APPENDIX 1

OTHER CIA SETS By Pete McCollum ©

Apart from the generally known CIA sets, covered in Pete's website, WftW Volume 4 and this Supplement, the sets listed below were known to exist, but detailed information was lacking, so the description is brief. Most of the information for this Appendix came from the CIA's "Electronic Reading Room" site at https://www.cia.gov/library/readingroom/ .

RS-5 Mentioned in documents from February 1950 (when it was "under development") to April 1954 [ref 107, 125, 130, 131, 132, 134, 135, 136, 137, 139, 144]. The RS-5 is often mentioned together with the RS-1 and RS-6. Mentioned April 1958 in an RT-21 memo; becoming "surplus" in 1960. Power output 2 watts. Lower power consumption than RS-11 or RT-21.
RS-11 Includes RT-11C xmtr and RR-11C rcvr.
RT-11C prototype built Dec 1956, based on RT-11B. "A" model existed also. Two bands: 4-8 MC and 8-16 MC. Two 1AD4's, two 5A6's, CR-18 crystal. 6 watts output, neon bulb side-tone osc. Half-power switch turns off one 5A6.
RR-11C based on RR-11A. Tubes 1AD4 x 3, 1C8, 1AK4 x 3, TG9 crystal diode. Tuning dial mylar tape on rollers [like RR-49?].
RS-13 Proposed development discussed October 1954. NEMS-Clarke was the contractor. Design shall operate from 12VDC battery with a universal charger, use the RR-6A receiver intact, other portions to possibly use RS-6A components if applicable. Includes a 300 WPM keyer. Use plug-in tuning units instead of a bandswitch. Final tube is 1614 (ruggedized metal 6L6), 25 watts out, 3-24 MC, 600V on the plate. Two other miniature tubes: oscillator and multivibrator. Xmtr size was initially 2-5/8 x 4-5/16 x 8 inches; tuning unit 1-1/8 x 1-1/2 x 4-1/2 inches (concern that this is too large – desired to be the size of king-size cigarette pack). PS is about the same size as the xmtr; battery charger is a separate unit operating from 70-240 VAC 40-400 CPS. The set is housed in a suitcase.
The keyer is motor-driven, using paper tape that is hand-inked with a pen with conductive ink, using a plastic stencil. "As the tape is pulled through the keying head, four spring-loaded contacts scan the tape by contacting the conducting marks. Combinations of pairs of contacts conducting determine the transmission of marks and spaces. Keying is frequency shift with a 1000 cycle shift. … Initial contact with the base station is made by transmitting 110 cycle dots generated by driving the multivibrator with the output of the 110 cycle power supply vibrator.". This appears to be the first instance of a medium-speed keyer, as there were concerns about testing it in Europe, because the opposition would then learn that we were using this type of system. The RS-13 system was imitating a foreign system that was known to exist using a graphite-based ink-on-paper scheme. A type AR-2 Hellschrieber printer was used to receive text with the RS-13.
Field testing started April 1955 in Lexington, KY and Denver, CO. Tested on 8 frequencies between 3 and 16 MC. In July, further tests were conducted at St. Louis and Denver. By September 1955, the RS-13 system had been "tested and accepted", and made available for issue.
Base station receiving equipment was tested using two methods: 1) The received signal is converted to a 10 KC beat by an RBR-13 converter with an SP-600 receiver, recorded on magnetic tape at 30 IPS, then played back at 1-7/8 IPS for audible copy. 2) A URA-8A FSK converter feeding into a McElroy RAPC "undulator" which writes the received signal directly on a paper tape. The scheme based on the RBR-13 was preferred based on the results of the July 1955 field tests.
In early 1956, design changes (these and others) were initiated: 1) Change to support A1 (Morse CW) transmission; 2) Change antenna loading system to be similar to RT-6, and support a single antenna; 3) Reduce acoustic noise; 4) Support operation from AC power (presumably without requiring a battery); 5) Change the tape marking template to work with standard Scripto pencils using IBM electrographic lead. In May 1956, these modifications became known as "RS-13A" for units modified by NEMS-Clarke, and "RS-13B" for a second unknown contractor in California, whose name is abbreviated with 2 or 3 letters. RS-13B deliveries were expected to start in December.
In June 1956, the set was discussed/demonstrated with "SMOTH" (British Intelligence Service). SMOTH had a similar set at that time. They pointed out some weaknesses of the RS-13 system (which CIA Commo was "well aware of").
In April 1957, deliveries of RS-13 sets were to be suspended pending the outcome of the development of the new AS-3 system.
RT-15 xmtr. In 1955, proposed replacement for commercial HT-4 xmtrs. Procurement suspended; looking into T-368 and GPT-750.
RS-16 High-Speed Agent Communications System. Prototype under development, April 1957. Sets being refurbished Sept. 1961.
RS-18 Agent Tri-Phase Communications Set. Under development, April 1957.
AS-3 Under development, April 1957.
ASR-1, ASR-2 Audio Surveillance Receiver, August 1957. ASR-1 is lo-band, ASR-2 is hi-band, 50-200 MC. Used with RT-3R xmtr (a surveillance xmtr, not related to RT-3 – a transmitter which was part of the RS-1). Typical mics are Shure MC-30 and RCA BK-6B. ASR-3 project also being considered.
RR-33 receiver, 1959. A modified and repackaged Zenith Royal 500 transistor radio. Operates 3-12 MC. Mods include: Output jack for headset operation; FT-243 crystal holder; External connector for plugging in an external power pack composed of "D" cells. The first 20 of 40 sets were delivered April 1959. A subsequent study project in April was done to determine the feasibility of modifying Royal 500D radios to operate 3-6.5 MC, but without repackaging the radio. The mods were limited to the RF and oscillator stages. Sensitivity was OK, image rejection was poor, upper tuning range was limited to 6 MC.
RT-21 xmtr. 3-30 MC in 3 bands; xtal or external VFO. Built-in hand key, RF meter on front panel. AC PS (270-70V), also 12VDC input. Breadboarded in late 1959; first delivery about April 1960. 2 watts output, using two 2N1337 in the final. 25 transistors total. Has an auto-tune capability. Problems with mechanical oscillation during tune. Concern that RT-21 duplicates RT-11 xmtr.

