

ADJUSTMENT OF MODEL 74.

1. ADJUSTMENT OF OSCILLATOR

- 1.1. Push both function selector switches to «Record» position (stereo record) and the tape motion lever to position in the oscillator coil to a frequency of 85.5 kc/s. The voltage across the erase heads should then be between 180—210 volts. The bias current should be about 700 μ A. (70 mV across 100 ohms in series with the head.) It can be adjusted \pm 30% by means of the variable capacitors C120 and C170 (see point 8.2).
- 1.2. With function selector switch for channel 1 in «Record» position check that the oscillator voltage is the same (\pm 5%). The oscillator frequency will be a few kc/s lower.
- 1.3. The function selector for channel 2 is then put in «Record» position to check that the oscillator voltage remains the same (\pm 5 volts), and the frequency as in pt. 1.2.

2. ADJUSTMENT OF HEADS

- 2.1. Demagnetizing. Demagnetize the heads and adjacent parts.
- 2.2. Preliminary Adjustment.
- 2.2.1. Set Tape Motion Lever to Normal Forward Drive and check that the tape runs equidistant from the flanges of the adjustable tape guide.
- 2.2.2. The Playback Head.
- 2.2.2.1. The height of head is adjusted by the height adjustment screws. The upper edge of the tape should run even with the upper edge of head. Be sure that the mounting plate for the heads and the upper mounting plate are parallel.
- 2.2.2.2. Adjust the playback head with the azimuth alignment screw for max. reading on the output meter by playing back a standard azimuth alignment tape.
- 2.2.2.3. Lift the pressure pad away from the tape. If the meter readings decrease more than 3 dB, turn the playback head by turning the head mounting plate. The direction is determined by increasing the contact angle to the right or left side of the head by means of a non-magnetic pin. (F. ex. if the meter reading increases with increasing contact angle on the right side of the gap, turn the head clockwise.) Recheck the azimuth alignment (2.2.2.2.).
- 2.2.3. The Erase Head.
- .01" (2 mm) of the face of the erase head should be visible above the tape. The mounting plate for the head must be parallel with the upper mounting plate.
- 2.3. Fine Adjustment.
- 2.3.1. The Record Head.
- 2.3.1.1. Insert a blank tape. Record a (1000 cps) signal on track 1 and then on track 3. Turn the tape and record on track 2 and 4. The recorded tape is cut off the reel and put in a mixture of iron powder and alcohol to make the track visible (Magna-See).

- 2.3.1.2. If the picture shows that the position of the record head is incorrect, the height of the head must be corrected. Correspondingly the azimuth position must be adjusted (2.2.2.2).

- 2.3.3. The Playback Head.
- 2.3.3.1. Use a tape with one signal recorded in the tape's full width. Record a suitable length of tape on lower track (track 3) and put a piece of the recorded tape in the iron oxide/alcohol mixture.
- 2.3.3.2. Check that the recorded track lies within the erased track. Adjust the erase head if necessary.

3. RECORDING CURRENT, DISTORTION

- 3.1. The recording current in the head should be such that during recording at max. recording level one will get 4—8% distortion on the recorded program, corresponding to a recording current in the head of about 150 μ A. (15 mV across 100 ohms in series with the head).
- 3.2. Distortion at output terminals may be checked with a distortion meter. If distortion is too high or too low, the sensitivity of the indicators is adjusted by means of the variable potentiometers R126 (ch. 1) and R176 (ch. 2) so that the indicator light beams touch each other at correct recording level.

4. PLAYBACK

- 4.1. With both function selector switches in «Playback» position the stereo playback function can be checked, preferably with a standard frequency tape. Connect instruments, insert tape, and put the tape motion lever in Normal Forward Drive. At 250 cps set the output meters to zero dB, and play back the remaining tape. Tolerance \pm 2.5 dB for all frequencies, but the difference between the curves must not be more than 3 dB.
- 4.3. Play back a tape with different programs on upper and lower tracks (such as two different tones). With one function selector switch in «AMP» (amplifier) position, check that the program from the channel in «Playback» mode goes to both outputs. Reverse the position of the function selector switches and check the same for the other channel.

5. MIXING OF PROGRAMS

- 5.1. Put one of the function selector switches in «Record» position. Both input preamplifiers are connected together. If signals are put on both pre-amplifiers simultaneously, the signals will be mixed into the recording amplifier which is in record position. Record a signal from one input and with microphone from the other. The correct functioning of this is checked by monitoring.
- 5.3. Play back the tape to check both signals.
- 5.4. Repeat the check for the other channel.

6. STEREO RECORDING CHECK

With both function selector switches in «Record» position, stereo recordings can be made. Record on a tape a signal in one channel and from microphone in the other. Check monitoring and play back to check the quality of the programs for each channel.

7. AMPLIFIER

- 7.1. With both function selector switches in «AMP» position the taperecorder functions as a stereo amplifier for microphone or radio input.
- 7.2. Input impedance for microphone: 3 Mohms, and for radio input 5 Mohms. The voltage division from radio input is variable from 1 : 1 to 1 : 50 by means of a 5 Mohm potentiometer, from factory set to about 1 : 50.
- 7.3. Put a signal on the input for channel 1 or channel 2 and check the signal on the corresponding output.

