



Overview of currently known infrared communication equipment developed in the GDR. Top left: JO-4.02 known as 'Große Dahme'; top right: JO-4.03 'Kleine Dahme'; bottom left JO-4.01, a passive IR set; bottom right Finow I; in the centre infrared signalling devices disguised as ordinary electric torches. (See Chapter 69).

Infrared II Country of origin: GDR

DATA SUMMARY

Organisation: MfS HV A.
Development / Maker: OTS²; VEB Carl Zeiss, Jena; INT.
Year of Introduction: Early 1960s onwards.
Purpose: Agents cross border communication and various other applications.

REMARKS

In 1959 a Western agent was captured in possession of an American infrared (IR) communication set (see Chapter 67). One of the expert witnesses of the trial suggested the development and production of equipment operating on this principle in the GDR. A number of infrared speech communication sets and related equipment was ultimately developed of which the currently known are described in this and the next three chapters. Among the first infrared equipment built for MfS were 'Dahme I'¹ and 'Dahme II'¹.

'Dahme II'



The Dahme II infrared set was used in combination with a photo camera. (See next page for more details).

Though initially used for cross border duplex speech communication by agents, interesting was the use for other applications such as concealed spy bugs, carrier telephone transmission between 7 and 70kHz, and one way video and border crossing signalling devices. Another application of infrared communication was a device which had the infrared led and photo transistor hidden in the glass eyes of a toy fox, placed on the parcel shelf of a car. The other infrared station was hidden in the side searchlight of another car. This allowed inconspicuous speech conversation when the two cars were parked behind each other in a car park. The production and development of the JO models (JO means 'JustierOptik' which translates to 'adjustment optics', a covert name, hiding the production of these sets) was by VEB Carl Zeiss in Jena (CZJ); OTS² produced the Finow and probably 'Signalgeber' (Chapter 69) and other infrared equipment; unknown is the production of infrared equipment at INT (Institut für Nachrichtentechnik, called ALD). All infrared communication at MfS HV A fell under the covert name 'Palme'.

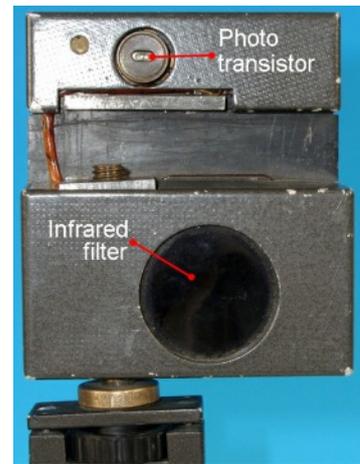
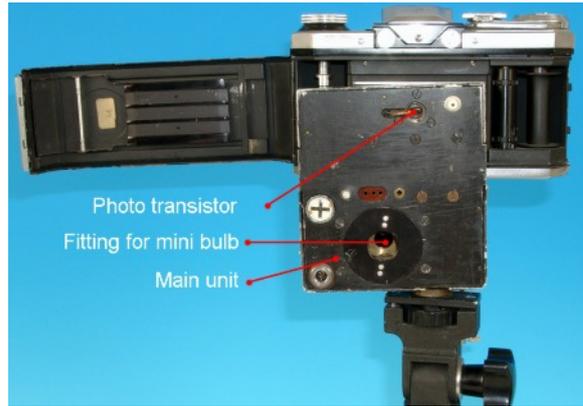
¹ Named after the Dahme, a river near Berlin.

² OTS= Operativ Technischer Sektor des MfS (Operational Technical Branch of the Ministry of Security). Development and small scale production of all special covert and security items, including infrared equipment, was in the hands of OTS, an organisation with over 1000 employees.

References:

- Detailed information and photos for compiling this chapter were provided by Detlev Vreisleben, DC7KG, Germany. Without Detlev's assistance this chapter would not have been possible!
- Detailed photos and technical data of the 'Große Dahme' were included with kind permission of Karsten Hansky, DL3HRT, Germany.
- Enigma 2000 Newsletter, Issue 86, January 2015. pp 2-8.

'Dahme II' (cont.)



