THE LOWE EUROPA HF225

Chuck Mitchell, WB9NWF

FORWARD

The Europa version of the HF-225 is another enticing offering in the expanding Lowe product line. The Europa produces excellent, non-fatiguing audio and performs admirably as a transportable DX receiver. Elegant, rugged design blended with engaging audio reproduction are typical attributes of British audio electronics. U.K. Hi-Fi manufacturers such as Linn, Naim and Creek produce some of the world's finest domestic stereo systems. These products satisfy the music enthusiast by reproducing the source signal with accuracy and integrity. It is my opinion that Lowe Electronics, Ltd. brings this philosophy to the communications receiver market. It is evident once again that Lowe's design staff know what makes a great receiver.

THE EUROPA DIFFERENCE

The success of the HF-225 provoked many European DXers to request modifications for this dependable receiver. The DX Club of Finland petitioned Lowe with a number of mods to fit their specific needs. Lowe agreed to modify the club's receivers and dubbed the project "Finlandia", in honor of their northern DX customers. Although circuit changes were costly, the transformed receiver satisfied the members. Lowe was recognized for their enhanced 225 when the "Finlandia" was proclaimed as "Best DX Receiver of the Year" by the European DX Council in 1992. The receivers tested included the JRC NRD-535 and the ICOM R-72E. It's impressive to discover a company that listens and responds to constructive advice.

News of this special edition receiver spread around Europe. Because of the extensive interest, Lowe decided to produce a special edition of the HF-225 called the "Europa". The "Finlandia" project was then terminated.

The Europa modifications are not available as a retrofit kit for a standard HF-225. The HF-225 is modified to the Europa spec during production. So what are the differences between the HF-225 and the HF-225E?

The IF filter bank has been changed to improve filter performance over the original HF-225. A new 3.3 kHz filter replaces the original 10 kHz that was previously determined by the 45 MHz first IF filters. The control software was rewritten to reflect the new filter configuration.

Bandwidth Matrix Chart: A Comparison

HF-225					HF-225E				
FILTER SWITCH POSITION	1st IF FILTER 45 MHz	SECOND IF FILTER 455 kHz			FILTER SWITCH POSITION	1st IF FILTER 45 MHz	SECOND IF FILTER 455 kHz		
		Filter 1	Filter 2	Filter 3			Filter 1	Filter 2	Filter 3
10	15	Thru	Thru	10	7	15	7	Thru	7
7	15	7	Thru	10	4.5	15	7	4.5	7
4	15	7	4	10	3.5	15	3.5	4.5	7
2.2	15	2.2	4	10	2.2	15	2.2	4.5	7

Figure 1. Filter Matrix

All filter chokes have been replaced by high quality magnetically shielded chokes in order to prevent unwanted leakage across the new filters. Filter decoupling capacitors are bypassed by new chip capacitors. Additionally, filter selection diodes are replaced by low capacitance switching diodes. According to Lowe, the effect of these changes is a noticeable improvement in skirt selectivity and residual noise performance of the receiver.

The only cosmetic difference is the word "Europa" that appears under the volume and tone controls on the front panel. Lowe includes the synchronous detection/FM option and the keypad with every Europa receiver.

