



This photograph shows Michael's wife Hsiao Li looking on intently as an operator reads a message and sends it via the key. It also shows how the transmitter and receiver units were mounted one above the other in a protective wooden frame suitable for transport in a back pack. Two rather untidy wires diverge up, presumably to a dipole antenna. Their first child is peaceful in the arms of a nurse. Michael Lindsay will have taken the picture.

DATA SUMMARY

Organisation: Chinese communist partisan army fighting against Japanese invaders.

Purpose: Wireless communication connecting partisan group headquarters, Chinese Nationalist army and links to India and USA. Continental broadcast by Xinhua, the Chinese news agency.

Date: 1940 to 1945.



Michael Lindsay (1909-1994) was a British academic who from childhood built radios and experimented with circuit design. Just before World War II he was invited to Yenching University in Beijing to introduce the English tutorial system and lecture in economics.

Chinese Guerilla sets
(The story of Michael Lindsay)
By John Seager
Country of origin:
China

Deviating from publishing history in the Supplements, in this chapter it is told how Michael Lindsay, an Englishman and his wife Hsiao Li Lindsay, helped the Chinese partisans in their fight against the Japanese invaders.

Stimulated by John Seager's draft article to read Hsiao Li Lindsay's fascinating book 'Bold Plum', I felt that this story should be included in the WftW, Volume 4, Supplement series.

REMARKS

The Japanese army had seized part of China in 1931 and in July 1937 they had occupied Beijing. Michael Lindsay was deeply moved by what he saw of the arrogance and arbitrary cruelty of the invaders when he was visiting the countryside with other western colleagues in the summer of 1938. He realised that the communists were the only effective force fighting against the Japanese occupation. Determined to help, he was able to use his protected status as a foreign national to send medicines and surgical supplies. He soon realised there was an urgent need to improve the army's radio equipment and teach the operators how to use it. The story of how he and Hsiao Li, a Chinese student he married in 1941, smuggled home built radios and spare parts and then spent 4 years with the army is remembered in China to the present day. The trail in the Western Hills which Michael and Hsiao Li followed after escaping Beijing is now named after them. Years later Michael inherited his father's peerage as the 2nd Lord Lindsay of Birker.

In her extraordinary book *'Bold Plum: with the Guerrillas in China's War against Japan'*, Hsiao Li Lindsay makes it clear that she and Michael were not Communists or members of the communist party of China. Their inspiration was the thought of a free united China once the invading forces had been driven out.

Michael had no formal training in radio and in the amateur tradition was entirely self taught. He was able to get parts from Hong Kong and Shanghai and through contacts with the British embassy where he had briefly worked as Press Attaché. This will have helped with building and testing, but Michael would work with components and soldering iron in his own small rooms in the University President's house. His wife Hsiao Li commented that when they moved to their own larger house on the campus '... after Michael had spread out all his radio parts it seemed quite full.'

Between their academic work and Michael's radio activities, he and Hsiao Li would practice Morse code.

Over more than a year Michael made journeys through Japanese lines, with technical books, radios and spare parts. On one trip Michael took a prototype transmitter and kits to make another nine. His foreign status carried him through where others would have faced arrest. One trip with colleagues was timed for the Autumn Festival so guards would assume that like most Chinese they were simply out to eat moon cakes and contemplate the moon.

Pearl Harbour

All this ended with the Japanese attack on Pearl Harbour. On the morning of 8th December 1941 the daily Shanghai news broadcast was unexpectedly absent. Looking for a reason, Michael heard by chance a German news report of the attack. Faculty members at Yenching had a degree of independence because of the university's links with America. Realising this protected status had now ended, Michael and Hsiao Li, within minutes of hearing the news, filled a car with food and radio equipment and fled the university campus, leaving their personal possessions behind. Chinese colleagues had advised them which would be the safest gate and they drove out at high speed. Subsequently they learned that the Japanese secret police, entering through another gate, had come to arrest them and had ransacked their house less than ten minutes after they had left. It took nearly three weeks of arduous journey on foot and horseback to reach the forward headquarters of the Chinese army in the hills just West of Beijing.

