Volume 2 AMENDMENT No. 15.

Introduction

Refurbished No. 19 Set 'S' and 'TH'.

Recently, I was contacted by Mike Willenbroek (Amsterdam) regarding a rare No. 19 Wireless Set that had long been overlooked in his collection and had only been discovered the previous day. Privileged to borrow the set for detailed inspection and photographic recording, I soon found that it was a standard Canadian Mk.3, designated WS No. 19 Mk.3-S refurbished by the Sinus company in Zeist, Holland, for service with the Dutch Army. Subsequent online search confirmed that this variant had previously been mentioned in a newsgroup as WS No. 19 Mk.3 'Special'.

The loan also included another Dutch-refurbished Canadian No. 19 Set. In this case, the unit was a Wireless Set No. 19/TH, a refurbished Mk.2 by Thermion. The existence of this type was already documented, although I had not previously inspected an example firsthand. Both sets—comprising fifty units refurbished by Sinus and one hundred units by Thermion—were overhauled for the Dutch Army, the Sinus model probably as a temporary measure to replace equipment already classified as beyond repair.

The refurbishment programmes involved the replacement of all the resistors, capacitors, coils, valves, and AF transformers; the removal of the B-Set; and the incorporation of several mechanical and electrical improvements. No official technical documents, circuit diagrams, project files, or troop-trial reports relating to these activities have been located to date. No documented justification has been found for the requirement to extend the communication coverage into the 8–12 MHz band in the 19/TH variant. This addition was technically notable, given that such frequencies were unnecessary for routine military communication within the geographically compact Netherlands. A plausible operational explanation is that the Army required long-range HF communication for use in (former) Dutch New Guinea and Dutch Surinam, where distances, terrain, and atmospheric conditions demanded higher-frequency sky-wave operation. In this context, the /TH model might have been evaluated as a trial set for a full replacement of the already outdated No. 19 Set. By approximately 1955, specifications were drafted for the replacement of the No. 19 Set in 1958 by the KL/GRC-3030, developed and manufactured by 'Van der Heem' in The Hague.

Wireless Set No. 19 Mk.3-S.

Front-panel layout of the Wireless Set No. 19 Mk.3-S.

Top-chassis view of the Wireless Set No. 19 Mk.3-S, showing the revised layout of components.

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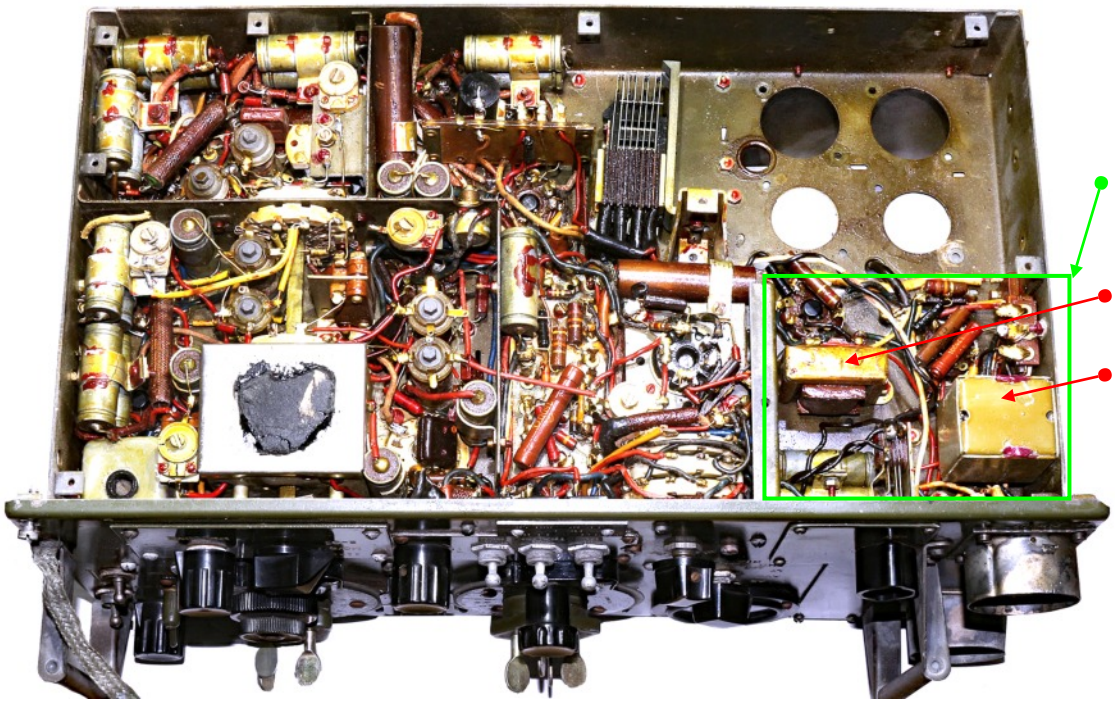
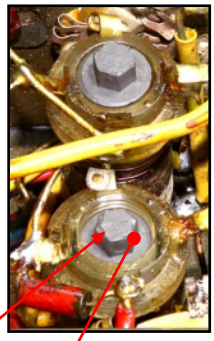


