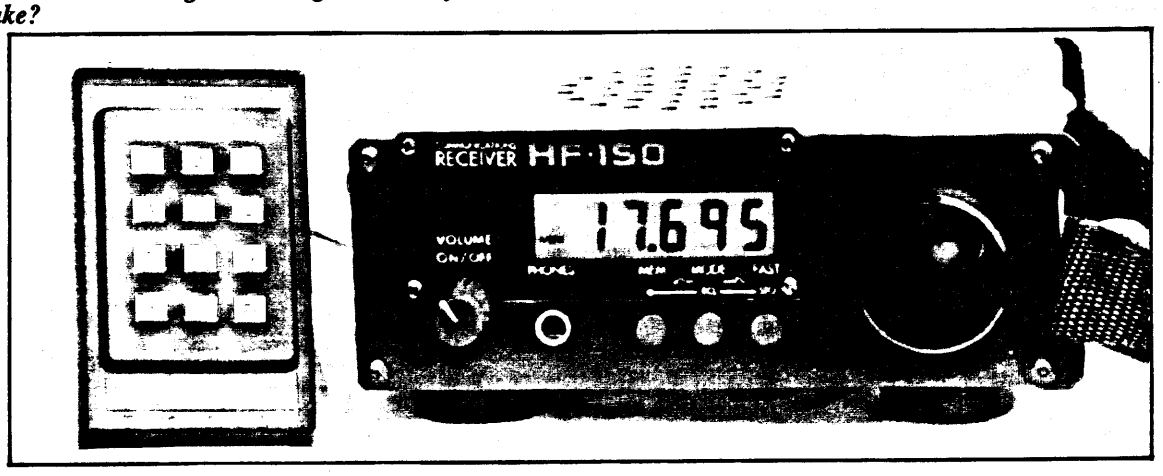
It's the external keypad for the Lowe receivers and it's a winner!

This thing is so easy to use you can almost use it in your sleep.

Want to tune the radio to the BBC on 5975 kHz? Press 5-9-7-5 and you're there! No "enter." No decimal points. (To be fair, if you want to tune below 3 MHz, you'll have to hit the pound sign (#) too, but that's the only time.) If you make a mistake, just hit the asterisk (*).

This keypad is the fastest manual means of entering a frequency I've ever seen. It's absolutely wonderful to be able to jump around a frequency list as fast as your finger can poke, and the fact that it lies flat on the table makes it still easier to use.

This is the greatest single accessory I've ever used. Every communications receiver should have one. Drake?



INSIDE THE HF-225

Following a modern design concept it shares with the Drake R8, the HF-225 dispenses with the potentially noisy and intermod-prone RF amplifier stage, instead feeding the antenna's signal through a bank of six switched bandpass filters, directly to the first mixer. There, the signal gets mixed with the tunable local oscillator and is upconverted to a first IF of 45 MHz.

This IF is passed through a 15 kHz crystal filter to the second mixer, where it's downconverted to 455 kHz and passed on to the first of the selectable passband filters, in this case 2.2 or 8.8 kHz, then on to an IF amplifier stage.

The output of this IF amplifier drives the 5.9 kHz filter or a passive attenuator network that exhibits the same loss as the 5.9 kHz filter, so there's no difference in signal level whether the filter is in or out of the circuit. Another stage of IF amplification follows, which then feeds the receiver's detector circuits, through the always present 10 kHz IF filter.

This means that, unless you are listening with the ultra wide 10 kHz filter, there are at least two 455 kHz IF filters in the signal path, thus enhancing the receiver's selectivity. If you have selected the 5.9 kHz filter position, you're utilizing not only that filter, but the 8.8 and 10.0 kHz filters, as well.

If the AMS/NBFM detector is in use, the IF signal is picked off before it reaches the 10 kHz filter, then it's passed through a 12 kHz filter on the optional board. This very wide filter is needed for NBFM reception.

The IF signal is demodulated by a normal envelope detector for AM or by a product detector for SSB and CW. The synchronous AM detector board contains a PLL-controlled carrier oscillator that supplies a regenerated carrier to a product detector. NBFM detection is by a one-chip discriminator.

The radio's noise blanker operates by detecting noise bursts at the AM detector, then applying a muting voltage to the audio amplifier's input. Thanks to the rapid switching characteristics of solid-state devices, this circuit is much more effective than the similar "ANL" or automatic noise limiter circuits found in old tube receivers. It's not as effective as an adjustable IF noise blanker, but side-by-side tests with other receivers prove it works.