Michael was appointed technical adviser to the forward area communications department, where his duties included teaching radio engineering to the army technicians. He immediately began the task of repairing damaged radios, modifying them to make them lighter and more stable and teaching the operators how to get the best from their rather basic equipment.

There is no doubt that he was a charismatic teacher, whether on economics or practical aspects of radio.

With these very low power transmitters it was an advantage to use 'continuous wave' (cw) telegraphy, so the power amplifier could operate in the efficient 'Class C' mode.

This maximised the range of the transmitter and kept down battery drain, but it also meant that operators had to use Morse code. As there was no suitable Chinese code they all had to learn some English.

Hsiao Li explained how, as well as giving birth to two children, the first in a remote mountain village and the second in a cave hospital in Yen-an, she gave regular English lessons to the radio students.

A radio teacher's training school had been set up at the front line headquarters in March 1942 and from the start included more than 20 students whose university course had been interrupted or postponed when war intervened. Larger groups of soldiers from various backgrounds were given training in wireless procedure. Michael taught radio and Professor William Band ran courses in other scientific topics such as physics and mathematics. Several of their students held senior positions in industrial and academic fields in the post-war period.

By January 1944 Michael had rebuilt nearly all the sets for the front line units and there were not enough parts to make more. All students with sufficient maths to understand it had been taught basic radio engineering.



Michael showing five army students details of a short wave receiver. Note his ubiquitous multi meter in the foreground

Michael Lindsay in army uniform smoking a professorial pipe and watched by attentive army 'students'.

The multi-meter which accompanied him through thick and thin sits on the table. The glass valves in the little sets are recognisable as the triodes or pentodes available in Britain in pre-war years. These had delicate directly heated filaments rather than cathodes. The more modern indirectly heated types widely used in American equipment drew much more current and needed a heavy power supply. Apart from being as fragile as light bulbs these glass enveloped valves needed almost exactly 2 volts for the heater circuit, usually from a lead-acid accumulator. Any less and they were inefficient, a bit more and they would glow brightly and expire. Behind the receiver that Michael is adjusting are some EverReady 1.5v dry cells; two of them in series would require some form of dropper resistor to prevent disaster. The source for the 120v or so of high tension (HT) is not clear. The transmitter being studied with evident delight by Michael's Chinese colleague will be a 'MO / PA' design.



Michael explaining the circuit diagram of a MO-PA transmitter

Plans for cooperation, developed with the American Observers Section in Yen-an, always seemed to get stuck when referred back to senior American officials in Chongqing. Michael saw the benefits to Yen-an in communicating directly to China's allies in Britain and America. There was skepticism that it would be possible to build a transmitter which could be received in America, but it was agreed he should be allowed to try.

Even in Yen-an they still had only low power transmitters but Michael was sure he could make them more effective. In particular he wanted to put up a 'V' beam antenna to provide directional gain. Michael's transfer was agreed and he made the hazardous journey taking few possessions apart from his test meter and slide-rule. Together with his

wife and child and a small army escort they were pursued from village to village by enemy troops and were lucky to escape an ambush on a mountain pass. On arrival at the Communist Headquarters in Yen-an in May 1944 they were treated as honoured guests. At a welcoming dinner they sat at table with Chairman Mao and Zhou Enlai. Although it was the army headquarters, conditions in Yen-an were basic; indeed the majority of officials, including the leaders were living in caves hollowed out of the impacted yellow earth of the Loess plateau. As before, Michael was asked to improve radio communications. Curiously he was also asked to study their banking and financial system to see if it could be improved.

Modification and rebuild of existing radios.

It appeared that the old-fashioned wireless equipment was unsuitable for guerilla warfare in several aspects. The cumbersome transmitters were just single-stage Hartley oscillators and had front panels some 60cm square. These were completely rebuilt with a more stable master-oscillator power amplifier (MO/PA) circuit, whilst the aerial matching was improved by logarithmic tapping of the output coil. With size down to 25x20x15cm they could be carried as part of a backpack.