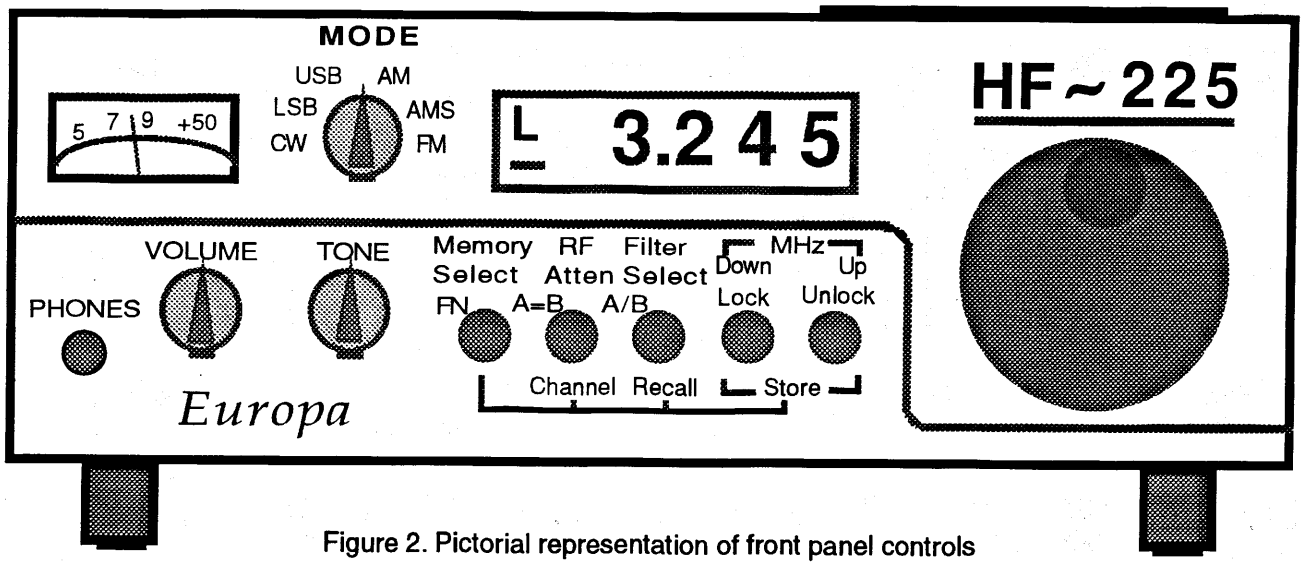


Figure 2. Pictorial representation of front panel controls

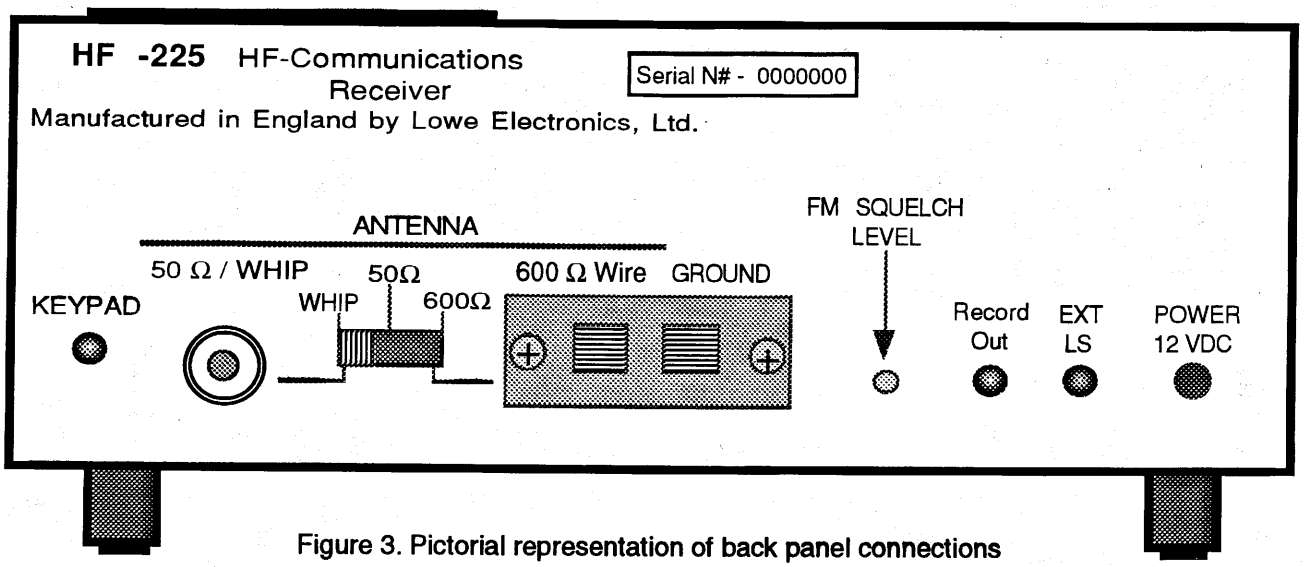


Figure 3. Pictorial representation of back panel connections

PERFORMANCE

Although the Europa can be configured as a self contained portable, this review will focus on the receiver as a transportable DXpedition rig. I would like note that as a portable, with whip antenna and preamp option included, it is more sensitive than a Grundig Satellite 500 or Sony 7600 with equal antenna lengths. The three receivers were tested in one of the worst situations possible: a noisy apartment complex sitting on the ground floor. It was impressive to copy a weak WWV at 2:00 PM local time on 5.0 MHz ONLY on the Europa. I do recommend the addition of the preamp/whip at the time of order. It's an inexpensive option but does require soldering to the base board if installed by the owner. Sensitivity is on par with all desktop receivers that I used for this review. These rigs included the NRD-515, Drake R7a/ RV-75, Drake R7 and a Kenwood R-5000.

A DXpedition is a good judge of a receiver's character. This is especially valid when one has the luxury of comparing it to familiar receivers on the same antenna system. A trip to the field proved helpful in evaluating the HF-225E against the Drake R7 and a modified Kenwood R-5000. Dynamic range, selectivity and audio reproduction were the three areas most noticeably different in the test. The Lowe exceeded all receivers tested in terms of audio reproduc-

