

ALIGNMENT INSTRUCTIONS MASTERPIECE VI

In the accompanying photograph all circuit alignment trimmer adjustments found beneath the chassis are identified as to circuit end purpose. It should never be necessary to realign a MASTERPIECE VI in the field due to the use of air alignment trimmers and permanent, non-varying coils and wiring.

I. F. AMPLIFIER

The I.F. amplifier alignment will require an oscilloscope, a frequency modulated R.F. generator, and an output meter. The oscilloscope and generator should preferably give the double trace pattern and have a total frequency modulation of 40 kc. (20 kc. below and 20 kc. above 465 kc.)

First using a 400 Cycle amplitude modulated 4 kc. signal from the generator applied to the 6L7 first detector grid, fidelity switch first in 4 kc. position, then in 32 kc. position, align all I.F. transformer trimmers so that maximum deflection is obtained on output meter, making certain that the I.F. and R.F. AVC trimmers are detuned so that the AVC's will not affect alignment.

Second, connect oscilloscope ground connection to tuner chassis and the input terminal of oscilloscope to the junction of resistors R17L and A17K in the cathode circuit of the 6J5 second detector. Substitute the 40 kc. frequency modulator signal for the 400 cycle amplitude modulated 465 kc. signal, place the fidelity switch in 32 kc. position, and wave switch in B band position with the dial tuned so that no interfering signal will destroy the scope pattern.

Turn the grid trimmers of I.F. transformer T5, T6, T4, one complete revolution each separately (see picture of chassis for designations). Each grid trimmer (G) will have one point at which there will be a minimum output (smallest pattern on scope). Adjust all grid trimmers, T5, T6 and T4 to this position, increasing the signal input from generator as necessary to keep a visible pattern on scope. Next adjust all plate trimmers (P) of T5, T6, and T4 until a single trace is obtained having a single "hump" and maximum output (at 456 kc. resonance) **MAKE CERTAIN THE T5, T6, and T4 PLATE TRIMMERS ARE NOT TOUCHED AGAIN DURING ALIGNMENT.**

Now adjust the grid trimmers (G) of T5, T6, and T4 until the picture shows a single trace double "hump" pattern of maximum output. It will be necessary to decrease signal as these trimmers reach proper alignment, and it will require retrimming of T5, T6, and T4 grid trimmers only two or three times before a perfect picture is obtained. **DO NOT TOUCH THESE TRIMMERS AGAIN.**

To align transformer T3 throw fidelity switch to 8 kc. position and adjust T3 trimmers P and G until a single trace double "hump" picture is obtained which has greater selectivity than obtained before. **DO NOT TOUCH THESE TRIMMERS AGAIN.**

Transformers T1 and T2 should be aligned by throwing fidelity switch in 4 kc. position and aligning the trimmers of T1 and T2 until maximum signal trace pattern of extreme selectivity is obtained.

Increase signal from generator to approximately $\frac{1}{2}$ volt and adjust the trimmers of R.F. and I.F. AVC until pattern decreases to a minimum. This will give proper alignment of I.F. and R.F. both AVC's if properly carried out.

To set Beat Oscillator, turn the treble control to the left until the switch clicks. Then adjust the Beat Oscillator trimmer until a zero beat is obtained when one-tenth of a volt of 465 kc. unmodulated carrier is applied to grid of 6L7 first detector.

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R.F. ALIGNMENT

At the left of the photo all trimmers are labeled for bands A, B, C, D and E, and for first and second R.F. stages, first detector and oscillator. All high frequency trimmers should be aligned upon test signals at frequencies specified below with the main tuning dial set to these frequencies:

- A. 350 kc.
- B. 1400 kc.
- C. 5000 kc.
- D. 16,000 kc

After the above high frequency alignment, the low frequency oscillator trimmers must be set. This is done on the following test frequencies:

- A. 175 kc.
- B. 600 kc.
- C. 2000 kc.
- D. 6000 kc.

In this low frequency oscillator alignment, ONLY the oscillator low frequency trimmers are adjusted. The method involves, for an example applicable to all four bands, tuning in on band B a 600 kc. Signal with the tuning dial set at 600 kc. And then adjusting the B low frequency oscillator trimmer at the same time that the tuning dial is rocked very slightly around its 600 kc. Setting in order to obtain the maximum output meter deflection. In this low frequency alignment, dial calibration is of secondary importance, and the alignment is intended to permit of accurate tracking between the UNTOUCHED r.f. and the varied oscillator circuit by means of the low frequency oscillator trimmer adjustment in conjunction with dial rocking to bring all four circuits into track. After the above low frequency oscillator alignment, high frequency alignments should be rechecked for the above bands.

Band E has no trimmers and should never need alignment.

All above alignment instruction will require the use of an insulated screw driver or one having a very short metal shank, particularly in D band alignment where the insulated screw driver is practically essential.

Voltage check data is found in sufficient amount to indicate voltages to be anticipated at different points in the circuit directly upon the diagram herewith. All voltage measurements must be made with a high resistance voltmeter and should be plus or minus 10% of specified values.

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CATHODE VOLTAGES

6K7 – 1st R.F. – 3.7 volts
6K7 – 2nd R.F. – 3.7 volts
6L7 – 1st Det. – 7.8 volts
6L7 – 1st A.F. – 11.2 to 17.2 volts
(with change of Exp. Control)
6J5 – Exp. Amp. – 4.0 volts
6J5 – Exp. Rect. – 18.0 volts
6J5 – 2nd Audio – 7.0 volts
6J5 – 2nd Det. – 20.0 volts
6K7 – 3rd I.F. – 7.2 volts
6K7 – 2nd I.F. – 9.7 volts
6K7 – 1st I.F. – 10.2 volts
6B8 – R.F. AVC – 10.4 volts
6B8 – I.F. AVC - -30.0 volts