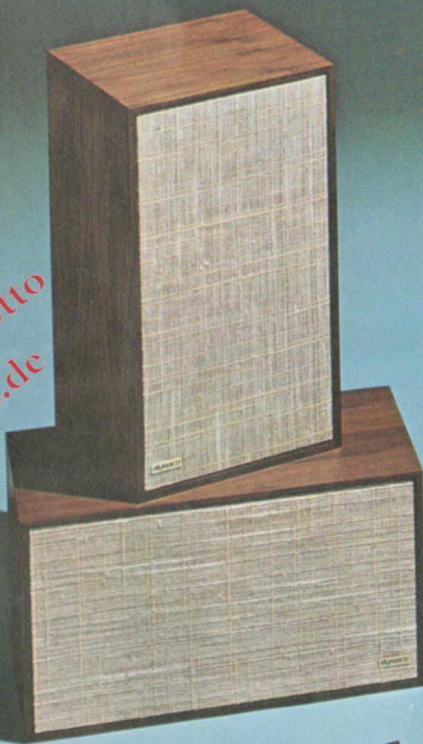


dynaco®

dynakit™



A-10s



A-35s



Stereo 400



SCA-80 Q and AF-6
in CAB-2D cabinet

FOR THE AUDIO PERFECTIONIST

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TUNERS

FM-5
FM MULTIPLEX STEREO

AF-6 NEW
AM and FM MULTIPLEX

Dynaco products have always had a reputation for superior specifications, but no matter how impressive any tuner's specs, they are of little value if they cannot be easily achieved in the normal tuning of a station. Where most tuners depend on the user's observation of meters of dubious precision, the unique Dynatune™ automated FM tuning logic circuit zeroes in on the **exact center of channel** faster and more accurately than any other tuner made, and continues to track this lowest distortion point, assuring perfect reception. Coupled with the smoothest, quietest muting circuit ever (which is effective on all listenable signals) the result is either exact station in precise tune—or absolute silence. A signal strength meter is provided for proper antenna orientation. Silken-smooth flywheel tuning with automatic mono/stereo switching and an alternative high frequency blend stereo filter position for noisy stations. Exemplary performance in four-dimensional stereo is made possible by the extremely low distortion reception of out of phase signals (which carry the extra dimensional information) in addition to conventional measurements. High rejection of multipath and AM interference and 67 kHz SCA carriers, combined with exceptional ability to handle heavily overmodulated signals at low distortion, results in meaningfully improved reception of normal signals in typical listening situations. An auxiliary high level input is provided for future capabilities, and this may

be converted to accept a magnetic phono cartridge by adding the accessory \$30 phono preamp module PPM-5 inside the tuner. 1.75 μ v sensitivity; less than 0.5% THD and IM distortion; 40 dB separation; 65 dB signal-to-noise ratio; 3 FETs, 12 transistors, 8 integrated circuits and 8 ceramic filters for 1.5 dB capture ratio and 65 dB selectivity. The assembled, tested and aligned front end and two circuit boards contain all the active circuitry, and with the easy dial stringing enable 6 hour kit construction. 13½" x 4¼" x 9" deep; Weight: 11 lbs.

To all of the performance specifications of the FM-5 above, the AF-6 adds an extraordinary AM section. The signal strength meter facilitates precise AM tuning, and where the signal is of high quality, the "wide" position of the unique audio bandwidth switch permits AM reception of unexpected quality. The remaining "normal" and "narrow" positions provide useable reception of less perfect signals. A broad band 12 section LC design IF filter, and broad band detector provide outstanding selectivity of 20 dB at 10 kHz and 55 dB at 20 kHz. An outstanding AGC characteristic provides easy listening to signals from 50 to 500,000 microvolts. 60 dB image rejection; 70 dB IF rejection; less than 2% distortion; 10 kHz notch filter. 8 hours assembly time, using the same circuit boards as the FM-5, plus a new AM board. 13½" x 4¼" x 11" deep; Weight: 14 lbs.

AMPLIFIERS

SCA-80 Q
4-D 80 WATT
CONTROL AMPLIFIER

PAT-4
CONTROL
PREAMPLIFIER

STEREO 80
80 WATT
POWER AMPLIFIER

STEREO 120
120 WATT
POWER AMPLIFIER

STEREO 400 NEW
400 WATT
POWER AMPLIFIER

All Dynaco amplifiers have similar high performance standards, differing mainly in power output. The SCA-80Q has all the performance, and most of the features of the PAT-4, plus the Stereo 80's power, and built in 4-D decoding. Controls are simplified with single knob bass and treble controls, and a "narrow band" hi/low filter, but it includes a front panel power amp output for headphones. The SCA-80Q is very nearly the ideal amplifier for most users. You can connect two speakers for stereo now, or four speakers for Quad sound now, or later. Four pre-assembled circuit boards facilitate construction in 12 hours. 13½" x 4¼" x 11" deep. Weight: 18 lbs.

"In sonic quality, we would unhesitatingly say that the Dynaco PAT-4 is unsurpassed by any preamplifier we have seen . . . a remarkable unit and unmatched at anywhere near its low price" says Stereo Review. "(Sonically) we cannot see how any preamp, present or future, could surpass the PAT-4" reiterates Stereophile Magazine. This remarkably versatile control center exemplifies Dynaco's reputation for excellence achieved through innovation and a constant striving for simplicity in both engineering and operation. THD and IM distortion is below 0.05% at 2 volts, 600 ohm output; 4 tone controls provide continuous adjustment with a true "center-flat" position; 3-step high filter; rumble filter; 7 inputs; 600 ohm front panel output plus two pairs of audio outputs and tape output on the back; front panel input; 54 dB phono gain with noise 70 dB down from 10 mv input. 13½" x 4¼" x 9" deep; Wt. 10 lbs.

The Dynaco reputation for "state of the art" performance at realistic prices was built on, and has been sustained by its power amplifiers. It is likely that more Stereo 120s have been purchased than all other solid state power amps put together. As High Fidelity magazine reported, "(The Stereo 120) is utterly uncolored and neutral; its ability to drive any speaker system self-evident. Truly, another 'amplifier great' and at a very reasonable price on today's market." The Stereo 120's history is ample proof of the security of your investment. The Stereo 80 employs similar audio circuitry and most of the same components except for the Stereo 120's regulated power supply. With its conventional power supply and lower operating voltages, the Stereo 80 gains an added measure of reliability, yet it provides the same IHF music power as the Stereo 120, though lower continuous power. Each has electronic protection

and a unique bias system which markedly reduces low power distortion and eliminates the need for adjustments. Both are stable with all loads, including electrostatic loudspeakers. THD and IM distortion is below 0.5% from zero to full rms power (60 watts/channel for the Stereo 120; 40 watts/channel for the Stereo 80) into 8 ohms; noise 95 dB down; 1.3 volt sensitivity for 40 watts; ½ IHF power bandwidth 8-50k Hz. 5 hours assembly time. Stereo 80: 14" x 8" x 4" high; Weight: 15 lbs. Stereo 120: 13" x 10½" x 4" high; Weight: 20 lbs.

The new Stereo 400 amplifier is strikingly different from other high power amplifiers in two respects: over 1000 square inches of cooling surface permits continuous operation at full rated output of 200 watts per channel into 8 ohms; and the exclusive Dynaguard™ adjustable dynamic power limiter which permits full power capability for short term transient wave forms, but clamps sustained output above the selected level. The exclusive IC-controlled Dynabias™ circuit eliminates the crossover notch while assuring thermal stability with precise tracking of the quiescent current. The Stereo 400 delivers 300 watts per channel into 4 ohms, or its full complementary symmetry outputs can be switched to mono 600 watt output at 8 ohms, for a 70 volt line, tone, THD and IM distortion is well below 0.25% from zero to full power, response at 200 watts is \pm ¼ dB, 20-20k Hz; at one watt +0, -1 dB, 10-50k Hz; noise 106 dB down; 1.6 volt sensitivity for 200 watts; switched 50 Hz and 15kHz filters; 500k ohms input impedance.

In addition to Dynaguard™, loudspeaker protection includes relay for delayed turn-on, clean shut-off, and DC load protection; volt-amp limiting for low impedance or reactive loads; and front panel speaker fuses which do not affect either damping factor or distortion. Amplifier protection includes volt-amp and dissipation limiting; thermal cutout with front panel indicator; B+ fuses; primary circuit breaker; and provision for optional fan cooling on the chassis. At levels up to several watts Class A operation assures absolutely no "crossover notch" for near-zero distortion. Front panel level controls do not affect performance below 100 kHz. The Stereo 400 is the culmination of extensive Dynaco research leading to what we believe is the cleanest-sounding, most reliable high power solid state amplifier available—and at a remarkably low cost per watt. 17" x 13" x 7" high; Shipping Weight: 65 lbs.

LOUDSPEAKER SYSTEMS

A-10 pair
THE BEST BUY

A-25
THE GREATEST VALUE

A-35 NEW
THE MOST ACCURATE

A-50
THE DEEPEST BASS

Since the introduction of the A-25 in late 1968, Dynaco loudspeakers have rapidly ascended to the front rank of popularity by virtue of unprecedented consumer appreciation of their outstanding value. All four models reflect identical design philosophy and exhibit markedly similar sonics. They are renowned for clarity, smoothness, precision, and above all, **value**. The sound of the four differs only in detail—greater power handling, plus deeper bass from the A-50; unexpectedly big sound from the little A-10; crisply defined detail in the new A-35. So subtle are the differences that the casual first listener could confuse any of these with the widely acclaimed A-25. It is the phenomenally popular speaker which Stereophile Magazine calls "quite probably the best buy in high fidelity today".

Dynaco's primary concern has always been literal translation of the original—verbatim reproduction—and the success of each of these models is proof that such has been achieved to a high degree. All have the patented Dynaco **aperiodic** design which affords an unusually smooth impedance curve throughout the bass range, providing ideal amplifier matching and power transfer characteristics, and superior results when used in 4-D sound systems.

The A-10 and A-25 are externally vented through a special acoustic impedance system. The A-35 and A-50 have Dynaco's exclusive double cabinet con-

struction, with the woofer(s) in one section, which is internally vented to the second sealed compartment. This dual spectrum damping refines the aperiodic concept to provide its critical damping at resonance plus the low distortion benefits of the sealed enclosure at very low frequencies.

The woofers and tweeters in these models appear similar, but differ in detail. The A-10 uses a smaller woofer with an identical magnet structure to the 10 inch woofer in the A-25. All are two-way systems (though the A-50 has two woofers) with the advantage of lowered distortion through simplified cross-overs and careful complementary driver design. As High Fidelity magazine described the A-50, "we soon found ourselves . . . listening to the program material rather than to the equipment."

Each design exemplifies Dynaco's value-conscious, no-nonsense approach to high fidelity—pure, articulate, balanced sound. All are supplied in oiled walnut wood finish with beige linen grille cloth; a five position high frequency control (except the A-10); and concealed wall mounting brackets for flush mounting (except the A-50). The optional stand for the A-50 is available from Dynaco

A-10: 8½" x 15" x 8" deep; Weight: 30 lbs. per pair.
A-25: 20" x 11½" x 10" deep; Weight: 24 lbs.
A-35: 22½" x 12½" x 10" deep; Weight: 30 lbs.
A-50: 28" x 21½" x 10" deep; Weight: 47 lbs.

