

THÖRESS

F2a11 Integrated Amplifier



"F2a11 Integrated"



INSTRUCTION MANUAL

Thank you for purchasing the THÖRESS F2a11 Integrated Amplifier!

Our all-tube Integrated utilizes the famous F2a11 vacuum tube in single-ended triode operation mode for an output power of up to 6 watts into a 4, 8 or 16 ohm load. Notably, the F2a11 Integrated can also be employed as a stereophonic power amplifier (in combination with a line or full function preamplifier) in which case the volume control knobs of the amplifier serve as input attenuators to match the gain of the line device to the efficiency of the loudspeaker.

The amplifier provides 3 line level inputs (2x3 RCA jacks) of equal gain status selectable via rotary switch on the rear panel. High-grade continuously variable potentiometers are employed for separate (manual) volume control of the channels. The output transformers (OPT) are made in house to the highest possible standards and allow for precise matching of a 4, 8 or 16 ohm loudspeaker load to the power tube by way of jumpers soldered to the secondary terminals.

Please read the following explanations and instructions carefully to get the most out of your F2a11 Integrated Amplifier!

TUBES

The power tubes are biased automatically (via voltage drop over a cathode resistor). An obvious design choice (and very reliable setting of grid bias) in view of the comparatively low grid bias voltage required for the F2a11 tube (thanks to its high mutual conductance). The ideal (average) F2a11 tube draws an anode current of $I_a=73\text{mA}$ when it is exposed to an anode voltage of $U_a=380\text{V}$ and a control grid bias voltage of $U_{g1}=(-)16\text{V}$ (in triode operation mode, screen grid connected to the anode). Representing an excellent quiescent point for single-ended operation which we have chosen for the F2a11 power tube in our amplifier. Corresponding to an anode dissipation ($P_a=28\text{W}=380\text{V}\times 0.073\text{mA}$) well below the permissible design maximum of 35W,

$(U_a, U_{g1}, I_a, P_a) = (380V, (-)16V, 73mA, 28.5W)$.

Automatic grid bias is applied for the F2a11 power tube. The grid bias voltage cannot be trimmed to adjust the idle current of the power tube!

Allowing for a tight 7% tolerance in anode current under the given voltage conditions (380V, (-)16V) , only F2a11 tubes with I_a values in the range

$$68mA=73mA-5mA \dots 78 mA=73mA+5mA$$

are suitable for service in the amplifier. It is advisable to use only matched pairs of F2a11 tubes tested for the above specs supplied by the manufacturer or a reliable tube supplier. If there is any doubt that a given F2A11 tube fulfills the above requirements, the actual idle current I_a can be determined (with the aid of Ohms law) by measuring the voltage drop U_k over the cathode resistor R_k ($R_k=220$ ohms) on the living object, $I_a=U_k/R_w$.

Measurements within the F2a11 amplifier circuitry should be carried out by an experienced technician only!

A 12SN7GT double-triode is used in the driver stages. The amplifier comes with a tube which has been carefully tested and hand-picked to meet tight specifications.

The use of a driver tube with questionable characteristics may lead to a degraded sonic and signal-to-noise performance. Even serious circuit damage may occur in worst case scenarios!

FUSE

The THÖRESS F2A11 Integrated Power Amplifier draws a current of 0.5 (1.0A) from the 230Vac (115Vac) mains, corresponding to a power consumption of about 115W. It is protected with a

1A slow-blowing 5x25mm fuse

in the power inlet. Occasionally, the fuse may blow at the moment the amplifier is switched on due to the current spike drawn by the mains transformer, especially when a power cord with very low resistance is used. Should this problem arise more regularly it is advisable to use a fuse with higher current rating.

LOUDSPEAKER LOAD MATCHING

The F2A11 Integrated Amplifier allows for precise 4, 8 and 16 ohm load matching by way of jumpers soldered to the secondary terminals of the output transformer (OPT) according to the patterns indicated below. Each of which pattern corresponds to a specific (primary versus secondary) turns ratio of the OPT.

