

Equipment Profiles

- Nikko TRM-1200 Amplifier 44
- Garrard Zero 100 Turntable 46
- Acoustic Research FM Tuner 49
- Realistic Sound Level Meter 51

Nikko Model TRM-1200 Stereo Preamp-Amplifier

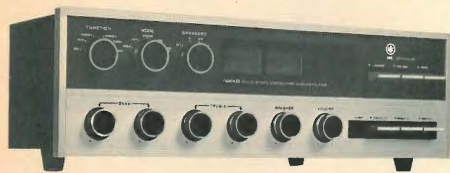


Fig. 1—Rear panel layout.

MANUFACTURER'S SPECIFICATIONS

IHF Music Power: 130 watts @ 4 ohms; 120 watts @ 8 ohms. **RMS Power:** 45 watts per channel @ 8 ohms, single channel driven; 40 watts per channel @ 8 ohms, both channels driven. **THD:** 0.3% at rated output, 0.1% @ 1 watt. **IM Distortion:** 0.3% @ 30 watts; 0.1% @ 1 watt. **Power Bandwidth:** 15 Hz to 30 kHz (-1 dB, 0.5% THD). **Frequency Response:** Power amplifier section, 13 Hz to 50 kHz ± 1 dB; Aux. Input, 20 Hz to 40 kHz ± 1 dB. **Input Sensitivity:** Mic, Phono 1 & 2, 2 mV; Tuner, Tape & Aux., 220 mV. **S/N Ratio:** Mic, 70 dB; Phono 1 & 2, 70 dB; Tuner, Tape & Aux., 85 dB. **Tone Control Range:** Bass, ± 12 dB @ 70 Hz; Treble, ± 12 dB @ 10 kHz. **Rumble Filter:** -6 dB @ 70 Hz. **Scratch Filter:** -10 dB @ 10 kHz. **Damping Factor:** 15 @ 4 ohms; 30 @ 8 ohms. **Dimensions:** 15 1/4 in. W. x 4 1/2 in. H. x 12 1/4 in. D. **Suggested Retail Price:** \$249.95.

The sudden interest in "separate" amplifier components just as the industry became convinced that the integrated receiver would dominate the field forevermore has prompted many manufacturers to offer amplifiers and tuners in just about every price category. The latest integrated amplifier entry from Nikko Electric Corporation of America is their moderately priced but impressive looking Model TRM-1200. The most impressive aspect of the front panel of this unit is the pair of illuminated VU meters at the center of the upper portion of the panel. The gold anodized and black panel also includes a six-position selector switch, a mode switch (with settings for RIGHT, LEFT, STEREO, REVERSE, and MONO L+R), a speaker selector switch (with positions for one or both pairs of speakers and OFF position for headphone use) and three piano-key switches for LOUDNESS COMPENSATION, TAPE MONITOR and POWER. The lower section of the panel includes separate BASS controls for each channel, separate TREBLE controls for each channel, BALANCE, and VOLUME controls. A stereo headphone jack and three more piano-key switches are slightly recessed in the lower right corner of the front panel. These last three switches introduce scratch and rumble filters and bypass the tone controls.

The rear panel is laid out in orderly fashion. The a.c. line cord is of the interlock type, so that removal of the amplifier's cover automatically disconnects the line cord from the amplifier. Three circuit breakers of the "push to re-set" type are accessible at the rear panel. They are located in the transformer primary circuit and in the two speaker output lines. Two convenience outlets (one switched, one unswitched) are also located in this section of the rear panel. Speaker terminals are well isolated by barrier strips and, although each terminal screw head is slotted, the sides of the screw-head are knurled and easily turned by finger pressure. Thus no tools are really needed to connect the speakers. A pair of jumper cables connect the