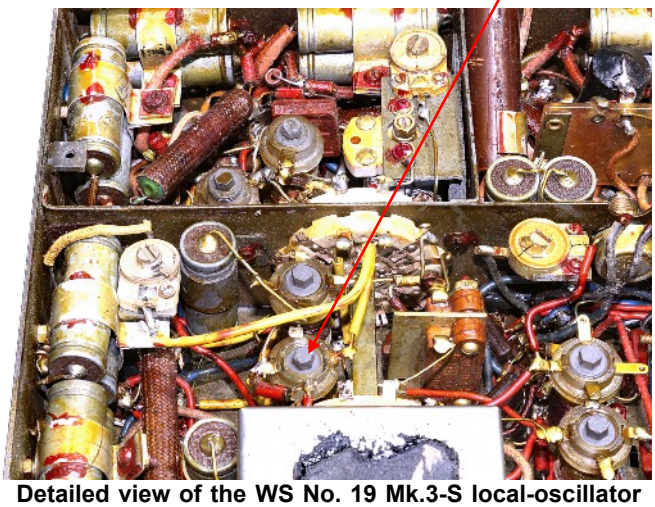
Chassis wiring underside of the Wireless Set No. 19 Mk.3-S, detailing the rewired circuits and updated component configuration.



Adjustable iron-powder cores in the RF coils.

Remarks

The refurbishment of fifty Canadian-manufactured WS No. 19 Mk.3 units into the WS No. 19 Mk.3-S configuration by Sinus, under contract to the Dutch Army, began with the complete stripping of each set, including the removal of the B-set. All valves, condensers, and resistors were replaced, together with the three IF transformers, the IC and the 'A'-Set microphone and AF output transformers.



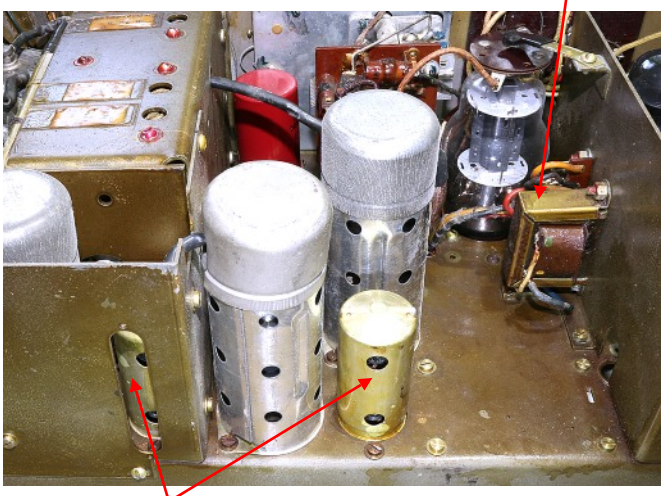
Detailed view of the WS No. 19 Mk.3-S local-oscillator and RF section, showing the RF coils fitted with adjustable iron-powder cores.

