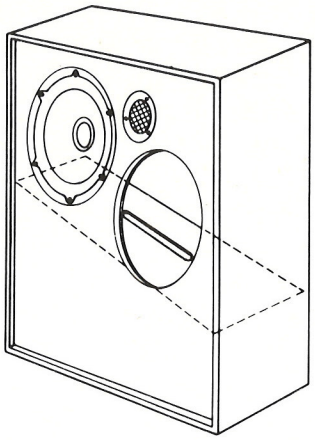
is designed to reproduce 5 Hz square waves, it is important that overshoot on such long excursions be minimized, since the harmonics generated by the overshoot fall in the normal audio spectrum. It is the reduction of such spurious responses that yields the precise bass of the Dynaco speakers. Specifically, the acoustical resistance (fiberglass) lowers the "Q" of the system through a high friction venting action and the amplifier works into a more resistive (and therefore more linear) load. This technique permits—in the A-50 in particular—more acoustic output from the same amplifier than other systems of the same nominal efficiency which have the typical larger impedance variations.

The listening result of the aperiodic design is not only better bass and transient response, but an alleviation of the problems which cause Doppler distortion effects as well. Vastly improved vocal articulation is evident in all three Dynaco speakers. Women in particular will note that this performance has been achieved without the offensive stridency or harshness which accompanies exaggerated midrange or tweeter characteristics.

A single wide-range tweeter in each speaker provides improved dispersion, greater sonic homogenity, and minimal interference effects that contribute to the "big sound" and excellent stereo imaging of the speakers. Each tweeter is a non-rigid hemisphere, specially designed to reduce cavity resonance effects. Their remarkable freedom from aberrations contributes in large measure to the remarkable smoothness and the precise delineation of subtle orchestral nuances so closely associated with the sonic character of Dynaco speakers.

The three Dynaco speaker systems were specifically engineered as two-way systems to avoid the sonic disturbances caused by the more elaborate crossover networks of multi-speaker systems. Special emphasis was placed on driver roll-off characteristics to reduce time-delay distortion and eliminate the need for complex crossovers. No inductors are used in any Dynaco speaker; rather, a simple single section R-C network diverts low frequencies from the tweeter to minimize phase distortion and smooth the mid-range response.

How well these design theories have been converted to actual practice is substantiated by Gordon Holt's comments on the A-25, Dynaco's first speaker system. "This is one of the very few speaker systems we have ever heard that seemed to have virtually no sound of its own. Brasses, strings, woodwinds and most percussion instruments were reproduced equally naturally and with nary a trace of hollowness or nasality or steeliness, and it was just not possible to characterize the sound as Row-A or Row-G or Row-M."



The top half of the A-50's cabinet contains the two 10" woofers and dome tweeter; the acoustic venting is between the top and bottom halves.

All three speakers have similar impedance, efficiency and sonic qualities and were designed to be used interchangeably in the Dynaco four-dimensional stereo system. On much program material they will sound almost the same, except for the slightly smoother midrange of the A-50. Only when the deepest bass is present or when considerably greater power levels are radiated will the A-50 demonstrate its superiority.

Dynaco's popularity in the loudspeaker field is based on the same factors as its success in electronics. As Julian Hirsch wrote in Stereo Review: "Dynaco has long been noted for its development of inexpensive components capable of the highest quality performance . . . [the] A-25, we are happy to note, lived up to our expectations."

SPECIFICATIONS

	A-10	A-25	A-50
Rated Impedance	8 ohms	8 ohms	8 ohms
Minimum and Maximum rms power rating (per channel) suggested for associated amplifiers for music reproduction	20-60 watts	20-60 watts	25-75 watts
Crossover frequency	2500 Hz	1500 Hz	1000 Hz
Number of Tweeters	1	1	1
Number of Woofers	1	1	2
Woofer Diameter	6.5"	10"	10"
High frequency level positions	1	5	5
Dimensions (each)	8½" x 15" x 8" D	20"x11½" x 10" Deep	28"x21½" x 10" Deep
Shipping Weight	30 lbs./pr. (13.6 kg)	24 lbs. (10.9 kg)	47 lbs. (21.4 kg)
	A-10 Available in pairs only	**A-25**	**A-50**
PRICE Oiled Walnut	**$99.95** THE PAIR	**$79.95** EACH	**$179.95** EACH
Rosewood	n. a.	**89.95** EACH	n. a.
Teak	n. a.	**89.95** EACH	n. a.

