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CENTRAL INTELLIGENCE AGENCY

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COUNTRY USSR

REPORT

SUBJECT Wiring Diagrams and Calibration Charts for the Soviet RBP-4 Radar Gunsight (MUSHROOM)

DATE DISTR. 5 March 1964

NO. PAGES 1 50X1-HUM

REFERENCES

DATE OF INFO.

PLACE & DATE ACQ.

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a copy of an English-language Soviet manual entitled Set of Diagrams: Supplement to Operating Instructions of RBP-4 Radar Bombsight. The album contains 16 insets, all of which were classified SECRET by the Soviets. Insets 1 through 11 contain wiring diagrams; insets 12 through 16 consist of calibration charts. 50X1-HUM

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SET OF DIAGRAMS

SUPPLEMENT TO OPERATING INSTRUCTIONS OF RBP–4 RADAR BOMBSIGHT

(English Language)

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SET OF DIAGRAMS

(Supplement to Operating Instructions of РБП-4 Radar Bombsight)

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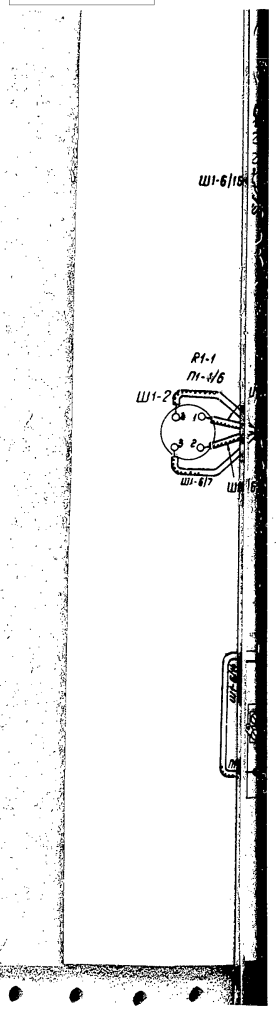
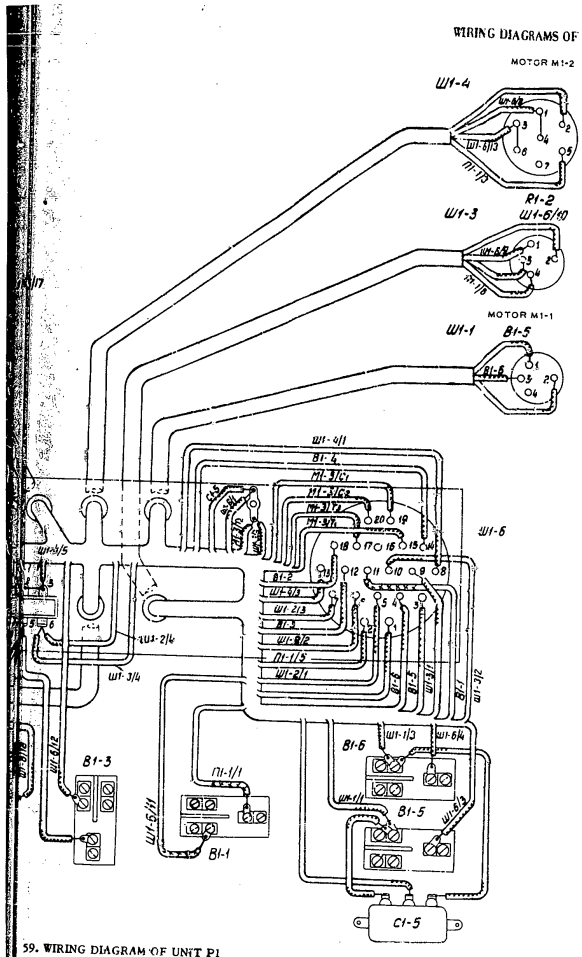
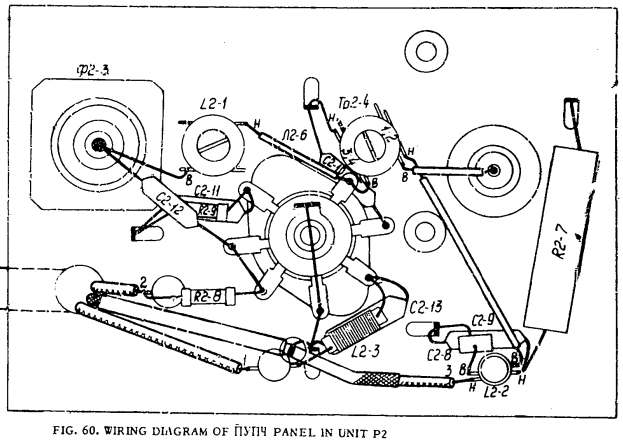
(All insets are secret)

This album contains 22 pages and 16 insets on 16 sheets





59. WIRING DIAGRAM OF UNIT P1



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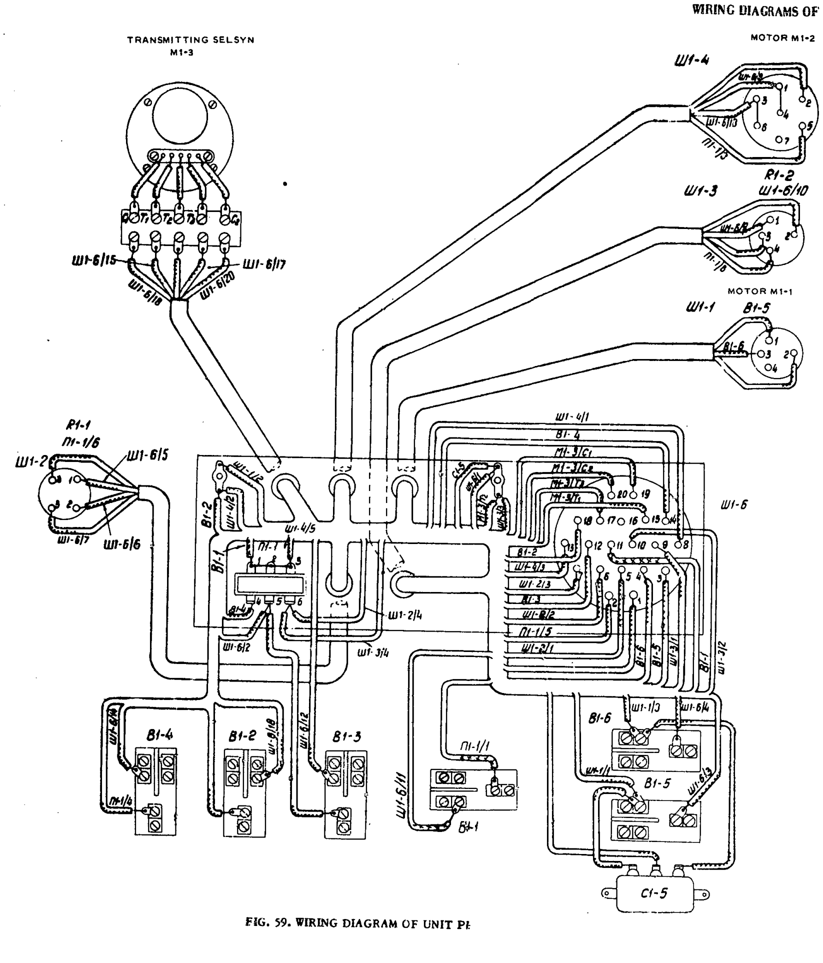
WIRING DIAGRAMS OF UNITS



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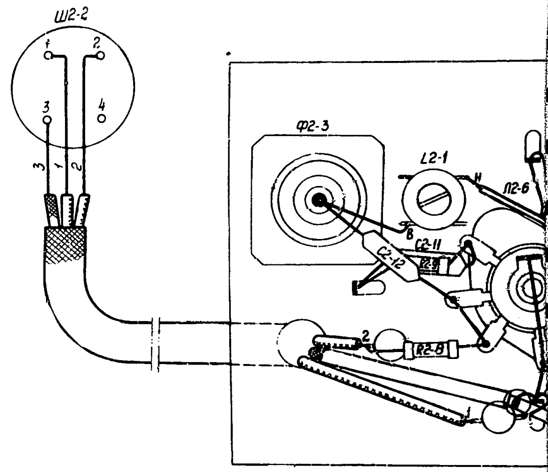
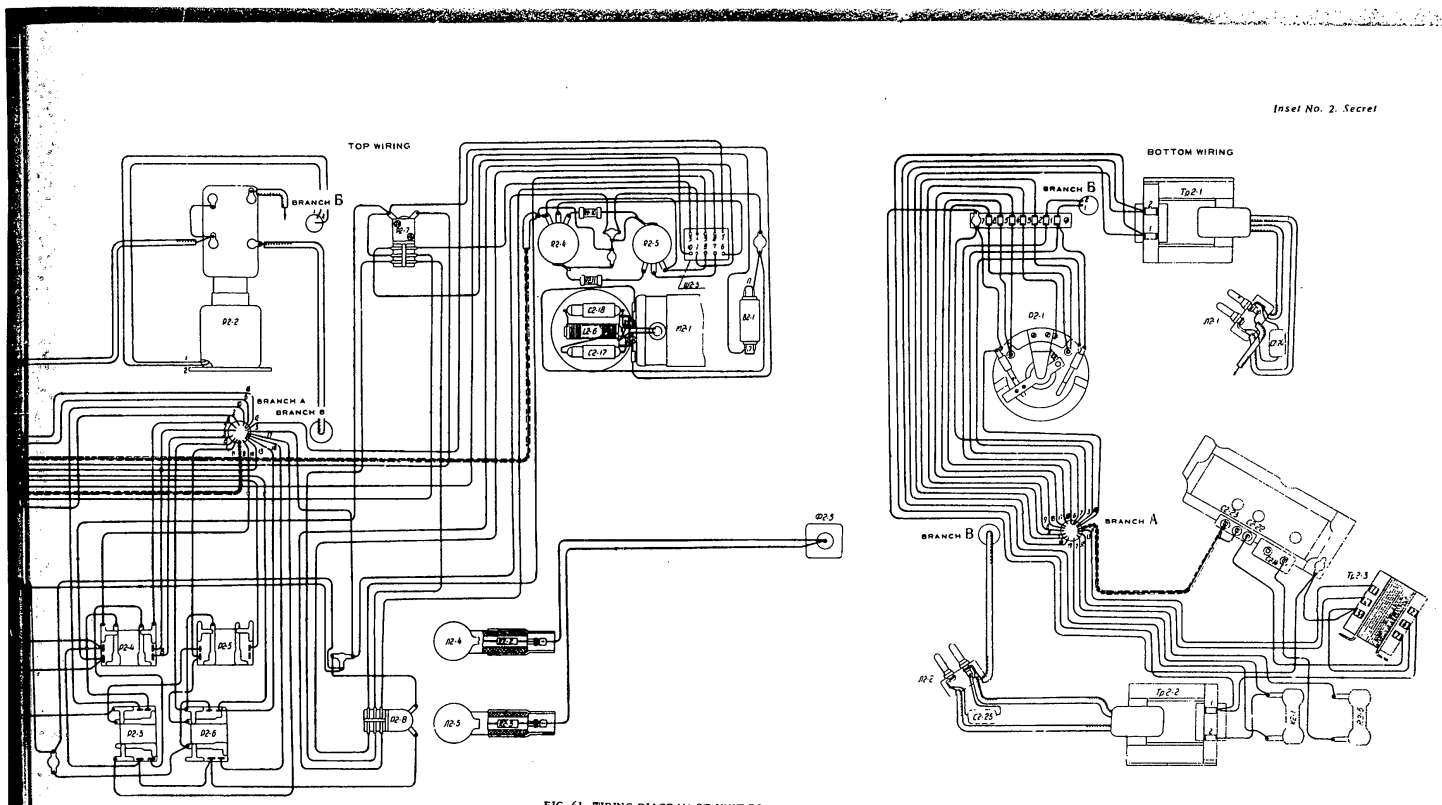


FIG. 60. WIRING DIAGRAM OF ПУПЧ PANEL



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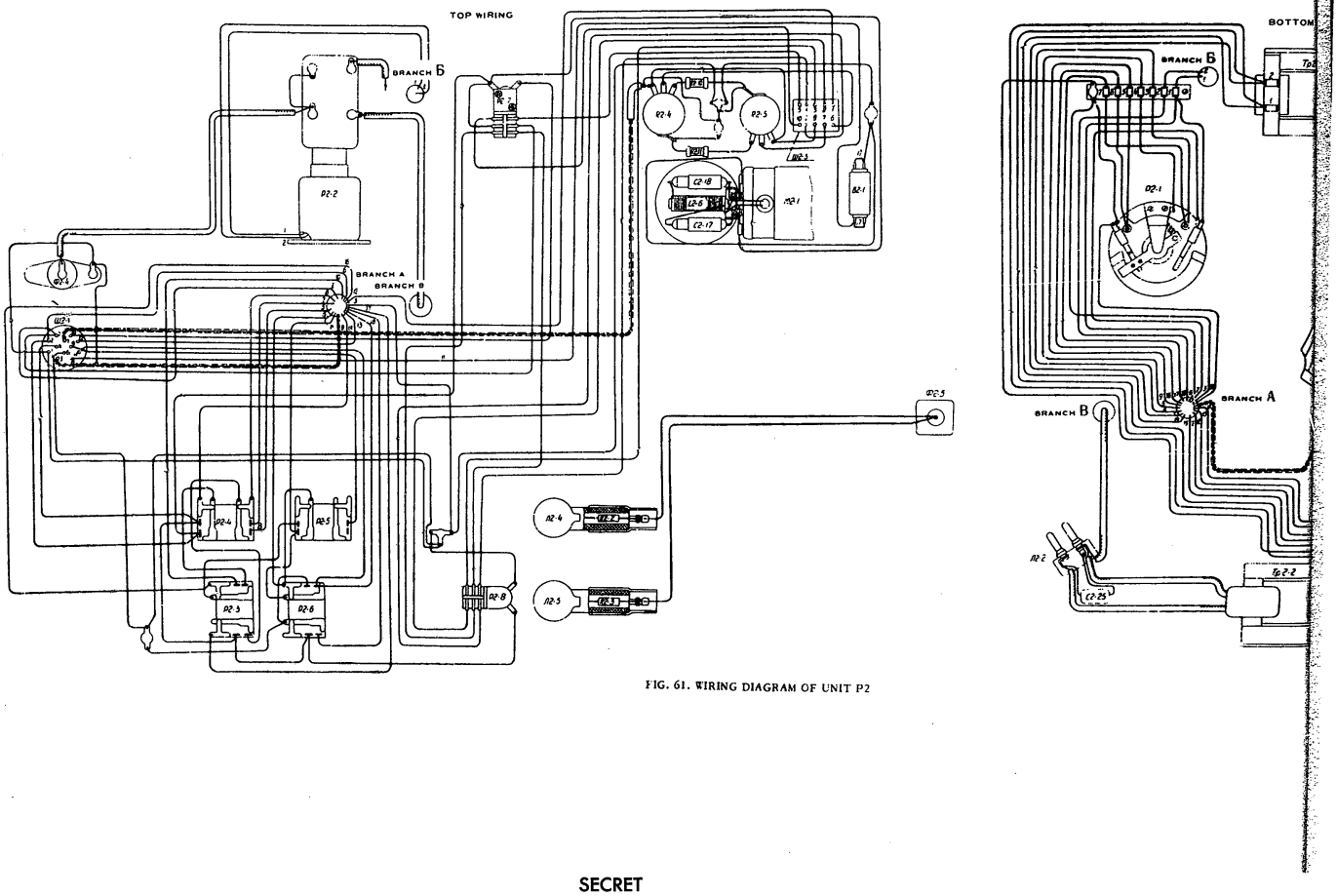

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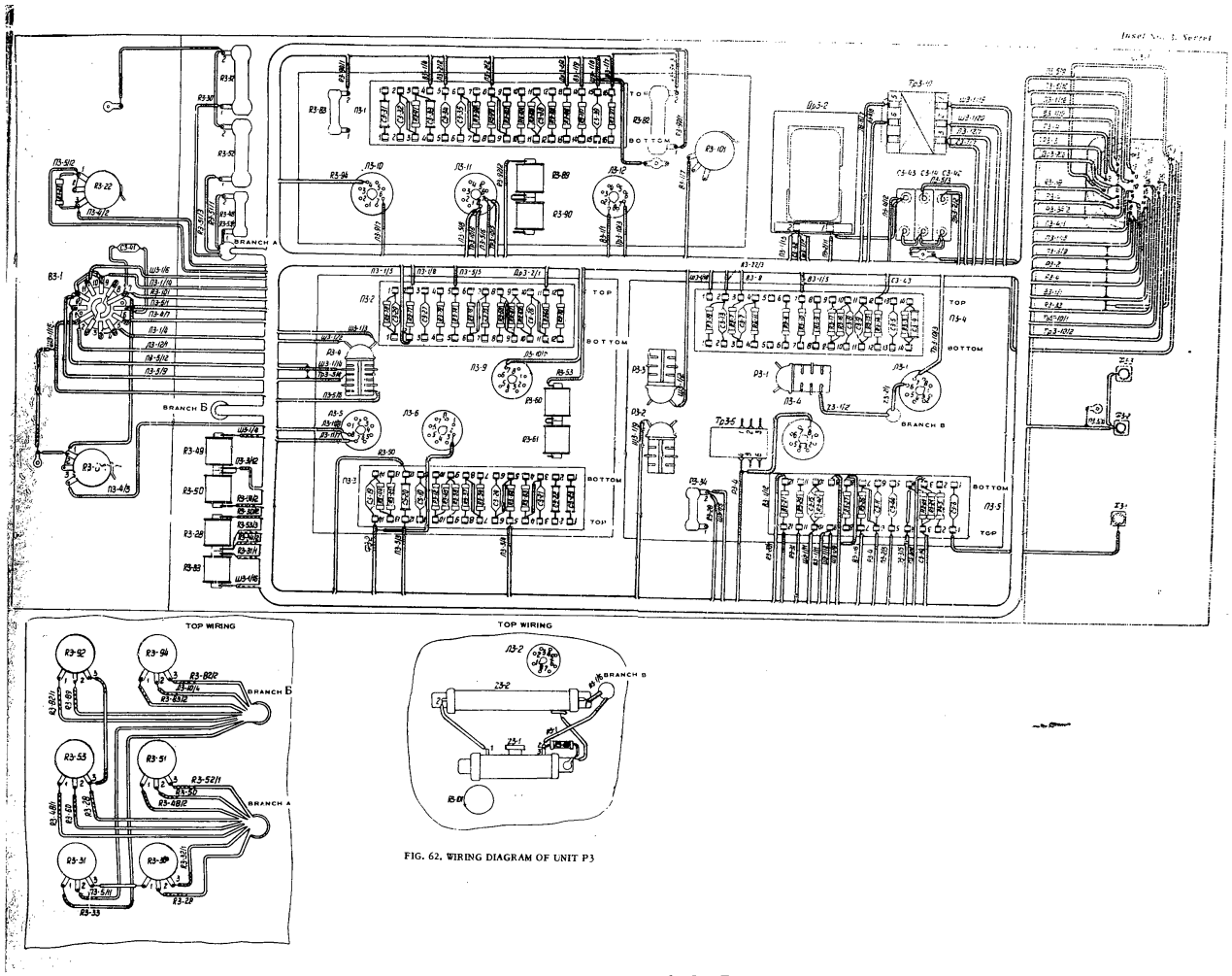

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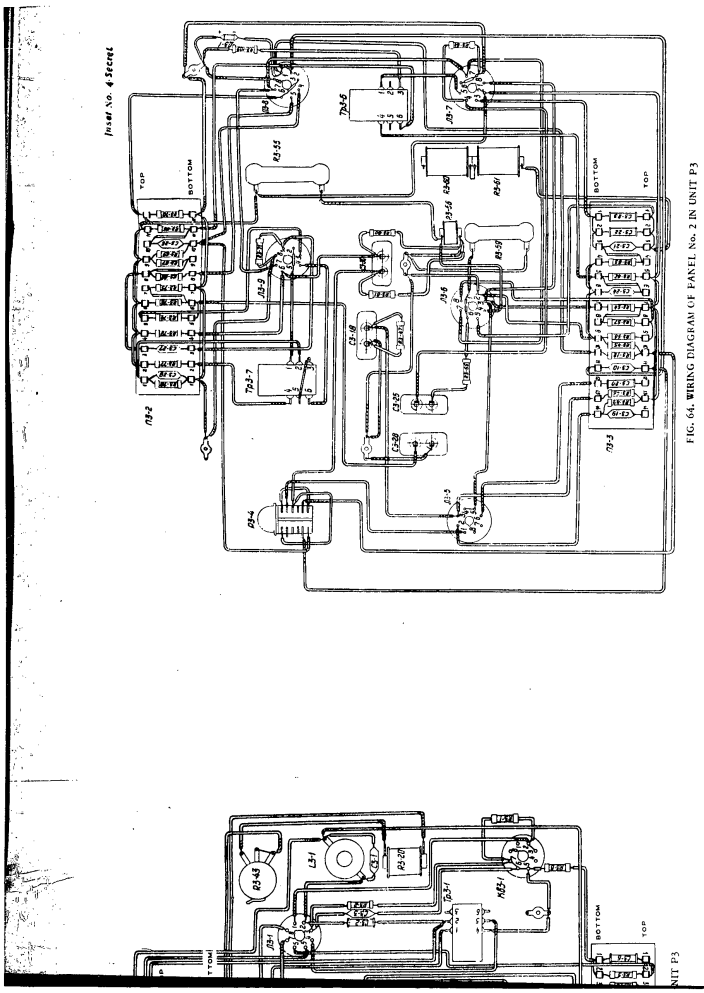

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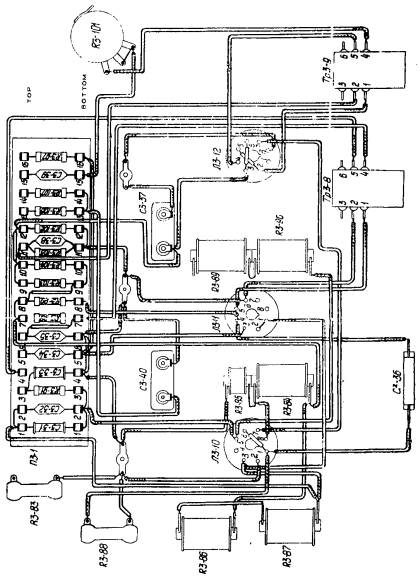

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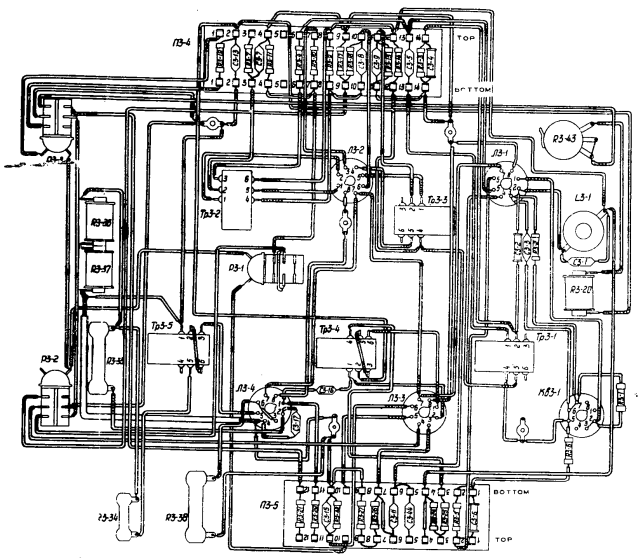

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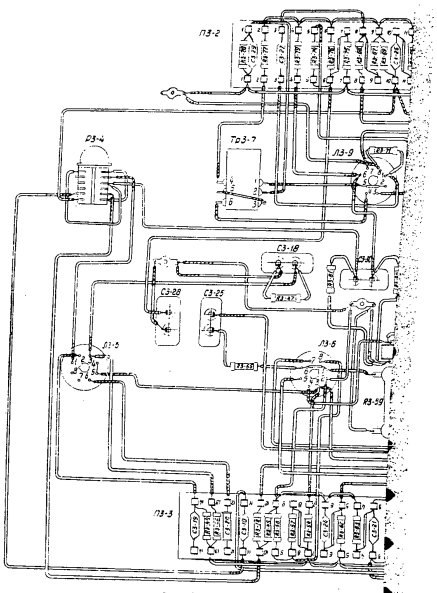

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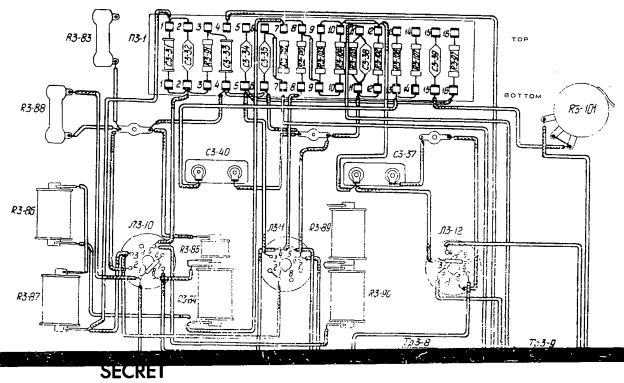