Sinus

'Sinus' was originally the trademark of Radio-apparaten en Instrumentenfabriek Ridderhof & Van Dijk, located at De La Reylaan 37–39 in Zeist, the Netherlands. The firm produced wireless broadcast receivers and a range of technical instruments—including transformers, Morse keys, and medical apparatus—from the 1920s until 1941. Following the Second World War, the company, then operating under the name Sinus (previously Ridderhof & Van Dijk), discontinued the manufacture of broadcast receivers but continued to produce a broad assortment of technical equipment.

Among its post-war products were WS No. 18/38 bench mains power-supply units and a batch of fifty refurbished No. 19 Sets supplied to the Dutch Army in the early 1950s. The former Sinus premises remain extant and, after the company's closure, were occupied by various small enterprises, including a car body-repair and paint workshop. The trademark Sinus continued to be used in later years; however, it bore no connection to the former company.

Replaced 'A' Set AF output transformer.



The original intermediate-frequency transformers fitted to the WS No. 19 Mk.3-S were removed and replaced with Philips-manufactured units

References:

- 'Sinus' sales advert in '*Radio-zenders en ontvangers*', by J. Corver, Diligentia, Amsterdam, 1944.
- WftW Amendment Vol. 2 No. 14, 'Sinus' power unit, 2026.
- Info and confirmation retrieved from various Internet sources.

Historic Sinus company site in Zeist, as it appeared some years ago.

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Wireless Set No. 19/TH.

Front-panel view of a Wireless Set No. 19/TH.

Thermion.

Apparatenfabriek Thermion N.V., founded in 1931 as a manufacturer of wireless valves, was originally located in Nijmegen in the Netherlands. In the following years, the company expanded its activities to include the production of broadcast receivers, DIY radio kits, amplifiers, and related electronic equipment.

In 1937, the company relocated to Lent, a village situated north of Nijmegen on the opposite bank of the river Waal. The factory sustained partial destruction during the later stages of World War II.

In 1947, the complex was rebuilt and enlarged, giving it an appearance that differed from its pre-war form. In the post-war period, while still producing valves, Thermion also engaged in the assembly of Hoover washing machines, the manufacture of camping equipment, and the overhaul of military communication systems. Philips acquired the company in 1957 and continued operations at the site—such as the production of components and semiconductors—until its closure in 1984. In 2005, the municipality of Nijmegen purchased the main building and the boiler house (Ketelhuis). Since then, and continuing to the present day, both structures have served as a multi-tenant business and medical facility, as well as a restaurant.