4-DIMENSIONAL QUADAPTOR

QD-1

Converting your present stereo system to 4-dimensional sound need not be expensive. Connect the Dynaco Quadaptor™ between your present stereo amplifier and four speakers. Dynaco's 4-D sound needs **no second amplifier**. The QD-1 provides up to 12 dB attenuation of the rear speakers if they are close to the listener, plus a null balance switch for correct separation adjustment, and switch-out of the back speakers for conventional stereo listening. Like the other matrix decoders, the Quadaptor

recovers properly processed front, rear, left and right signals from all sources—tape, records and FM stereo. Its striking advantage is its ability to recover **more** of the previously hidden ambient or directional information already on most conventional stereo signals, making them far more lifelike. Use your present stereo speakers up front, and add a pair of high quality 8 ohm back speakers which are similar in sound and efficiency (the A-10s are ideal). QD-1: 4½" x 4¼" high x 7" deep; Weight: 2½ lbs.

VACUUM TUBE AMPLIFIERS

MARK III AMPLIFIER

SCA-35 CONTROL AMP

STEREO 70 AMPLIFIER

PAS-3X PREAMPLIFIER



With hundreds of thousands of Dynaco tube amplifiers in use, there are many who continue to prefer them for reasons of flexibility, low cost, and reliability. The PAS-3X and Stereo 70 are probably still the most popular of all high fidelity combinations. On a performance versus price basis, standardized designs cannot match the SCA-35. The Mark III is becoming increasingly popular with professional musicians and sound installers, where severe service applications favor use of tube equipment, as well as in laboratory and industrial applications.

Mark III: Mono 60 watts into 4, 8 or 16 ohms within 1 dB, 20-20k Hz, at less than 1% distortion; noise 90 dB down; 9" x 9" x 7" high; Weight: 28 lbs.

SCA-35: 2 x 17.5 watts into 8 or 16 ohms within 1 dB, 20-20k Hz, at 1% distortion; 4 mv phono sensitivity; noise 70 dB below 10 mv input. 13½" x 11" x 4¼" high; Weight: 20 lbs.

Stereo 70: 2 x 35 watts into 4, 8 or 16 ohms within 1 dB, 20-20k Hz, at less than 1% distortion; noise 90 dB down; 13" x 9½" x 7" high; Weight: 32 lbs.

PAS-3X: 2 volts output at less than 0.05% THD or IM distortion; 2 mv phono sensitivity with noise 74 dB below 10 mv input; high level noise 85 dB below 0.5 volt input; 1000 ohm output; frequency response \pm 0.5 dB, 10 Hz to 40k Hz; 3 low level and 4 high level inputs; 13½" x 9" x 4¼" high; Weight: 11 lbs.

DETAILED SPECIFICATIONS ON ANY DYNACO PRODUCT FURNISHED ON REQUEST IMPARTIAL TEST REPORTS ON MANY OF THEM ARE ALSO AVAILABLE

All loudspeaker systems are available assembled only. All kits feature preassembled circuit boards of low loss FR4 fiberglass, pretested to assure proper operation without any adjustments when assembled in accordance with the simple, detailed, step-by-step instructions.

WOOD CABINETS

CAB-1S
CAB-1D
CAB-2S
CAB-2D

Single Short 14½" x 5" x 8½" 6 lbs.
Single Deep 14½" x 5" x 11" 6 lbs.
Double Short 14½" x 9½" x 8½" 7 lbs.
Double Deep 14½" x 9½" x 11" 7 lbs.

Low cost single and double-stacked oiled walnut veneer cabinets make your Dynakits look as good as they sound. The short ones fit the FM-5, PAT-4 and PAS-3X, which need no ventilation. The deep ones have top vents for the SCA-80Q, and also accommodate the AF-6, or separately, the SCA-35 or the FM-3 tube tuner.

SUGGESTED DYNACO SYSTEMS

THE LEAST EXPENSIVE WAY TO QUALITY STEREO

Stereo FM radio offers a wide range of high quality programming for almost every taste. So unless you already have a substantial record library, we suggest you consider an FM tuner as your primary music source. Since the FM-5 has a volume control, it needs only a power amplifier like the Stereo 80, and two speakers like the A-10s (or A-25s) to complete a music system of unimpeachable quality. Most important is the ease with which this system can be expanded into a versatile two or four channel system as need or budget permits. The FM-5 includes an auxiliary input which will accept a tape recorder output. But, this extra input can be converted to accept a magnetic phono cartridge record system as an alternative by simply adding the \$30 PPM-5 phono module. Later, you can gain the versatility of a complete control pre-amplifier by selecting the PAT-4, and if you choose to step up to larger speakers like the A-35s, the addition of the Quadaptor will enable using the original A-10s as back speakers in a 4-D system. This basic system will be of particular interest to the space-conscious college student, as well as for background music in stores, or as a home's supplementary system for a remote location.

POPULAR STEREO / 4-D SYSTEM FOR THE MUSIC LOVER

The SCA-80Q is the heart of this widely used combination. With sufficient versatility for all but the ardent hobbyist, and enough power to handle almost any speaker systems in typical homes, the SCA-80Q is the ideal all-around amplifier. A pair of A-25s completes the most popular combination, but A-35s or A-10s may better suit your particular needs. To enjoy 4-D sound you can mix or match two more Dynaco speakers now or later. With the AF-6 or FM-5, and a high quality record player, you will have a music system which will be the envy of friends who have spent twice as much.

VERSATILE STEREO SYSTEM FOR THE ENTHUSIAST

The PAT-4 and FM-5 (or the AF-6) provide a compact control center of supreme flexibility and impeccable performance. Since they require no ventilation, these units can be fitted into tight quarters if convenience so demands, and the Stereo 120 (or Stereo 80) placed where ventilation is available. The A-35s are the most likely match here, though the A-50s are alternates if space permits. For 4-D sound, add the Quadaptor and another pair of speakers like the A-10s. These facilities warrant the very best associated record and tape components.

AN ELITIST SYSTEM FOR THE DEMANDING FEW

The Stereo 400 is in a class by itself. For those who hear the difference, no other amplifier will suffice. The PAT-4 and AF-6 (or FM-5) are logical, though unprepossessing complements in this ultimate system. Choose the A-50s, A-35s or cost-no-object speakers to suit your taste. Coupled with the finest turntable and tape facilities, you can relax, secure in the knowledge that the state of the art is yours.

SYSTEM 1

FM-5 kit
PPM-5 module
Stereo 80 kit
(2) A-10 speakers

SYSTEM 2

SCA-80Q kit
AF-6 kit
(2) A-25 speakers

SYSTEM 3

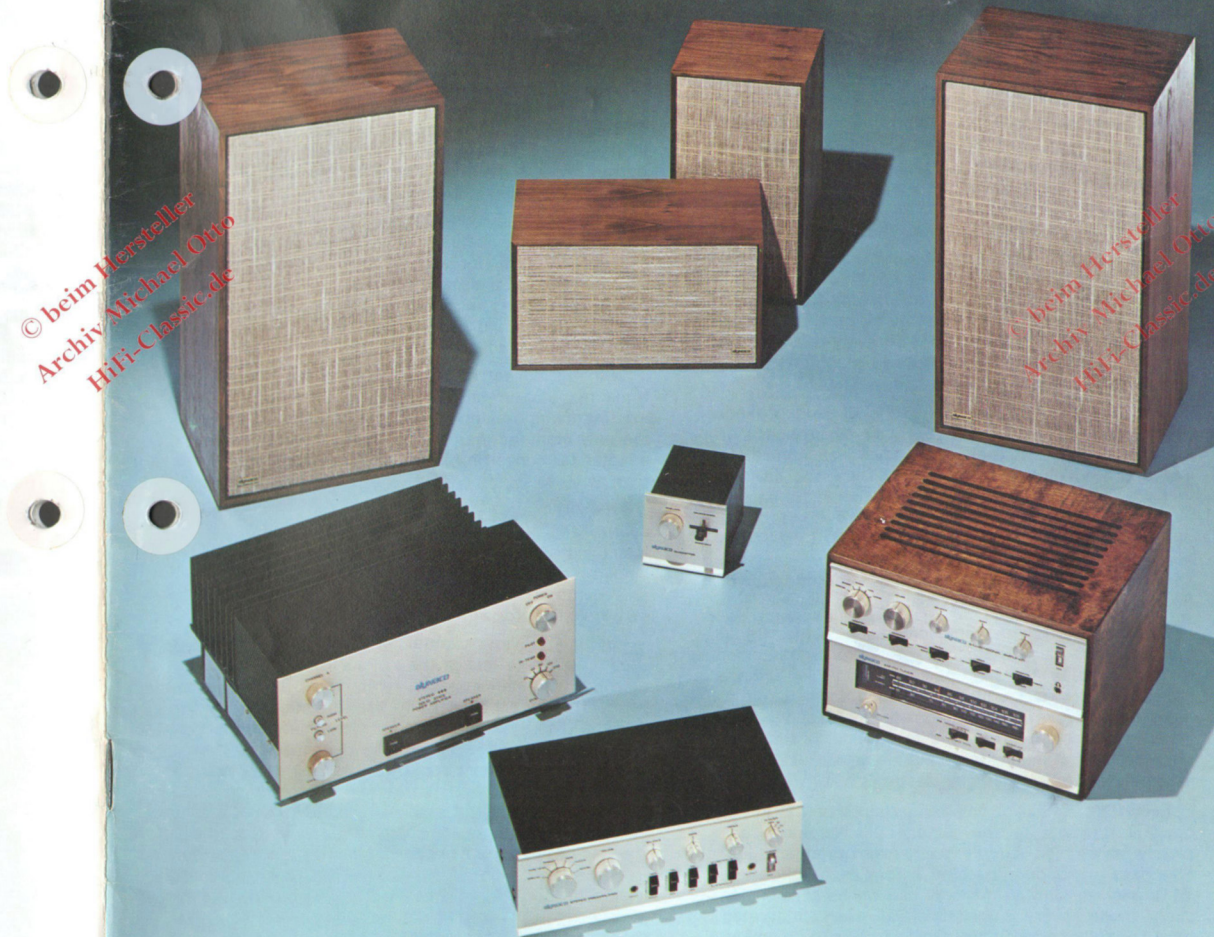
PAT-4 kit
FM-5 kit
Stereo 120 kit
(2) A-35 speakers

SYSTEM 4

Stereo 400 kit
PAT-4 kit
AF-6 kit
(2) A-50 speakers

dynaco®

dynakit™



“Over the past decade, Dyna amplifiers have achieved an enviable reputation for uncompromised quality at bargain prices. Either in the form of easy-to-build kits or as factory-wired models, the Dyna units have consistently matched or surpassed the performance of competitive models costing far more.

“As we see it, the ‘secret’ of Dynaco’s success has been in their refusal to incorporate gadgets or passing fads into their products. Sound engineering practice, combined with deceptively simple yet highly effective circuit design, has characterized every Dyna product we have tested over the years.”