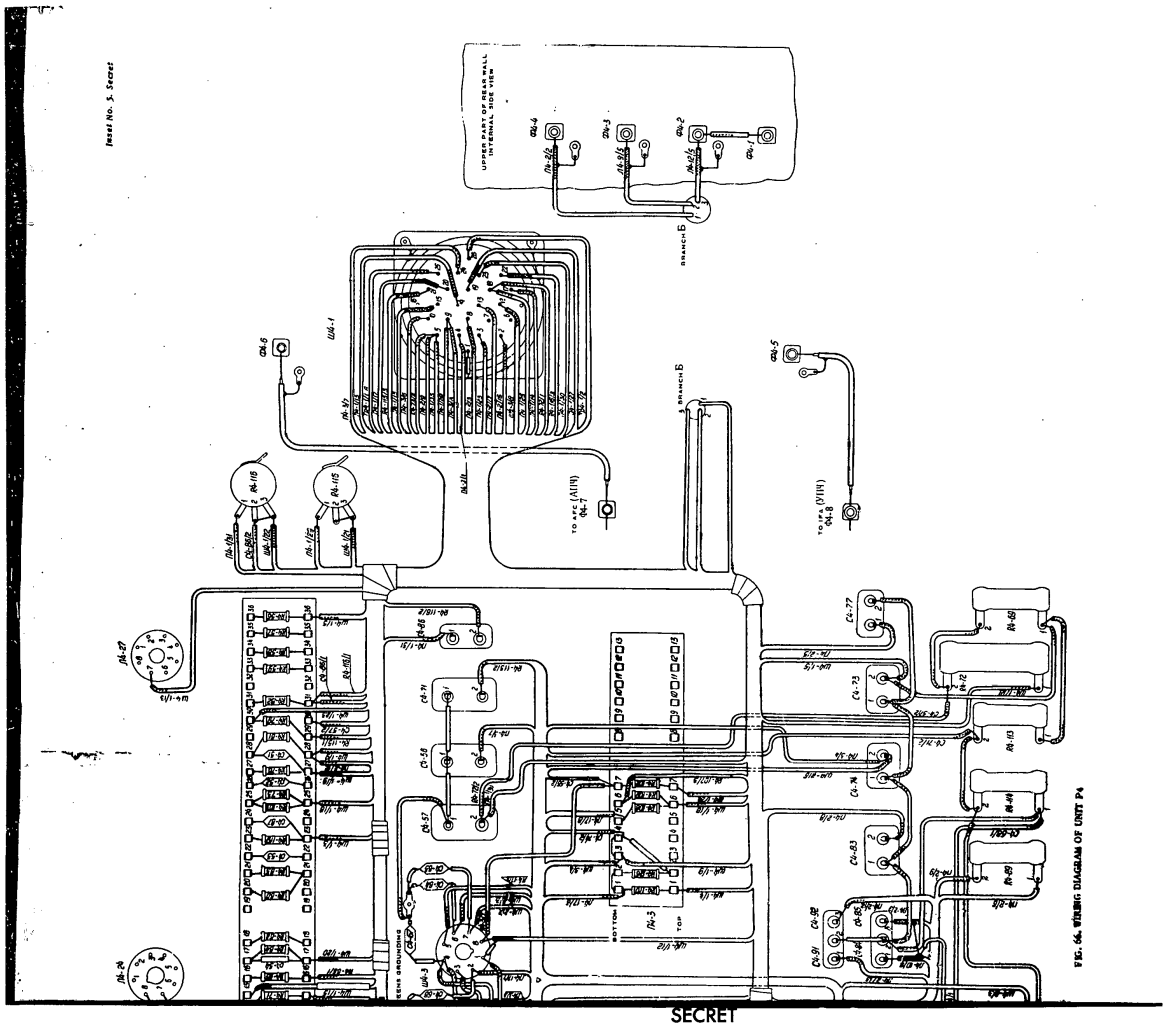

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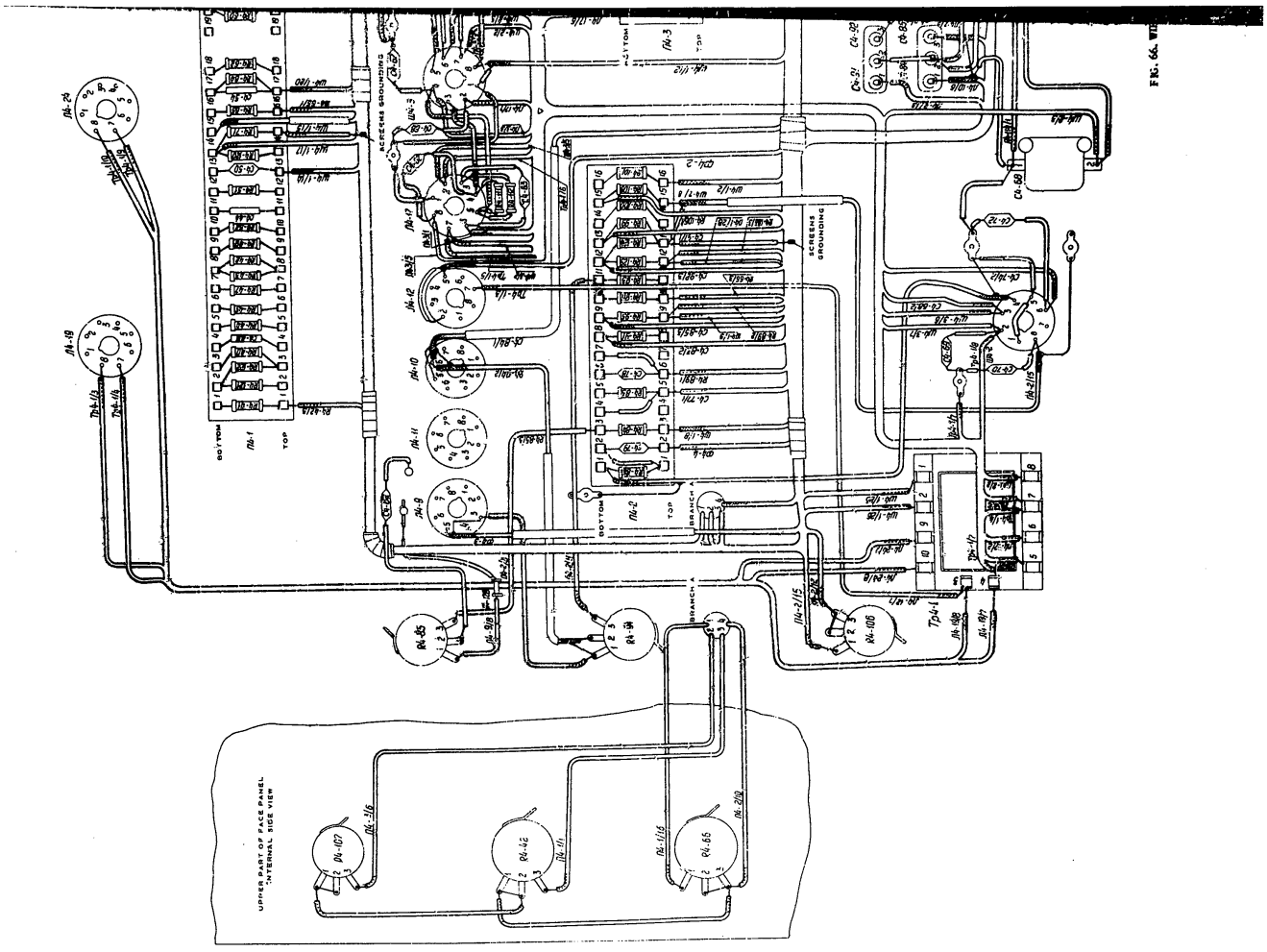

FIG. 66. WIR

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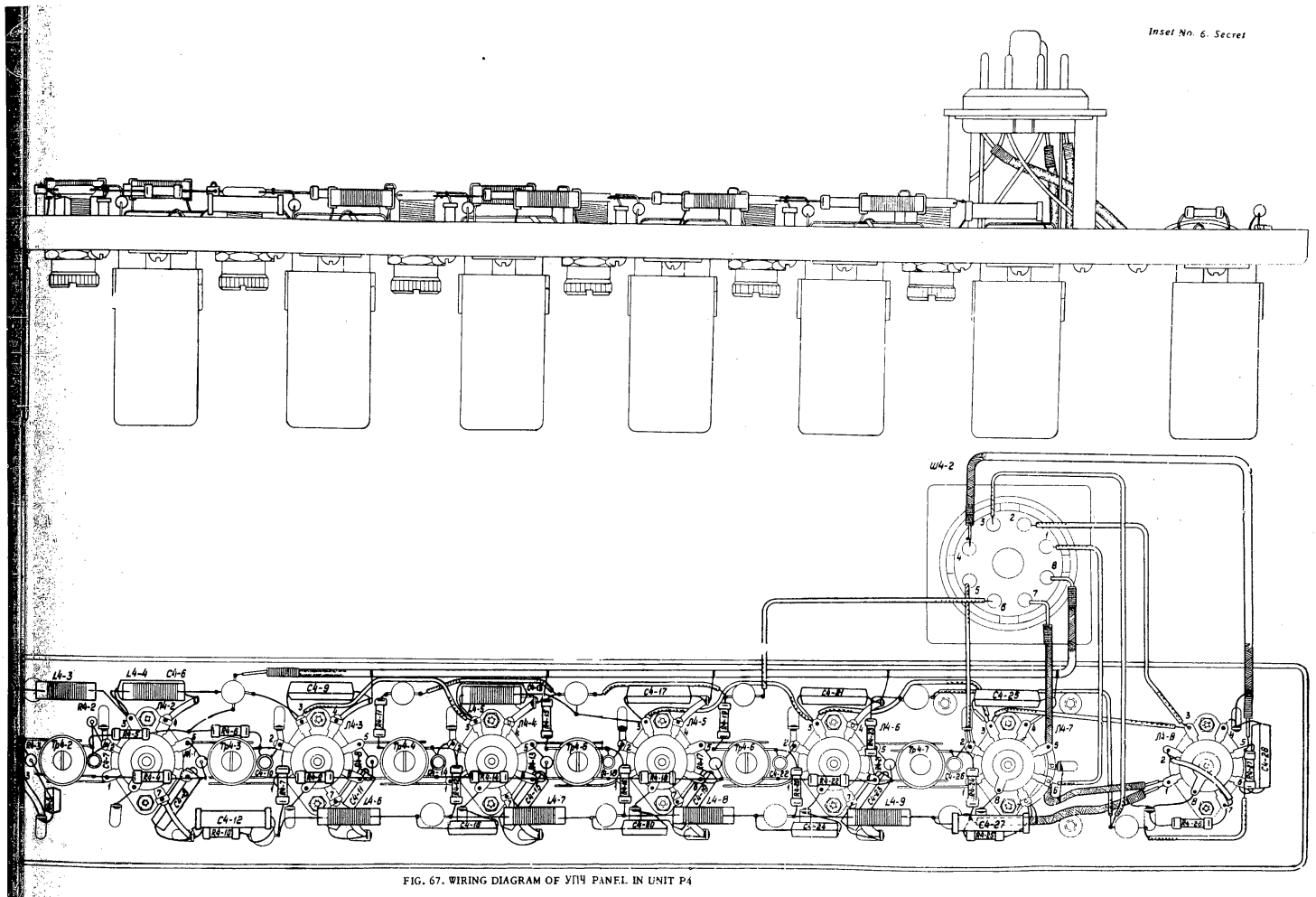

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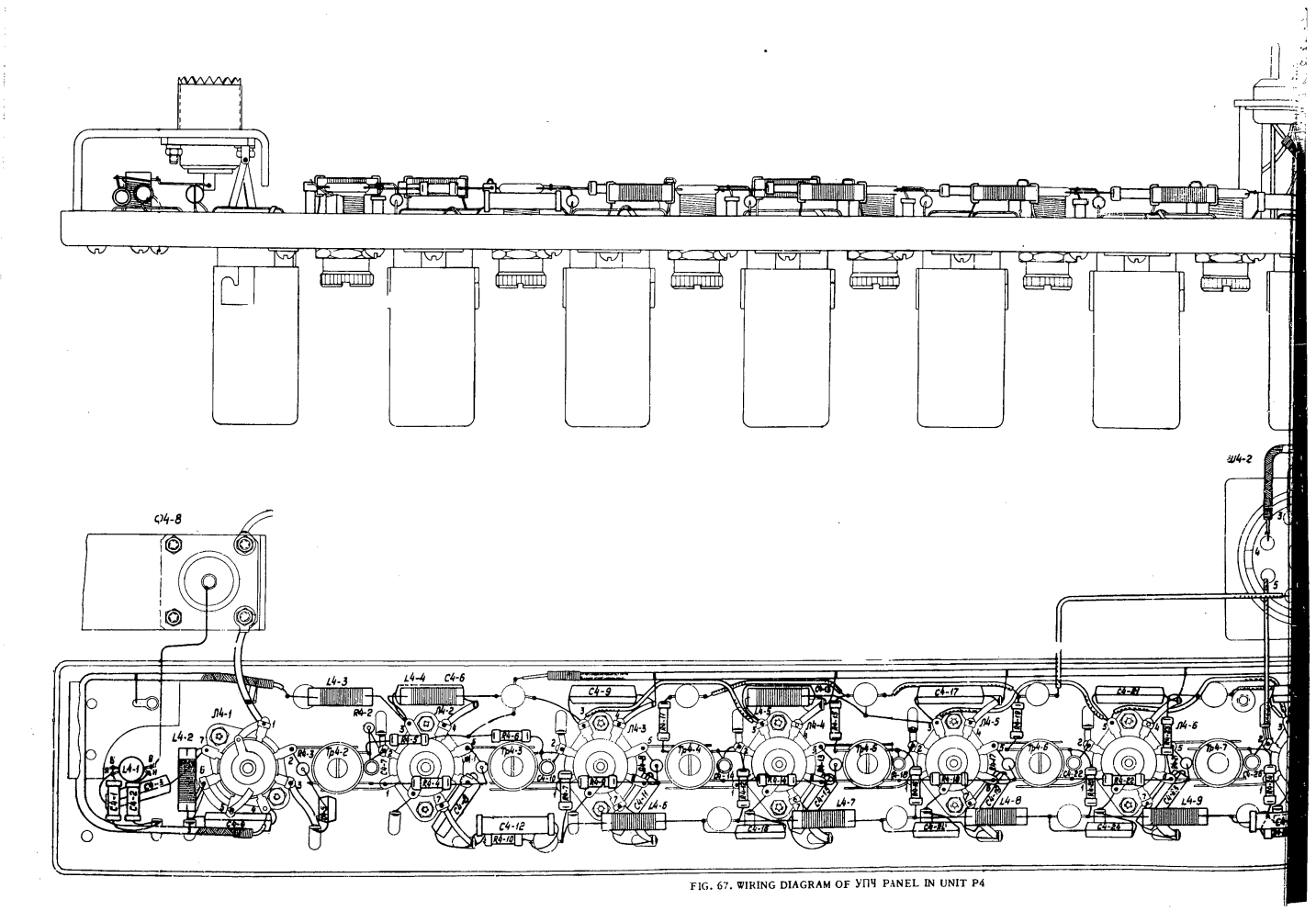

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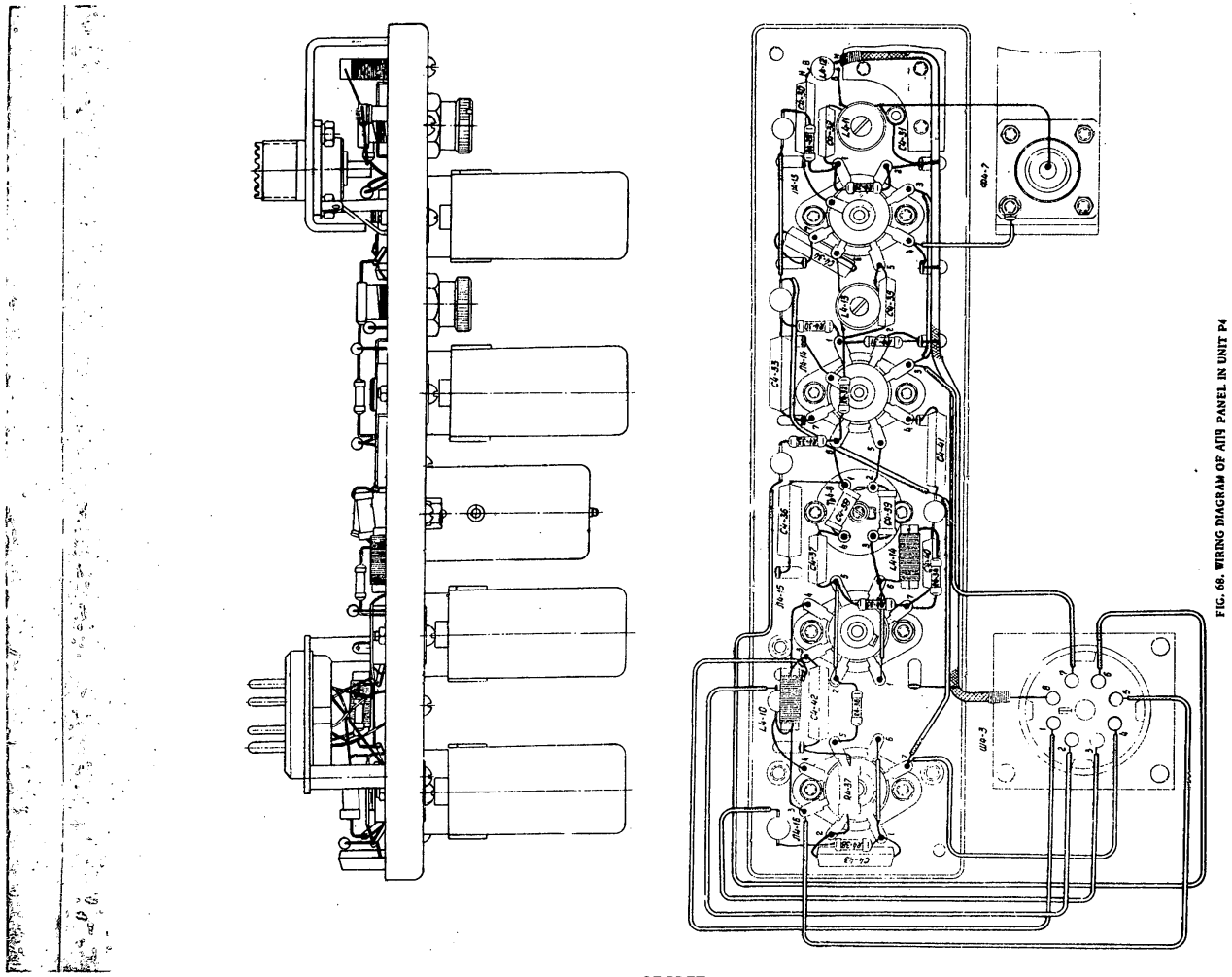

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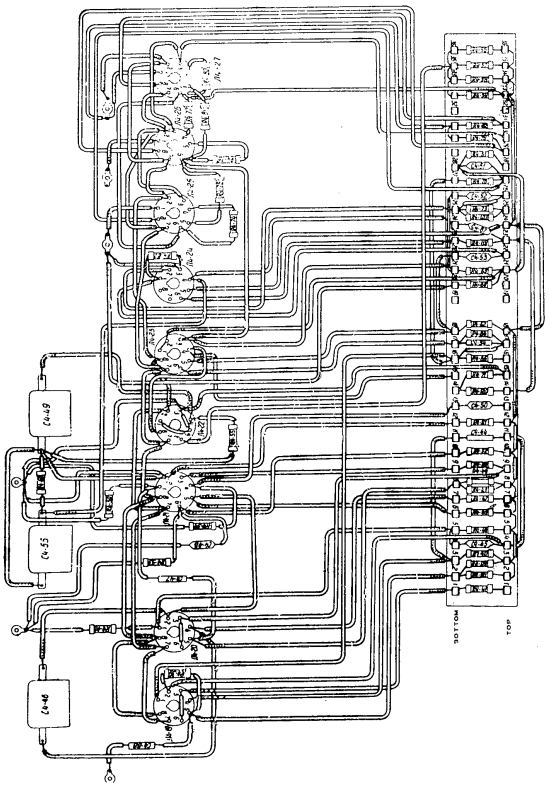

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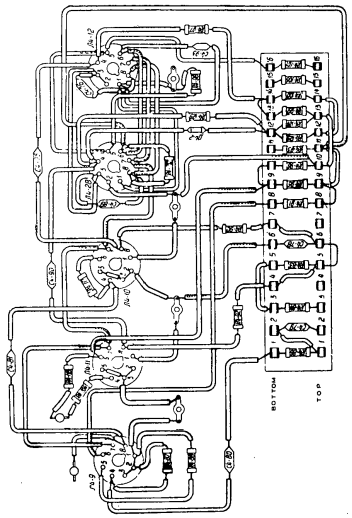

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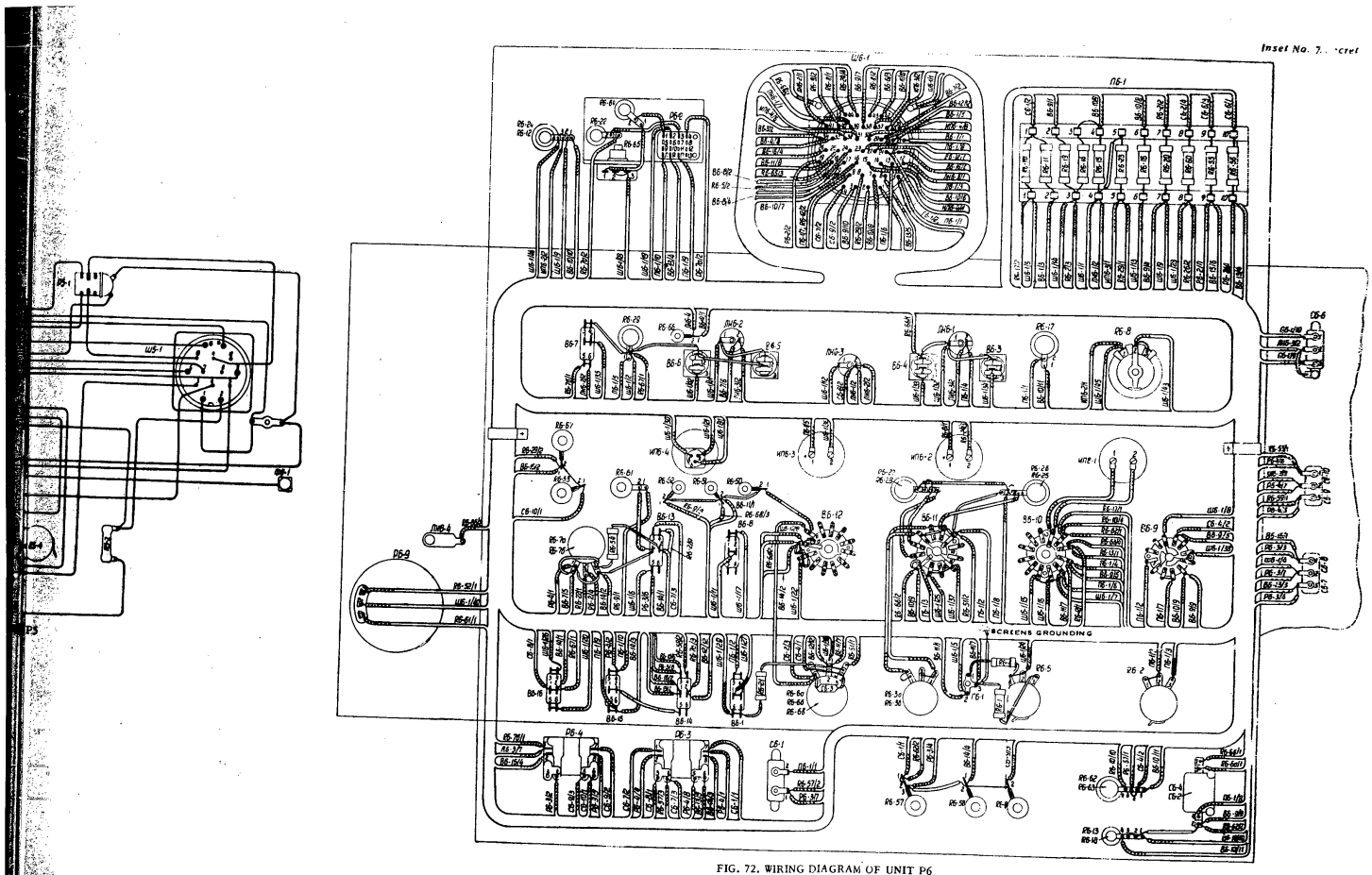

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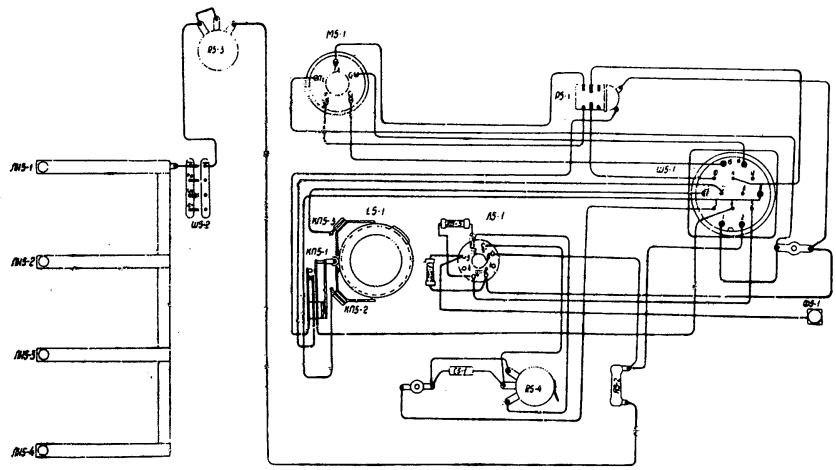

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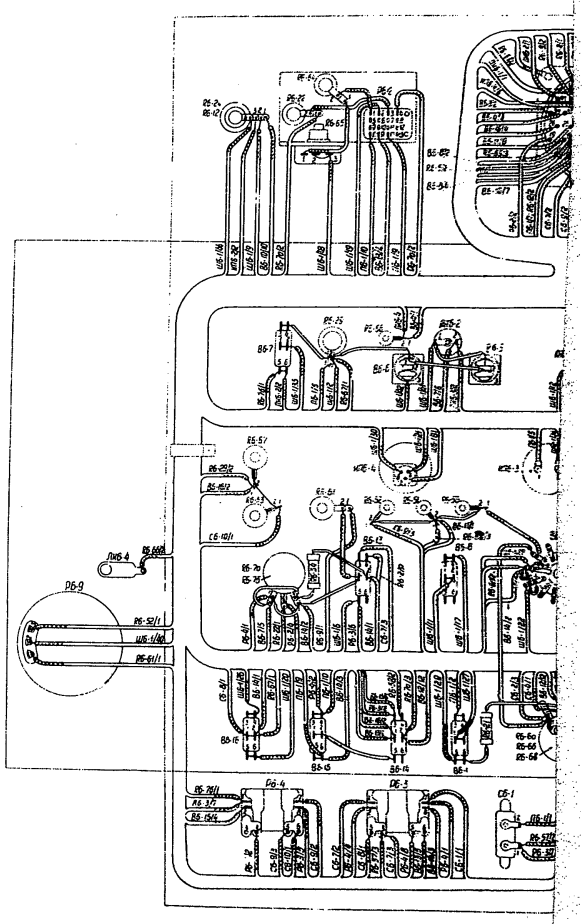