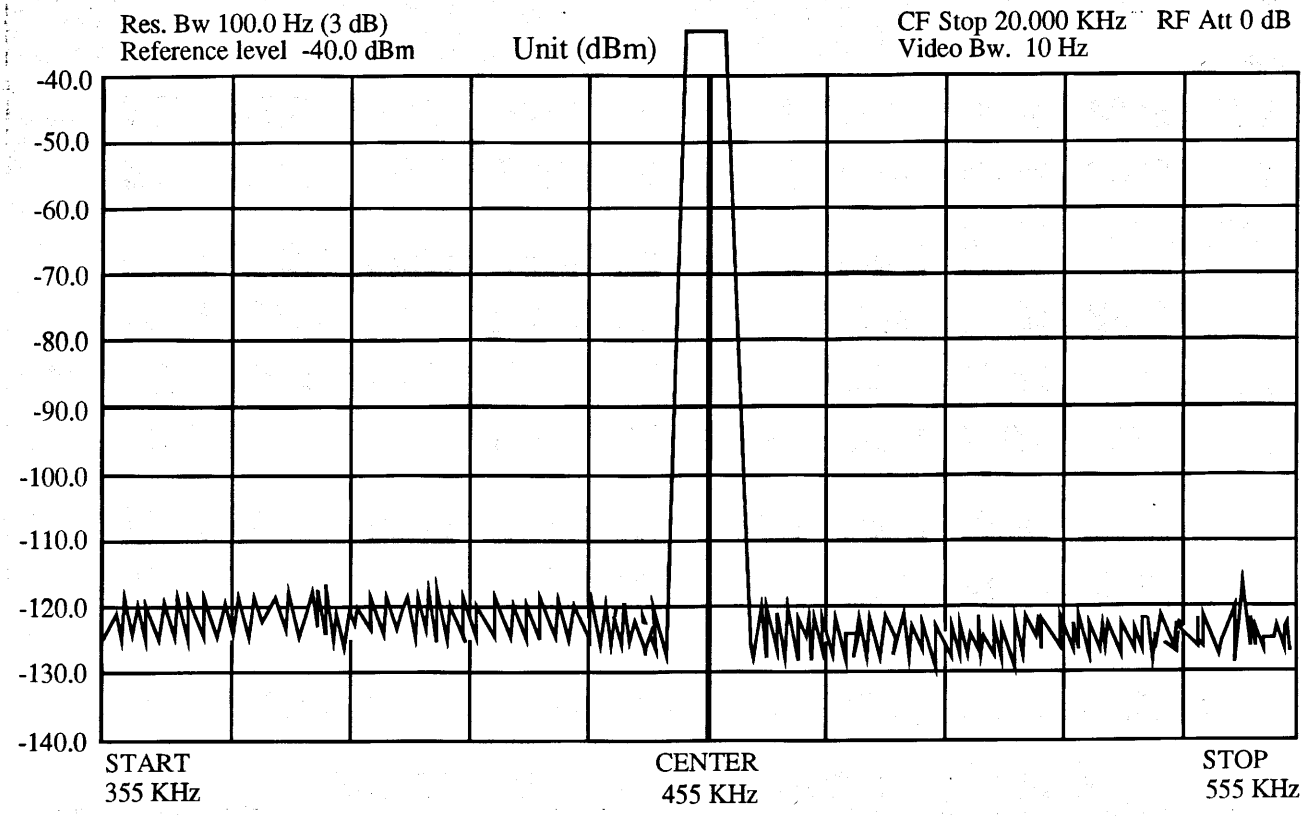


Figure 4. Wide sweep from 40 to 140 dB at 10 dB/div. of the receiver IF filter strip (AGC disabled) in the 4.5 kHz filter position. Note figure 1 bandwidth chart.

tion. The two field test receivers were connected to an I.C.E., Ltd. active antenna splitter. The splitter provides unity gain from one antenna to a maximum of four receivers. It could be connected to any of five Beverages ranging from 200' to 1000' in length. The most startling difference was between the R-5000 and Europa, in terms of dynamic range and selectivity. All three receivers were tuned to 650 kHz where RCN of Colombia was coming through with a respectable S7 signal and good audio. Squawk and splatter from adjacent channel stateside stations was annoying on the R-5000 in any mode, regardless of filter selection. The Lowe and Drake R7 came shining through with a clean, splatterless signal! I was able to open the HF-225E to the 3.5 kHz position and still enjoy a clean signal. Keep in mind the R-5000 was equipped with crystal filters of 1.8, 2.2, 4.0 and 6.0 kHz. This situation was common as the evening progressed. John Thorpe, one of the Lowe engineers, attributes this difference to gain distribution in the IF stages . Modern solid state rigs often use a fairly high amount of gain in the early IF stages. The HF-225E minimizes gain in the first IF to improve dynamic range and selectivity. I was beginning to understand why the EDXC choose the Europa as a premier DX receiver.

Front end overload characteristics appeared equal to the other test receivers. Radio Enga on 2410 kHz surprised us with audio that morning and I expected to hear some MW leaking through the Europa's front end at sunrise. Although connected to some very long antennas, the Europa never overloaded. Despite intense levels from local MW stations, I have never had an overload problem on the Europa on any or at