

Lowe Electronics and the receiver project.

In September 1974, Lowe Electronics was already a leading amateur radio importer, distributor and retailer but things took a decided step upward when, following a visit from Takashi Endo and Masa Nakamura from Trio-Kenwood Corporation, Lowe was appointed the distributor for the UK. As the man responsible for the technical side of the company I was gratified by the comment about "High standards" in the announcement, since that was entirely my responsibility.



This marked the start of a new era for Lowe and for Trio-Kenwood who had taken a bold step in discontinuing their entire product line and launching an innovative and impressive new range of products that took the radio world by surprise. The only disappointment for me was their so-called communications receiver, the QR-666. This design was, frankly, a throw-back to previous designs using a general coverage frequency range and a "calibrated" band spread tuning system which was more hit-and-miss than accurate. Fortunately, the rest of the product range was better than excellent and we had huge sales success in the amateur radio world.

The out-of-date QR-666 was soon replaced by the equally hopeless R-300 that was nothing more than a slight face lift, but we had other (non-Trio) receivers in the stock list so we hid our disappointment and carried on regardless. Then, in late 1979 Trio went nuclear with a totally new receiver; the R-1000. This really set the short wave world on fire.



For the first time, users had a receiver that could be “dialed” on to frequency using PLL synthesis coupled with digital frequency readout. This little receiver was so easy to use that it sold in huge quantities and boosted our turnover to record levels. That’s the up side; the down side is that the actual receiver performance under typical strong signal levels was not terribly good, suffering from easy overload and intermodulation products. On the medium and long wave ranges the designers had resorted to fitting a permanent 20dB attenuator to combat the problem but hardly a good solution.

In 1982 Trio announced a cut-down version of the R-1000 called the R-600.

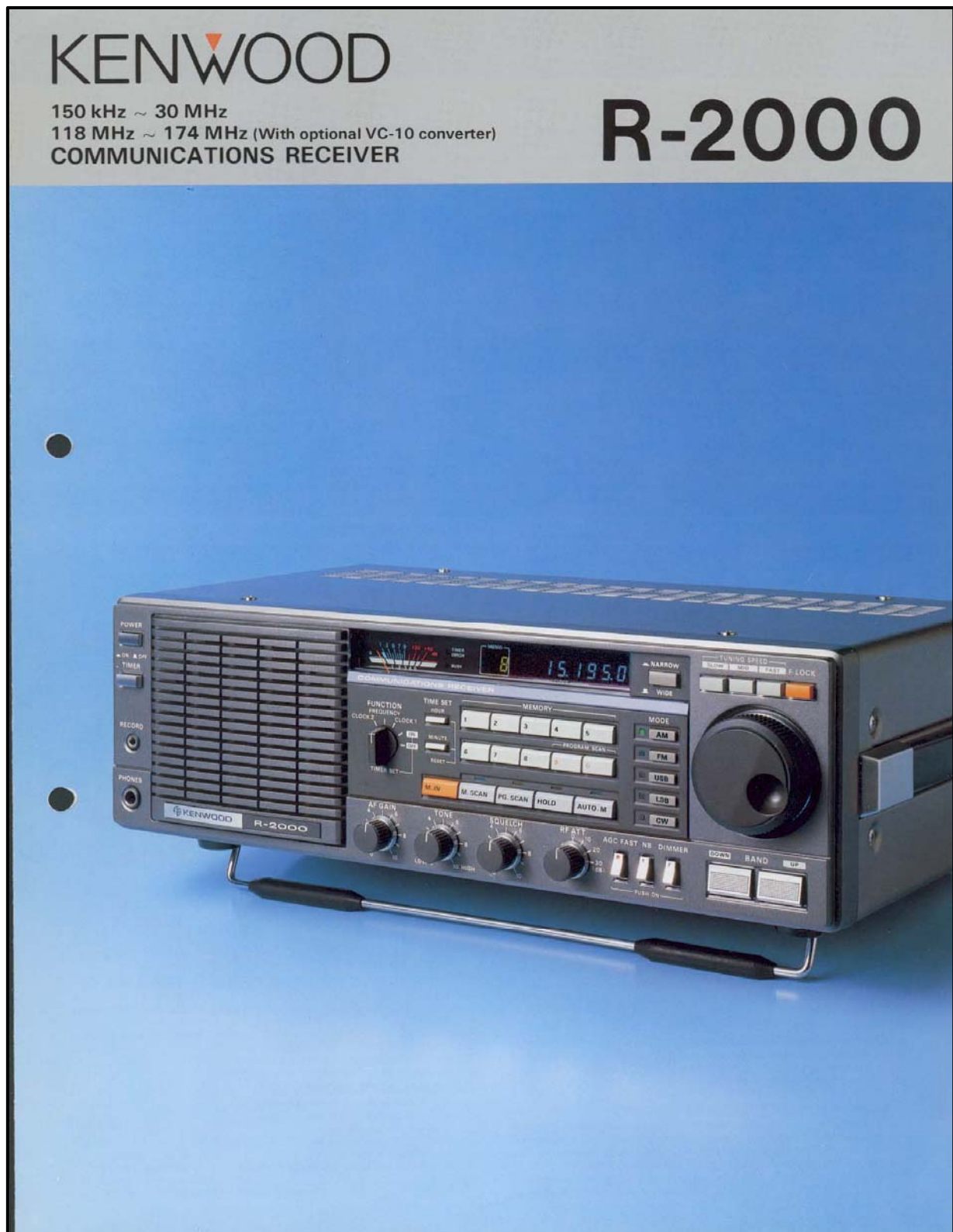


As one can see, the heritage is obvious but the performance was not improved, and the cheaper rotary encoders were less durable than those used in the R-1000. Note the “RF ATTN” button that told us that the overload/intermodulation performance was not likely to be acceptable to the serious short wave listener; and so it proved to be. Bill Lowe had a saying the he had used to describe earlier British Eddystone receivers; “It’s like biting into a large chocolate éclair and finding no cream inside” (*Lowe advertising, RSGB Bulletin, March 1967*). Not flattering but fairly accurate!

So we had the R-1000 in 1979 and the R-600 in 1982 but the models kept coming. In 1983 we saw the R-2000, and this is where I began to think that the Japanese designers and marketers were heading in the wrong direction. Because of the Japanese method of educating everyone to the same curriculum and undergoing the same training, once a trend has been established all the designers head off in the same direction and each “new” model of a particular type of equipment is “improved” by adding “features”. Take a look at the front panel of the R-2000 and you can

count the buttons and knobs and see what I mean. More “features” but sadly no improvements in actual receiver performance where it matters; when connected to an antenna.

Incidentally, “Trio” was the brand name used for UK sales and “Kenwood” was the brand name used in America and the rest of the world.



And so it is 1983; what else was going on at Lowe Electronics? In 1980 Lowe sourced a PC manufacturer in Hong Kong (EACA Ltd.) who were producing a clone of the established Tandy TRS-80. The home computer market was a hot topic at the time and Lowe secured an exclusive

deal with EACA to import and market their "Genie" PC. We sold them by the container load and became serious players in the home computer market, so much so that by 1983 we had a thriving computer sales and marketing department and had employed our first software writing team to concentrate on semi-professional point-of-sale systems for our own use.

BENCHTEST

COLOUR GENIE

Maggie Burton finds out whether this is the Genie we've all been wishing for.