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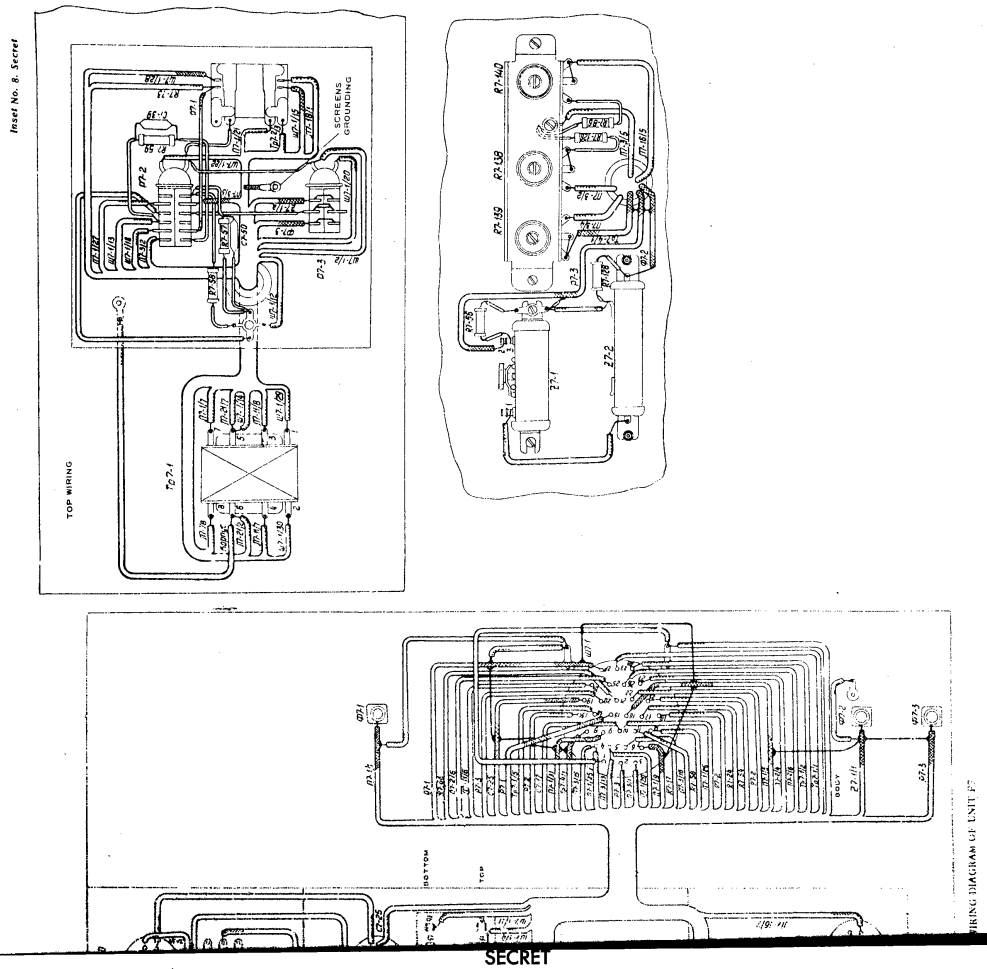

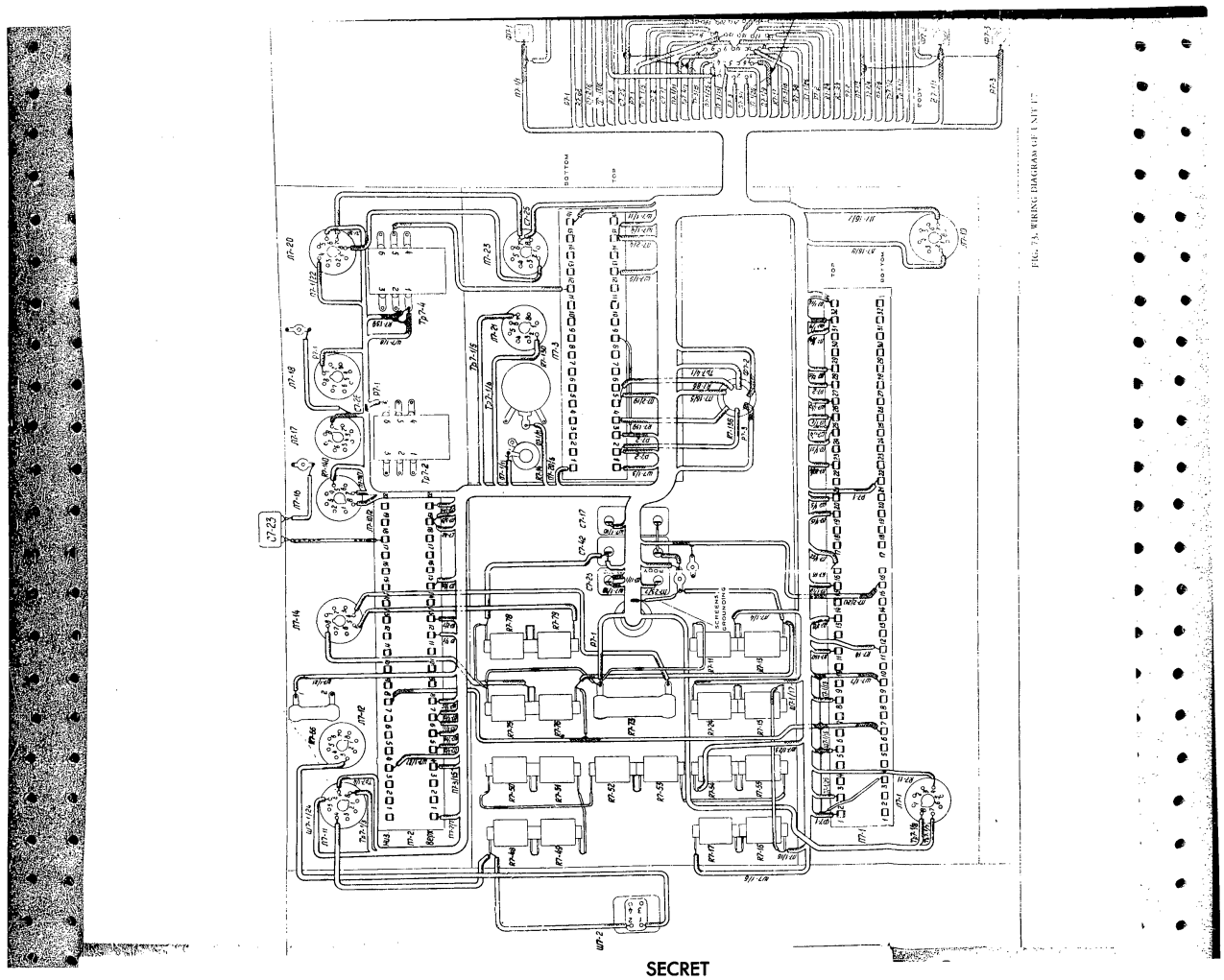

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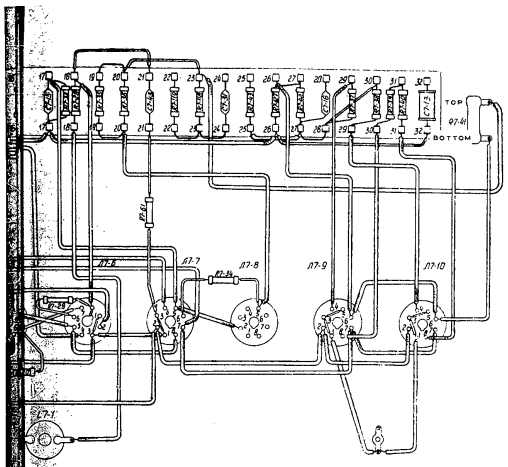
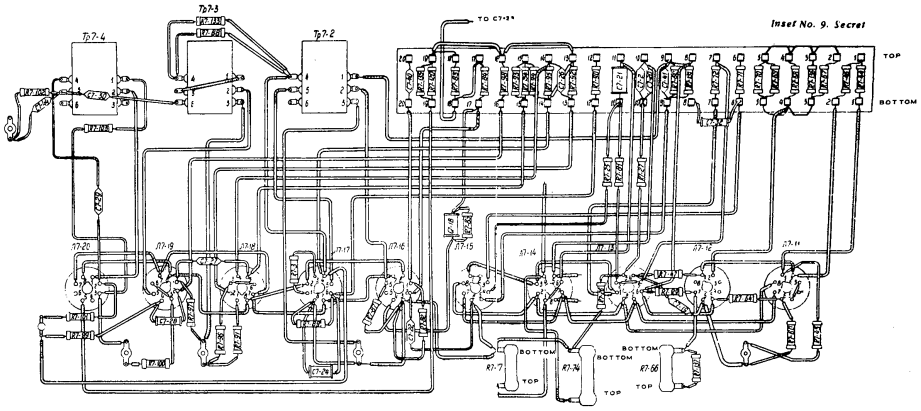


RAM OF PANEL No. 1 IN UNIT P7



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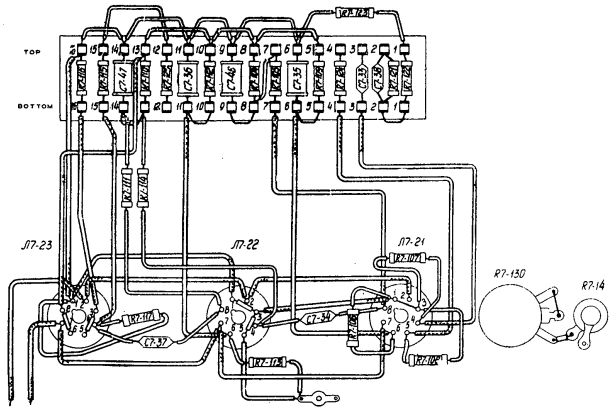

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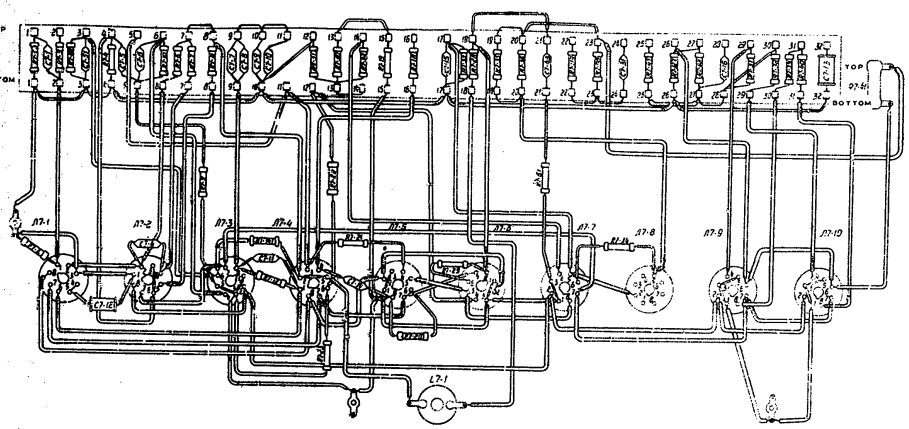

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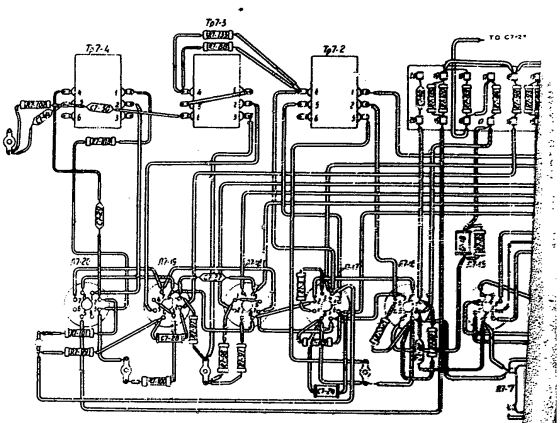

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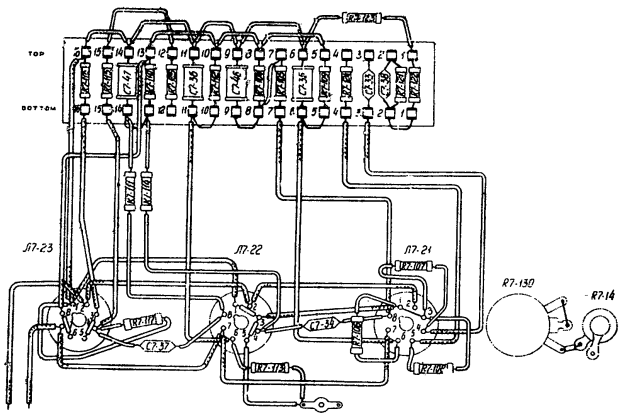

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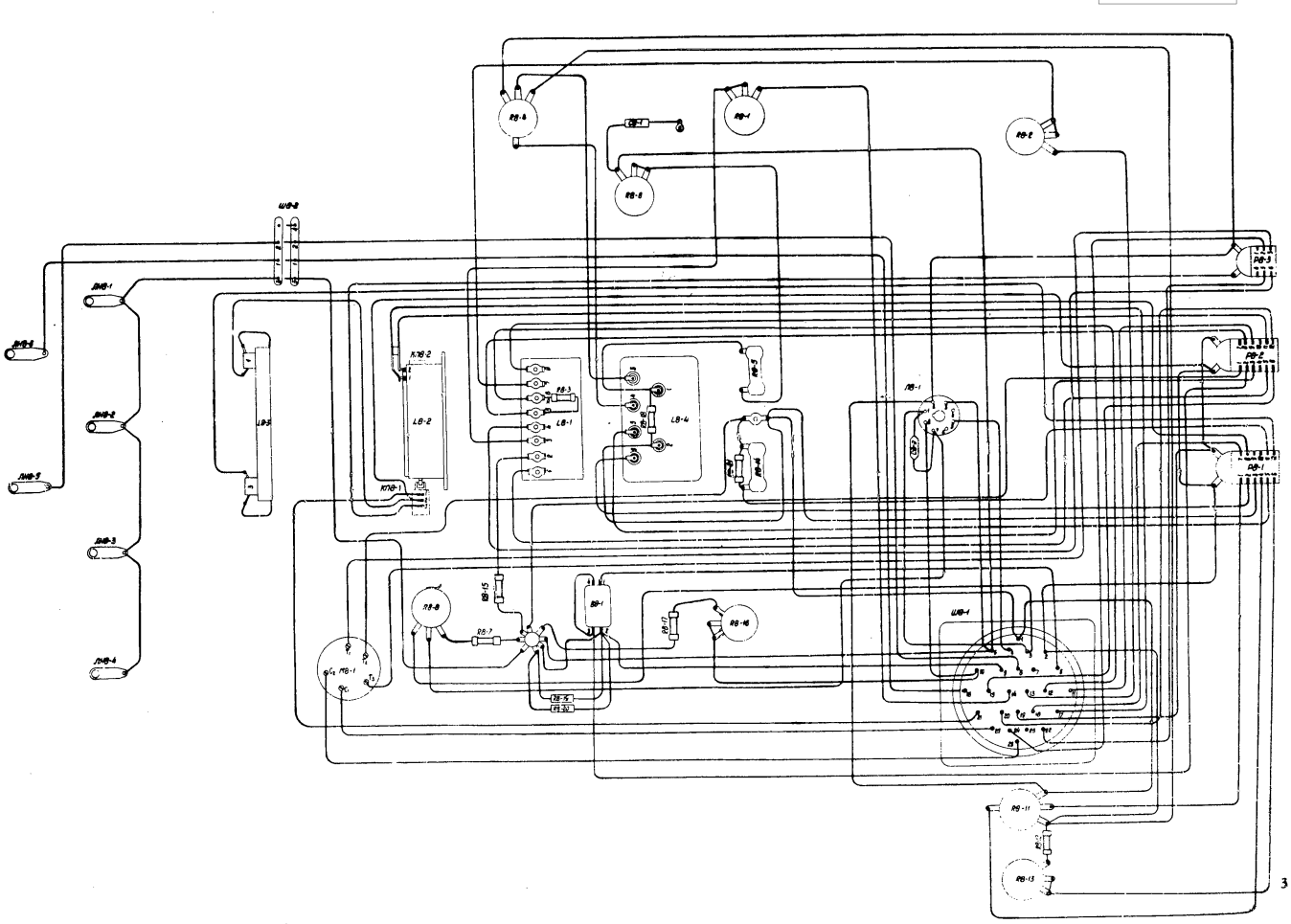

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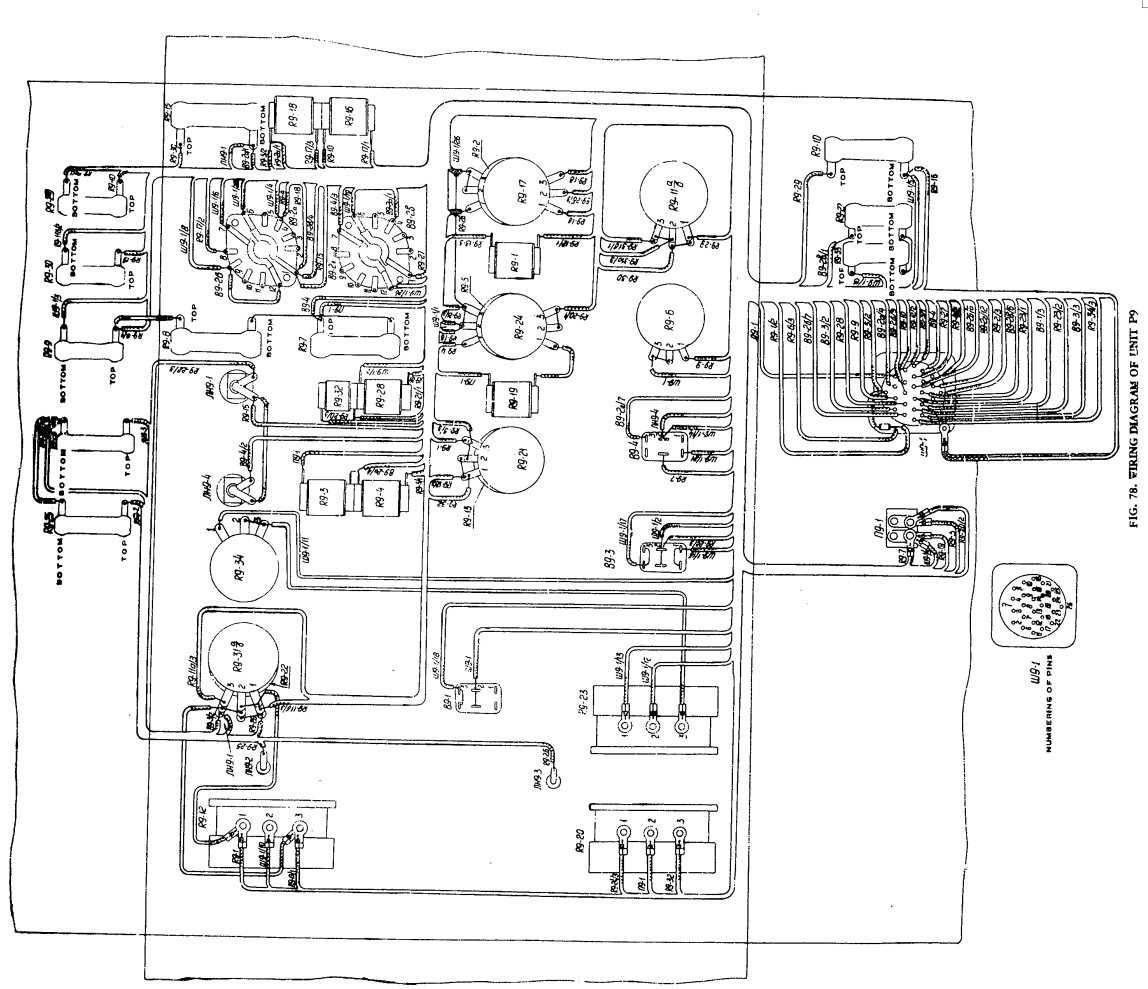

FIG. 78. WIRING DIAGRAM OF UNIT P9

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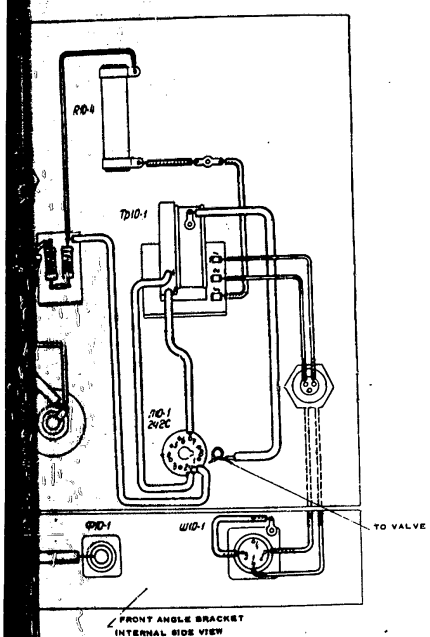

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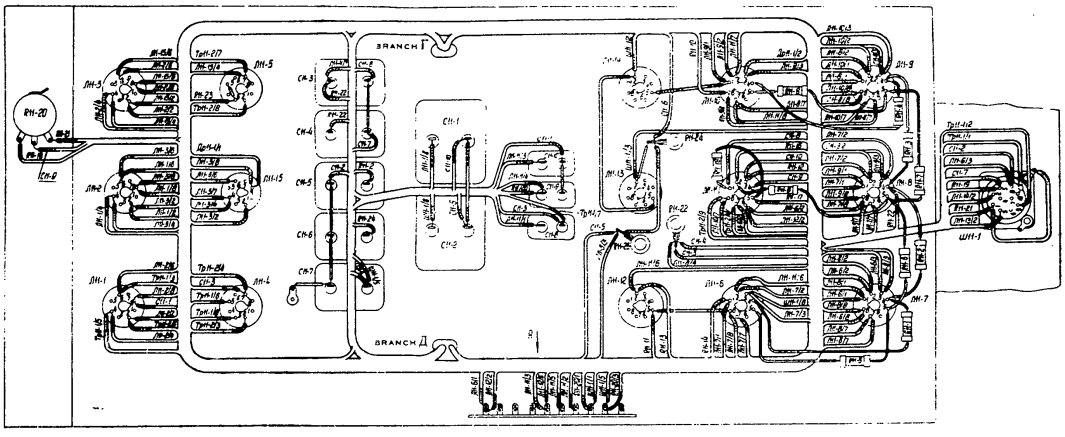

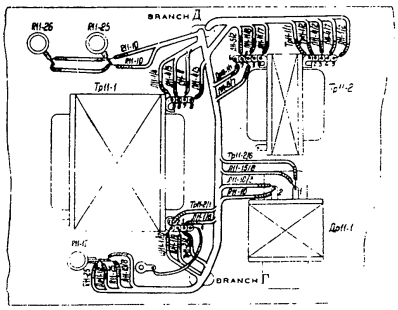

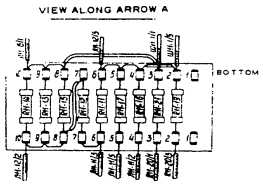

FIG. 80. WIRING DIAGRAM OF UNIT P11.

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FIG. 78. WIRING DIAGRAM OF UNIT P9

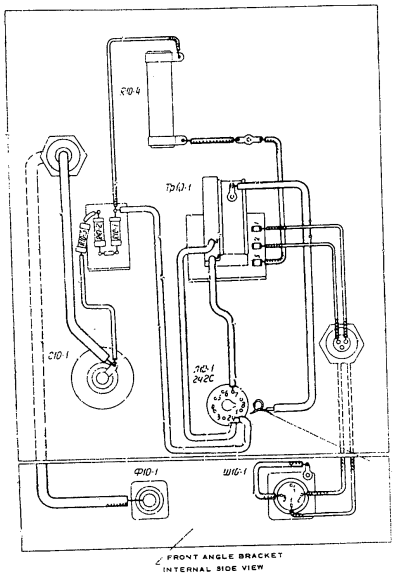
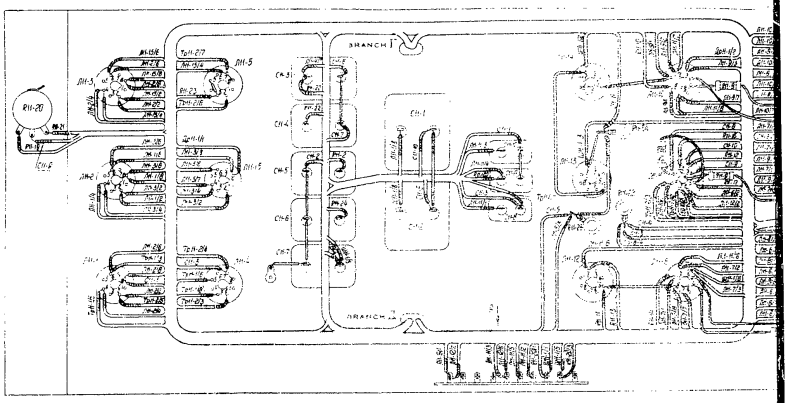
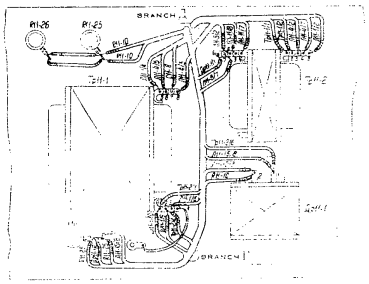
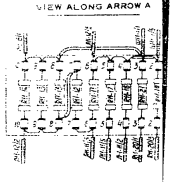


FIG. 79. WIRING DIAGRAM OF UNIT P10







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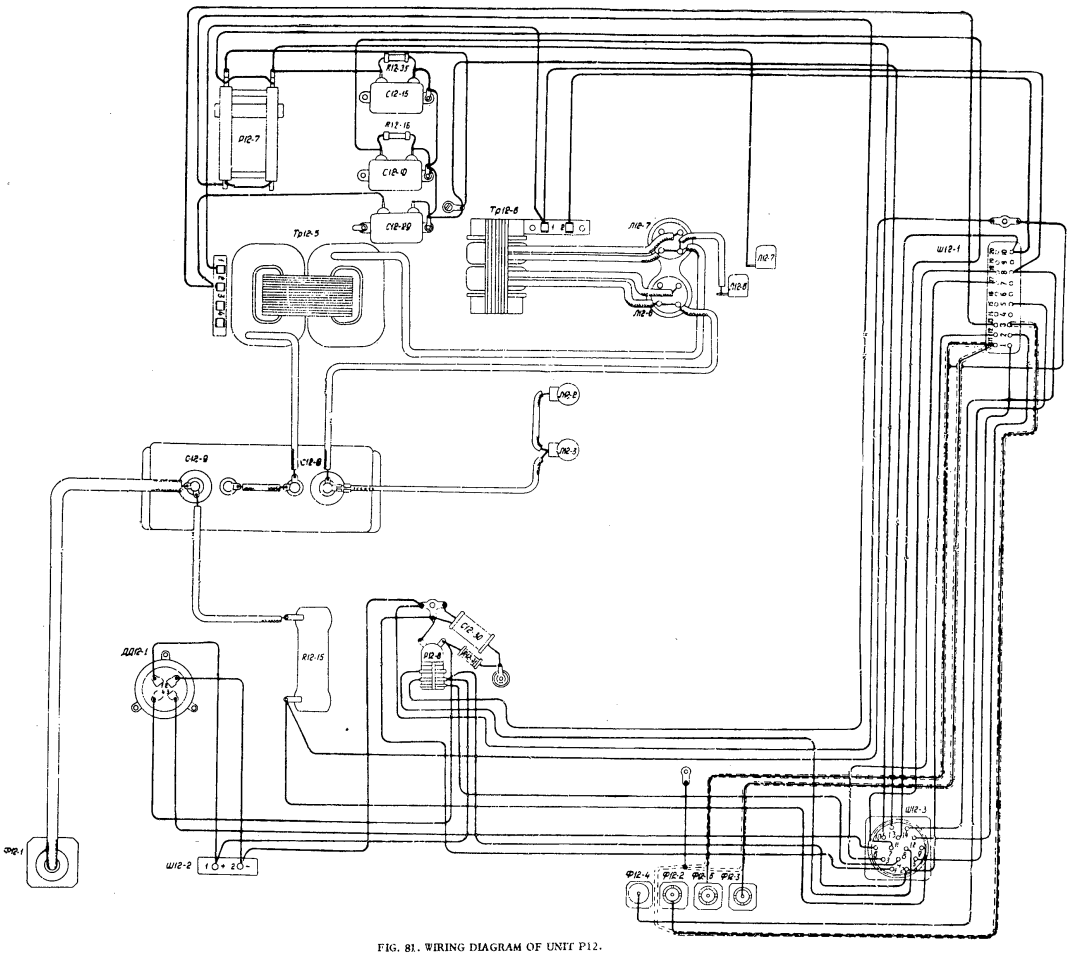


FIG. 81. WIRING DIAGRAM OF UNIT P12.

