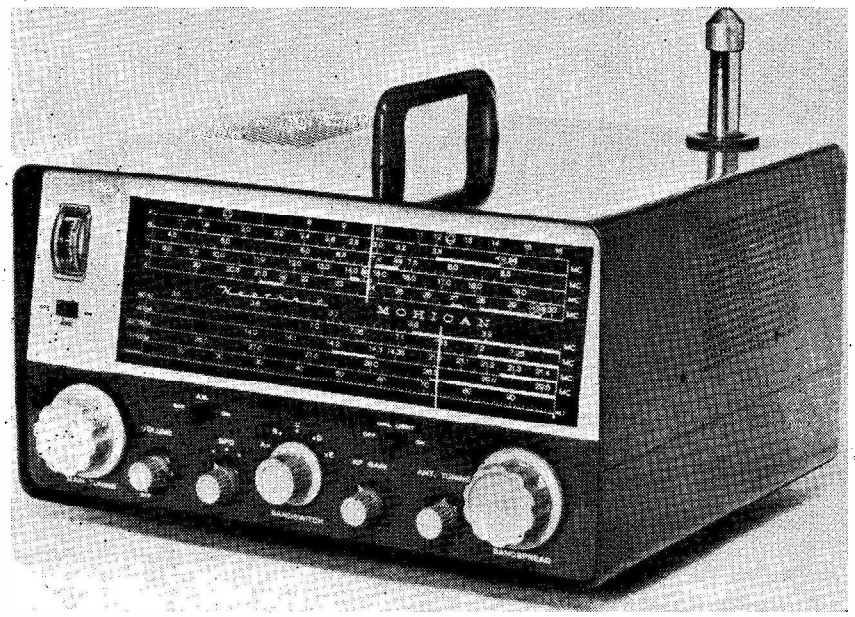

Finished appearance of a kit-built Mohican.

USING THE MOHICAN AS STATION RECEIVER

EXPERIENCES IN MALAWI — AND SOME MODIFICATIONS TO ACCOMPANY TRANSMISSION

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THE writer, posted to a bush-station having mains electricity for only a few hours of each evening, yet hoping to get his transmitting licence eventually, considered that an early step would be to acquire a battery driven receiver. A BFO was essential for SSB reception and good bandspread was particularly desirable for amateur work. With a £50 ceiling in mind, the choice was immediately very restricted. The fact that the Mohican fitted all requirements so far and, additionally, was available in kit form, clinched the matter.

Seven weeks of travelling by a variety of routes including the final 200 miles by bus along earth roads, resulted in no detectable external damage to the parcel or its contents. On unpacking, it was found that all items listed were present and some small items were there in excess.

General Points

Building the receiver took about a week of spare time, soldering often being done with the aid of accumulators and an inverter. Mechanically, everything fitted together perfectly. The chassis layout and finish (as can be seen from the photographs) is to a very high standard. The front-end is pre-built and supposedly pre-aligned but in the author's experience the alignment was 'way out, possibly owing to the journey. In any case, at first switch-on the set was disappointing. After a lot of searching, which itself was an education, the major trouble was traced to a faulty feed-through condenser (C25) in the pre-built front end.

On powerful local stations, the built-in speaker seemed to be producing a lot of distortion. Ten days after a letter had been written to *Daystom*, an airmail package arrived containing a free replacement speaker and feed-through condenser, with compliments.

With the new speaker and feed-through condenser installed, the alignment and sensitivity were not good by comparison with the performance of the domestic S/W broadcast receiver. Some improvement was effected by aligning each band with the aid of broadcast stations. With any fading this approach is limited. Some accuracy of calibration was achieved by use of 5 mc and 10 mc standard-frequency stations. Further improvements were made when the local Post Office engineer obtained a good signal generator from headquarters for a few days.