Nobody seems to know much about EACA International Ltd, except that it is in Hong Kong. Before the entry, some years ago now, of the Genie I into the micro market, the company was almost unknown.

The Genie III, launched in summer last year, is a large 64k business box with two disk drives. The Genie I and its brother (sister if you're a feminist), the Genie II, are both TRS-80 compatible. Programs are written for TRS-80 model III and/or Video Genie all the time – rarely explicitly for one or the other. So you might logically expect the Colour Genie to be TRS-80 colour compatible. Well, we'll explode that possible misconception first of all. It's a very different machine indeed, in spite of some inevitable similarities.

The Colour Genie (note the English spelling – this is used all the way through the manual, pleasantly enough) was announced late last summer. Delays fol-

lowed (they are mandatory, it seems, if you are to produce a home computer at all). The machine was made available to dealers late in November 1982 under the auspices of Lowe Electronics, the sole distributor for this country.

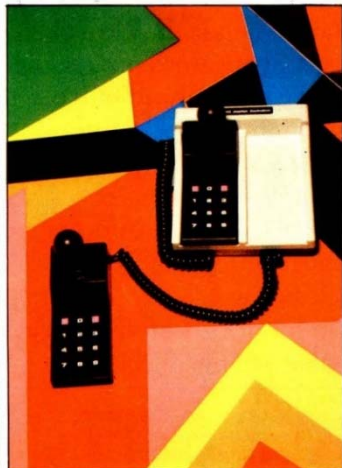
The machine is available throughout the world, except the USA. Perhaps that would account for the use of English English (inasmuch as the Chinese produce English documentation) rather than American in the manual.

Lowe itself is a company with a comparatively long history. Amateur radio equipment is another of its specialities; micros being a relatively new venture. An attempt to secure distribution for the VIC-20 failed because Lowe wanted the sole distributorship and would settle for nothing less. Instead, it took on the Colour Genie.

The initial impression of this beast is one of a machine which was built to withstand a lot of knocking around. Should robustness rate highly on your list of points to consider when buying a machine, the Genie will almost certainly rise in your estimation.

The Genie (or EG2000 to give it another name) is cream in colour with a coffee coloured band running across it to distinguish the keyboard (I sound like a furniture designer now). It's thickset and rather angular to look at.

It's very heavy – about eight pounds – simply because the PSU is internal. The machine is, incidentally, unearthed (like many of its competitors). The TV lead is also fixed. This is sensible in a home machine. It makes it quicker to set up and put away and there are no leads (apart from the cassette) to get lost. To overcome the resultant heat problem, the PSU itself is surrounded by a huge heat-sink and the bottom of the machine consists more of ventilation slots than plastic. What looked (from the outside) like an internal speaker at first glance actually



12-key numeric joysticks

turned out to be no more than a round ventilation hole at the back on the right, behind the keyboard. The Genie outputs sound through the TV loudspeaker or another amplifier and speakers. In spite of all the holes, the machine still gets pretty warm after an hour or so.

It's also very big (as compared to other home machines), as its dimensions will show. It's 43.2cm wide, 28cm from front to back, and 8.4cm high at the highest point (the back). The casing is cuboidal although the height tapers a little towards the front.

Looking at the back, from left to right are the cassette port, expansion bus (into which ROM cartridges can plug), TV lead, audio (hi fi) output, video (RGB

My two partners in the business were totally hooked on the personal computer market as being the next biggest opportunity, so much so that at a social function when I was away on business my wife overheard these two commenting that “Computers are the future and we should maybe consider dumping ham radio together with John and his merry men” (i.e. the entire radio based staff). With partners like this, who needs enemies? As things turned out, my so-called partners learned a sharp business lesson when the dealers who had been buying the Genie computers in shed-loads found a different product to buy and stopped the orders. Lowe had in the meantime forward ordered thousands of computers from Hong Kong and they kept arriving by the container. We ended up with warehousing full of computers that no-one wanted and it nearly broke the company.

Time for “John (W) and his merry men” to step up and rescue the situation. Now the John Thorpe story.

When we first laid out the Genie computers in our showroom a teenager from the local Grammar School began appearing each Saturday to play on the keyboard. He was obviously a smart chap and we offered him a deal whereby we gave him a free computer so long as he came in regularly and demonstrated the system to potential customers. That young man was John Thorpe. As we became close friends he revealed that he was heading for Cambridge University to study engineering and that he would be sponsored at Cambridge by the Plessey company. However, John (T) was very much a country boy and the prospect of having to live and work in North London after graduation was not to his liking. I went to work on my partners and persuaded them that we should provide the financial sponsorship for JT and make it a contractual condition that he would stay and work for us for a minimum of three years after graduation. JT jumped at the opportunity and eventually came out of Cambridge and joined us in Derbyshire.

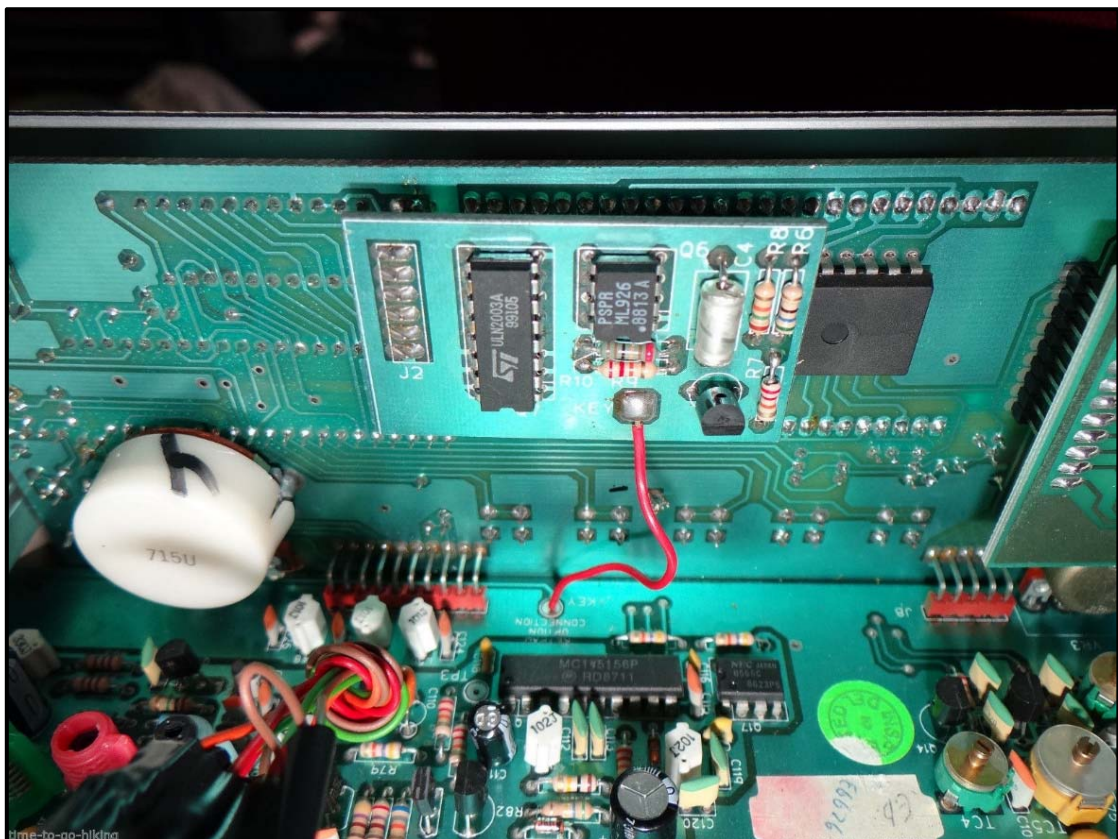
As an aside, a Cambridge engineering degree carries BA and not BSc because engineering is considered there as an art rather than a science, and is taught across the entire engineering spectrum and not as separate compartmentalised subjects. As a result, a Cambridge graduate can apply his or her talents to almost anything in the field. This was certainly the case with John Thorpe. It also helped that John is a true polymath.