One of the earlier developments of infrared equipment for use by agents was the 'Dahme II'. It was used with an unmodified Edixa 35 mm photo camera, intended to be used in the West, working over the Teltow channel to a 'Dahme I' at the other side in the GDR. In the early '60s approximately 10 units were produced. There is no information known on 'Dahme I', except of its existence. The equipment comprised a standard photo camera, the 'Dahme II' main unit with infrared transmitter and receiver, and a control unit for connection the audio gear. The main unit was fitted between the tripod and camera of which only the optics were used for the receiver, and view finder. (Right hand photo taken with camera removed). The transmitter was fitted on the lower part and consisted of an intensity modulated miniature bulb fitted behind an infrared filter. Noted is the later development of a 700bd data only trial model which was completely enclosed in the body of a Practica camera.

Finow I was developed for infrared communication by agents, primarily intended to be fitted in hidden spots, featuring small dimensions and easy to set up without the use of visual means. The station on the other side could be another Finow I, a JO-4.02 or JO-4.03. The range was 100 to 2000m, depending the site and model of station located at the other side. For automatic function to a JO-4.02 or JO-4.03, a third unit 'Quartz' was required, connected to the Finow I transmitter unit. See Chapter 71 for more details on automatic operation.

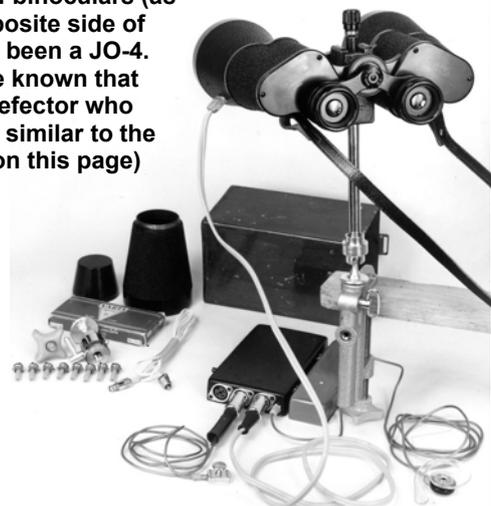
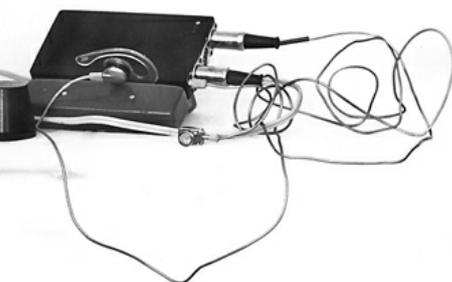
Finow I



Finow I comprised two separate main units: The transmitter (left) and receiver (right with dark lens) which could be bolted together or used separately, both connected to the Control Unit in the centre-left side of the photo.

Finow II

Finow II infrared set, concealed in a pair of binoculars (as seen from front and sight side). At the opposite side of the link was a larger set which might have been a JO-4. This project was cancelled once it became known that the concept was compromised by a MfS defector who escaped to the West. The control unit was similar to the one used with the 'Dahme II' (see top left on this page)



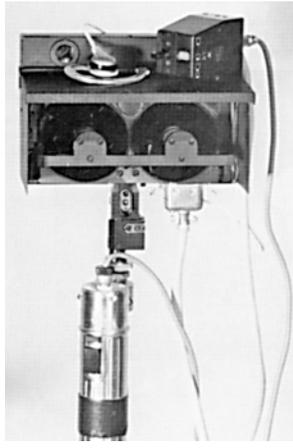


JO-4

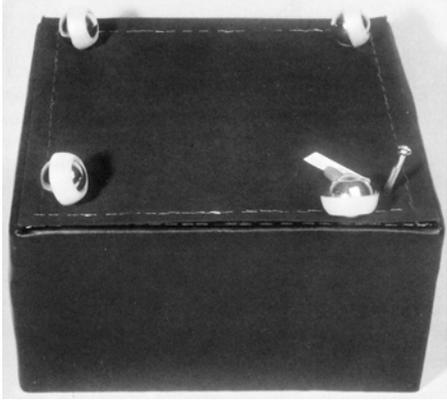
Infrared communication set JO-4, was of the first generation infrared sets (believed to be known as 'Neue Dahme') and the predecessor of JO-4.03 'Kleine Dahme'. It had a range of about 3km, powered by an external 4½V battery. The control unit shown here is an early version using an external microphone. See chapter 71 for the later replacement model.



Photo taken in 1985 showing how a JO-4 might have been used. Taking in account the small width of the infrared beam, the separate microphone and control unit, plus the unstable handheld position, it is more likely that it normally was used mounted on a small tripod.



