New FREED Components for HI-FIDELITY Amplifier Provide IMPROVED PERFORMANCE

BULLETIN NO. 5402
FREED
TRANSFORMER CO., INC.
BROOKLYN 27, N. Y.

This Freed circuit incorporates several changes from the original Williamson circuit to provide optimum performance at high and low frequency extremes. It is rated at 10 watts with triode connected output tubes. However, by connecting the screen grids of these tubes to taps provided on the Freed KA-10 output transformer, it is possible to double the power output for a given distortion percentage.

Values of the two feedback resistors (R_{11} and R_{12}) are chosen to provide 20 db of negative feedback from the 16 ohm tap. If it is desired to change the screen feedback arrangement, R_{12}, R_{23} and R_{24} should be removed. The screen grids of V_3 and V_4 are then connected to the taps provided on the primary of transformer T_2.

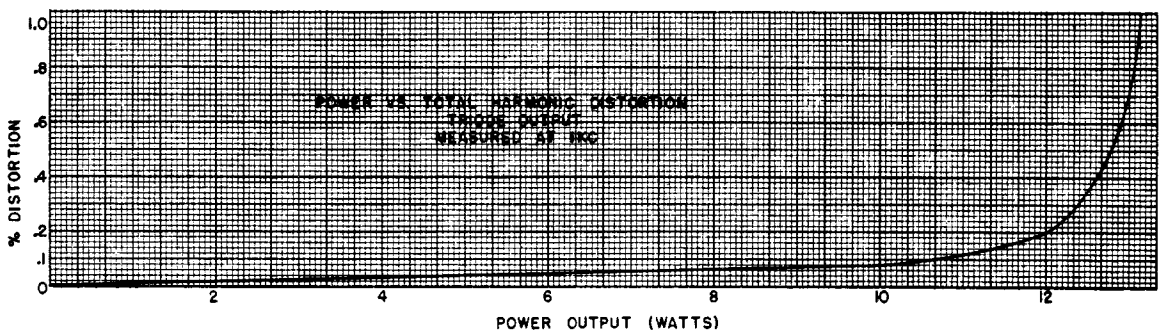
Recommended power supply is choke-input type with a two-section L-C filter to maintain constant D.C. output and to improve filtering to the voltage amplifiers.

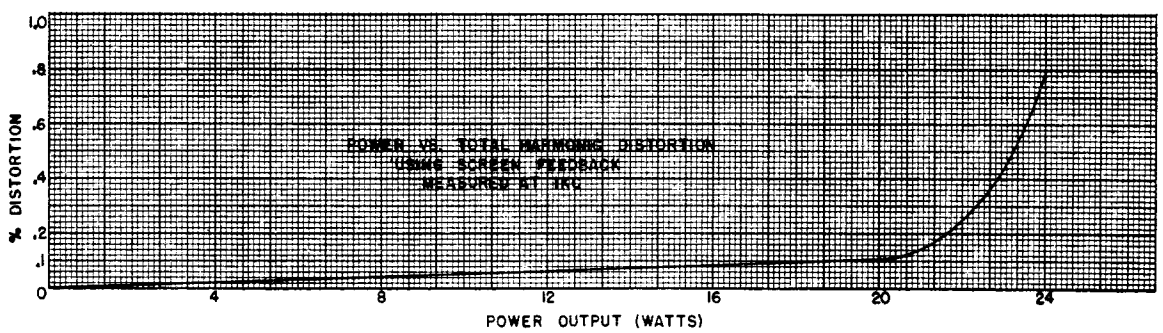
The required 550 volts AC for the rectifier can be furnished by a Freed KP-10 power transformer. Filtering is provided by Freed KC-10 and KC-11 filter reactors and the 20 mfd. filter condensers.

