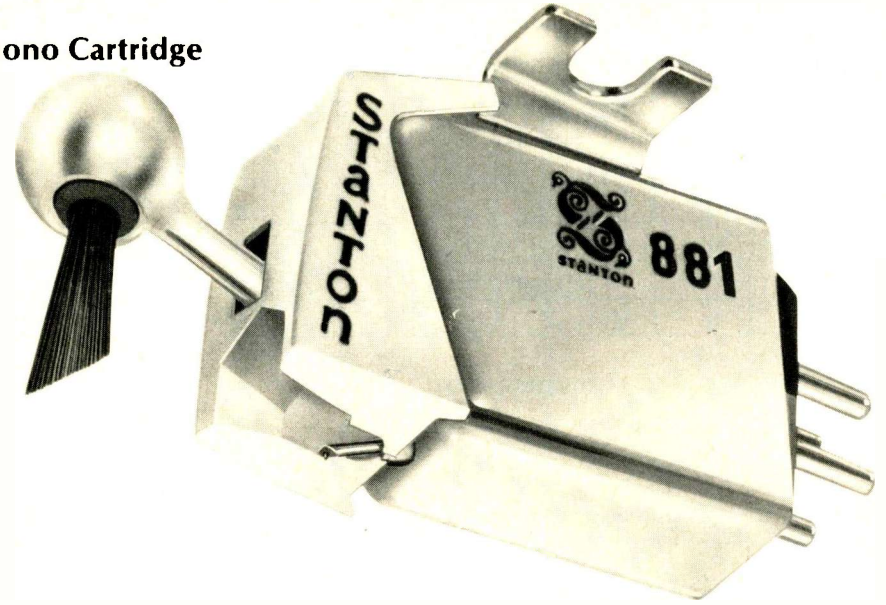
Stanton Model 881S Stereo Phono Cartridge



MANUFACTURER'S SPECIFICATIONS
Stylus Description: Nude Stereohedron.
Tracking Force: ¾ to 1¼ grams.
Frequency Response: 10 Hz to 20 kHz, ±1.5 dB.
Output: 1.01 mV/cm/sec.
Channel Separation: 35 dB at 1 kHz.
Inductance: 518 mH, each channel.
Resistance, Each Channel: 889 ohms.
Load Resistance: 47 kilohms.
Load Capacitance: 275 pF.
Replacement Stylus: D81.
Accessory Stylus for Mono LP Records: D810.
Accessory Stylus for 78-rpm Records: D827.
Price: $150.00, with "longhair" brush attached.

Stanton Magnetics introduced the first American-made CD-4 cartridge, which was capable of reproducing frequencies up to 30 kHz with their now historical Quadrahedral® stylus. Continued research and development brought about the new stereo stylus shape, Stereohedron®, which has its roots in the CD-4 Quadrahedron stylus design. The Stereohedron stylus offers a greater contact area with the record groove, resulting in less groove wear. This stylus development is included in Stanton's new generation of cartridges whose much smaller than usual magnet is made of samarium-cobalt and positioned closer to the center of rotation for low inertia, using a newly patented suspension principle. Its cantilever is strong enough to withstand repeated rough skating across a record surface without damage, though we don't recommend the procedure. Another little known but important feature of the Stanton cartridges is that hardly any dust collects on the stylus or cantilever because the cantilever is grounded. Like all Stanton cartridges, a removable longhair dust brush is mounted on the front which is said to add some stabilization to the cartridge in fighting warps.

Measurements

As is our practice, measurements are made on both channels, but only the left channel is reported. During the test period the average temperature was 74° F ±1° (23.3° C) and the relative humidity 58 per cent, ± 3 per cent.

