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INFORMATION REPORT INFORMATION REPORT

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REPORT

SUBJECT English Translation of a Manual on a Soviet Airborne Transmitter Entitled Description of the Medium-Wave Unit "SVB-5"

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DESCRIPTION OF MEDIUM-WAVE UNIT SVB-5

LIST OF ILLUSTRATIONS

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ATTENTION!

Since October 1957, the monitoring circuit of the radio set has been changed whereby the audio signal from the detector (Д-101) is fed directly to the audio frequency amplifier (Д-305), by-passing the mixer (Д-301) through an additional capacitor C-333 of 1,000 pf. Capacitor C-333 is connected between terminal "И" and the control grid of Д-305 in the antenna element. Resistor R-317 is eliminated.

The capacitance of C-329 was changed from 510 to 1,000 pf.

In this connection a note is introduced on the schematic diagram in the specifications.

Chapter I. [SPN 3]

General Information on the Medium-Wave Unit SVB-5

The medium-wave unit SVB-5, as with the type 805 radio set, is an aircraft-type transmitting set designed for [Note: the remaining portion of this page was covered by a sheet containing the following information.]

NOTE!

During joint operation of the medium-wave unit with the radio transmitters R-805 and R-806, the following changes are made in the medium-wave unit.

Paragraph Number	Page	Line	Reads	Should Read
1	67	3rd from bottom	KSO-2-500-A-II	KSO-5-500-A-1000-II
2	68	2nd from top	—	Moulded mica capacitor C-333 KSO-5-500-A-1000-II Conversion from rectifier of the indicator to the grid of the 1st stage of the af amplifier
3	70	4th from top	Resistor R-317 carbon, MLT-0.5-0.47-II-A	Eliminate

Main Characteristics of the Medium-Wave Unit SVB-5 [SPN 6]

1. The medium-wave unit has a smooth wave range from 600 to 857 meters (350-500 kc) which is covered by one band.

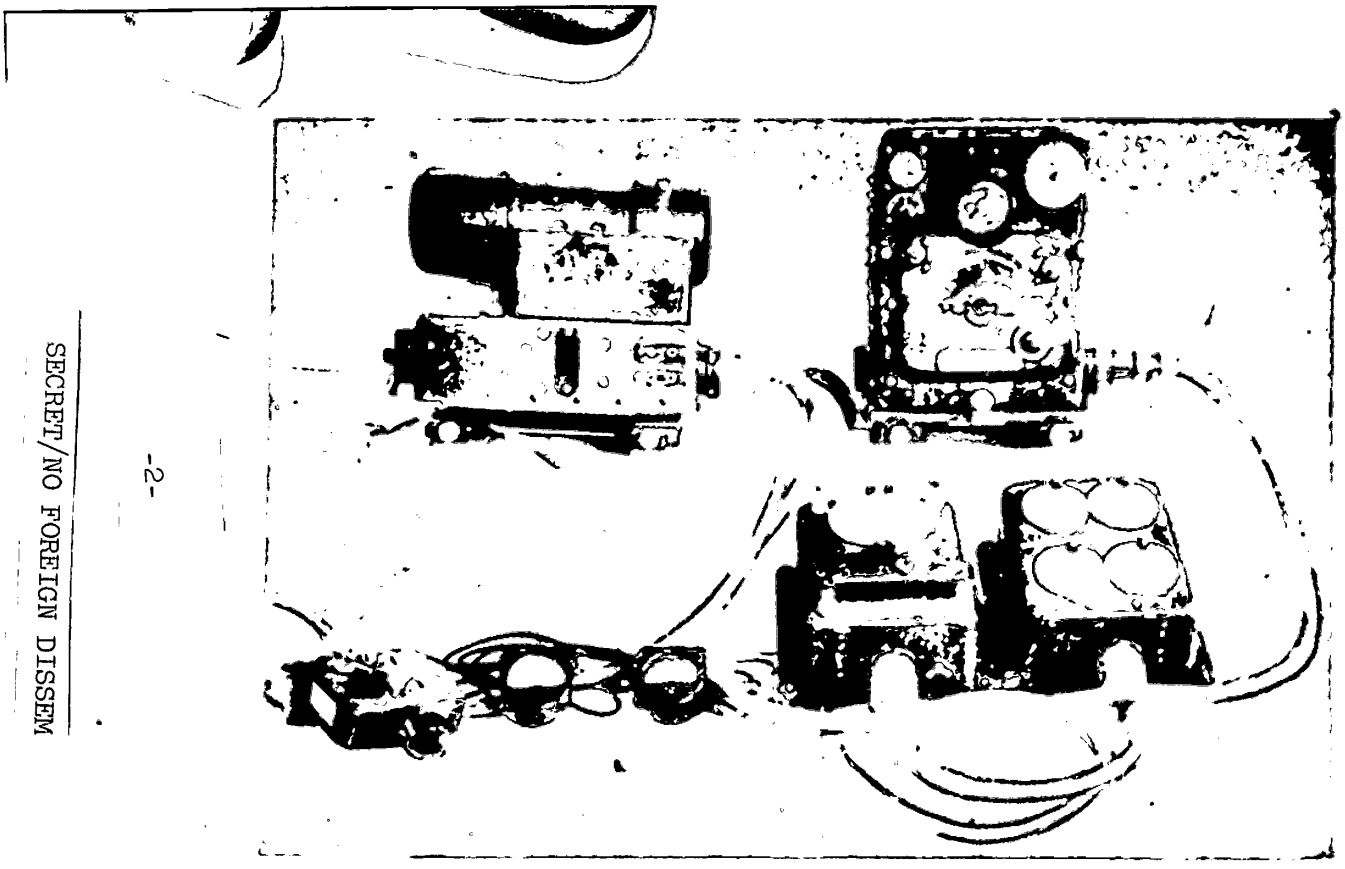

Рис. 1. Общий вид передающего устройства средневолнового блока, работающего в качестве самостоятельного передатчика.

Fig. 1. General view of the transmitting equipment of the medium-wave unit, operating as an independent transmitter.

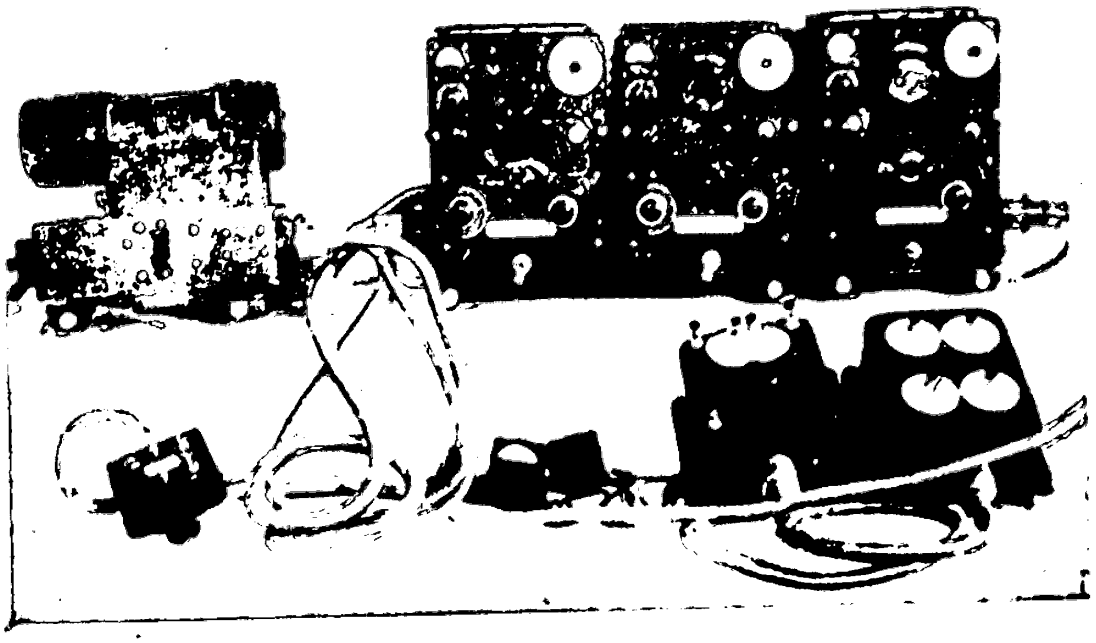

Рис. 2. Общий вид средневолнового блока СВБ-5 в комплекте с радиостанцией Р-805.

Fig. 2. General view of the SVB-5 medium-wave unit of the R-805 radio set.

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The scale for setting the frequency of the unit is calibrated in kc.

Every 10 kc, above a lengthened calibration line, is shown the appropriate frequency.

2. The quartz calibrator makes it possible to control the frequency of the medium-wave unit SVB-5 within 10 kc. During this time, the switch of the quartz calibrator is in the "10" position.

3. The output stage of the medium-wave unit is designed for operation over a trailing antenna of steel cord with a length up to 75 meters, regardless of the type of aircraft. In addition, the output stage provides for operation over a rigid L-type and an inclined beam-type antenna with a length of 12-15 meters.

4. The output provided to the trailing antenna by the transmitter varies depending on the resistance and reactance of the antenna, and amounts to approximately 50-80 watts in the telegraph mode and 10-20 watts in the voice mode. Besides, the transmitter can operate by telegraph and voice at lowered (25 percent) output.

5. The medium-wave unit is efficient at flying altitudes to 8,500 meters for operation at full output, and up to 14,000 meters for operation at reduced (25%) output over the trailing antenna; and for an altitude up to 5,000 meters at full output and 9,500 meters at reduced output over the fixed antenna.

6. Used as the power supply is an aircraft circuit with a rating of 27 volts. The maximum power consumed by the medium-wave unit, in the telegraph mode at full capacity, is no more than 800

watts.

The medium-wave unit is efficient for changes in the voltage of the aircraft circuit of ± 10%, i. e., at 24.3 and 29.7 volts.

7. The medium-wave unit is efficient for changes in ambient temperature from + 50 deg C to -60 deg C.

8. The medium-wave unit of the radio set permits continuous operation for a period of 30 minutes after initial switch-on, and extended operation (to 10 hours) based on a cycle of 5 minute operation and 10 minute break.

9. All control of the radio set during flight -- conversion from reception to transmission, from voice to telegraph, from full power to reduced power, and the switching of three waves remotely is performed from the control panel using three toggle switches and one gang switch located on it. [SPN 7]

Structurally, the control panel is together with the telegraph key. For convenience in monitoring the operation, the transmitter of the radio set has control of its voice and telegraph operation based on radio frequency, regardless of the receiver tuning.

10. The following types of tubes are used in the medium-wave unit SVB-5: two Г-411 and one ГК-71.

A type ДГЦ-4 germanium diode is used as a radio frequency rectifier in the tuning indicator circuit.

11. The overall dimensions of all of the components of the radio set are given on the general diagram showing the connection of the radio set components - Diagram No 1.

12. The "SVB-5" switching circuit of the radio set, in combination with the "R-805," allows cutting in a maximum of three radio

frequency units and, thus, provides for the selection in flight of any of 3 frequencies remotely.

Chapter II.

Circuit of Medium-wave Unit SVB-5

Nomenclature

On the schematic diagram (Diagram No 2) is given the nomenclature for separate parts and components, such that they can be easily located on a diagram. According to this system, the letter of the code indicates the part (capacitor, resistor, tube, etc.). The first digit of the code indicates the radio set component containing the given part. The last two digits indicate the order of the given part in the component.

Name of Part [SPN 8]

В - fuse insert (fuse);

Г - detachable contacts, terminals;

Д - motor-generator set, dynamo-motor;

И - measuring instrument;

Л - tube;

П - switch;

Э - relay;

L - inductance coil;

C - capacitor;

R - resistor;

X - quartz crystal;

Ц - rectifier;

Т - thermocouple.

Component Number

1 - SVB-5 unit;

2 - power unit;

3 - antenna unit;

4 - control panel;

5 - element for fixed-trailing antenna.

Nomenclature Examples

Л 101 - first tube in the unit;

Л 102 - second tube in the unit;

R 101 - first resistor in the unit;

R 102 - second resistor in the unit;

Л 201 - first tube in the power unit;

R 201 - first resistor in the power unit;

Э 301 - first relay in the antenna unit;

П 401 - first switch on the control panel.

The general schematic diagram of the medium-wave unit is shown in Diagram No 2. A general view of the parts of "SVB-5" is given in Figure 1 and on the diagram for connecting up the components of the radio set, Diagram No 1.

Structure of the System

As seen from the schematic diagram, the transmitting part consists of six basic units:

1. Three-stage SVB-5 medium-wave unit.
2. Power unit, including:
   a) "PYK-3006" motor-generator set with a stepping starter system; [SPN 9]
   b) Two-stage amplifier for amplifying audio frequencies fed in by throat microphone;
   v) Audio frequency oscillator with rectifier for negative bias and monitoring of its operation.
3. Antenna element with quartz calibrator.
4. Fixed - trailing antenna element for switching to fixed or trailing antenna.
5. Main control panel.
6. Switch panel for fixed and trailing antennas.

Below is given a detailed description of the system and operation of the units concerned only with the medium-wave unit and their switching.

1. Medium-Wave Unit SVB-5

The medium-wave unit differs little in external appearance from the external appearance of the short-wave units of radio set R-805.

The medium-wave unit is a self-contained 3-stage radio frequency oscillator.

The first stage is a self-excited oscillator (master oscillator).

The second stage is the intermediate stage, which operates in a direct amplification mode.

The third stage is the output stage (power amplifier).

A. antenna tuning
B. frequency range in kilocycles

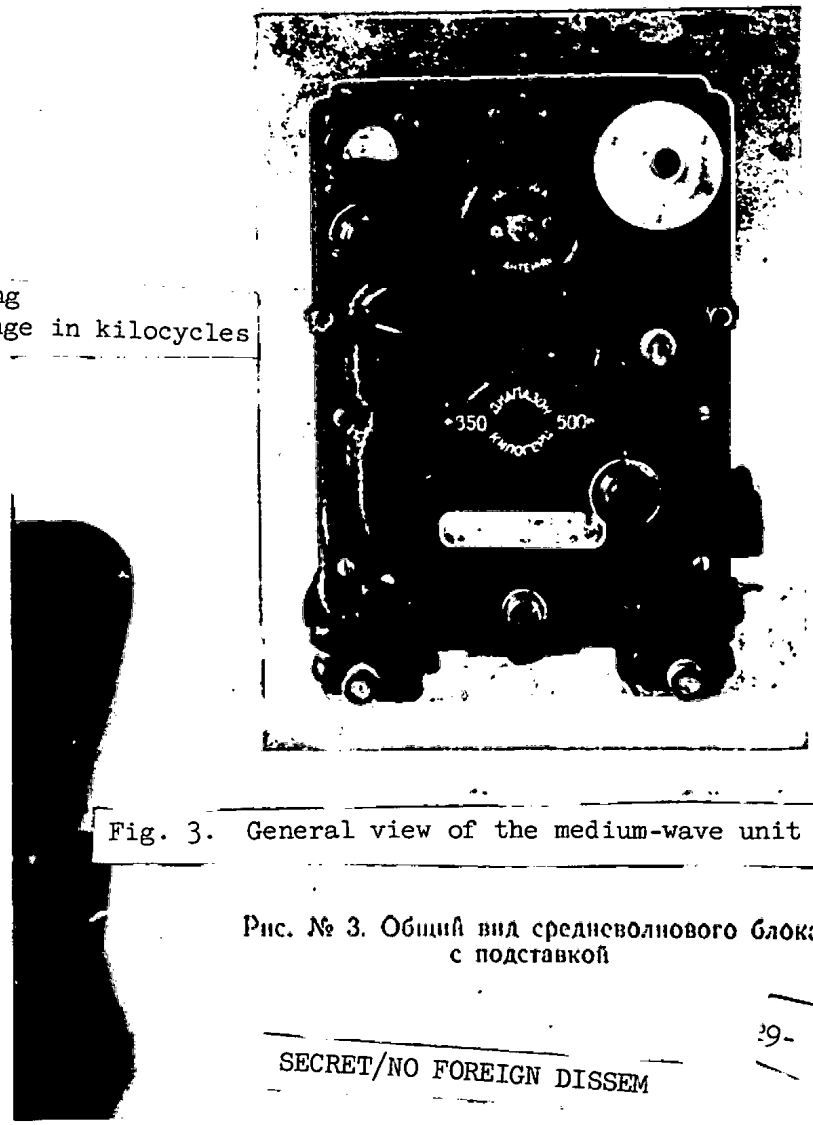

Fig. 3. General view of the medium-wave unit with mounting.