4-DIMENSIONAL STEREO CONTROL AMPLIFIER SCA-80Q

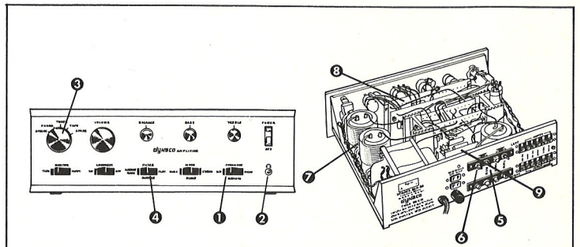
The SCA-80Q is a one-piece transistorized amplifier consisting not only of a stereo power amplifier and stereo preamplifier, but with the Quadaptor™ circuitry built-in as well. No external adaptor is required to enjoy four-dimensional stereo when you use the SCA-80Q. Just connect four Dynaco (or other matched 8-ohm) speakers to the stereo outputs provided—two for the front speakers and two for the back.

The power amplifier section is the same as the Stereo 80; the preamplifier has all the quality and most of the features of the PAT-4. The far right rocker switch has, in addition to the normal "FOUR" dimensional, a "NULL" position which assures that the system is properly balanced for optimum front-to-back separation. The same switch also has facilities (the "FRONT" position) for turning off the back speakers so that normal, two channel stereo can be heard as well. Alternately, the "FRONT" position also enables selecting between a standard two-channel system in one room and remote speakers in another.

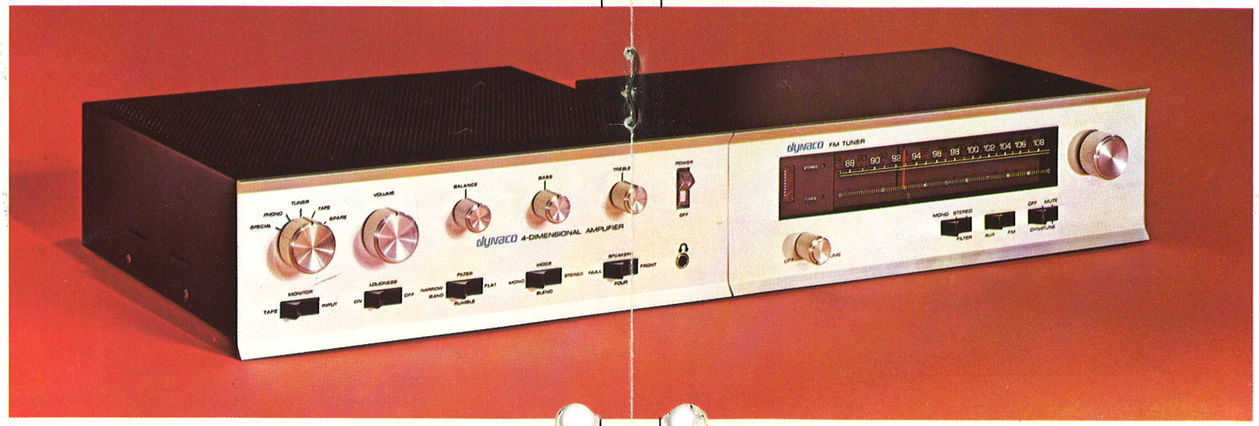
Sopnisticated switchable features such as loudness, filters, blending and tape monitor are provided, yet the SCA-80Q is simple to operate with a basic two-knob control action. The front panel headphone jack automatically turns off all speakers when stereo headphones are inserted. Listening is greatly enhanced by the extraordinarily quiet preamplifier section—even when the volume control is at its full setting.

PRICE: Kit **$169.95** East; $174.95 West
Assembled **$249.95** East; $254.95 West

SPECIFICATIONS
Harmonic distortion: Less than 0.5% at any power level up to 40 watts rms per channel into 8 ohms at any frequency between 20 Hz and 20 kHz with both channels driven simultaneously. Distortion reduces at lower power levels. **Intermodulation Distortion:** Less than 0.5% at any power level up to 40 watts rms per channel into 8 ohms with any combination of frequencies. Distortion reduces at lower power levels. **Power Bandwidth (IHF):** 8 Hz to 50 kHz, at less than 0.5% total harmonic distortion into an 8 ohm load. **Clipping Point at 1000 Hz, one channel only:** 50 watts rms at 8 ohms; 36 watts rms at 4 ohms; 26 watts rms at 16 ohms. **Input Sensitivity:** Phono: 3 mV for 40 watts rms output; High Level: .13 V for 40 watts rms output. **Impedances:** Magnetic Phono Input: 47,000 ohms; High Level Inputs: 100,000 ohms; Tape Output: from low level inputs—600 ohms; from high level inputs—same as source; Headphone output; 8 ohms or greater. **Frequency Response at 1 watt:** Phono: ±0.5 dB of RIAA equalization; High Level: ±0.5 dB 15 Hz to 50 kHz. **Tone control action:** ±12 dB @ 50 Hz and 10 kHz. **Hum and noise:** Phono better than 60 dB below rated output. High Level better than 80 dB below rated output. **Separation:** 65 dB by IHF standards; 50 dB or more from 20 Hz to 10 kHz. **Semiconductor complement:** 20 transistors, 10 diodes. **Dimensions:** 13½" x 10" x 4¼" high. Weight 18 lbs. (8.1 kg). **Power consumption:** 35 watts quiescent; 250 watts max. 50-60 Hz AC, universal voltage.