the test shack in Indianapolis, Indiana. The longwave band has been free of bleed through from strong local MW stations. Antennas have included half wave dipoles, full wave Delta Loops, random long wires and 1000' Beverages. Tuners or preselectors have not been required so far. The Europa's front panel 20dB attenuator has never been needed on MW or SW.

Navigating around the shortwave spectrum is a breeze with the supplied keypad. I prefer the Europa's mouse style keypad over the front panel type found on many contemporary communications receivers. Direct frequency entry is possible on frequencies above 3000 kHz. Below 3000 kHz, the user must punch the "#" key after each entry. Selection of memory channels one through ten is available at the keypad.

The rig's dual VFOs and 30 memories proved sufficient for storing potential targets and rapid checks on parallel stations. A controls lock is switched from the front panel.

The DXer may connect two antennas to the Europa. A 50ê or 600ê input can be selected with a back panel slide switch. Spring loaded push connectors are provided for the high impedance antenna input and ground connections. A standard SO-239 coaxial connector is furnished for the low impedance antenna.

The receiver has extended front legs that can rotate out from the base. This provides the perfect angle for viewing and tuning.

Currently, there are no computer control applications available for the HF-225/HF-225E. This may appear to be confusing since Lowe offers a software control program for the HF-150 via the keypad jack. Although both radios use the same KPAD-1 keypad, the HF-150 and HF225E microprocessors interpret control commands differently.

Engaging the W-225 amplifier is likely to cause overloading when lengthy external antennas are used. This is not surprising for a simple broad banded whip amplifier. The amp works fine for short wires or the supplied whip.

