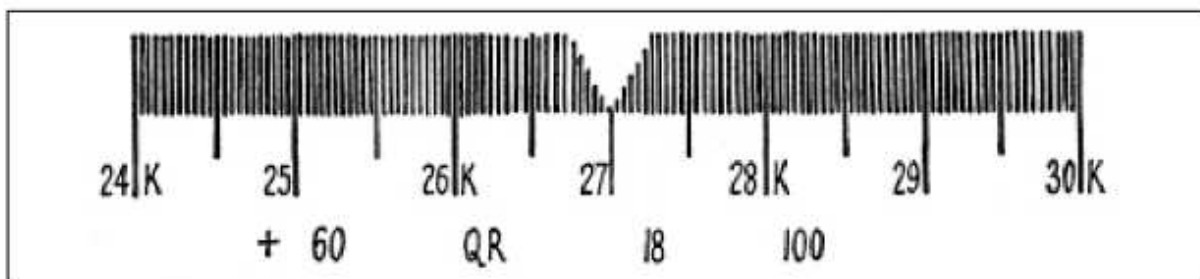


and *Mannheim* equipments. For the long-suffering fighter-controllers on the ground there were the *Jagdschloss-Z* and *Forsthaus-Z* centimetric wavelength GCI radars to replace the earlier *Jagdschloss*. In each case prototypes had been built, but none existed in quantity. Within a few months these could have posed a formidable threat to the bomber forces once more, since neither the electronic nor the 'Window' jamming techniques then in use would have affected them.

Finally, the Luftwaffe was on the point of overcoming a major impediment to effective night-fighting, the jamming of its ground-to-air communications channels. Several *Bernhard* transmitters had been erected throughout Germany, each with a large aerial structure about seventy feet high and almost as broad. This focussed the transmissions into a narrow beam, which rotated in azimuth once per minute. A growing number of night-fighters were being equipped with the corresponding airborne receiver, *Bernhardine*. This interpreted the system's coded signals, and printed them out on paper tape in the manner of a teleprinter. The airborne receiver also printed out the bearing of the aircraft from the ground station, and identified the station concerned with a code-letter. Once every minute, as the narrow-beam transmission swept past the aircraft, the airborne *Bernhardine* receiver printed a new bearing or orders, or repeated the old ones. The information was presented in the form of a simple code, thus:



The bearing of the aircraft from the ground station was read, in tens of degrees, by taking the number seen at the apex of the 'V' (in this case 270 degrees, or due west). The letter printed every twenty degrees along the bearing scale identified the Bernhard

station concerned: 'K' indicated the transmitter was at Leck in Schleswig-Holstein. The running commentary on the movement of raiding forces was transmitted in standardised form, and it was printed below the bearing information. The air situation reported in the example shown decoded as follows:

- + = beginning of message
- 60 = altitude of the leading aircraft in the bomber stream (i.e. 6,000 metres)
- QR = head of bomber stream at grid reference QR (near Mainz)
- 18 = course of bomber stream 180 degrees due south)
- 100 = estimated strength of raiding force (i.e. 100 aircraft)

Because it relied on beamed high-powered transmissions, and because teleprinter signals, like Morse code, have good 'breakthrough' qualities, the *Bernhard* system would have been almost impossible to neutralise using a conventional jammer such as 'Jostle'. The system was scheduled to enter large-scale service late in the summer of 1945, but the Reich had been overtaken by other events by then.

On 8 May 1945, the war in Europe came officially to an end. But that still left the Allies engaged in a major war against Japan, which was also reaching its climax. The use of countermeasures in that theatre will be described in the next chapter.