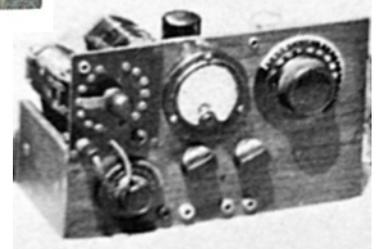
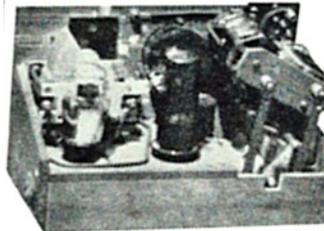
The receivers comprised a regenerative detector followed by two transformer coupled audio frequency stages; a widely used design

in the 1930s. These were also rebuilt much smaller, but the circuit was not changed. Regenerative receivers were highly sensitive but needed a fair amount of skill to use, unlike the 'superhet' in the No. 18 and No. 38 field sets then available to the British Army, which made few technical demands on the operator.

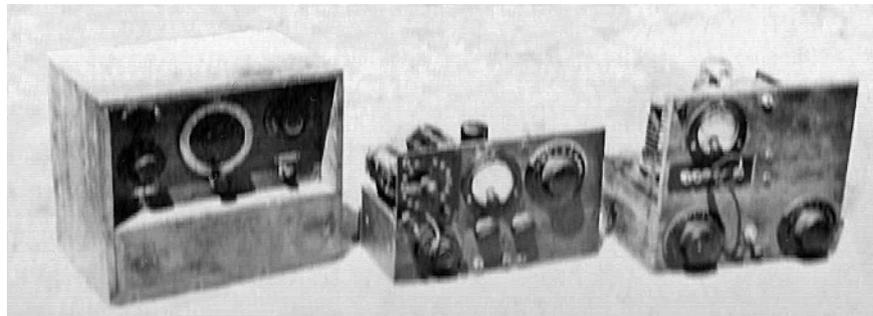
In his book *Unknown War* Michael explained that the receivers were battery operated and most transmitters got their power from a hand generator. The best had an output of around 25W. Operating distances varied from local to several hundred miles, so it was an advantage to have a wide frequency range typically 2.5 to 10MHz.



One of the old and cumbersome Chinese transmitter-receivers which were inefficient, large and difficult to transport via backpack.



Close up view of a rebuilt transmitter. Probably a version with an RF output of up to 25W, as the RF output valve seems to be a 6L6. This type was powered by a hand generator.

