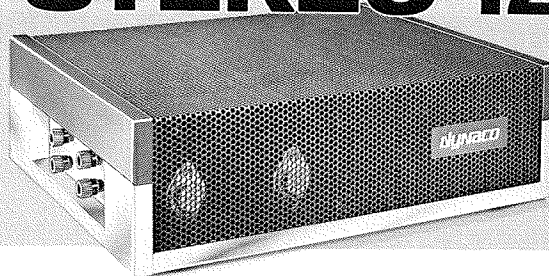


THE DYNACO STEREO 120

A SOLID STATE POWER AMPLIFIER FOR PERFECTIONISTS



Dynaco's engineering and marketing philosophy has always been to produce high fidelity components of the very highest quality and to sell them at moderate prices. This direction of activity has led to a successful line of products characterized by engineering innovations which have influenced the design trends of the entire high fidelity industry. It is natural that we should attempt to maintain this philosophy whenever new devices or new techniques show promise in high fidelity applications.

The Dynaco Stereo 120 is a completely new dual power amplifier which represents the successful application of Dyna "distillation" techniques to solid state devices. Its continuous power rating of 60 watts RMS per channel will do justice to the lowest efficiency loudspeakers. Its specifications, sonic characteristics, and component parts are representative of the highest level yet attained by any amplifiers—tube or transistor.

The most widely acclaimed and accepted high power amplifier design in high fidelity history has been Dynaco's Mark III. The new Stereo 120 has all of the audio attributes of the Mark III, plus the compact design and cool operation possible through transistorization—and in an outstanding economic breakthrough, the Stereo 120 costs no more than a pair of Mark IIIs, offering comparable continuous power in a transistorized unit at the price of these tube amplifiers which have been considered a tremendous bargain for almost a decade.

The significantly superior performance of the Stereo 120 is described in detail overleaf. However, these specifications cannot convey the purity of its sound, wholly free from coloration of any kind.

Our research over a period of several years has convinced us that high quality transistorized amplifiers should not add perceptible coloration to the sound—just as fine tube amplifiers have demonstrated this capability in numerous "Live versus Recorded" concerts. We have flatly denied the allegation that "transistor sound" is better sound and have clearly established the distortion characteristics which create it. This investigation reaffirmed the validity of the measurement methods which have previously differentiated quality levels of tube equipment. Since many currently available solid state amplifiers do not show up well by these standards, their advocates have sought to change the conventional measurement techniques. We prefer to make the amplifier meet the measurement standards rather than relax the standards to conform to existing designs.

DISTORTION of current transistor amplifiers has not been as low as that of high quality tube amplifiers. Where a fine tube amplifier's distortion diminishes to zero at low power levels, current transistor amplifiers show rising distortion at the very low power levels which represent most normal music reproduction. This "notch distortion," which shows most clearly on intermodulation distortion measurements, accounts for the attempts among solid state enthusiasts to ignore both IM measurements, and distortion specifications at other than maximum power. Current solid state amplifiers are also notoriously rich in fatigue-inducing high order harmonics, and the distortion of conventional circuits rises sharply at the frequency extremes, requiring excessive midband capability. In the Stereo 120, total distortion content, individual harmonics as defined by spectrum analysis, and distortion versus power level compare favorably with the best tube designs. At the frequency extremes, the Stereo 120 maintains low distortion with the flattest power curve of any units—tube or transistor.

RELIABILITY of transistor amplifiers has been touted to be high, but actually has been far lower than tube designs due to the ease of destruction of costly transistors and the practice of operating them at maximum ratings. Such simple action as inadvertent opening or shorting of loudspeaker leads will render many transistor amplifiers inoperative, or cause component failure. The Stereo 120 is **electronically protected** against such failure—not by fuses, circuit breakers, thermal cutouts, or other devices, but by the nature of the inherent current limiting of its novel biasing circuit, on which patents are pending. This complete electronic protection permits operation into shorted or open circuits, or heavily loaded circuits, with as little worry as any rugged tube amplifier, and the transistors cannot be overstrained by use or abuse. It will not deliver

power into an abnormally heavy load, but will shut itself off, and restore the sound instantaneously when the load is lightened. The Stereo 120 requires no adjustments of any kind, whether the unit is assembled from a kit, or when service may require the replacement of a transistor (if ever). The bias is automatically set, and all components are operated well within ratings.