8. RECORD AND PLAYBACK CURVES

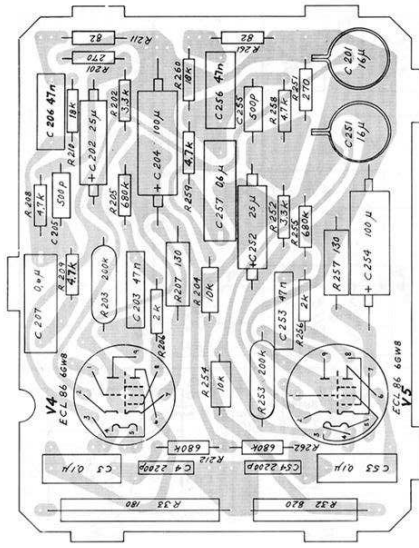
- 8.1. Connect a signal (1000 cps) to both radio inputs. Speed selector to 7 1/2 ips. Adjust the volume so that the recording level indicator light beams touch each other. Reduce volume 20 dB and record the desired frequencies. By playing back the recording and measuring output voltage of the whole frequency range the frequency response curves can be checked. Same procedure for 3 3/4" and 1 7/8" speed. Tolerances at all speeds \pm 3 dB.
- 8.2. If the tape recorder's treble response is too high or too low, the bias current can be adjusted with the variable capacitor C120 (ch. 1) and C170 (ch. 2). (Do not decrease the bias current below 600 μ A.) Recheck point 3.2., and see that the recorded program is not reduced in quality because of dropouts.

9. SPEED CHECK

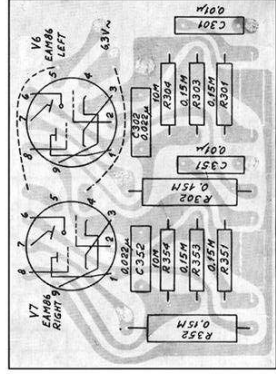
- 9.1. Make sure that the flywheel and the transfer wheel move freely. Use a tape with a marked section of 450 inches (1144 cm) (start and end markers). Measure the time for the tape-section to pass by the recording head. Correct time: 1 min. for 7 1/2", 2 min. for 3 3/4", and 4 min. for 1 7/8". Speed tolerance \pm 1% at all speeds.

10. ERASE CHECK

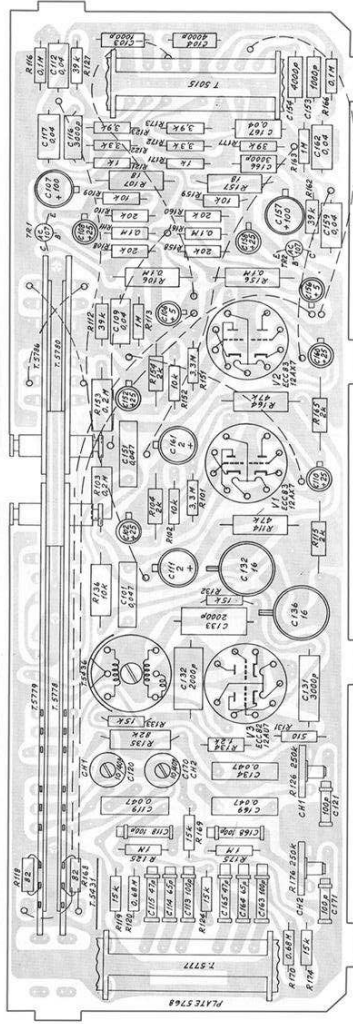
- 10.1. Record from microphone at max. recording level. Rewind, play back and listen to check recording.
- 10.2. Set volume control to zero and erase the program. Rewind the tape and play back with the volume control on max. Check that the program is erased completely.



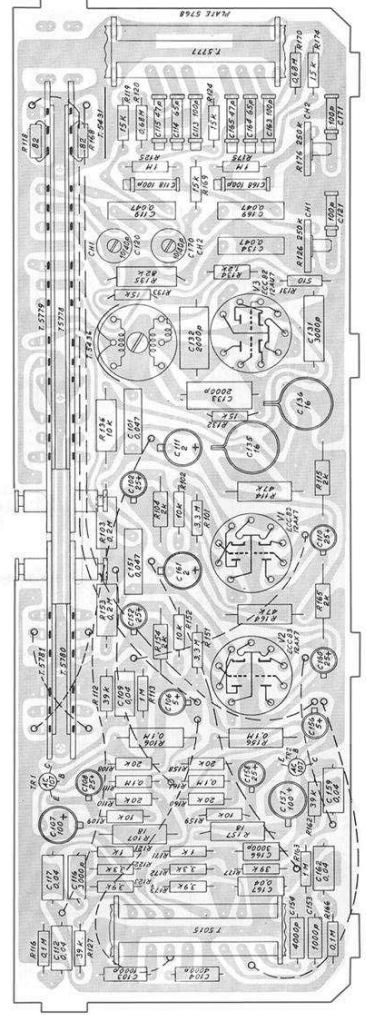
Output Amplifier Board No. 5444



Indicator Board No. 5454



Amplifier Board No. 5445, Soldering Side.



Amplifier Board No. 5445, Component Side.