RT-27 xmtr. First sample available Dec. 1958. Contractor in Phila. PA. 3-32 MC in 2 bands, xtal or VFO. RP-27 PS, 110 or 220 VAC. Tubes 6197 x2, 4CX250D.
RS-19 Agent Short-Range Communications Set. Prototype tested April 1959, operated at 7 MC.
RS-23 Radio Relay System. 3 systems tested April 1959.
RS-43 Portable Microwave Communications System. Testing August 1962.
RT-38 xmtr. Feb. 1963. 4.5-15 MC in two bands; 6-9 watts output. Six xtal channels. Ni-Cd battery.
RS-48 March 1963, RR-48A is 3.5-12 MC, RR-48B is 10-20 MC. Memo says RR-D/11 are all committed, and RR-49 still one year away, thus no modern rcvr available for above 12 MC – procure 100 RR-48B's ($125 each) while waiting for RR-49.
RR-48A rcvr, from the manual: 3.5-12 MC, four xtal channels, Morse, tone, or voice. Channel 1 xtal is on front panel; other three are inside. Operates from a single 1.5V AA battery. Physical size appears to be about 4" x 3" x 1.5".
RT-48 and BS-48 rechargeable battery. RT-48 appears to be about 5" x 4" x 1" (?). 4-16 MC in 2 bands. Single xtal on panel. Use with AN-58 antenna. BS-48 battery has integral AC charger.
RS-50 Carrier-current transceiver.
RS-54 Memo January 1964 says "The RS-54 is a replacement for the AN/URC-4 transceiver". Bids being solicited.
RS-69 became available Summer 1965. In April 1965: "…the RS-69 (former AN/PRC-64), which is due soon,…" (see under RS-100).
ASR-100 VHF Survival Radio. Became available late 1965. Only available replacement for URC-4, but not ready for August 1965 need, will have to use URC-4. URC-11, URC-10, and Navy AN/RRC-49 also mentioned. In July 1966, experiments with ASR-100 in a ground-to-air relay system.
RS-100 / RS-101
RS-100 could be procured in 1966, discussed as an RS-1 replacement. Medium-speed transmission capability; reception; synthesized freq control; message preparation; all within one case. RS-101 will be procured instead: adding voice capability for para-military use; deleting medium-speed (but it can be added with an accessory). ["Medium-speed" means (for example) 300 WPM with a burst-coder.]
It appears that the RS-101 was a predecessor to the TAR-224: It is 2-24 MC, the physical size is the same as the TAR, it used the same military-style audio connectors, had an auto-tune capability, and the contractor was very likely AVCO (progress meetings were in Cincinnati, which is where AVCO was). The RS-101 supported an AM-voice mode; 20W CW, 5W voice. It was "intended for para-military operations". Development started mid-1965; early testing was in mid-1966; full production was about mid-1967. There were problems with the xmtr power transistors.
This tends to explain why the TAR-224 has military audio connectors: it was an existing requirement for para-military use, carried over from the RS-101. Memos mention using the military H-251 headset.
In April 1965, there was a discussion saying: "There was considerable discussion on the role the RS-100 would play in CIA clandestine operations. It was generally agree that the RS-100 was not being considered as a catch-all replacement for the RS-1, because we now have, or have coming, equipments which will provide a family of units from which to select equipment for a specific operation, depending upon the particular requirement. This represents a change from the situation a few years back when almost all para-military requirements were met by one single set. The RS-48 and RS-49 in waterproof carrying cases were displayed as examples of equipments that could be used for many operations and the RS-69 (former AN/PRC-64), which is due soon, would add further variety to the equipment available."
The OS/B-100 was a "digitally tuned oscillator" (PLL synthesizer) accessory.
The AN/B-101 was an antenna coupler with a 15' whip antenna.
CK-30 keyer, July 1966. Stores 300 groups on magnetic tape; keys at 300 WPM. Much smaller than the previous CK-8 system. Perhaps an early version of the GRA-71-type coder/keyer system?
RR-59 receiver. 2-16 MC; 10-channel xtal matrix; 4-1/8" x 2-5/16" x 1-5/16". Prototype August 1966.
RT/A-60 xmtr. Nov. 1966; two prototypes coming. Prototype demo'd with KE/A-8 and KE-29 keyers.
RR-75 receiver. 2-7 MC; 3 internal xtals and 1 external; ferrite loop antenna. Replacement for RR-44.
RT-66 xmtr. Oct. 1967; recommended to replace RT-49. Some RS-49 systems being transferred to DIA. RS-49 stock will be depleted by end of 1968.