Frequency responce using the Columbia STR-100 test record and our reference tone arm, an Audio-Technica AT-1009, mounted on a Technics SP-10 turntable, is flat within 0.5 dB from 40 Hz to 5 kHz, down almost 1 dB from 5 to 6 kHz, rises slowly to 0 dB at 9 to 13.5 kHz, and then slowly descends to -1.5 dB at 20 kHz. The optimum tracking force for the cartridge we tested was greater than the maximum tracking recommended. We found it necessary to increase the maximum tracking force by another 250 mg with the brush removed for a total of 1.5 grams if we were to track, without distortion, some of the very high recorded velocities that are present on some direct-to-disc records. However, we must state that the 881S successfully tracked some classical and jazz recordings at just 0.6 grams tracking force without distortion. This is absolutely remarkable since it is a rare cartridge that can track below 0.75 grams without distorting on this type of recording. The optimum anti-skating force was 1.5 grams. Separation was excellent, being 29 dB at 1 kHz, 26 dB at 10 kHz, and 17.5 dB at 20 kHz. The load resistance and capacitance, respectively, were 47,000 ohms and 280 pF. Square waves show some ringing that dies rapidly, indicating that the resonances are well damped, with the peak well beyond 20 kHz.

To check the frequency response, we used the General Radio 1521-B Graphic Level Recorder and a relatively new United Recording Electronics Industries (UREI) Model 200 X-Y plotter with the Model 2010 plug-in module for frequency response with any sweep-frequency test record. This is an improvement on other graphic level recorders since they are generally limited to a special sweep-frequency test record (s) made for them. The frequency response plotted on the UREI X-Y recorder was identical to that plotted on the General Radio recorder, using the same test record. One great advantage of the UREI X-Y recorder is its ability to pick up and automatically record the recorded spot frequencies on a test record without regard to the voice announcing the frequencies. In many ways, this is the more accurate way to test cartridge frequency response than the usual recorded sweep frequencies and just as automatic.

The following test records were used in making the following reported measurements: Technics SFC-TR100; Micro-Acoustics TT2002; Shure TTR 103, TTR 109, TTR 110, TTR 115; Columbia STR-100, STR-112, SQT-1100; JVC TRS-1007; Stereo Review SR-12; B & K QR-2009; Deutsches HiFi No. 2, and Nippon Columbia Audio Technical Records (PCM) XL-7004-6.

The cartridge weighs 5.19 gm without brush; d.c. res. 830 ohms; ind. 527 mH; opt. tracking force 1.5 gm; opt. anti-skating force 1.5 gm; output 1.36 mV/cm/sec; IM dist. (4:1) + 9 dB lateral, 200/4000 2.7 per cent, +6 dB vertical, 200/4000 6.1 per cent; crosstalk - 35 dB (Shure TTR 109); ch. bal. 1 dB; trackability, high freq. (10.8 kHz pulsed) 30 cm/sec, mid-freq. (1000 + 1500 Hz lat. cut) 31.5 cm/sec, low freq. (400 + 4000 Hz lat. cut) 24 cm/sec; Deutsches HiFi No. 2 300 Hz test bands tracked to 95 microns (0.0095 cm) and lateral to 55.4 microns (0.00554 cm) vertical. Arm-cartridge resonance curve was double peaked with the first resonant peak being +1 dB at 6 Hz and the second as +2½ dB at 7.5 Hz.

The Micro-Acoustics Transient and Tracking Ability Test Record TT-2002 was used to check for tracking ability first and then transient ability. The Stanton 881S cartridge had no difficulty in playing all tracking-ability bands, including one with the highest level a modern stereo cutter head can record just prior to tripping its overload protection circuit. The stereo percussion levels check the cartridge for both vertical and lateral tracking ability. The transient ability of the 881S is

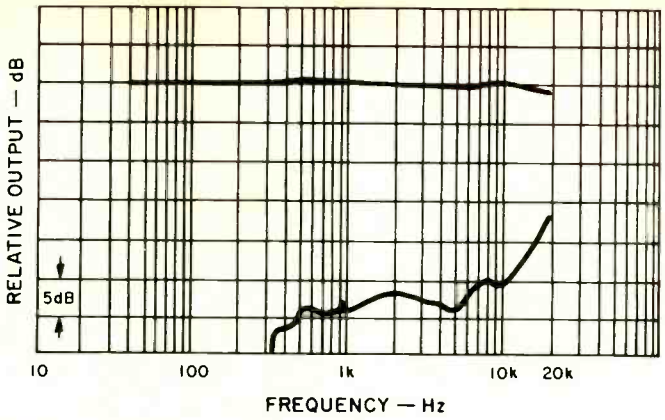


Fig. 1 — Frequency response.

excellent. The computer-generated high, low, and the high/low mixed frequencies presented no problems to this cartridge.