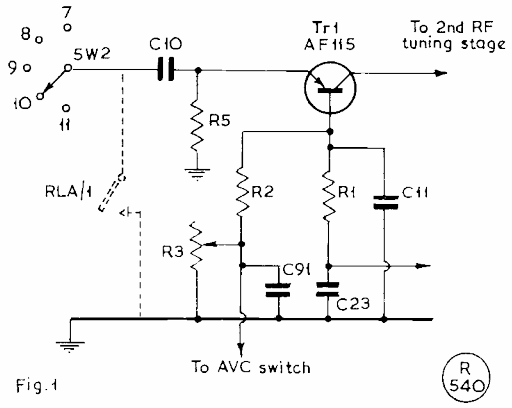


Fig. 1. A method of muting the RF amplifier in the Mohican, the modification being shown dotted.

But by the time the receiver was home again, the alignment was decidedly off. (It was discovered that on the journey in the heat, the ferrite slugs had settled down in their locking paste!)

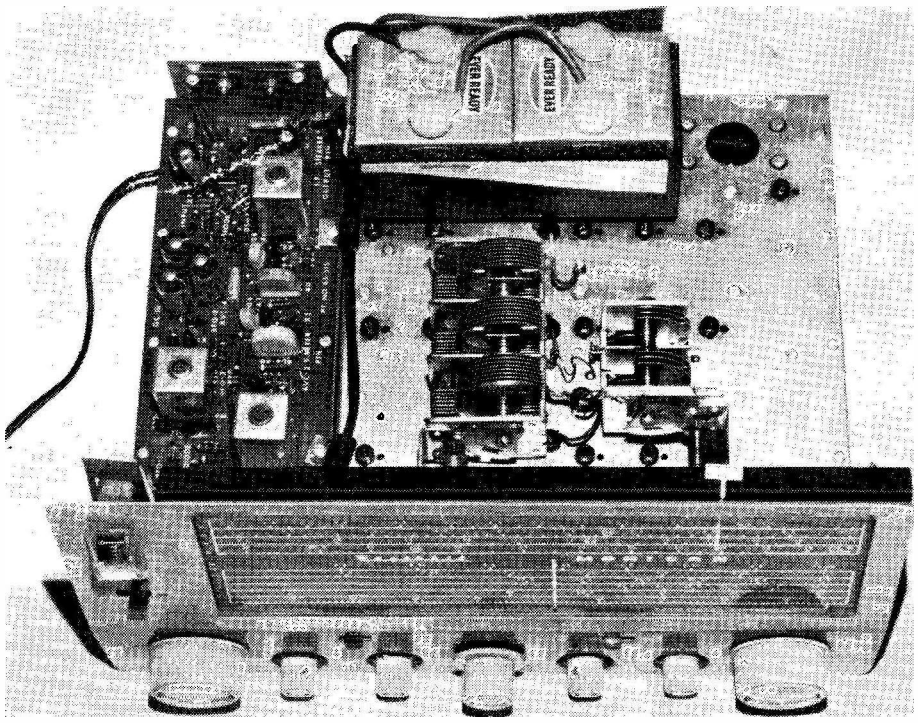
Calibration Problems

A Nombrex battery signal generator was bought by post. It was realised that its average ± 1% accuracy was not good enough for accurate calibration but since it could itself now be checked by comparison with the 5 and 10 mc standard-frequency broadcasts, and since it was rich in harmonics, this presented no problems. Ultimately, calibration accuracy of the order of ± 10 kc was achieved.

The author was learning a great deal through all this, and was beginning to appreciate subtler things. Accurate calibration being assured, sensitivity was next sought and after that, image rejection. Sensitivity was a matter of many happy hours of tracking and

FREQUENCY COVERAGE

BAND	Frequency mc	Amateur Bands included
A	·580 — 1·540	(MW BC only)
B	1·650 — 4·5	160m. and 80m.
C	4·5 — 8·8	40m.
D	8·5 — 20·0	20m.
E	20·0 — 30·0	15m. and 10m.



Looking into the interior of a Heathkit Mohican.