APPENDIX 2

OBSERVED CIA EQUIPMENT NOMENCLATURE By Pete McCollum ©

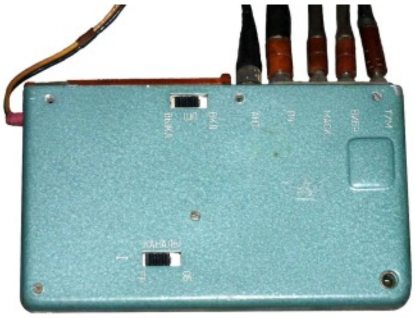
The list below details the nomenclature used for most CIA equipment. The items in square brackets are examples of the nomenclature.

AM Antenna Tuner
AN Antenna
AP AC Power Supply
AR Receiving System
AS Automatic Station [AS-3]
ASR Audio Surveillance Receiver [ASR-1]
AT Automatic Station Transmitter [AT-3]
AU Accessory Unit
BC Battery Charger [BC-16]
BN Beacon [BN-2]
BS Battery PS
BT Tape Recorder
CA Tape cartridge [CA-3B]
CB Tape Recorder
CC Crystal Case
CK Coder-Keyer [CK-30]
CL Clamp (used with HG)
CM Crystal Matrix [CM-48]
CO Coder [CO-3B]
CP Control Panel [CP-4]
CR Collection Receiver (i.e. intercept)
CRA Collection Receiver Aperiodic [CRA-4]
CU Timer/Actuator
CV Converter
DD Dual-Diversity receiving system [DD-1]
DS Display System
ER Equipment Rack [ER-3]
HG Hand-crank Generator [HG-48]
HK Hand Key [HK-1]
HRS Homing Receiver System (?) [HRS-23]
HRT Homing Radio Transmitter (?) [HRT-2]
IS Infrared Communication System [IS-5]
KE Keyer [KE-8]
KT Tool Kit [KT-2]
OS Oscillator (VFO or freq. synth.)
PS Power Supply
RA Radio Accessory [RA-2]
RR Radio Receiver [RR-2B]
RP Radio Power supply [RP-2]
RS Radio Station [RS-1]
RSR Radio Switch Receiver [RSR-1]
RT Radio Transmitter [RT-3]
SRR Surveillance Radio Receiver [SRR-4]
SRT Surveillance Radio Transmitter [SRT-3]
ST Surveillance Transmitter [ST-2A]
SY Synthesizer, voice line message [SY-3]
TAR [TAR-224 - Possibly “Transmitter And Receiver”?.
Note that “TAR-224” may be an AVCO designation (not CIA),
since their name appears on the front panel, and in the manual.]
TK Training Kit
TP Tape Printer [TP-3]
TS Test Set
TV CCTV
UGP Gas Generator [UGP-12]
UPI Universal Power Inverter (?) [UPI-10]
URR Universal Radio Receiver (?) [URR-10 DF rcvr]
URT Universal Radio Transmitter [URT-11]