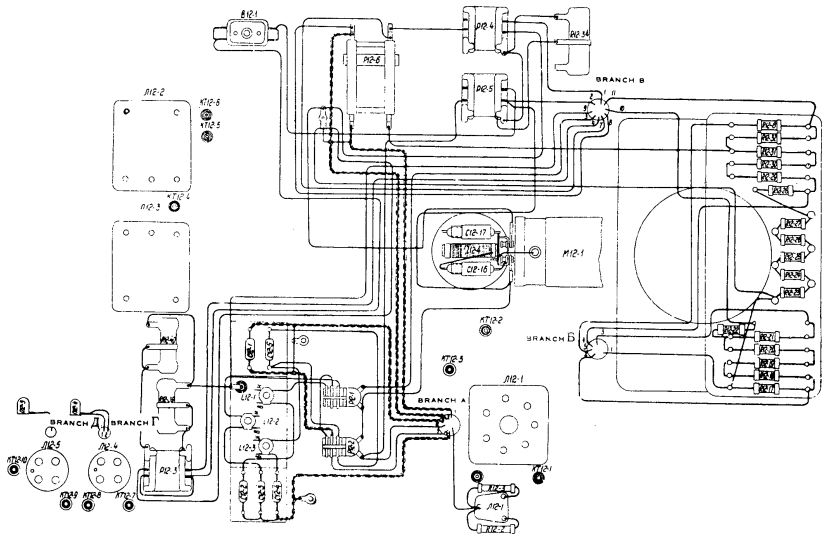
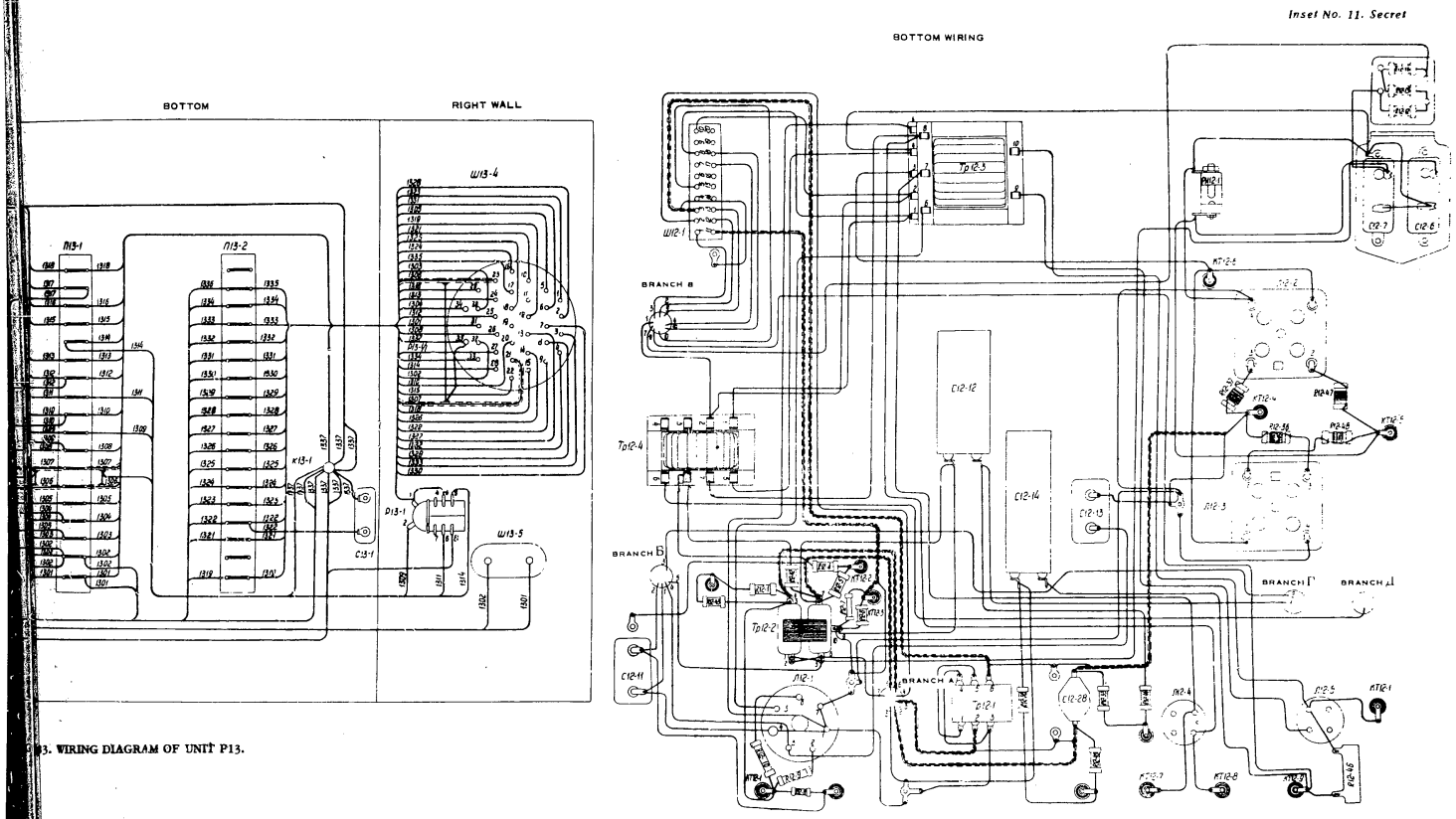


FIG. 82. WIRING DIAGRAM OF MODULATOR VALVES PANEL IN UNIT P12

Inset No. 11. Secret



3. WIRING DIAGRAM OF UNIT P13.

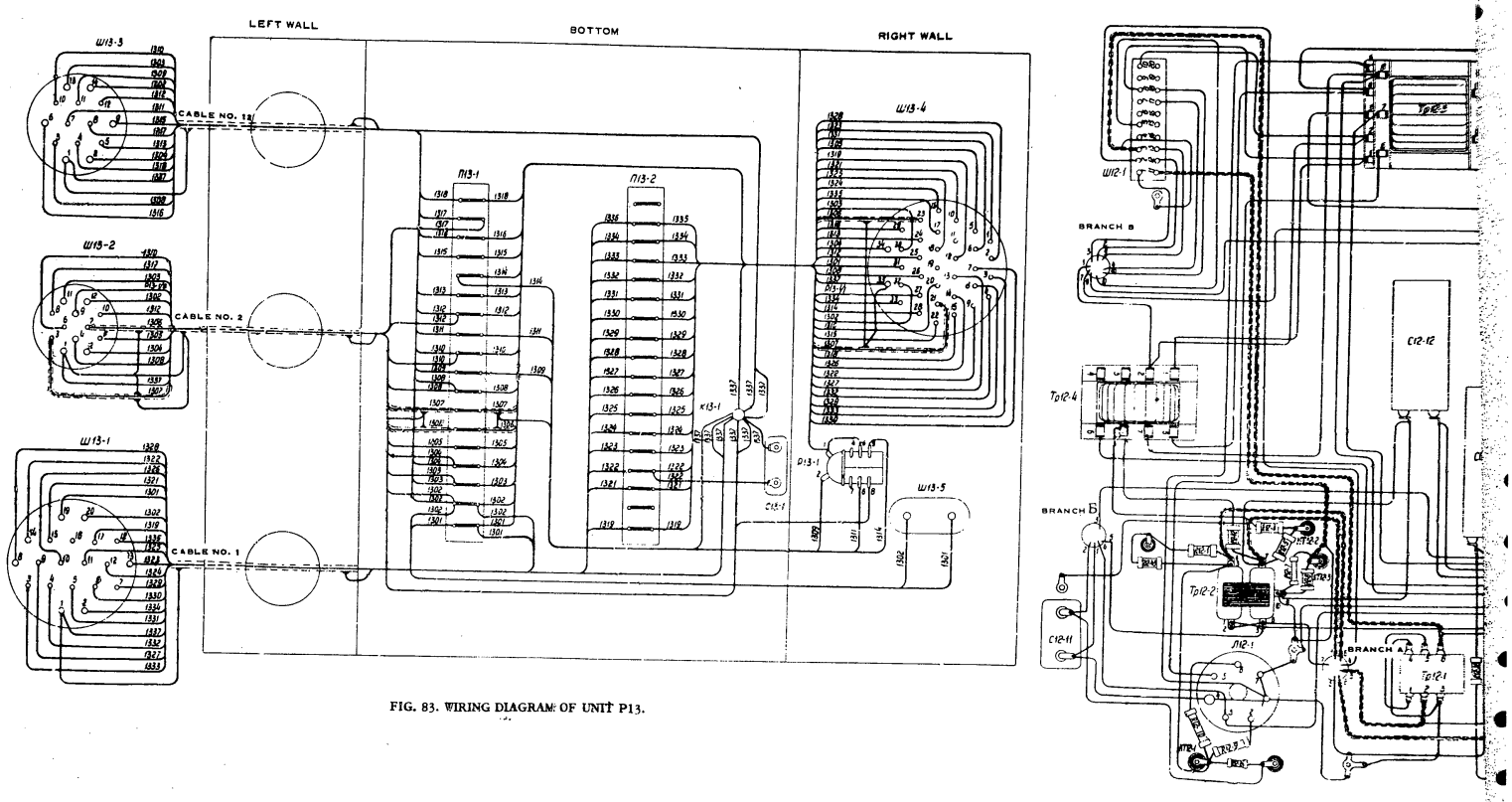


FIG. 83. WIRING DIAGRAM OF UNIT P13.

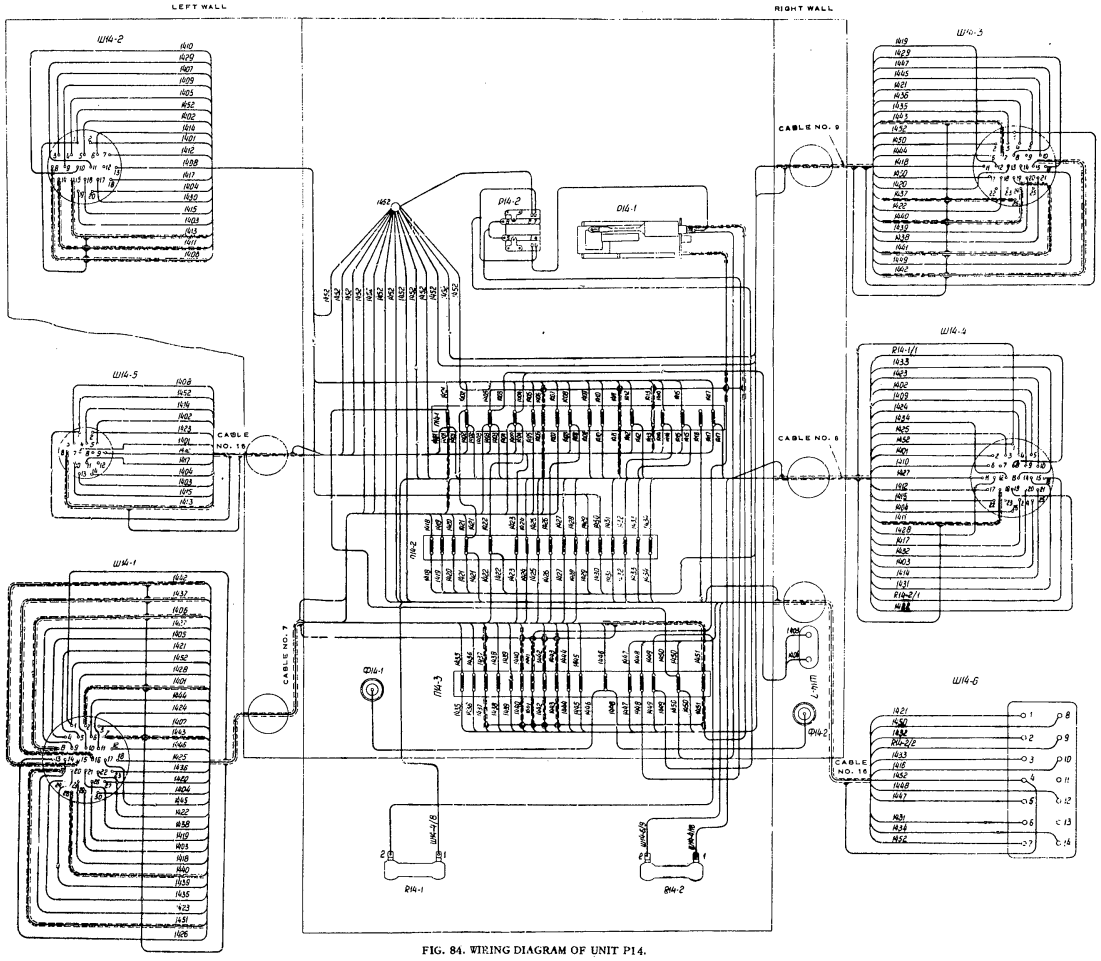


FIG. 84. WIRING DIAGRAM OF UNIT P14.

INTERNAL CONNECTIONS DIAGRAM

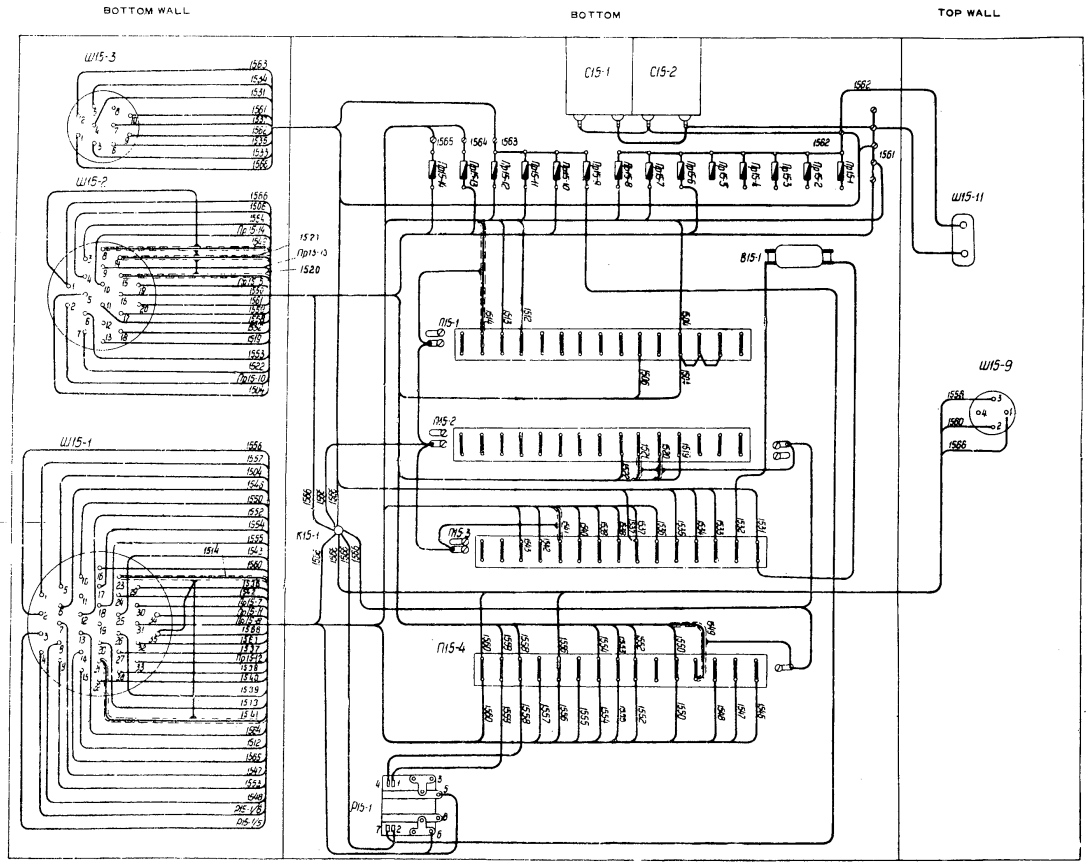


FIG. 85. WIRING DIAGRAM OF INTERNAL CONNECTIONS IN UNIT P15.

EXTERNAL CONNECTIONS DIAGRAM

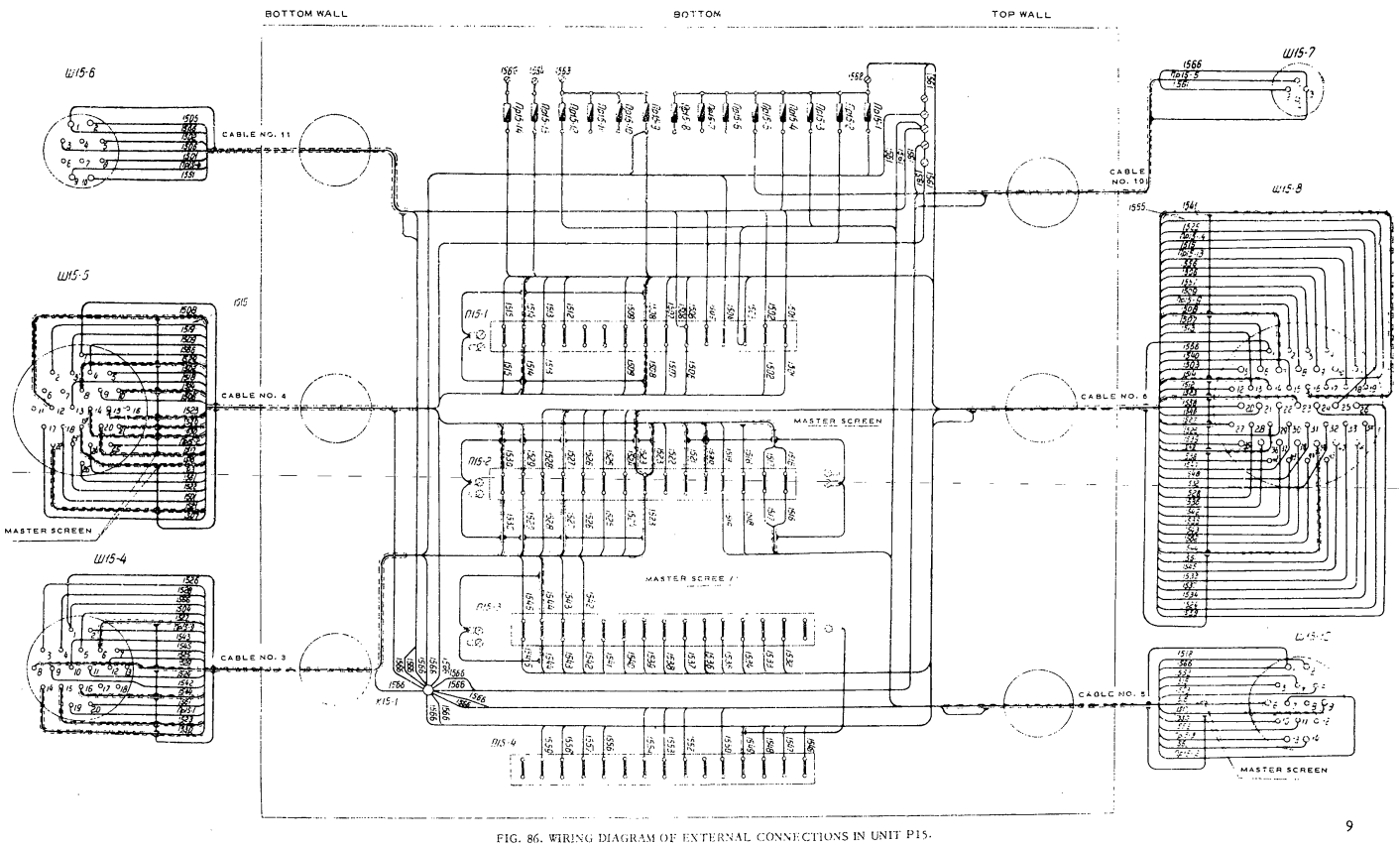
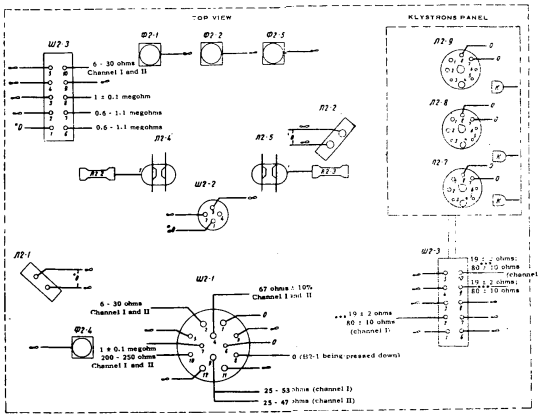


FIG. 86. WIRING DIAGRAM OF EXTERNAL CONNECTIONS IN UNIT P15.

CALIBRATION CHARTS OF UNITS

contacts of plug-nector Ш1 - 6 which resist-is being sured	Rating values. Resistance	Measurement conditions
body	0	
body	25 ohms ± 20%	
-4	∞	Extreme upper position
-4	∞	Extreme lower position
-6	500 ohms ± 15%	Tilt 0°
-7	310 ohms ± 15%	Tilt 0°
-7	280 ohms ± 15%	Tilt 0°
-10	100 ohms ±15%	Position of unit along course line
-body	50 ohms ± 15%	do
0-body	50 ohms ± 15%	do
11-2	0	do
12-2	0	Position of unit in sector 157° – 203°
14-2	0	do
18-body	∞	Position of unit in sector 90° – 270°

CALIBRATION CHART OF UNIT P1 MEASUREMENTS ARE TO BE EFFECTED BY ABO-5 INSTRUMENT



No.	Nos of contacts between which resistance is being measured	Rating values Resistance	Note
1	12Ш2-1-11Ш2-1	4.2 ± 0.5 ohm	
2	2 Ш2-1-10Ш2-1	220 ± 22 ohms	
3	2Ш2-1-4Ш2-1	65 – 100 ohms	Channel I and II
4	2Ш2-1-9Ш2-1	20 ± 2 ohms	
5	5Ш2-1-2Ш2-2	15 ± 1.5 kilohms	
6	5Ш2-1-5Ш2-3	0	
7	7Ш2-1-6Ш2-3	0.75 ± 0.14 megohm (with lead-in R2-4)	
8	7Ш2-1-7Ш2-3	0.75 ± 0.14 megohm (with lead-in R2-5)	
9	7Ш2-1-8Ш2-3	0	
10	3Ш2-1-3Ш2-2	approximately 7 ohms	
11	Ф2-5-1Ш2-4	4.7 ± 0.5 megohm	
12	Ф2-5-1Ш2-5	4.7 ± 0.5 megohm	
13	1Ш2-1-2Ш2-1	6 – 30 ohms	(channel I)
14	1Ш2-1-2Ш2-3	6 – 30 ohms	(channel II)
15	3Ш2-1-5Ш2-1	3.2 ± 0.3 ohm	
16	6Ш2-1-7Ш2-1	3.2 ± 0.3 ohm	

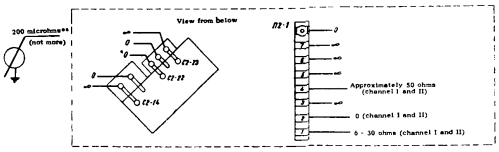


FIG. 88. CALIBRATION CHART OF RESISTORS IN UNIT P2

Instructions. 1. Resistors are to be measured with respect to body, besides points indicated in Table.
2. Resistors are to be measured with blocks being disconnected and valves taken out.
3. Resistor marked with 0* sign means resistor <0.5 ohm.
4. ∞ means resistor > 50 megohms.
5. ∞ is to be measured by megohmmeter for 250 V.
6. All other measurements are to be made with the help of ABO-5 instrument.
7. Resistor marked with sign** is to be measured by means of M-246 microohmmeter between terminal and body.
8. Measurements indicated by sign *** are to be effected by pressing plunger of electromagnet of corresponding klystron until contacts of contact group become disengaged.

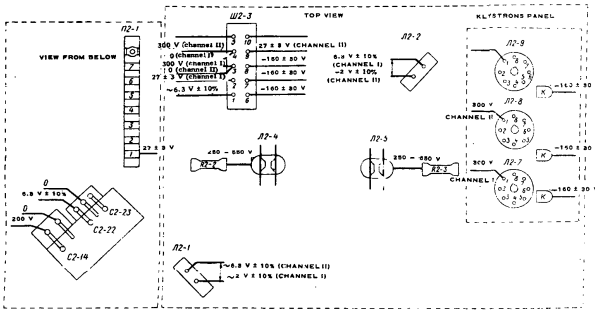


FIG. 89. CALIBRATION CHART OF VOLTAGES IN UNIT P2.