Mention the word Lowe and most DXers will associate it with outstanding audio quality. The Europa produces some of the sweetest sound you'll ever hear from a shortwave signal. Connect a hearty communications speaker to the 225E and crank up the volume. You'll swear there are tubes under the hood! (The venerable Drake MS-4 speaker is a perfect match for the rig.) One thing I have noticed about Lowe receivers is how involving the listening experience is. Tuning in your favorite Latin American station yields Salsa that's more "caliente" and Bossa Nova that transports you and the girl from Ipanema back to Rio. This little receiver reproduces music in tuneful manner and digs deep in the QRM to retrieve critical voice information. AM audio is good enough that you'll use it in this mode more often than with other rigs.

The tone control is actually a variable high pass/low pass filter. The center position renders flat audio response. Turn it clockwise and low frequencies are attenuated. Counter clockwise positioning will roll off high frequencies. Careful manipulation of the tone control with various filter selections can be most helpful in refining audio from a station in heavy QRM and QRN. One of my favorite combinations is the 3.5 kHz filter position in the AM mode with the tone control adjusted to approximately 3 o'clock. Tuning off to the edge of either sideband yields highly intelligible audio with a medium IF bandwidth.

Audio quality from the record out jack on the back panel is excellent.

IF IT ONLY HAD A...

Competing against heavy weight receivers like the R7 and NRD-515 is not always a winning situation. The obvious shortcomings on the Europa are the lack of readout to .1 kHz, IF notch filter and IF passband tuning. A narrower voice filter of 1.8 kHz would have been a good fifth filter choice. Although the unwanted sideband rejection is excellent when using the 2.2 kHz filter, this is not the case with the 3.5 kHz position. You can ECSS tune with the 3.5, but a medium strength het can bleed through to the opposite sideband. The audio in ECSS narrow is excellent, however.

Datong produces a compact audio filter called the ANF-Automatic Notch Filter. This product is a perfect solution for the missing notch on the Europa. The palm sized filter can be used in "seek and destroy" mode or manual mode to wipe out heterodynes. The ANF preserves the audio quality of the Europa and is virtually transparent when switched in line. It actually improves the audio a little in the narrow mode by reducing hiss when the tone control is in the high pass mode. The ANF easily connects between the receiver's audio out and a speaker/headphones like most audio filters. Low current drain makes it ideal for battery use. The Datong ANF sells for about U.S.$165.00.

Some people have expressed frustration with the absence of selectable sidebands in synchronous mode. I don't feel that this is a major issue for the DX listener. The receiver more than compensates for this fault by it's superior tuning ease in ECSS mode and superb audio quality when using the narrow 2.2 filter. The synchronous detector works competently and is a real treat to the ear when a station is in the clear.

The antenna selector would be more convenient if mounted on the front panel.

POWER ISSUES

The Europa draws approximately 200-350 ma at 12 VDC, depending on the options installed and volume level. Lowe ships a nice regulated power supply with the receiver. The external supply provides a clean, hum free DC source. There is no internal AC supply. For DXpeditions, I use a 12v/12amp sealed lead cell purchased from an astronomy supply store. Lowe has an internal nicad pack option that produces 9.6 VDC from 8 cells that are suspended above the main circuit board. The assembly holds the batteries securely, but does not protect the receiver's mother board from the unlikely event of battery leakage. This makes the Europa a self contained system, but should not be considered ideal for the DXer. A 12-14 VDC supply should be used to insure maximum performance. The first mixer is operates more efficiently on the high side of the voltage range. Fourteen volts is probably ideal, according Lowe. Twelve to fourteen volts will assure maximum dynamic range.

PRICE

At the time of writing, the only Lowe dealer in the U.S. that will import the receiver is the Electronic Equipment Bank of Vienna, Virginia. The stock Europa costs U.S. $899.00 and includes keypad, synch/FM option and power supply. The W-225 whip option sells for U.S. $40.00. You may have to wait a couple months for delivery. The Europa is a good seller and it's frequently on back order.

