Dynaco SCA-80
Integrated Stereo Amplifier

MANUFACTURER'S SPECIFICATIONS:
Frequency Response: (at 1-watt output) High-level inputs, ±0.5 dB from 15 to 50,000 Hz. **Power Output:** 40 watts per channel into 8 ohms with less than 0.5% THD from 20 to 20,000 Hz. **Power Bandwidth:** 8 Hz to 50 kHz at less than 0.5% distortion. **IM Distortion:** Less than 0.1% at any power level up to 40 watts per channel with any combination of test frequencies. **S/N:** High-level inputs, 80 dB below rated output; Phono, 60 dB below rated output. **Inputs:** RIAA magnetic phono, 47k ohms, 3. mV; Special low-level (2nd phono), 47k ohms, 3 mV; High-level (tuner, tape amp, spare) 100k ohms, 0.13 V. **Outputs:** Main and remote speakers, 4 to 16 ohms; tape, 600 ohms, same level as high-level input; Headphone (front-panel jack), 8 ohms or higher. **Semiconductors:** 20 transistors, 10 diodes. **Damping Factor:** greater than 40. **Dimensions:** 13½" wide, 4¼" high, 10" deep. **Weight:** 16 lbs. **Price:** $169.95 in kit form; $249.95 wired.

The name DYNACO has long meant a quality product in the kit field, and the current project is one of a long line of products that have given their builders a practical device on which they could expend their desires to "build something" and which when completed could well take its place among the best in hi-fi equipment. The SCA-80 is a combination of the PAT-4 preamplifier (reported in these pages in December, 1967) and the Stereo 80 (which was reported in February, 1970). It utilizes a relatively simple circuit, and still simpler construction, since there is no "chassis" in the accepted sense, and since there are no transistor-equipped circuit boards to assemble—they are all completely assembled at the factory, so all the builder has to do is install them in the proper places in the

unit and make the necessary connections. The actual assembly requires only the putting together the few components on the power supply circuit board, assembly of the front and rear panel components, and the building of the two output-stage sections on their heat sinks—a comfortable twelve or thirteen hours of pleasant construction. None of the work is difficult, nor does it require any special talents in soldering, wiring, or even in the assembly.

Circuit Description

The preamplifier section is prefabricated on one circuit board for each channel, and consists of the feedback pair used for the phono preamp, followed by an additional feedback pair to provide the necessary gain for the tone-control circuits. These two sections are interconnected by the selector switch. The phono preamp pair consists of two Telefunken BC109B NPN transistors, with the first selected for low-noise characteristics. The tone-control pair uses two more BC109B transistors, and both sections have combined d.c. and a.c. feedback. A unusual feature of the input selector switch is the provision of a "special" position which the user may customize to accommodate a second phono input or a tape-head input for those installations where those functions are desired. The selector switch provides all the usual positions in addition to the *special* position mentioned—PHONO, TUNER, TAPE, and SPARE. Directly under the selector switch is the MONITOR rocker switch which permits listening either to the source signal or to the output of the tape recorder.

The next knob controls volume, and under it is the LOUDNESS rocker switch, which introduces an RC combination across the lower portion of the volume control to increase bass response at low levels. The BALANCE control is next on the panel, and under it is the FILTER switch, which has three positions—OFF, RUMBLE, and NARROW. The rumble position rolls off the low-frequency response starting at about 100 Hz, and reaching a 20-dB droop at 20 Hz. In the narrow position, the rumble filter is in, and an additional section rolls off the high end starting at about 6000 Hz, and reaching 18 dB at 20 kHz.

The BASS tone control knob is next, and under it is the MODE switch, also with three positions—MONO, BLEND, and STEREO. In the former, both channels are paralleled, and in the latter both operate separately. The blend position places a resistor between the two channels to reduce separation to 6 dB, a condition used when the Dynaco three-speaker system is

Fig. 1—Inside view

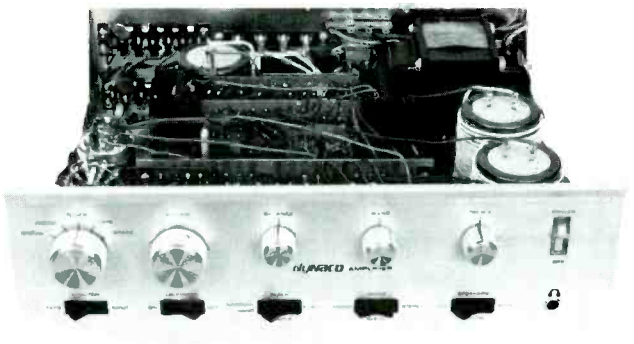


Fig. 2—Rear panel

Fig. 3—Power Output Watts RMS (One ch)