JULIAN HIRSCH IN JUNE, 1967 STEREO REVIEW

As the Dean of American Hi Fi reviewers expressed it so succinctly a few years ago, Dynaco products have consistently enjoyed an unparalleled reputation for value. We are proud of the fact that our customers are our best advertising. Dynaco has long been acknowledged world-wide as being the “best for the money”. As high fidelity perfectionists ourselves, we frankly doubt the implication that better sound reproduction could be achieved by spending more money, at least within the physical considerations (size, power, etc.) which define practical limits.

Every Dynaco product is engineered to meet the same high standards—there is no “second grade”. Never is an attempt made to limit quality for the sake of cost. Yet, our concern for delivering maximum value dictates that we will always trim off every ounce of fat which does not directly contribute to reliability, easier kit construction, or audio performance.

Dynaco set out to develop a line of loudspeakers which would yield such extraordinary performance at reasonable cost that their acceptance was immediate and unprecedented in enthusiasm. Thus, the savings in high speed production techniques could be passed along to the consumer. For example, it takes but a half hour to manufacture and test the A-25—from lumber to finished product. Dynaco loudspeakers are sold only in assembled form because the integrity of the cabinet is crucial to loudspeaker performance.

Dynaco still regards simplicity as a virtue. In an era when advertising frequently extols the large number of transistors or the multiplicity of controls, Dynaco engineers work assiduously to reduce each circuit to its essentials; to refine and automate any function which leads to easier operation; and to streamline and simplify mechanical details to facilitate easy access for kit assembly and future servicing needs.

Every Dynakit buyer can be certain that the kit he buys is identical to the factory-built version. Completely assembled circuit boards on premium FR4 fiberglass are in-circuit tested before each solid state kit is packed. Only in this way can we be certain that every diode, every transistor, and every integrated circuit is fully performance checked prior to shipment.

Each assembled unit is further subjected to a full set of performance tests.

Dynaco warranties are never ambiguous, either. All Dynakits have a one year parts replacement warranty. Factory assembled units have a one year warranty on parts and labor which includes one year return freight to the owner. Speaker systems carry a full five year warranty on the drivers themselves, provided they have not been subjected to abuse.

Dynaco’s value-conscious, no-nonsense approach to high fidelity is evident in other areas as well. Model changes are rare, for sophisticated, practical designs stay current for a decade or more. The Mark III amplifier, introduced in 1957, is still widely sought by musical groups and professional installers who appreciate the unique advantages of tubes.

With the advent of stereo, Dynaco was one of only three manufacturers who made it convenient to use existing mono preamps to step up to stereo. It was also the only manufacturer to provide an integral multiplex adapter for converting its mono tuners to stereo—and then at 1/2 to 1/4 the cost of others which were external.

When Dynaco made a styling change years ago, it confounded the competition by offering panel and knob kits to inexpensively update the tens of thousands of similar units already in the field. A subsequent change in preamp tone control circuitry yielded an optional conversion kit for units already in service many years.

The most obvious example of Dynaco consumer consciousness is its role in the current four channel race. As a major amplifier maker, Dynaco was the only innovator of a low cost means to four directions of sound which did not require another stereo amplifier! Now widely imitated and licensed, the Dynaquad™ system’s ability to convey new sonic dimensions, from a high percentage of conventional stereo recordings as well, is proof of its value. In essence, where the room layout permits, it requires no more than a single back speaker. Transposing this system to the more popular four speakers near the corners of the room adds the low cost Quadaptor™. Never has such a striking improvement in realism been achieved from so many programs at such low cost.

FOUR DIMENSIONAL FOUR CHANNEL DYNAQUAD™ SOUND WITH THE QUADAPTOR™

The advent of 4-channel sound offers the promise of total listener involvement by completing the stereo sound image—adding that heretofore missing information which is composed largely of signals reflected from the sides and rear of the room. Sound sources can also be located in the rear if desired. A true (discrete) 4-channel system offers the most flexibility because each signal can be isolated or mixed at will. Such a system is complex, expensive, and presently successful only with tape (except cassettes). A satisfactory 4-channel disc system remains to be proven, and 4-channel broadcasting is farther away.

A second technique is matrixing, in which the rear signals are superimposed on the normal (front) stereo channels in such a way that the rear signals can be separated and reconstructed in playback. Back source localization is possible, but none of the matrix systems can achieve the solo isolation of a discrete system in creating specific directional effects. Artificial enhancement (synthesizers or logic circuits), if added, aids separation only at the expense of accuracy, and is not in keeping with Dynaco’s striving for verbatim reproduction.

All matrix systems like Dynaquad™ are reasonably compatible, and recover properly processed signals from stereo FM, tape or records. They can add realism because music listening strives to reproduce the original on-stage performance—not just soloists in each corner.



A good matrix system can accurately recreate the reflected signals to truly make you feel “you are there”, and in addition can include rear directional effects if needed.

All matrix systems use 2 channels. All but the Dynaquad™ need four amplifiers, and thus are erroneously called “4 channel”. Dynaco has chosen the more accurate term “4-Dimensional”. Only the much copied Quadaptor™ technique **saves you a stereo amplifier** by reconstructing the four related signals at the output of the stereo power amplifier, rather than between the preamp and power stages.

The Quadaptor™ connects to your amplifier’s present speaker terminals and the four speakers connect to it. Your front (identical) speakers may be 4, 8 or 16 ohms. The rear speakers should be 8 ohms, matched, and for best results should be similar to those in front in efficiency and sonic characteristics. They should also have a very smooth impedance characteristic, for the smaller this variation, the more accurate will be the Quadaptor’s™ decoding. Full range rear speakers are desirable because the greater sense of space in 4-D playback is derived largely from the low end, and source location is defined mostly by the high end. The Dynaco Aperiodic speakers are ideal.

The Quadaptor™ is more than a junction box between the amplifier (or receiver) and the four speakers. It contains the passive decoding circuitry to separate the four related signals, but it does not alter the incoming signals in any way, and it is not a synthesizer. Its function is to fully utilize **all** of the material that has been recorded, including signals of dissimilar phase which contribute the “ambience” or “hall sound” effects previously hidden in conventional 2-channel playback of many of your **present** recordings. It further provides up to 12 dB attenuation of the back speakers to obtain proper balance when they are close to the listener; it facilitates easy, accurate adjustment of the system for optimum separation; and it enables switching off the back speakers when conventional stereo listening is desired.

The Quadaptor may be used with any Dynaco amplifier (it is redundant with the SCA-80Q) and virtually all other makes of amplifiers and receivers.* The kit can be assembled in an hour. If you desire more complete information on the theory behind this most practical of matrix decoding systems, as well as complete application advice, the very detailed instruction manual is available postpaid from Dynaco for \$1.50.

*The rare exceptions are a few transistorized amplifiers that cannot be used with 40 ohms between their output ground terminals, or those with a “floating” output circuit. If you have such an amplifier—usually with separate power supplies for each channel—consult the manufacturer. This does not preclude the use of mono tube amplifiers like the Dynaco Mark III, which is eminently suitable. There must also be a common ground elsewhere in the preamplifier or power amplifier circuit.

SPECIFICATIONS

Dimensions: 4 1/4" high x 4 1/2" wide x 6 3/4" deep.
Matches other Dynaco control units.
Shipping Weight: 2 1/2 lbs.
AC line requirements: None; the Quadaptor is passive.

SCA-80 Q 4-DIMENSIONAL STEREO CONTROL AMPLIFIER

The SCA-80Q is the ideal amplifier for the typical music listener who seeks outstanding sound from popular speakers like the Dynaco Aperiodic series in the average living room. In one single unit it combines the superb performance and most of the features of the PAT-4 control preamplifier with the Stereo 80 power amplifier, plus the 4-Dimensional decoding circuitry of the Quadaptor™.

4-Dimensional sound is Dynaco's more precise term for the Dynaquad™ matrix decoding technique which, like other matrix systems, is often incorrectly called "4-channel". It enables four directions of sound to be recovered from specially encoded stereo FM, tape and records. The Dynaquad™ system is far simpler, since it does not require two more amplifier channels, and is thus less costly, yet it accomplishes the same results. It has the further benefit of yielding markedly greater realism from many conventional stereo recordings as well. You will be astounded at what two additional speakers like the A-10s can add, even to your present record library, when connected for 4-D sound.

With 40 watts of rms power per channel by Dynaco's conservative standards, there is plenty of reserve for almost any need. Simply connect two speakers now for stereo, or four speakers directly for 4-Dimensional sound now or later. Alternatively, you can connect two pairs of speakers for stereo in separate locations. The front panel headphone output accommodates either low or high impedance phones, disconnecting all speakers when the phone plug is inserted. The stereo-mono mode selector switch also includes a 6 dB blend position which frequently provides a more natural perspective for headphone listening, as well as helping to overcome the problem of excessive speaker separation in some room arrangements.

The exclusive feedback tone control system of the SCA-80Q, like the PAT-4, is a Dynaco development which provides continuous adjustment of the frequency extremes while assuring a specific "center-flat" setting. At their mid-point of rotation, the controls are out of the circuit and have no effect whatsoever on performance. This is accomplished by special Dynaco-designed potentiometers. It is a typical Dynaco innovation, simplifying operation by eliminating a separate cut-out switch while retaining maximum performance and versatility.

In like manner, the filter switch provides just low frequency cut-off for eliminating rumble, or a "narrow band" position which rolls off both frequency extremes simultaneously to preserve the original tonal balance and thus make listening to poorer program material more enjoyable. The speaker selector, in addition to switching between 4-D and stereo listening, provides a spring-return "null" position which, in conjunction with

the balance control, makes adjustment for optimum front-to-back separation particularly easy. The "Special" input, which is a second high gain preamp position, is normally wired for RIAA equalization to provide another magnetic phono input. A number of alternative options for this switch position are suggested to meet individual needs.

All of the solid state components in the SCA-80Q are silicon devices—20 transistors and 10 diodes. Modular construction, employing four preassembled and tested etched circuit boards, pre-wires most of the components, leaving to the builder only the mechanical assembly and interconnection through eyelets on the circuit boards. This reduces the typical kit builder's construction time to perhaps 12 hours and assures that with proper assembly each and every kit can meet specifications identical to factory assembled versions.

A 5000 mfd output coupling capacitor in each channel protects the loudspeaker in the event of amplifier malfunction, and extends low frequency power capabilities. The 7200 mfd of filtering in the power supply provides more low frequency power, better low frequency separation, improved power supply regulation, and lower hum.

Dynaco's patented protection circuit in each amplifier channel is designed to reduce—not just limit—the current through the output stage when there is any tendency to exceed a reference limit as a result of excessive drive signals or heavy loads. This protects both the loudspeaker and the output transistors. Normal operation is automatically restored once the problem is corrected.

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 4¼" x 11½" deep.

Shipping Weight: 18 lbs.

Power Consumption: 35 watts quiescent; 250 watts max., 50/60 Hz, 100, 120, 220 or 240 V AC.

NEW AF-6 SOLID STATE AM-FM STEREO TUNER

The spectacular success of the FM-5 tuner Dynaco introduced last year initiated popular demand for an AM-FM version. Never willing to settle for a "me-too" design, Dynaco engineers have developed an AM section which can rival FM, with broad frequency response, low distortion, low noise and exceptional selectivity.

