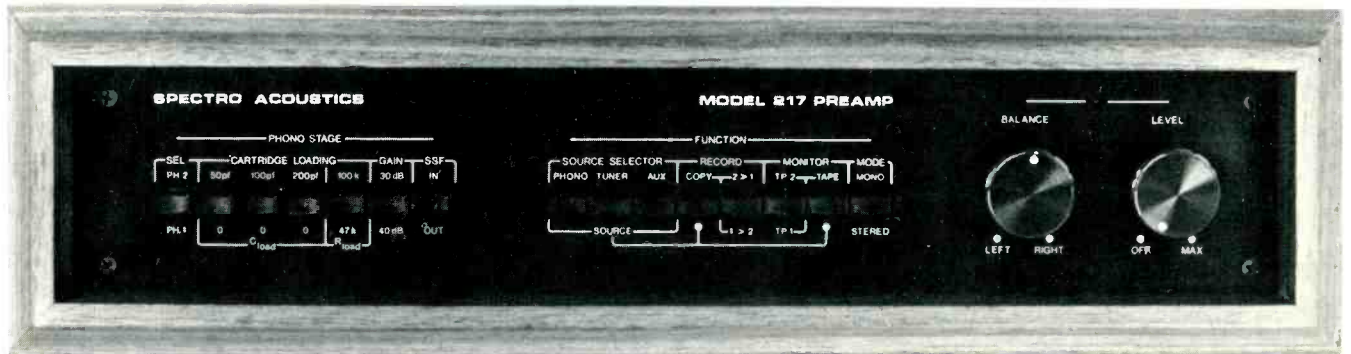


Spectro-Acoustics Model 217 Preamplifier



MANUFACTURER'S SPECIFICATIONS

Rated Output: 2.0 V rms into 10 kilohm load or greater.

Max. Output: 10 V rms.

THD: Less than 0.05 per cent at rated output, 20 Hz to 20 kHz.

IM Distortion: Less than 0.0075 per cent at rated output (SMPTE).

S/N: Phono, 74 dB, unweighted below 10 mV input; high level, 90 dB below rated output.

Frequency Response: Phono, RIAA

within 0.5 dB, 20 Hz to 20 kHz; high level, 20 Hz to 20 kHz, within 0.1 dB, 10 Hz to 100 kHz, within 1.0 dB.

Gain: Phono, 30 or 40 dB, selectable; high level, 15 dB maximum.

Input Overload: Phono, 100 mV or 300 mV (depends on gain setting), high level, 10 V rms.

Input Impedances: Phono, see test; high level, 50 kilohms, shunted by 20 pF.

Main Output Impedance: Less than 600 ohms, resistive, direct coupled.

Power Requirements: 105 to 125 V a.c., 50/60 Hz, 14 W.

Dimensions: 17 in. (43.2 cm) W 3½ in. (8.9 cm) H 7 in. (17.8 cm) D. Model 217R available for 19 in (48.3 cm) rack mount.

Weight: 4.5 lbs. (2 kg) and rack version, 4.9 lbs. (2.2 kg).

Price: \$250.00.

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The Spectro-Acoustics Model 217 preamplifier/control is another in that class of preamplifier units which has come to be called "straight line" preamps. Devoid of such control frills as bass and treble controls, high and low cut filters, and the like, the chief points stressed by Spectro-Acoustics in designing their little preamp-control unit center around the phono preamplifier section which includes 16 permutations of resistive and capacitive cartridge loading, selectable gain, a switchable sub-sonic filter, and a choice of two separate sets of phono inputs.

The only rotary controls present on the black front panel of the 217 are a detented, center-click balance control and a dual element volume control, both of which are silicone damped for smooth rotary operation. The volume control turns off power in its counterclockwise setting. Seven identical looking pushbuttons clustered at the left of the panel relate to the phono section; included are the phono 1/phono 2 selector, three buttons used for capacitive loading of connected phono cartridge (with individual buttons providing 50, 100, and 200 pF of capacitance, but capable of being used in combinations for up to 350 pF in addition to the 18 pF residual loading capacitance) and a button which chooses either 47 kilohm or 100 kilohm resistive loading of the cartridge. Another button selects 30 dB or 40 dB gain for the phono stages while the last button in this cluster introduces an 18 dB per octave sub-sonic filter. An additional group of eight pushbuttons located near the center of the panel handle program source selection (phono, tuner, or aux), tape copying (from either of two tape decks to the other,

tape monitoring of up to two connected tape decks and mono/ stereo mode. A small LED indicator light above the two rotary controls glows red when power is turned on.