APPENDIX 3

Summary of Warsaw Pact covert (VHF FM) radios

This appendix is a condensed overview of technical and operational specifications of the currently known Warsaw Pact body wearable covert radios, including intercept/DF receivers, used by special forces and security agencies.

Body wearable covert radios		
 NEVA Chapter 140	 CHAIKA Chapter 181	 KAMA Chapter 182
 KIARA Chapter 183	 ANKER Chapter 184	 ALYCHIA Chapter 185
 ACCACIA Chapter 186	 ‘CIGAR CASE’ Chapter 187	 ATAKA Chapter 188
 ARYK Chapter 192	 ANGSTREM Chapter 193	 AIWA Chapter 194

VOLZHANKA Chapter 195

O2R2 Chapter 199

Covert radios produced in Czechoslovakia.

PR-35 Chapter 120

PR-36 Chapter 121

PS-31 Chapter 65

Covert Direction Finding/Intercept receivers

FILIN Chapter 104

SINITSA Chapter 105

SOYKA Chapter 106

Special covert receivers

ORANGE-2 Chapter 189

KOPCHIK Chapter 190

LILY Chapter 191

Channel numbers

The apparently cryptic band and channel numbers of e.g. Angstrem and Alycha was basically simple.
Remove the C, - , /, add a point before the last three digits, and a 0 if required. Note 25kHz channel spacing.

Channel C17-19/25 is 171.925MHz.
Channel C17-8/75 is 170.875MHz.
Channel C17-21/25 is 172.125MHz.
Channel C15-10/25 is 151.025MHz.

At the time of writing, information on channel numbers in the C9 range e.g. used in the Kama, Acacia and Ataka, had not been found.

Type	Chapter	Period of use	Freq band	Channels	Mod Mode	Scram-bler y/n	Remote control	Purpose	Carrying Method	RF out	Aerial	Technol.	Power source	Chan. Space
Neva	140	1958	148-149	Free tune	AM	No	Yes	Surveillance	Harness	0.5-1W	Miniflex/wire	Valves	Silver-sink	
Chaika	181	1970s	148-150	1	FM	No	Yes	Surveillance	Cloth vest	0.5W	Wire	Transistor	9V Nicad/batt	
Kama	182	1968	148-150	1 or 2	FM	No	Yes	Surveillance	Canvas bag	Unknown	Wire	Transistor	Nicad	100
Kaira	183	1989	148-150	2	FM	No	Yes	Surveillance	Harness	0.5W	Wire	Transistor	8V Nicad/batt	
Anker	184	1983	148-150	2	FM	Yes	Yes	Surveillance	Harness	Unknown	Wire	Transistor	Nicad	
Alycha	185	1980s	170	2	FM	No	Yes	Surveillance	Belt	Unknown	Wire	Transistor	Nicad	25
Acacia	186	1970s	148-150	5	FM	Yes	Yes	Surveillance	Pocket / sling	Unknown	Wire	Transistor	12.5V Nicad	50
Cigar case	187	1980s	148-150	2	FM	Yes	Yes	Surveillance	Pocket	Unknown	Wire	Transistor	Nicad	50
Ataka	188	1980s	148-150	2	FM	No	Yes	Surveillance	Carrying case	Unknown	Wire/blade	Transistor	Nicad	50
Aryk	192	1980s	148-150	2	FM	No	No	Surveillance	Fixed/vehicle	Unknown	Rod	Transistor	AC mains	25
Angstrem	193	1970s	150-170	1-8	FM	No	No	Surveillance	Pocket	0.5W	Miniflex	Transistor	7V Nicad	25
Aiwa	194	1980s	40	18	FM	No	Yes	Surveillance	Pocket / strap	2W	Miniflex	Transistor	9V Nicad	
Volzhanka	195	1970s	150	5	FM	No	Yes	Surveillance	Unknown	Unknown	Unknown	Transistor	Nicad	
O2R2	199	1950s	40	Free tune	AM-FM	No	Yes	Surveillance	Backpack	Unknown	Kulikov	Valves	2.4V accu	
PR-35	120	1977	80-160	3	FM	No	Yes	Surveillance	Pocket	0.3W	Miniflex/wire	Transistor	NiCad	25
PR-36	121	1988	80-160	5	FM	Yes	Yes	Surveillance	Pocket	0.3W	Miniflex/wire	Transistor	NiCad	25
PS-31	65	1980	80	48	FM	Yes	Yes	Surveillance	Sling	1W	Miniflex/rod	Transistor	12V Nicad	25
Filin	104	1970s	24-308	Free tune	AM-FM	No	No	Interception/DF	Harness	N-A	Loop	Transistor	12V Nicad/batt	
Sinitsa	105	1980s	30-1000	Free tune	AM-FM	No	No	Interception/DF	Harness	N-A	Loop	Transistor	12V Nicad	
Soyka	106	1970s	0.7-30	Free tune	AM-FM	No	No	Interception/DF	Harness	N-A	Loop	Transistor	9V Nicad/batt	
Orange-2	189	1978	148-150	1	FM	No	Yes	Surveillance	Wrist - pocket	N-A	Wire	Transistor	Nicad	
Kopchik	190	1970s	Aperiodic	Wide band	AM/FM	No	Yes	Surveillance	Pocket	N-A	Wire	Transistor	Nicad	
Lily	191	1980s	VHF	Wide band	FM	No	Yes	Surveillance	Unknown	N-A	Grnd. Plane	Transistor	Nicad	