AM signals are so subject to local interference that even component tuners restrict their bandwidth to substantially less than the best broadcast signals, in the interest of maintaining low noise. To achieve quality AM reception Dynaco engineers included a 3-step audio bandwidth circuit. It provides extended audio range when the signal quality warrants it, normal reception of weaker signals, and a narrow bandwidth for high interference conditions. A broad band 12 section LC design F filter provides superior selectivity. The signal strength meter facilitates precise AM tuning, and an outstanding AGC characteristic accommodates signal levels from 50 microvolts to 500,000 microvolts with low distortion. A 10 kHz notch filter reduces effects of off-channel interference.

FM SPECIFICATIONS

See FM-5 Electrical Specifications on following page.

AM SPECIFICATIONS

Sensitivity: 50 microvolts with external input.
Selectivity: 20 dB @ 10 kHz, 55 dB @ 20 kHz.
Image Rejection: 60 dB.
Total Harmonic Distortion: Less than 2%.
Intermediate Frequency: 455 kHz. IF Rejection: 70 dB @ 1000 kHz.
Tuning Range: 535-1620 kHz.
Antenna Provisions: Built-in ferrite rod. Connections for external antenna and ground.
Dimensions: 13½" x 4¼" x 11½" deep. Shipping Weight: 13 lbs.
Power Consumption: 12 watts, 50/60 Hz, 100-120 or 220-240 V AC.



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FM-5 STEREO TUNER

When the FM-5 was released last year, anxious Dynakit enthusiasts who had waited years for it found the demand so great that some had to wait in line a few months more. The delays are past, and as High Fidelity magazine affirmed, "It was worth waiting for, without question. Dyna has done it again—given us a component that will bear comparison with other companies' top models, but at moderate price. The value it represents is most striking in the kit version; many readers will think the \$90.00 saving a windfall in view of the unit's simple assembly . . . The FM-5 looks like a real winner."

As the culmination of years of design research, the FM-5 achieves ideal tuner operation automatically: each station is received in exact tune, or there is utter silence. That is the promise of DYNATUNE™—an exclusive Dynaco circuit that automatically fine-tunes the desired station, and continues to track the precise center of channel to assure minimum distortion in both mono and stereo. This is coupled with a sophisticated muting circuit which is free from switching transients regardless of how fast the tuning dial is moved. Spin the dial and all is silent. Stop on any station, and it is unerringly in tune.

The signal strength meter, driven by a special amplifier, is designed to give useful readings from a few microvolts to tens of thousands of microvolts, as an aid to correct antenna orientation. Its non-linear action is quite different from other such meters, in the intent to provide maximum information for the signals which present the greatest problems—the very powerful ones, as well as the weakest ones.

The FM-5 automatically switches to stereo operation in the presence of the broadcast stereo carrier, lighting the front panel indicator, and reverts to mono on a weak stereo signal. A switch provides high frequency blending and filtering on noisy stereo signals, or mono operation. Another switch selects an auxiliary high level input for such as a tape recorder, with 28 dB of gain controlled by the tuner volume control, which feeds two pairs of outputs. These facilities also provide some flexibility for

possible future developments requiring additional circuitry, such as four channel broadcasting.

Adverse reception conditions will best demonstrate the FM-5's audio superiority. Urban users will applaud the achievement in multipath rejection. Broadcasting's common fault of overmodulation is easily accommodated, for the FM-5 can handle up to 200% modulation with low distortion. Superior rejection of the 67 kHz SCA subcarrier is coupled with frequency response far surpassing FCC broadcast standards.

The combination of extremely low distortion and low phase shift yield marked audio advantages. The obvious advantage of exceptional stereo separation at the extremes, as well as mid-band, is not half as significant as the low distortion even when out-of-phase stereo signals are measured. This is the worst case (we've never seen it in any listed specs) and it rarely exceeds 0.5% on the FM-5. It is one of the keys to exemplary performance in 4-Dimensional DYNAQUAD™ (or other matrix broadcast) reception.

The performance in fringe areas is unexcelled with 1.75 microvolts sensitivity, but more important, a steep quieting curve which achieves a 40 dB signal to noise ratio with only 2 microvolts input. Full limiting is reached with less than 10 microvolts.

The Dynaco tradition of sophisticated design simplicity is evident in the FM-5. Yet it includes a total of 3 FETs, 12 transistors, 8 integrated circuits, and 21 diodes. Two 4-pole ceramic filters in the IF are responsible for the tuner's sharp selectivity and virtually permanent alignment. All active circuitry is included on the two preassembled circuit boards which are in-circuit tested and aligned with the "front end" for each kit, assuring performance to all specifications after only 6 hours assembly, including its easy dial installation.

According to Stereo Review, "The Dynaco FM-5 is indeed one of the finest FM tuners available at any price. As for overall performance and sound quality, the first is the equal of any tuner we have used, and the second is entirely a function of the FM program quality."

SPECIFICATIONS

IHF Sensitivity: (noise and distortion —30dB @ 100% modulation): 1.75 μ v.
 Input required for 50 dB S/N @ 100% modulation: 5.0 μ v.
 Frequency Response before de-emphasis: 20 Hz to 52 kHz \pm 1 dB.
 Frequency Response in Stereo: 30 Hz to 15 kHz \pm 1 dB.
 Harmonic and Intermodulation Distortion at 100% modulation: Mono—0.5% (0.25% typical). Stereo—0.9% (0.5% typical).
 Capture Ratio: 1.5 dB.
 Output @ 100% modulation: 2 volts @ 1000 ohms output impedance.
 Ultimate Signal to Noise Ratio @ 100% modulation: 65 dB.
 Selectivity: (alternate channel): 65 dB.
 AM suppression: 58 dB.
 Stereo Separation: 40 dB @ 1000 Hz; 30 dB from 50 Hz to 10 kHz.
 19 kHz and 38 kHz subcarrier suppression: 50 dB minimum.
 67 kHz SCA subcarrier suppression: 80 dB minimum.
 Antenna input: 72 ohm balanced and 300 ohm unbalanced.
 Muting and Stereo switching threshold: 4 μ v.
 Dimensions: 13 1/2" x 9" x 4 1/4" high.
 Shipping Weight: 11 lbs.
 Power Consumption: 10 watts, 50/60 Hz, 100-120, 220-240 V AC.

PPM-5 PHONO PREAMP MODULE FOR FM-5

There is space on the inside back panel of the FM-5 to install a stereo phono preamp module to convert the auxiliary input to an RIAA equalized input for a magnetic phono cartridge. The PPM-5 includes integrated circuit operational amplifiers which provide 32 dB gain. The added gain of the new FM-5's audio amplifier yields an overall sensitivity of 2 millivolts for 2 volts output at 1000 ohms output impedance. Harmonic and IM distortion are below 0.05% with a 75 dB signal to noise ratio.

PAT-4 STEREO PREAMPLIFIER and CONTROL CENTER

A versatile control center of impeccable performance to suit the most demanding audiophile; yet designed for easy operation. As Stereo Review said, "In sonic quality we would unhesitatingly say that the Dynaco PAT-4 is unsurpassed by any preamplifier we have seen . . . a remarkable unit and unmatched at anywhere near its low price." More emphatic was the Stereophile: "(Sonically) we cannot see how any preamp, present or future, could surpass the PAT-4."

Almost unmeasurable noise and distortion with extremely wide frequency response defies comparison. Four Dynaco-designed tone controls allow continuous adjustment, but are truly "centered-flat". Front panel input and output facilitates tape recording (plus similar back panel connections) and also accommodates 600-2000 ohm high efficiency headphones. The "Special" high gain input provides optional equalization choices. Two pairs of back panel audio outputs. 8 silicon transistors and 2 diodes on two preassembled and pre-tested circuit boards enable 8 hour assembly with the assurance of meeting every specification.

SPECIFICATIONS

Frequency Response:
 High Level inputs \pm 0.5 db from 10 Hz to 100 kHz.
 Low Level inputs \pm 1 db from 20 Hz to 20 kHz (equalized).
 Distortion at rated 2 volt output:
 THD less than 0.05% 20 Hz to 20 kHz.
 IM less than 0.05% with any combination of test frequencies.
 Hum and Noise: Magnetic Phono: 70 db below a 10 mV input signal.
 High Level: 85 db below a 0.5 volt input signal.
 Gain: Magnetic Phono: 54 db at 1000 Hz (3 mV for 1.5 V out).
 High Level: \pm 16 db @ 50 Hz, \pm 12 db @ 10 kHz.
 Tone Control Range: \pm 16 db @ 50 Hz, \pm 12 db @ 10 kHz.
 Maximum Output: 10 V into high impedance
 5 V into 600 ohms.
 Impedances:
 Magnetic Phono: 47,000 ohms To Tape: from low level inputs,
 Tape Head: 100,000 ohms 600 ohms
 High Level: 100,000 ohms To Tape: from high level in-
 Audio Output: 600 ohms puts, same as source
 Amplifier Input: Nominal load 10,000 ohms or higher.
 Inputs: Low level or high level RIAA magnetic phono or ceramic phono; NAB 7 1/2" tape head; Special (normally microphone);
 Tape amplifier; Tuner; Spare high level; Front panel high level.
 Outputs: Tape output ahead of controls; 2 Audio outputs (one switched by front panel jack); Front panel output.
 Stereo-Mono switches: Provide A or B channels independently or combined (A+B) with 6 db blend, or stereo.
 Semiconductor Complement: 8 transistors; 2 diodes.
 Dimensions: 13 1/2" x 9" x 4 1/4" high. Shipping Weight: 10 lbs.
 Power Consumption: 5 watts, 50/60 Hz, 100-120, 220-240 V AC.



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STEREO 120 AND STEREO 80 POWER AMPLIFIERS

The Dynaco reputation for "state of the art" performance at realistic prices was built on, and has been sustained by its power amplifiers. It is likely that more Stereo 120s have been purchased than all other solid state stereo power amplifiers put together. In a field where fanfare accompanies new designs every year, only to see them vanish thereafter, the Stereo 120 is still going strong after 6 years.

Dynaco did not rush into transistorized designs. When it was introduced in 1966, the *Stereophile* magazine greeted the Stereo 120 with, "We are finally forced to do an about-face on our long-held conviction that transistor amps are not for the perfectionist. Not only does this one seem to have no sound of its own, it also makes most loudspeakers sound *better* than do tube amplifiers. This kind of performance, finally, justifies switching from tubes to transistors."

It would be presumptuous to expect that the Stereo 120 will have the 15-year demand which continues for Dynaco's famous Mark III. Solid state technology, being so new, moves too rapidly. The Stereo 120's history is however ample proof of the security of your investment.

The Stereo 80 employs almost identical audio circuitry and most of the same components with the exception of the Stereo 120's regulated power supply. With its simpler conventional power supply and lower operating voltages, the Stereo 80 gains an added measure of reliability, while the Stereo 120 has the advantage of 50% more continuous power. The music power ratings of the two amplifiers are the same.

The Stereo 120's electronically regulated power supply is a luxury rarely found in consumer equipment. Dynaco chose this course because it made possible the use at this power level of certain transistor types having superior audio performance characteristics. If a conventional power supply had been used for 120 watts power output, adequate safety margins would have required the use of higher power transistors which had inferior audio qualities.

