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CENTRAL INTELLIGENCE AGENCY

INFORMATION FROM
FOREIGN DOCUMENTS OR RADIO BROADCASTS

REPORT

CD NO.

STAT

COUNTRY USSR

SUBJECT Scientific - Electronics, receivers

DATE OF INFORMATION 1952

HOW PUBLISHED Monthly periodical

DATE DIST. 5 DEC 1952

WHERE PUBLISHED Moscow

NO. OF PAGES 3

DATE PUBLISHED Jun 1952

LANGUAGE Russian

SUPPLEMENT TO REPORT NO.

THIS IS UNEVALUATED INFORMATION

SOURCE Radio, No 6, 1952, pp 19-20.

THE ARZ-51 AND ARZ-52 RECEIVERS

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The ARZ-51 receiver is a modernization of the well-known ARZ-49. The ARZ-51 receiver (see appended figure) differs from its predecessor in many features. A 6P6S (6V6) tube is used in the output stage in place of a 30P1M and a 6Ts5S (6X5) is used together with a power transformer in a full-wave rectifier circuit to replace the half-wave selenium rectifier. Moreover the reflex, output, and detector stages and the AVC circuit have been changed. The changes in the detector and reflex stages and the increased plate voltage have considerably improved the frequency response and cut down nonlinear distortion, especially for large signals.

The input circuit, the oscillator, and the i-f amplifier were not changed.

The features of the ARZ-51 are discussed below.

Rectifier

The voltage is fed to one rectifier plate from sections IA, IB, and IC of the primary winding and to the other plate from the secondary winding of the power transformer. The rectifier filament is supplied by a specially insulated winding III which eliminates the possibility of sparkover between the cathode and heater.

Reflex Stage and Detector

The reflex stage has been simplified and its quality characteristics improved. The af voltage from the volume control which enters the detector load passes through capacitor C28 and grid coil L7 of the first i-f filter directly to the grid of the 6B8S. Resistor R7 is the plate load for af currents. From this point, the amplified af voltage passes through capacitor C20 to the control grid of the output stage.

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Resistor R12, together with capacitor C21, form a filter which prevents self-excitation of the reflex stage when the volume control is set for maximun output or close to it.

The output stage is of the usual type, employing negative feed-back (the bias resistor is not shunted by a capacitor). Compensation of background noise with the auxiliary winding of the output transformer is not used in the ARZ-51 and ARZ-52.

The electrical parameters of the ARZ-51 receiver are as follows: frequency bands, 150-415 kc (722-2,000 m) and 520-1600 kc (187-576 m); the sensitivity is not less than 200 mv, the adjacent channel selectivity (for detuning of ± 10 kc) is not less than 26 db (20-fold); the image channel attenuation is 15-20 db (tenfold); the output power is 0.5 va, with a harmonic content of less than 5%; and the frequency response is 150-3500 cps, with a variation of not more than 10-12 db (threefold). For an input voltage change of 26 db (20-fold), the output voltage does not change by more than 6 db (twofold).

The power drawn from the ac line is not more than 35 w.

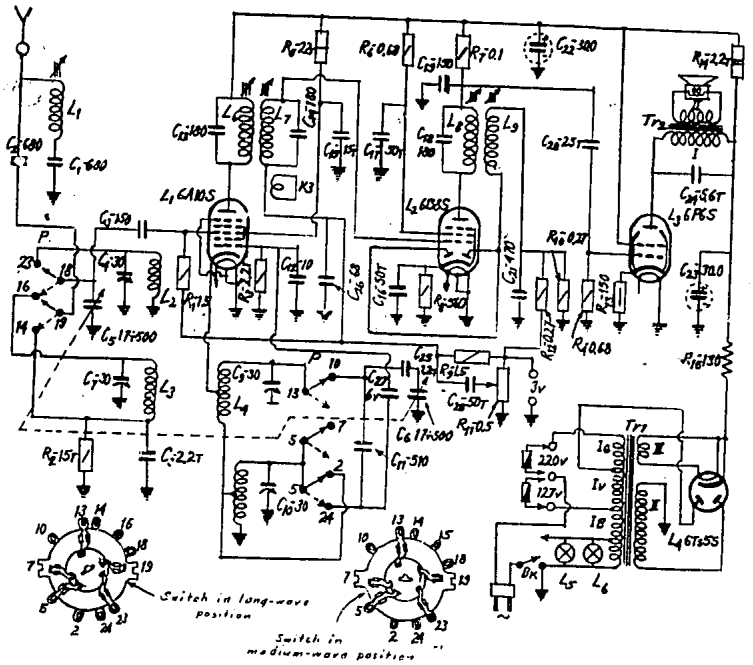
The ARZ-52 receiver has a more uniform frequency response because the tuned circuit in the grid of the 6B8S is tuned to a somewhat higher frequency and the tuned circuit in the plate of the converter to a somewhat lower frequency than the i-f tuned circuit in the plate of the 6B8S, which is tuned to 112 kc.

The assembly of the ARZ-51 and ARZ-52 receivers is the same as that of the ARZ-49. All the coils have the same specifications as in the ARZ-49 receiver (see Radio No 5, 6, 1949), except that coil L6 in the ARZ-52 receiver consists of three sections having 290 turns each (in the ARZ-51 and ARZ-49, it has three sections of 265 turns each); to reduce the circuit Q of L7C14, a steel ring KZ (shorting loop) is attached to the coil form in the ARZ-52 receiver.

The output transformers of the ARZ-51 and ARZ-52 have cores of standard Sh-16 laminations with a stack thickness of 16 mm; winding I has 2,500 turns of PEL-1 Q1 wire and winding II has 61 turns of PEL-1 0.51 wire.

The power transformers of the ARZ-51 and ARZ-52 have cores of standard Sh-24 laminations with a stack thickness of 30 mm. Section IA of the first winding has 38 turns of PEL-1 0.8 wire; section IB has 655 turns of PEL-1 0.2 wire; section IV, 355 turns of PEL-1 0.18 wire; and section IG, 165 turns of PEL-1 0.18 wire. Winding II has 1,130 turns of PEL-1 0.15 wire and winding III has 37 turns of wire PEL-1 0.51.

[Appended figure follows.]



Schematic Diagram of the ARZ-51 and ARZ-52 Radio Receivers. The Switch Positions Indicated by the Solid Arrows Correspond to the Medium-Wave Band; Those Indicated by the Broken Arrows Correspond to the Long-Wave Band. The Short-Circuited Loop K2 Is Not Present in the ARZ-51 Receiver.

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