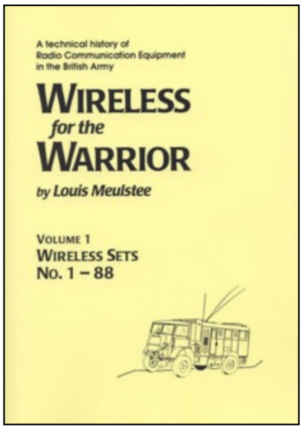
Technical and operational features of the currently known Warsaw Pact covert (VHF FM) radios.

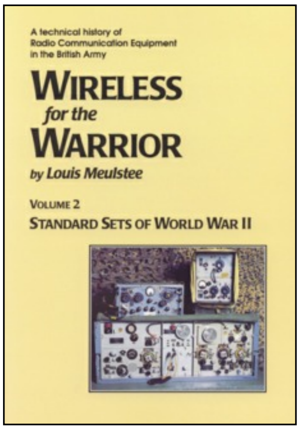
It should be noted that part of the information provided in this appendix was generally based on a number of Internet sources, which could obviously not be verified against official records, even since the equipment has been obsolete and regularly offered for sale on flea markets and eBay.

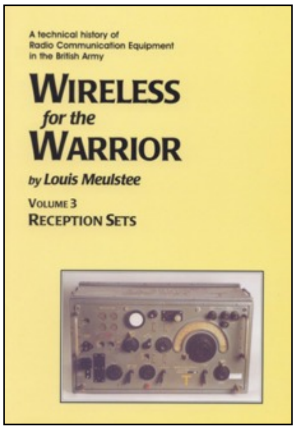
Notes

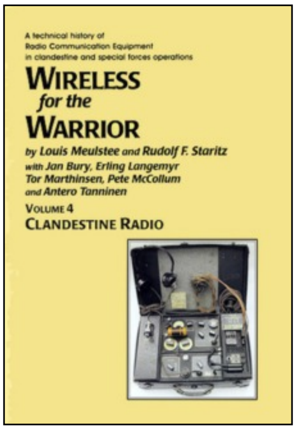
About the Wireless for the Warrior books.