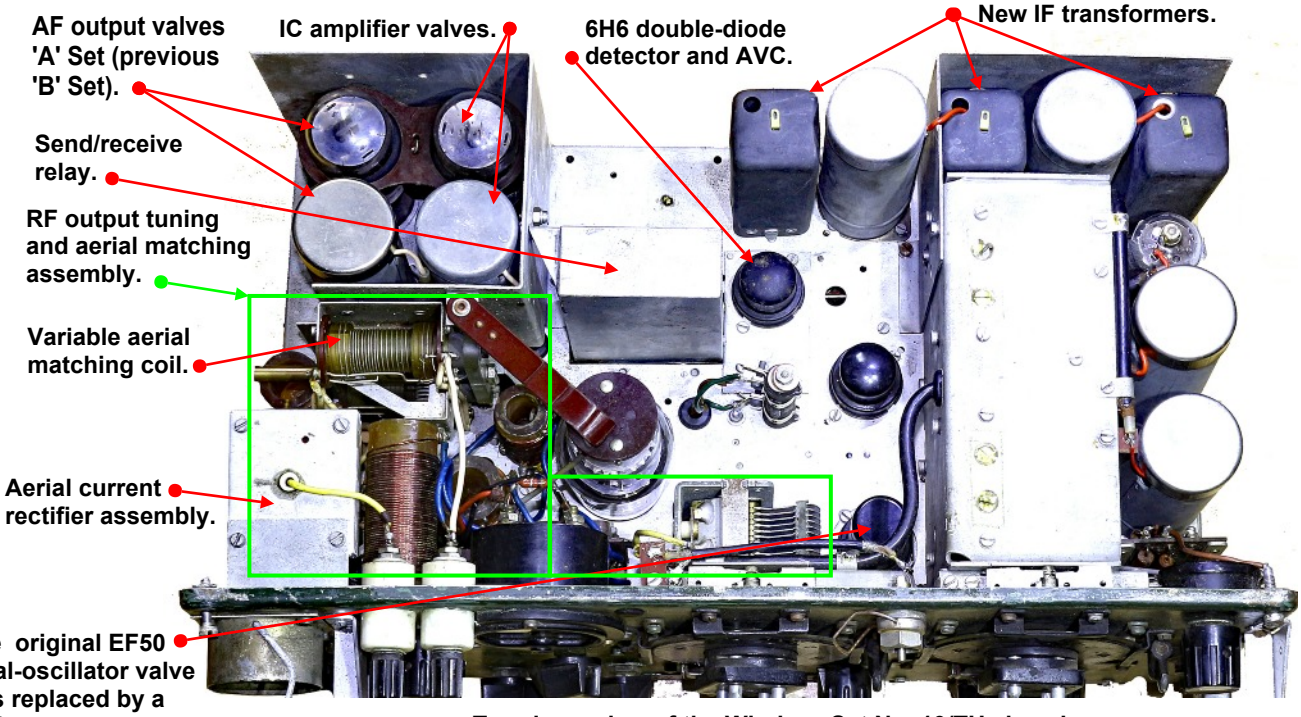
Remarks.

Modifications requested by the Army and carried out by Thermion during the refurbishment of the original Canadian Wireless Set No. 19 Mk. II—resulting in the No. 19/TH—were considerably more substantial than those incorporated into the Sinus No. 19 Mk. III-S. The most significant change was the addition of a third frequency band, extending the operating range from 2 to 12 MHz. Thermion also replaced the original combined detector/AF output valve with a 6H6 double diode serving as detector and AVC, while retaining the original B-Set, which was now used as the A-Set AF output amplifier.

Furthermore, an aerial selector switch was introduced, enabling the set to be matched to a whip (rod), reel (wire), or doublet aerial (a non-resonant, open-wire-fed dipole). This innovation eliminated the earlier requirement for an aerial variometer.

Recent photographs of the fully restored former boiler house with original chimney, (now a restaurant, right) and the former factory, now a multi tenant business complex. (left).

The serial number plate above indicated the manufacturer (Thermion), the contract quantity (100 units), and the individual serial number (5).



Top-down view of the Wireless Set No. 19/TH chassis.