❶ Three position switch permits rapid, accurate balancing for four-dimensional stereo; front speakers only; normal four-dimensional stereo listening.
❷ Low impedance headphone jack; speakers are automatically turned off when headphone plug is inserted.
❸ Selector switch includes position for "special" low level input. Can be equalized for dynamic microphone or second phono cartridge.
❹ Three position filter switch provides for both high and low frequency filters or low frequency filter only.
❺ Two sets of speaker output terminals—the upper for the left and right front speakers, the lower for the two back speakers.
❻ Quadaptor circuitry built into amplifier; no external adaptor is required for four-dimensional stereo.
❼ 5000 μfd output coupling capacitor in each channel extends low frequency power capabilities. 7200 μfd power supply filtering provides more low frequency power, better low frequency separation, improved power supply regulation, and lower hum.
❽ Factory-assembled and tested etched circuit boards (a total of four—one for each preamplifier and one for each power amplifier section) require no further adjustments or test equipment.
❾ Patented Dynaco current limiting circuit protects against shorted speaker leads and other abusive conditions. Operation automatically recommences after overload is removed.



NEW TRANSISTORIZED FM TUNER FM-5

The new FM-5 transistorized tuner is the culmination of years of design research aimed at offering performance at low cost that can be only approached by other tuners of the highest price.

How well the FM-5 fulfills this goal is illustrated by . . . "Dynatune," a Dynaco circuit innovation that automatically fine tunes a desired station so distortion in stereo is typically under 0.50%.

. . . Exemplary performance in four-dimensional stereo, made possible by the tuner's extremely low distortion when receiving out-of-phase signals [which carry the extra dimensional information].

. . . a muting circuit which is totally free of switching transients regardless of how fast the tuning dial is moved.

. . . extraordinary AM rejection, which eliminates multipath usually present under difficult receiving conditions.

. . . ability to handle highly overmodulated signals without deterioration of sonic quality.

. . . highly effective 19 and 38 kHz filters to prevent interference when making off-the-air tapes.

. . . low phase shift which permits more than 40 dB stereo separation at mid-frequencies and 30 dB to over 10 kHz.

. . . an auxiliary high level input for any future development requiring additional circuitry, such as four-channel multiplexing.

Probably the most remarkable feature of the FM-5 is its automatic electronic tuning circuitry—Dynatune. You simply tune a desired station as usual. Then switch in Dynatune which electronically seeks out the precise center-of-channel so that regardless of the weakness or strength of a listenable signal, the tuner's rated distortion will never be exceeded. The inherent low distortion of the FM-5, the certainty of optimum tuning, and the rejection of multipath provide highly accurate reproduction of the transmitted audio signal.

Pleasure in using the FM-5 is enhanced by its effective muting circuit. Not only is inter-channel noise suppressed at least 60 dB, but no distracting thumps or interstation "hiss" accompany the muting circuits use, yet selectivity is completely unhampered. The muting can be defeated if reception of a station of marginal signal strength (below 4μV) is desired.

Dynaco has applied its tradition of sophisticated design simplicity to the FM-5. Other than the FET front end, active devices in the tuner total seven integrated circuits, ten transistors, and one FET.

Seven ceramic filters in the IF are responsible for the FM-5's sharp selectivity and ability to handle signals as much as 100% overmodulated.

The FM-5's ability to reject spurious signals together with its unusual selectivity and multipath rejection make it unmatched for the city dweller who is usually faced with

having many strong, closely spaced stations. The tuner's desirability also extends to areas of marginal signal strength due to its steep quieting curve. Full limiting occurs at 1.3μv, a characteristic alone which is unusual in a tuner at any price.

The front end and the two etched circuit boards containing the power supply and all active circuitry are preassembled and in-circuit tested for the kit builder. Specifications can be met without use of any test equipment when the construction manual is faithfully followed.