The Wireless for the Warrior range of books (comprising the **Volume** and **Compendium** series) are intended as a source of reference to the history and development of radio communication equipment used by the British Army from the very early days of wireless up to the 1960s. Line equipment and military radio communication equipment from other countries is also covered in the recently published Compendiums. For detailed information, review pages and order information visit www.wftw.nl

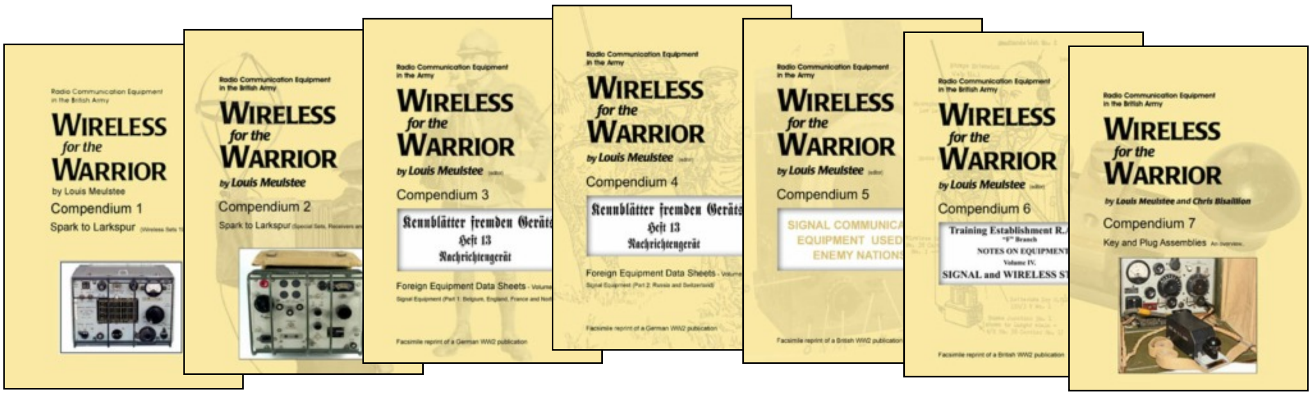




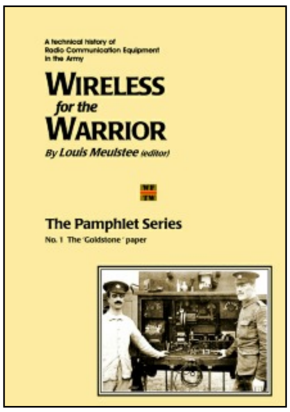


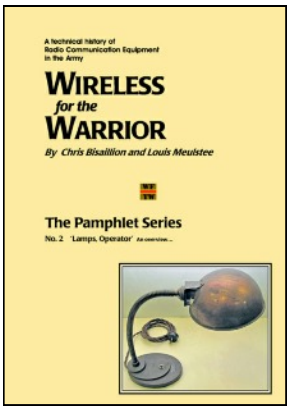


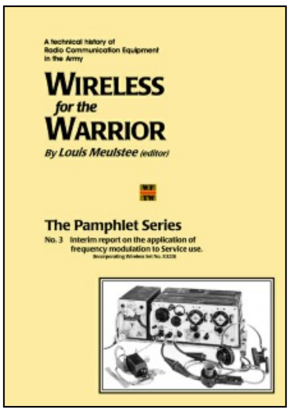
The books in the WftW **Volume** series are very detailed and include circuit diagrams, technical specifications and alignment data in addition to technical development history, complete station lists and vehicle fitting instructions. Generally no operational histories are given as these have been published extensively in numerous other books.

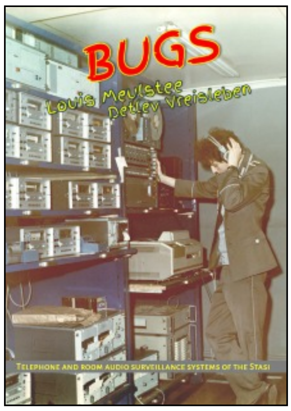


The WftW **Compendium** series is a new addition to the Wireless for the Warrior range, currently comprising 7 books. The new series is principally intended as a practical guide and reference source to vintage military signal communication equipment. The books are particularly valuable to anyone with an interest, professionally or otherwise, in this subject, requiring an elementary but complete quick reference and recognition handbook. Containing condensed data summaries, liberally illustrated with photos and drawings, explanatory captions and short description of the main ancillaries, its pocket size format and laminated soft cover makes it an ideal reference and reliable companion for events such as auctions and radio rallies, or just for browsing at leisure.









The WftW **Pamphlet** series is the latest addition to the Wireless for the Warrior range, created to accommodate a future range of reprints of articles and reports of historical importance, hitherto not published documents, and technical reports on British Army signalling. This new series replaces the now discontinued 'Overview' booklets, free to download and print ready.

WftW **'BUGS'** is the newest book describing the technical history of telephone and room surveillance systems of the Stasi.