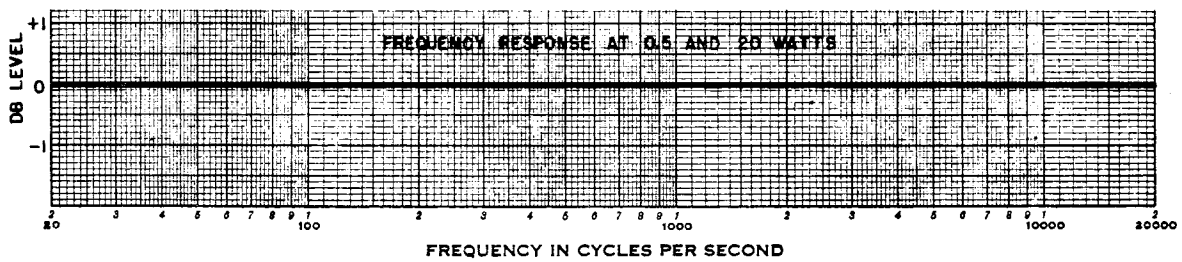
In construction, all grounds should be made to a common bus wire which is tied to the chassis at only one point (the input jack). Filament leads should be twisted and routed away from all grid leads. Filaments should be grounded through a center tap on the filament winding, or a 100 ohm potentiometer across the winding.

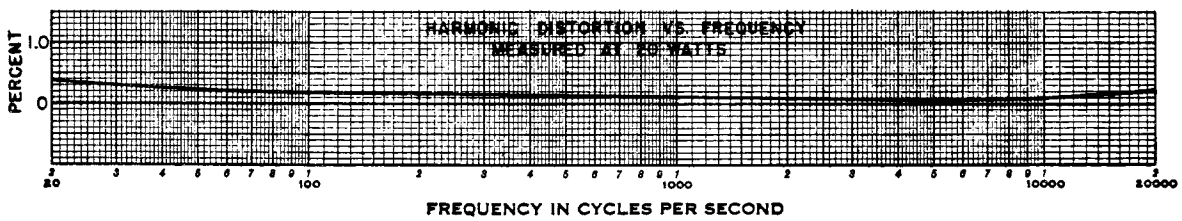
The completed amplifier requires three adjustments:

1. Bias: Adjust R_{19} for 36 volts D.C. at point "A". This will give a total cathode current of about 112 ma. for the output stage.
2. D.C. Balance: Insert milliameter alternately in the cathode leads of V_3 and V_4 adjusting R_{21} for equal currents.
3. A.C. Balance: Connect a sensitive A.C. voltmeter to point "A" and feed a signal into the amplifier. Adjust R_{16} for minimum meter reading.