By the time John joined us as an employee the computer craziness had subsided and John had become much more interested in high performance radio engineering. This was a wonderful transformation as far as I was concerned because it neatly coincided with my own view that it was time to consider taking on the Japanese at their own game and producing a short wave receiver that better suited the European serious user market. It's a long story covering many hours of detailed discussion, together with investment in test equipment that cost more than a small house at the time, but the result was the HF-125. Now it has to be said that its appearance was not as shiny and well finished as the Japanese offerings, but we wanted a receiver that actually received signals rather than offering “features” and lots of buttons. It was 1986.

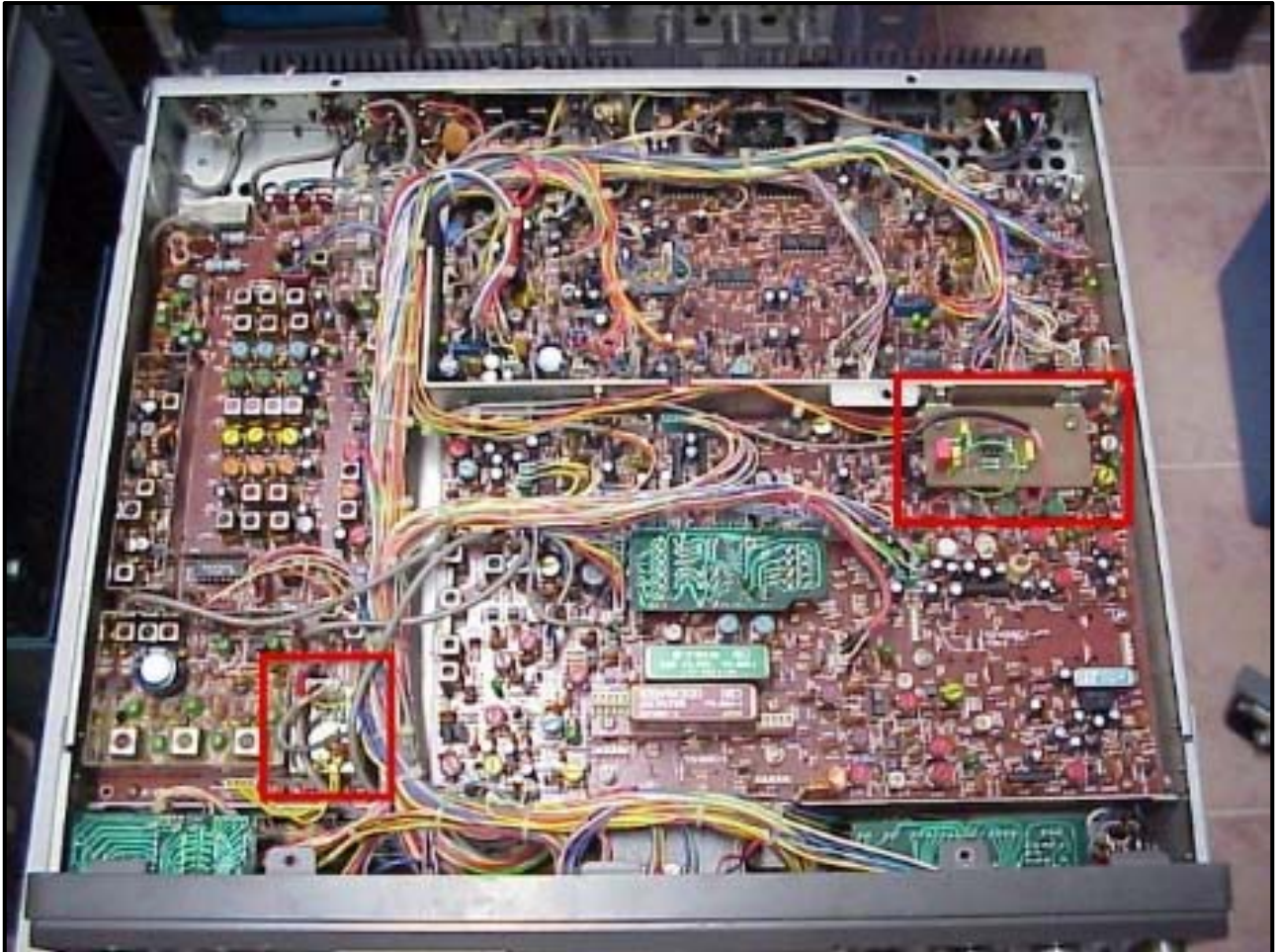


Design objectives:

- 1 The best RF characteristics possible in the area of strong signal handling; the area where all Japanese radios failed. High sensitivity (the Japanese criterion) is useless if the receiver collapses under strong signal conditions (i.e. real life) and self-generates intermodulation products within the receiver itself.
- 2 No wires! Experience with Japanese ham radio products in which circuit sections were inter-connected using cable harnesses made up of hundreds of thin conductors showed that this was a major cause of faults. The thin wires broke and/or became detached at the point of connection to the circuit boards. Look at the inside of the HF-125.



This is a view of the back of the front panel and shows how we used right angle connectors to join the panel to the main circuit board. These connectors were permanently soldered, not used as plug and socket. The only wires actually used to connect to the circuit board were the wires to the loudspeaker mounted under the top cover. Yes, there is a single wire shown in the picture but that is the single connection to the keypad option board when fitted as shown. The little curl of wires at the lower left are for the option whip antenna amplifier. We never, and I mean never, had a single report of faults caused by connectors. Now look at the underside of the Trio TS-940S transceiver.



- 3 Quality of recovered audio. JT had “Golden Ears” and was equally dedicated to audio reproduction. His later work on re-clocking CD systems was unparalleled and he went on to found “Audio Synthesis”, a company specialising in high end audio systems. Not cheap but unarguably the best. Cambridge engineering degree! Every user review of the HF-125 (and its successors) commented favourably on the high quality of the recovered audio, and short wave broadcast stations had never sounded so good. Probably why even the BBC came to buy?
- 4 Ease of use. JT not only did every part of the design, he also wrote the firmware that ran the receiver, and once again all the reviews commented on the way every necessary operation was simple to use and easy to understand despite the comprehensive nature of the functions.

Did we succeed? The reviews at the time were universally excellent and reflected that our design objectives resonated with the market and with users. The HF-125 was well received (pun intended), and we almost could not keep up with demand, not only in the UK and Europe but in the United States and around the world. The ne plus ultra of reviewers was Rainer Lichte, a professional engineer at the top of the tree who had close connections with Rohde & Schwarz in Germany and the German military communications industry. In his book "More receivers, chance or choice" his review of the HF-125 was confirmation that we had succeeded. Here are a few quotes:

Made in the United Kingdom

Lowe is well known as the supplier of various general purpose radios and other electronic niceties. The company offered some low-priced shortwave receivers of Japanese origin a while back. These were the XCR-30 Wadley-Loop design and the digitalized version XCR-30D. The radios were also sold under various other names, e.g. Century 21.