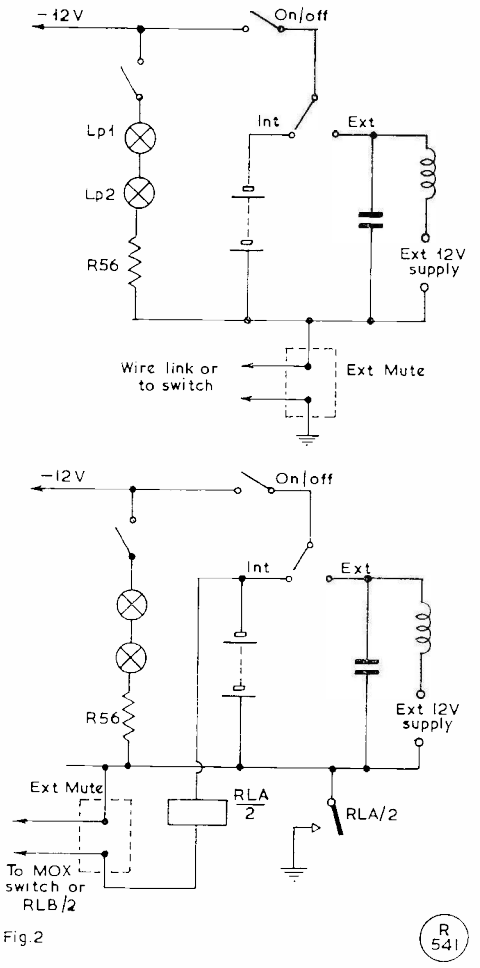


Fig. 2. Muting of the Mohican power supply, before and after modification—see text.

trimming with the chassis kept horizontal and supported at eye level so that the slugs sank in their locking paste.

The bands were aligned at the nearest convenient whole mc points at their respective HF and LF ends. With an IF of 455 kc, image rejection becomes progressively less effective as one goes from Band A to Band E. In this respect Band E proved particularly troublesome and the best that could be achieved, adhering to the alignment instructions, was to get signal and image *equal*. Since the image could be made *stronger* than the signal, a little headscratching indicated that there was no harm in putting the local oscillator on the *high* side of the signal instead of the low side. Possibly there was insufficient adjustment latitude in the second RF stage of Band E. At all events, Band E eventually came up to specification with this rearrangement of the oscillator frequency.

Distances being what they are in and from Africa and the state of SSB art being what it is, the original plan to operate the Mohican in conjunction with a low-power AM transmitter was scrapped. A KW-2000 became available locally at an attractive price. The Mohican continued in service during no-electricity hours and also provided some excellent duplex contacts with relatively local (less than 1000 miles) stations. This was particularly effective on "40m. transmit" and '80m. receive." In this method of working, the second receiver and the transmitter at each end are working continuously, producing a more natural conversational style of QSO! Under these conditions, with the Tx feeding a dipole and the Mohican on its internal telescopic aerial, no trouble was experienced. But one day the inevitable happened when the receiver was tuned to a frequency close to that of the transmitter—the RF transistor burned out.

Modifications

When a replacement was fitted, some thought was given to modifying the receiver so that not only would the battery supply be switched off (the normal in-built muting arrangement) but also the signal would not be allowed to reach the first transistor. Experiment with the transmitter barely radiating, showed that earthing either of the Rx antenna terminals only reduced the signal a few S-points. Obviously, the RF tuning stage was still picking up some stray RF. Shorting condenser C10 to earth as shown in Fig. 1 was found to be much more effective.

Accordingly, a small relay was installed at the rear underside of the chassis near the muting terminals, which were rewired as shown in Fig. 2. The muting terminals were connected to the Tx/Rx changeover switch as in Fig. 3 and were only disconnected at times of duplex working. Thus, the receiver was muted whenever the transmitter was radiating. Of course, the push-to-talk button on the microphone was not used and the KW-2000 was without Vox. The contacts on the changeover switchboard were arranged for feather touch operation using thin spring steel.