Electronic regulation affords five advantages over conventional power supplies: 1) It assures that the Stereo 120 will meet its performance specifications over a wide range of line voltages; 2) It protects the amplifier from damaging AC line transients; 3) It maintains the prescribed operating margins to assure long term transistor life; 4) It provides a "clean" overload characteristic; 5) It avoids transient distortion caused by changing operating parameters when the supply voltages change under heavy current demands—a major benefit of pure Class A operation, while preserving the efficiency and cool operation of the Class B mode.

To protect both the supply and the speaker load

from damage that could result from excessive current, a novel circuit switches the supply from a fully regulated, low impedance source to a de-regulated, high impedance one when a predetermined maximum current is reached. Other circuits protect against the sharp "thump" at turn-on in many designs, and also prevent turn-on if the input signal is so high that loudspeaker damage may result.

The power amplifier modules of both the Stereo 80 and Stereo 120 include their own protective circuits which are designed to reduce—not just limit—the current through the output stage when there is any tendency to exceed a reference limit as a result of excessive drive signals or heavy loads. This protects both the loudspeaker and the output transistors.

The unique biasing system used in both amplifiers sharply reduces the inherent non-linearities of their transistors, and markedly drops distortion at low power without any need for periodic adjustments. The output transistors are operated without quiescent current and without the consequent heat rise caused by the bias current, to eliminate the need for temperature compensating devices. However, there are no signs of any "Class B notch" commonly attributed to a lack of bias current. The biasing arrangement is an integral part of the automatic electronic protection circuit.

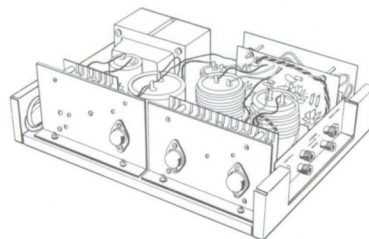
The highly reproducible circuits developed for these amplifiers have made them particularly suitable as kits. Preassembled circuit boards and modular construction in an open, uncluttered layout make assembly a matter of perhaps 5 hours. Stable circuits with DC feedback control of transistor characteristics enable a consistent level of operation over a wide range of devices. The output sections use series-connected push-pull transistors driven by a direct coupled complementary symmetry driver with automatic bias adjustment, and containing its own DC feedback connection to stabilize the operating characteristics. Only silicon transistors are used. The Stereo 80 employs 5000 mfd output coupling capacitors in each channel to assure loudspeaker protection with superior low frequency performance. The Stereo 120 includes its 3300 mfd couplers within the feedback loop, thus greatly increasing their apparent size.

Both amplifiers are considered unconditionally stable with all loudspeaker loads, including electrostatic types. Years ago Dynaco was one of the very first to identify and satisfy this question of amplifier-speaker interrelation, and the matter of absolute amplifier stability is a paramount consideration in the design of every Dynaco amplifier.

The detailed specifications attempt to define the outstanding performance capabilities of these amplifiers. But these specifications—impressive as they are—are not alone sufficient to assure the natural and effortless sound quality which has characterized every Dynaco product. Many transistor amplifiers have a distinctive sound characteristic which is the result of subtle forms of distortion, even where the total distortion content appears low. A specification of total harmonic distortion (THD) does not, for example, identify the proportion of higher order (especially odd order) harmonics which we believe have an inordinate effect on sonic quality.

Conscious of this, Dynaco designs have sought to eliminate or minimize many of the customary transient and non-linear distortions which have been prevalent in less sophisticated solid state equipment. As High Fidelity

magazine reported, "(The Stereo 120) is utterly uncolored and neutral; its ability to drive any speaker system self-evident. Truly, another 'amplifier great' and at a very reasonable price on today's market."



STEREO 120 SPECIFICATIONS

Harmonic Distortion: Less than 0.5% at any power level up to 60 watts rms per channel into 8 ohms at any frequency between 20 Hz and 20 kHz; both channels operated with out-of-phase signals. Distortion reduces at lower power levels.

Intermodulation Distortion: Less than 0.5% at any power level up to 60 watts rms per channel into 8 ohms with any combination of test frequencies. Distortion reduces at lower power levels.

½% Power Bandwidth (IHF): 5 Hz to 50 kHz half power output at less than 0.5% total harmonic distortion into an 8 ohm load.

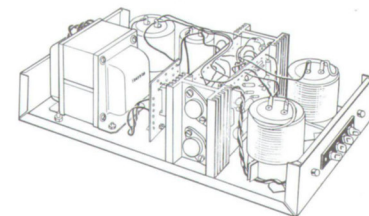
Clipping Point at 1000 Hz, one channel only: 60 watts rms minimum at 8 and 4 ohms; 35 watts rms minimum at 16 ohms.

Noise: 95 db below rated output unweighted with shorted input; 100 db down by IHF standards.

Separation: In excess of 70 db from 20 Hz to 20 kHz.
Input: 100,000 ohms; 1.5 volts for 60 watts rms output.
Semiconductor Complement: 15 diodes, 15 transistors.
Dimensions: 13" x 10½" x 4" high.
Shipping Weight: 20 lbs.

Power Consumption: 35 watts quiescent; 400 watts maximum, 50/60 Hz, 100-120 or 220-240V AC.

STEREO 120



STEREO 80 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 test frequencies. Distortion reduces at lower power levels.

½% Power Bandwidth (IHF): 8 Hz to 50 kHz half power output 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.

Noise: Better than 90 db below rated output.
Separation: In excess of 60 db from 20 Hz to 20 kHz.
Input: 100,000 ohms; 1.3 volts for 40 watts rms output.
Semiconductor Complement: 12 transistors, 10 diodes.
Dimensions: 14" x 8" x 4" high.
Shipping Weight: 13 lbs.

Power Consumption: 35 watts quiescent; 250 watts maximum, 50/60 Hz, 100, 120, 220 or 240V AC.

STEREO 80



NEW STEREO 400 HIGH POWER AMPLIFIER

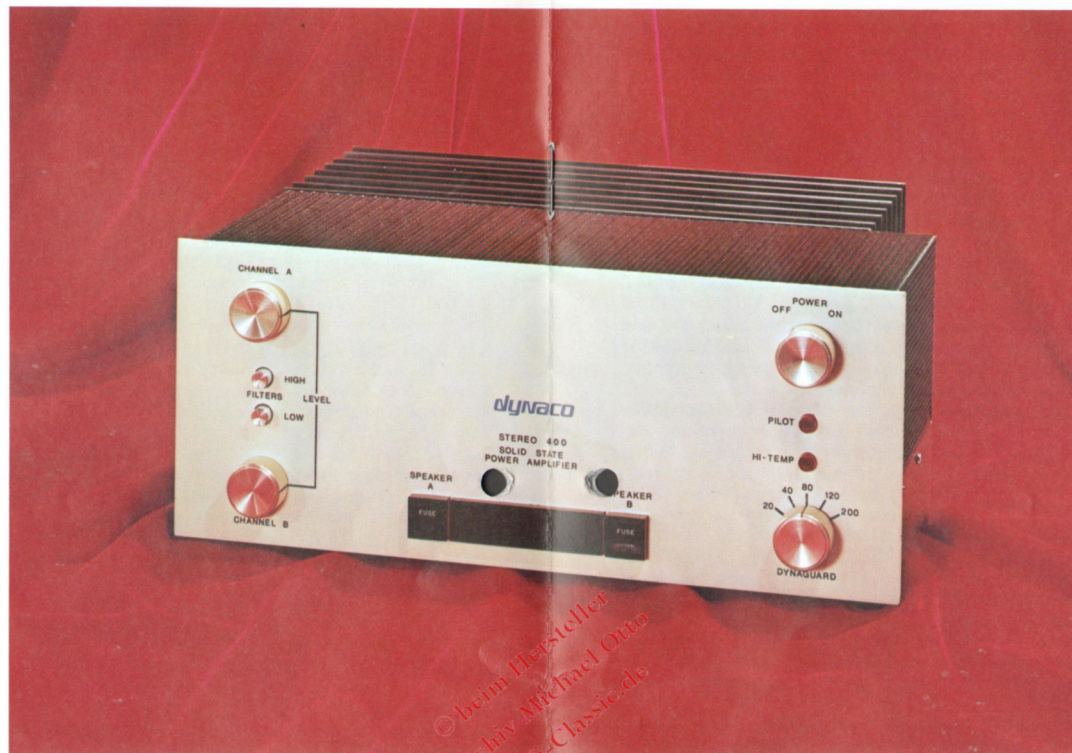
This new 400 watt power amplifier affirms the traditional Dynaco philosophy of offering a new product only when new engineering concepts achieve superior performance at modest cost. The audio quality of the Stereo 400 has been approached by only one or two amplifiers of far higher price. This new amplifier surpasses them with a number of unique advantages for the serious audiophile and for the professional musician, as well as in public address and laboratory usage.

The Stereo 400 sets new standards for conservative operation, stability with varying loads, protection of the amplifier and of the speaker, and low distortion. Your first glance will note its mammoth heat sink—4 times the size of similar amplifiers—over 1000 square inches of cooling surface—which enables continuous duty operation up to full power output without external cooling. But Dynaco goes beyond that to include provision for mounting a standard "whisper fan" on the chassis for safe operating margins in restricted environments, or for severe service applications.

Notable among new circuit techniques is the exclusive DYNAGUARD™ protection circuit—an adjustable dynamic power limiter to protect the loudspeaker. At any selected power setting the amplifier's full output capability is available for short term transient wave forms, but steady state output above the selected level is clamped. Unlike conventional "clipping" circuits which simply reduce power output to a fraction of what you've paid for, or compressor circuits which reduce the dynamic range, DYNAGUARD™ delivers the superior sonic quality of a high power amplifier with the safety of more conservative levels.

Absolute stability when driving any conceivable loudspeaker load was a basic design requirement, and Dynaco believes this has been achieved to a degree never before realized. One clearly audible benefit is the consummate delineation of sonic detail conveyed by this amplifier. The rated distortion specifications inadequately express the Stereo 400's ability to reveal nuances of complex musical passages through the most definitive of loudspeakers. Further, individual units have demonstrated distortion figures an order of magnitude better than (1/10) specification, so Dynaco's reputation for meeting conservative specifications is clearly upheld.

Low distortion at high power has never been a problem for good solid state amplifiers, but assuring that the distortion remains at vanishingly low values at fractional-watt power levels is the key to extraordinary performance. At levels up to several watts the Stereo 400 operates in Class A, thereby eliminating any sign of "crossover notch" distortion. Coupled with this is a unique IC-controlled DYNABIAS™ circuit—a voltage regulator with gain—which monitors the temperature



of the heat sink and tracks the quiescent current of the output stage. This assures thermal stability with corresponding maintenance of notch-free operation, even with wide variations in transistor characteristics.

When extremely high power is a requirement, an internal switch permits bridging the full complementary symmetry outputs and the inputs together to provide monophonic operation at similar specifications with 600 watts rms into 8 ohms. This output is suitable for directly driving distribution systems having a nominal 70 volt line.