The idea of producing a better, home-made shortwave receiver was conceived several years ago by John Wilson, Technical Director of this company. It took some years to finally realize this concept. Most of the circuits for the new HF-125 were drawn by John Thorpe, Head of Development since 1982.

The final plans were agreed upon in January 1986. Of course, most of the details

had been worked out by then, but it still is a remarkable feat to get a production line started in only one year. The HF-125 is assembled in the UK, using standard parts and a simple run-of-the-mill aluminum cabinet. A daring venture, considering the situation. There are quite some competitive designs from Japanese manufacturers, offering more spectacular packaging and a multitude of novel features.

A different approach

The primary goal was to build a receiver with above average performance at a very competitive price. Special attention was given to the design of the front end and its large signal handling capability. This feature is a must for receivers to be used in Europe, where an exceptional number of high powered shortwave transmitters are located.

On shortwave (AM-mode) the receiver consistently showed outstanding sensitivity and good dynamic properties. Sony's ICF-2010 was easily outperformed on AM and SSB. The synchrophase detector in the HF-125 is just a bit better, too. Unfortunately, the designers didn't include a "LOCK" indicator. The unit tested had no FM circuit, narrow band FM, that is. Lowe informed me, that this part of the optional FM/SYNCH board is undergoing some re-design and will be substantially improved in production models.

The dynamic properties of the HF-125 are without criticism, substantially better values are not possible in this price bracket. ICP 3rd was determined at +6 dBm (output of 1. mixer, signals at ± 25 kHz). At a spacing of ± 10 kHz dynamic range dropped to 79 dB.

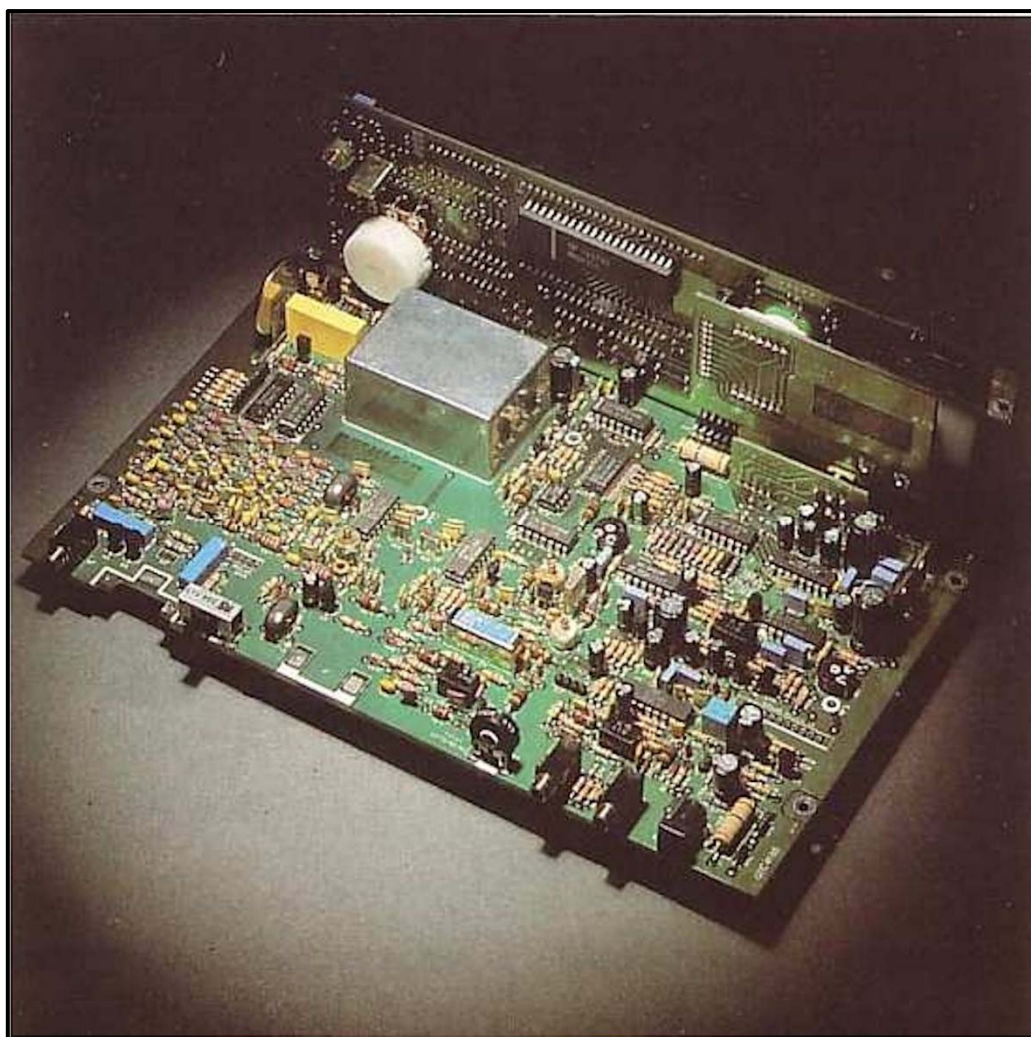
One really has to do some side-by-side comparisons before passing final judgement on this funny looking design. The HF-125 is a serious piece of equipment, don't be deceived by the unassuming front panel and the lack of spectacular features. The HF-125 will outperform most competitors. If you like an honest approach to receiver design, this is it: British Understatement at it's best.

The mention of Sony felt good, because this was the competition at the time and we had clearly established our position in the market, despite "This funny looking design".

Having had close connections with Japanese companies for almost twenty years and had many trips to manufacturers in Japan, we did absorb some of their methods, notably "Kaizen" which translates as "Continuous small improvement" involving the entire design and production staff. That wasn't difficult for a two-man team of JW and JT with a small but enthusiastic production group, and the result of "Kaizen" was the introduction in 1990 of the HF-225. The advertising (I also wrote all the publicity handouts, magazine advertising and technical bulletins for the company) happily used the Rainer Lichte quote from the HF-125 review.

The HF-225 was as enthusiastically received amongst the cognoscenti as had been the HF-125 and sales were remarkable, soon outstripping the sales figures for our established amateur radio business. "Kaizen" was still being applied and when a group of Finnish short wave buffs took the HF-225 and suggested some improvements to lift its performance even higher, we took on board their findings. The Finns had called their modified receiver the "Finlandia"; hardly surprising, but we decided that "Europa" would be a less restrictive name and so the HF-225 Europa came into production. This was not a low cost operation and we also decided to include all the available options such as the keypad and the synchronous detector boards. The Europa was without doubt the best receiver available at the time, and reviews comparing it to the very best (and much more expensive) Japanese products confirmed its superiority.

Needless to say, the "No Wires" concept was incorporated in the HF-225 as well.