The rear panel of the 217 contains a total of 18 phono-tip jacks corresponding to the input, tape output, and main output facilities already described. Switched and unswitched a.c. receptacles are also provided on the rear panel, as are individual chassis ground terminals below the pairs of phono input jacks.

Circuit Configuration

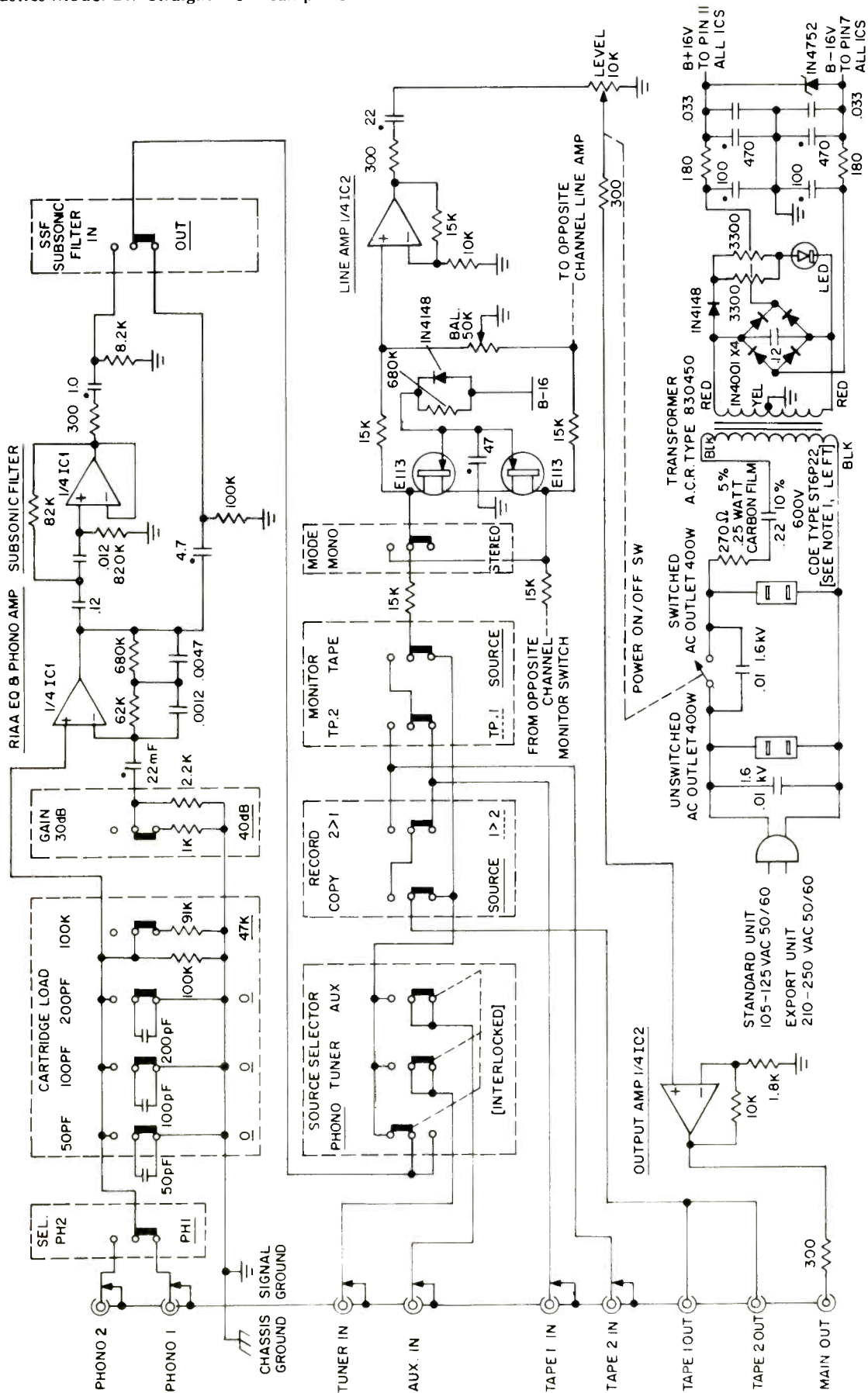
A complete circuit diagram of the Spectro-Acoustics Model 217 is reproduced in Fig. 1. Only one audio channel is shown, since both channels are identical in circuitry. By using monolithic IC op-amps with isolated feedback and signal input points, the phono amp stage is afforded a high degree of isolation between the RIAA feedback network and the signal input point. The 4136 devices used contain four gain and phase-matched op-amps and offer an open-loop bandwidth of 3 MHz, 105 dB of isolation between the four stages, and a 0.1 microsecond rise time. The same IC sections are used for the line amp and the output amp of the 217. The ICs are powered from regulated supplies of ± 16 volts.

