

I-F ALIGNMENT PROCEDURE

- EQUIPMENT REQUIRED:**
1. Vacuum tube voltmeter (VTVM)
 2. Signal Generator covering 455 KC and 2.075 MC
 3. Output meter. (Use AC scale of VTVM)

It is necessary to remove the receiver chassis from the cabinet to make the I-F alignment. The chassis is held in the cabinet by two screws on the bottom rear and by screws on the side and bottom of the panel flanges.

The output meter should be connected between the 500 ohm speaker terminal and ground. The output of the receiver should be properly loaded by means of a speaker or dummy load. Speaker loading will enable the operator to monitor the signal.

The following adjustments were made with the VOLUME, TONE and SENSITIVITY controls fully clockwise, NOISE LIMITER switch at OFF, RECEIVE/STANDBY switch at RECEIVE, CRYSTAL PHASING control at zero and both dials set at 50 on the logging scale. With the CRYSTAL PHASING control set at zero, the capacitor plates should be half meshed. Refer to Figs. 11 & 12 for location of all adjustments.

Step	Signal Gen. Coupling	Signal Gen. Frequency	Receiver Control Settings	Receiver Dial Settings	Adjust	Remarks
*1	Connect gen. to stator of gang. (center section) through a .00025 mfd. capacitor.	455 KC No Modulation	BAND SELECTOR at 2. RECEPTION SWITCH at BROAD CRYSTAL. BFO switch at BFO.	Both dials set at 50 on the logging scale.	BFO Slug	Remove CW PITCH control knob and set shaft for a zero beat. Do not replace knob.
*2	Connect gen. to pin 4 of V-5 through a .00025 mfd mica capacitor.	455 KC (approx.) No Modulation	Adjust CW-PITCH for a 400-1000 cycle note. Other controls same as Step 1.	Same as Step 1	U	While turning the slug very slowly in one direction, slowly "rock" the signal generator. As the adjustment passes through the response of the crystal filter, the output goes through a maximum, dips down, and starts going up again. The correct setting of this slug is in the center of the observed dip. A swishing note, in contrast to the sharp crystal tone will be apparent when the correct adjustment has been reached.
<p>*NOTE: The crystal filter I-F transformer secondary winding (adjustment U) is carefully adjusted at the factory to the frequency of the crystal. A signal generator which may be accurately set to within .25 KC of any frequency between 450 to 460 KC is required to make this adjustment. Since the average service signal generator will not meet this requirement, DO NOT attempt to make this adjustment unless a suitable signal generator is available. Start the I-F alignment with Step 3 when a standard type of signal generator is used.</p>						
3	Same as Step 1	Crystal Frequency	RECEPTION SWITCH at SHARP CRYSTAL. Other controls same as Step 1.	Same as Step 1	Sig. Gen.	Adjust the generator frequency for maximum output. This will be the exact frequency of the crystal. A slight reduction in output will be noted when switching from BROAD to SHARP CRYSTAL.
4	Same as Step 1	Same as Step 3	Same as Step 1	Same as Step 1	BFO slug	Rotate shaft of C. W. PITCH control until a zero beat is obtained. Replace knob with zero in line with the panel index mark.
5	Same as Step 1	Same as Step 3 (Modulated)	RECEPTION SWITCH at NORMAL I.F. BFO switch at OFF. Other controls same as Step 1.	Same as Step 1	V W X Y Z 1 2	Maximum output Maximum output Maximum output Maximum output Maximum output Maximum output Repeat above steps for maximum gain.
6	Same as Step 1	Same as Step 3. Increase output to approx. 1000 microvolts.	RECEPTION SWITCH at NBFM. Other controls same as Step 1.	Same as Step 1	3	Connect the test circuit shown in Fig. 10 to test points (A) and (B). Adjust core (3) for a zero reading between a positive and negative peak.
7	Same as Step 1. To prevent a spurious indication, keep the generator output as low as possible.	2.075 MC Modulated	RECEPTION SWITCH at NORMAL I.F. BAND SELECTOR at 4.	Same as Step 1	4 5 6 6	Until a signal is heard. Maximum output Maximum output Repeat above steps for maximum gain.

R-F, MIXER, & OSCILLATOR ALIGNMENT

EQUIPMENT REQUIRED:

1. Output meter. The AC scale of a vacuum tube voltmeter (VTVM) or other suitable meter may be used.
2. Signal generator covering 600 KC to 54 MC. Provisions for a modulated signal should be available.