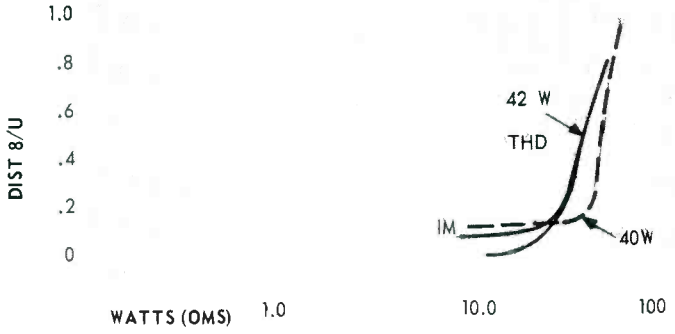
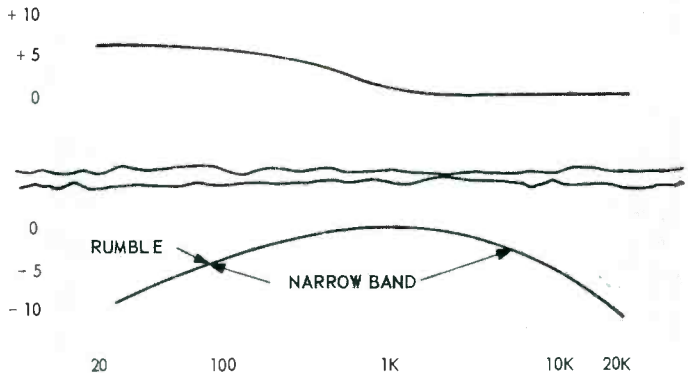
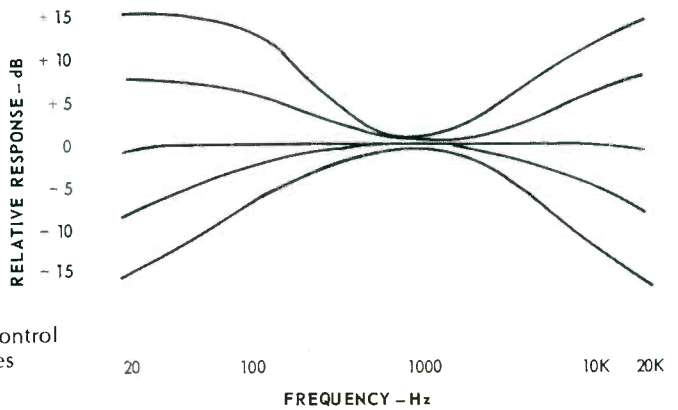


Fig. 4—Loudness −30 on Vol. control



Rumble & Narrow band filters

Fig. 5—Tone control Curves



employed for a center fill, or for remote mono speakers. The TREBLE tone control knob is next, and under it the speaker switch which has three positions—OFF, REMOTE, and MAIN. The tone-control circuitry is of the patented Dynaco arrangement which takes them out of the circuit when they are in the center position. This eliminates the possibility of unwanted phase shift or effect upon the performance, and with the specially designed controls, they are actually out of the circuit when centered. This is one of the features that the perfectionist looks for in his amplifier, since he wants to make sure that there is no effect on frequency response when the controls are "flat." In most amplifiers, this condition is met only by using switches for the tone controls.

The power switch is next in line with the knobs. It is of the push-push type, and is illuminated when the amplifier is on. The headphone jack is directly below the power switch, and accommodates the usual 8-ohm stereo headphones, fed from the outputs through 120-ohm resistors.

The power amplifier section consists of a pair of factory assembled printed-circuit boards, each of which accommodates four transistors and three diodes. The first transistor is a 40233, which drives a 2N5320, with both d.c. and a.c. feedback applied. The second transistor feeds the driver pair—2N5320 and 2N5322—in the usual complementary-pair configuration, and they feed the output transistors, a pair of 2N3055's mounted on the heat sink. An interesting construction of the complete output amplifier involves a pair of slots in the heat sinks, and the printed-circuit boards slip into these slots when the heat sinks are mounted. Feed to the output terminals is through 5000-μF computer-grade electrolytics and the r.f. choke which is wound around the capacitors to provide the 3-mH of inductance to roll off the response in the r.f. region so as to reduce interference and to afford stability.

The power supply uses a transformer with two primaries, both tapped, so as to accommodate line voltages of 100, 120, 220, and 240. The secondary—approximately 54 volts—is fed to a bridge rectifier consisting of four separate diodes, filtered by another 8000-μF capacitor, then further filtered and fed to the preamplifier section. The junction between the output transistors is fed stabilizing voltages from the power supply.

Performance

While we have heretofore reported on the PAT-4 and the Stereo 80 independently, we also measured the SCA-80 for its performance figures. Power bandwidth measured from 7 Hz to 47 kHz at a distortion of 0.5 per cent.

Frequency response of the RIAA-equalized phono preamp was within 1.5 dB from 20 to 20,000 Hz, and the tone-control curves are of the usual configuration, as shown in Fig. 5. Loudness equalization is a mild 7 dB at the −30-dB setting of the volume control, and is shown in Fig. 4, along with the effect of the filter switch in the RUMBLE and NARROW positions. Distortion measured less than 0.15 per cent at a 1-watt output, and at rated distortion of 0.5 per cent, the output was 42 watts per channel, both channels operating. Separation was 37 dB at 40 Hz, 35 at 1000 Hz, and dropped to 31 dB at 20 kHz, all of which are good figures.

Signal-to-noise ratio measured 83 dB on the high-level inputs, and an average 61 dB on the phono inputs.

For those audiophiles who build just for enjoyment or those who want to economize in their systems, the SCA-80 will give them the desired pleasure in the construction part of the project, and the performance of the finished amplifier will satisfy them completely. The name Dynaco has been synonomous with quality products having a minimum of "gimmicks" which add up in cost to satisfy the presumed requirements of the ultimate user.

C.G.McP.