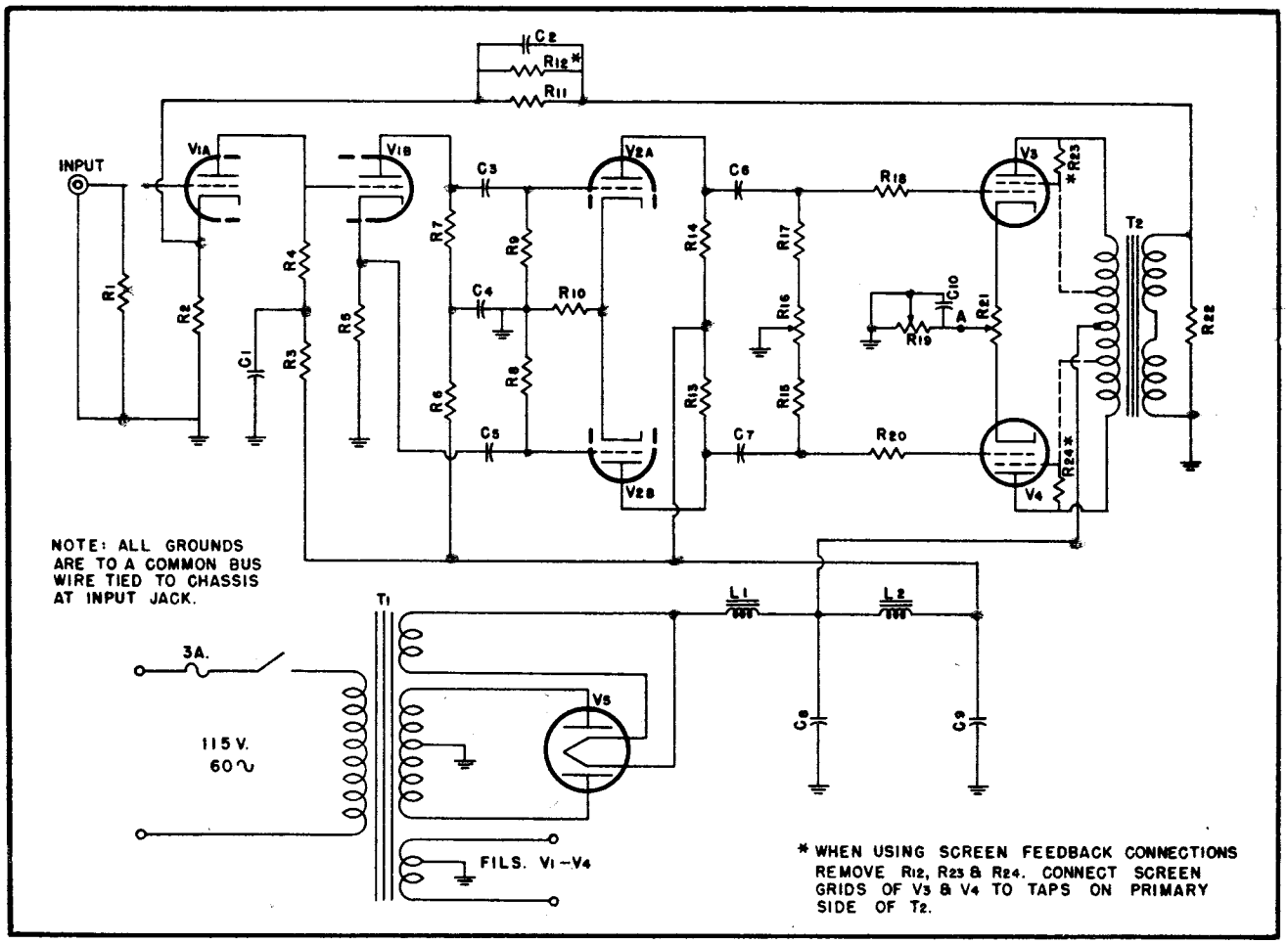








CIRCUIT DIAGRAM OF THE **FREED** HI-FI AMPLIFIER



PARTS LIST

R_1, R_4, R_9 = 470KΩ, 1 watt CARBON RESISTORS

R_2, R_{10} = 470Ω, 1 watt CARBON RESISTORS

R_3, R_5, R_6, R_7 = 20KΩ, 1 watt CARBON RESISTORS

R_8, R_{13}, R_{14} = 47K, 2 watt CARBON RESISTORS

R_{11} = 6,800Ω, 1 watt CARBON RESISTORS

R_{12} = 15KΩ, 1 watt CARBON RESISTOR
(REMOVE WHEN USING SCREEN TAPS ON T_2)

R_{15}, R_{17} = 120K, 1 watt CARBON RESISTOR

R_{16} = 50KΩ, 2 watt CARBON POTENTIOMETER

R_{18}, R_{20} = 1000Ω, ½ watt CARBON RESISTOR

R_{19} = 400Ω, 10 watt wirewound
RESISTOR, ADJUSTABLE

R_{21} = 50Ω, 2 watt CARBON POTENTIOMETER

R_{23}, R_{24} = 100Ω, ½ watt CARBON RESISTORS
(USED WITH TRIODE OUTPUT PLATE TO SCREEN GRID)

C_1, C_4 = 20 mf, 450 volt ELECTROLYTIC CAPACITORS

C_3, C_5 = .22 mf, 400 volt, MOLDED PAPER CAPACITOR

C_6, C_7 = .47 mf, 400 volt, MOLDED PAPER CAPACITOR

C_2 = 50 mmf MICA CAPACITOR

C_8, C_9 = 20 mf, 500 volt ELECTROLYTIC CAPACITORS

T_1 = FREED KP-10 POWER TRANSFORMER

T_2 = FREED KA-10 OUTPUT TRANSFORMER
= CONNECTED 16 ohm SECONDARY

L_1 = FREED KC-10 FILTER REACTOR

L_2 = FREED KC-11 FILTER REACTOR

V_1, V_2 = 6SN7-GT

V_3, V_4 = 5881

V_5 = 5U4-G

C_{10} = 100 mf, 50 volt ELECTROLYTIC CAPACITOR

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