Level controls are not normally included on Dynaco power amplifiers because their conventional application has an adverse effect on performance. Amplifiers with level controls normally meet specifications only when the controls are out of the circuit. Not so with the Stereo 400—they have no effect on performance below 100 kHz. And, uniquely for a solid state power amplifier, the input impedance is 500,000 ohms—suitable for any input.

Because high power amplifiers carry added risk of damage to the speaker from supersonic interference or subsonic noise effects, two front panel push button switches insert a Gaussian 12 dB per octave 50 Hz high pass filter or a linear phase 12 dB per octave 15 kHz roll off, assuring minimum deformation of audio signals.

In addition to DYNAGUARD™, a number of protection techniques ensure virtually complete loudspeaker and amplifier safety in normal operation. A time-delay circuit eliminates any possibility of the turn-on thump common in other very high power amplifiers. Relay circuits instantaneously disconnect the speakers during operation in the event of any DC abnormalities, and the speakers will remain disconnected until the cause is corrected. The DC protection circuit will not allow the load to be connected if any DC is present at the output of the amplifier at turn-on. It also provides clean shut-off without decaying transients. It affords considerable protection as well against the all-too-common hazards of inferior tuner muting circuits, the tendency to "flick" a stylus clean with the finger, or accidentally dropping a stylus onto the record. Such disasters powering a brute amplifier have been responsible for the sudden demise of many a speaker. The circuit also provides volt-amp limiting for reactive or low impedance loads.

The availability of front panel fuses for each output enable the user to limit maximum power capability. Dynaco has avoided speaker fuses in the past because routine applications could have adverse effects on distortion or amplifier damping of the loudspeaker. A novel arrangement in the Stereo 400 avoids any such possibilities.

Concern for amplifier longevity has been of paramount importance in this design. Conservative rating of components based on known stress factors, together with new circuit techniques, in-circuit testing of all circuit boards and transistors, plus extraordinary thermal dissipation capability, amply demonstrate the Stereo 400's intended reputation as the most reliable solid state amplifier. Dissipation limiting, volt-amp limiting, thermal overload protection with a front panel indicator light in the event of shut-down, and separate B+ fuses are in addition to the primary circuit breaker. A heavy duty power switch is provided on the front panel, for the power switching facility of most preamplifiers cannot long endure the demands of high power amplifiers.

An alternative front panel providing two output power meters and necessary related switching will be available as an extra cost accessory. These meters, in contrast to the typical VU type meters generally used (which are really more ornamental than informative), actually measure the power into the load rather than the output voltage. This is particularly significant in view of the wide impedance variations throughout the useful range of most loudspeakers.

While not a kit project for the novice, typical Dynaco thoroughness and completely proofed circuit modules make the Stereo 400 a surprisingly uncomplicated kit for the dedicated hobbyist. This amplifier is the culmination of extensive Dynaco research leading to what we believe will become recognized as the cleanest-sounding, most reliable high power solid state amplifier available. Expected Dynaco value is evident in its remarkably reasonable cost per watt.

SPECIFICATIONS:

Power Output: 200 watts rms per channel @ 8 ohms.
300 watts rms per channel @ 4 ohms.
600 watts rms monophonically @ 8 ohms.
Continuous duty, 20 Hz—20 kHz, both channels driven.
Intermodulation Distortion: Less than 0.1% at any power level up to 200 watts rms per channel into 8 ohms with any combination of test frequencies. Distortion reduces at lower power levels.
Harmonic Distortion: Less than 0.25% at any power level up to 200 watts rms per channel into 8 ohms at any frequency between 20 Hz and 20 kHz, with both channels driven. Distortion reduces at lower power levels.
Frequency Response: +0, -1 dB, 10 Hz—50 kHz @ 1 watt into 8 ohms.
Frequency Response at rated power: ±0.25 dB, 20 Hz—20 kHz at 200 watts into 8 ohms.
Hum and Noise: 106 dB below rated output.
Less than 8 μv equivalent noise input unweighted, shorted input.
Sensitivity: 1.6 volts rms for 200 watts into 8 ohms.
Input Impedance: 500,000 ohms.
Slewing Rate: 20 volts per microsecond.
Filters: -3 dB @ 50 Hz; -3 dB @ 15 kHz. Switchable.
Dynaguard™ Protection Circuit: Dynamic power limiter to adjust total power delivered to the load under steady state conditions. Operates independently on each channel. Graduated power/time relationship regulates duration of permissible signal above selected power limit as a function of the percentage of overdrive. Provides up to 10 second total envelope delay. Zero breathing effect. No change from rated distortion or frequency response.
Connectors: Inputs: Phono jacks.
Outputs: 3-way binding posts with 3/4" spacing.
Dimensions: 16 1/2" x 14" deep x 7" high.
Shipping Weight: 65 lbs.
Power Consumption: 75 watts quiescent; 1100 watts maximum; 50/60 Hz, 100-120, 220-240 V AC.

VACUUM TUBE AMPLIFIERS

Hundreds of thousands of Dynaco tube amplifiers and preamplifiers are in use around the globe. It is probable that more music systems include the PAS preamplifier and Stereo 70 power amplifier than any other combination. With generous operating margins, and sufficient power for the popular speaker systems to meet most listeners' needs, the Stereo 70 has made audio history. As High Fidelity magazine summed up its 1959 test report, "This amplifier's components are operated more conservatively than those in any other commercial amplifier we have tested. . . Its power and distortion ratings are completely conservative. Its listening quality is unsurpassed." You can build it in 5 hours.

The PAS series of preamplifiers demonstrates flawless performance, high gain, infinitesimal noise and unmeasurable distortion, coupled with utmost simplicity for easy assembly in just 8 hours. With 60 dB of gain, the phono input requires only 2 mv for rated output, yet it can accept up to 250 mv with low distortion—unprecedented range. So conservative is the PAS design that tube replacement is rare, even in ten year old units.

The SCA-35 control amplifier cannot be matched by any transistor design on a performance versus cost basis. Though its power rating is modest, it delivers this across the audible band—not just at mid-frequencies. As High Fidelity magazine said in 1964, "A kit-built version of the SCA-35 proved to be an outstanding performer among low-power amplifiers. The power bandwidth, for rated harmonic distortion, extended from 18 Hz to 30,000 Hz—which would be excellent for any amplifier, and is somewhat remarkable for a unit as compact and low-cost as this one. . . It is, in a word, an excellent amplifier—especially so in view of its cost." Joseph Marshall concluded in the 1964 Hi Fi Tape Systems Annual, "The SCA-35 is the finest low powered amplifier on the market." Assembly takes 12 hours.

Where high sustained power levels and peak energy low frequency transients are common, tube amplifiers have won renewed interest. The Mark III 60 watt monophonic power amplifier is currently the most popular of Dynaco's tube units by a wide margin, though its design is unchanged in 15 years. It is most sought by professional musicians who need pure power in a guitar amplifier with absolute reliability under abusive operating conditions. Hundreds of others are in production line testing facilities of many loudspeaker manufacturers. The Mark III is often specified for sound distribution, public address, industrial and laboratory applications. To meet these specialized requirements, two additional models are available. The Mark III-70 provides a 70 volt line output, plus the usual 4, 8 and 16 ohm connections. The Mark III-500 provides either 500 ohm or 125 ohm balanced or unbalanced outputs. Any can be built in just 3 hours.

Tube amplifiers are preferred in severe service applications where minimal down time is an important consideration and where even short term equipment failure must be avoided. Tube designs are capable of withstanding most types of user and signal abuse which can cause transistor failure. Solid state equipment, for all its advantages, must rely on elaborate protective circuitry to forestall an innate tendency toward self-destruction with excessive signals. Tubes rarely fail instantaneously, but instead give adequate warning of impending breakdown. The majority of such repairs can be made in the field by replacing tubes—an unlikely practice with most high quality solid state amplifiers, whose transistors have been meticulously selected.

Tubes are relatively unaffected by high ambient temperatures, where transistors must be de-rated as their temperature rises. For similarly rated amplifiers operating above 40% of rated power, solid state units typically generate as much heat as tube designs, so heat dissipation and ventilation is important. The output transformers in tube amplifiers have the added benefit of providing the same power at different load impedances, gaining a power advantage at 16 ohms and safer operation at low impedances, compared with the typical 8 ohm load to which transistor amplifiers are matched.

MARK III SPECIFICATIONS

Power Output: 60 watts rms @ 1000 Hz at 4, 8 or 16 ohms. Within 1 dB of full power 20 Hz—20 kHz.
Harmonic and IM Distortion: Under 1% at rated output; under 0.05% at 1 watt.
Frequency Response: ±0.5 dB from 6 Hz to 60 kHz.
Hum and Noise: More than 90 dB below 60 watts.
Input Sensitivity: 1.6 V for 60 watts.
Damping Factor: 15.
Tubes and semiconductor complement: 6550 (2); 6AN8; GZ-34; selenium rectifier.
Dimensions: 9" x 9" x 7" high. **Shipping Weight:** 28 lbs.
Power Consumption: 150 watts @ 120 V, 50/60 Hz AC.

MARK III

MARK III-70

MARK III-500

STEREO 70 SPECIFICATIONS

Power Output: 70 watts rms (both channels driven) @ 1000 Hz to 4, 8 or 16 ohms. Within 1 dB of full power 20 Hz—20 kHz, both channels driven. 35 watts rms each channel 20 Hz—20 kHz.
Harmonic and IM Distortion: Under 1% at rated output; under 0.05% at 1 watt.
Hum and Noise: More than 90 dB below 35 watts on each channel.
Frequency Response: ±0.5 dB from 10 Hz to 40 kHz.
Input Impedance: 500,000 ohms.
Input Sensitivity: 1.3 V for 35 watts output.
Damping Factor: 15.
Tubes and Semiconductor Complement: EL-34 (4), 7199 (2), GZ-34; selenium rectifier.
Dimensions: 13" x 9 1/2" x 6 1/2" high. **Shipping Weight:** 32 lbs.
Power Consumption: 190 watts @ 120 V, 50/60 Hz AC.

STEREO 70

The Mark III and Stereo 70 amplifiers require a simple meter adjustment on completion to assure proper operation. Dynaco's patented Biaset™ makes this setting independent of meter inconsistencies.

ALL TUBE UNITS ARE AVAILABLE WITH DUAL VOLTAGE POWER TRANSFORMER FOR 120/240 VOLT, 50/60 Hz AC LINES ON SPECIAL ORDER AT \$5 ADDITIONAL COST.

SCA-35 SPECIFICATIONS

Power Output: 35 watts rms (both channels driven) at 1000 Hz; 28 watts rms (both channels driven) 20 Hz—20 kHz. Either channel alone 17.5W rms 20 Hz—20 kHz.
Distortion: Harmonic distortion under 1% at rated output. Intermodulation distortion under 1% at rated output. Both Harmonic and IM distortion decrease as power is decreased; below 0.2% at average listening levels.
Frequency Response: ±0.25 db from 20 Hz to 20 kHz.
Tone controls: ±12 db at 50 Hz and 15 kHz.
Input signal required for rated output at 1 kHz: 4 mV magnetic phono; 2.5 mV tape head; 1 V high level inputs.
Hum and Noise: 70 db below 10 mV on low level inputs; 80 db down on high level inputs.
Rear panel inputs: RIAA magnetic phono (high and low level); NAB 7 1/2" tape head; Radio, Tape and Spare.
Rear panel outputs: 8 and 16 ohm speaker; tape output (unaffected by balance, tone and volume controls); center channel output (no auxiliary amplifier needed); provision for headphone connection; two AC convenience outlets.
Rear panel controls: Dual hum balancing pots.
Tube and semiconductor complement: 12AX7 (2); 7199 (2); 6BQ5 (4); 2 silicon diodes.
Dimensions: 13 1/2" x 10 1/2" x 4 1/4" high. **Shipping Weight:** 20 lbs.
Power Consumption: 100 watts @ 120 V, 50/60 Hz.