Instructions. 1. Measurements are to be effected while cutting in high voltage bus with

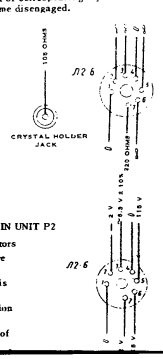
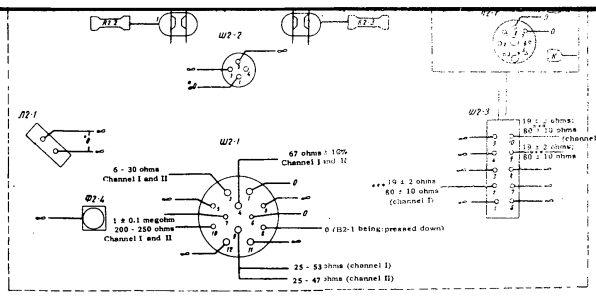


FIG. 90. CALIBRATION CHART OF ПУПЧ PANEL IN UNIT P2

Instructions. 1. Measurements of resistors is to be effected with respect to body with valve being taken out.
2. Permissible tolerance of resistance value is ±10%.
3. Voltage tolerance for all points of calibration chart, unless specified otherwise, ±20%.
4. Measurements are to be effected by means of

	500 ohms ± 15%	Tilt 0°
	310 ohms ± 15%	Tilt 0°
	280 ohms ± 15%	Tilt 0°
0-	100 ohms ±15%	Position of unit along course line
ody	50 ohms ± 15%	do
-body	50 ohms ± 15%	do
	0	do
	0	Position of unit in sector 157° – 203°
	0	do
-body	∞	Position of unit in sector 90° – 270°

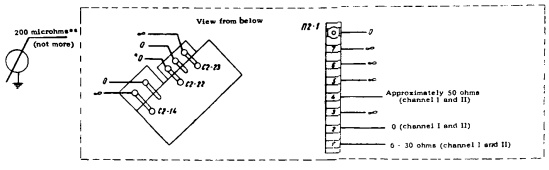
ALIBRATION CHART OF UNIT P1 MEASUREMENTS ARE TO BE EFFECTED BY ABO-5 INSTRUMENT



5	5Ш2 - 1 - 2Ш2 - 2	15 ± 1.5 kV/ohms
6	6Ш2 - 1 - 5Ш2 - 3	0
7	7Ш2 - 1 - 6Ш2 - 3	0.75 ± 0.14 megohm (with leads R2-4)
8	8Ш2 - 1 - 7Ш2 - 3	0.75 ± 0.14 megohm (with leads R2-5)
9	7Ш2 - 1 - 8Ш2 - 3	0
10	8Ш2 - 1 - 8Ш2 - 2	approximately 7 ohms
11	Ф2 - 5 - 1Л2 - 4	4.7 ± 0.5 megohm
12	Ф2 - 5 - 1Л2 - 5	4.7 ± 0.5 megohm
13	1Л2 - 1 - 2Л2 - 1	6 – 30 ohms (channel I)
14	1Л2 - 1 - 2Л2 - 1	6 – 30 ohms (channel II)
15	2Л2 - 1 - 5Л2 - 1	3.2 ± 0.3 ohm
16	5Л2 - 1 - 7Л2 - 1	3.2 ± 0.3 ohm

FIG. 88. CALIBRATION CHART OF RESISTORS IN UNIT P2

Instructions. 1. Resistors are to be measured with respect to body, besides points indicated in Table.
2. Resistors are to be measured with blocks being disconnected and valves taken out.
3. Resistor marked with 0* sign means resistor <0.5 ohm.
4. ∞ means resistor > 50 megohms.
5. ∞ is to be measured by megohmmeter for 250 V.
6. All other measurements are to be made with the help of ABO-5 instrument.
7. Resistor marked with sign** is to be measured by means of M-246 microohmmeter between terminal and body.
8. Measurements indicated by sign *** are to be effected by pressing plunger of electromagnet of corresponding klystron until contacts of contact group become disengaged.



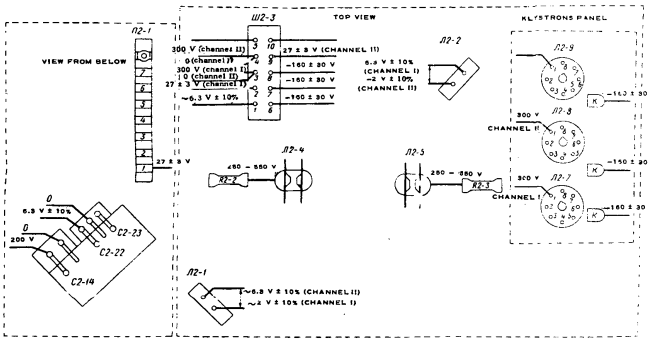


FIG. 89. CALIBRATION CHART OF VOLTAGES IN UNIT P2.

Instructions. 1. Measurements are to be effected by means of ABO-5 instrument.
2. All voltages are given in volts.
3. Measurements on Л2 - 1 and Л2 - 2 are to be effected while cutting in high voltage but with Пр-12-1 fuse being taken out from P12 unit.
4. Measurements from bottom side are given for reference.

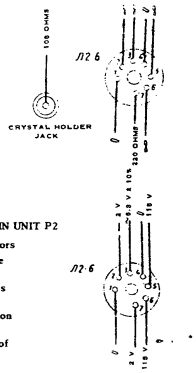


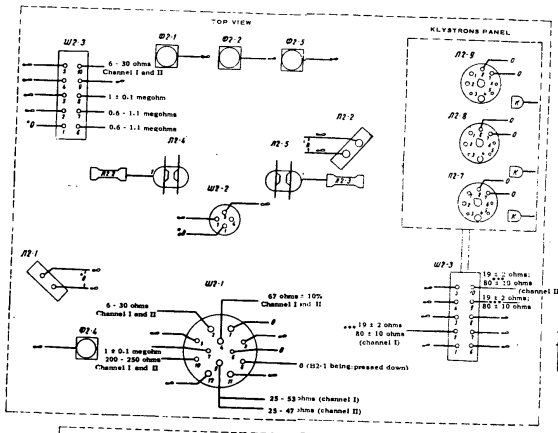
FIG. 90. CALIBRATION CHART OF ПУП4 PANEL IN UNIT P2

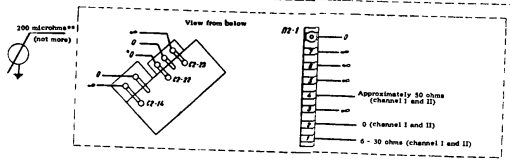
Instructions. 1. Measurement of resistors is to be effected with respect to body with valve being taken out.
2. Permissible tolerance of resistance value is ±10%.
3. Voltage tolerance for all points of calibration chart, unless specified otherwise, ±20%.
4. Measurements are to be effected by means of ABO-5 instrument.

CALIBRATION CHARTS OF UNITS

No.	Nos of contacts of plug-connector Ш1 - 6 between which resistance is being measured	Rating values. Resistance	Measurement conditions
1	1-body	0	
2	2-body	25 ohms ± 20%	
3	3-4	∞	Extreme upper position
4	3-4	∞	Extreme lower position
5	5-6	500 ohms ± 15%	Tilt 0°
6	5-7	310 ohms ± 15%	Tilt 0°
7	6-7	280 ohms ± 15%	Tilt 0°
8	9-10	100 ohms ±15%	Position of unit along course line
9	9-body	50 ohms ± 15%	do
10	10-body	50 ohms ± 15%	do
11	11-2	0	do
12	12-2	0	Position of unit in sector 157° – 203°
13	14-2	0	do
14	18-body	∞	Position of unit in sector 90° – 270°

FIG. 87. CALIBRATION CHART OF UNIT P1 MEASUREMENTS ARE TO BE EFFECTED BY ABO-5 INSTRUMENT





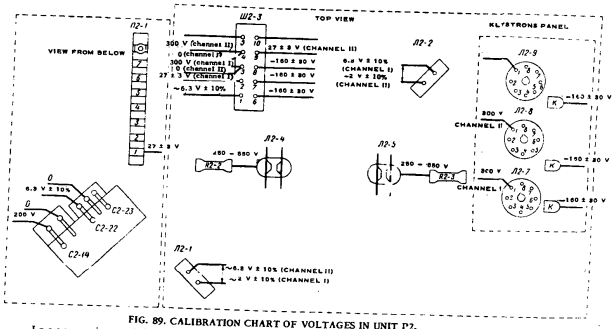


FIG. 89. CALIBRATION CHART OF VOLTAGES IN UNIT P2.

Instructions. 1. Measurements are to be effected while cutting in high voltage but with effected by means of ABO-5 instrument.

FIG. 88. CALIBRATION CHA

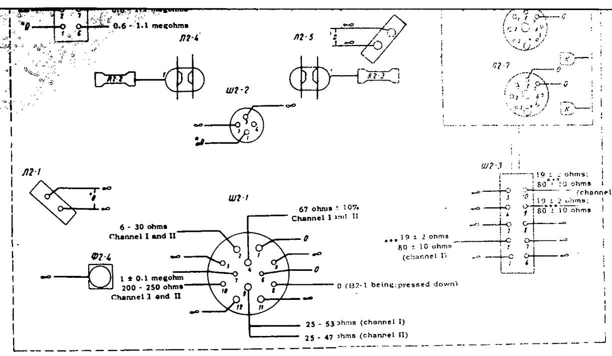
Instructions. 1. Re
respect to body, besides point
2. Resistors are to be meas
nected and valves taken out.
3. Resistor marked with 0*
4. ∞ means resistor > 50
5. ∞ is to be measured by
6. All other measurements
of ABO-5 instrument.
7. Resistor marked with si
of M-246 microohmmeter betwe
8. Measurements indicated
by pressing plunger of electro
until contacts of connect group

FIG. 90. CALIBRATION CHART OF ПУПЧ P

Instructions. 1. Measurement of
is to be effected with respect to body wit
being taken out.
2. Permissible tolerance of resistance
±10%.
3. Voltage tolerance for all points of ca
chart, unless specified otherwise, ±20%.
4. Measurements are to be effected by

[illegible]	
[illegible]	Extreme upper position
[illegible]	Extreme lower position
[illegible] 15%	Tilt 0°
[illegible] ± 15%	Tilt 0°
280 ohms ± 15%	Tilt 0°
100 ohms ±15%	Position of unit along course line
50 ohms ± 15%	do
50 ohms ± 15%	do
0	do
0	Position of unit in sector 157° – 203°
0	do
∞	Position of unit in sector 90° – 270°

…T OF UNIT P1 MEASUREMENTS ARE TO BE …TED BY ABO-5 INSTRUMENT



1	12Ш2-1-2	± 0.5 ohm	
2	2Ш2-1-1	20 ± 22 ohms	
3	2Ш2-1-4	– 100 ohms	Channel I and II
4	2Ш2-1-6	± 2 ohms	
5	5Ш2-1-2	5 ± 1.5 kilohms	
6	5Ш2-1-5	0	
7	7Ш2-1-6	75 ± 0.14 megohm (with lead-in R2-4)	
8	7Ш2-1-7	75 ± 0.14 megohm (with lead-in R2-5)	
9	7Ш2-1-8	0	
10	3Ш2-1-3	approximately 7 ohms	
11	Ф2-5-1Л	4.7 ± 0.5 megohm	
12	Ф2-5-1Л	4.7 ± 0.5 megohm	
13	1Ш2-1-2	6 – 30 ohms	(channel I)
14	1Ш2-1-2	6 – 30 ohms	(channel II)
15	3Ш2-1-…	…2 ± 0.3 ohm	
16	6Ш2-1-…	…2 ± 0.3 ohm	

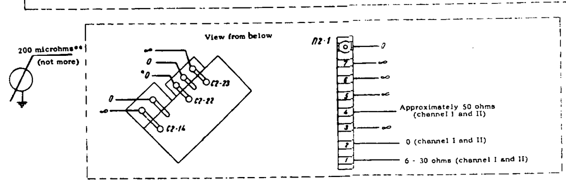


FIG. 88. CALIBRATION …ESISTORS IN UNIT P2

I n s t r u c t i o n s. 1… to be measured with respect to body, besides … d in Table.

2. Resistors are to be … blocks being disconnected and valves taken c…

3. Resistor marked wit…s resistor <0.5 ohm.

4. ∞ means resistor >…

5. ∞ is to be measur…eter for 250 V.

6. All other measurem… made with the help of ABO-5 instrument.

7. Resistor marked wi… be measured by means of M-246 microohmmeter …nal and body.

8. Measurements indic… *** are to be effected by pressing plunger of e…f corresponding klystron until contacts of contact… disengaged.

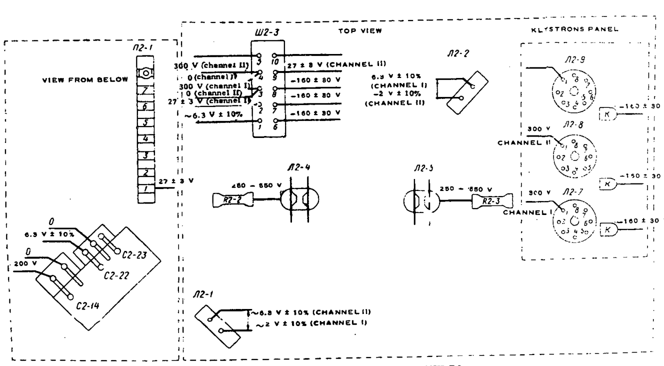


FIG. 89. CALIBRATION CHART OF VOLTAGES IN UNIT P2.

I n s t r u c t i o n s. 1. Measurements are to be effected by means of ABO-5 instrument.

2. All voltages are given in volts.

3. Measurements on Л2-1 and Л2-2 are to be effected while cutting in high voltage but with Пр-12-1 fuse being taken out from P12 unit.

4. Measurements from bottom side are given for reference.

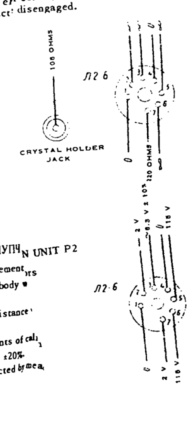


FIG. 90. CALIBRATION CHART OF ПУПЧ N UNIT P2

I n s t r u c t i o n s. 1. Measurements is to be effected with respect to body • being taken out.

2. Permissible tolerance of resistance ±10%.

3. Voltage tolerance for all points of cal… chart, unless specified otherwise, ±20%.

4. Measurements are to be effected by mea… ABO-5 instrument.

FIG. 91. CALIBRATION CHART OF RESISTORS IN UNIT P3

Instructions. 1. Resistor ratings are given with respect to body.

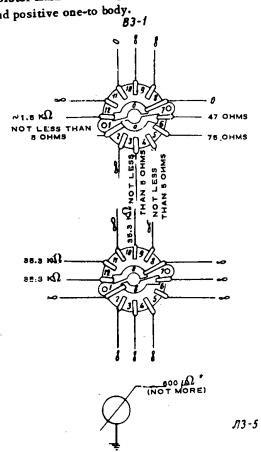
2. Measurements are to be effected when the switch is set to OPERATION position (РАБОТА).

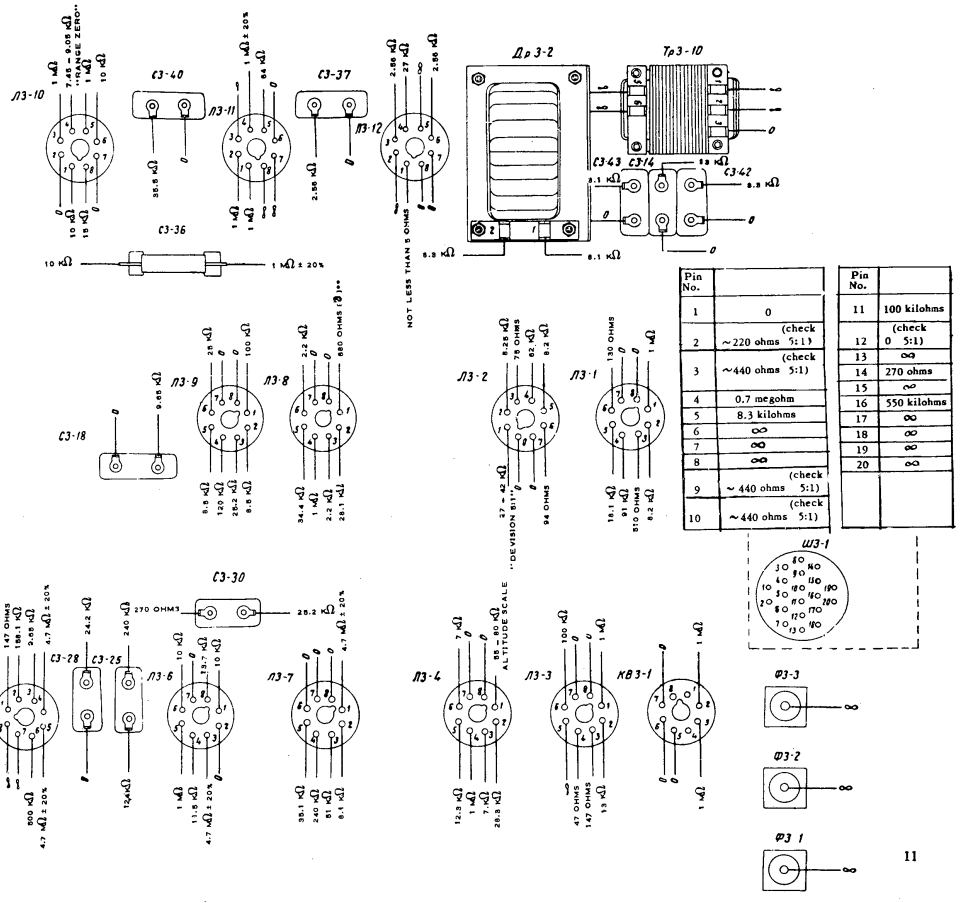
3. Permissible tolerance of resistor value is ±10%.

4. Measurements are to be effected by means of АВО-5 instrument or by like one with valves being taken out.

5. Resistor marked with sign * is measured by М-246 microohmmeter between terminal and body.

6. While measuring resistor marked with sign ** connect negative conductor to valve pin and positive one-to body.





Pin No.		Pin No.	
1	0	11	100 kilohms
2	~220 ohms (check 5:1)	12	0 (check 5:1)
3	~440 ohms (check 5:1)	13	∞
4	0.7 megohm	14	270 ohms
5	8.3 kilohms	15	∾
6	∞	16	550 kilohms
7	∞	17	∞
8	∞	18	∞
9	~ 440 ohms (check 5:1)	19	∞
10	~440 ohms (check 5:1)	20	∞

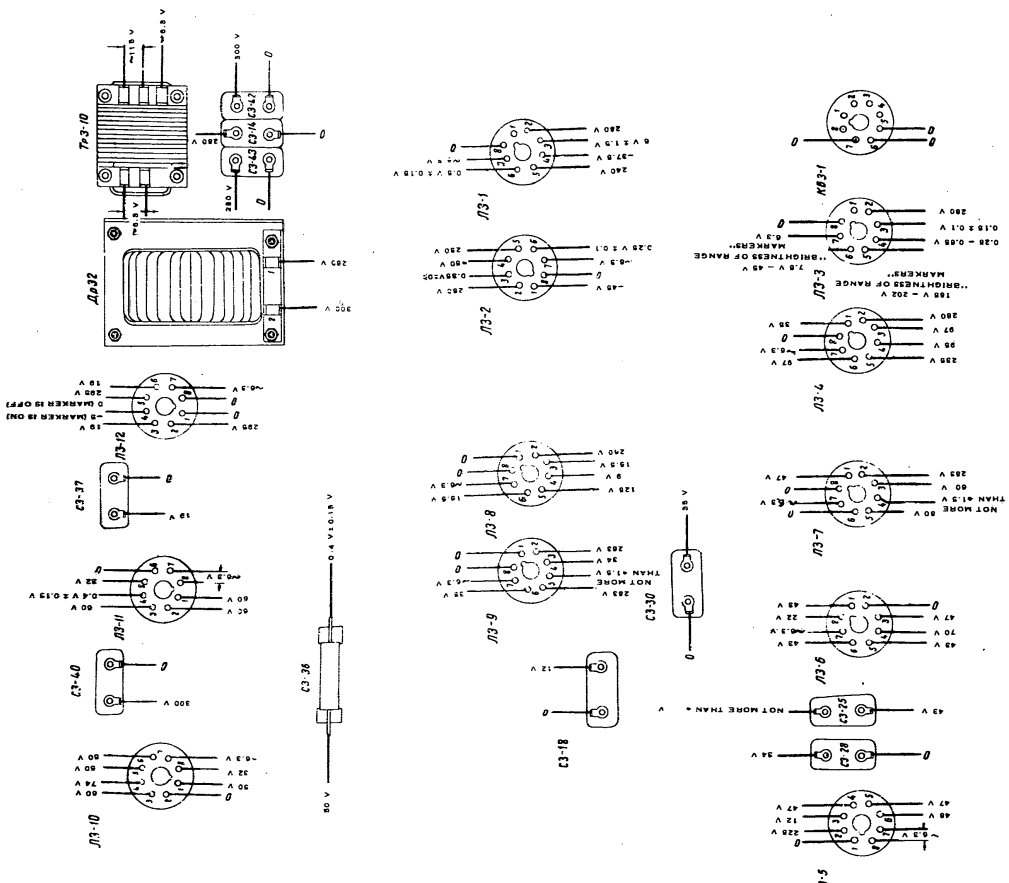


FIG. 92. CALIBRATION CHART OF VOLTAGES IN UNIT P3

Instructions. 1. Measurements are to be effected with step-delay zero, range delay 2 km, altitude zero and with computer-marker at a frequency of 1250 being switched on.

2. Switch on unit P3 is set to OPERATION (РАБОТА) position.
3. Voltages are to be measured by means of АВО-5 instrument or by like one.
4. For all points where tolerance is not indicated, its size being ±20%.
5. While measuring voltage at 5th pin of valve Л3-3, LOW LEVEL and HIGH LEVEL (НИЗКИЙ УРОВЕНЬ and ВЫСОКИЙ УРОВЕНЬ) potentiometers respectively should be in extreme left position (under complex checking).
6. Tolerance for filament voltage being ±10%.

No.	Valve number	Numbers of valve pins	Sphape and amplitude of pulses	Conditions for measurement
1	Л3-1	1	120 V; 13M/sec.	
2	Л3-1	2	330 V; 13.3 M/sec.	
3	Л3-1	5	120 V; 13.3 M/sec.	
4	Л3-1	6	25 V; 13.3 M/sec.	
5	Л3-2	3	45 V; 50 V; 66.5 M/sec.	
6	Л3-2	6	13.3 M/sec.	
7	Ф3-1		0.8 - 1.5 V	
8	Л3-3	3	12 V	Range scale 10 km.
9	Л3-4	1	80 V	
10	Л3-4	5	Pulse duration changes with introduction of altitude; 70 V; 130 M / sec.; 240 M/sec.	
11	Т3-5	Outlet 4	Not less than 22 V; Pulse begins to move with introduction of altitude	

No.	Valve number	Numbers of valve pins	Shape and amplitude of pulses	Conditions for measurement
12	Л3-5	1	50 V	
13	Ф3-2		70 V	During bench check
14	Л3-5	2	50 V	During complex check (for reference)
15	Л3-5 Л3-6	4,5 3	18 V	Delay 20 km.
16	Л3-5 Л3-6	4,5 3	50 V	Delay 60 km.
17	Л3-5 Л3-6	4,5 3	70 V	Delay 140 km.
18	Л3-6	1,6	20 V	Delay 20 km.
19	Л3-6	1,6	35 V	Delay 60 km.
20	Л3-6	1,6	50 V	Delay 140 km.
21	Л3-7	5	125 V	Delay 20 km.
22	Л3-7	5	150 V	Delay 40 km.

No.	Valve number	Numbers of valve pins	Shape and amplitude of pulses	Conditions for measurement
23	Л3-7	5	140 V	Delay 140 km.
24	Л3-8	1	Not less than 3 V; 20 km; 120 km	Step-delay zero
25	Л3-8	1	Not less than 3 V; Pulse begins to move with growth of delay	Step-delay is on
26	Л3-8	5	200 V; 190 M/sec	Step-delay zero
27	Л3-8	5	200 V; 120 M/sec	Step-delay is on
28	Л3-9	1	18 V	Step-delay zero
29	Л3-9	1	18 V	Step delay is on
30	Л3-9 Л3-9	2 5	120 V	
32	Л3-9	6	50 V	
33	Л3-10	1,6	35 V	Range delay 2 km.

No.	Valve number	Numbers of valve pins	Shape and amplitude of pulses	Conditions for measurement
34	Л3-10	1,6	30 V	Range delay 30 km.
35	Л3-10 Л3-11	3 1,2	25 V	Range delay 2 km.
36	Л3-10 Л3-11	3 1,2	150 V	Range delay 30 km.
37	Л3-11	5	25 V	Range delay 2 km.
38	Л3-11	5	200 V	Range delay 30 km.
39	Л3-12	1	8 V	Range delay 2 km.
40	Л3-12	1	25 V	Range delay 30 km.
41	Л3-11	3	30 V	
42	Л3-12	5	200 V	
43	С3-39		$U_{min.} = 5$ V; $U_{max.} = 16$ V	Adjusting potentiometer R3-101

FIG. 93. CALIBRATION CHART OF PULSES IN UNIT P3

I n s t r u c t i o n s. 1. Changeover switch on unit P3 is in OPERATION (РАБОТА) position.

2. Set the SWEEP DELAY IN KM changeover switch (ЗАДЕРЖКА РАЗВЕРТКИ КМ) to 0 position; band switch – to 10 km.; RANGE potentiometer (ДАЛЬНОСТЬ) to 2 km.; altitude potentiometer is in extreme left position; marker switch to COMPUTATION (ВЫЧИСЛ.).