Рис. № 3. Общий вид средневолнового блока с подставкой

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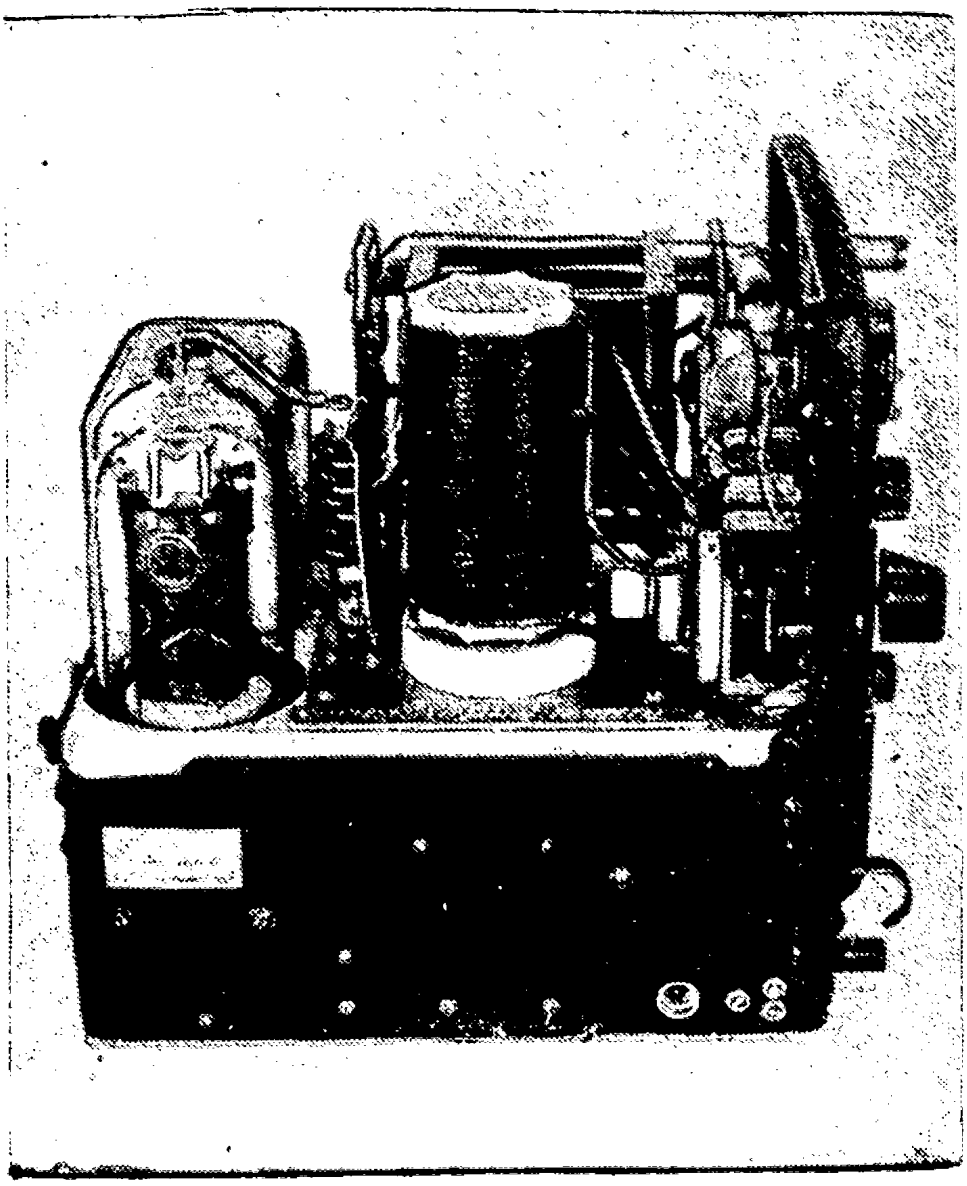

Рис. № 4. Средневолновый блок со снятым футляром, вид сверху.

Fig. 4. Medium-wave unit with casing removed, top view.

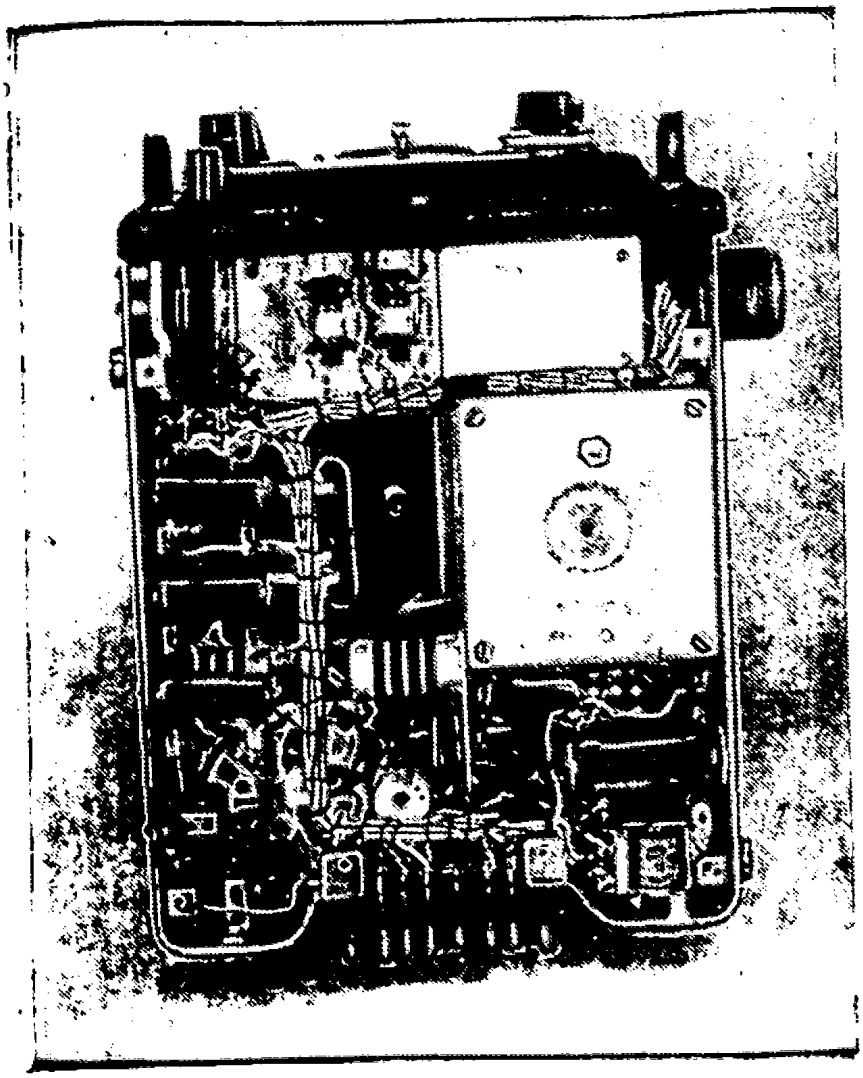

Рис. № 5. Средневолновый блок со снятой подставкой

Fig. 5. Medium-wave unit with mounting and bottom removed, bottom view.

Below is given a description of the stages of the medium-wave unit.

A. Master Oscillator

The master oscillator operates with a " Г-411" type tube (Л -101), which is a pentode beam power tube.

The oscillator consists of an oscillatory network in the control [SPN 13] grid circuit and a feedback coil in the plate circuit.

The oscillatory network consists of an L-101 self-inductance coil with a carbonyl iron core for adjustment of the inductance, two parallel connected variable air capacitors C-101 and C-102 serving to cover the frequency range of the exciter, trimmer capacitors C-103, C-104, and C-105 for adjusting the initial capacitance of the variable capacitors and correcting the frequency of the exciter during a tube change, and a ceramic capacitor C-106 serving to accommodate the frequency range on the scale of the master oscillator.

The L-102 feedback coil is wound on the same frame as the circuit coil.

To prevent the possibility of spurious oscillations arising, the coupling coil is made of a conductor with a high resistance (constantan).

A distinguishing characteristic of the system is the use of a very weak grid coupling and a plate circuit with a network, which ensures high stability of the frequency generated by the master oscillator.

In order to obtain a weak coupling, a radio frequency voltage is fed to the grid of the tube, not from the whole circuit, but from part of the turns of the circuit coil. Oscillations are sent to the control grid of the tube through the C-109 capacitor.

The necessary negative bias on the grid of the tube is produced by the grid currents flowing through the R-104 resistor, bypassed by the C-108 capacitor.

The plate power supply of the master oscillator is drawn from a + 350-volt source through an R-101 dropping resistor.

The screen grid of the tube is fed from a potentiometer consisting of resistors R-102 and R-103 connected between a + 350-volt source and the frame.

The screen grid is blocked from radio frequency by the C-107 capacitor.

Either a positive (+ 27) or a negative (-300) voltage is fed through the P-105 resistor, blocked by the C-110 capacitor, to the suppressor grid of the tube of the master oscillator -- which accomplishes telegraph manipulation.

In the "key down" mode as well as in the voice mode of operation [SPN 14] the suppressor grid supply of the master oscillator is from a + 27-volt source.

In the "key up" mode a negative bias of -300 volts is supplied to the suppressor grid, the plate current of the tube is sharply reduced, the tube cuts off, and the generation of oscillations ceases.

B. Intermediate Stage

Radio frequency oscillations are supplied from the master oscillator circuit through the C -111 decoupling capacitor, bypassed by the R -106 resistor, to the control grid of the Л -102 tube of the intermediate stage, identical with the tube of the master oscillator (Г-411).

As seen from Diagram No 2, the intermediate stage operates with an aperiodic load at the plate on the L-104 choke coil.

The necessary bias in the control grid of the tube in the intermediate stage is obtained by the grid current flowing through the R -106 resistor and the current flowing through the R -116 resistor. The R -116 resistor serves also to remove any interaction between the intermediate stage and the master oscillator.

The power supply for the plate of the intermediate stage comes from a + 350-volt source through the R -119 dropping resistor.

The screen grid of the tube of the intermediate stage, blocked from radio frequency by the C -112 capacitor, is supplied from a + 350-volt source through the R -107 dropping resistor.

As with the master oscillator, either a positive (+ 27) or a negative (-300) voltage is supplied to the suppressor grid of the tube of the intermediate stage, blocked from radio frequency by the C -113 capacitor, for accomplishing telegraph manipulation.

Resistor R -109 is connected to the cathodes of tubes Л -101 and Л-102 of the SVB-5 unit, serving to terminate the oscillations of the master oscillator and the intermediate stage of this unit in

the event that it is not connected with the general control panel.

The plate currents of the master oscillator and the intermediate stage cause a potential drop across the R-109 resistor, the positive terminal of which is at the end of the resistor connected to the cathodes, and the negative terminal is connected to the frame of the unit.

Since the leakage resistors of the control grids of the tubes [SPN 15] in the master oscillator and the intermediate stage are connected to the frame of the unit, a potential drop across the R-109 resistor causes a negative bias in the control grids of both tubes which is sufficient to terminate the oscillations of the master oscillator and the intermediate stage.

When the unit is put into operation from the general control panel, the R-109 resistor is cut in by the contacts of the Э-101 relay, and the master oscillator with the intermediate stage begins to operate normally.

C. Output Stage (power amplifier)

Radio frequency oscillations are fed from the plate of the intermediate stage through the C-116 decoupling capacitor to the control grid of the Л-103 tube of the output stage. The ГК-71 tube serves as a high capacity transmitting pentode.

The output stage operates as a simple output network.

The plate circuit of the output stage is fed from the 1000-volt collector through the L-107 high frequency choke coil, blocked by the C-120 capacitor.

A. to buffer stage
B. to power element
C. coarse coupling
D. to antenna through fixed and trailing antenna element

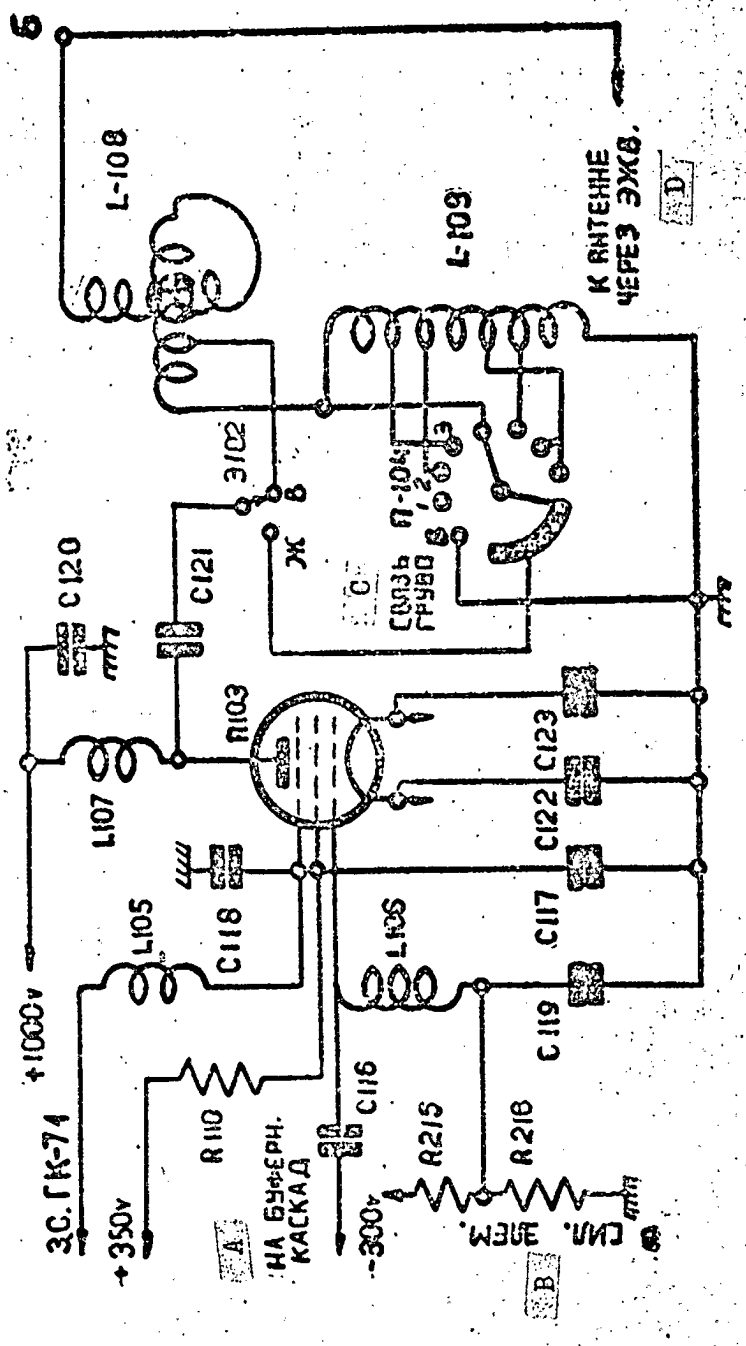

Рис. 6. Схема выходного каскада средневолнового блока СВБ-5

Fig. 6. Diagram of output stage of SVB-5 medium-wave unit.

When the fixed antenna is in operation, toggle switch П-103, situated on the forward panel of the medium-wave unit, must be placed in the "Ж" position. Then to the plate circuit of the output stage, except for the L-108 variometer coil, is connected the L-109 inductance coil through the contacts of the Э-102 relay and П-104 switch.

During operation in the 350 kc to 390 kc range, switch П-104 must be placed in the first position; in the 390 kc to 450 kc range, in the second position; and in the 450 kc to 500 kc range, in the third position.

When the trailing antenna is in operation, the plate circuit of the output stage is connected directly to the variometer through the contacts of the Э-102 relay. Then switch П-104 is placed in the "В" position, cutting in the L-109 loading coil.

The variometer parameters for antenna tuning are a direct part of the parameters of the airborne antenna (fixed and trailing).

The degree of coupling of the antenna network with the tube of [SPN 17] the output stage necessary for the optimal mode of operation with the trailing antenna is obtained at the middle point of the stator of the variometer for the entire range of the medium-wave unit; for operation with the fixed antenna, the optimal coupling is obtained by varying the L-109 inductance by means of switch П-104.

Voice operation of the medium-wave unit is accomplished by supplying to the suppressor grid of the tube in the output stage an

audio frequency voltage taken from the throat microphones and amplified by a special audio frequency modulator.

The suppressor grid is blocked from radio frequencies by the C-118 capacitor, which has a high resistance to audio frequencies.

To obtain the desired operating point on the modulating curve a negative bias from a special rectifier in the power unit is supplied to the suppressor grid. This bias is obtained from a potentiometer consisting of resistors R-220 and R-221.

During telegraph operation with full power + 50 volts is supplied to the suppressor grid of the tube in the output stage from a potentiometer, which is connected to a + 350-volt collector. This potentiometer, consisting of resistors R-229 and R-230, is located in the power unit.

The voltage is supplied to the suppressor grid of the tube in the output stage through the L-105 radio frequency choke coil, which presents a low resistance to a direct current and an audio frequency current.

This choke coil serves to prevent the passage of radio frequency currents through the plate-suppressor grid capacitance of the tube to the power lead.

Besides its operation in the voice and telegraph modes at full (100%) output, the output stage of the unit can also operate in these modes with a reduction (25%) in output.

Reduced output is attained by supplying appropriate negative biases to the suppressor grid.

The screen grid of the tube in the output stage, blocked from radio frequencies by the C-117 capacitor, is supplied from a + 350-volt collector through the R-110 dropping resistor.

The control grid of the tube in the output stage receives the necessary negative bias from a combined source: partially from a negative bias obtained from the R-216 resistor in a potentiometer connected to a 300-volt rectifier in the power unit, and partially from grid currents flowing through the R-216 resistor. [SPN 18]

The negative bias is supplied to the control grid of the tube through the L-106 radio frequency choke coil, blocked by the C-119 capacitor.

Since the "ГК-71" tube of the output stage is a tube with "left" characteristics, its plate current, in the absence of voltage on the grid, is sufficient.

This condition is utilized to equalize the load on the 1000-volt collector between pauses and signals during operation in the telegraph mode at full (100%) capacity.

As described earlier, telegraph manipulation in the SVB-5 unit is accomplished by "blanking" the tubes of the master oscillator and the intermediate stage. Thus, when the key is released (pause), radio frequency oscillations are absent from the control grid of the tube in the output stage.

If the negative bias on the grid of the tube in the output stage were obtained only by the grid currents, then during a pause this

bias would be equal to zero and the plate current of the tube would attain a magnitude on the order of 250 ma. This would mean that during a pause the power, being dissipated at the plate of the tube, would not be great enough.