REPRODUCIBILITY of solid state circuits for audio has been poor due to immense variations in the characteristics of the transistors and the marginal nature of the circuits used. The Stereo 120 uses stable circuits with DC feedback control of transistor characteristics to enable a consistent level of operation over a wide range of transistor characteristics. Cognizant of the problems in matching critical special transistors in existing circuits, we have delayed the introduction of the Stereo 120 so that standard transistors which are screened for voltage and beta could be used, and can be replaced with similar types which will be readily available. We have selected all silicon devices for this application. However, the type of transistor used does not automatically guarantee quality. It is the engineering excellence of the design and manner of utilization of the device which determines quality.

THERMAL STABILITY is the goal of all designers of solid state equipment. Instability causes shifts in operating conditions and possible destruction of semi-conductor components, including transistors. A self-adjusting bias arrangement in the Stereo 120 eliminates changes through the thermal cycle.

TRANSIENT DISTORTION of existing transistor equipment is far worse than in quality tube designs due to the great shifts in operating conditions which occur as voltages shift due to wide dynamic current changes. The Stereo 120 is completely free from this insidious form of distortion. No "transistor sound" mars the purity of orchestral dynamics.

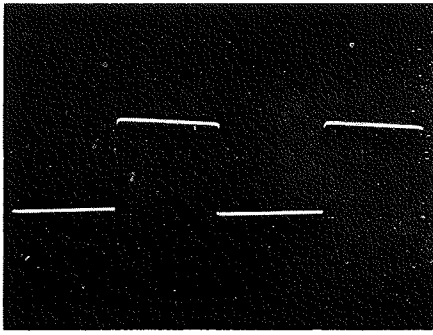
THE CIRCUIT is unconventional, and is the subject of several patent applications. The low impedance power supply has exceptional filtering and its own unique protection against overload, in addition to independent protection in each output amplifier. No interstage or output transformers are used. The low level driver utilizes a pair of transistors in a DC feedback configuration. The output sections use series-connected push-pull transistors driven by a direct coupled complementary-symmetry driver, biased by Dynaco's unique circuit, and containing its own DC feedback connection to stabilize the operating characteristics. The damping factor is far higher than required—about 40 over the range from 20 Hz to 20 kHz, but once a damping factor of 5 or more is reached, the effect on audio reproduction is undetectable. This is contrary to some claims, but easily demonstrated by simple tests.

THE POWER RATING is based on RMS continuous power handling from 20 Hz to 20 kHz. We do not believe music power (now called IHF "dynamic power") ratings are meaningful since we would not call an amplifier a 60 watter unless it could deliver 60 watts of sustained power. As with other transformerless amplifiers, power output capability will vary with load impedance. In the Stereo 120, the output with a 16 ohm speaker is 36 watts. With 4 and 8 ohm speakers, which include the popular low efficiency types, the full 60 watts is available. The Stereo 120 easily handles all conventional loudspeakers, including electrostatic types, and it is unconditionally stable with all loads.

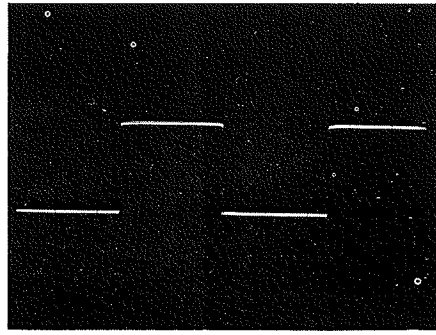
COMPONENT QUALITY of the Stereo 120 is in the Dynaco tradition of acceptability to the perfectionist. From the heavy gauge plated chassis, through high purity long life electrolytic capacitors and oversize power transformer, nothing is spared to make this unit a long-lasting trouble-free design of custom quality.