Output Transformer Coil

1 o	o 5
2 o	o 6
3 o	o 7
4 o	o 8

o = secondary terminal, 1 = loudspeaker RED, 8 = loudspeaker BLACK

4 ohm loudspeaker

Connect (1 and 2), (3, 4, 5 and 6), (7 and 8).

8 ohm loudspeaker

Connect (2, 3 and 5), (4, 6 and 7) .

16 ohm loudspeaker

Connect (5 and 2), (6 and 3) and (7 and 4).

A single-ended triode amplifier can adequately drive a loudspeaker when the OPT is configured for a lower load impedance than the rated impedance of the loudspeaker, especially when the loudspeaker is highly efficient. In this case the (primary versus secondary) turns ratio of the OPT is higher than the nominal index value. This reduces the voltage gain but also the harmonic distortion and the output resistance of the amplifier, at the expense of a somewhat lower maximal power output.

It can be beneficial to use a 16 ohm loudspeaker with the 8-ohm or even the 4 ohm load pattern of the OPT, especially when the loudspeaker is highly efficient!

It is possible to use a 8 ohm loudspeaker with the 4-ohm load pattern of the OPT, especially when the loudspeaker is highly efficient!

On the other hand, a compromised amplifier performance is definitely to be expected when the OPT is configured for a higher load impedance than the actual loudspeaker impedance. Thus:

It is not advisable to use a 4 ohm loudspeaker on the 8-ohm or 16 ohm load pattern of the OPT!

It is not advisable to use a 8 ohm loudspeaker on the 16-ohm load pattern of the OPT!

SETUP

To setup the F2a11 Integrated Amplifier switch off all components of the system and proceed as follows.

Do not connect the amplifier to the mains until steps 1 to 6 have been taken.

1. Bring the power switch on the power inlet module into the OFF position.
2. Install the tubes carefully. Ascertain that the guide pins of the tube bases are properly aligned with the notches of the sockets.

Never power on the amplifier until ALL tubes have been installed!

Never pull out a tube while the amplifier is powered on!

Never pull out a tube of the socket as long as it is still hot!

Always de-install the tubes and wrap them in their original protection case before shipping or transporting the amplifier!

3. Set both volume controls to a very low angle of rotation.
4. Bring the amplifier into its final position. Make sure that there is sufficient clearance around the tubes to allow for adequate ventilation!
5. Connect the amplifier to the loudspeakers. Ascertain that the load matching installed on the output transformer suits the loudspeaker impedance. Take notice of the explanations presented in the section LOUDSPEAKER LOAD MATCHING of this manual.
6. Connect the amplifier to program sources and/or a phono preamplifier.
7. Connect the amplifier to the mains (while leaving the unit powered off).
8. Power on the program sources or/and the phono preamplifier (while the F2a11 Integrated remains powered off). Wait until the warm-up process on these components has come to an end.
- 9. Power on the F2a11 Integrated.**
10. Wait until the amplifier has warmed up.

Always switch on the program sources first and then switch on the F2a11 Integrated, observing a delay of at least 30 seconds!

Always make sure that the volume controls are in zero position before powering on the F2a11 Integrated!

Never switch a program source on or off while the F2a11 Integrated is powered on!

11. Activate the desired program source with the input selector and listen to music. Use the L+R volume control to adjust the listening loudness and the channel balance.

When powering off the system, always switch off the F2a11 Integrated first, then switch off the other components of the system observing a delay of at least 30 seconds!

Keep the original crate and the tube protection case for later use. They have been specifically designed for safe transport under rough conditions! Shipping the amplifier in inadequate packaging will result in catastrophic damages!

SETUP II

The F2a11 Integrated can be employed as a stereophonic power amplifier (in combination with a line or full function preamplifier) in which case the volume controls of the amplifier serve as input attenuators to match the gain of the line device with the efficiency of the loudspeaker. In order to setup the F2a11 Integrated as a stereophonic power amplifier power off all components of the system and proceed as follows.