When a negative bias is supplied to the grid entirely from a constant source, the plate current of the tube during a pause would drop to zero, since the bias required for the tube (-50 volts) corresponds to the point at which the plate current ceases, and in the "key down" mode (signal) the plate current would attain a maximum.

Thus, the load on the 1000-volt collector would change from zero (pause) to maximum (signal).

This would lead to 1000-volt oscillations and would mean that at the beginning of a signal the voltage on the plate of the tube in the output stage would be noticeably higher than at the end of the signal. In consequence of this, the quality of high-altitude operation would deteriorate.

To eliminate this effect, the bias on the control grid of the tube is in a combined form, whereby the magnitude of the bias from a constant source is such that in the pause mode the power required by the plate of the tube is only 40%-60% of the power required in the signal mode, and the power allowed to dissipate at the plate of the tube (125 watts) does not increase. [SPN 19]

The voltage on the filament of the tube in the output stage comes from the control panel only when the SVB-5 medium-wave unit is in operation.

By means of a 2-way non-arresting switch (П-102) the SVB-5 unit can be turned on for tuning from the front panel of the radio frequency unit as well as from the control panel. In addition to turning on the unit, this switch is also used for decreasing the power dissipated at the plate of the tube during tuning.

As is known, during the detuning of the output stage of a simple circuit all the power supplied will be dissipated at the plate of the tube. This can lead to failure of the tube in the output stage.

In order to avoid this, place the switch in the "Н " position when starting to tune. For this position of the key, the screen and suppressor grids of the tube in the output stage are supplied from a 27-volt aircraft circuit.

The power supplied to the plate of the tube is reduced sharply and there are no detrimental effects from the detuning of the circuit.

However, the oscillatory power in the circuit will decrease and the current in the antenna will be negligible. Therefore, it becomes difficult to record the tuning of the circuit on the Т 5-1 ammeter with the thermocouple connected to the antenna counterpoise network.

When tuning is begun, with the switch in the " Н" position, it is recorded in the same way as on the М-20 indicator of the Р -805 radio set, with the former connected to the circuit of the screen grid of the Л-301 tube of the antenna unit.

In contrast with the Р-805 radio set, a ДГЦ -4 type germanium diode is used as a rectifier to indicate the tuning in the SVB-5 medium-wave unit.

A detailed description of the tuning indicator is given in the instructions for the R -805 radio set.

After the circuit has been tuned, turn the switch to the right position, causing the screen grid to draw a normal voltage from the + 350-volt collector and the suppressor grid to draw + 27 volts as before.

For this position of the switch a final fine adjustment of the circuit of the output stage is made on the basis of the highest reading of the T 5-1 instrument.

The supply to the plate circuits, screen grids, and suppressor grids, and of negative biases to the control grids of the tubes in the output stages of the various radio frequency units is from the same points, common to all units, since of all the units of the radio set there is only one in which are connected the filaments of the tubes in the output stage. The tubes in the output stages of the other units at this time are not connected and therefore require no power.

D. Auxiliary Circuits of the Medium-Wave Unit

The auxiliary circuits of the medium-wave unit include the circuits of the filaments of the " Г-411" tubes, the control device M -61, the starting circuit of the motor-generator set, and the circuits of the unit mounting.

The filaments of the parallel connected tubes "Л -411" of the master oscillator and the intermediate stage of the unit are fed from the + 27-volt aircraft network through a dropping resistor R -108.

Connection of the filaments of these tubes of the SVB-5 unit is made simultaneously with the connection of the radio set to the aircraft network, regardless of whether the radio set is switched to "receive" or "transmit."

The filaments of the output stage, as previously indicated, are fed from the aircraft network and are switched on from the control panel simultaneously with switching on the unit for operation.

Since the voltage of the aircraft network is 27 volts while the voltage rating of the filament of the "ГК-71" tube is 20 volts, the excess 7 volts of the medium-wave unit, as with the radio frequency units of the radio sets R-805 and R-806, is quenched across one common resistance for the output tubes of all units.

Serving as this resistance are the windings of the triggering relay Э-202 and the receiving-transmitting relay Э-203, which are located in the power unit, and resistor R-226.

Thus with the application of filament voltage to one of the tubes [SPN 21] of the output stages the triggering relay operates and the motor-generator set РУК-300 Б starts, feeding the plates and screen grids of the tubes in the radio frequency units.

To balance the output stage and control the operating modes of other stages of the radio frequency unit a monitoring device with shunts is installed on the front panel of each unit.

With monitoring device И-101 the following currents can be checked:

1. Plate of the master oscillator (position A I)
2. Plate of the intermediate stage (position A II)

3. Over-all current based on high voltage collectors (position "общ ")

4. Screen grids of output stage (position Э III)

5. Control grids of output stage (position У III)

Using gang switch П -101, control device И -101 is paralleled in turn during measurements with shunts R -111, R -112, R-113, and R -114, which are connected to the appropriate circuits of the medium-wave unit.

During measurements of the over-all current consumed through the high voltage collectors (position "общ "), device И -101 is connected to the minus high voltage circuit of the motor-generator set РУК -300Б .

The medium-wave unit is connected to the power unit with terminal blocks Г -104 and Г -103, installed on the mounting of the radio frequency unit.

Besides, located on the unit mounting is the terminal block Г -105 for connecting the phones during the correction of the frequency of the oscillator based on the quartz calibrator and monitoring its operation.

The element for the fixed and trailing antennas is connected to the medium-wave unit with terminal box Г-106 located directly on the SVB-5 unit.

Element for Fixed and Trailing Antennas

The element for the fixed and trailing antennas is designed for switching the fixed and trailing antennas, and also for connecting them to the medium-wave unit SVB-5. Besides, through this element

the aircraft antenna is connected to the short-wave units during joint operation of the SVB-5 unit with the R-805 radio transmitter. [SPN 22]

Located on the front side of the element are the terminals: "КВ", "СВ", "Ж", "В".

The short-wave units are connected to the element for the fixed and trailing antennas (to terminal "КВ") with terminals "Б" and "А" of the antenna element. The lead-ins of the fixed and trailing antennas are connected to the terminals "Ж" and "В".

The antenna is connected to the short-wave units through the contacts of relays Э-501 and Э-502 located in the element for the fixed and trailing antennas, and the contacts of relay Э-301 of the antenna element. The antenna is connected to the medium-wave unit through the contacts of relays Э-501 and Э-502.

With the application of + 27 volts to the winding of the relay Э-503, the relay operates and connects the end of the coil of relay Э-501 to the frame. Relay Э-501 operates and connects the medium-wave unit to the fixed or the trailing antenna. In switching on the short-wave units of the radio transmitter R-805 for operation, + 27 volts is disconnected from the winding of the relay Э-503 and the armature of this relay connects to the frame the secondary of the winding of the relay Э-501, as a result of which the antenna is connected to the short-wave units.

Switching from fixed to trailing antenna is effected with relay Э-502 and controlled toggle switch Э-103, installed on the front panel of the medium-wave unit. In toggle switch position "В" (trailing antenna), toggle switch П-103 connects to the frame the

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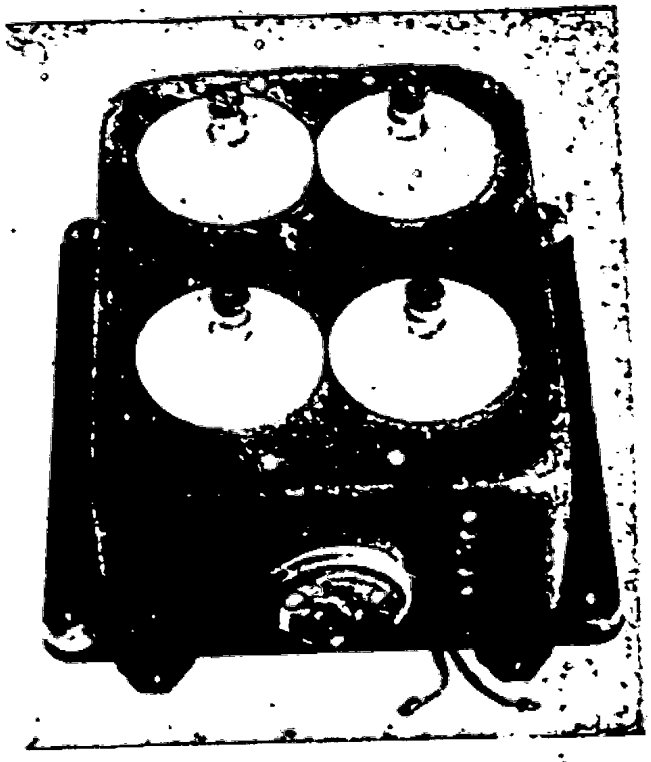


Рис. № 7. Элемент жесткой и выпускной антенн (общий вид)

Fig. 7. Fixed and trailing antenna element (general view)

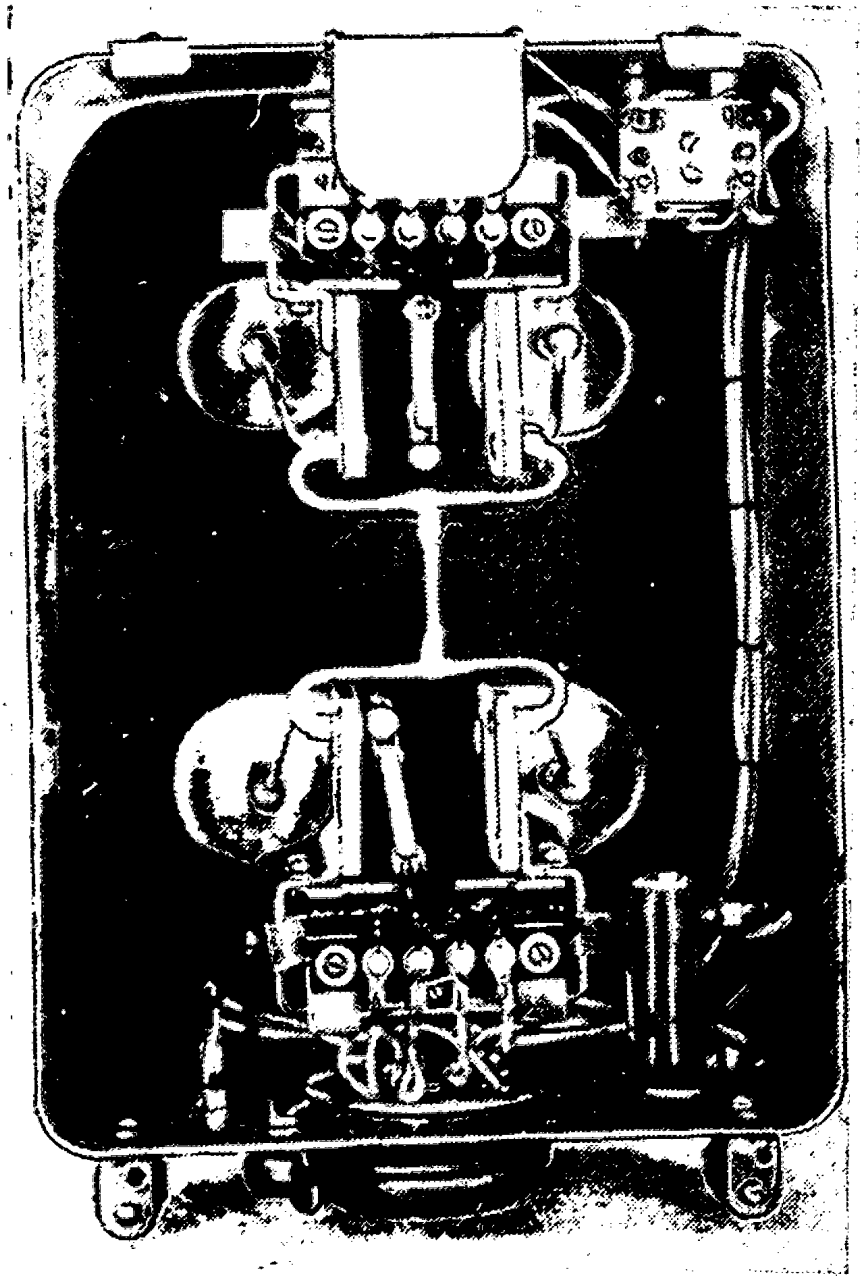


Рис. № 8. Элемент жесткой и выпускной антенн, вид сзади

Fig. 8. Fixed and trailing antenna element, rear view.

end of the coil of relay Э-502, the relay operates and connects the trailing antenna to the medium-wave unit. In toggle switch position "Ж" (fixed antenna), the toggle switch connects to the frame the end of the secondary winding of relay Э-502, the relay operates and connects the fixed antenna to the unit. In the case where the medium-wave unit SVB-5 is taken from the support, the switching from trailing to fixed antenna is effected through the switch panel of the fixed and trailing antennas.

Upon connecting the radio set to the aircraft electrical network in the "receive" position, the + 27 volts of the network is applied to one end of the winding of relay Э-301. The secondary of this winding is connected to the frame through [cable] conductor 24 and the contacts of relay Э-203 of the power unit. Relay Э-301 operates and connects the antenna of the aircraft to the receiver.

E. Switch Panel for Fixed and Trailing Antennas [SPN 25]

During joint operation of radio set R-805 with the medium-wave unit SVB-5, the switching of the fixed and trailing antennas is effected by toggle switch "Ж-В", located on the front panel of the medium-wave unit. In the case where the SVB-5 is removed from the mounting and the radio set operates without the SVB-5 unit, the fixed antenna is connected to the radio set through the switch panel for the fixed and trailing antennas. Moreover, the panel is connected to the 27-volt aircraft electrical network by two conductors, and the cable running from the element for the fixed and trailing antennas is connected to the panel. The switching is effected by throwing

4. Щиток коммутации жесткой и выпускной антенн

При совместной работе радиостанции Р-805 со средневолновым блоком СВБ-5 коммутация жесткой и выпускной антенн производится тумблером «Ж-В», расположенным на передней панели средневолнового блока. В том случае, когда СВБ-5 изъят из подставки, и радиостанция работает без блока СВБ-5, подключение жесткой антенны к радиостанции производится через щиток коммутации жесткой и выпускной антенн. При этом щиток двумя проводниками подключается к бортовой сети 27 вольт, а кабель, идущий от ЭЖВ, подключается к щитку. Коммутация производится переключением тумблера, установленным на щитке.

A. Fixed

B. Trailing

Рис. № 9. Щиток коммутации жесткой и выпускной антенн (вид сверху)

Fig. 9. Switch panel for fixed and trailing antenna (top view).

Рис. № 10. Щиток коммутации жесткой и выпускной антенн (вид снизу)

5. Автоматическая антенная лебедка с моторным приводом

Автоматическая антенная лебедка с моторным приводом позволяет производить выпуск и подъем антенны дистанционно на любую ее длину из любой точки самолета, где установлен щиток управления антенной лебедки.

Это даст возможность устанавливать антенную лебедку с моторным приводом, трубой и грузиком даже в мало доступном месте самолета.

Конструкция антенной трубы предусматривает возможность установки ее на любом типе самолета.

Fig. 10. Switch panel for fixed and trailing antenna (bottom view).

А. ОБЩЕЕ ОПИСАНИЕ

Антенное устройство средневолнового блока состоит из следующих четырех основных элементов:

1. Электромеханизма типа МПА-4.
2. Щитка управления с гибким валиком.
3. Антенной трубы и грузиком.

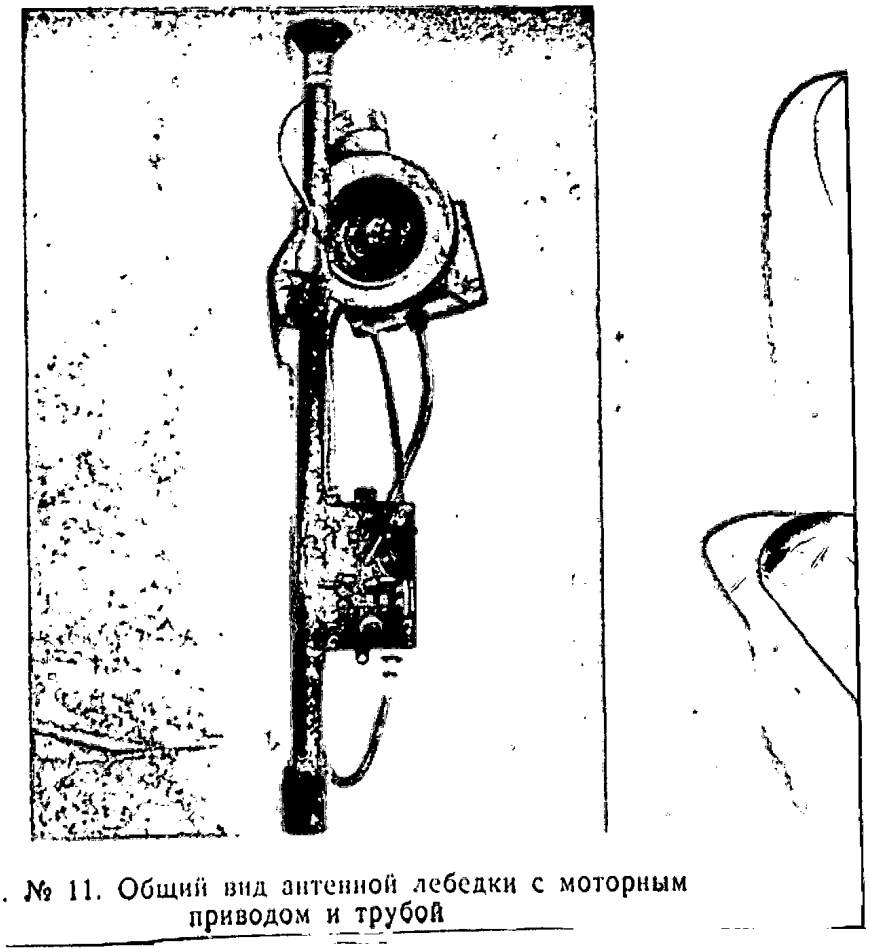


Рис. № 11. Общий вид антенной лебедки с моторным приводом и трубой

Fig. 11. General view of the fairlead and antenna winch with motor drive.

the toggle switch located on the panel.