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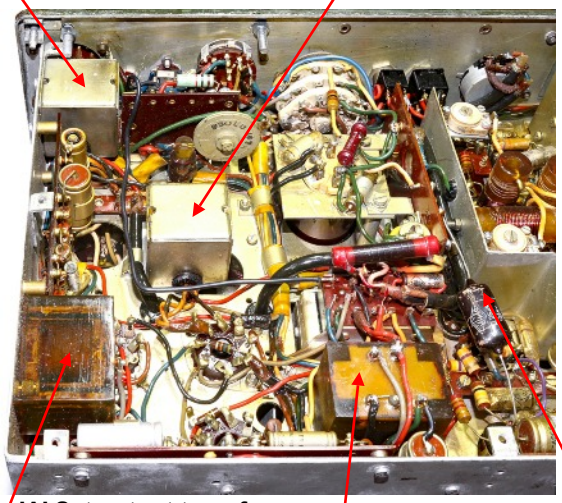
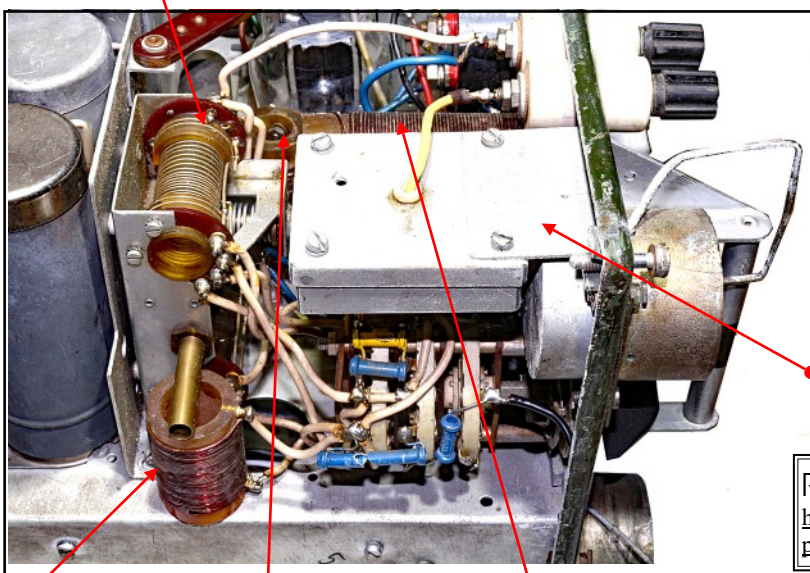


Detail view of sections of the chassis underside showing the 'A' Set AF output amplifier—previously part of the 'B' Set—and the Intercom amplifier.

Detail of the RF section in the bottom view of the chassis, showing the installation of new coils and most of the condensers, along with the replacement band-switch assembly.

Condensers of the older WIMA series, especially polycarbonate film types, had a general reputation for catastrophic failure. They became notoriously failure-prone due to moisture ingress, aging of the dielectric, and metallisation degradation. (It was not impossible that this Wima condenser was a later replacement after being released by the Dutch Army).

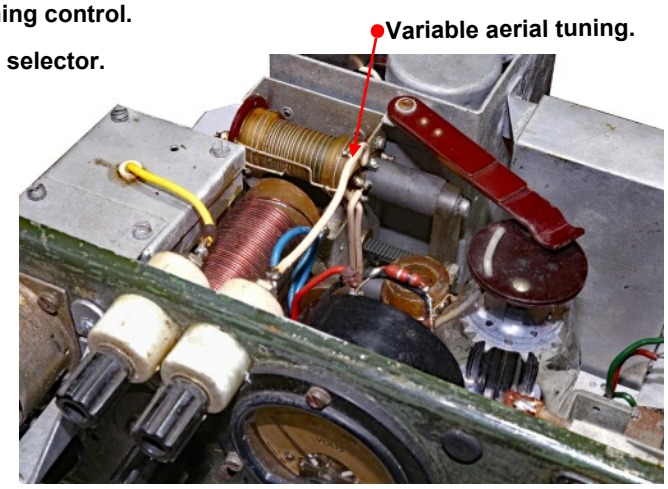


RF PA tuning and aerial matching.

Detail view of the RF aerial tuning assembly with a standard RF output current transformer on top. The sliding-coil unit appears to be of U.S. origin, suggested by American terminology such as whip, reel, and doublet. Its design shows similarities to the iron-powder core tuning assembly used in the SCR-694 (1944) and AN/GRC-9.

Refereces:
https://fabriekofiel.com/wpcontent/uploads/2020/05/philips-erfgoed-splendor-thermion.pdf

Acknowledgement:
Many thanks to Mike Willenbroek for the loan of the Mk.3-S and 19/TH sets from his collection.



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