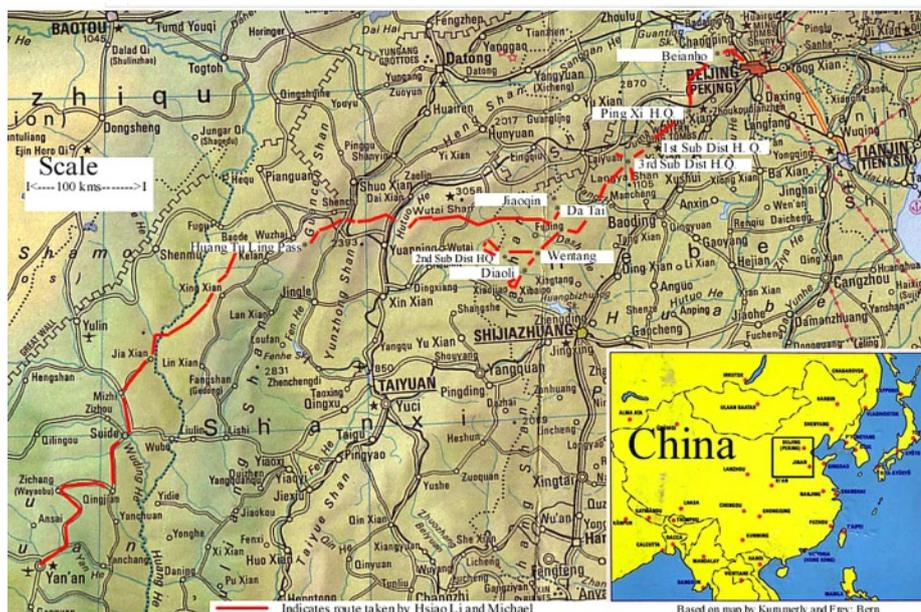


Front panel and internal view of compact radios constructed by Michael Lindsay. Parts were taken from captured Japanese radios and what could be obtained. Left is a 0V2 receiver, the others transmitters.

He set to work to build a transmitting station that could be received in America or by British Intelligence in India. Two senior members of the radio department had some technical background, so tact was required. They had a generator driven by truck engines and some transmitting tubes, though these were less powerful than Michael had hoped. He calculated it should be possible to achieve a power output of around 600W. For broadcast purposes, much would depend on a directional aerial. He designed the new transmitter and supervised its building in the radio department. Michael had dimensions for the 'V'-beam but one source referred to the huge antenna he built as being 'diamond shaped' raising the possibility that it could have been the more elaborate rhombic: Each leg in a 'V'-beam can be up to 6 wavelengths long, giving a narrow arc of gain up to 10-12dB over a dipole. A rhombic antenna of the same overall length will have even more gain, but the beam will be narrower still. Unlike the 'V', the rhombic can be made mono-directional if a terminating resistor is used. Equipment at Yanan was minimal and bearings had to be taken from the stars.

It turned out that the optimal direction lay across a valley between two hills. This would certainly favour the 'V' beam which only needs 3 supporting poles. There was no shortage of space, and Japanese telephone line provided a ready supply of copper wire. The plan was a success and using comparatively low power the station established links with San Francisco and India as well as allowing radio contact with the Nationalist army in Chongqing. Weather reports and

details of enemy troop movements were of particular interest to the Allies. It is remarkable that the very first intercontinental broadcasts by Xinhua, the Chinese news agency, went out from this 'home built' amateur-designed system. Because of his special position of trust Michael was also consulted on what form the news should take and what would interest journalists and correspondents from abroad. He even briefly persuaded the broadcasters to give up the careless Chinese habit of routinely adding epithets (Dog, dog-face, dog meat) to the names of generals or public figures whose politics differed from theirs.



Hsiao Li Lindsay (with daughter Erica) among a group of American observers and fellow Chinese at Yanan (Yan'an) airfield in 1945.

As time went on it became increasingly clear that when the Japanese had been defeated there would be no happy ending, but the two Chinese armies would turn on each other in civil war. By 1945 Michael and Hsiao Li now had two children and with regret they decided to leave the country and travel to Michael's family in post-war England. Before leaving they had a private dinner with Mao and his wife and were able to speak directly of their concerns for the future. Mao claimed that he still hoped for a peaceful settlement with the nationalist government. That is not how it turned out, but it is timely to recall a moment when by force of circumstance Britain, America, Russia and China and much of the world besides were united to a single purpose.

That a brave and altruistic foreigner should have made such an unusual contribution is worth remembering in Britain and America as well in China, where his story is still widely known.

After a University appointment in the UK, they moved to Australia. His son James, third Lord Lindsay of Birker, and a retired Australian diplomat recalls his father in Canberra in the 1950s 'his work room ... full of radio parts, valves, transformers, resistors, etc. and Dad sitting there with a soldering iron'. Moving to Washington in 1960 as a Professor of Far Eastern Studies, there was a similar room full of parts in the basement.

In 2015 China's President Xi Jinping praised Michael as one of the foreign heroes who helped to defeat the Japanese.

References:

This Chapter is principally a very slightly reworked manuscript written by John Seager, who kindly permitted reproduction in the Supplement series, with a few additional photographs. The photographs are published with the permission of James Francis Lindsay, the 3rd Lord Lindsay of Birker.

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