5. Automatic Antenna Winch With Motor Drive [SPN 26]

The automatic antenna winch with motor drive permits releasing and retracting the antenna remotely to any length from any point of the aircraft where the control panel for the antenna winch is located.

This makes it possible to install the antenna winch with motor drive, conduit, and antenna weight in a little-used part of the aircraft.

The design of the antenna conduit provides the opportunity to install it in any type of aircraft.

A. General Description [SPN 27]

The antenna equipment of the medium-wave unit consists of the following four [sic] basic elements:

1. MPA -4 type electrical mechanism.
2. Control panel with flexible shaft.
3. Fairlead and weight.

The electrical control circuits and power supply of the antenna winch are independent of the general network of the transmitting part of the radio set. [SPN 28]

B. Motor Drive

The release and retraction of the antenna are accomplished by means of an antenna winch on which is wound 80 meters of single-strand copper plated steel cable.

The antenna winch is run by a motor.

As seen from figure 12, a cylindrical steel gear wheel А is mounted on the motor shaft. This gear wheel engages a textolite gear wheel Б, which is connected with a worm gear В .

Gear wheel Б and worm gear В rotate freely around an axis К . Engaging the worm gear is a gear wheel Г , which is held in a position of tension (as indicated by the arrow Л) by a spring М , whereby the worm gear is pressed tightly against gear wheel Б .

When the worm gear moves toward gear wheel Б , its tapered end presses against button Д , tripping a switch.

The bronze gear wheel Г is directly connected with the shaft of the antenna winch. Right next to this gear wheel on the shaft of the winch is a tapered brass gear wheel А .

The tapered gear wheel А is connected to a tapered gear wheel Е , which rotates freely on a shaft В , on the opposite end of which is mounted a cylindrical gear wheel И .

The gear wheel И is connected to a flexible shaft which drives the counter, situated on the control panel of the antenna winch, indicating the number of meters the antenna is let out.

On the opposite end of shaft К between spring М and a stronger spring Н is a tapered steel disc О which can move freely along the shaft.

C. Principle of Operation of the Antenna Winch Control Mechanism

If, while the antenna is being retracted, a force is applied to the antenna winch which is significantly greater than the tension of the antenna in flight during maximum speed of the airplane, then worm

gear B will exert a force on disc O such that the latter will press against button Л [sic] and shut off the power to the motor driving the antenna winch. At the same time, worm gear B will disengage from gear wheel Б, and rotation of the antenna winch will abruptly [SPN 29] stop.

This arrangement provides for stopping the motor in the event that during retraction of the antenna the antenna weight comes up against the mouth of the fairlead, increasing the tension on the winch. Whenever the antenna unwinds to the end and the tension on the winch increases appreciably in the opposite direction, the disc on worm gear B presses against button Ж and a switch stops the motor. Additionally, the switch provides for uniform movement of the antenna cable for any speed of the plane, inasmuch as the speed of the plane, in addition to the antenna weight, affects the tension on the winch.

During the release and retraction of 75 meters of antenna cable the disc of the antenna winch makes 157 revolutions, and the release of this amount of cable requires about one minute.

Such a system of automatic stopping during release and retraction of the antenna is reliable and stable in operation.

D. Electrical Circuit of the Antenna Winch Control

The antenna winch is controlled from a separate control panel which under operational conditions should be in the immediate vicinity of the main control panel of the radio set.

Вид на коробку со стороны антенной лебедки
(без крышки и лебедки)

View of antenna winch housing from winch side (without winch and cover)

A. disconnected
B. disconnected

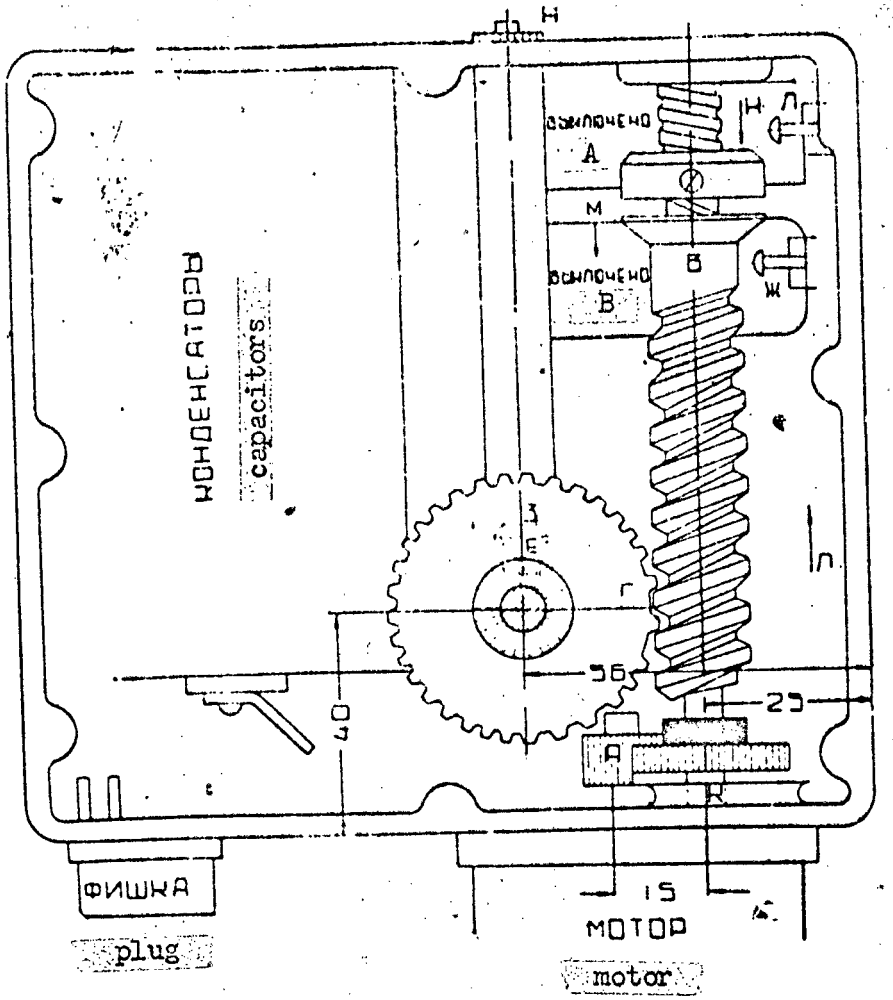


Рис. № 12. Механизм управления антенной лебедки

Fig. 12. Antenna winch control mechanism.

Щиток управления антенной лебедки с помощью 5-ти жильного кабеля и гибкого валика связан с блоком лебедки, который устанавливается рядом с антенной трубой.

Напряжение 27 вольт бортовой сети, приводящее в движение мотор антенной лебедки, подключено к выведенным двум жилам кабеля на фишке блока антенной лебедки. Причем к жиле с биркой 2 подводится + 27 вольт, а к жиле с биркой 3 —27 вольт.

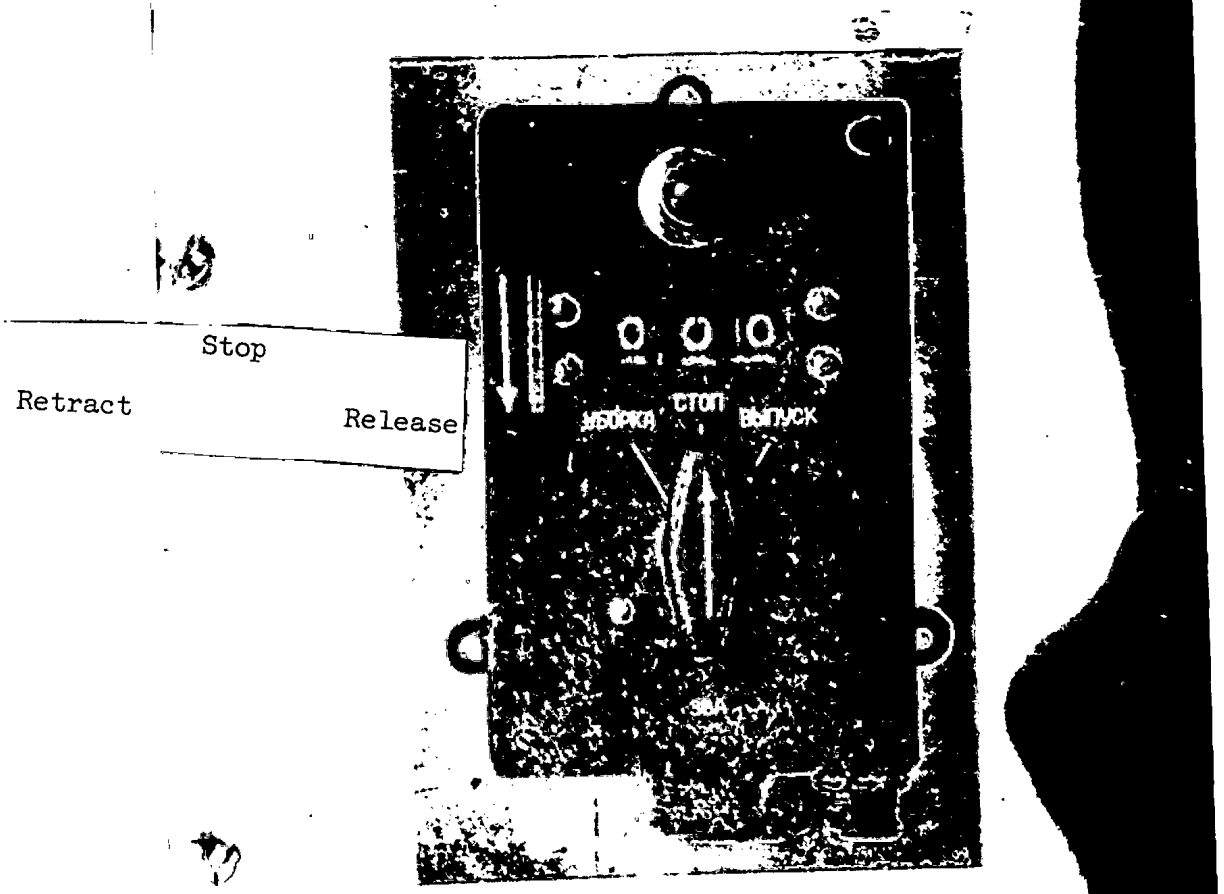


Рис. № 13. Щиток управления антенной лебедкой

Fig. 13. Antenna winch control panel

Located on the control panel:

a) A switch with three positions: middle position, "Stop"; left position, "Retract"; right position, "Release."

b) A counter over the switch which registers the number of meters the antenna has been let out.

v) At the left under the counter is a disc for setting the number in the counter to zero.

g) Above the counter is a warning light which goes on at the instant of release of the antenna and goes off when the antenna is completely retracted (position indicator).

The antenna winch control panel, by means of a 5-conductor cable and flexible shaft, is connected to the winch unit, located next to the antenna tube. [SPN 31]

A 27-volt aircraft circuit, which drives the motor of the antenna winch, is connected to two conductors of the cable at the plug of the antenna winch unit. The conductor labeled "2" is connected to + 27 volts; and the conductor labeled "3," to -27 volts.

E. Release of the Antenna [SPN 32]

To release the antenna it is necessary to turn the switch on the antenna winch control panel to the "Release" position. Then + 27 volts is fed from the "Release" position of the switch on conductor no 8 of the antenna winch and the contacts of the switch on the control panel and conductor no 1 to the windings of the motor, and the motor begins to rotate clockwise, releasing the antenna.

During release of the antenna a counter located on the control panel registers the number of revolutions of the antenna reel.

Depending on the type of airplane, the antenna, when fully let out, will have a definite length prescribed in the instructions included with each radio set.

Thus, the operator can stop the release of the antenna at the right time by glancing at the counter.

This operation is accomplished by placing the switch on the control panel in the "Stop" position, cutting off the power supply to the motor and stopping it.

F. Retraction of the Antenna

To retract the antenna, place the switch on the control panel in the "Retract" position. Then + 27 volts from the "Retract" position of the switch is fed to cable conductor no 4, running through the "Retract" position of the switch in the control panel, thence to conductor no 6; and, finally, the + 27 volts from conductor no 6 is fed to the windings of the motor for the retracting operation.

The motor begins to rotate in the opposite direction, thereby causing the antenna winch to reel in the antenna. The antenna is reeled in until the antenna weight comes up against the mouth of the fairlead. Then the tension on the winch increases sharply, the disc mechanism of the winch presses against the switch, and the power supply to the motor is cut off.

At the same time that the switch circuit is broken, the voltage to the warning light is cut off. The light's going off indicates

that the retraction is complete.

The operator places the switch on the control panel in the "Stop" position. The "Release" and "Retract" positions of the switch are bypassed by capacitors to avoid arcing and burning of the contacts.

Chapter III. [SPN 33]

Design of the Transmitting Equipment

In these instructions is described the design of the units associated with the transmitting part of the radio set.

The individual units of the radio set have been designed from the standpoint of their convenient arrangement on the airplane and their ease of use. All the units of the radio set are mounted on shock absorbers to protect them from vibration. Each of these can easily be removed from the unit.

A. Medium-Wave Unit

The SVB-5 medium-wave unit does not differ structurally from the R-805 short-wave unit.

Each of the units consists of the following parts: front panel, frame, housing, and bottom.

All of the controls for tuning and mode of operation of the unit are located on the front panel.

In the center of the front panel of the SVB-5 medium-wave unit is located the dial of the master oscillator, graduated in kilocycles.

Adjusting the frequency by the dial is accomplished with a "Frequency" knob, situated to the right below the face panel. The "Fre-

quency" knob is turned by means of a system of friction linkage and a pair of toothless gears, causing the rotors of the variable capacitors in the master oscillator circuit to turn.

The "Frequency" knob has a ring-shaped catch which serves to lock the dial of the master oscillator in a particular position.

In the center of the upper part of the front panel is the "Antenna Tuning" knob, turning the variometer which adjusts the output stage. In the middle of the "Antenna Tuning" knob is a wing nut, which serves to lock the variometer knob in place.

The dial of the variometer is connected with the variometer by means of a pair of toothless gears with a ratio of 1:2. Thus, for a half turn of the variometer, the dial makes a full turn. The variometer dial is divided into 100 parts.

On the face panel to the left of the master oscillator dial is a 4-position switch for the extension coil for operation with fixed antenna. [SPN 34]

In the upper right corner of the forward panel is the "Б " terminal for connecting the input lead from the fixed-trailing antenna element.

In the upper left corner of the front panel is a monitoring device, under which is located a 5-position switch.

In the lower left corner is a non-arresting switch that turns on the unit for tuning.

To the right of the master oscillator dial is a toggle switch whose two positions are labeled " А" and " В ".

This toggle switch connects the windings of relays 3 -102 and 3 -502.

On the lower central part of the panel is a white celluloid lid covering the access to the trimmers, which serve to correct the dial to correspond to the quartz calibrator. At the same time, this lid is used to record the various positions of the tuning knob of the transmitter.

Brackets supporting the housing are attached to both sides of the front panel.

Handles are attached to the bottom of the face panel on both sides for withdrawing the unit from its supports.

The unit is fastened to its supports by a clamp.

On the supports of the unit are located a "T" socket for connecting phones, a counterpoise terminal, and a socket for connecting a 12-conductor cable to the power unit.

The face panel of the unit is secured with 4 screws to the frame, which is in the form of a stamped aluminum box.

On the upper part of the frame, covered by the housing, are located the output stage tube and the plate choke (see fig 4).

Also on the upper half of the frame is a shielding cup for the tubes of the master oscillator and the intermediate stage.

On the frame immediately next to the front panel are located: on the right, the antenna tuning variometer; in the middle, a vernier with the tuning variometer dial; on the left, the loading coil for operation with fixed antenna.

On the lower part of the frame are located: the unit for the [SPN 35] variable capacitors of the master oscillator circuit, the master circuit coil, enclosed in a special shield, a relay connecting the plate for operation with fixed and trailing antenna, and other items related to the power supply circuits and putting in operation of the various stages of the units.

The bottom of the unit covers the frame from below and at the same time serves to guide the unit during its installation on its mounting.

2. Element for Fixed and Trailing Antenna

The fixed and trailing antenna unit is in a stamped aluminum box, on the face panel of which are terminals with 4 insulators for connecting the input leads from the fixed and trailing antennas and also from the short-wave and medium-wave units. Inside the box are located three relays. The power supply to the relays and the cutting in of the fixed and trailing antenna unit circuits are accomplished by means of a seven-conductor cable connecting the BP -1 medium-wave unit with the fixed and trailing antenna element.

Switch Panel for Fixed and Trailing Antennas

The switch panel for fixed and trailing antennas is in the form of a stamped aluminum box, on the upper part of which is a switch for fixed and trailing antennas. Inside the box is a strip connecting two terminals. The switch panel is enclosed by a bottom which is secured with four screws.