CONNECTING THE TEST EQUIPMENT:

1. The output meter should be connected between the 500 ohm speaker terminal and ground. The output of the receiver should be properly loaded by means of a speaker or dummy load. Speaker loading will enable the operator to monitor the signal and better alignment will result.
2. Connect the high side of the signal generator to antenna terminal "A1" through a 330 ohm carbon resistor. The jumper provided on the antenna terminal strip should be in place between "A2" and "G". Keep the output of the signal generator as low as possible at all times to prevent overloading of the high gain stages. Use just enough output to give a useable indication on the output meter. If the signal generator output is too high when coupled through the resistor, use a capacitor or place the hot lead from the generator near antenna terminal "A1". The ground side of the signal generator should be connected to the frame of the large main tuning capacitor. A modulated signal is used for all of the following alignment adjustments.

NOTE: An alignment tool made of polystyrene or similar material will be required. These adjustments may be made without removing the receiver from the cabinet. However, if the chassis is removed from the cabinet the bottom cover plate of the R.F., MIXER, and OSC. compartments must be in place.

The following adjustments are made with VOLUME, TONE, and SENSITIVITY controls fully clockwise, BFO switch OFF, CRYSTAL PHASING at ZERO. NOISE LIMITER switch at OFF, RECEPTION switch at NORMAL I.F., and BFO switch at OFF. Refer to Figs. 11 & 12 for location of all adjustments.

Step	Signal Generator Frequency (Mod.)	BAND SELECTOR Switch Setting	Band Spread Dial Setting	Main Tuning Dial Setting	Adjust	Remarks
1	1500 KC	1	100	1.5 MC	A	Until a signal is heard.
	1500 KC	1	100	1.5 MC	B	Maximum output
	1500 KC	1	100	1.5 MC	C	Maximum output
	600 KC	1	100	.60 MC	D	Until a signal is heard.
	1500 KC	1	100	1.5 MC	A	Maximum output
	1500 KC	1	100	1.5 MC	B	Maximum output
	1500 KC	1	100	1.5 MC	C	Maximum output
	600 KC	1	100	.60 MC	D	Maximum output
	1500 KC	1	100	1.5 MC	A, B & C	Maximum output
2	4 MC	2	100	4.0 MC	E	Until a signal is heard.
	4 MC	2	100	4.0 MC	F	Maximum output
	4 MC	2	100	4.0 MC	G	Maximum output
	4 MC	2	100	4.0 MC	E, F & G	Maximum output
3	12 MC	3	100	12. MC	H	Until a signal is heard.
	5.2 MC	3	100	5.2 MC	I	Until a signal is heard.
	12 MC	3	100	12. MC	H	Maximum output
	5.2 MC	3	100	5.2 MC	I	Maximum output
	12 MC	3	100	12. MC	H, J & K	Maximum output
4	30 MC	4	100	30 MC	L	Until a signal is heard.
	14 MC	4	100	14 MC	M	Until a signal is heard.
	14 MC	4	100	14 MC	N	Maximum output
	14 MC	4	100	14 MC	O	Maximum output
	30 MC	4	100	30 MC	L	Maximum output
	30 MC	4	100	30 MC	P	Maximum output
	30 MC	4	100	30 MC	Q	Maximum output
	14 MC	4	100	14 MC	M, N & O	Maximum output
	30 MC	4	100	30 MC	L, P & Q	Maximum output
5	54 MC	5	54 MC	100	R	Until a signal is heard.
	54 MC	5	54 MC	100	S	Maximum output
	54 MC	5	54 MC	100	T	Maximum output
	54 MC	5	54 MC	100	R, S & T	Maximum output

PERFORMANCE DATA FOR SERVICE ENGINEERS

MEASUREMENT CONDITIONS

Modulation - 30% at 400 cycles
 Dummy Antenna:
 Standard RMA on bands 1 and 2.
 300 ohm resistor on bands 3, 4 and 5.
 Output - 50 milliwatts into 500 ohms.
 Power Supply - 117 volts, 60 cycles.

AUDIO RESPONSE ± 5 db from 100 to 3000 cycles.

SIGNAL TO NOISE RATIO - Not less than 10 db with 2 microvolt input.

I-F AMPLIFIER GAIN (455 KC) & BANDWIDTH

Stage	Gain	6 db	60 db
2nd conv. (osc. working; receiver tuned to 3 MC)	15X	6 KC	15 KC
1st I-F amplifier	29X	6 KC	16 KC
2nd I-F amplifier	4.5X	6 KC	15 KC
3rd I-F amplifier	24X	20 KC	125 KC

OVERALL BANDWIDTHS

Frequency	6 db	60 db
2075 KC (NORMAL I.F.)	3.5 KC	14 KC
2075 KC (BROAD XTAL)	.7 KC	11 KC
1000 KC (NORMAL I.F.)	3.2 KC	13 KC

GENERAL PERFORMANCE

Band	Freq. (MC)	Sens. (uv)	Image Ratio
1	.6	13	24,000 X
	1.0	6.5	7,000 X
	1.5	5.3	1,800 X
2	1.8	1.5	28,000 X
	3.2	*	1,000 X
	4.0	*	300 X
3	5.2	2.4	8,800 X
	9.0	1.4	2,500 X
	12.0	*	570 X
4	14.0	*	1,500 X
	24.0	*	180 X
	30.0	1	100 X
5	48.0	1	36 X
	54.0	*	20 X