The 881S performed excellently on all bands of the Shure Audio Obstacle Course — Era III (TTR-110). With the newer Shure Audio Obstacle Course — Era IV (TTR-115) the trackability of the 881S on the bells and flute individually was just shy of reproducing the very highest level cleanly. However, the cartridge had no difficulty in reproducing the highest level of the same flute and bells playing a duet. These results clearly point out the excellence of the tracking ability of the Stanton 881S phono cartridge.

Listening and Use Tests

Our listening tests are performed both prior to actually testing the cartridge parameters and after all tests have been completed. While listening to the various records played with the Stanton 881S cartridge, we were quite impressed with the excellent sonic clarity, bass response, and the transient and tracking ability of this cartridge, particularly on some of the direct-to-disc recordings with their very high levels. Continued listening brought out the fact that the Stanton 881S did not introduce any sound or coloration that could be ascribed to the cartridge, per se. In general, we found that the listening tests were in agreement with the various measurement tests.

The following equipment was used for the listening evaluation: Technics SP-10 turntable with Audio-Technica AT-1009 tonearm, Technics SP-10 Mark II turntable with EPA-100 tone arm, Crown IC-150A preamplifiers, a pair of Crown DC-300A amplifiers used as monophonic amplifiers, and a pair of stacked Duntech DL-15B speakers for each channel. One turntable was equipped with a Platter Pad (Dundis Distr. Co., Waterloo, Neb. 68069) which appeared to be an improvement over the usual rubber pad, particularly in damping out extraneous vibrations. The speakers were connected to the amplifiers with Polk Audio high-definition, low-distortion speaker cables, which appear to have improved bass definition and high-end detail and smoothness. The SQ quadraphonic decoder was the Columbia SQL-400A Full Logic Decoder and Stereo Enhancer.

As is our practice, a rigorous listening evaluation was conducted utilizing the specific records listed below as well as some of the records listed in our past reviews. These excellent recordings demonstrate very effectively the ability of the Stanton 881S cartridge to reproduce difficult high level recordings faithfully. All records were cleaned with the Discwasher and destaticized with the Zerostat. The SQ records listed are compatible and can be played as stereo records.

Stereo

Pops Concert, the Israel Philharmonic Orchestra, Mehta — London CS 7065.

Vladimir Ashkenazy: *The Piano Music of Chopin, Volume 3* — London CS 7030.

The Art of Regina Resnik — London OS 26574.

Organ Recital, Volumes 1 & 2, Earl Barr — The Sound Environment TR-1003 and TR-1006. (Suite 114, Butler Sq., 100 North 6th St., Minneapolis, Minn. 55403).

Zgodava Plays Recital Favorites — The Sound Environment TR-1001. (Note the great clarity and brilliance of the nine-foot Steinway on Side 1. A seven-foot Steinway was used on Side 2. These exceptionally good recordings were recorded by Russell Borud of St. Paul, Minnesota).

Rogers and Hammerstein: *The King and I* — RCA ABL 1-2610.

Check Up Your Sounds, Volume 2, Audio Symphony No. 2, NHK Symphony Orchestra, K. Komatsu — RCA (Japan) RVL-2. Distributed by Audio-Technica, Inc. (This is a superb recording that all audiophiles should hear and own.)

Direct to Disc

Rimsky-Korsakov & Tchaikovsky: *Capriccio espagnol & Capriccio italien*, the Boston Pops, Fiedler — Crystal Clear Records CCS-7003 (225 Kearney St., San Francisco, Calif. 94108).

Virgil Fox: *The Fox Touch, Volumes 1 & 2* — Crystal Clear Records CCS-7001 and 7002. (*Audio's* Associate Editor, Bert Whyte, was the recording engineer for the above three super records).

Joe Marcinkiewicz and Blu — M&K Sound, Inc. 10014. (8719 Wilshire Blvd., Beverly Hills, California 90211).

Rough Trade: *Live!* — Umbrella UMB-DD1, Distributed by Audio-Technica, Inc.