When you are ready to graduate to real listening Look to Lowe



The New HF-225 Receiver

I am delighted that the HF-225 has been a raging success world wide, and I will just quote a letter received from one of our American customers: —

"I received my Lowe HF-225 about a week ago. Since then I have enjoyed many pleasant hours listening to it. As a past owner of receivers such as the Sony ICF2010 and Grundig Satellit 650 and 500, I must say that none compare to your Lowe HF-225. Without question, for hour after hour listening, nothing compares. I especially like the Genie key pad. Why more receivers do not incorporate such intelligent ergonomics is beyond me. I also thought both the instruction manual and the short wave book were well written, with the shortwave guide particularly enjoyable."

The letter comes from Chris Williams in Massachusetts, but is typical of many letters we are receiving from all over the world about the HF-225.

Technically, the HF-225 distinguishes itself by having a low phase noise synthesiser, which gives a reciprocal mixing performance not far off that of "professional" receivers costing up to ten times the price, and that's not just advertising talk, it is really true. The synthesiser actually tunes in steps of 8Hz, which betters most other receivers and gives a smooth "VFO" feel when tuning. As one user has already commented "If you tuned the HF-225 with your eyes closed, you would believe you had a £5,000 receiver on the table".

The HF-225 has a range of low cost options which extend its appeal; such as a keypad for direct frequency entry, which simply plugs into a rear panel jack; an active whip aerial; a rechargeable battery pack for portable use; and an attractive carrying case which protects the receiver whilst allowing full operational use. The new D-225 detector option is really something special, because it gives true synchronous AM detection for dragging sensible programme quality out of a signal being affected by selective fading distortion. The same option also gives narrow band (communications) FM demodulation.

Every listener these days appreciates a receiver which offers facilities for memorising favourite or regularly used frequencies, and the HF-225 offers 30 memory channels for this purpose. Using the memories has been made particularly versatile, because the operator can review the contents of the memories whilst still listening to the frequency he is using, or alternatively in the "Channel" mode, can tune through the memory channels using the main tuning knob, listening to each frequency as it appears on the display. Just like having a bank of single channel receivers under your control. Terrific for checking HF airband channels for activity.

Unlike most HF receivers on the market, the HF-225 comes complete with all filters fitted for every mode: — 2.2kHz, 4kHz, 7kHz, and 10kHz. There is also a 200Hz audio filter for CW, and if the D-225 detector is fitted, a 12kHz filter for FM. The correct filter for each mode is automatically selected by the receiver mode switch, but further selection can be made by the user from the front panel and the receiver remembers which filter was last used. True versatility and all built in at no extra cost. When selecting filters in use, the filter bandwidth is shown on the main display.

The display itself is a high contrast liquid crystal type, and shows frequency, filter bandwidth, detector lock (when D-225 is fitted), and whether the receiver is in memory mode. Automatic placing of the decimal point takes place as the receiver is tuned, so there can be no ambiguity in reading.

At the end of the day, what does the HF-225 offer you as a user? I can do no better than quote what was said by Rainer Lichte about the earlier HF-125: — "The HF-125 is a serious piece of equipment; don't be deceived by the unassuming front panel and the lack of spectacular features. The HF-125 will outperform most competitors. If you like an honest approach to receiver design, this is it. British understatement at its best".

The HF-225 is even better.

HF-225 £395

John Wilson

FREE

Send four first class stamps to cover the postage and we will send you, by return of post, you FREE copy of "THE LISTENERS GUIDE" (2nd edition), a commonsense look at radio listening on the LF, MF and HF bands. Its unique style will, I am sure, result in a "good read" but underneath the humour lies a wealth of experience and expertise. You will also receive detailed leaflets on our range of receivers and a copy of our current price list.

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The Lowe Electronics HF-225 "Europa"

Background information

The HF-225 was designed to be as close to "all things to all men" as possible and the specification was carefully drawn to give a wide appeal, balancing features against retail price. The success of the HF-225 across a wide spectrum of users drew requests for special versions of the receiver for more dedicated applications, and amongst these requests was one from the DX club of Finland for a series of modifications to make the HF-225 fit their very specific needs. Although the modifications were quite costly, the new HF-225 "Finlandia" not only satisfied the members of the DX club, but also brought the "Finlandia" to the front in the European DX Council "Best DX receiver of the year" contest against the JRC NRD-535 and the ICOM R72E.

News of the award for "Best DX receiver of the year" spread around Europe and because of the widespread interest we decided to produce a "Special Edition" version of the HF-225 which we called the "Europa", drawing for its specification on the "Finlandia". So what are the differences between the standard HF-225 and the "Europa"?

1. The IF filter bank has been changed to include higher specification components around the filters than the original HF-225, including a new 3.3kHz filter (X3) following the second mixer. And we have replaced the original 10kHz filter with a 7kHz (X5).
2. The control software has been re-written to show the new tighter filter bandwidths and to select the filter configuration as follows:-

Bandwidth	Filters in use
2.2 kHz	X2 + X4 + X5
3.3 kHz	X3 + X4 + X5
4.5 kHz	X3 + X4 + X5
7.0 kHz	X3 + X5

3. To prevent unwanted leakage across the new filters, all filter select chokes are replaced by high quality magnetically shielded chokes.
4. All filter selection diodes are replaced by low capacitance switching diodes.

The overall effect of these changes is a noticeable improvement in skirt selectivity and residual noise performance of the receiver, and the new filter bank is rather like having a close ratio gearbox in a car. When winking out the really weak stations, the closer selection of filter bandwidths allows the user to tailor the receiver bandwidth more closely to the transmitted signal and squeeze the last drop of information from it.

The complete "Europa" specification includes a factory fitted D-225 FM/synchronous AM detector option, and the famous KPAD 1 keypad frequency controller.

Remember.... The HF-225 in this format was voted a better DX receiver than the JRC NRD-535 and the ICOM R-72E.



And so it is 1990. Bill Lowe was 67 years old and had been adopting a lower physical profile in the day to day running of the company whilst at the same time making weekly visits to the head office in Matlock, always looked forward to by the staff because he inevitably brought laughter with him. Trio/Kenwood had expressed an interest in acquiring Lowe Electronics but nothing came of negotiations and Kenwood Corporation later decided to open their own London operations. An approach from Zycomm Electronics, owned and run by an old friend (and ex-employee) was seen as a sensible merger but by a rather dubious dodge, Zycomm were cheated by their backer who then acquired Lowe for himself in 1991.

Bill was able to retire with dignity and I was retained on a five year contract to ease the transition to a new company structure. It was clear from the outset that this was going to be difficult since the new owner appointed a new "managing director" who had a completely alien view of how Lowe Electronics was to be operated. The new owner also had a different view of the future since he turned out to be an asset stripper possessed of a cold heart and the eyes of Vladimir Putin. One could never discern what was going on behind those eyes. The first redundancy took place within weeks of the takeover; Bob Ellis, author of the Lowe "Listener's Guide" was shown the door and there was nothing I could do to stop it happening. There were more serious consequences with our Japanese business relationships.

The long held distributorships for Daiwa Corporation, Signal Communications and others were cancelled by them overnight, and doubts were expressed by AOR with whom we had been working since they themselves had started in business. My friend and colleague Tak Endo (the same Takashi Endo who gave us the Trio distributorship in 1974) and who was now part of the Lowe team in Matlock, was extremely unhappy about the atmosphere at Lowe and departed at the beginning of 1991 taking our Matlock sales manager and the AOR distributorship with him. The first ads for AOR UK appeared in June 1991. As AOR flourished I later lost my three best service engineers who chose to leave the unhappy Lowe organisation and join Tak and Richard at AOR UK. What a bloody mess.