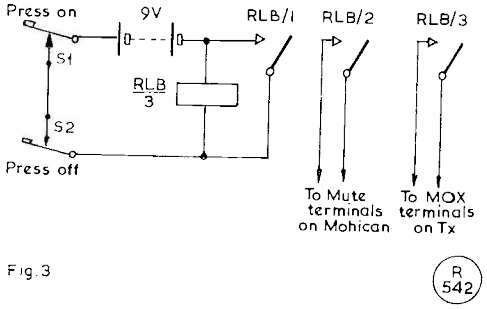
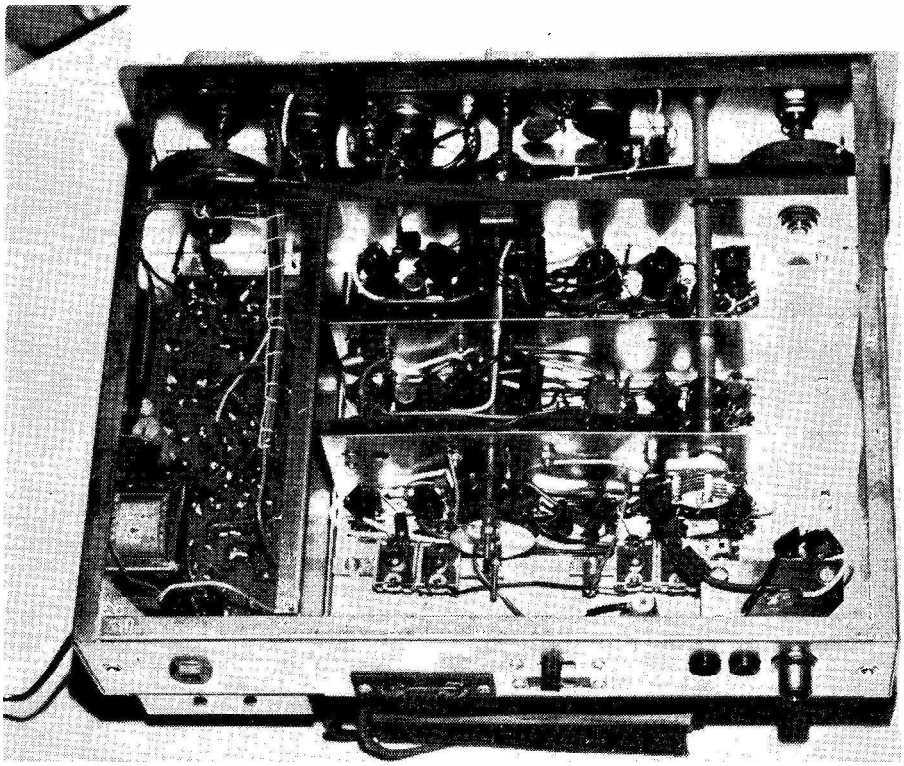


Fig. 3. Send-receive changeover switch using self-latching relay circuit. Touch switches S1, S2 are made of small pieces of spring-steel and wood screws; they overhang the edge of a small wooden board on which the battery and RLB are also mounted. S1 and S2 only require the most delicate momentary touch for a changeover.



Under-chassis layout, Mohican GC-1U.

Points of Interest

This is not of course a review of the Mohican, but the writer would like to remark on a number of points. If the Mohican is assembled according to the instructions in the manual, and aligned patiently, one has a good-looking, highly versatile receiver with enough sensitivity and selectivity for ordinary amateur purposes. All the MW and S/W BC bands are available. The switchable AVC and ANL are very effective. The BFO is easily set for USB/LSB operation as well as CW. Antenna tuning and RF gain controls are useful, the former for final peaking up of signals, the latter for improving S/N ratio on stronger stations. It cannot be too strongly emphasised that *all* the many controls have to be used with discrimination to achieve optimum results for each mode and band. It was found that the switchable panel lamp provided a fairly heavy drain on the battery. The option of telescopic aerial, high-Z or low-Z aerial connection is readily appreciated. Main tuning and band-spread tuning are through flywheels and are smooth as oiled silk. The amateur bands are clearly marked on both scales and it will be noted that all the amateur bands except 160m. and 15m. are at the HF end of each range.

This is a piece of equipment which any SWL or aspiring amateur can build, confident that the kit and instructions are more than adequate to meet the quoted specifications. The after-sales service is of a very high order. And there is much to be learned in the building of the Mohican GC-1U general coverage receiver. The free leaflet says much; the 60-page illustrated manual available separately at 10s. says a great deal more.

Will all readers please note that the January issue of "Short Wave Magazine" will appear on January 2, to avoid Christmas mail delays. The February issue will publish on January 30, the due date.