The New Brubeck Quartet: *A Cut Above!* — Direct-Disk DD-106. (Direct-Disc, 16 Music Circle So., Nashville, Tenn. 37203).

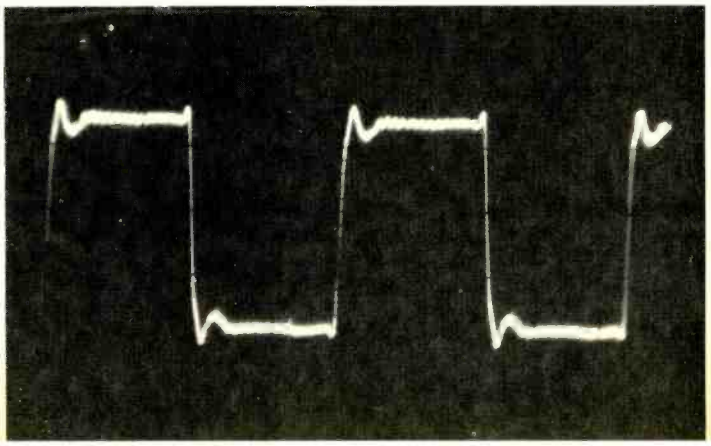
Power — Direct-Disk Labs, DD-107.

Pulse Code Modulation

Frank Foster and the Loud Minority: *Manhattan Fever* — Denon YX-7521-ND.

Tommy Flanagan: *Alone Too Long* — Denon YX-7523-ND. (Solo piano.)

Fig. 2 — Response to 1-kHz square wave.



Archie Shepp: *On Green Dolphin Street* — Denon YX-2524-ND.
(Denon records are available through local outlets from American Audioport, 1407 No. Providence Rd., Columbia, Mo. 65201).

Quadraphonic

Stokowski Conducts Sibelius, The National Philharmonic Orchestra — Columbia M34548.
Preservation Hall Jazz Band — Columbia M34549. *Boulez Conducts Varèse,* New York Philharmonic Orchestra — Columbia M34552.

The Stanton 881S played all the above records without difficulty, particularly *The Fox Touch, Volume 2,* and the Boston Pops recording of *Capriccio espagnol,* with their high level bass. It appears that most all direct-to-disc recordings are challenging the modern cartridge to reproduce the music with sonic clarity.

In conclusion, we are impressed with the Stanton 881S cartridge, particularly with its ability to reproduce flawlessly any recorded sound, including those at the high velocities present on many current records. The Stanton 881S merits serious consideration by all music lovers. *B. V. Pisha*

Enter No. 92 on Reader Service Card

Pioneer Model TVX-9500 TV Audio Tuner

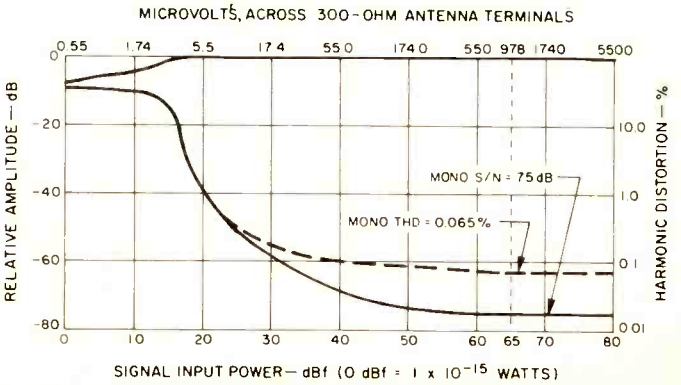
MANUFACTURER'S SPECIFICATIONS

50-dB Quieting Sensitivity: 32 dBf (22 μV/300 ohms).
S/N Ratio: 65 dB @ 85 dBf.
THD at 65 dBf: 0.7 per cent at 100 and 1000 Hz; 0.2 per cent at 6 kHz, for ±25 kHz deviation.
Capture Ratio: 1.0 dB.
Alternate Channel Selectivity: 25 dB.
Frequency Response: 50 Hz to 10 kHz,+0.5, -1.0 dB.
Spurious Response Rejection: VHF, 50 dB; UHF, 40 dB.
Image Rejection: VHF, 50 dB; UHF, 40 dB.
I.f. Rejection: VHF, 50 dB; UHF, 55 dB.
AM Suppression: 50 dB.
Muting Threshold: 34.1 dBf (28 μV).
Output Level: 400 mV for 100 per cent modulation.
Power Requirements: 120 V, 60 Hz, 12W.
Dimensions: 16 9/16 in. (42 cm) W x 3⅞ in. (10 cm) H x 13¾ in. (35 cm) D.
Weight: 13 lbs., 7 oz. (6.1 kg).
Price: $250.00.