ANT., RF & OSC. STAGE GAIN

Ant.	RF	Osc. (Conv. Gain)
3.4 X	2.9 X	14 X
3.5 X	3.5 X	13 X
3.6 X	3.5 X	12 X
4.7 X	3.2 X	18 X
4.9 X	6.1 X	18 X
4.7 X	7.2 X	16 X
1.9 X	7.1 X	10 X
2.9 X	7.6 X	12 X
3.3 X	7.7 X	12 X
1.3 X	8.0 X	12 X
1.7 X	8.5 X	14 X
1.7 X	8.1 X	9 X
1.8 X	6.6 X	13 X
1.8 X	7.7 X	18 X

* Less than one microvolt.



Communication
equipment

SERVICE OR OPERATING QUESTIONS - For further details regarding operation or servicing of the receiver, contact your dealer. Make no shipments directly to the factory as the factory does not accept the responsibility for unauthorized shipments. Factory type service is available at any **HALLICRAFTERS AUTHORIZED SERVICE CENTER**. For the location of the **SERVICE CENTER** nearest you; consult your dealer, telephone directory or look for the sign shown at the left.

The Hallicrafters Co. reserves the privilege of making revisions in current production of equipment and assumes no obligation to incorporate these revisions in earlier models.

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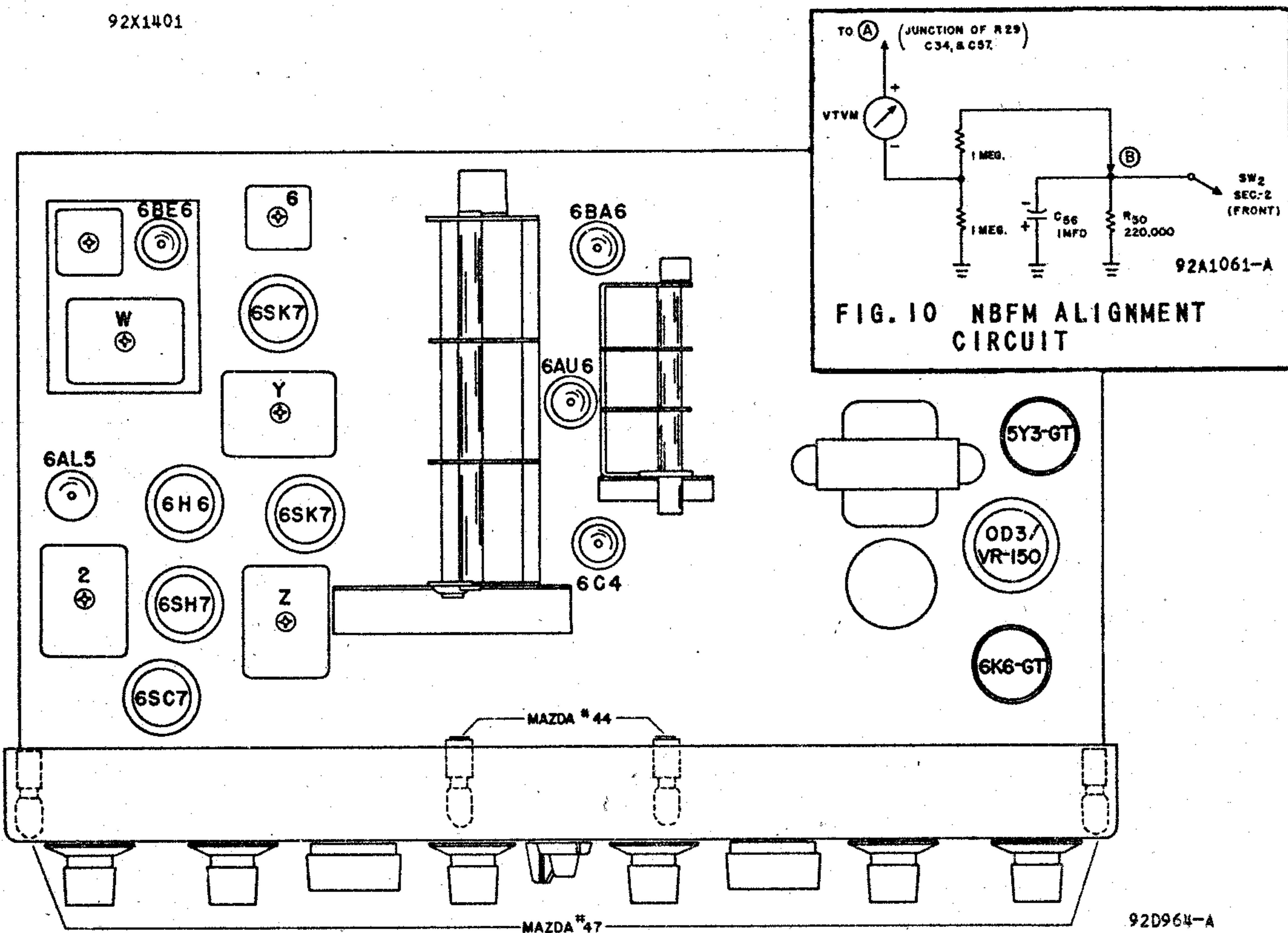