Do not connect the amplifier to the mains until steps 1 to 7 have been taken.

1. Bring the power switch on the power inlet module to the OFF position.
2. Install the tubes carefully. Ascertain that the guide pins of the tube bases are aligned with the notches of the sockets.

Never power on the amplifier until ALL tubes have been installed!

Never pull out a tube while the amplifier is powered on!

Never pull out a tube of the socket as long as it is still hot!

Always de-install the tubes and wrap them in their original protection case before shipping or transporting the amplifier!

3. Set both volume controls to a very low angle of rotation.
4. Bring the amplifier into its final position. Make sure that there is sufficient clearance around the tubes to allow for adequate ventilation.
5. Connect the amplifier to the loudspeakers. Ascertain that the load matching installed on the OPT suits the loudspeaker impedance. Take notice of the explanations presented in the section LOUDSPEAKER LOAD MATCHING of this manual.
6. Choose an arbitrary unassigned input of the F2a11 Amplifier, in the following denoted by STER for the sake of convenient explanation. Activate STER with the input selector. Connect STER with with the (line or full function) preamplifier.
7. Turn the volume control on the preamplifier to about the middle position.
8. Connect the F2a11 amplifier to the mains (while leaving the unit powered off).
9. Power on the preamplifier and the program sources (while the F2a11 Integrated remains powered off). Wait until the warm-up process on all these components has come to an end. Switch the desired program source active on the preamplifier.
- 10. Power on the F2a11 Amplifier.**
11. Wait until the warm-up process on the unit has come to an end.

Always switch on the preamplifier and the program sources first and then switch on the F2a11 amplifier, observing a delay of at least 30 seconds!

Never switch the preamplifier or a program source on or off while the F2a11 Amplifier is powered on!

12. Listen to music with the various program sources. Adjust the L+R volume control knob on the F2a11 Amplifier for convenient loudness in average (while the volume control on the preamplifier rests in about the middle position) and correct channel balance. After this adjustment the attenuated gain of the F2a11 amplifier matches

the gain of the line section with respect to the efficiency of the loudspeaker.

13. Let the volume controls of the F2a11 Amplifier rest in the positions determined in step 14 and from now on use the volume control knob on the preamplifier for loudness control as long as input STER is switched active.

When powering off the system, always switch off the F2a11 amplifier first, then switch off the other components of the setup, observing a delay of at least 30 seconds!

Keep the original crate and the tube protection case for later use. They have been specifically designed for safe transport under rough conditions! Shipping the amplifier in inadequate packaging will result in catastrophic damages of the unit!

FEATURE OVERVIEW

- All-Tube Integrated Amplifier with 6 watts of output power per channel.
- Minimalist zero-feedback schematic utilizing NOS F2a11 power tubes in single-ended triode mode and a 12SN7GT double-triode in the driver stages.
- 3 inputs (RCA jacks) selectable via rotary dial located on the rear panel.
- Manual volume control via and independently adjustable pair of proprietary high-grade rotary potentiometers with low angle sensitivity (conveniently fine volume adjustment).
- Ultimate C-Core output transformers produced in-house. Precise 4, 8, and 16 ohm loudspeaker load matching via jumper settings on the secondary terminals.
- High-grade electrolytic capacitors made in Germany in the power supply.
- Ultra low noise mains transformer made in-house for 230Vac (115Vac via jumper setting), 100Vac (Japan), 220Vac (South-Korea, China, Thailand, Indonesia) or 245Vac (Australia).
- Full hand construction, point-to-point wiring throughout.
- Nonmagnetic aluminum casework, anodized printing on front and rear panel, powder-coated chassis and lids.
- Dimensions: 150x595xH330 mm, 330=20 (case feet) +210+100 (power tube over case), 595=575+20 (speaker binding posts), weight 18 Kg.
- Dimensions of the shipping crate 400x950xH460 mm.

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**A Tribute to Professional Audio Components
from the Golden Age of the Electronic Tube !**

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