Brief Instructions for Assembling and Installing the Medium-Wave Unit on the Airplane

The arrangement and installation of the medium-wave unit should be made from standpoint of maximum ease of use, and measures should be taken to avoid possible breakdown in the connecting leads of the antennas. Installation of the unit should be done in such a way that all the connecting leads are as short as possible and away from the fuselage of the airplane to eliminate the possibility of breakdown. All the antenna leads should be connected to the terminals so that no ends are protruding. The connected leads must not have any sharp ends or burrs. All components of the radio set must have a reliable bonding with the fuselage of the airplane.

When the medium-wave unit is operating jointly with the R -805 [SPN 36] radio set, toggle switch " К-В ", situated on the front panel of the medium-wave unit, must be placed in the " К" position to put the short-wave units into operation.

In the event of a break in the fixed antenna during flight, operation of the short-wave units of the R-805 radio set with trailing antenna is allowable. Toggle switch " К-В " is then set in the " В" position. The antenna should not be let out more than 10-15 meters.

All connections of the medium-wave unit when it is operating jointly with the " R-805" radio set must conform with the diagram for connecting components, as given in the description of the medium - wave unit.

Possible Malfunctions and Methods for Correcting Them

During a breakdown in the SVB-5 medium-wave unit and search for its cause it should be remembered that the primary cause of malfunctions is the radio tube. Therefore first of all, attention should be paid to the condition of the tubes, and only after that should a search be made for some other cause of the malfunction.

The condition of the tubes may be determined by the reading of the monitoring device on the front panel of the SVB-5 unit, the reading of the indicating device, the operation of the quartz calibrator, and the monitoring of voice and telegraph operation.

It must be kept in mind that the filaments of the tubes in the medium-wave unit are connected in series, so that a tube with a bad filament can only be detected by consecutive replacement of the tubes in the group with a tube known to be good.

If the defect is not corrected by the replacement of a tube, it is recommended that the following table be used to find malfunctions in components of the radio set:

No	Type and Signs of Malfunctions	Possible Malfunctions	Methods of Correction	
1	Short in the 350 v circuit B-201 fuse blows	1. Plate contact of Л-102 tube shorted out with the shield covering Г-411 tubes.	Tighten the plate contact spring of the Л-102 tube plate terminal and move the plaited plate wire next to the partition between the tubes.	[SPN 37]
		2. Gas or interelectrode short in the Л-102 tube.	Replace tube	
		3. Damaged C-201 electrolytic capacitor in the power unit.	Replace C 201 capacitor	
		4. Damaged B-201 or B 202 fuse socket.	Replace socket	
		5. Damaged primary winding in the T-201 transformer.	Replace transformer	
		6. Damaged L-204 choke	Replace choke	
		7. Damaged antenna element switch П-304.	Replace switch	
		8. Damaged wire in PYK-300B motor-generator set (jumper between collectors)	Replace jumper	[SPN 38]
		9. Interelectrode short in the Л202 tube of the audio oscillator.	Replace Л-202 tube	
2	Short in the 1000 v circuit B 202 fuse blows	1. Gas in Л-103 tube	Replace tube	
		2. Damaged C-120 capacitor	Replace capacitor	
		3. Damaged C-202 capacitor	Replace capacitor	

No	Type and Signs of Malfunctions	Possible Malfunctions	Methods of Correction	
		4. Broken wire (jumper between collectors) in motor-generator set.	Replace jumper	
		5. Damaged B-201 or B-202 fuse socket.	Replace socket	
3	Short in the 27 v circuit B 204 fuse blows	1. Damaged L-201 choke	Replace choke	
		2. Short between Э-202 "receive-transmit" relay contacts.	Bend back the contacts	
4	Inoperative master oscillator In position AI the И 101 monitoring device reading is irregular (not according to the table), in position AII the instrument needle reads off-scale, in position YIII the instrument reading is absent.	1. Defective Л-101 tube of the type Г-411.	Replace tube	[SPN 39]
		2. Damaged R-101 resistor	Replace resistor	
		3. Damaged R-104 resistor	Replace resistor	
		4. Nonoperation of Э-101 relay or no contact in it	Replace the relay or bend contacts	
		5. Plate contact of the Л-101 tube shorted out with the frame.	Place the cap on the tube plate and move the plaited plate wire next to the partition between the tubes.	
5	Inoperative amplifier The reading of the monitoring device in position AII is not in accord with standards, in position YIII the instrument reading is absent.	1. Defective Л-102 tube of the type Г-411.	Replace tube	
		2. Damaged L-104 choke	Replace choke	[SPN 40]
		3. Damaged R-107 resistor	Replace resistor	
6	Inoperative power amplifier	1. Defective Л-103 tube of the type ГК-71.	Replace tube	

No	Type and Signs of Malfunctions	Possible Malfunctions	Methods of Correction	
		2. Damaged R-110 resistor	Replace resistor	
		3. Break in L-106 choke	Replace choke	
7	No reading on the И-101 instrument for any position of the П-101 switch.	Defective И-101 instrument	Replace the instrument	
8	No reading on the И-101 instrument in one of the positions AI, AII, YIII, ЭIII-общ.	No contact in the П-101 switch	Bend the П-101 switch springs	
9	No output to the antenna according to T5-1 instrument	1. No contact in the Э-102 relay contact system	Replace the antenna relay armature	[SPN 41]
		2. Nonoperation of Э-102 relay, break in the relay winding	Replace relay	
		3. No contact in the П-103 toggle switch	Replace toggle switch	
		4. Nonoperation of Э-501, Э-502, Э-503 relay, break in relay winding	Replace relay	
		5. Damaged C-126 capacitor	Replace capacitor	
		6. T5-1 instrument thermocouple burned out	Replace thermocouple	
10	No telegraph keying	1. Damaged Л-202 tube	Replace tube	

No	Type and Signs of Malfunctions	Possible Malfunctions	Methods of Correction	
	M-20 monitoring device needle does not drop to zero when telegraph operation key released.	2. Breakdown of the T-201 transformer	Replace transformer	[SPN 42]
		3. Breakdown of the C-210 capacitor	Replace capacitor	
11	No modulation - the M-20 monitoring device needle does not fluctuate during phone operation.	1. Defective Л-201 tube of the type 6H7 in the power unit	Replace tube	
		2. Break in R-206 resistor	Replace resistor	
		3. No contact in the external modulation terminal block	Tighten the terminal springs	
12	No self-monitoring, voice and telegraph signal not heard over operator's phones.	1. Defective Л-305 tube of the 6H7 type in the antenna unit or the filament of one of the type 6H7 tubes in the power unit burned out	Replace tube	
		2. Defective Л-301 tube of the 6H7 type in the antenna unit or the filament of one of the antenna element tubes burned out	Replace tube	[SPN 43]
		3. ДГЦ-4 rectifier burned out	Replace ДГЦ-4	
13	No indication	1. Indicating wire is not connected to terminal "И" on the antenna element and mounting of the radio-frequency units	Connect the wire	
		2. Defective Л-301 tube of the 6A7 type in the antenna element or the filament of one of the 6A7 type tubes in the antenna element burned out	Replace tube	

No	Type and Signs of Malfunctions	Possible Malfunctions	Methods of Correction
		3. Break in ДГЦ-4 rectifier in SVB-5 unit	Replace ДГЦ-4 rectifier
14	РУК-300Б motor-generator does not start	1. Filament of the power amplifier tube Л-103 of the type ГК-71 burned out	Replace tube
		2. Break in the Э-202 relay winding	Replace relay [SPN 44]
15	Antenna circuit is out of alignment for operation on fixed or trailing antenna.	Defective "Ж-В" toggle switch	Replace П-103 toggle switch

SPECIFICATIONS [SPN 45]

for the Schematic Diagram of the Transmitting

Section of the Medium-Wave Unit

"SVB-5"

Schematic Diagram No 1	Name 2	Electrical Data 3	Purpose 4	
		MEDIUM-WAVE UNIT SVB-5		
C-101	Variable air capacitor	min. 15 pf max. 65 pf	Exciter circuit capacitor	[SPN 47]
C-102	Variable air capacitor	min. 15 pf max. 120 pf	Exciter circuit capacitor	
C-103	Semivariable air capacitor	max. 5 pf	Exciter circuit alignment during scale correction	
C-104	Semivariable air capacitor	max. 2 pf	Exciter circuit alignment	
C-105	Semivariable air capacitor	5 pf	S a m e	
C-106	TiO_2 ceramic capacitor	KTK-2M-82-I	Coarse adjustment of band capacitor	
C-107	Molded mica capacitor	KSO-5-500-A-3900-II	For exciter tube screen grid circuit	
C-108	Ceramic capacitor	KTK-1-D-20-II	For exciter tube screen grid circuit	
C-109	Ceramic capacitor	KTK-1-D-51 pf	Exciter tube control grid circuit separator	[SPN 48]
C-110	Molded mica capacitor	KSO-5-500-A-3900-II	For exciter tube suppressor grid circuit	
C-111	Ceramic capacitor	KTK-1-D-30 pf	Amplifier control grid circuit separator	
C-112	Molded mica capacitor	KSO-5-500-A-3900-II	For amplifier screen grid circuit	

Schematic Diagram No 1	Name 2	Electrical Data 3	Purpose 4	
C-113	Molded mica capacitor	KSO-5-500-A-3900-II	For suppressor grid circuit of the amplifier	
C-114	Molded mica capacitor	KSO-5-500-A-3900-II	Blocking of the plate circuit choke of the amplifier	
C-115	Molded mica capacitor	KSO-5-500-A-3900-II	Blocking capacitor in the feedback circuit of the exciter tube plate	
C-116	Ceramic capacitor	KTK-1-D-51 pf	Blocking capacitor in the amplifier plate circuit	
C-117	Molded mica capacitor	KSO-5-500-A-3900-II	For screen grid circuit of the power stage tube	[SPN 49]
C-118	Molded mica capacitor	KSO-6-1000-A-1000-II	For suppressor grid circuit of the power stage tube	
C-119	Molded mica capacitor	KSO-5-500-A-3900-II	Decoupling of the grid circuit of the power stage tube	
C-120	Molded mica capacitor	KSO-11-2000-A-3300-II	Blocking of the choke in the plate circuit of the power stage tube	
C-121	Molded mica capacitor	M-2-3500-A-2000-III	Separator in the plate circuit of the power stage tube	
C-122	Molded mica capacitor	KSO-5-500-A-3900-II	Blocking of the power stage tube filament	
C-123	Molded mica capacitor	KSO-5-500-A-3900-II	"	
C-124	Molded mica capacitor	KSO-2-500-A-510-II	Blocking the monitoring device	

Schematic Diagram No	Name	Electrical Data	Purpose	
1	2	3	4	
C-125	Molded mica capacitor	KSO-5-500-A-3900-II	Blocking the buffer stage cathode	[SPN 50]
C-126	Ceramic capacitor	4 pf	Rectifier coupling capacitor	
C-127	Molded mica capacitor	KSO-5-500-A-3900-II	Blocking the "И" terminal	
C-128	Molded mica capacitor	KSO-2-500-A-3900-II	Blocking the ДГЦ-4 rectifier	
L-101	Inductor with a trimmer	L=0.85 mh	Exciter circuit coil	
L-102	Inductor	R=100 ohms	Feedback coil in the exciter plate circuit	
L-104	Radio-frequency choke	L=5 mh	Amplifier plate circuit choke	
L-105	Radio-frequency choke	L=5 mh	Choke in the suppressor grid circuit of the power stage tube	
L-106	Radio-frequency choke	L=5 mh	Choke in the control grid circuit of the power stage tube	[SPN 51]
L-107	Radio-frequency choke	L=2.5 mh	Plate circuit choke of the power stage tube	
L-108	Variometer	L min.=180 μh L max.=645 μh	Variometer of the antenna circuit tuning	
L-109	Loading coil	L max.=0.9 mh	Loading coil for fixed antenna operation	
R-101	Vitrified resistor	PEV-25-10000-II	Dropping resistor in the exciter tube plate circuit	

Schematic Diagram No 1	Name 2	Electrical Data 3	Purpose 4	
R-102	Carbon resistor	MLT-2-0.1-II-A	Exciter tube screen grid supply potentiometer	
R-103	Carbon resistor	MLT-1-33000-II-A	Same	
R-104	Carbon resistor	MLT-1-0.1-II-A	Exciter tube control grid leak	
R-105	Carbon resistor	MLT-0.5-0.1-II-A	Exciter tube protective grid decoupling	
R-106	Carbon resistor	MLT-0.5-0.1-II-A	Amplifier tube control grid leak	[SPN 52]
R-107	Carbon resistor	2xMLT-2-75000-II-A	Dropping resistor in amplifier screen grid circuit	
R-108	Vitrified resistor	PEV-10-10 ohm-II	Dropping resistor in tube filaments	
R-109	Carbon resistor	MLT-0.5-0.47-II-A	Resistor in cathodes of the exciter tubes	
R-110	Vitrified resistor	PEV-10-2000 ohm-II	Dropping resistor of the power amplifier screen grid circuit	
R-111	Wire-wound resistor	143 ohms ± 3 ohms	Monitoring device shunt in the exciter plate circuit	
R-112	Wire-wound resistor	45 ohm ± 1 ohm	Monitoring device shunt in the amplifier plate circuit	
R-113	Wire-wound resistor	45 ohm ± 1 ohm	Monitoring device shunt in the power amplifier screen grid circuit	

Schematic Diagram No / 1	Name 2	Electrical Data 3	Purpose 4	
R-114	Carbon resistor	143 ohms ± 3 ohms	Monitoring device shunt in the power amplifier control grid circuit	[SPN 53]
R-115	Vitrified resistor	PEV-10-2000 ohn-II	Dropping resistor in the buffer plate circuit	
R-116	Vitrified resistor	PEV-10-220 ohm-II	Amplifier cathode resistor	
R-117	Carbon resistor	MLT-0.5-33000-II-A	In detector circuit	
Г-101	"И" terminal		Wire connection terminal from terminal "И" of the antenna unit	
Г-102	Terminal		Radio-frequency unit antenna connection terminal	
Г-103	Terminal block		Power supply block on the radio-frequency unit	[SPN 54]
Г-104	Plug		For connection of the power unit cable to the mounting.	
Г-105	Plug		Terminal block on the stand for phone connection	
Г-106	Terminal block		"ЭЖВ" power supply block	
И-101	Monitor	М-61 (3000 mv)	Standard operation monitor of separate stages in the radio-frequency unit	
Л-101	Tube	Г-411	Exciter tube	
Л-102	Tube	Г-411	Amplifier tube	

Schematic Diagram No	Name	Electrical Data	Purpose
1	2	3	4
Л-103	Tube	Г-71	Power stage tube
Ц-101	Germanium diode	ДГЦ-4	Tuning indicator rectifier
П-101	Switch		Switching controlling circuits of the medium-wave unit
П-102	Switch		Switching on and tuning the radio-frequency unit from the front panel [SPN 55]
П-103	Toggle switch	ТВ2-1	Fixed-trailing antenna switch
П-104	Switch		Loading coil switch for fixed antenna operation
Э-101	Relay		Radio frequency unit switch-on relay
Э-102	Relay		Fixed - trailing antenna plate coupling switch relay
Т-101	Thermocouple		Thermocouple for Т5-1 instrument
П-104	Switch		Plate coupling switch

NOTE: Specifications for BP-2 and BP-3 units are given in R-805 radio station description.