3. Shape and amplitude of pulses are to be checked by oscillograph type 41И "Вольфрам".

4. Shapes and amplitudes of pulses given above are approximate.

50X1-HUM

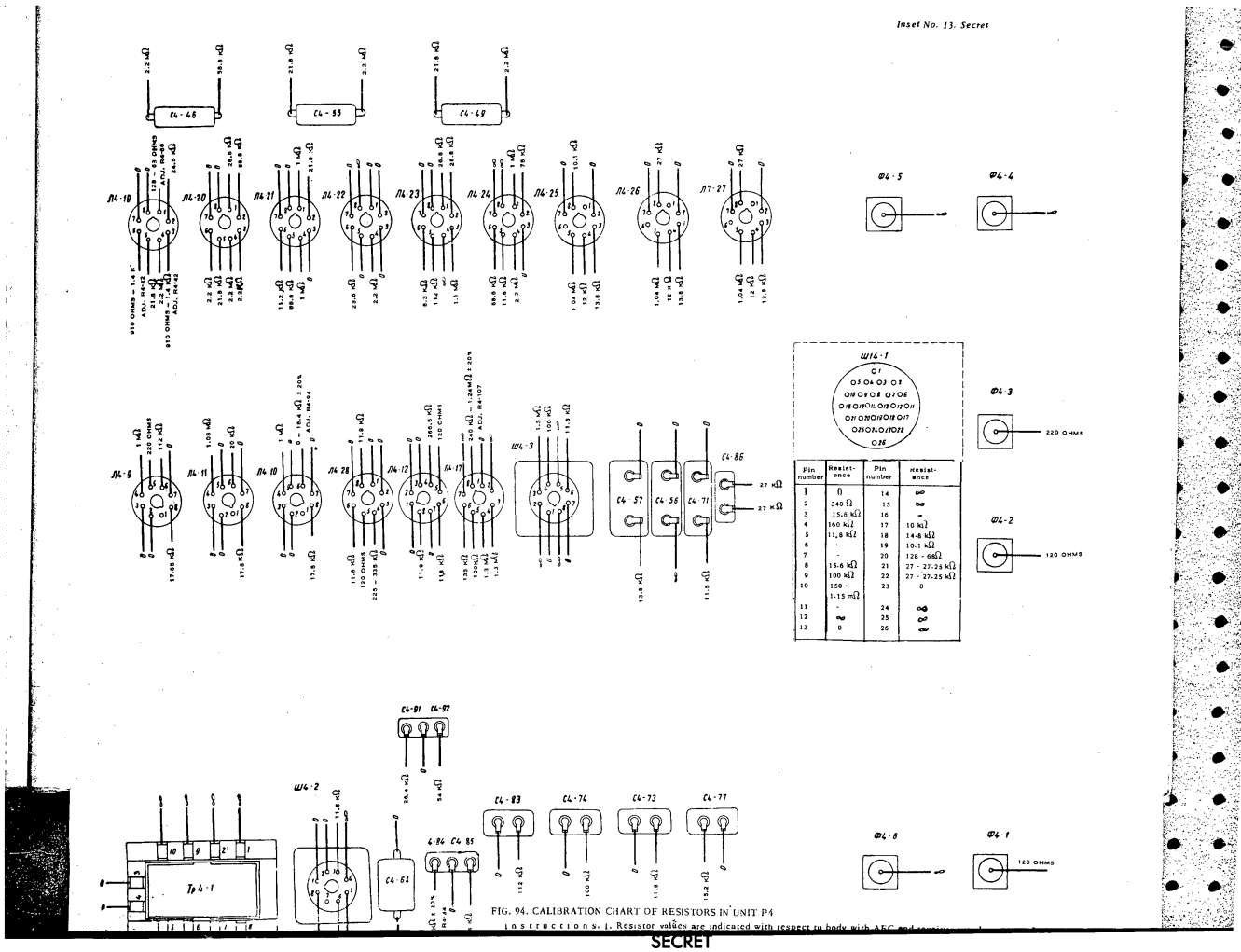
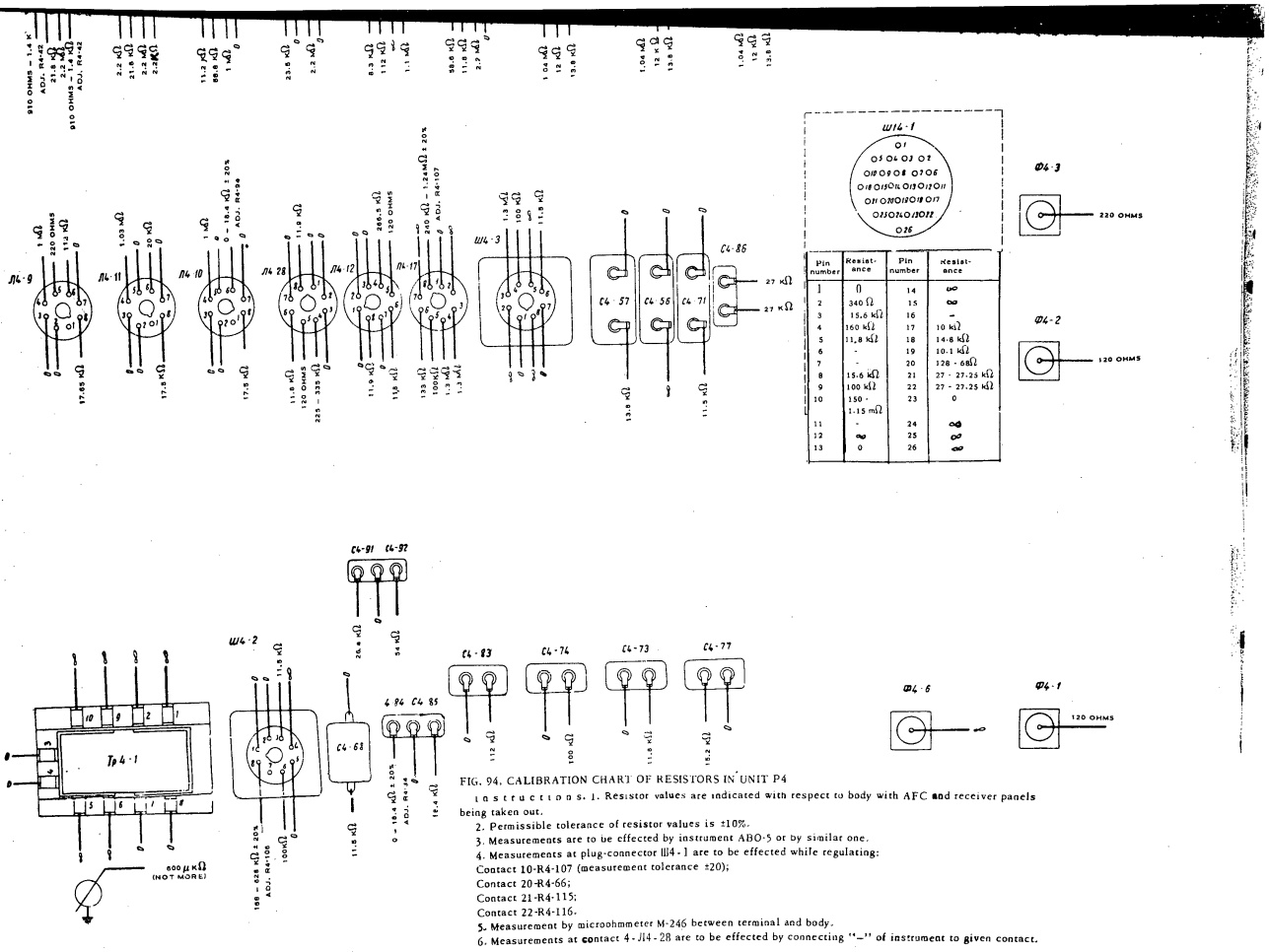


FIG. 94. CALIBRATION CHART OF RESISTORS IN UNIT P4

Instructions. 1. Resistor values are indicated with respect to body with ASC and

SECRET



Pin number	Resistance	Pin number	Resistance
1	0	14	∞
2	340 Ω	15	∞
3	15.6 kΩ	16	-
4	160 kΩ	17	10 kΩ
5	11.8 kΩ	18	14.8 kΩ
6	-	19	10.1 kΩ
7	-	20	128 - 68Ω
8	15.6 kΩ	21	27 - 27.25 kΩ
9	100 kΩ	22	27 - 27.25 kΩ
10	150 - 1.15 mΩ	23	0
11	-	24	∞
12	∞	25	∞
13	0	26	∞

FIG. 94. CALIBRATION CHART OF RESISTORS IN UNIT P4

Instructions. 1. Resistor values are indicated with respect to body with AFC and receiver panels being taken out.

2. Permissible tolerance of resistor values is ±10%.
3. Measurements are to be effected by instrument ABO-5 or by similar one.
4. Measurements at plug-connector Ш4-1 are to be effected while regulating:
Contact 10-R4-107 (measurement tolerance ±20);
Contact 20-R4-66;
Contact 21-R4-115;
Contact 22-R4-116.
5. Measurement by microohmmeter M-246 between terminal and body.
6. Measurements at contact 4-Ш4-28 are to be effected by connecting "–" of instrument to given contact.

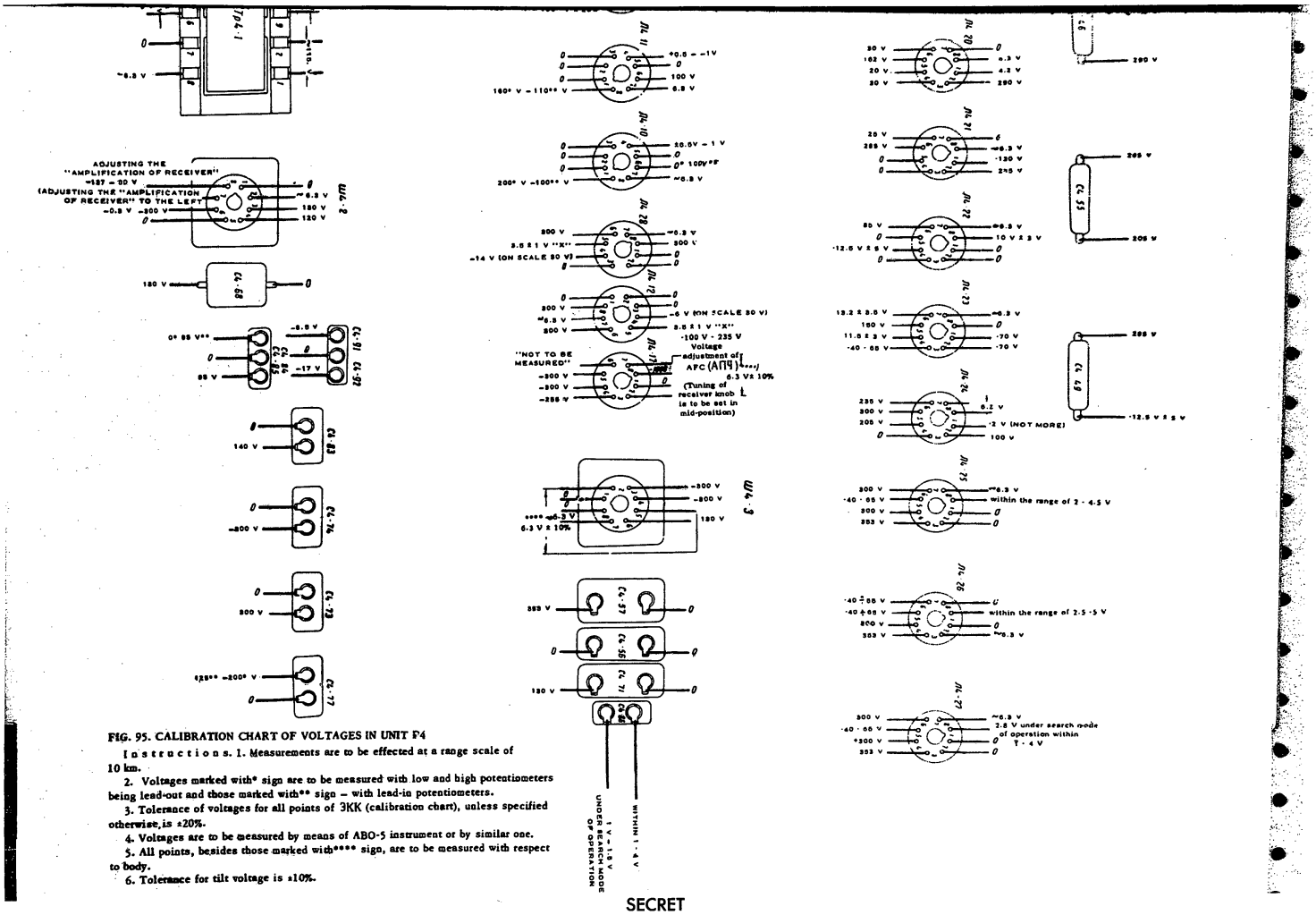


FIG. 95. CALIBRATION CHART OF VOLTAGES IN UNIT F4

Instructions. 1. Measurements are to be effected at a range scale of 10 km.

2. Voltages marked with* sign are to be measured with low and high potentiometers being lead-out and those marked with** sign – with lead-in potentiometers.

3. Tolerance of voltages for all points of ЭКК (calibration chart), unless specified otherwise, is ±20%.

4. Voltages are to be measured by means of АВО-5 instrument or by similar one.

5. All points, besides those marked with**** sign, are to be measured with respect to body.

6. Tolerance for tilt voltage is ±10%.

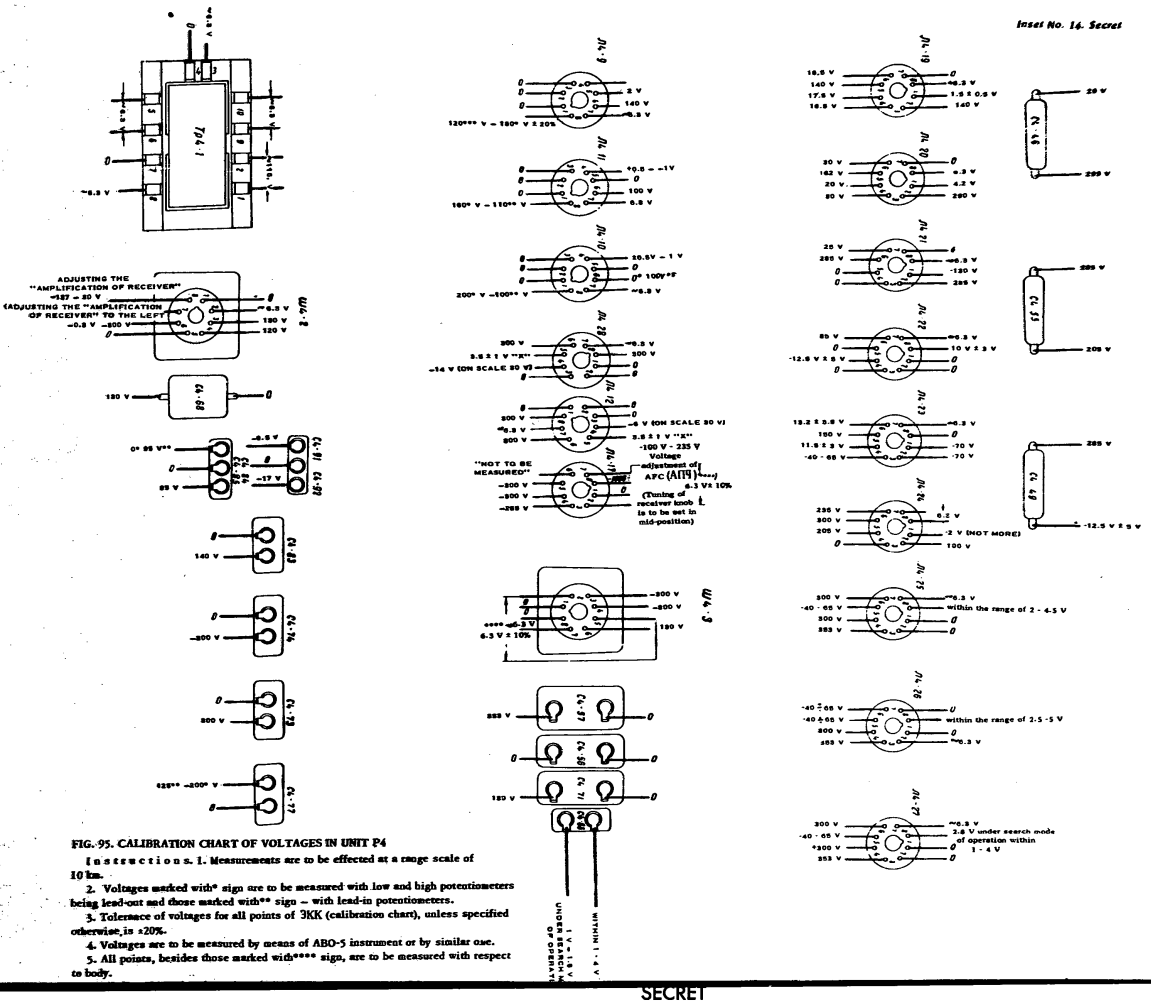


FIG. 95. CALIBRATION CHART OF VOLTAGES IN UNIT P4

Instructions. 1. Measurements are to be effected at a range scale of 10 km.

2. Voltages marked with° sign are to be measured with low and high potentiometers being lead-out and those marked with°° sign – with lead-in potentiometers.

3. Tolerance of voltages for all points of 3KK (calibration chart), unless specified otherwise, is ±20%.

4. Voltages are to be measured by means of ABO-5 instrument or by similar one.

5. All points, besides those marked with°°°° sign, are to be measured with respect to body.

No.	Valve No. as per diagram	Lug No.	Shape and amplitude of pulses: Range scale 10 km.	Range scale 200 km.
1	Л4-19	1	15 V	12 V
2	Л4-19	3	8 V	8 V
3	Л4-19	4	20 V	20 V
4	Л4-19	5	4 V	4 V
5	Л4-20	1	22 V	22 V
6	Л4-20	2	150 V	150 V
7	Л4-20	3	25 V	25 V
8	Л4-20	4	150 V	150 V
9	Л4-20	5	150 V	150 V
10	Л4-21	1	150 V	140 V
11	Л4-21	2	160 V	150 V
12	Л4-21	4	27 V	27 V
13	Л4-21	5	150 V	150 V
14	Л4-22	4	160 V	150 V
15	Л4-22	6	260 V	260 V
16	Л4-22	8	14 V	12 V
17	Л4-23	2	70 V	70 V
18	Л4-23	3	140 V	100 V
19	Л4-23	4	14 V	12 V
20	Л4-23	5	25 - 50 V	7 V
21	Л4-23	8	14 V	12 V
22	Л4-24	1	28 - 80 V	28 V
23	Л4-24	2	140 V	150 V
24	Л4-24	4	150 V	150 V
25	Л4-25	8	100 V	80 V
26	Л4-26	8	100 V	80 V
27	Л4-27	8	100 V	80 V

FIG. 96. CALIBRATION CHART OF PULSES IN UNIT P4

Instructions. 1. Shape and amplitude of pulses are to be checked by means of oscillograph 41И "Вольфрам".

2. The above indicated shapes and amplitudes of pulses are approximate.

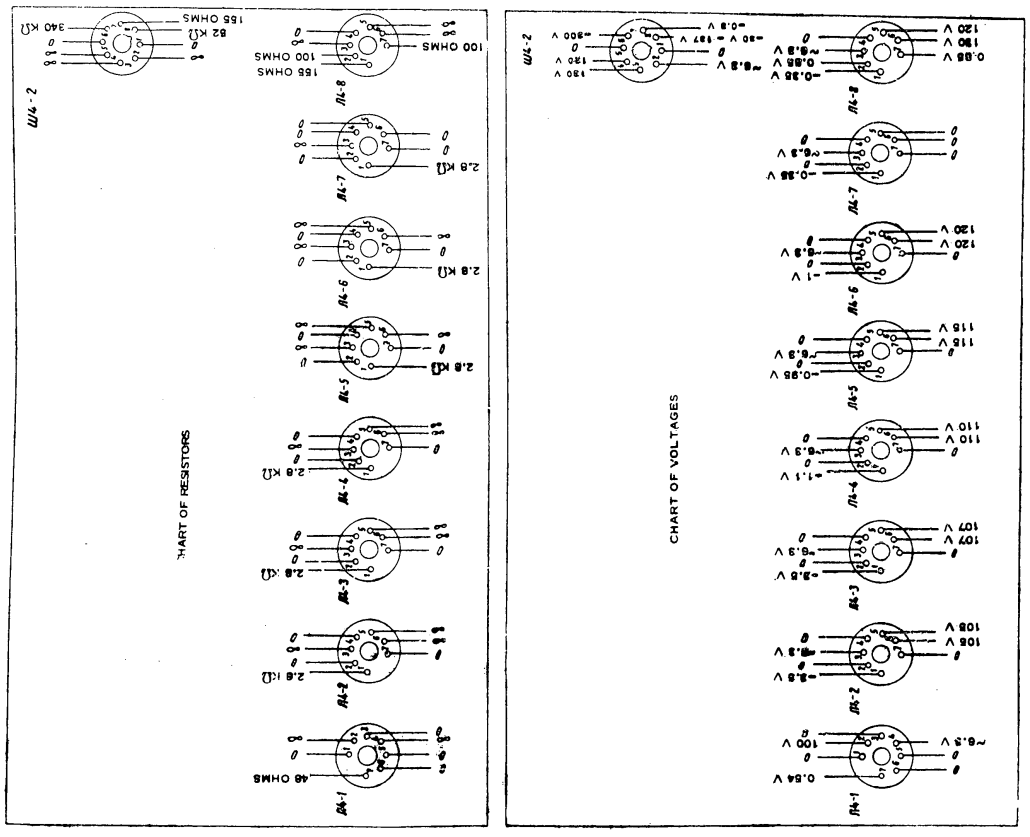
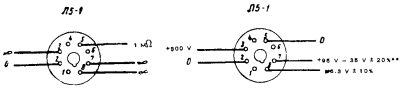
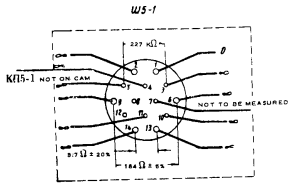


FIG. 97. CALIBRATION CHART OF VTH PANEL IN UNIT P4

Instructions. 1. Resistors are to be measured with respect to body.
2. Permissible variation from resistor values is ±10%.
3. Voltage tolerance for all points of ЭКК (calibration chart), unless specified otherwise, is ±20%.
4. Measurements are to be effected by means of АВО-5 instrument or by similar one.
5. Tolerance for filament voltage is ±10%.
6. Voltages are to be measured with AMPLIFICATION OF RECEIVER (УСИЛЕНИЕ ПРИЕМНИКА) knob being in extreme left position.



tance	Special conditions for measurements
relay P5-1	
alive	
5.8 ohms ± 20%	Connect 27 V to the 4th pin of Ш5-1 and unit chassis (roller КП5-1 is on cam)
5.8 ohms ± 20%	
Not to be measured	К5-3 potentiometer is in extreme right position
	R5-3 potentiometer is in extreme left position
ct КП5-1	To be achieved by turning L5-1 coil around axis
On cam	
∞	



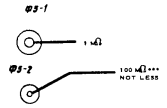


FIG. 99. CALIBRATION CHART OF P5/1 AND P5/2 UNITS

Instructions. 1. All resistors, besides specified, have tolerance of ±10%.

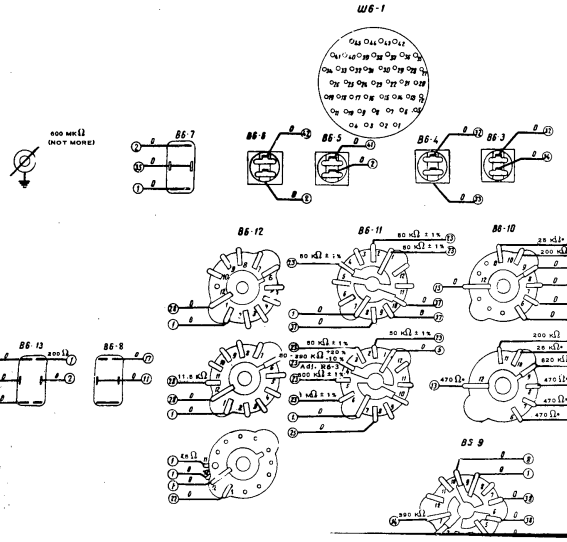
2. All resistors and voltages, besides specified, are to be measured with respect to body under absence of video signal.

3. While measuring resistors, valves Л5-1, ЛН5-1, ЛН5-2 and ЛН5-3 are to be taken out.

4. Measurements are to be effected by means of АВО-5 instrument.

5. Measurements marked with** sign are to be effected while rotating R5-4 BRIGHTNESS (ЯРКОСТЬ) potentiometer (measurement corresponds to operation in complex at a range of 200 km.).

6. Measurements marked with*** sign are to be effected by megohmeter for 500 V.



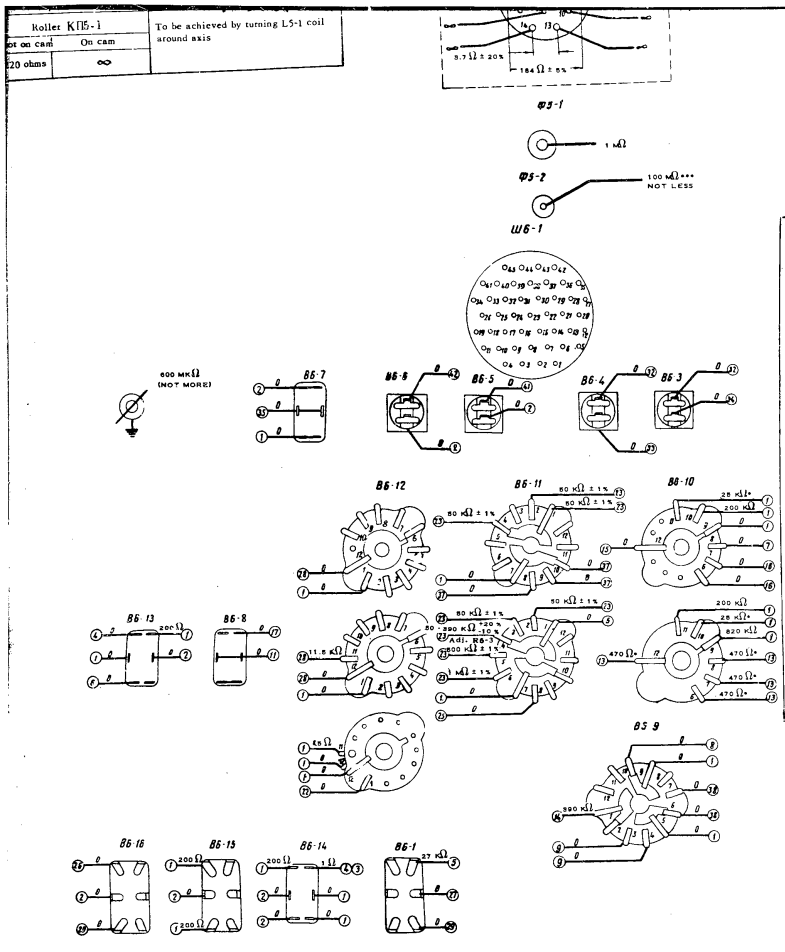
Contact No. in plug-connector	Resistors	Conditions for measurement	Contact No. in plug-connector	Resistors	Conditions for measurement
1-body	0		27-body	51 Ω	"Markers" tumbler switch to "Sight" position
2-body	520 Ω		28-body	0	
3-4	2 Ω		29-body	51 Ω	
5-body	9.6 kΩ		30-body	∞	
6-body	0		31-body	∞	
7-body	∞		32-33	0	
8-body	0		34-32	∞	
9-body	210 kΩ		34-32	0	Upon pressing button "Power On".
10-body	∞				Clearness tumbler switch is in 1 position
11-17	∞ 0	Tumbler switch "Course Line" On and Off	35-body	520 Ω	Clearness tumbler switch is in II position
12-body	∞	ЛН6-3 valve is to be taken out.	35-body	0	Not to be measured
13-body	∞		36		
14-body	1 mΩ		37-body	0	
15-body	∞		38-body	0	With "Altitude delay" adjusting potentiometer
16-body	∞		39-body	3 Ω** – 12 kΩ	With "Range" adjusting potentiometer
18-19	1 MΩ**	Set R6-65 potentiometer to the right.	40-body	6.8 kΩ – 14 kΩ	Valve ЛН6-2 is to be taken out.
20-2	0	Set tumbler switch "tilt" to the Upward position.	41-2	∞	
21-body	∞		41-2	0	Upon pressing down "Transmitter On" button
22-body	0				
23-body	59.5 kΩ		42-2	0	
24-body	15-1 kΩ ±20%	"Brightness of range markers" adjusting potentiometer	43-45	0** – 500 Ω	With "≂115 V Control" adjusting potentiometer
25-body	0	Upon pressing "Antenna tilt downwards" tumbler switch			
26-2	0				
27-body	36.5 kΩ	"Markers" tumbler switch to "Computation" position			

FIG. 100. CALIBRATION CHART OF UNIT P6

Instructions. 1. Prior to measurements all tumbler switches should be set to "OFF" (ВЫКЛЮЧЕНО) position and wafer switches and potentiometers are to be set to extreme left position.