FIG. 11 TOP VIEW - LOCATION OF ALIGNMENT ADJUSTMENTS, TUBES AND DIAL LAMPS

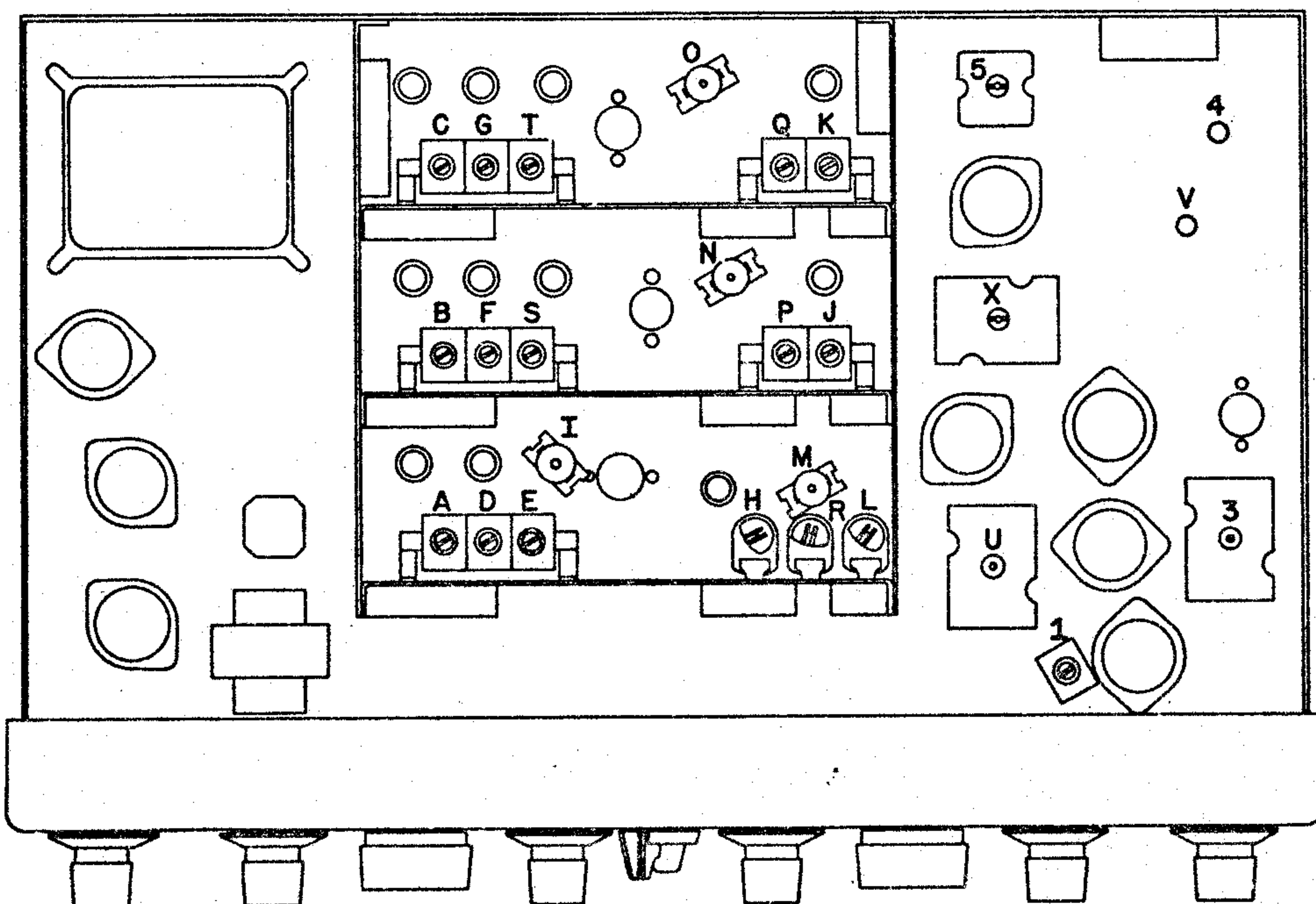


FIG. 12 BOTTOM VIEW - LOCATION OF ALIGNMENT ADJUSTMENTS