Audio from the detectors is fed to a preamplifier, then through the volume and tone controls to the input of a single IC output amplifier, delivering two watts into 4 ohms.

All critical stages are fully isolated in shielding cans, and all the radio's digital circuitry goes into a "static idle" state when the set's not being tuned. This helps eliminate the digital "hash" that plagues many modern receivers, especially when using nearby loop antennas.

INSIDE THE HF-150

Unlike its big brother, the HF-150 has no RF bandpass filters to aid its front end selectivity. This causes problems when the radio is used near a powerful MW or SW transmitter. Since I live in such a location I've found it necessary to front-end the receiver with a tunable preselector. An external MW filter such as the Palomar Amplifilter or the NCP MW filter should work just as well. The receiver has more than enough sensitivity throughout its frequency range so that an **amplifying** preselector or preamp isn't necessary. I use a Palomar P-408 simply because I have one on hand.

Signals from the antenna are passed through a switchable 20 dB attenuator and a 30 MHz low-pass filter to the RF port of a transistor-tree mixer, where the RF signal is mixed with a local oscillator to upconvert it to the first IF of 45 MHz.

This first IF is passed through a PIN attenuator (for AGC), then through a 15 kHz crystal filter and on to the second mixer's input port. Here, the 45 MHz signal is mixed with a heterodyne oscillator that tunes between 44.544 and 44.545 MHz in 128 steps, giving an effective tuning rate of 7.8 Hz per step. The resulting 455 kHz IF is passed directly to the selectable IF filters.

These filters, nominally 6.8 and 2.5 kHz, are selected by diode switches controlled by the radio's microprocessor. The radio's first IF amplifier follows these filters.

The HF-150 has two IF amplifiers, each feeding a separate 6.8 kHz IF filter, so there are three IF filters in the circuit at all times.

The output of the IF chain is sent to an envelope detector for normal AM reception and to a product detector for SSB and synchronous AM detection. A fixed-frequency BFO supplies carrier for detection of SSB or CW signals, while the BFO's frequency is varied by a control loop that's phase-locked to the received carrier, for synchronous AM reception.

Lowe performs a neat trick here, too: by increasing the BFO's offset frequency in the ASF "HiFi" mode, the same IF filters can be audibly "widened," thus producing more treble in the output.

Audio from the detectors (including the noise blanker) is handled just as in the HF-225, except that there's no tone control as on the older radio.

ATTENTION TO DETAIL

Throughout the design and assembly of both receivers, the people at Lowe Electronics had three goals in mind: build a competent shortwave radio that sounds good and do it at a competitive price. They succeeded, admirably, by paying strict attention to detail.

Great care was taken in the choice of ceramic IF filters and in impedance matching for them. The end result is better selectivity than one would expect from filters of this width. The filters' shape factors are all on the order of 1:1.6. (There's also virtually no level change between filters or modes, on either receiver.)

The same care was applied to the mixers and their surrounding components. This resulted in exceptionally good image and spurious signal rejection.

All amplifiers in the receiver are operated very conservatively, their operating parameters adjusted for minimum distortion with the least amount of circuit noise.

Lowe claims an overall distortion figure of less than one percent, and I have no reason to doubt them.

SUMMARY

In the year since I bought my HF-225 I've grown to appreciate its ease of handling and its superb audio. The receiver's performance in the tropical bands and in the mediumwave broadcast band is also superb. Lowe's attention to detail in the design and construction of the radio is obvious to anyone who has used one.

In the short time I've had it, the HF-150 seems to offer much of the performance of its older brother, and has the added advantage of synchronous, selectable sideband reception.

To use either of the Lowe receivers for mediumwave DXing requires the use of a tuned loop antenna. Both radios are extremely sensitive in the MW band, but they need the extra selectivity afforded by a loop antenna. You cannot DX the MW band with a long wire in an urban area, because neither receiver's front end is selective enough to allow this.