Performance Measurements

Measurements of the effect of different loads on a variety of cartridges could not, of course, be made in our static

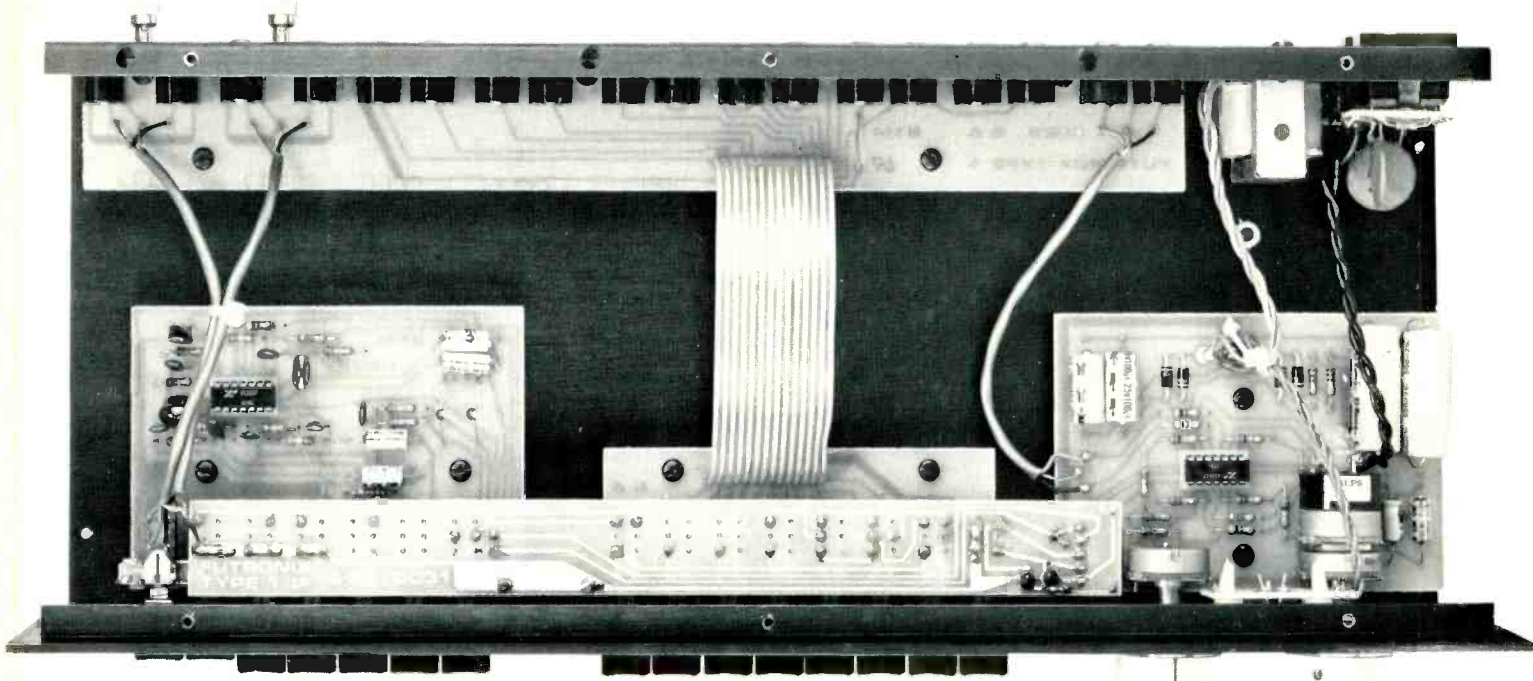


Fig. 1—A complete circuit diagram of the Spectro-Acoustics Model 217 Straightline Preamplifier.