2. Resistance at nodal points is to be measured with respect to pins of Ш6-1 plug connectors.

3. Figures in circles correspond to pins of plug connectors.



Contact No. in plug-connector	Resistors	Conditions for measurement
1-body	0	
2-body	520 Ω	
3-4	2 Ω	
5-body	9.6 kΩ	
6-body	0	
7-body	∞	
8-body	0	
9-body	210 kΩ	
10-body	∞	
11-17	∞ 0	Tumbler switch "Course Line" On and Off
12-body	∞	ЛН6-3 valve is to be taken out.
13-body	∞	
14-body	1 mΩ	
15-body	∞	
16-body	∞	
18-19	1 kΩ**	Set R6-65 potentiometer to the right.
20-2	0	Set tumbler switch "tilt" to the Upward position.
21-body	∞	
22-body	0	
23-body	59.5 kΩ	
24-body	15-1 kΩ ±20%	"Brightness of range markers" adjusting potentiometer
25-body	0	Upon pressing "Antenna tilt downwards" tumbler switch
26•2	0	
27-body	36-5 kΩ	"Markers" tumbler switch to "Computation" position
27-body	51 Ω	"Markers" tumbler switch to "Sight" position
28-body	0	
29-body	51 Ω	
30-body	∞	
31-body	∞	
32-33	0	
34-32	∞	
34-32	0	Upon pressing button "Power On".
35-body	520 Ω	Clearness tumbler switch is in I position
35-body	0	Clearness tumbler switch is in II position
36		Not to be measured
37-body	0	
38-body	0	
39-body	3 Ω** – 12 kΩ	With "Altitude delay" adjusting potentiometer
40-body	6.8 kΩ – 14 kΩ	With "Range" adjusting potentiometer
41-2	∞	Valve ЛН6-2 is to be taken out.
41-2	0	Upon pressing down "Transmitter On" button
42-2	0	
43-45	0** – 500 Ω	With "~115 V Control" adjusting potentiometer

FIG. 100. CALIBRATION CHART OF UNIT P6

Instructions. 1. Prior to measurements all tumbler switches should be set to "OFF" (ВЫКЛЮЧЕНО) position and wafer switches and potentiometers are to be set to extreme left position.

2. Resistance at nodal points is to be measured with respect to pins of Ш6-1 plug connectors.

3. Figures in circles correspond to pins of plug connectors.

4. Resistance with tolerance of ±1% is to be measured on Wheatstone bridge with an accuracy of not less than 0.5%.

5. The rest of the resistors are to be measured by means of АВО-5 instrument.

6. Resistor values marked with* sign are approximate and are to be determined by selection through ИП6-2 instrument; resistor marked with** sign is approximate; resistor marked with*** sign is to be measured by means of М-246 microohmmeter between terminal and body.

7. Resistor tolerances, unless specified otherwise, are ±10%.

50X1-HUM

No.	Ш5-1 pin numbers	Resistance		Special conditions for measurements
		Winding of relay P5-1		
		dead	alive	
1	10-11	∞	5.8 ohms ± 20%	Connect 27 V to the 4th pin of Ш5-1 and unit chassis (roller КП5-1 is on cam)
2	1-10	∞	5.8 ohms ± 20%	
3	Ш5-1/2 Ш5-2/1	5 ohms 55 ohms	Not to be measured	K5-3 potentiometer is in extreme right position
				R5-3 potentiometer is in extreme left position
4	1-7	Roller КП5-1		To be achieved by turning L5-1 coil around axis
		Not on cam	On cam	
		220 ohms	∞	

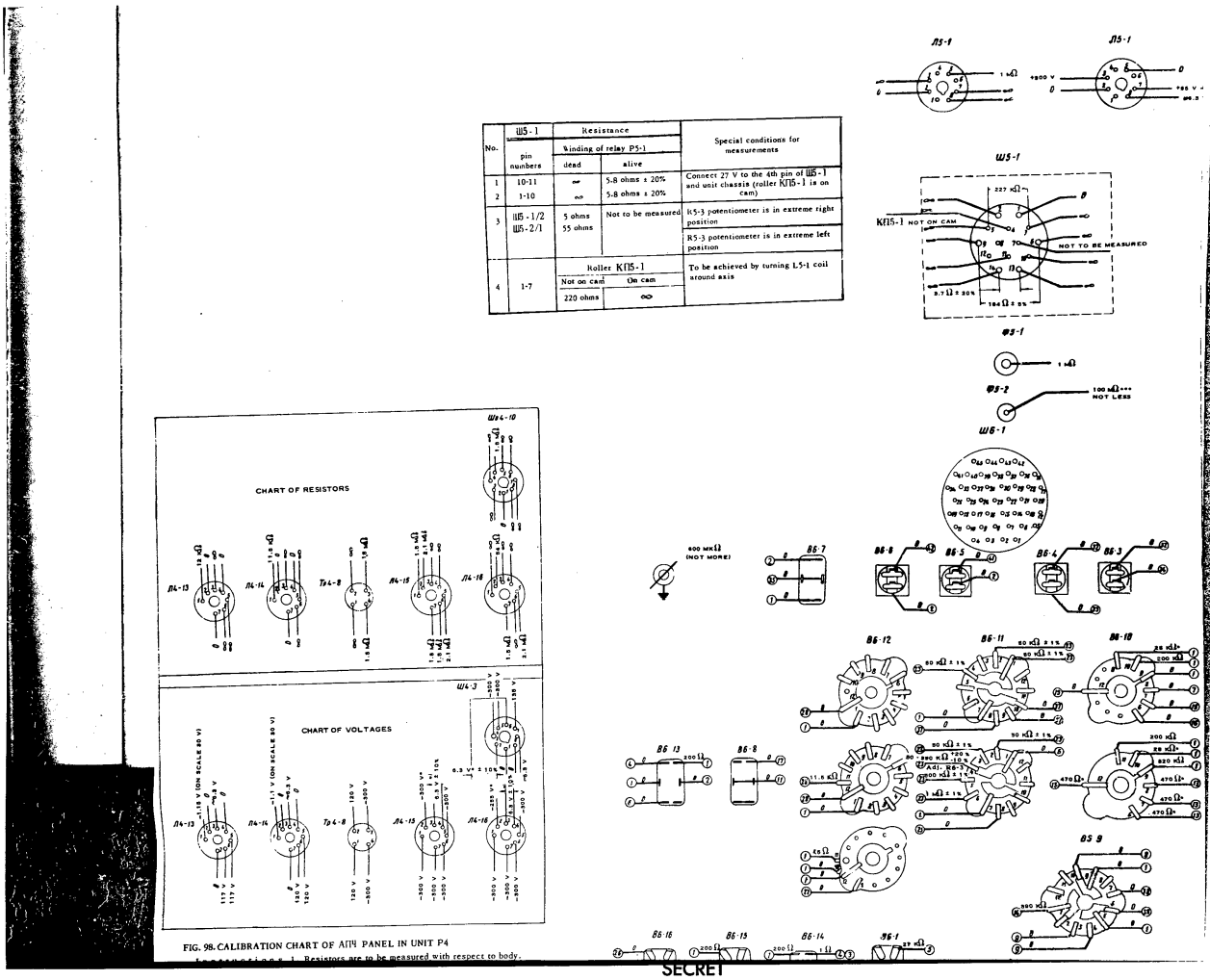


FIG. 98. CALIBRATION CHART OF АП4 PANEL IN UNIT P4

Resistors are to be measured with respect to body.

4	1-7	Roller КП5-1	To be achieved by turning L5-1 coil around axis
		Not on cam: 220 ohms / On cam: ∞	

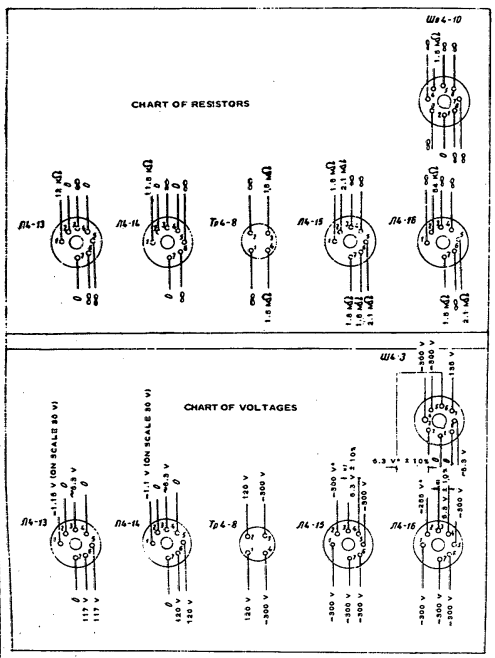
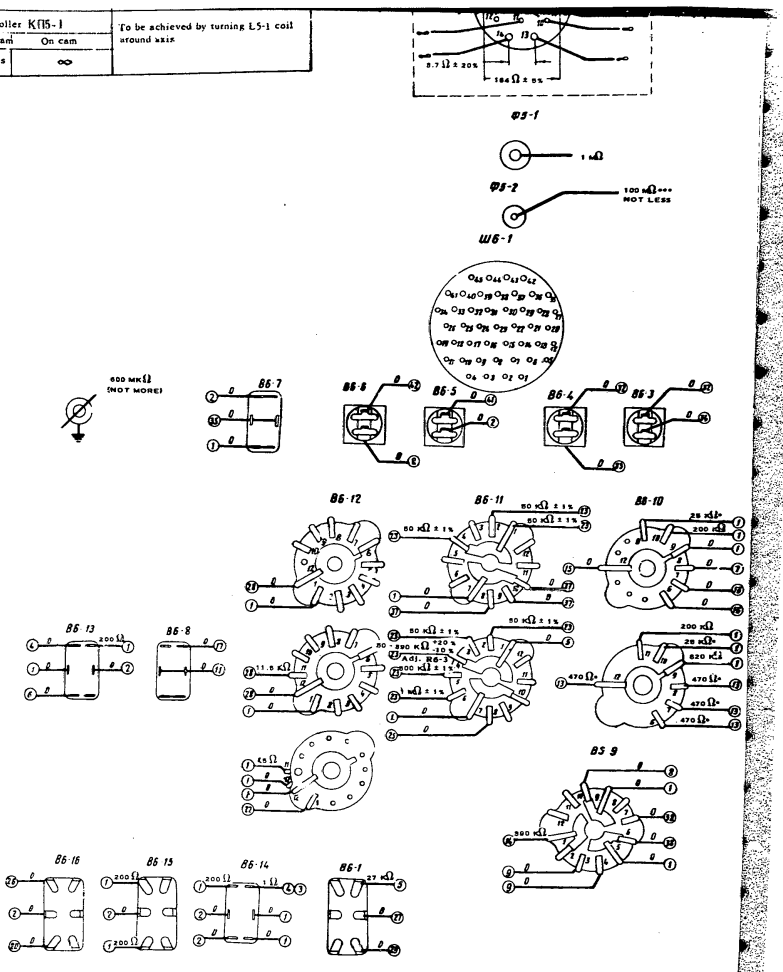


FIG. 98. CALIBRATION CHART OF АП4 PANEL IN UNIT P4

Instructions. 1. Resistors are to be measured with respect to body.
2. Permissible variation from resistor values is ±10%.
3. Voltage tolerance for all points of ЭКК (calibration chart), unless specified otherwise, is ±20%
4. Measurements are to be effected by means of АВО-5 instrument or by similar one.
5. Tolerance for filament voltage is ±10%.
6. All points, besides those marked with* sign, are measured with respect to body.



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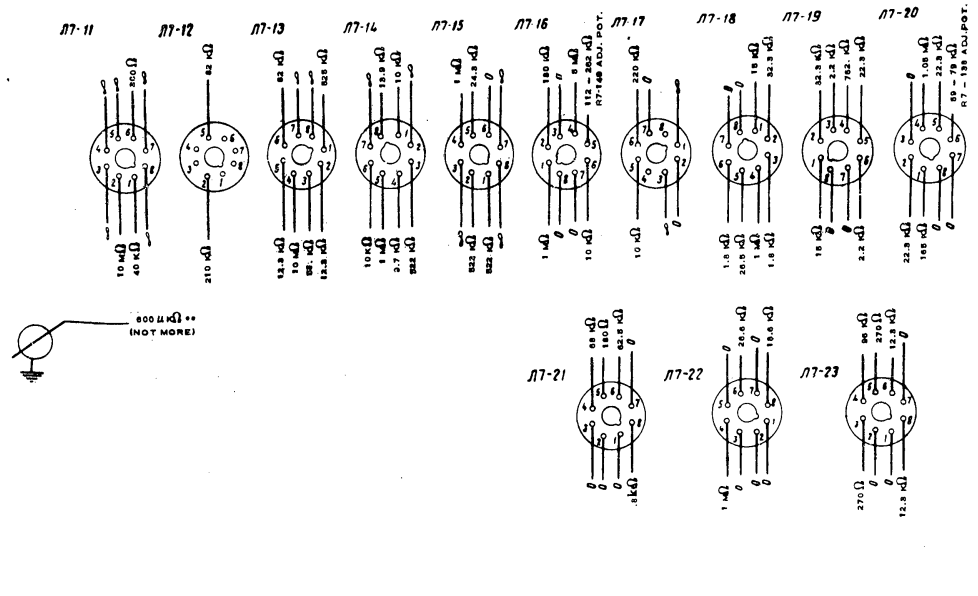

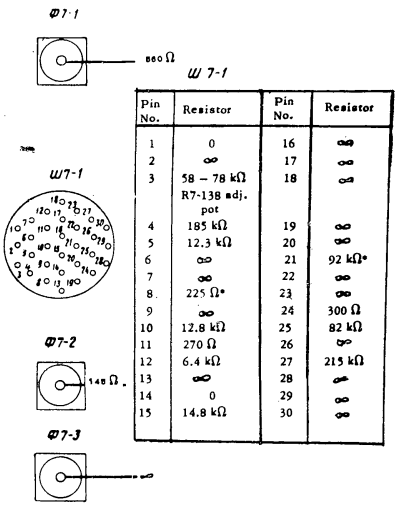

Ш 7-1

Pin No.	Resistor	Pin No.	Resistor
1	0	16	∞
2	∞	17	∞
3	58 – 78 kΩ R7-138 adj. pot	18	∞
4	185 kΩ	19	∞
5	12.3 kΩ	20	∞
6	∞	21	92 kΩ*
7	∞	22	∞
8	225 Ω*	23	∞
9	∞	24	300 Ω
10	12.8 kΩ	25	82 kΩ
11	270 Ω	26	∞
12	6.4 kΩ	27	215 kΩ
13	∞	28	∞
14	0	29	∞
15	14.8 kΩ	30	∞

FIG. 101. CALIBRATION CHART OF RESISTORS IN UNIT P7

Instructions. 1. Resistor values are indicated with respect to body and are to be measured with an accuracy of ±10%.

2. Resistor values marked with * sign are to be selected while tuning the unit and are indicated approximately.

3. Measurements are to be effected by means of ABO-5 instrument of by similar one.

4. Resistors marked with ** sign are to be measured by M-246 microohmmeter between terminal and body.

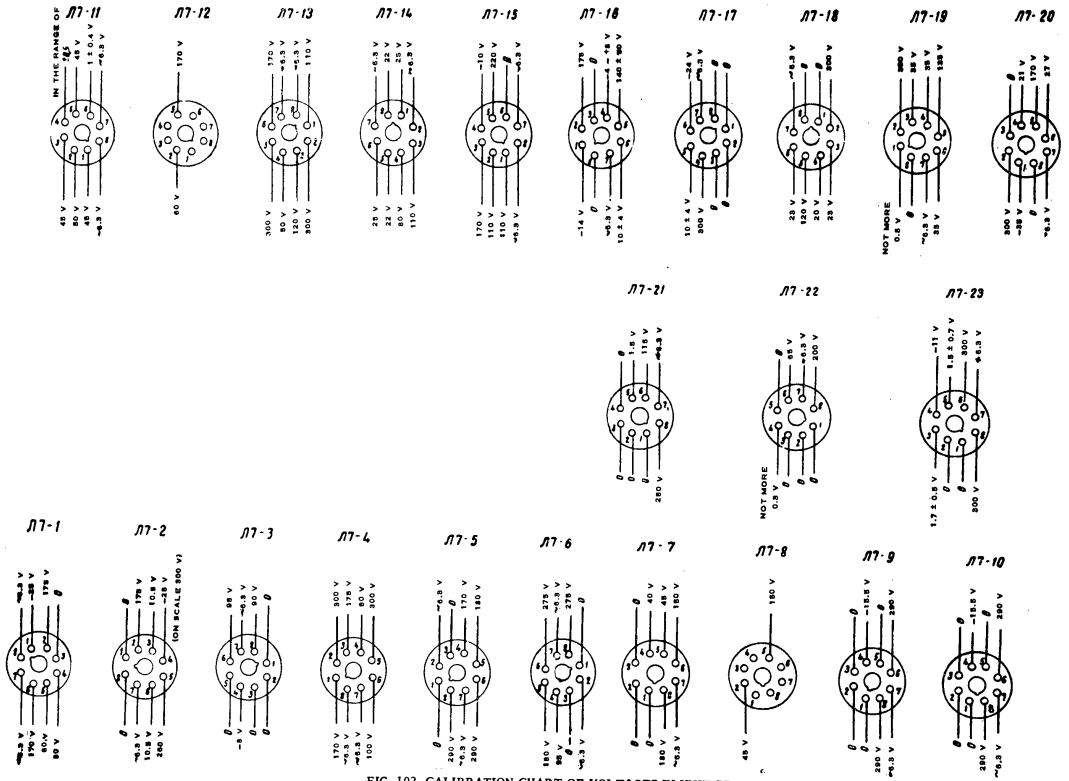

FIG. 102. CALIBRATION CHART OF VOLTAGES IN UNIT P7

1. Voltages are to be measured when the unit has been tuned with the adjustment devices being in the following positions: CALIBRATION (КАЛИБРОВКА) switch is set to RANGE (ДАЛЬНОСТЬ) position; SPEED GENERATOR (ГЕНЕРАТОР СКОРОСТИ) switch is in "OFF" position; POSITION (ПОЛОЖЕНИЕ) knob is in extreme left position; GROUND SPEED (ПУТЕВАЯ СКОРОСТЬ) knob is at 600 km.; SEARCH-HOMING (ПОИСК - НАВЕДЕНИЕ) switch is in HOMING (НАВЕДЕНИЕ) position; ПНД knob is at 0.

2. Sight marker is to be set onto 4 km.

3. Range scale on operator's panel (under complex checking) is to be set to 10 – 70 km.

4. Filament voltage of valves Л7-11, Л7-13, Л7-14, Л7-15, Л7-1, Л7-4, Л7-5 and Л7-6 is to be measured between filament lugs of each valve.

5. All other measurements are to be effected with respect to body.

6. Measurements are to be effected by means of АВО-5 instrument or by similar one.

7. Tolerance for filament voltage is ±10%.

8. Voltage tolerance for all points of ЭКК (calibration chart) where no special tolerance is indicated, is ±20%.

No.	Valve No.	Pin No. of valves	Shape and amplitude of pulses	Note	No.	Valve No.	Pin No. of valves	Shape and amplitude of pulses	Note	No.	Valve No.	Pin No. of valves	Shape and amplitude of pulses	Note
1	Л7-1	1	*) 40	"Calibration" switch in any position	11	Л7-6 Л7-6	6 8	28 V	"Calibration" switch is to be set to "Range" position	21	Л7-16	6	26 V	"Calibration" switch is to be set to "Speed" position, "Speed Generator" tumbler switch is in "OFF" position and "Position" knob is in extreme clockwise position.
2	Л7-1 Л7-2	2 2	150 V	do	12	Л7-9 Л7-10	4 4	60 m/sec. 15 V	"Calibration" switch is to be set to "Range" position. "Search-Homing" tumbler switch is to be set to "Homing" position.	22	Л7-17	5	6,5 V 20 V	"Calibration" switch is to be set to "Operation" position. "Speed Generator" tumbler switch is in "OFF" position and "Position" knob is in extreme counter-clockwise position.
3	Л7-2	4	130 V 44 V	do	13	Л7-9 Л7-10	8 8	450 V	do	23	Л7-17	5	20 V	"Calibration" switch is to be set to "Operation" position. "Speed Generator" tumbler switch is in "OFF" position. "Position" knob is in extreme clockwise position. Range from ОПБ sight is approximately 10 km.
4	Л7-2	5	150 V	do	14	Л7-15	3	50 V	"Calibration" switch is to be set to "Speed" position. "Speed generator" tumbler switch – to "OFF" position and "Position" knob is to be set in extreme position counter-clockwise.	24	Л7-18	1	14 V	"Calibration" switch is to be set to "Range" position
5	Л7-2 Л7-2	3 6	600 m/sec. 21 V	do	15	Л7-15 Л7-14	1 3	150 V 120 V	do	25	Л7-18	2	80 V 60 M/sec.	do
6	Л7-3	4	175 V 72 V	do	16	Л7-14 Л7-14	1 6	225 V	do	26	Л7-19	1	45 V	do
7	Л7-4 Л7-5	3 4	180 V	do	17	Л7-15	4	30 V	"Calibration" switch is to be set to "Speed" position. "Speed generator" tumbler switch is set to "OFF" position and "Position" knob is to be set to extreme counter-clockwise position.	27	Тр7-4	1	Not less than 7 V	do
8	Л7-4 Л7-1	1 6	600 m/sec. 200 ± 20 V	do	18	Л7-15	5	200 V	do	28	Л7-20	4	160 V	"Calibration" switch is to be set to "Range" position. "Search-Homing" tumbler switch is set to "Homing" position.
9	Л7-5 Л7-5	6 8	30 V	"Calibration" switch is to be set to "Range" position	19	Л7-16	1	20 V	do	29	Л7-20	6	30 V 28 V	do
10	Л7-5 Л7-6 Л7-7	5 5 8	140 ± 20 V	do	20	Л7-16	2	45 V	"Calibration" switch is to be set to "Speed" position, "Speed Generator" tumbler switch is in "OFF" position and "Position" knob is in extreme clockwise position.	30	Л7-23	5	12 ± 2 V	do

FIG. 103. CALIBRATION CHART OF PULSES IN UNIT P7

1. Shape and amplitude of pulses are to be checked by means of oscillograph, type 4И "Вольфрам".
2. Shapes and amplitudes of pulses indicated above are approximate.
3. Pulse marked with * sign is indicated while starting from unit P12 (on stand it is checked by amplitude which is to be not less than 22 V).
4. R7-140 potentiometer – extreme counter-clockwise position.

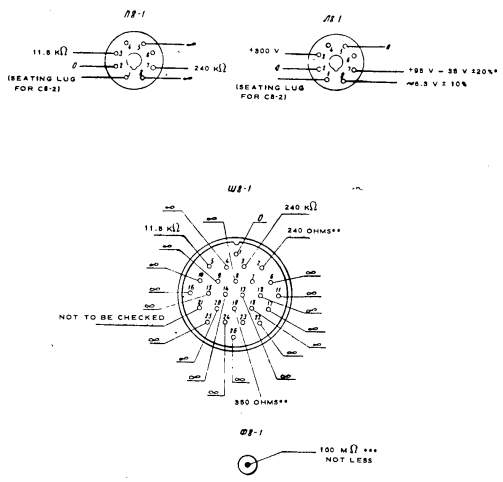

Fig. 104. CALIBRATION CHART OF UNIT P8

Instructions.

1. All resistors have tolerance of ±10% unless specified otherwise.
2. All resistors and voltages are to be measured with respect to body, unless specified otherwise (provided the video signal is absent).
3. Take out valves while measuring resistors.
4. Measurements are to be effected by ABO-5 instrument or by similar one.
5. All measurements of resistors in circuits correspond to extreme clockwise position of knobs of R8-4, R8-6, R8-8, R8-11 and R8-13 potentiometers unless specified otherwise.
6. While measuring resistors, with P8-1 and P8-2 relays being switched on, cut in 27 V onto 2nd and 19th pins of Ш8-1 plug connector.
7. Measurements marked with * sign are to be effected while rotating R8-8 BRIGHTNESS (ЯРКОСТЬ) potentiometer at scale of 200 km. and under starting frequency of 535.
8. All measurements of resistors marked with ** sign are to be effected while КП8-3 roller is on cam.
9. Measurements marked with *** sign are to be effected by means of megohmmeter for 500 V.
10. Resistor value 0 indicated in items 11 and 18 is approximate (from 0 to several units of ohm).