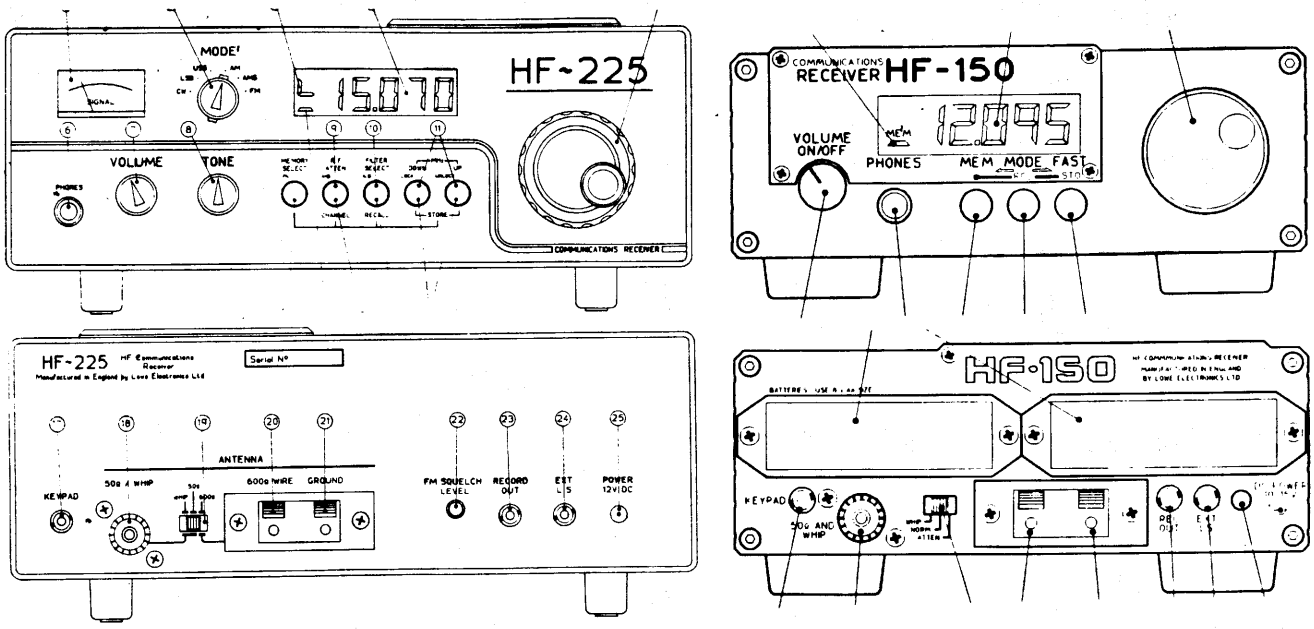
The HF-150 overloads very easily, so a MW attenuator or preselector that incorporates one is a must when the set is used near a powerful MW transmitter.

The Lowe keypad option is in a class by itself. It's the best accessory of any kind I have ever used.

My use of the receivers as tunable IF strips and detectors with my other radios is an extra advantage. It really makes the search for obscure carriers a snap.

In their portable configuration with the whip antenna both receivers perform well, but strong MW stations can and do overload the HF-150. When I take them out into the countryside and hook them up to a random hunk of wire, both Lowes will blow away any portable I've used, including the Sony ICF-2010.

As I said at the start, the Lowes are my favorite receivers. The folks at Lowe Electronics have produced two sets that could qualify as the best program listener's receivers of all time.



FRONT AND REAR VIEWS -- The only way to tell these radios are built by Lowe Electronics is to look at their backsides. Come on, Lowe! You can be proud of these machines! You don't have to hide your name! Everything is plainly marked on these diagrams, so I don't feel I have to identify them further. One thing that ISN'T shown is the mysterious "Hole to Nowhere" on the back of the HF-225. It's in the lower right-hand corner, but doesn't show up on Lowe's diagram.

SIDEBAR -- *The Lowe Listeners' Guide*

Packed along with each Lowe receiver is a little gem of a book called ***The Lowe Listeners' Guide***, which serves as an introduction to DXing without attempting to provide one of those frequency lists that's invariably outdated.

This little book covers an awful lot in its 60-odd pages, and does it with a dry, refreshing wit. I've been DXing for more than 40 years, yet I found things in the little Lowe book that I'd never tried.

It begins with some pointers on antennas, then moves on to a guided tour of the spectrum from ELF through 30 MHz. Here's a sample of what you'll find "off the beaten track:"

"If you really want to frighten yourself, a couple of transistors and a few large coils can be cobbled into an ELF receiver. Around 10 kHz or so the action of static discharges anywhere in the atmosphere, coupled with changes in the earth's magnetic field, create "Whistlers," not unlike the cry of a rogue whale. Very eerie all this. All worthy of John Carpenter..."

While it's written from a European perspective, with a distinctly British accent, the information contained in Lowe's wonderful little ***Listeners' Guide*** is perfectly valid anywhere on earth.

Like the receivers it accompanies, ***The Lowe Listeners' Guide*** is for shortwave connoisseurs. Priced at only £1.95 (about $3.50), it would make an ideal stocking stuffer for any shortwave aficionado.