Found in possession of GDR agent named Horst Jahn was a JO-4 which he used for communicating over the border to the GDR. Shown left is a picture of a captured set which had a later version control unit with built-in microphone. The 4½V battery was in an external holder which was a standard round electric torch of which the bulb was replaced by the power cable terminating in an E10 socket. The complete set was concealed in the false bottom of a piece of furniture, which could only be opened by insertion of a small pin. (right)



Infrared bug



Infrared bug for transmission of conversations picked up by a hidden microphone. The other side of the link could be a JO-4.02, JO-4.03 or even a Finow I of which only the receive side was used.

Cover name	Type	Description/use	Range
Dahme I		Camera set base.	Unknown
Dahme II		IR set in camera.	Unknown
Finow I		Miniature IR set.	100-2000m
Finow II		Binoculars IR set.	Unknown
Neue Dahme	JO-4	Late 1960s	3000m
Unknown	JO-4.01	Passive IR set.	500m
Große Dahme	JO-4.02	Early 1980s.	5000m
Kleine Dahme	JO-4.03	About 1986.	3000m
	JO-4.05	Video transmitter.	Unknown
	JO-4.06	Video receiver.	Unknown

Provisional list of currently known GDR developed infrared equipment.

JO-4.02 'Große Dahme'

JO-4.02, also known as 'Große Dahme', was produced in the 1980s. It was the largest infrared communication set and had a range of about 5km. The two reflectors with secondary mirrors were for transmit (left) and receive (right), allowing full duplex communication. Fitted in centre between the mirrors was a view finder.

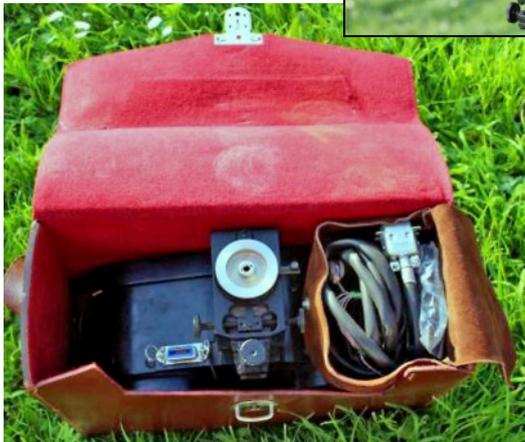
The control unit (shown at the bottom of left photo) had a built-in microphone and a led level indicator for the output of the type VQ120c infrared LED. The nominal output was less than 1mW. At the receiving side was a type SP211 photo transistor. Both components were originally developed for use in punched tape readers etc. and had a diameter of only 1.5mm. An infrared coating was applied to the 130mm Cassegrain reflectors. The optical beam width was 0.18° which resulted at 1km in a beam diameter of 3.1m. The JO-4.02 was also used for the reception of infrared bugs (see page 3 for an example).



A sliding protective hood was provided as protection against the sun and unwanted stray light. (right)



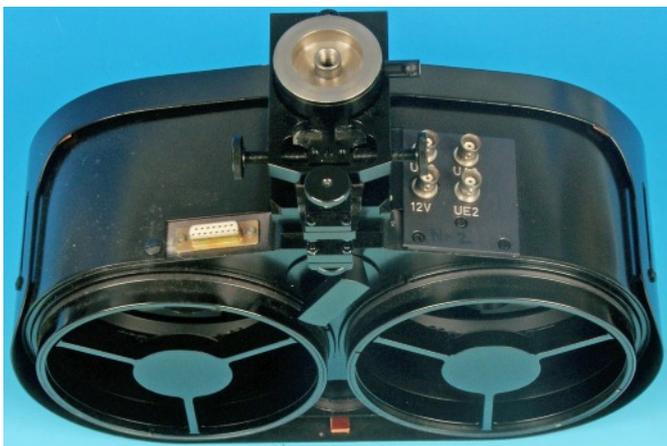
Internal view of control unit with cover removed. Note the microphone (top left), black calling button and volume control below.



The JO-4.02 packed in its leather transit case. This contained the main unit and accessories such as microphone, earphone, cables and cleaning material.



Internal view of JO-4.02 as seen from the rear. Conventional components and transistors were mounted on the PCB. The set had an integrated battery compartment for three AA alkaline batteries. The later developed JO-4.03 was designed with mainly ICs manufactured in the GDR.



A modified JO-4.02 used for one way transmission of video was known as JO-4.05; at the opposite side was the JO-4.06. The external differences to the parent model were extra BNC sockets and a different type of system socket at the bottom.