SCA-35

PAS-3X SPECIFICATIONS

Frequency Response: High Level inputs: ±0.5 db from 10 Hz to 40 kHz. Low level inputs ±1 db from 20 Hz to 20 kHz (equalized).
Distortion at rated 2 volt output: Harmonic distortion: unmeasurable. IM less than 0.05%.
Hum and noise: Magnetic phono: 74 db below level of 30 mV cartridge. High level: 85 db below a 0.5 volt input signal.
Tone Control Range: ±20 db at 20 Hz, ±14 db at 20 kHz.
Maximum output: 10 Volts into 100,000 ohms or higher.
Phono overload: in excess of 250 mV.
Impedances: Magnetic phono input: 47,000 ohms. Tape Head input: 47,000 ohms. High level input: 250,000 ohms. Audio output: 1,000 ohms. Tape output: from low level, 47,000 ohms; from high level, same as source. Nominal amplifier input load 100,000 ohms or higher.
Rear panel inputs: RIAA phono, NAB 7 1/2" tape head. "Special" (optional second phono, second tape head, or microphone), FM multiplex, FM-AM, Tape, Spare.
Rear Panel Outputs: Audio output to power amplifier; Tape output. **Tubes and semiconductors:** 12AX7 (4), 12X4; selenium rectifier.
Dimensions: 13 1/2" x 9" x 4 1/4" high. **Shipping Weight:** 11 lbs.
Power Consumption: 30 watts @ 120V, 50/60 Hz AC.

PAS-3X



MARK III



SCA-35



STEREO 70



PAS-3X

APERIODIC LOUDSPEAKER SYSTEMS A-10, A-25, A-35 and A-50

Since the introduction of the first Dynaco A-25 loudspeaker at the end of 1968, enthusiastic consumer acceptance has pushed it rapidly to the front rank of speaker popularity, both in the United States and overseas. All of the Dynaco loudspeaker systems are renowned for clarity, smoothness, precision, and above all, **value**. In contrast to some loudspeaker lines which seem intent on producing a different sound from each model, the sonic qualities of all Dynaco speakers differ only in detail.

Since the design intent was literal translation of the original performance, or verbatim reproduction, we considered it a challenge successfully met in accomplishing meaningful refinements rather than notable variations in successively larger systems. In fact, the casual listener may at first perceive no differences at moderate sound levels. You will find that the little A-10 delivers unexpectedly "big sound". At the other extreme, the A-50 can accommodate larger amounts of low end power with low distortion and crisp definition heretofore unattainable in an enclosure of such compact dimensions.

For sheer value, however, the A-25 is clearly the winner. It demands comparison with speakers two and three times its cost. It was introduced when Dynaco felt it had achieved a sonic balance which fulfilled most listening requirements in a true bookshelf size at less than \$80. How well we succeeded is indicated by Gordon Holt's statement in the *Stereophile* magazine, "You'll have a hard time buying more musical naturalness at any price . . . (the A-25s) are quite probably the best buy in high fidelity today", and as Julian Hirsch commented in *Stereo Review*, "When the music contained low bass . . . the Dynaco (A-25) left no doubt of its capabilities . . . Nothing we have tested had a better overall transient response." *Audio Magazine* echoed, "The A-25 produced the finest tone-burst response of any speaker tested in this manner, regardless of price."

The new A-35 is a sonic refinement of the A-25 with a different crossover in a more complex cabinet design which wrings the last iota of performance from a moderately larger and more expensive system. The result is subtly smoother, wider range, and more articulate,

seamless sound which begs comparison with larger, far more costly systems.

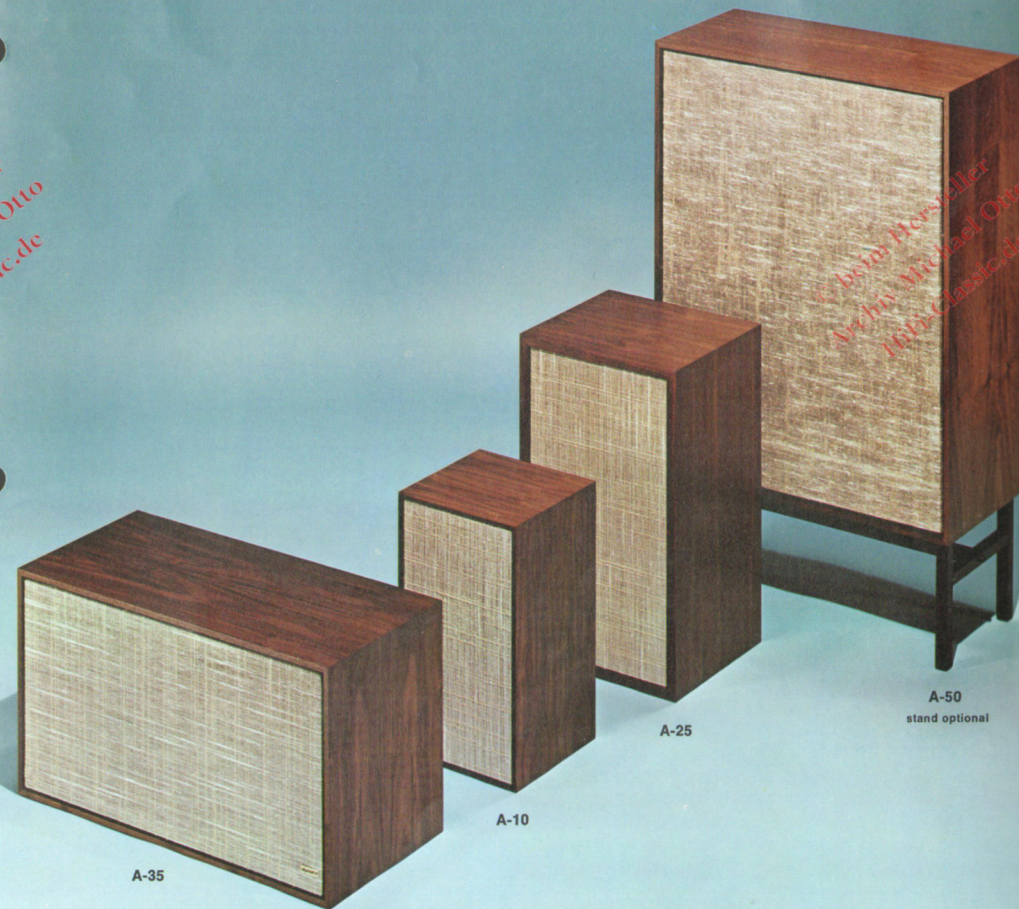
You will most appreciate the articulate imaging of the A-35 when comparing it to systems of other design, and even against the phenomenal A-25. On continued listening, its tighter, better defined bass will reveal its authenticity. Careful tailoring and balancing of the drivers with the crossover yield nearly perfect transition of woofer and tweeter in the crucial midrange. The resulting sonic unity is the key to the A-35's unquestioned resolution of detail.

The development of the A-10 was spurred by the need for a high quality, compact and low cost full range speaker system to function harmoniously as back speakers in four channel and 4-Dimensional playback. The A-10's sonic success has secured for it unexpected acceptance as a primary speaker system on its own merits. As *Stereo Review* put it, "Its wide dispersion and tonal balance are such that it *sounds* big, and a blindfolded listener would never suspect that he is listening to a speaker system of sub-compact size and price."

The drivers (the actual speaker elements) in all the Dynaco speakers are similar. They differ only in detail. Not only does the A-10 use the same tweeter as the A-25, but it employs the same woofer magnet structure as well, driving the smaller cone. And both aperiodically vent the woofer compartment externally. Thus, except for the last half octave of bass, these speakers are remarkably similar.

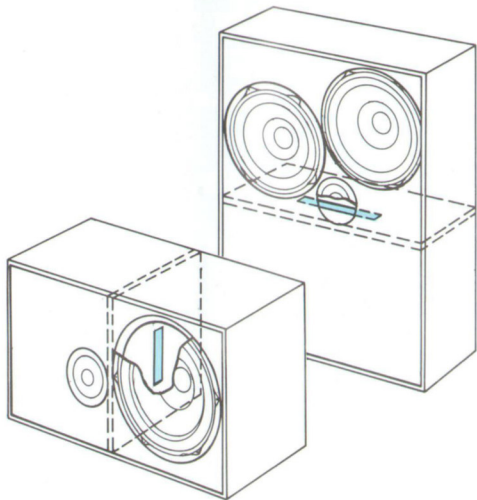
The A-35 and A-50 use the same tweeter and comparable 10" woofers in an exclusive double compartment cabinet design which places the woofer(s) in one section which is internally vented to the other half. The result is a sealed system embodying the patented **aperiodic** design virtue of variable volume action for critical damping at resonance, plus the benefits of a larger sealed enclosure for minimum distortion at the lowest frequencies. The result of this "dual spectrum damping" is, as Norman Eisenberg wrote in *High Fidelity* magazine, ". . . We soon found ourselves . . . listening to the program material rather than to the equipment".

THE DEEPEST BASS The magnificent A-50
THE MOST ACCURATE The new A-35
THE GREATEST VALUE The popular A-25
THE BEST BUY The little A-10



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reproduced by different drivers. While the ideal reproducer would be a unified source, physical limitations preclude this in practical systems. Dynaco has stressed the careful tailoring of its drivers for specific integral roll-off characteristics to eliminate the need for complex crossover networks, to assure a smooth blending through the critical mid-range, and to minimize both time-delay and phase distortion.

The choice of a single wide-range tweeter, which has sufficient power handling capability, provides greater sonic homogeneity and improved dispersion with minimal interference effects. It contributes to the "big sound" and excellent stereo imaging of these speakers. The 1½ inch tweeter is a non-rigid dome, specially designed to reduce cavity resonance effects. Its remarkable freedom from aberrations contributes in large measure to the smoothness and precise delineation of subtle orchestral nuances so often used to describe the sonic character of these speakers. Women, who often have more sensitivity to high frequency distortion than men, will note that this clarity has been achieved without the offensive stridency or harshness which accompanies exaggerated midrange or treble characteristics.

Extensive investigation established that the 10 inch woofer diameter affords the optimum combination of low frequency generating capability, low moving mass, and adequate structural rigidity to rule out the adverse effects of cone breakup for a smoother midrange. The A-50's dual woofers provide ½ more radiating area than a 12 inch cone for a deeper low end with superior transient response and greater power handling capacity.