preamp outputs to the main amp inputs and, with these jumpers removed, this unit can really be used in any way that a separate preamp and basic amplifier might be used. A center channel output jack is also provided, but a third monophonic power amplifier would be needed to utilize this feature for a middle channel arrangement. Two adjusting potentiometer shafts are available for calibrating the front-panel VU meters, about which more will be said later. In addition to the usual input and tape output jacks, there is a tape record and playback socket, wired in accordance with the DIN (Foreign) standards, and a pair of microphone jacks. Having the mic jacks on the rear panel may be a bit of an inconvenience for some people if the amplifier is to be custom installed, but the feature is a welcome addition, which all too few of today's amplifiers and receivers can boast. We would have preferred to see the input jacks on the front panel for easier access. A grounding terminal and a "speaker compensator" switch complete the rear panel layout. The latter feature is new to us on integrated amplifiers and it will be discussed later.

Figure 2 shows the internal layout and construction of the Nikko TRM-1200 amplifier. The low level preamp stages are fully enclosed in a shielded metal structure for minimum hum pickup. Driver transformers used in the power amplifier section are toroidally wound for extremely accurate balance between secondary sections.

The low level preamplification (for phono and mic inputs) is accomplished by means of IC's, with appropriate equalization components externally wired. Amplification of preamp output signals as well as high level input sources is accomplished by a pair of d.c. coupled NPN transistors in each channel, followed by a Baxandall feedback tone control state for bass and treble control action. This latter state is completely by-passed when the front panel tone control switch is moved to the OUT position. Each power amplifier channel consists of three d.c. coupled stages (the last two of which are in emitter-follower configuration) followed by the driver transformer and a pair of NPN power output transistors. The latter are powered by negative and positive 35 volts d.c. so that the center take-off point to the loudspeakers requires no isolating coupling capacitors. While there are no adjustments for d.c. balance or biasing, we found the d.c. potential at the speaker take-off points to be so low

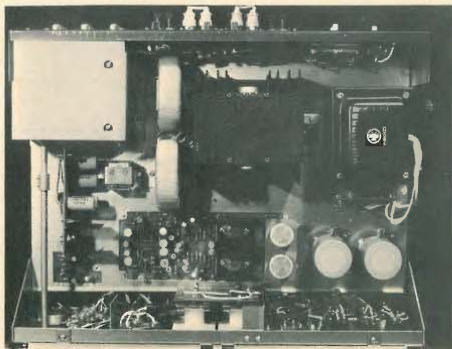


Fig. 2—Top view of the Nikko TRM-1200.

as to be insignificant, indicating that the output pairs have been well matched.

The pair of d.c. coupled NPN transistors in the earlier stages of the preamplifier serve a second purpose. A frequency-sensitive feedback loop with a crossover frequency set at about 150 Hz is introduced when the "speaker compensator" switch is moved to the ON position. This portion of the circuit (for one channel only) is shown in the partial schematic of Fig. 3. With lower frequencies applied, the 0.15 μ F capacitor no longer acts as a short-circuit and the 22K resistor across it is introduced into the feedback network, decreasing total feedback around the pair of transistors and increasing gain at low frequencies. The circuit differs from the normal bass control in that the crossover frequency has been specifically set to boost the lower bass region only, to raise the lowest octave or two.

Measurements

With both channels driven, we reached rated distortion (0.3%) at an output power of 37 watts per channel. At 40 watts output (still with both channels driven) THD reached 1.0% exactly. With only a single channel driven, rated distortion was reached at 47.5 watts, a bit better than claimed. All power output levels below 28 watts per channel were reproduced with 0.1% distortion or less. As for IM distortion, 47.0 watts was developed before the IM figure reached 1.0%. At 1 watt output per channel, IM measured somewhat less than 0.2%. The THD and IM characteristics of the amplifier are plotted in more detail in Fig. 4. Power bandwidth is 1 Hz to 32 kHz, as plotted in Fig. 5.