There is a ten year tradition of Dynaco quality and integrity. We have delayed the introduction of transistor equipment until we could uphold this tradition. Through painstaking effort, infinite patience, and ingenuity we have arrived at new circuits, not reworks of what others are doing, which permit economic value and the quality standards to which we have adhered without deviation.

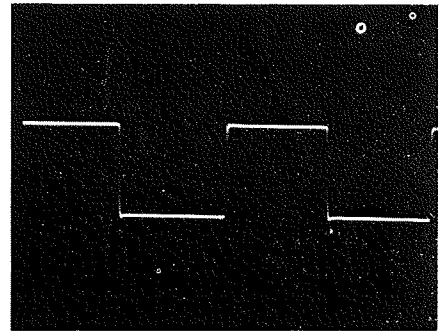
DYNACO STEREO 120



100 Hz



1 kHz



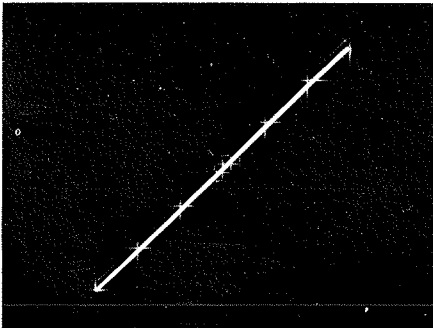
10 kHz

SQUARE WAVE PERFORMANCE: This is a good indication of linearity from 10 Hz to 100 kHz, since good square wave reproduction requires bandwidth in excess of 1/10th to 10 times displayed frequency.

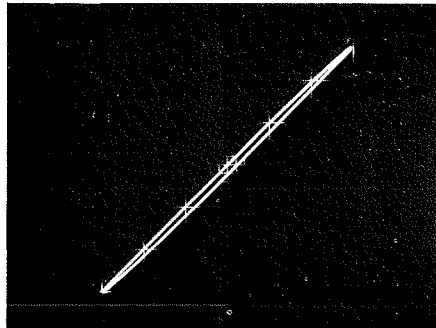
½% POWER BANDWIDTH (IHF): 5 Hz to 50 kHz half power output at less than 0.5% total harmonic distortion.

HARMONIC DISTORTION: Less than 0.25% at any power level up to 60 watts, at any frequency between 20 Hz and 20 kHz.

INTERMODULATION DISTORTION: Less than 0.5% at any power level up to 60 watts, with any combination of test frequencies.

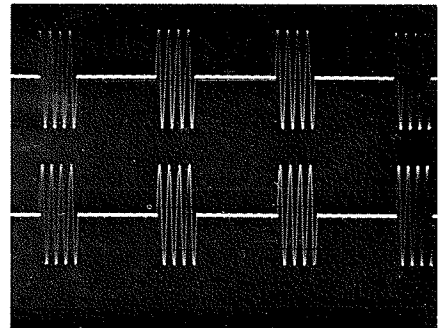


2 kHz



20 kHz

INPUT-OUTPUT LINEARITY AT 60 WATTS



TONE BURST:

4 cycle 20 kHz through amplifier at 60 watts is indistinguishable from generator (below).

NOISE: 95 db below rated output **unweighted.**

SEPARATION: In excess of 70 db from 20 Hz to 20 kHz.

INPUT: 100,000 ohms; 1.5 volts for 60 watts output.

SEMICONDUCTOR COMPLEMENT: 13 diodes, 15 transistors.

SIZE: 13" x 10½" x 4"

WEIGHT: 20 lbs.

PRICE: East \$159.95 kit; \$199.95 assembled
West \$164.95 kit; \$204.95 assembled

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