POWER UNIT

С-201	Electrolytic capacitor	КЕ-2-450-10-III	Blocking capacitor in the +350 v circuit
С-202	Paper capacitor	КБГ-МН-1-1000-2.0-III	Blocking capacitor in the +1000 v circuit

Schematic Diagram No 1	Name 2	Electrical Data 3	Purpose 4	
C-203	Paper capacitor	KBGI-400-0.05-II	Decoupling capacitor in the first modulator stage plate	[SPN 56]
C-204*	Molded mica capacitor	KSO-5-500-A-3300-II	Input circuit capacitor	
C-205*	Molded mica capacitor	KSO-5-500-1300-II	Coupling capacitor for the grid of the first modulator stage	
C-206	Molded mica capacitor	KSO-5-500-A-3900-II	Coupling capacitor for the grid of the second modulator stage	
C-207	Paper capacitor	KBG-MP-2-B-1000-0.05-II	Coupling in the power stage suppressor grid circuit	
C-208	Paper capacitor	MKV-260-0.5-III	Decoupling the potentiometer	
C-209	Molded mica capacitor	KSO-11-500-A-10000-II	Audio oscillator circuit capacitor	
C-210	Electrolytic capacitor	KE-2-450-10-III	Rectifier filter capacitor	[SPN 57]
C-211	Paper capacitor	MKV-260-0.5-III	For plate circuit of the self-monitoring amplifier	
C-213	Molded mica capacitor	KSO-5-500-3900-II	Coupling capacitor for the indicator grid	
C-215	Paper capacitor	MKV-260-0.5-III	Blocking capacitor in +80 v circuit	
C-216	Paper capacitor	MKB-260-0.5-III	Blocking capacitor in +27 v circuit	
C-217	Paper capacitor	KBM-14-600-0.5-III	Decoupling in the audio oscillator plate circuit	
C-218	Paper capacitor	KBM-14-600-0.5-III	Decoupling in the audio frequency amplifier plate circuit	

Schematic Diagram No 1	Name 2	Electrical Data 3	Purpose 4	
L-201	Audio-frequency choke	L=3 h	Throat microphone supply circuit choke	
L-202	Audio-frequency choke	L=0.3 h	Throat microphone load choke	
L-203	Audio-frequency choke	L=0.8 h	Input circuit choke	[SPN 58]
L-204	Audio-frequency choke	L=13 h	Choke in plate 2 of the modulator stage	
L-205	Audio-frequency choke	L=3 h	Indicator grid circuit choke	
R-201	Carbon resistor	0.25 ohm	Stepped starting resistor	
R-202*	Carbon resistor	MLT-0.5-0.39-II-A	Input sensitivity control resistor	
R-203	Carbon resistor	MLT-0.5-0.15-II-A	S a m e	
R-204	Carbon resistor	MLT-0.5-47000-II-A	Input sensitivity control resistor	
R-205	Carbon resistor	MLT-0.5-0.1-II-A	S a m e	
R-206	Carbon resistor	MLT-0.5-1.8-II-A	First stage modulator decoupling resistor	
R-207	Carbon resistor	MLT-0.5-2400-I-A	Modulator input circuit resistor	[SPN 59]
R-208	Carbon resistor	MLT-0.5-0.1-II-A	Stage modulator grid I leak	
R-209	Carbon resistor	MLT-0.5-1.8-II-A	Stage modulator grid II leak	
R-210	Vitrified resistor	PEV-15-3600-II	Dropping resistor in the audio oscillator tube plate circuit	

Schematic Diagram No 1	Name 2	Electrical Data 3	Purpose 4	
R-211	Carbon resistor	MLT-0.5-1.0-II-A	Potentiometer of negative bias on modulator grid	
R-212*	Carbon resistor	MLT-0.5-4700-II-A	S a m e	
R-213*	Carbon resistor	MLT-0.5-15000-II-B	S a m e	
R-214*	Carbon resistor	MLT-0.5-3900-II-A	Audio oscillator grid leak	
R-215	Carbon resistor	2xMLT-1-0.1-II-A	Negative bias potentiometer resistor	[SPN 60]
R-216	Vitrified resistor	PEV-15-5100-II	Potentiometer of negative bias and grid leak of the output stage tubes	
R-217	Carbon resistor	MLT-2-0.13-II-A	Potentiometer for suppressor grids of the 1st and 2nd stage tubes	
R-219	Carbon resistor	MLT-0.5-0.1-II-A	Dropping resistor for the 2nd stage of the audio-frequency amplifier plate	
R-220	Carbon resistor	MLT-0.5-0.2-II-A	Bias potentiometer for suppressor grids of the output stage tubes	
R-221*	Carbon resistor	MLT-0.5-0.15-II-A	S a m e	
R-223	Carbon resistor	MLT-2-33000-II-A	Plate circuit resistor for self-monitoring audio-frequency amplifier	
R-225	Carbon resistor	MLT-1-0.1-II-A	Limiting resistor in self-monitoring plate circuit	[SPN 61]
R-226	Vitrified resistor	2xPEV-10-8 ohm-II	Ballast winding relay ∂-203	

Schematic Diagram No 1	Name 2	Electrical Data 3	Purpose 4
R-227	Vitrified resistor	PEV-10-27 ohm±10%	Throat microphone supply circuit resistor
R-228	Vitrified resistor	PEV-10-9 ohm-II	Dropping resistor for filaments of 6H7C, Д-201, Д-202, Д-305 tubes
R-229	Vitrified resistor	PEV-10-3300 ohm-II	Resistor of power supply potentiometer for suppressor grids of tubes
R-230	Vitrified resistor	PEV-25-10000 ohm±10%	S a m e
R-231	Wire-wound resistor	4 ohms	Monitoring device shunt in the main current supply circuit
R-232	Wire-wound resistor	1 ohm	Resistor for 6H7C and 6A7 tube filaments in power and antenna units
B-201	Fuse		Fuse in 350 v circuit [SPN 62]
B-202	Fuse		Fuse in 1000 v circuit
B-203	Fuse		Fuse in +27 v receiver circuit
B-204	Fuse		Fuse in +27 v transmitter circuit
Г-201	Terminal block "Д"		For throat microphone connection
Г-202	Plug connector		Plug connector of the cable from aircraft electrical system to the power unit

Schematic Diagram No	Name	Electrical Data	Purpose	
1	2	3	4	
Г-203	Plug connector		Plug connector of the cable from receiver to power unit	
Г-204	Plug connector		Plug connector for the cable from power unit to radio-frequency unit No 3	
Г-205	Plug connector		Plug connector for the cable from power unit to radio-frequency units No. 1 and 2	
Г-206	Plug connector		Plug connector for the cable from power unit to control panel	[SPN 63]
Г-207	Plug connector		Plug connector for the cable from power unit to antenna element	
Г-208	Terminal "П"		Counterpoise terminal	
Л-201	Tube	6H7C	Modulator tube	
Л-202	Tube	6H7C	Audio oscillator with rectifier tube	
П-201	Switch "1", "2", "3"		Modulator input circuit sensitivity control	
Г-209	Terminal "С" (self-monitoring)		For connection of wires from radio operator's earphones to the intercom	
Г-210	Plug connector		Plug connector for the cable from power unit to RU-11AM motor generator of the "УС-П" receiver	
П-203	Automatic terminal block		External modulation terminal block	[SPN 64]

Schematic Diagram No 1	Name 2	Electrical Data 3	Purpose 4
T-201	Transformer		Audio oscillator transformer
Э-201	Relay		Step starting relay
Э-202	Relay		Starting relay
Э-203	Relay		"Send-receive" relay
		ANTENNA ELEMENT	
C-301	Ceramic capacitor	KTK-2-M-82-I	For quartz master oscillator grid circuit
C-302	Semivariable ceramic capacitor	KPK-1-4/15 pf	Quartz frequency correction
C-303	Ceramic capacitor	KTK-2-M-91-I	For quartz master oscillator screen grid circuit
C-304	Molded mica capacitor	KSO-5-500-A-1800-II	For mixer plate circuit
C-305	Ceramic capacitor	KTK-1-D-33-II	For circuit III of the mixer grid
C-306	Ceramic capacitor	KTK-1-D-33-II	Coupling capacitor for the 200 kc grid [SPN 65]
C-307	Ceramic capacitor	KTK-2-M-91-II	200 kc oscillator circuit capacitor
C-308	Molded mica capacitor	KSO-2-500-A-510-II	Coupling capacitor of the 200 kc oscillator grid
C-309	Ceramic capacitor	KTK-1-D-82-II	Coupling capacitor for the 40 kc oscillator grid

Schematic Diagram No 1	Name 2	Electrical Data 3	Purpose 4
C-310	Ceramic capacitor	KTK-1-D-10-II	Coupling capacitor for mixer grid
C-311	Molded mica capacitor	KSO-2-500-V-510-II	40 kc circuit capacitor
C-312	Molded mica capacitor	KSO-2-500-A-510-I	Coupling capacitor of the 40 kc oscillator grid
C-313	Ceramic capacitor	KTK-1-D-10-II	Coupling capacitor for the 10 - 20 kc oscillator grid
C-314	Ceramic capacitor	KTK-1-D-10-II	Coupling capacitor for mixer grid
C-315	Molded mica capacitor	KSO-5-500-V-2400-I	10 kc circuit capacitor
C-316	Molded mica capacitor	KSO-5-500-V-2400-I	20 kc circuit capacitor [SPN 66]
C-317	Molded mica capacitor	KSO-2-500-A-510-II	Coupling capacitor of the 10 - 20 kc oscillator grid
C-318	Molded mica capacitor	KSO-2-500-A-510-II	Coupling capacitor for the third grid of the 10 - 20 kc oscillator
C-319	Ceramic capacitor	KTK-1-D-33-II	Mixer grid coupling capacitor
C-320	Molded mica capacitor	KSO-5-500-A-3900-II	Coupling capacitor between audio frequency amplifier grid and mixer plate
C-321	Molded mica capacitor	KSO-2-500-A-3900-II	Coupling capacitor between plate of 1st stage of audio frequency amplifier and grid of 2nd stage

Schematic Diagram No	Name	Electrical Data	Purpose	
1	2	3	4	
C-322	Molded mica capacitor	KSO-2-500-A-510-II	For audio oscillator amplifier 1st stage grid circuit	
C-323	Molded mica capacitor	KSO-11-500-A-10000-II	Mixer plate decoupler	
C-324	Molded mica capacitor	KSO-1-500-A-510-II	Coupling capacitor of the indicator tube grid for frequency supply from audio oscillator	[SPN 67]
C-325	Molded mica capacitor	KSO-5-500-A-3900-II	Blocking +80 v circuit	
C-326	Ceramic capacitor	KTK-1-D-10-II	Mixer grid coupling capacitor	
C-327	Ceramic capacitor	KTK-1-D-33-II	Grid III to 200 kc oscillator grid coupling capacitor	
C-328	Molded mica capacitor	KSO-5-500-A-510-II	Grid III to 40 kc oscillator grid coupling capacitor	
C-329	Molded mica capacitor	KSO-2-500-A-510-II	For control grid circuit of 2nd stage of the audio-frequency amplifier	
C-330	Molded mica capacitor	KSO-5-500-A-3900-II	Blocking the terminal "I"	
C-331	Molded mica capacitor	KSO-5-500-A-3900-II	Blocking the amplifier plate	
C-332	Molded mica capacitor	KSO-5-500-A-3900-II	Blocking the "И-301" instrument	[SPN 68]
L-301	Inductor with a trimmer	7 mh	200 kc oscillator circuit coil	

Schematic Diagram No 1	Name 2	Electrical Data 3	Purpose 4	
L-302	Inductor with a trimmer	32 mh	40 kc oscillator circuit coil	
L-303	Inductor with a trimmer	32 mh	10 kc oscillator circuit coil	
L-304	Inductor with a trimmer	32 mh	20 kc oscillator circuit coil	
R-301*	Carbon resistor	MLT-0.5-0.47-II-A	Mixer plate dropping resistor	
R-302	Carbon resistor	MLT-0.5-1.0-II-A	Decoupling in the mixer plate	
R-304*	Carbon resistor	MLT-2-47000-II-A	Dropping resistor in screen grid circuit of the quartz oscillator	
R-305	Carbon resistor	MLT-0.5-1.8-II-A	Mixer 3rd grid leak	
R-306	Carbon resistor	MLT-0.5-47000-II-A	Dropping resistor in the 200 kc oscillator plate	[SPN 69]
R-307	Carbon resistor	MLT-0.5-47000-II-A	200 kc oscillator control grid leak	
R-308	Carbon resistor	MLT-0.5-0.1-II-A	3rd grid leak of the 200 kc oscillator	
R-309	Carbon resistor	MLT-0.5-0.22-II-A	Dropping resistor in the 40 kc oscillator plate	
R-310	Carbon resistor	MLT-0.5-47000-II-A	40 kc oscillator control grid leak	
R-311	Carbon resistor	MLT-0.5-0.15-II-A	3rd grid leak of the 40 kc oscillator	

Schematic Diagram No 1	Name 2	Electrical Data 3	Purpose 4	
R-312	Carbon resistor	MLT-0.5-0.47-II-A	40 kc oscillator decoupling resistor	
R-313	Carbon resistor	MLT-0.5-0.22-II-A	Dropping resistor in the 10 - 20 kc oscillator plate	
R-314	Carbon resistor	MLT-0.5-15-II-A	10 - 20 kc oscillator control grid leak	[SPN 70]
R-315	Carbon resistor	MLT-0.5-0.1-II-A	3rd grid leak of the 10 - 20 kc oscillator	
R-316	Carbon resistor	MLT-0.5-0.47-II-A	10 - 20 kc oscillator decoupling	
R-317	Carbon resistor	MLT-0.5-0.47-II-A	10-20-40 kc frequency filter resistor	
R-318	Carbon resistor	MLT-0.5-1.8-II-A	Grid leak of the audio-frequency amplifier 1st stage	
R-319	Carbon resistor	MLT-0.5-0.47-II-A	Grid leak of the audio-frequency amplifier 2nd stage	
R-320	Carbon resistor	MLT-0.5-0.47-II-A	Audio-frequency amplifier 1st stage plate resistor	
R-321	Carbon resistor	MLT-0.5-33000-II-A	Quartz oscillator grid leak	
R-322	Carbon resistor	MLT-0.5-0.47-II-A	Indicator grid decoupling resistor	
R-323	Carbon resistor	MLT-0.5-0.2-II-A	For quartz calibrator screen grid in position "kop"	[SPN 71]
R-324	Carbon resistor	MLT-0.5-2400-II-A	In indicator instrument circuit	

Schematic Diagram No	Name	Electrical Data	Purpose
1	2	3	4
R-325	Vitrified wire resistor	MLT-2-5100-II-A	Potentiometer resistor in +80 v circuit
R-326*	Carbon resistor	MLT-0.5-36000-II-A	In indicator instrument circuit
R-327	Carbon resistor	MLT-0.5-1.8-II-A	Decoupling of the audio-frequency amplifier plate
R-328*	Carbon resistor	MLT-0.5-10000-II-A	Mixer screen grid supply potentiometer
R-329	Wire-wound resistor	3 ohm	For the filament circuit of the 6A7 tube
Г-301	Terminal block "АИ"		For indicator instrument connection
Г-302	Plug connector		Plug connector for the cable from antenna element to power unit [SPN 72]
Г-303	Terminal "А"		For transmitter antenna connection
Г-304	Terminal "АП"		For receiver antenna connection
Г-305	Terminal "Б"		For connection of the antenna wire from transmitter
Г-306	Terminal "С" (communication)		For connection of the communication wire with the mixer grid
Г-307	Terminal "П"		Terminal for counterpoise connection
Г-308	Terminal "И"		For connection of induction wire from terminal "И" on the mounting

Schematic Diagram No	Name	Electrical Data	Purpose	
1	2	3	4	
И-301	Galvanometer	1 milliampere, M-20	Antenna balance indicator instrument	
Л-301	Tube	6A7	Quartz oscillator and mixer tube	[SPN 73]
Л-302	Tube	6A7	200 kc oscillator tube	
Л-303	Tube	6A7	40 kc oscillator tube	
Л-304	Tube	6A7	10 - 20 kc oscillator tube	
Л-305	Tube	6H7C	Self-monitoring audio-frequency amplifier	
П-301	Switch		10 - 20 kc circuit switch	
П-302	Switch		Exciter tube control grid switch	
П-303	Switch		+80 v circuit switch	
П-304	Switch		+350 v circuit switch	
Х-301	Quartz crystal	1000 kc		
Э-301	Relay		Antenna relay	[SPN 74]
Э-302	Relay		Receiver input cut-in relay	
		CONTROL PANEL		
С-401	Paper capacitor	MKV-260-0.5-III	Capacitor for telegraph operation at 25% output	

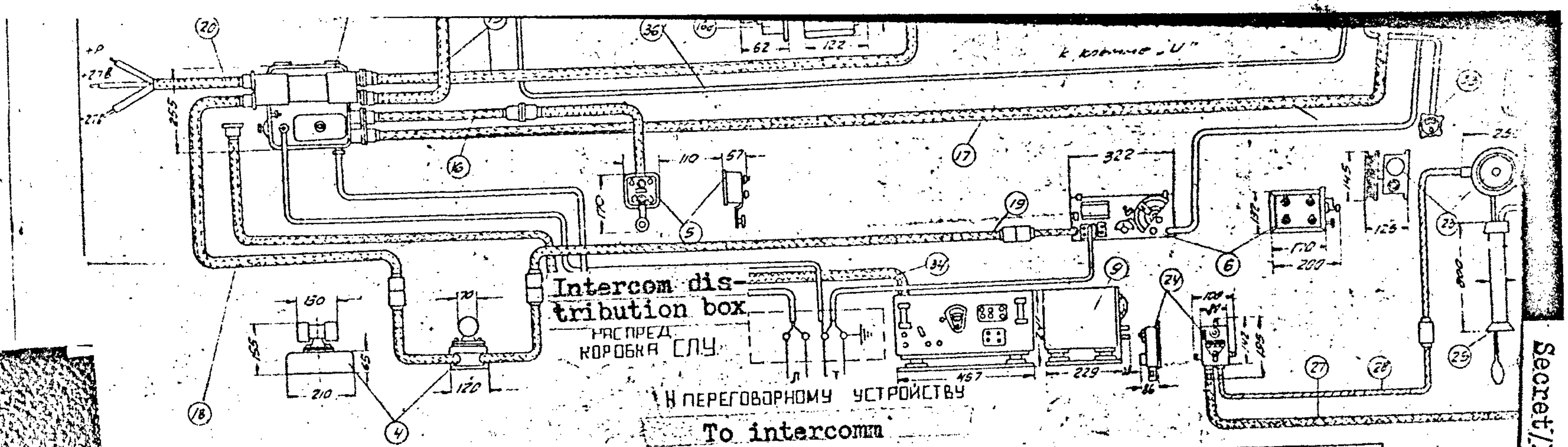
Schematic Diagram No	Name	Electrical Data	Purpose
1	2	3	4
C-402	Oil-impregnated paper capacitor	KBGI-600-0.025-II	Capacitor for lowering percentage modulation at 25% output
R-401*	Carbon resistor	MLT-0.5-0.22-II-A	Bias resistor for telegraph operation at 25% output
R-402*	Carbon resistor	MLT-0.5-0.22-II-A	Resistor for telegraph operation at 25% output
R-403*	Carbon resistor	MLT-0.5-15000-II-A	Resistor for lowering percentage modulation at 25% output
Г-401	Terminal		Control panel to power unit cable terminal [SPN 75]
П-401	Switch		"Receive-Send" switch
П-402	Switch		"Telegraph-Phone" toggle switch
П-403	Switch		"25-100%" switch
П-404	Switch "1-2-3"		Wave selector
П-405	Telegraph key		
П-406	Coupling contact		Change over contact of the telegraph key terminal block
П-407	Coupling contact		S a m e