Tone control action and filter characteristics are plotted in Fig. 6 and are seen to correspond closely to the published specifications. The loudness-contour action, taken at -30 dB from maximum volume setting, is also shown in this figure, as is the bass boost action of the "speaker compensator" circuit described earlier. With tone controls deactivated, frequency response in the AUX position was uniform within 1 dB from 9 Hz to 35 kHz. With tone controls introduced and set at mechanically flat position, uniform response within 1 dB was again excellent, extending from 10 Hz to 25 kHz.

Residual hum and noise measured -65 dB on phono, referred to a 2 mV input for full output. Referred to a more usual 5 mV, this figure would increase to over 70 dB, a really excellent reading for such low level circuits. Mic hum and noise was down

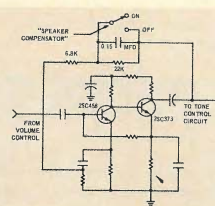


Fig. 3—Voltage amplifier stages of Nikko preamp section (one channel shown) includes feedback network to boost bass frequencies below 150 Hz.

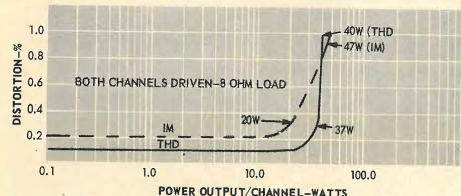


Fig. 4—THD and IM distortion characteristics.

70 dB while TAPE and AUX inputs measured a hum and noise level of 85 dB below full output.

Use and Listening Tests

When the amplifier is first turned on, there is a four second time delay which prevents "pops" to the speakers—a very welcome feature, especially on an amplifier having such excellent low-frequency power response. To the right of the illuminated VU meters, the position of the selector switch is indicated by illuminated lettering. In trying out the VU meters, we discovered that they are really more flexible than is indicated in the instruction manual. By means of the rear calibrating potentiometers, we were able to set the meters so that "0 VU" corresponded to any power output level from 1 watt to full-power output. The instructions make no mention of this useful adjustment feature.

The amplifier sounded very clean with all the recorded music we used in our tests (which now includes some of the "multimedia" Stockhausen works that really demand dynamic range and good transient response from all elements of the reproducing system). Power output was adequate for two sets of low-efficiency systems and there was no evidence of "break-up" during loudest recorded passages.

We also tried the "speaker compensator" but, with our high quality speaker system, we found the lower bass emphasis to be a bit too much at our listening levels and in our particular listening room. As we switched the tone control circuits in and out, there was absolutely no audible difference (either in gain or in tonal effects), confirming the precision of the Baxandall circuitry used when the tone controls are "in-circuit." Since the VU meters are larger (and probably more accurately calibrated) than those normally found on home tape recorders, we found using the TRM-1200 for recording work (with its microphone inputs in use, instead of those on our tape recorder) to be very convenient and effective. We checked the circuit breakers by placing momentary shorts across the speaker terminals and found them fast-acting and fool-proof. Upon pressing the re-set buttons, the four second time delay is still in effect, however.

The Nikko TRM-1200 has so many other worthwhile features typical of the "new breed" of separate solid state amplifiers that, at its "under \$250" price, it offers excellent value, even if you evaluate amplifiers purely on a "dollars per watt" basis. L.F.

Check No. 45 on Reader Service Card

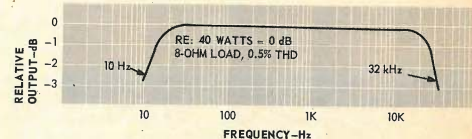


Fig. 5—Power bandwidth.

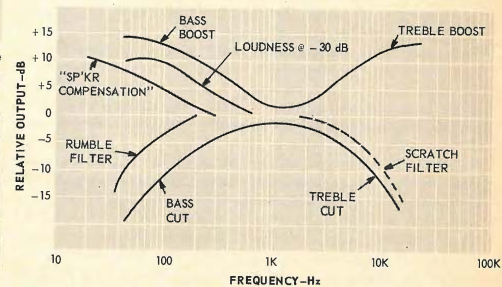


Fig. 6—Tone control, loudness, filter, and speaker compensator characteristics.