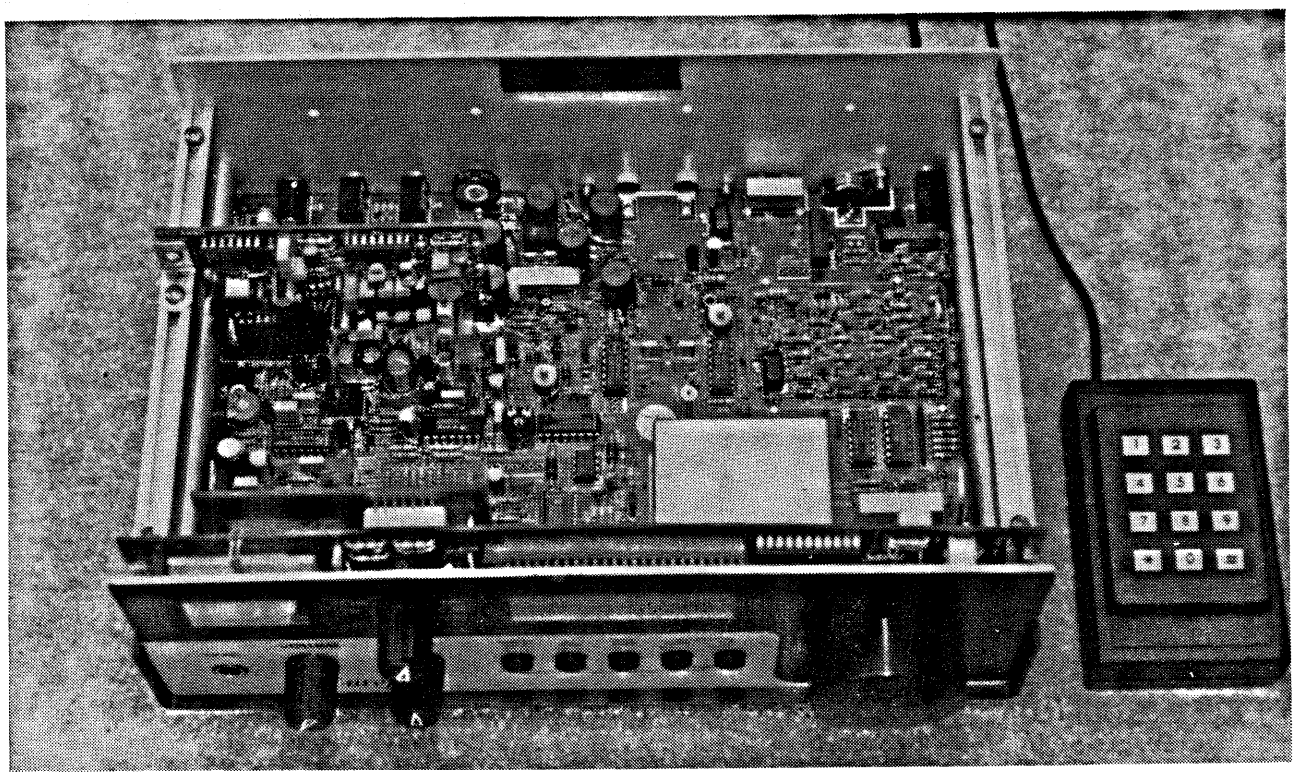


Figure 5. Interior view of the Europa and external keypad. The keypad is standard with Europa model.

CONCLUSIONS

If you are looking for a multitude of bells, whistles and clocks, the Europa can't compare to other similarly priced receivers in the U.S. If you are searching for a great transportable DX receiver, then Europa will satisfy, if not exceed, your expectations. I don't believe you will find a more selective and better sounding receiver in a rugged lightweight package. The quality of design is evident inside and out. This is a well crafted, low maintenance receiver. The controls have a solid and positive feel. There are no wiring harnesses or point to point wiring inside (Note figure 5). Weak signal DX performance is very close to that of formidable desktop rigs like the NRD-515. While the Europa appears subtle on the exterior, it's a dependable DX receiver at heart. The HF-225 "Europa" has been placed on my top ten list of things I would require if stranded on a desert island.

ABBREVIATED SPECIFICATIONS

Dimensions: 253 x 109 x 204 mm (WxHxD, including projections).**Power Requirements:** 10-15 VDC, Quiescent current 200ma, no options, no audio. Typical consumption 250-300 ma.**Weight:** 1.9 kg., 2.6 w/internal battery.