The typical audio enthusiast probably regards the audio portion of TV broadcasts with some disdain. Still, TV sound, as authorized by the FCC, is not only transmitted by FM, but has the very same frequency response potential as FM radio — 30 to 15,000 Hz. The fact that, up until now, TV sound has been anything but hi-fi is caused by one of those recurring vicious circles that often plague the consumer electronics industry. Initially, TV broadcasters and networks used standard telephone lines to transmit their audio signals to transmitters and to other points in the network. Since those lines, typically, cut off at around 5 kHz, the TV audio that was finally aired was strictly low-fi. TV set manufacturers, aware of this limitation (and rightly more concerned with picture quality), saw no reason to build sophisticated audio systems into their receivers.

Now, however, TV networks are beginning to employ a diplexing system which permits the audio signals to ride right along on the coaxial cable with the wideband video signals. Public Service Broadcasting has been using satellite communications to beam both its video and audio signals around the country, and both such techniques lend themselves to wideband audio transmission. Only the TV set manufacturers have been slow to improve the audio capabilities at the receiving end. So, Pioneer decided to fill in the TV audio gap with the introduction of their TVX-9500 TV sound tuner.

Fig. 1 — Mono quieting and distortion characteristics of the Pioneer TVX-9500 TV audio tuner.



Styled to complement other components in a high fidelity system, the front panel of the TVX-9500 is equipped with a power switch at the left and twelve slim pushbuttons which are numbered from 2 through 13, corresponding to the VHF TV channels used in the United States. Above each of these buttons is an LED indicator which lights up when the corresponding button is depressed. A thirteenth button, separated from the others, is labelled UHF, and when it is depressed a rotary UHF selector knob comes into play, along with its concentric fine-tune control.

Although the VHF channels are pre-tuned by the factory prior to shipment, fine tuning of these "fixed" selectors i possible, since, under the bottom of the tuner are individual adjustment potentiometers for trimming these frequency selectors, as required. To perform this calibration operation, the user would also turn off the built-in AFC by means of a slide switch also located on the undersurface of the chassis. With the AFC switch in the *Off* position, the built-in muting circuit is also temporarily defeated to permit precise adjustment of channel frequencies. When a given TV channel's audio carrier is accurately tuned in, a green LED lights up to indicate that fact.

The rear panel of the TVX-9500 is equipped with two audio output jacks and with 300-ohm balanced UHF and VHF screw terminals, plus a connection terminal for a 75-ohm coaxial transmission line (for VHF only). As readers are surely aware, TV sound as presently broadcast is monophonic, but two audio output jacks are provided to permit connection to both high-level input channels of a stereo component system so that sound will emanate from both loudspeakers. Ideally, the TV set (with its volume control turned down) could then be placed mid-way between the stereo loudspeaker array and TV audio would again seem to emanate from the TV set's location.