All Dynaco speaker systems have an 8 ohm nominal impedance (minimum 7 ohms) which permits pairs to be connected in parallel if desired. All have similar efficiency, and are uniquely interchangeable in stereo systems to assure optimal directional integrity. All are supplied with beige linen grille cloth, and the A-25, A-35 and A-50 include a 5-position high frequency level control, and professional 3-way binding posts. The A-10, A25 and A-35 include concealed hangers for flush mounting on the wall. An optional 8 inch high stand is available for the A-50 for \$7.95 postpaid direct from Dynaco. The A-50's shallow depth affords a unique opportunity for a system of its size and capability to be installed in room dividers, or flush mounted in normal bookshelf depths.

All of the Dynaco speakers will usually be found to yield the most realistic reproduction when they are mounted near ear level in most rooms. There is rarely any need for bass reinforcement achieved by setting the speaker directly on the floor, or moving it to a corner. Such placement will adversely affect the balance in most instances. Where the opportunity avails, placement above ear level is often preferred.

Dynaco's success 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-35	A-50
Rated Impedance	8 ohms	8 ohms	8 ohms	8 ohms
Power rating range suggested for associated amplifiers (rms watts per channel)	15-50	20-60	20-60	25-100
Tweeter	1½"	1½"	1½"	1½"
Woofer	6.5"	10"	10"	(2) 10"
Crossover frequency	2500 Hz	1500 Hz	1200 Hz	1000 Hz
High frequency level positions	1	5	5	5
Replaceable grille	no	no	yes	yes
Dimensions	8½" x 15" x 8" deep	11½" x 20" x 10" deep	12½" x 22½" x 10" deep	21½" x 28" x 10" deep
Shipping weight	30 lbs./pair as pairs only	24 lbs.	30 lbs.	47 lbs.

The Dynaco patented **aperiodic** (essentially non-resonant) design affords marked control of the wide impedance variations common in all dynamic speakers near their resonant frequency. Here the impedance variation in Dynaco speakers is 2:1 or less, contrasted with 400% or greater variations in most similar systems. Dynaco speakers thus not only have smoother response, but also more efficient amplifier power transfer characteristics as well, since the amplifier is working into a more nearly resistive—and more linear—load. Thus in comparison with a conventional speaker of the same efficiency, the Dynaco design could yield higher sound levels before amplifier overload occurs.

In each Dynaco speaker system, the aperiodic design utilizes a highly damped vent (not a reflex port) whose acoustical resistance is very carefully controlled. This lowers the "Q" of the system through a high friction venting action. The venting system is critically adjusted while observing the back EMF of a 5 Hz square wave source. The damping material which forms the acoustical resistance is altered until an optimum square wave is visualized. Although no speaker system 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 within the normal audio spectrum. It is the reduction of such spurious responses that yields the precise bass of the Dynaco speakers. The listening result of the aperiodic design is better control of bass and improved transient response, and also alleviation of the problems which can cause Doppler distortion effects as well.

All Dynaco speaker systems are specifically engineered as 2-way systems (the A-50 employs two identical woofers) to avoid the problems introduced by elaborate crossover networks, and to minimize the inevitable differences when the same frequencies are



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OF COURSE YOU CAN BUILD A DYNAKIT!

In 1955 the first Dynakit Mark II opened a new era in low cost high performance audio for the hobbyist. And, it initiated the concept of preassembled etched circuit modules as the heart of successful kit designs. Supplying most of the circuitry prewired and tested assured consistent reproducibility, easy assembly, and compact, uncluttered designs with high reliability. Hundreds of thousands of Dynakits, including many Mark IIs still in use today, are ample evidence that successful kit building requires no special skills or knowledge.



The only tools needed to assemble a Dynakit are a 50 watt pencil soldering iron, rosin core solder, long nose side cutting pliers, and a screwdriver.

Reasonable familiarity with common hand tools, an appreciation of the importance of a good solder connection and how it is made (each manual describes the procedure in detail), and a willingness to follow instructions are your keys to success. Step-by-step instructions which are geared to the novice rather than to the technician, coupled with detailed pictorial diagrams which permit tracing every step against the completed layout, have enabled teenagers, secretaries and housewives, as well as doctors and electronic technicians to complete thousands of Dynakits without error.

All of the semi-conductors (transistors, diodes and integrated circuits) on the circuit boards in every solid state Dynakit are checked under actual operating conditions before they are packed. Only the interconnection of the circuit boards to the controls, switches and other major components is left to the builder after mechanical assembly. None of the solid state units require any adjustment or any instrumentation upon completion.

Most Dynakits can be built in one or two long evenings unless this is your first kit. We don't stress the short time involved (experienced technicians often find they require far less time than our estimates) because it is more important that you do the job carefully. However, if you have yet to build your first kit, you will find that power amplifiers and tuners will seem less complicated than preamplifiers or control amplifiers.

If you have built other brands of kits, you may be surprised at Dynakit simplicity, where the typical manual is under 24 pages, and less than half of that is actual construction steps. If you are still uncertain, ask your dealer to lift the cover of his demonstrator or show you the instruction manual for a kit. Or, send \$1.50 to Dynaco for any manual. The manual not only provides detailed operating instructions and background information, but it also includes a schematic diagram and service information to aid the technician, as well as trouble-shooting information which often enables the builder to bail himself out of minor difficulties.

In addition, Dynaco maintains a technical service department to aid you in getting the most from your equipment, and tries to help you solve problems by mail or phone.

Enthusiastic kit builders point with pride to their own handiwork, prove to themselves how easy Dynakits are to build, and savor the significant savings. But the really important point is that, once properly assembled, a Dynakit provides sonic quality which cannot be excelled at any cost.

CHOOSING YOUR MUSIC SYSTEM

If you are new to high fidelity componentry, bewildering arrays of models, specifications and prices confront you. Properly presented and interpreted specs can be your best guide, but they are meaningful only if they afford a true basis of comparison and if they enable evaluation of the performance in ways important to your use.

Dynaco engineers have devoted much time and effort to defining and improving those factors which correlate with reproduction quality. We attempt to provide detailed, comprehensive specs on all our equipment, but without the certainty that you can compare ours with others which may be differently presented, the best advice is to "ask the man who owns one". Some suggestions may aid your understanding of the specs, however.

Power output is the primary criteria for evaluating amplifiers. Be sure you compare all power ratings on the same steady-state (rms) power per channel basis. This should be specified as a function of frequency bandwidth (not just a single figure at mid-band), distortion (some transistor amps have much higher distortion at low powers) and 8 ohm speaker impedance. Other factors affecting listening are noise level, transient response, power supply regulation, and the stability factor when driving complex speaker loads. Because solid state amplifiers are more susceptible than tube designs to damage through abuse or mis-use, effectiveness of the protection circuits in the amplifier and for the speaker is important.

Sensitivity is commonly regarded as the most significant tuner specification, but it is really well down the list in most listening situations. More important is the signal level required for "full limiting" (the tuner's best reception capability), and such factors as selectivity, multipath (AM) rejection, and 67kHz SCA rejection. The distortion in stereo determines the reception quality of most signals (only mono distortion, which is invariably far lower, is included in present industry standards),

and matrixed 4 channel reception is affected by the distortion of out-of-phase signals, which can be far worse. The ability to accommodate overmodulated signals can make a noticeable difference on some broadcasts. Even more significant is the consistency with which normal tuning can obtain the signal with the lowest possible distortion.

There are no American standards for measuring loudspeakers. Speaker performance is highly dependent on the environment, and qualitative evaluations require a composite body of tests plus listening comparisons under identical conditions. In this most subjective of audio performance evaluations, certain criteria seem consistently appropriate when the intent is (at least at Dynaco) accurate reproduction of the original. Dynaco speakers are designed to provide the optimum balance of the factors we believe most govern verbatim reproduction: wide, but more significantly smooth frequency response, good transient response, uniform dispersion, precise driver blending, and low Doppler distortion.

Judge speakers in a room similar to your own if possible. Use program material you are familiar with, and adjust the volume control for identical sound level from different speakers. A critical test is listening to a solo human voice. Can you close your eyes and believe the person is in the same room? Be wary of any speaker which sounds markedly different, whether brilliant, very "forward", bass-heavy (or shy), or one which lacks the precise instrument definition and placement that some will provide.

Compare tuners on the same antenna, under the most difficult reception conditions. Remember, that the selection of a good antenna will yield far more striking benefits in good reception than can be achieved by doubling or quadrupling the cost of a good tuner.

Measure Dynaco performance against the most expensive alternatives. We use the same standards for everything we make, differing only in power output or versatility. Evaluate our amplifiers on the most costly loudspeakers as well as with our own. Listen to our speakers using the most expensive high power amplifiers, and then try a Dynakit. In that way you can be sure you've avoided extraneous limitations.

WALNUT ENCLOSURES

Although all Dynakits are supplied complete with metal covers, we have acceded to numerous requests and offer decorative furniture finish oiled walnut cabinets for all current solid state and tube type "face plate" units, as well as the earlier FM-3 tube tuner. Double stacked versions are offered so that typical Dynaco value lets one cabinet do the work of two. The short ones are for units which do not require ventilation. The lower unit in double cabinets must be one which does not require ventilation. Our tests show that our tube models have minimal added temperature rise in the vented cabinets in normal use, provided they are functioning properly and air circulation is unimpeded.

CAB-1S Single short cabinet fits PAT-4, FM-5 or PAS-3X, but not the FM-3. 14½" x 5" x 8½" deep. Shipping weight 6 lbs.

CAB-1D Single deep vented cabinet fits SCA-80Q, AF-6, SCA-80, SCA-35 or FM-3. 14½" x 5" x 11" deep. Shipping weight 6 lbs.

CAB-2S Double short cabinet fits FM-5 with either PAT-4 or PAS-3X. Not for FM-3. 14½" x 9½" x 8½" deep. Shipping weight 7 lbs.

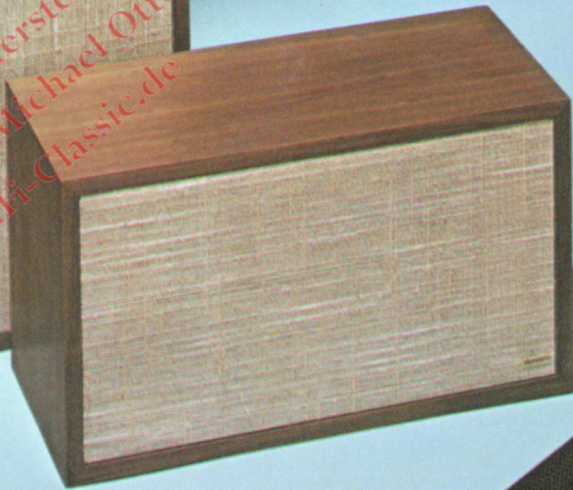
CAB-2D Double deep vented cabinet fits SCA-80Q with either AF-6 or FM-5; or SCA-35 with either AF-6 or FM-5; or either AF-6 or FM-3 with either PAT-4 or PAS-3X. Not for SCA-35 with FM-3 (use 2 CAB-1Ds). 14½" x 9½" x 11" deep. Shipping weight 7 lbs.



dynaco® *dynakit*™



A-25s



A-50



FM-5 and PAT-4
in CAB-2S cabinet



Stereo 120



Stereo 80



QD-1
Quadaptor

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