Schematic Diagram No 1	Name 2	Electrical Data 3	Purpose 4
		FIXED AND TRAILING ANTENNA ELEMENT	
Э-501	Relay		Relay for connecting "БП-3"and "БП-2" Shortwave units to the fixed antenna
Э-502	Relay		Change over relay for operation on fixed or trailing antenna
Э-503	Relay		Relay for connecting "БП-2"and "БП-3" shortwave units to the fixed antenna [SPN 76]
R-501	Vitrified resistor	PEV-10-43-II	Resistor in Э-503 circuit
Г-501	Plug connector		Plug connector for cable between antenna element "Ж", "В" and block "БП-1"
Г-502	Terminal "КВ"		Terminal for connection to the antenna element
Г-503	Terminal block "А"		Terminal block for thermoammeter connection
Г-504	Terminal "В"		Terminal for trailing antenna connection
Г-505	Terminal "Ж"		Terminal for fixed antenna connection
Г-506	Terminal "СВ"		Terminal for medium-wave unit connection
И-501	Thermoammeter	Т 5-1	For antenna balance

Key to Diagram No 1

No	NAME	Wt. in kg
1	Radio-frequency unit No 1 and No 2 with the mounting and shock absorbers	20.3
2	Radio-frequency unit "БП-1с" with mounting and shock absorbers	10.2
3	Power unit with shock absorbers	15.3
4	РУ-11АМ motor generator set with two cables	3.4
5	Control panel with cable	0.75
6	"УС-П"receiver with cable	5.5
7	Fixed and trailing antenna element	1.5
8	Antenna element with shock absorbers	2.05
9	"УС-9" receiver	
10	Fixed antenna	
11	Bushing insulator	
12	Antenna conductor	
13	Conductor for connecting units	
14	Receiver antenna conductor	
15	Cable from power unit to radio-frequency units	
16	Cable from power unit to control panel	
16a	Antenna switch panel	
17	Cable from power unit to antenna element	
18	Cable from power unit to motor-generator set РУ-11АМ	
19	"УС-П" receiver intermediate cable	
20	Aircraft electrical system cable	
21	"Flight" case	

No	Name
22	Helmet with throat microphone, earphones and cord
23	Winch and motor unit with reducer
24	Winch control panel
25	Antenna fairlead
26	Trailing antenna weight
27	Cable from control panel to winch unit
28	Flexible shaft
29	Cable from "ВП-1" unit to fixed-trailing antenna element
30	Jumper wire between antenna unit and fixed-trailing antenna element
31	Trailing antenna lead-in
32	Cable from aircraft electrical system to antenna winch
33	Detached instrument "M-20"
34	Cable from YC-5 receiver to power unit
35	T5-1 thermoammeter
36	Indicator conductor



Key

NN п/п	Наименование	Вес в кг.	Примечание	NN п/п	Наименование	Вес в кг.	Примечание
1.	Блок выс. частоты №1 и №2			17	Кабель от силов. элем. к антен. эл.		
	с подставкой и амортизац.	20,3		18.	Кабель от силов. элем. к умформ. РУ-11АМ		
2.	Блок выс. частоты Б.П-1с			19	Кабель приемника „УС-П" промежс.		
	подставкой и амортизац.	10,2		20	Кабель бортовой сети.		
3	Силовой элемент с амортиз.	15,3		21	Ящик „В полет"		
4.	Умформер РУ-11АМ с 2" кабелями	3,4		22	Шлем с ларинг. телеф. и шнур.		
5	Пульт управления с кабелем	0,75		23	Блок лебедки и мотор с редукт.		
6	Приемник „УСП" с кабелем	5,5		24	Щиток управления лебедкой		
7	Элемент жесткой выпускн. антен.	1,5		25	Труба антенная		
8.	Антенный элемент с амортиз.	2,05		26	Антенный грузик		
9.	Приемник „УС-9"			27	Кабель от щитка управ. к блок. лебед.		
10.	Антенна жесткая			28	Гибкий валик		
11	Проходной изолятор			29	Кабель от блока „БП-1" к эл. ж. в антен.		
12	Провод антенны			30	Перемычка от ант. эл. к эл. ж. в ант.		
13	Провод соединительн. блоков			31	Ввод выпускной антенны		
14.	Провод антенны приемника			32	Кабель от бортсети конт. леб.		
15	Кабель от силового эл. к блокам в.ч.			33	Выносной прибор „М-20"		
16	Кабель от силового эл. к пульту.			34	Кабель от приемника УС-9 к силов. элем.		
16с	Щиток коммутации антенн.			35	Термоамперметр Т5-1		
				36	Провод индикации.		

Diagram No 1. Connection Diagram of Components (1a)

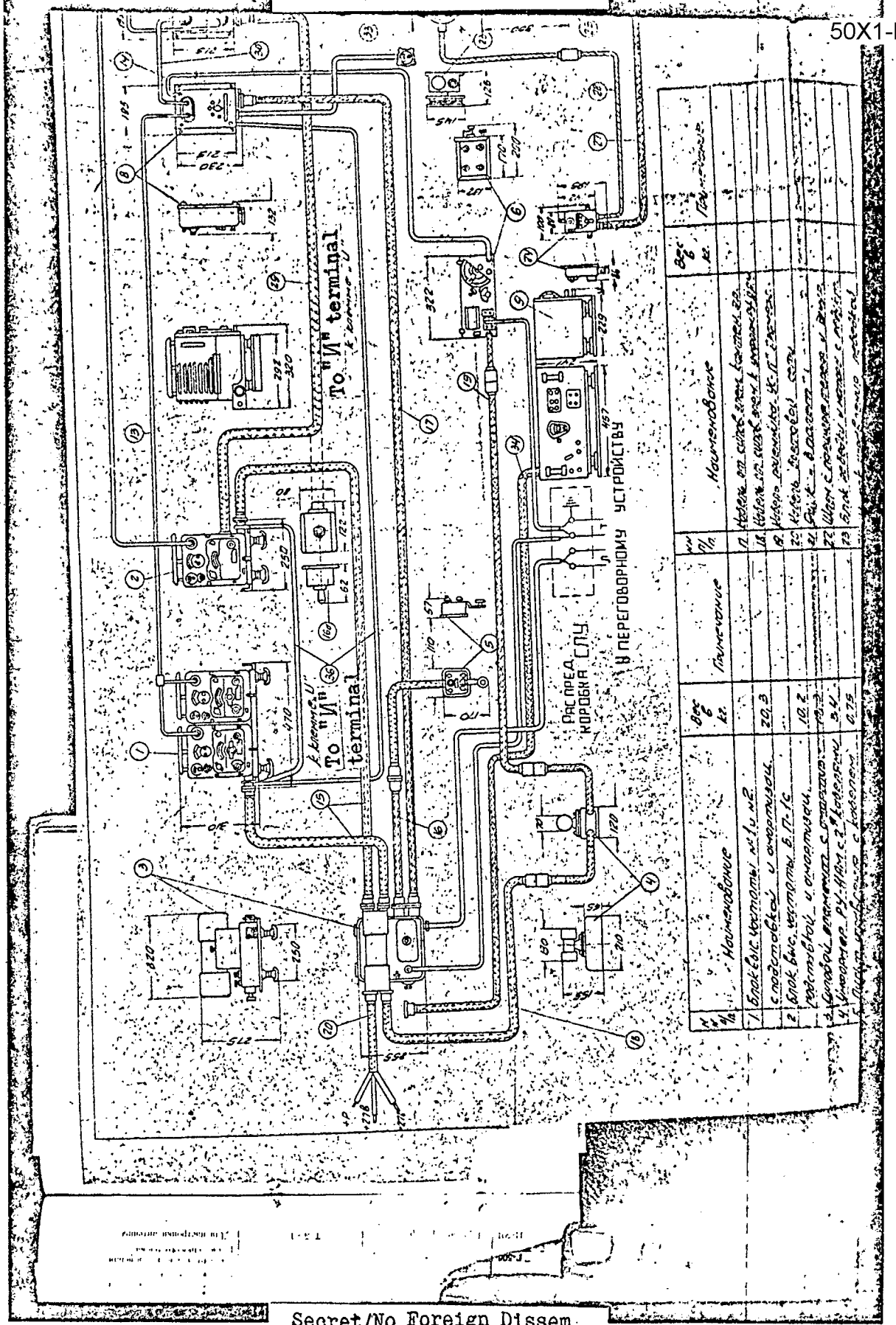
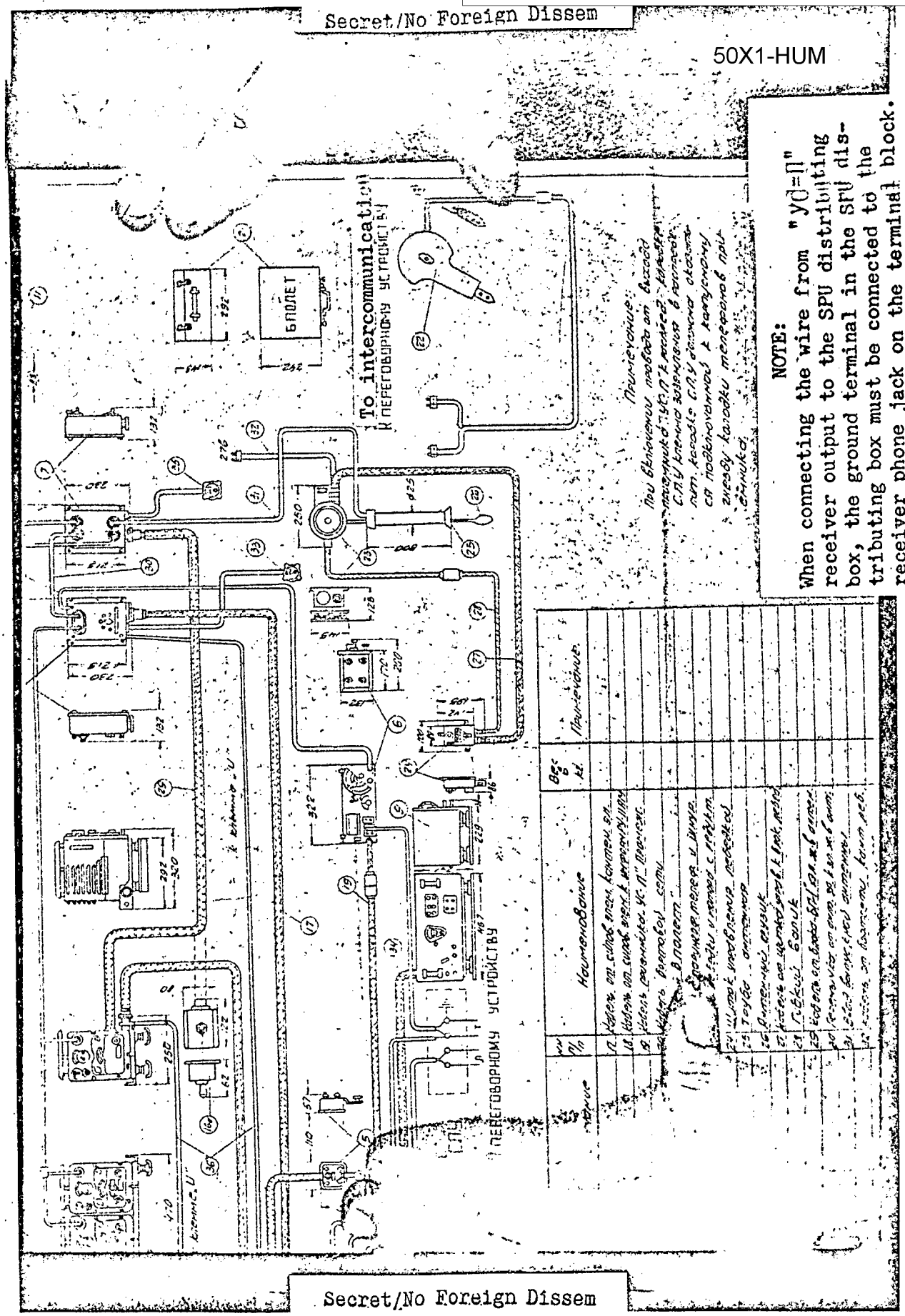


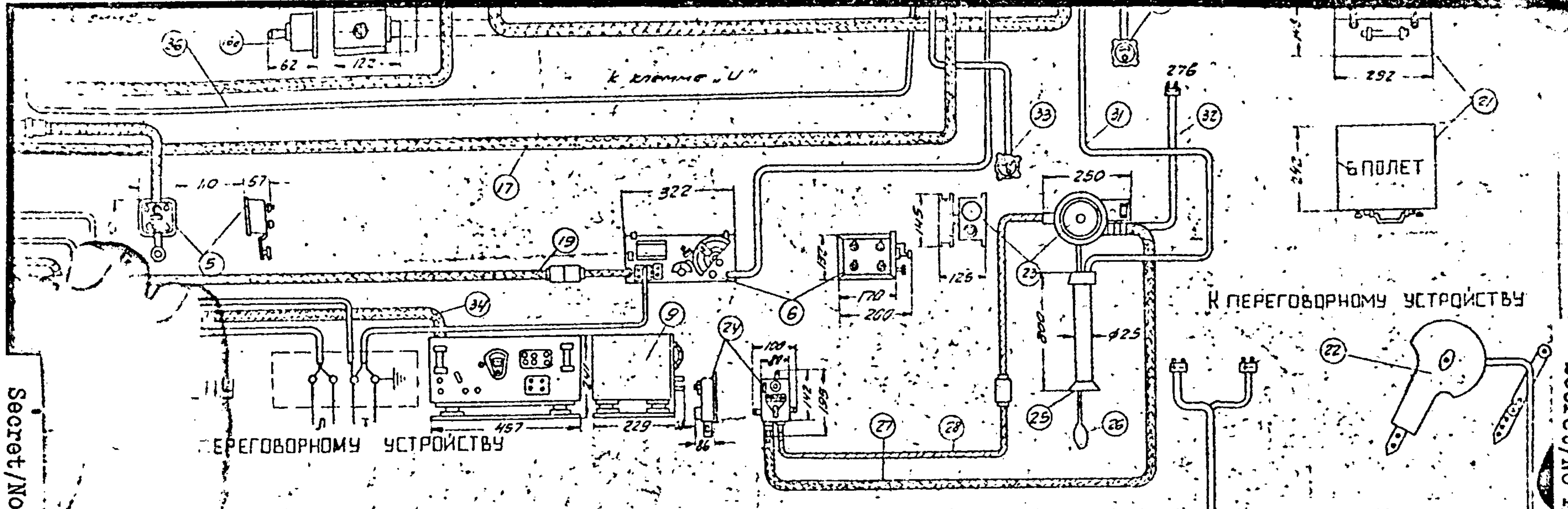
Diagram No 1. (continued, 1b)

50X1-HUM



NOTE:
When connecting the wire from "У()=П" receiver output to the SPU distributing box, the ground terminal in the SPU distributing box must be connected to the receiver phone jack on the terminal block.

Diagram No 1. (continued, 1c)



П/п.	Наименование	Вес в кг.	Примечание.
17	Кабель от силов. элем. кантен. эл.		
18	Кабель от силов. элем. к унформ. РУ-11АМ		
19	Кабель приемника "УС-П" промежс.		
20	Кабель бортовой сети		
21	Ящик "В полет"		
22	Шлем с паруиное телеф. и дину.		
23	Блок лебедки и мотора с редукт.		
24	Щиток управления лебедкой		
25	Труба антенная		
26	Антенный грузик		
27	Кабель от щитка управ. к блок. лебед.		
28	Гибкий валик		
29	Кабель от блока "БП-1" кл. ж. в антен.		
30	Перемычка от ант. эл. к эл. ж. в ант.		
31	Ввод выпускной антенны		
32	Кабель от бортсети конт. леб.		
33	Выносной прибор "М-20"		
34	Кабель от приемника "УС-з" к силов. элем.		
35	Термоамперметр Т5-1		
36	Провод индикации		

Примечание:
При включении провода от выхода приемника "УС-П" к распред. коробке С.П.У клемма заземления в распределит. коробке С.П.У должна оказаться подключенной к корпусному гнезду колодки телефонов приемника.