As for the receiver projects, and by a rather poignant coincidence, the same magazine issues in which the AOR UK launch appeared also contained the announcement of a major award for the HF-225.



I am the unhappy chappy holding the award flanked by the new so-called "managing director" and our local Member of Parliament, later Minister for Transport twiddling the tuning knob. I think one can tell how I was feeling by my facial expression. This was not a comfortable time (and it got much worse). Time to do something about this and detach my team from the looming disaster.

In the meantime, there were receivers to design and manufacture.

In the wider world the Soviet Union was disintegrating and the Baltic States withdrawing and declaring independence, starting with Latvia in 1990. In the general chaos surrounding these events, news gathering was difficult and made even more so by the lack of short wave broadcast facilities in these small countries. What local news was being broadcast was inevitably using the medium wave spectrum but these broadcasts could not be heard in the UK. We were asked by GCHQ and the BBC if we could supply suitable monitoring receivers having remote control facilities that could be installed closer to the borders of the Baltic so that they could be used to listen to the local broadcasts. John Thorpe, with his usual ability and agility, immediately designed a professional version of our HF-225 in a rack mounted configuration, having full remote control capability. This was the HF-235, and the BBC (we later discovered) installed these in a hotel in Moscow, controlling them from UK and enabling monitors to tune and listen to the Baltic local radio stations. I recently saw a proud owner of a second hand HF-235 on a listeners' forum asking if anyone knew why his HF-225 had a BBC label on it. Now you know why.

As 1991 progressed we received rumours from our remaining Japanese contacts that AOR were planning to introduce a short wave receiver of their own that would compete directly with our HF-225. I asked John Thorpe if he thought it feasible to design, develop and produce a new receiver with a price point of ca. £300 but crucially do this in a very short time span so as to compete with the AOR product. Once again, JT's ability and agility came into play and against all predictions he came up with what became the HF-150 which we launched to the market in December 1991.



I well remember the day when I first showed the HF-150 to our so-called "managing director" and the new owner of Lowe Electronics. They both laughed and poured scorn on it, saying that it was not a "proper receiver" and "where were the controls that a proper receiver should have". Well, we went on to sell some 10,000 HF-150s so I leave it to the readers to decide who got it right!

One outstanding feature of the HF-150 was its construction. JT introduced the idea of using an alloy extrusion for the case and we purchased the aluminium alloy in one ton lots which were then then extruded using dies designed by JT, to be cut into sections forming the case of the receiver. This meant that the front and back panels could be simple flat parts, mounted by self tapping machine screws driven into holes in the extrusion. In 1997 after I had departed from Lowe (see later) and was conducting independent equipment reviews for magazines, I revisited the HF-150 and my

review text from "Short Wave Magazine" for December 1997 is probably a good précis of the story of its development.

"The Lowe HF-150: a retrospective.

In the best Parliamentary fashion, I have to declare a personal interest in the HF-150 because it was I who said to John Thorpe "John, do you think we can produce a receiver with the performance of the HF-225 but at a selling price of around £300?". After some thought John told me that it might be possible providing we trimmed out some of the facilities and functions, and with that assurance we began to lay the design foundations for what was to become a very successful product, and one in which I took particular pride. However, that was a long time ago and it was with some enthusiasm that I agreed to take a second look not only at the HF-150 but also at the range of accessory units which sprang from its loins, as it were.

The familiar little house brick (still the strongest case ever made, including the AR 88 and B40) hadn't changed at all, except for the fact that when I switched it on the dial lit up with a fiery red glow of back illumination which was not in the original design specification - in fact dial illumination was one of the things we eliminated on cost grounds. It certainly made a huge difference to the readability of the frequency display but I was disappointed to learn that the illumination is not a standard feature but an add on extra, and it must be the world's most expensive dial light at a less than modest £40. Frequency readout is still to 1kHz, and despite many comments that it would be nice to have at least 100Hz digits, it probably doesn't matter a hoot for most listening done with the HF-150, and it did save some production costs. I will keep mentioning costs because our main design target was that magical £300, and we came pretty close to achieving it.

The HF-150 has one of the simplest front panel layouts of any receiver on the market, with the possible exception of the AKD Target 3, but a lot of clever thought went into the apparent simplicity, and what John T managed to make out of three push buttons and a volume control is quite masterly. Push the centre button marked "Mode" and the display changes to show the mode in use. To change the mode, the other two buttons step up or down through the available modes until you have the one you need and then you need do nothing more since the display automatically reverts to frequency after about two seconds - or immediately if you touch the main tuning knob. Modes provided are AM (narrow), AM, USB, LSB and a series of outstanding synchronous AM modes which demonstrate just how clever John T could be. You can choose between AM Sync which uses both sidebands of the incoming signal, AM Sync using either upper or lower sideband, or an offset filter arrangement which effectively gives you Hi-Fi audio. The synchronous detector hangs on to the signal during deep fades and is as impressive today as it was when it was originally designed.

The same three buttons are used to manage the memory stores - 60 provided, as well as fast tuning which allows you to tune the HF-150 in 100kHz steps to get around quickly, and the tuning rolls over at each end of the tuning range so you can go straight through from 30MHz to 30kHz and/or back again. The normal tuning rate is approximately 8Hz and there is the usual automatic speed up when the tuning knob is turned quickly. I did find the speed up came in too soon for my liking, and the tuning had quite a stiff feel to it which wouldn't have mattered except for the fact that when you try to use the dimple on the tuning knob the receiver slides away from you across the desk top, and you have to put one hand on top of it to hold it still.

One hidden function for the three buttons is to control the built in test routines for receiver alignment, and shows the depth of detail which went into the HF-150 design. At the time we produced the HF-150 only top end professional receivers had built in test facilities, so to have this in a £300 short wave radio was unheard of. As a little inside story, when John and I presented the HF-150 prototype to the new management at Lowe, we were told that "It doesn't have enough controls on it", but we managed to ignore that to the great benefit of future sales.

Looking at the rear panel of the HF-150 reveals the slide in carriers for the battery pack, the coaxial and wire antenna inputs, audio output jacks for tape recorder and external loudspeaker, the power input connector and the jack for the keypad (an extra cost option). The keypad was consistently voted as "the best in the world" by independent reviewers, and I haven't come across anything to touch it (Ho-Ho, there always has to be a feeble pun). I'm glad that I declared my pride in the HF-150 because in its original conception it was quite brilliant, and as an engineer I still find much to admire in it. However, as a now totally independent reviewer for Short Wave Magazine I have the responsibility to act as the potential purchaser of receivers and look at equipment as a user. Over the last two years I have had the pleasure of reviewing most of the current crop of receivers and as luck would have it I had the Yaesu FRG-100 and the HF-150 on the bench at the same time, which allowed me to compare two receivers which came on to the market virtually together.

The HF-150 started out as a simple straightforward receiver, and in that role it succeeded very well indeed. Its success was in many ways its downfall because it wasn't long before customers and dealers began the "WIBNI" routine (Wouldn't It Be Nice If). Wouldn't it be nice if the HF-150 had an "S" meter; or illumination for the readout; or readout to 100Hz instead of 1kHz; and so on and so on. John T pointed out that if all these things were incorporated it wouldn't be an HF-150 at all, and would cost considerably more than its target price. In fact, it would become more like the HF-225 which we were already producing - so why not buy an HF-225? However, one WIBNI we had to address was the one from Germany which went: - Wouldn't it be nice if the HF-150 had a better second order intercept performance, and it was this which led to the design and production of the first HF-150 add-on, the PR-150 preselector.