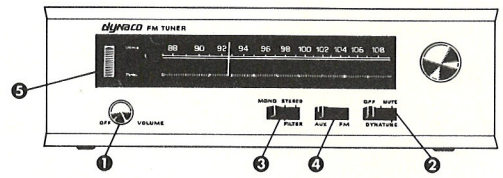
The FM-5 harmonizes with the SCA-80Q control amplifier and PAT-4 preamplifier, and is directly interchangeable, both physically and electronically, with the vacuum tube FM-3 tuner. Its power transformer has dual primary windings to permit operation on line voltages found in the Far East and Europe as well as North America.

Dynaco does not introduce any product unless it represents an unusual combination of performance and low cost to assure a long market life. Owners of the FM-5 can be secure that their tuner adheres to this philosophy.

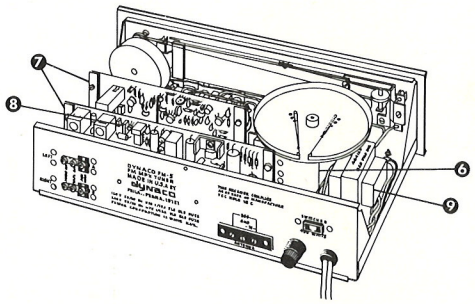
SPECIFICATIONS

IHF sensitivity (noise and distortion —30 dB @ 100 modulation): 1.75 μV
Frequency response before de-emphasis: 20 Hz to 52 kHz ± 1 dB
De-emphasis time constant: 75 μsec
Frequency response in stereo: 50 Hz to 15 kHz ± 1 dB
Harmonic distortion: Mono 0.5%; 0.25% typical
@ 100% modulation Stereo 0.25% typical
I.M. distortion: Mono 0.25% typical
@ 100% modulation Stereo 0.9%
Capture radio: 1.5 dB
Muting: 60 dB; Threshold=4 μV
Output @ 100% modulation: 1.8V ± 1 dB
Signal to noise level: 65dB; @ 100% modulation
Audio hum: —65 dB
Input signal required for full limiting: 1.3 μV
Drift: <50 kHz
Selectivity (alternate channel): 65 dB
AM suppression: 58 dB
Stereo separation: @ 1000 Hz 40 dB
@ 50 Hz 30 dB
@ 10 kHz 30 dB
19 kHz pilot carrier suppression: 30 dB
38 kHz subcarrier suppression: 55 dB
Antenna input: 75 ohm unbalanced and 300 ohm balanced.
Front panel controls: Power, Tuning Level; Circuit mode [off; muting; muting and Dynatune]; Mono-stereo filter-stereo; Output [FM, auxiliary];
Stereo switching threshold: 4 μV
Dimensions: 13½"x9"x4¼" H [same as PAT-4; front panel dimensions also same as SCA-80Q and SCA-35]
Shipping weight: 11 lbs. (5 kg).
Power consumption: 10 watts, 100-120V, 220-240V, 50-60 Hz AC.

PRICE: Kit **$149.95**
Assembled **$249.95**



❶ Level control permits output to be adjusted to be equal to other sources connected to control center.
❷ 3-position circuit mode switch permits choice of Muting and Dynatune, Muting alone, or operation with neither engaged.
❸ 3-position switch for selecting Stereo, Stereo Filter [high frequency mixing which reduces both noise and separation] or Mono. In "Stereo" position, tuner automatically is in stereo mode when receiving stereo.
❹ Output switch has provision for auxiliary high level facilities. Normal FM stereo operation uses "FM" position.
❺ Signal-strength meter aids in determining optimum antenna orientation.



❻ Preassembled front end supplied with kit.
❼ Preassembled etched boards for IF, multiplex, audio and power supply circuits facilitates kit construction.
❽ Seven ceramic filters and seven integrated circuits used in IF and multiplex circuitry require no alignment ever.
❾ Power transformer has dual primary windings for use overseas as well as in North America.

PHONO PREAMP MODULE

You can build-in a phono preamp module to an FM-5 kit so that a record player can be connected to the AUX input of the tuner. Switching between the tuner and the module, as well as the volume of the record being played, is controlled by front panel facilities already on the FM-5.

The compact (3" x 3½") module is mounted on the inside back chassis of the tuner. It consists of integrated circuit operational amplifiers on a p.c. module to provide truly extraordinary 75 dB signal: noise; 46 dB gain; 0.05% harmonic distortion (20-20,000 Hz) @ 2 V out and 0.05% IM at the same output. Input sensitivity is 5 mv for 1 V output. Its low output impedance (1000 ohms) permits considerable separation between the tuner and the power amplifier into which it is connected.

Phono Preamp Module Price: **$29.95**