Схема соединения элементов р/с. СВБ-5	Литер / Вес / Масштаб; Лист / Листов
Изм. / Кол. / № докум. / Подп. / Дата; Разраб. / Провер. / Т.контр. / Н.контр. / Утверд.	Копировал:

Diagram No 1. (continued, 1d)

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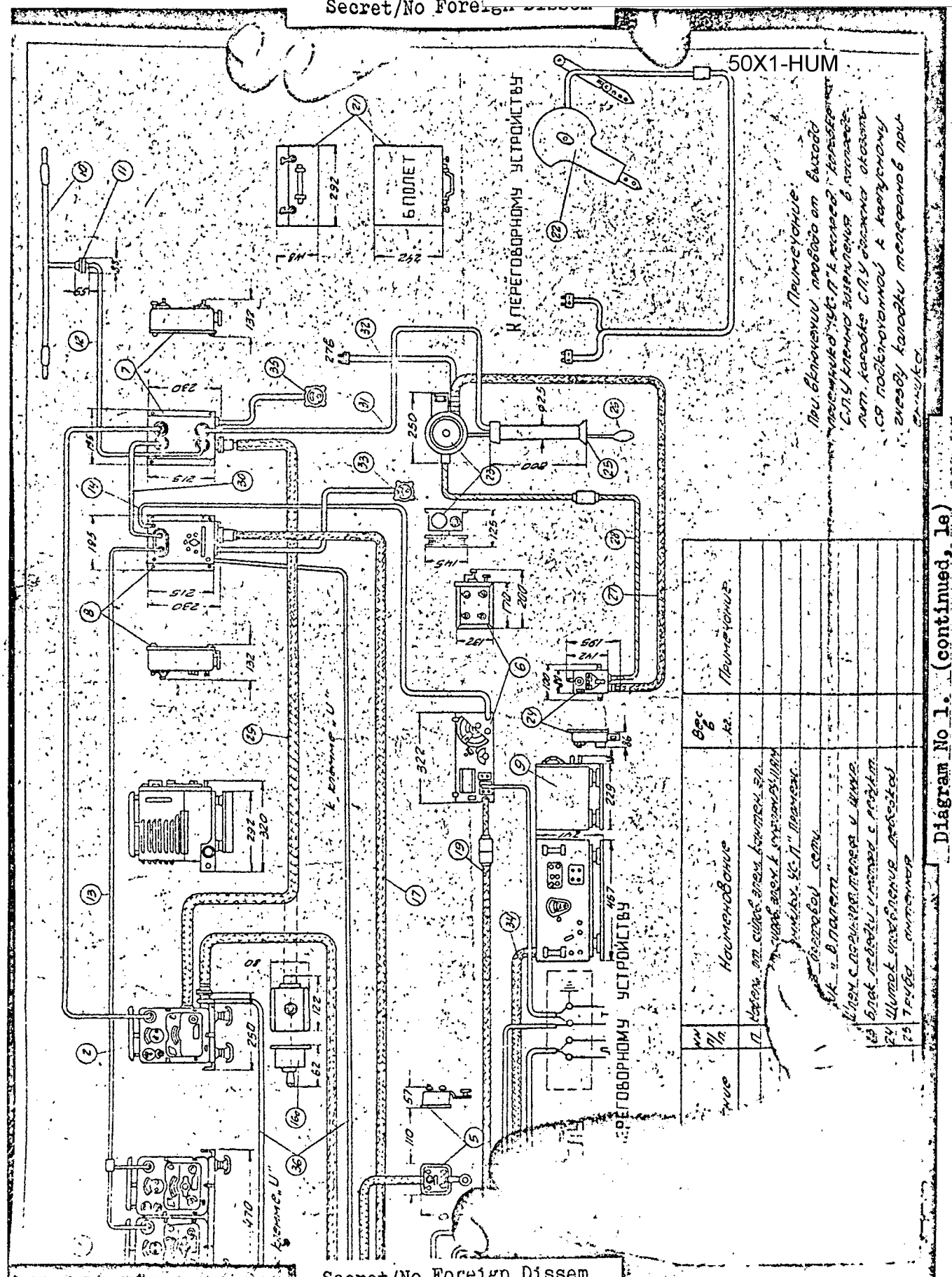
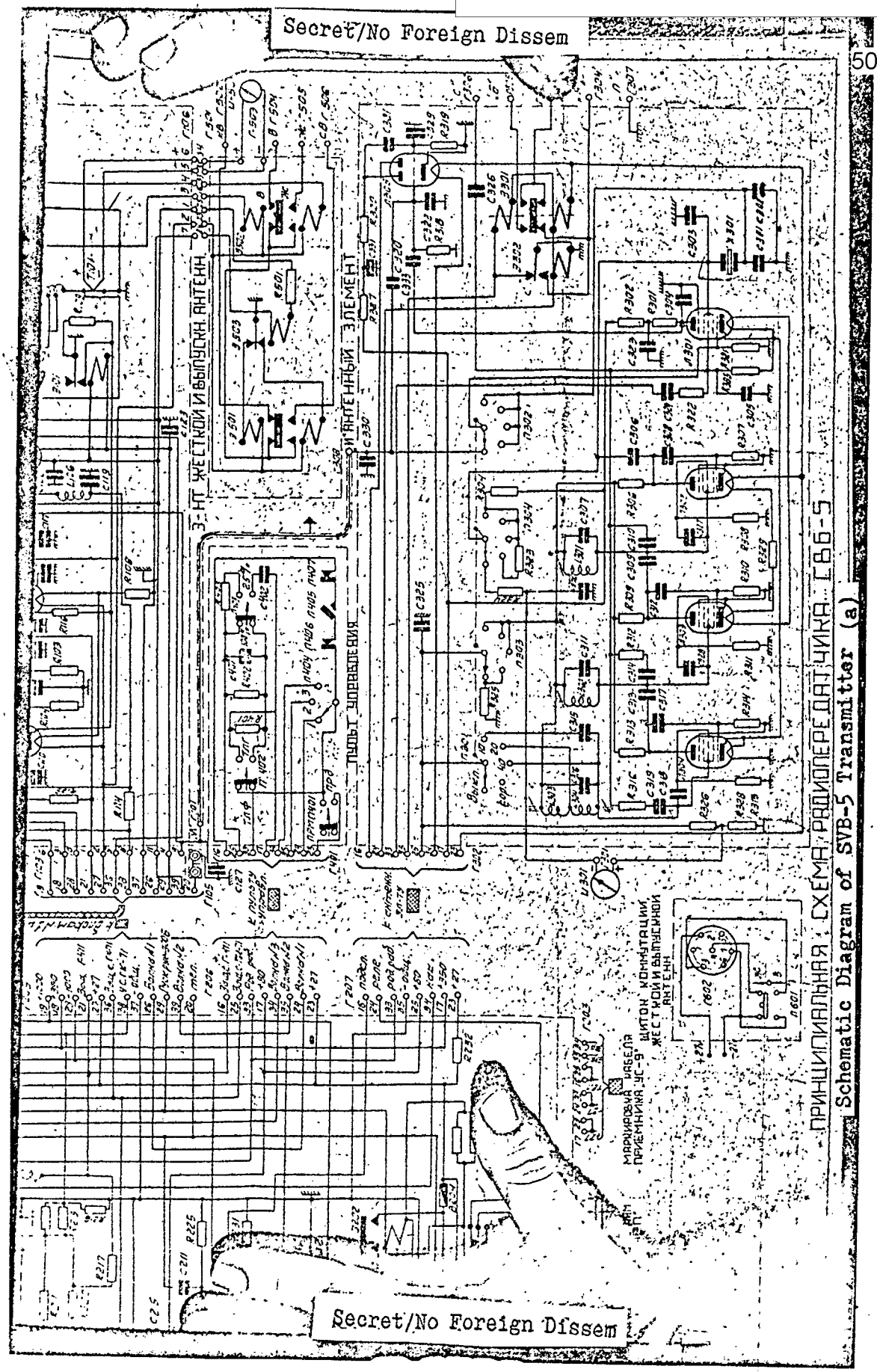
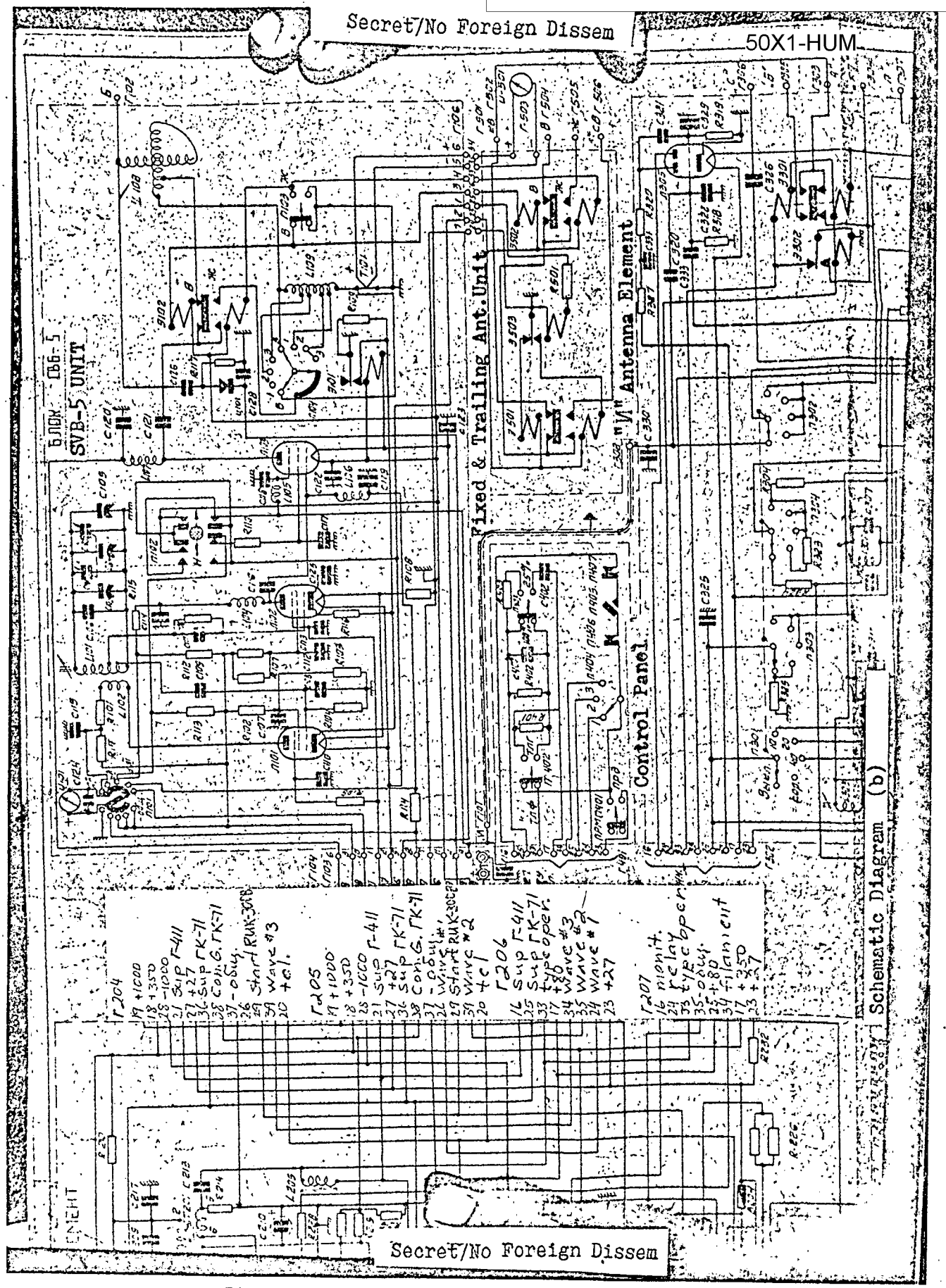


Diagram No 1. (continued, 1a)





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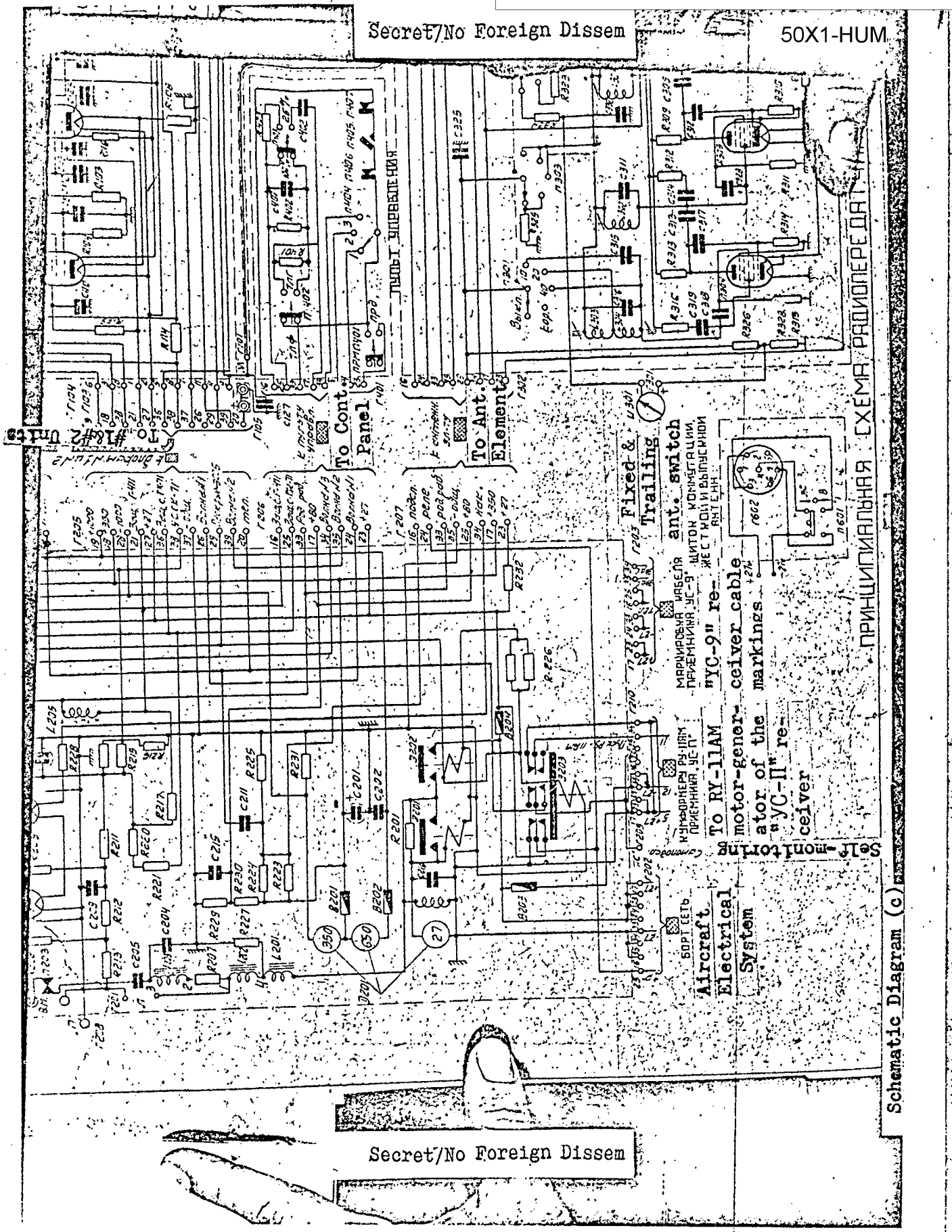

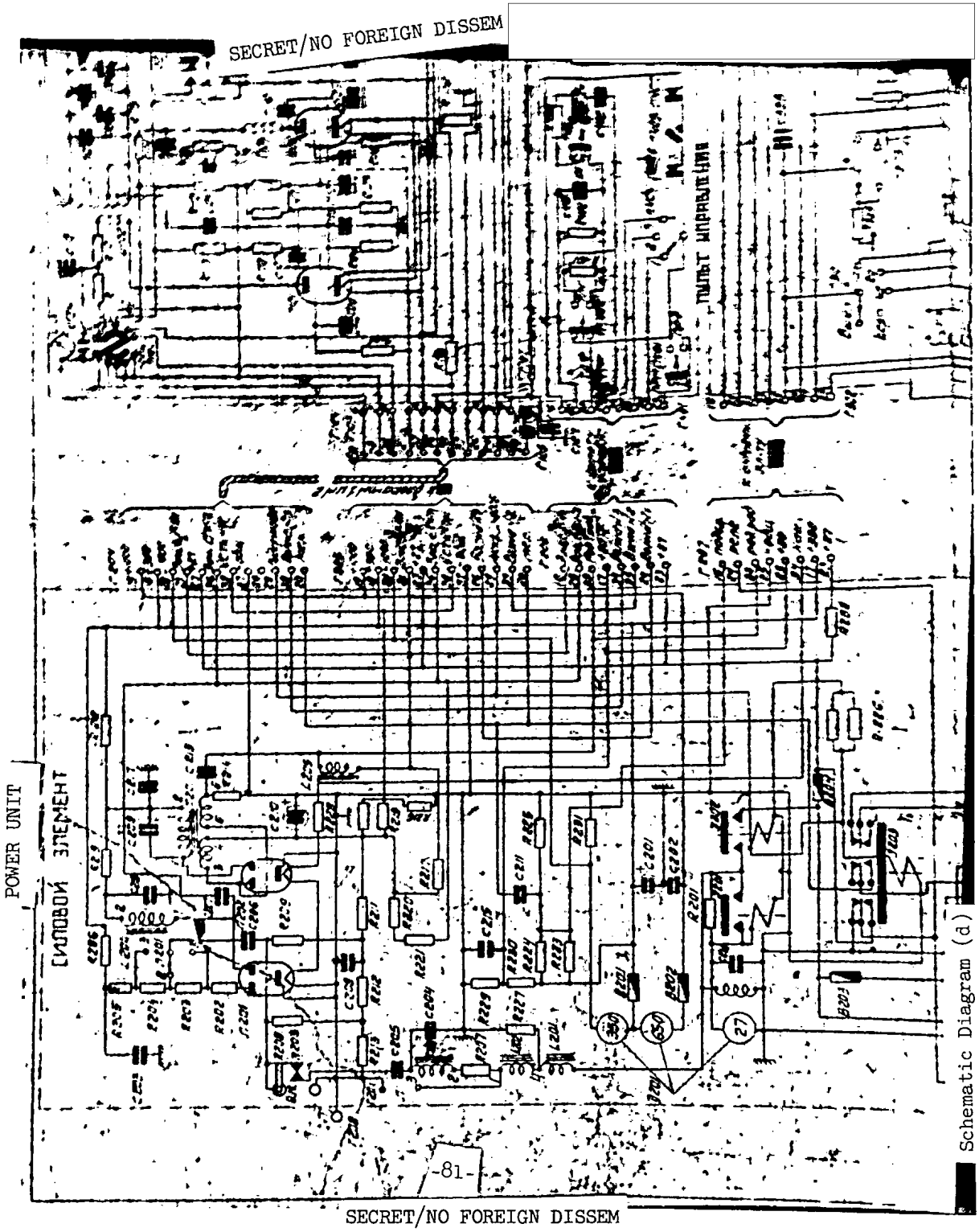

Schematic Diagram (d)

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