Second order intermodulation products are the sum and difference signals generated when two signals mix in a non-linear system, and unlike some third order products which appear close to the wanted signal and are therefore difficult to remove, second order products can be minimised by filtering before the non-linear elements. In simple receiver terms, RF filtering between the antenna and the first mixer will reduce second order products, and this filtering always existed in older receivers which used tuned RF amplifiers. However, the HF-150 doesn't have any front end filtering at all - part of the cost cutting sacrifices, and even I gulped a bit when I measured the second order intercept point at a miserable +35dBm. For comparison, the FRG-100 tested last month managed +91dBm and the classic Collins 51S1 tops 100dBm. In real terms, signals at 6.5 and 7MHz no stronger than S9+20 (and there are lots of them) will produce audible sprogs at 13.5MHz in the HF-150. Hardly any wonder that the German customers complained, when even Kenwood had to carry out modifications to their up-market R 5000 in order to satisfy the receiving conditions in some parts of Germany.

The PR-150 preselector was made as a general purpose unit which would go with any receiver, and it too was a success because almost any modern receiver with a wide open front end can benefit from additional selectivity. Built into the HF-150 bomb proof enclosure, the PR-150 uses two tunable loosely coupled sections of bandswitched filtering, in seven bands covering 100kHz to 30MHz. Additional features include a 6dB preamplifier to make up for the losses in the filtering, switching for two antennas, a "through" facility to bypass the filter and a method of powering the PR-150 and HF-150 from the same mains power unit. Adding the PR-150 to the HF-150 under test resulted in an improvement of the second order intercept point to a more respectable +51dBm but reduced the third order intercept point to +9.5dBm. Every silver lining has a cloud, I guess.

The problem for the HF-150 owner was that he had to lay down more cash and end up with two units to adjust when tuning around. This situation then led to the next HF-150 "add-on" which was the rack designed to hold the HF-150 and the PR-150 in some sort of tidy arrangement. Trying to look ahead, the rack was made extendable so that the owner could stack on another box such as a speaker or antenna tuning unit. At this point the WIBNI bird struck again and wanted a signal strength meter - so this was put in a box with a higher power audio amplifier and an audio peak and notch filter to become either the SP-150 or the AP-150. I say "either" because although they

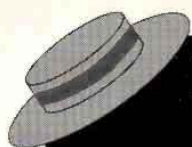
are both the same unit it's a bit confusing to see "AP-150" on the panel in front of me, but "SP-150" in the advertisement on the back cover of Short Wave Magazine. Incidentally, the PR-150 was the last unit John T designed for Lowe, and the AP/SP-150 was from the hand of a different designer."

1992 continued with another major blow for Lowe Electronics when Trio-Kenwood followed other Japanese companies in withdrawing their distributor status and opening a Kenwood office in UK. The atmosphere at Matlock was deteriorating daily but we tried hard to put this to one side and continue with receiver development. The success of the use of alloy extrusion for the HF-150 case was taken forward as we planned the eventual successor to the HF-225 but this was not something that could be brought to production in such a short time as the HF-150. This receiver had to be something at a much higher level and JT began detailed design work. However, the increasingly miserable atmosphere at Lowe Electronics certainly affected John's demeanour and progress on the design began to slow down. I was being harangued on a daily basis to speed up progress, and in the "hire and fire" approach of the so-called "managing director" I was told by him that John Thorpe was "only a designer" and that we could "easily find another one". My response was not taken too well when I suggested that this approach would be rather like Pope Julius II shouting up to Michelangelo "When are you going to finish painting that bloody ceiling". I will never know if this was actually understood by said managing director but it was probably the start of my own exit!

And the new receiver? This was to be the HF-250 and would take receiver design to a new level. The outer design was completed and parts manufactured but the circuit designs slowed to a crawl and in the end the project was put on hold. Sales of the existing receivers were still roaring away and I took the next step towards trying to resolve the difficulties.

We moved the production team out of the Lowe head office building in Matlock and after a spell operating in a temporary prefabricated building and a location in Ripley, I proposed that the receiver production should be made into a separate stand-alone company that I would manage and run as a manufacturing unit, selling product to Lowe Electronics as a retail buyer. Somewhat to my surprise the owner agreed to this, although the so-called "managing director" of Lowe was dismayed because at the same meeting this was agreed, my production controller Jean Jones and I presented accounts that demonstrated that receiver sales comfortably outstripped amateur radio sales and that receivers were actually supporting the losses from amateur radio. What I did not realise at the time was that our cold-eyed owner had a rather different outcome planned!

During 1993 premises were found and the team assembled for what was to become the new Lowe production company, and the first ads were placed announcing the changes. I have to admit that the choice of location was probably not the best for modern business but appealed to my sense of history in that we moved into the original workshops of Richard Arkwright at Cromford in Derbyshire at the site of Arkwright's Mill, built in 1771 and extended in 1776 and where Arkwright used his own invention of the carding machine at the start of the Industrial Revolution. The first ad under my name was posted in October 1993 from the Lowe Electronics Chesterfield Road address, and by January 1994 we were at the starting gate.



For the best in Communications Receivers Look to Lowe

New Year, New product from John Wilson

Although there's nothing new under the sun

It may be only six years to the end of the century (and that gives you pause for thought), but radio waves are still propagated by the same methods as always, and the trick is to receive them with as little interference as possible. Much of the noise we hear on signals these days is picked up locally from noise radiated by the ac mains wiring of the house, and I have been doing a lot of research into how this noise can be eliminated from the aerial system.

Since I really believe that there is nothing new under the sun, I finally got down to some original work on "anti-interference aerals" carried out by KB Radio and others in the 1930's. By developing those ideas and by application of modern materials we (that is, John Thorpe and I) have come up with a new wire aerial system for the short wave listener, which we have called the "WireMatch". It comes as a complete ready-to-erect wire aerial, with matching transformers, coax cable, plugs and aerial wire and the only thing we couldn't include was an earth spike, simply because if you have a dog like mine who waits by the door for the mail, you wouldn't want him speared to the floor by a 4 foot metal rod coming through the letter box. (In other words, we can't ship a metal rod). The results using this aerial are outstanding, because for the first time you can have total earth isolation from the ac mains supply which removes all the electrical noise normally coming in by this route.

No - I can't show you a picture of it because there's no excitement in a picture of a straight piece of wire, but for detailed information, just send a couple of first class stamps to me at the address below and ask for the John Wilson "WireMatch" leaflet (No. 3 in a series). However, I do have pictures of some of my other products, so take another look at the HF-150 and PR-150, two world class products from the brain of John Thorpe. Some folk say they are plain, but we put our money into performance and ease of use, not into useless "gimmicks". The *real* listener will know what we have done, and it is the *real* listeners who are enthusing over our receivers. Take a look, take a listen and you will hear the difference.

John Wilson

HF-150 receiver	£389
HF-225 receiver	£479
HF-Europa	£699
HF-235 receiver	£1116
PR-150 preselector	£235
WireMatch aerial	£t.b.a.



By the way; I am still looking for my SX-117 receiver which I traded in to Bill Lowe in 1965. If anyone out there has it, or any other SX series receivers, let me know - I have a nostalgia for this period. I'm also happy to come and talk to your club about receivers and their development over the years.