NOTE 1: 270Ω, 5%, 25 WATT CARBON FILM RESISTOR IS A FUSE LINK. USE EXACT REPLACEMENT ONLY. THIS RESISTOR IS USED IN BOTH STANDARD 105-125V UNITS AND EXPORT 210-250V UNITS. BOTH VERSIONS USE SAME TRANSFORMER - DO NOT SUBSTITUTE!! THE .22MF CAPACITOR IS AN AC CURRENT-LIMITING DEVICE USED ONLY IN 210-250V UNITS. THIS IS A SPECIAL U.L. APPROVED TYPE - DO NOT SUBSTITUTE!! TO CONVERT 210 - 250V UNIT TO 105-125V UNIT REMOVE THIS CAPACITOR AND WIRE-BRIDGE THE TERMINALS.

NOTE 2: ALL IC'S TYPE 4136 EXAR OR FAIRCHILD - ALL RESISTORS ARE .5 WATT 5% UNLESS NOTED - ALL CAPACITORS GIVEN IN MFD UNLESS NOTED - ONE CHANNEL ONLY IS SHOWN HERE.



bench tests but will be discussed later. Maximum output of the 217 measured 11.6 V rms before noticeable clipping occurred. For rated output of 2.0 Volts, phono input sensitivity measured 2.2 mV (in the 40 dB gain position) and 7.0 mV (for the alternate 30 dB gain setting). Signal input of 250 mV at the high level inputs was required to produce rated output of 2.0 V. At the 2.0 volt output level, THD measured 0.009 per cent for a 1-kHz signal, 0.009 per cent at 20 kHz, and 0.027 per cent at 20 Hz. IM distortion was 0.007 per cent for the same equivalent rated output voltage. Overload in phono, for the high-gain setting was 82 mV, a bit short of the 100 mV claimed, but of course, in the lower gain mode, overload capability increased to 250 mV. RIAA phono response accuracy was within 0.1 dB from 30 Hz to 20 kHz. With the sub-sonic filter activated, over all phono response came close to the newly recommended RIAA playback curve which calls for a roll-off beginning at 31.5 Hz. Unweighted S/N in phono was 66 dB below actual input sensitivity which, translated to a 10 mV reference works out to 79 dB, or 5 dB better than claimed by the manufacturer. For the lower phono gain setting, measured S/N was 71 dB with respect to a 7.0 mV input. Frequency response via the high level inputs was flat from 3 Hz to 145 kHz for 1 dB roll-off and from 2 Hz to 175 kHz for the -3 dB points.

Listening and Use Tests

If you ever had any doubts about the importance of correct cartridge loading in a hi-fi system, you have only to connect a cartridge—almost any cartridge—to the Spectro Acoustics 217 and start playing with those front panel switches to realize that much of the so-called “difference” between cartridges that is ascribed by some “experts” to the engineering differences between pickups is, in reality, a function of cartridge loading. Shure cartridges, for example, require much higher capacitive loading than do some other competitive brands; 450 pF is typical for most Shure Models. With audio cable manufacturers still featuring low-

capacitance cables as a “plus” feature (a throwback to the days when CD-4 cartridges were being sold for discrete quadraphonic playback), you would have to have a cable some five meters long or so to come up with the correct capacitance for these pickups. Insufficient capacitance results in audible high-frequency stridency in such pickups. The 350 pF plus of capacitance available at the input of the 217 makes the problem much easier to solve.

But the clean sound we heard when reproducing discs via the Spectro-Acoustics 217 was, we feel, more than just the result of proper cartridge impedance loading. The people at Spectro-Acoustics seem to have figured out the right sort of interface between a magnetic cartridge and its required associated low-level electronics. The sub-sonic filter *really* makes a difference, too, regardless of how low you think your turntables’s rumble is. Without in the least affecting low-frequency musical content, the steep sub-sonic filter when activated resulted in an audible “cleaning up” of mid-range and even high-frequency musical content which then seemed totally devoid of annoying intermodulation products.

Certainly, the 217 was designed for optimum phono performance with little concern for other tone controlling facilities. It does lend itself well, however, for connection of graphic equalizer, such as Spectro-Acoustics Model 210. Tape switching is sufficiently flexible to permit using this, or other equalizers, either before the inputs of connected tape decks (for making pre-equalized tapes) or after tape machine outputs to facilitate equalization during listening, monitoring, or tape copying, depending upon the settings of the associated equalizer switches.

For those audio buffs who are concerned with phono reproduction and care less about extra control frills, the Spectro-Acoustics 217 offers excellent value at its suggested price. Construction is professional, both in appearance and in terms of parts and circuit board quality. The little unit tends to dispel the myth that really superior separate preamp-control units have to cost a small fortune. *Leonard Feldman*