Frequency Coverage: 30 kHz to 30 MHz.

Reception Modes: AM, LSB, USB, CW, Narrow band FM, AM Synchronous.

Display: 5 digit back lit negative LCD (green) readout to 1 kHz. Analogue S-meter calibrated S1-S9, +10dB, +30dB and +50dB.

Tuning: keypad or variable rate tuning knob.

Tuning Rates: CW, SSB, AMS 8 Hz steps at 1.6 kHz per revolution, AM mode 50 Hz steps at 9 kHz per revolution.

Memories: 30 frequency memories selectable with spin dial, memories 1-10 can be selected with keypad, two tunable frequency stores (VFO A/B).

Memory Functions: Store, Recall Preview and Channel, current tuned frequency is saved when receiver is switched off.

IF Filters: 7, 4.5, 3.5 and 2.2 available in AM, AMS, LSB, USB, 12 kHz for FM, 2.2 kHz IF and 200 Hz audio filter (centered at 800 Hz) available for CW.

Receiver Shape Factors: 7 kHz/1.41:1, 4.5 kHz/1.38:1, 3.5 kHz/1.53:1, 2.2 kHz/1.4:1.

Frequency Stability: Less than 30 Hz per hour.

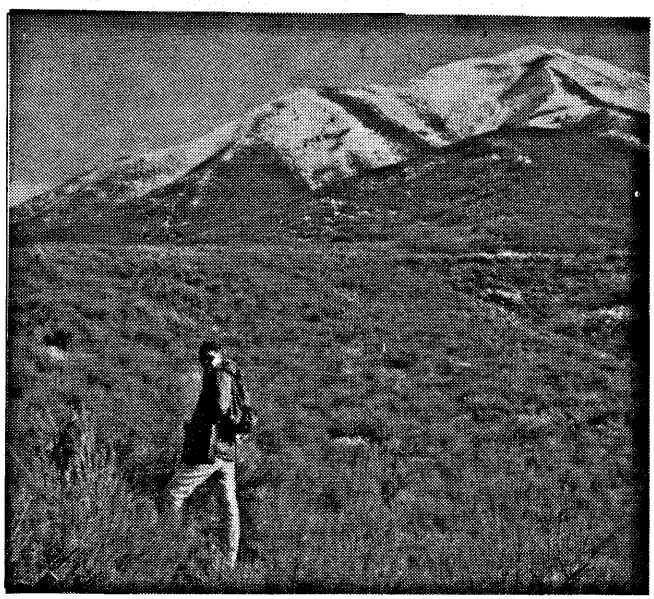
IF Frequencies: 45 MHz/455 kHz.

Dynamic Range: (2.2 kHz) greater than 90dB at 10 kHz from wanted station, 20dB RF attenuator front panel selectable.

Noise Blanker: audio blanking triggered by IF signal level permanently enabled on all modes, blanking period 500 ms.

Audio Outputs: 1/8" jack for record out at 350mV, 1/8" jack for external loudspeaker, 1/4" headphone jack, stereo or mono plugs.

Antenna Inputs: 50 ohms SO-239, 600 ohms wire and earth connections on spring terminals, Hi-Z active input for whip antenna.



Europa

AVAILABLE OPTIONS FOR THE HF225E:

B-225 Internal Battery: User installable inside receiver. The eight cell nicad pack will operate the receiver at 9.6vdc for 8 hours on a full charge. Batteries are charged when the rig is switched off.

C-225 Case: Hard leather case with removable speaker cover and rear panel cut-out for connections.

W-225 Whip Antenna: Small broadband preamp module fitted to main receiver board. Includes telescopic whip antenna that plugs into the 50 ohm SO-239 jack.

Service Manual: A must read!

Figure 6. The Europa provides the author with a desktop quality rig that can be tossed over the shoulder and transported anywhere.

Figure 7. The author's portable DX listening station includes the HF-225E, Datong ANF, Sony Walkman Pro WMD6C cassette recorder and a 12VDC rechargeable battery pack.