FREE

Send 4 first class stamps to cover postage and we will send your **FREE** copy of "The Listener's Guide", our ever-popular aid to LF, MF and HF listening. Ask for my leaflets (No1) "ATU or Preselector", (No2) "What makes a Lowe receiver so good", and the new (No3) "WireMatch Aerial" leaflet and we will include them in the pack.

Lowe Electronics Production
Unit 23, Cromford Mill, Cromford,
Derbyshire DE4 3RQ

Happy New Year
John Wilson

The mention in this ad that I would be happy to talk to clubs resulted in an unexpected invitation to fly over and address an American short wave convention to be held near Philadelphia under the auspices of the "Fine Tuning" group. Now defunct, this was a group of the leading and authoritative short wave aficionados led by John Bryant and including Dr. Harold Cones, author of books on the Zenith radios, and other professional engineers. I readily agreed to participate and used the trip to visit two US dealers with a view to appointing a US distributor for the Lowe receivers. But that's another story!



For Design and Manufacture Look to Lowe Production

New Year – New Company

When I first suggested some eight years ago that we had the knowledge and ability to design and manufacture a British short wave receiver, some people told me I was dreaming. But perhaps due to my foresight and certainly due to another man's talent (the genius of John Thorpe) I am delighted to announce that we have reached the point where the design and manufacturing team can stand alone as a separate company to be known as "Lowe Production Limited". During that eight year period we have produced a series of receivers with a particularly "Lowe" flavour which comes from having a clear vision of what the short wave listener needs from his radio, and an equally clear determination from John Thorpe and myself to design our products to give the results in performance, features, and reliability which we see as correct.

Not that we stop at receivers; in addition to a growing number of short wave accessories such as the WireMatch aerial system and the PR-150 preselector, we have also designed and produced pulsed laser equipment for the treatment of veterinary injuries, and we are involved in design consultancy for very high quality compact disc transports and signal processing, so there is more going on here than many folk realise.

I did say "The Team", and I consider myself fortunate to have an enthusiastic and capable group around me. In the photograph you will see John Thorpe in the centre, surrounded by Jean Jones my production controller; Kevin Whitehead my general manager; Beryl Goulding in charge of sales order processing and everything else; and then there's me at the back with the specs. We look happy because we are; it's not every day you get a chance to go forward to an exciting future, particularly in these dark days, but we are all short wave enthusiasts at heart and what better work than your hobby?

There is another "Team" of course, and that is made up of Carl and his merry men; Dave, Steve, Mark, John and Henry. If I could only stop them working and gather them together in front of a camera I could present them to you – perhaps next



month, but they are the chaps who have put together your receiver with such care and skill, and my thanks go to them for their dedication.

Finally, we all thank you dear reader for supporting our little company by buying, and I hope enjoying, the receivers which we make. Without you we would not exist, and I hope that we can count on your support in the future. If you have any comments on what we do, we are here at our new location for you to ring or write to us. It's by listening to you that we can all listen to the world with such ease.

Happy Listening

John Wilson
Managing Director

FREE

With every product we make; Expertise; Knowledge; Experience; and that most important ingredient of all; the personal touch in everything we do

Lowe Production Limited
Unit 23, Cromford Mill, Cromford,
Derbyshire DE4 3RQ

And so in March I jetted off to America to deliver a talk on the whole Lowe receiver project. Went down well, even with the people from Watkins-Johnson who manufactured receivers for the military and had just announced a “lower cost” version of their latest receiver at a “reasonable” price in UK of £4995! As one can see at the final dinner I was still happy (and being British, wearing a tie).



Kulpsville 1994

The launch date for our new company was 1st April (more fool me) and I returned home from America ready to go. On 30th of March I was called to a meeting with the owner of Lowe and his so-called “managing director”. The owner said “You have done all that I wanted you to do” and then terminated my contract on the spot and told me to leave. I puzzled about that comment but much later realised that what he meant was that I had nicely packaged up the receiver manufacturing into a separate entity and he then sold the whole operation to another company in Southampton. This involved breaking up that happy team, with Jean Jones being removed, Beryl Goulding being absorbed back into the Lowe head office (until she also resigned) and me disposed of. One rather more serious event was that one of the assembly team, John Bone, committed suicide when faced with the enforced move to Southampton.

And John Thorpe? Resigned from Lowe immediately and was gladly employed by AOR UK for whom he designed and produced their AR-7030, yet another world-beating receiver and probably what should have been and would have been the next Lowe receiver. That was that, apart from a period of reflection and move to Devon where I ran a European accredited EMC test house until my 70th birthday. Lowe Electronics spiralled slowly into the dust and is no more. Kevin Whitehead was given the task of cobbling together what was called the HF-250 but it was simply a re-packaged HF-225 and only launched after JT had gone.

The American story.

On my March 1994 trip to the US I visited two dealers in order to select one of them as my US distributor. First I went to Universal Radio in Worthington, Ohio owned and run by Fred and Barbara (Babs) Osterman. Universal Radio had a high reputation, justly earned and they were also a truly charming couple with whom I had instant rapport. The second visit was to Electronic Equipment Bank (EEB) in Vienna, Virginia run by Richard (Dick) Robinson. I found the store rather ramshackle and Robinson doing his best to avoid any questions about future business (rather odd). In the end he suggested that I take a visit to Washington and see the sights. There was no doubt in my mind that Universal Radio was the obvious choice and that is what I proposed when I returned to the UK. Imagine my anger when I discovered that our so-called "managing director" had already appointed EEB even before I returned which explained why Robinson had been evasive. He must have been pre-warned that I was about to be removed. How underhand can it get?

As to who had the better judgment on these two dealers was demonstrated later by an announcement in the Fairfax Journal newspaper.

EEB owner sentenced for fraud: The Fairfax Journal reports that the owner of the now-defunct Electronic Equipment Bank in Vienna, Virginia, Richard F. Robinson, K4EIH, has been sentenced to four months in jail and four months home detention for fraud.

The Journal report by Ellen Sorokin says that Robinson, 68, pleaded guilty last December for conspiring to submit false invoices to the Drug Enforcement Administration in 1995. Robinson also was ordered by US District Court Judge Leonie M. Brinkema to pay \$52,100 in fines and restitution. Robinson pleaded guilty in December to one count of conspiracy to submit false invoices to the DEA in August 1995.

The sentencing was February 19. Federal authorities say in documents filed in US District Court that Robinson conspired with Robert Burchell, a telecommunications specialist at the DEA's Northern Virginia headquarters. Court documents say Robinson was indicted on charges he submitted two bogus invoices to the federal agency totaling \$50,000 for batteries used in DEA radios, but the batteries never were delivered. Robinson received payment for the non-existent batteries and kept an estimated \$12,000 for his efforts, authorities said in the court documents, but Burchell instructed him to pay the rest of the money to third parties. Authorities said the third-party payments actually were for Burchell's personal benefit. Burchell was sentenced to four years in prison last October.

And that was the so-called managing director's choice for a distributor! The man was a crook in 1995, and probably before that date. I do not know if the new owner of Lowe had deliberately chosen a bunch of second-rate incompetents to run his company, but that is exactly what he got.

Am I bitter? Damned right I'm bitter. Will I forget and forgive? Would you?

John Wilson, now 84 years old and living quietly in Devon.