No.	Measurement points	Resistor values		Conditions for measurement
1	Ш8-1/2 - Ш8-1/19	110 ohms		
2	Ш8-1/3 - Ш8-1/5	227 kΩ		
3	Ш8-1/25 - Ш8-1/26	3.7 ohms ± 20%		
4	Ш8-1/10-8, lug Л8-1	0		
5	Ш8-1/8 – contact Л8-5	0		
6	Ш8-1/16 – contact Л8-6	0		
7	Ш8-1/10 Л8-2 Л8-3	4 ohms		R8-16 potentiometer – in extreme clockwise position
	Ш8-1/10 Л8-1 Л8-4	54 ohms		R8-16 potentiometer – in extreme counter-clockwise position
** 8	3rd lug Ш8-1/1 – Л8-4	240 ohms		R8-4 potentiometer – in extreme clockwise postion
		0		R8-4 potentiometer – in extreme counter-clockwise position
9	Ш8-1/1 – Ш8-1/21	220 ohms		КП8-3 roller is on cam
10	Ш8-1/22 – Ш8-1/24 Ш8-1/1	∞		КП8-3 roller is not on cam
11	Ш8-1/22 Ш8-1/24 Ш8-1/1	5.8 ohms ± 20% 5.8 ohms ± 20%		Cut in 27 V onto 2nd contact of Ш8-1 (+) and body (–)
		Relay P8-1 and P8-2 dead	alive	For switching on relay P8-1 and P8-2 cut in 27 V onto 2nd (+) and 19th (–) contacts of Ш8-1
12	Ш8-1/17 – Ш18-1/18	50 ohms	∞	
13	Ш8-1/11 – Ш8-1/12	∞	60 ohms	
**	Ш8-1/1 – 1st lug Л8-3	240 ohms	120 ohms	R8-13 potentiometer is counter-clockwise
14	Ш8-1/13 – Ш8-1/20	∞	420 ohms	R8-2 potentiometer is clockwise
			900 ohms	R8-2 potentiometer is counter-clockwise
15	Ш8-1/14 – Ш18-1/15	∞	195 ohms	R8-1 potentiometer is clockwise
			445 ohms	R8-1 potentiometer is counter-clockwise
16	Ш8-1/6 – Ш8-1/9	235 ohms	195 ohms ±10%	B8-1 tumbler switch is "ON"
		∞	∞	B8-1 tumbler switch is "OFF".
** 17	Ш8-1/1 – 6th lug Л8-4	240 ohms	0	R8-11 potentiometer is clockwise
		0	0	R8-11 potentiometer is counter-clockwise
18	5th lug Ш8-1/1 – Л8-4	70 ohms 1 R8-11 counter-clock-wise	85 ohms	R8-11 potentiometer is clockwise
			75 ohms	R8-13 potentiometer is counter-clockwise

Nos of Ш9-1 pins	Resistance in ohms	Specific conditions for measurements	Note
1-body	0		
2-body	∞		Valves ЛН9-1, ЛН9-2 and ЛН9-3 are removed
3-body	1.5 – 5.5 kΩ	While rotating "Speed zero" potentiometer	
4-body	0	"Calibration" switch is to be set to "Speed zero" position	
5-body	17.8 kΩ	R9-24, R9-21, R9-13 and R9-6 potentiometers are in extreme left position	
	18.3 kΩ	R9-24, R9-21, R9-13 and R9-6 potentiometers are in extreme right position	
6-body	5 – 25 kΩ	"Calibration" switch is set to "Range zero" position while rotating R9-17 potentiometer	
7-26	20 – 40 kΩ	While rotating "Range scale" potentiometer	
8-body	∞		
10-body	18 – 19 kΩ	While rotating R9-12 potentiometer and the rest of potentiometers being in extreme left position	
11-13	20 – 24 kΩ	While rotating R9-34 potentiometer	
12-13	0 – 20 kΩ	While rotating R9-23 potentiometer	
14-24	0	"Speed generator" tumbler switch is in "ON" position and "Calibration" switch is set to "Operation" position	Valve ЛН9-4 is removed
15-19	6 kΩ	"Calibration" switch is set to "Operation" position	Permissible deviation in resistor values is ±10%, unless specified otherwise
16-2	0	"Antenna tilt" tumbler switch is set to "up" position	
17-2	0	"Antenna tilt" tumbler switch is set to "Down" position	
18-body	∞	"Search-Homing" tumbler switch is set to "Search" position	
18-body	0	"Search-Homing" tumbler switch is in "Homing" position	
20-body	0	"Calibration" switch is set to "Operation" position	
21-body	16.7 kΩ	"Speed generator" tumbler switch is set to "OFF" position	
15-body	6 kΩ	"Calibration" switch is set to "Speed" position	

FIG. 105. CALIBRATION CHART OF UNIT P9

Resistance between earth terminal and body should not exceed 600 μkΩ (measurements are to be effected by M-246 microohmmeter).

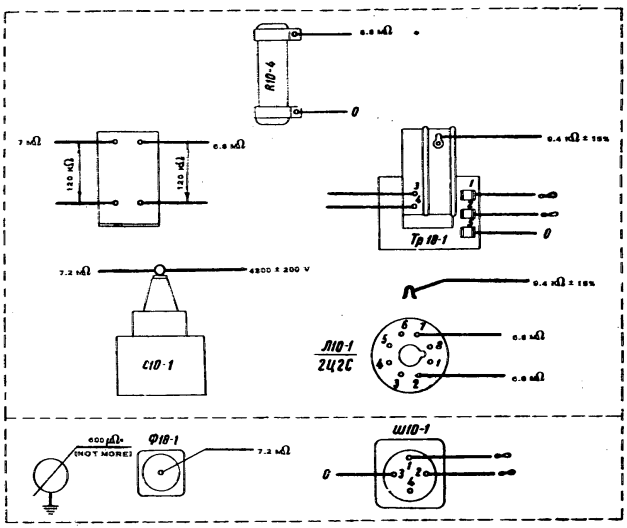

FIG. 106. CALIBRATION CHART OF UNIT P10

Instructions. 1. Resistors are to be measured with respect to body unless specified otherwise.

2. Tolerances in measuring resistors are ±10% unless specified otherwise.

3. Measurements are to be effected by means of АВО-5 instrument and by megohmmeter for 500 V.

4. Resistor is to be measured by M-246 microohmmeter between terminal and body.

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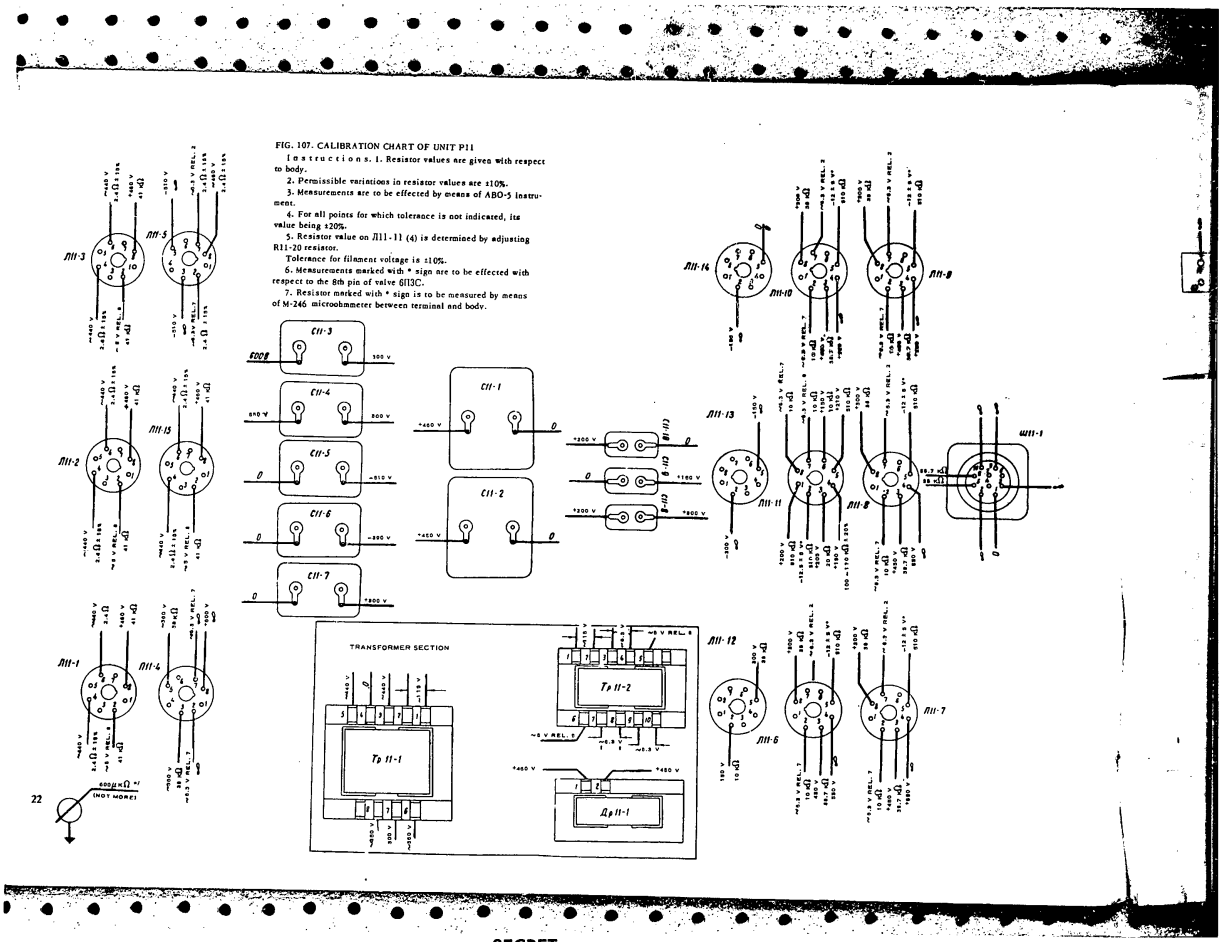

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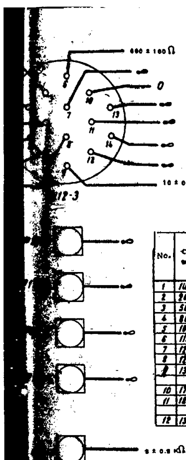

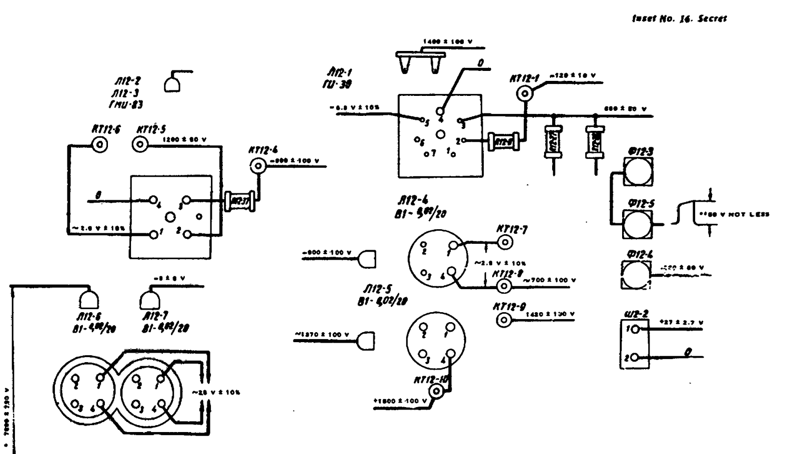

No.	Numbers of contacts between which resistance is measured	Resistor contact value	Note
1	1Ш12-1 – 6Ш12-3	0	
2	2Ш12-1 – 12Ш12-3	0	
3	5Ш12-1 – Ф12-4	0	
4	8Ш12-1 – 14Ш12-3	0	
5	10Ш12-1 – 13Ш12-3	0	
6	11Ш12-1 – Ф12-3, Ф12-5	0	
7	12Ш12-1 – 2Ш12-3	0	
8	12Ш12-1 – 1Ш12-2	0	
9	13Ш12-1 – 8Ш12-1	~0,5 OM	
10	17Ш12-1 – 3Ш12-3	0	
11	18Ш12-1 – 7Ш12-3	0	
12	13Ш12-3 – 14Ш12-3	11±1,1 OM	

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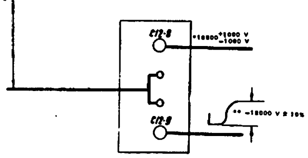


FIG. 109. CALIBRATION CHART OF VOLTAGES IN UNIT P12

I n s t r u c t i o n s. 1. Filament voltage of valves Л12-6 and Л12-7 is to be measured with valves taken out.

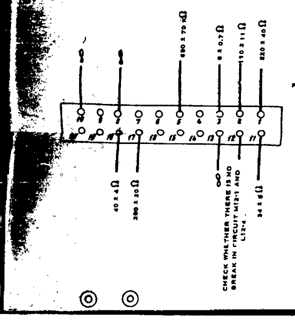
2. Measurement of all other voltages is to be effected when transmitter is on and magnetron current is equal to rated voltage.

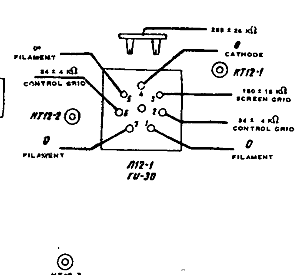
3. Resistor marked with * sign is to be measured by means of electrostatic voltmeter for 15 kV.

4. Resistor marked with ** sign is to be measured by means of 25И oscillograph and through divider ДКВ-1.

5. All other measurements are to be effected by means of ABO-5 instrument.

6. All voltages are given in volts.





I n s t r u c t i o n s. 1. Resistors are to be measured between point under control and body of unit (besides Table).

2. Resistors are to be measured when terminal blocks and plug connectors are disconnected and valves are taken out.

3. Sign 0* means resistor of < 1 ohm.

4. Sign ∞ means resistor of > 50 megohms.

5. ∞ is to be measured by means of megohmmeter for 500 V.

6. All other measurements are to be effected by means of ABO-5 instrument.

10	17Ш12-1 - 3Ш12-3	0	
11	18Ш12-1 - 7Ш12-3	0	
12	13Ш12-3 - 14Ш12-3	11±1,10M	

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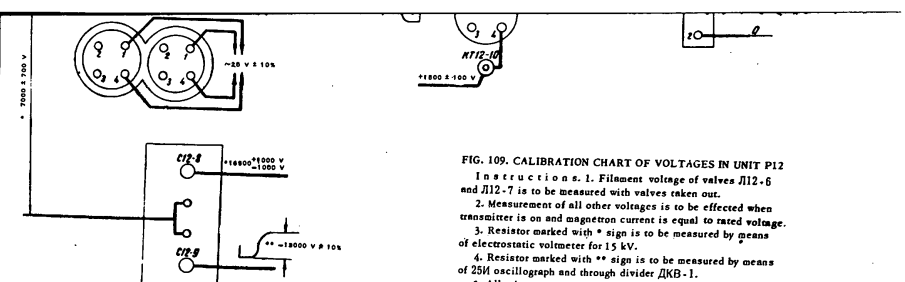


FIG. 109. CALIBRATION CHART OF VOLTAGES IN UNIT P12

Instructions. 1. Filament voltage of valves Л12-6 and Л12-7 is to be measured with valves taken out.

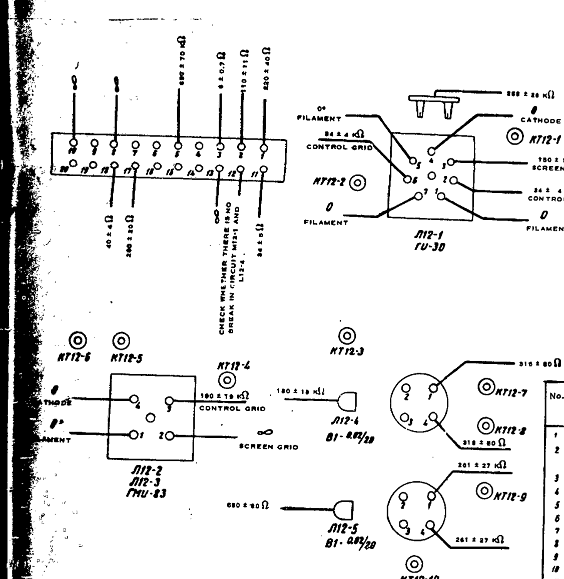
2. Measurement of all other voltages is to be effected when transmitter is on and magnetron current is equal to rated voltage.

3. Resistor marked with * sign is to be measured by means of electrostatic voltmeter for 15 kV.

4. Resistor marked with ** sign is to be measured by means of 25И oscillograph and through divider ДКВ-1.

5. All other measurements are to be effected by means of ABO-5 instrument.

6. All voltages are given in volts.



Instructions. 1. Resistors are to be measured between point under control and body of unit (besides Table).

2. Resistors are to be measured when terminal blocks and plug connectors are disconnected and valves are taken out.

3. Sign 0* means resistor of < 1 ohm.

4. Sign ∞ means resistor of > 50 megohms.

5. ∞ is to be measured by means of megohmmeter for 500 V.

6. All other measurements are to be effected by means of ABO-5 instrument.

No.	Numbers of contacts between which resistors are measured	Resistor control value	Note
1	8Ш12-1 — 10Ш12-1	about 1 ohm	
2	1Ш12-1 — 2Ш12-1	320 ± 32 Ω	
3	КТ12-1 — 2Л12-1	27 ± 3 Ω	
4	КТ12-1 — 6Л12-1	27 ± 3 Ω	
5	КТ12-4 — 3Л12-2	27 ± 3 Ω	
6	КТ12-4 — 3Л12-3	27 ± 3 Ω	
7	КТ12-5 — 2Л12-2	27 Ω	
8	КТ12-5 — 2Л12-3	27 Ω	
9	КТ12-6 — 1Л12-2	0	
10	КТ12-6 — 1Л12-3	0	
11	КТ12-7 — 1Л12-4	0	
12	КТ12-8 — 4Л12-4	0	
13	КТ12-9 — 1Л12-5	4.5 kΩ ± 450Ω	
14	КТ12-10 — 4Л12-5	0	

...CALIBRATION CHART OF MODULATOR VALVES PANEL RESISTORS IN UNIT P12.

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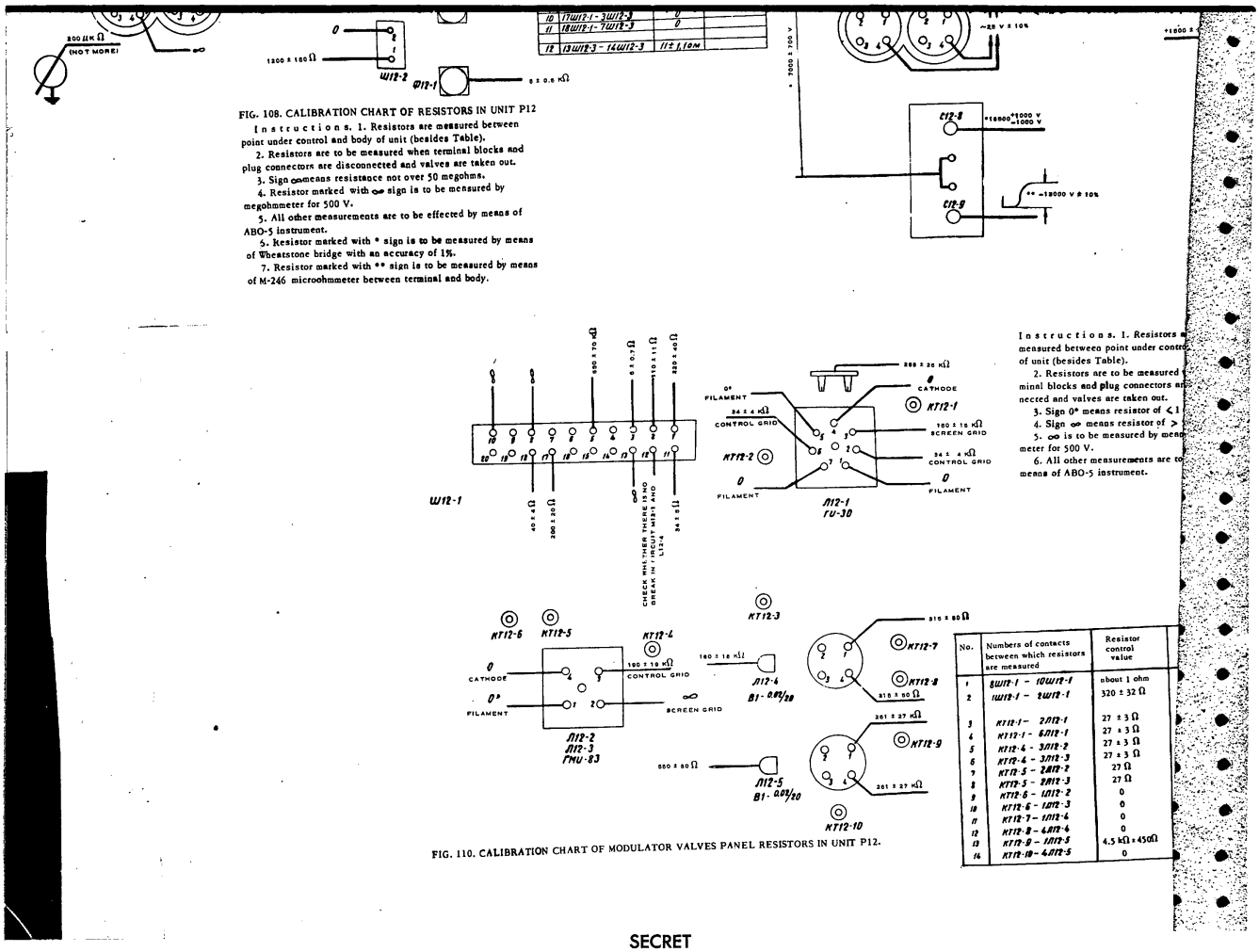

FIG. 108. CALIBRATION CHART OF RESISTORS IN UNIT P12

Instructions. 1. Resistors are measured between point under control and body of unit (besides Table).
2. Resistors are to be measured when terminal blocks and plug connectors are disconnected and valves are taken out.
3. Sign ∞ means resistance not over 50 megohms.
4. Resistor marked with ∞ sign is to be measured by megohmmeter for 500 V.
5. All other measurements are to be effected by means of ABO-5 instrument.
6. Resistor marked with * sign is to be measured by means of Wheatstone bridge with an accuracy of 1%.
7. Resistor marked with ** sign is to be measured by means of M-246 microohmmeter between terminal and body.

FIG. 110. CALIBRATION CHART OF MODULATOR VALVES PANEL RESISTORS IN UNIT P12.

Instructions. 1. Resistors are measured between point under control of unit (besides Table).
2. Resistors are to be measured when terminal blocks and plug connectors are disconnected and valves are taken out.
3. Sign 0* means resistor of < 1
4. Sign ∞ means resistor of >
5. ∞ is to be measured by megohmmeter for 500 V.
6. All other measurements are to be made by means of ABO-5 instrument.

No.	Numbers of contacts between which resistors are measured	Resistor control value
1	6W12-1 – 10W12-1	about 1 ohm
2	1W12-1 – 2W12-1	320 ± 32 Ω
3	KT12-1 – 2R12-1	27 ± 3 Ω
4	KT12-1 – 6R12-1	27 ± 3 Ω
5	KT12-4 – 3R12-2	27 ± 3 Ω
6	KT12-4 – 7R12-3	27 ± 3 Ω
7	KT12-5 – 2R12-2	27 Ω
8	KT12-5 – 2R12-3	27 Ω
9	KT12-6 – 1R12-2	0
10	KT12-6 – 1R12-3	0
11	KT12-7 – 1R12-4	0
12	KT12-8 – 6R12-4	0
13	KT12-9 – 1R12-5	4.5 kΩ ± 450Ω
14	KT12-10 – 6R12-5	0

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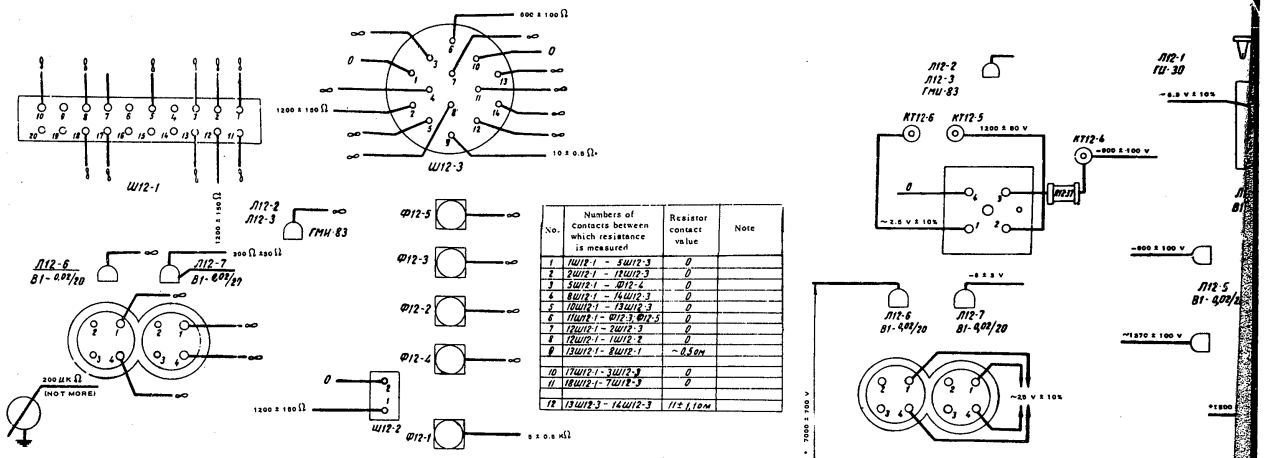


No.	Numbers of contacts between which resistance is measured	Resistor contact value	Note
1	1Ш12-1 – 5Ш12-3	0	
2	2Ш12-1 – 12Ш12-3	0	
3	3Ш12-1 – Ф12-4	0	
4	8Ш12-1 – 14Ш12-3	0	
5	10Ш12-1 – 13Ш12-3	0	
6	11Ш12-1 – Ф12-3, Ф12-5	0	
7	12Ш12-1 – 2Ш12-3	0	
8	17Ш12-1 – 1Ш12-2	0	
9	13Ш12-1 – 8Ш12-1	~0.5 Ом	
10	17Ш12-1 – 3Ш12-3	0	
11	18Ш12-1 – 7Ш12-3	0	
12	13Ш12-3 – 14Ш12-3	11 ± 1.10 М	

FIG. 108. CALIBRATION CHART OF RESISTORS IN UNIT P12

Instructions. 1. Resistors are measured between point under control and body of unit (besides Table).

2. Resistors are to be measured when terminal blocks and plug connectors are disconnected and valves are taken out.

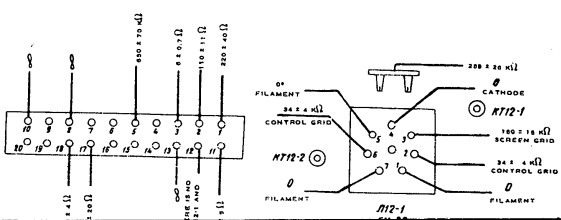
3. Sign ∞ means resistance not over 50 megohms.

4. Resistor marked with ∞ sign is to be measured by megohmmeter for 500 V.

5. All other measurements are to be effected by means of ABO-5 instrument.

6. Resistor marked with * sign is to be measured by means of Wheatstone bridge with an accuracy of 1%.

7. Resistor marked with ** sign is to be measured by means of M-246 microohmmeter between terminal and body.



Instructions. 1. Resistors are measured between point under control of unit (besides Table).

2. Resistors are to be measured when terminal blocks and plug connectors are disconnected and valves are taken out.

3. Sign 0* means resistor of < 1

4. Sign ∞ means resistor of >

5. ∞ is to be measured by megohmmeter for 500 V.

6. All other measurements are to be effected by means of ABO-5 instrument.

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