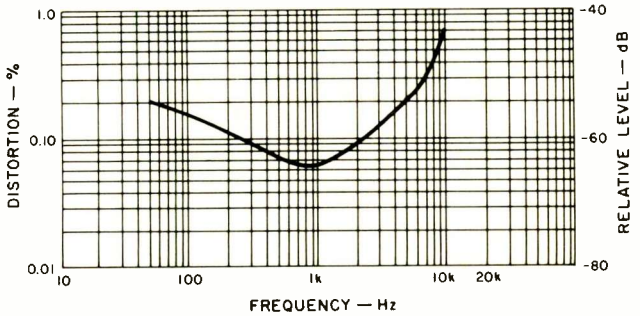
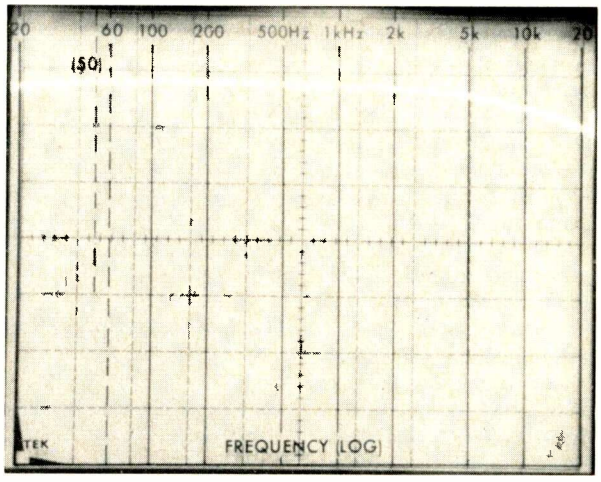


Fig. 2 — Distortion vs. frequency.

Circuit Highlights

The TVX-9500 circuitry is very much like that of a better grade FM tuner (which, in a sense, it is). Front ends are electronically tuned (using varactor diodes instead of a continuously variable tuning capacitor). The channel pushbuttons simply connect an appropriate level of d.c. voltage to the diode, thereby determining its effective capacitance in the tuned circuit of the front end. The i.f. circuitry employs a combination of LC and solid-state filters as well as a discrete transistor amplifier followed by a multiple purpose IC amplifier/limiter/quadrature detector. The recovered audio output from the detector is fed to a differential amplifier audio stage, while a d.c. AFC voltage is fed back to the front end in the manner familiar to anyone conversant with FM circuitry.

Fig. 3 — Frequency response (each vertical division equals 10dB).



FM Performance Measurements

The first problem we encountered in trying to measure the performance of the TVX-9500 was to come up with a suitable r.f. signal generator. Like many other consumer electronics engineers, we still own some ancient, if rudimentary, TV servicing equipment but that would hardly do for measuring the performance of a high-fidelity TV sound tuner. Happily, our Sound Technology generator with which we measure all FM tuner and receiver circuitry, though calibrated only from 88 MHz to 108 MHZ, goes a bit below the 88 MHz lower limit and, with the aid of a frequency counter, we adjusted its output to 87.75, the carrier frequency of the audio signal of TV Channel 6.

Thus equipped, we measured performance (only for Channel 6, of course) in much the same way that we would measure any FM tuner. It should be noted that standard de-emphasis on TV audio is 75 microseconds — the same value used in FM broadcasting. However, and this is an important difference, maximum audio modulation in TV is only ±25 kHz, as opposed to ±75 kHz used in FM broadcasting. In one respect, that makes it easier for the TV audio tuner designer, while in another sense it makes things more difficult.

Restricted to a ±25 kHz deviation limit, the TV audio tuner has a built-in limitation of 10 dB less in S/N ratio as compared with an FM tuner. We were therefore all the more impressed with the TVX-9500's ultimate S/N ratio, which, as can be seen by examining Fig. 1, reached a high of 75 dB. Pioneer claimed only 65 dB for S/N and, interestingly, quoted that figure for an 85-dBf input signal strength. The justification for this higher signal input no doubt comes from the fact that, generally speaking, TV transmitter power is much greater than that radiated by most FM radio stations, so Pioneer no doubt presumed that there would be greater available signal strength at the antenna terminals of this product. As indicated in Fig. 1, however, the unit did just as well in quieting with the standard 65-dBf signal normally used to check S/N of FM tuners.

The ±25 kHz deviation proves to be advantageous insofar as distortion is concerned, since the i.f. stages and detector's bandwidth need not be as wide or as linear as is necessary for heavier modulation FM reception. And indeed, the THD at 1 kHz for "full" modulation (remember, ±25 kHz) was an impressively low 0.065 per cent. Distortion versus frequency is plotted in Fig. 2, and THD rose to 0.21 per cent at 100 Hz and to just over 0.6 per cent at 10 kHz.

Note that Pioneer makes no claims for frequency response beyond 10 kHz and, as can be seen from the sweep-frequency plot (Fig. 3) recorded on the 'scope face of our spectrum analyzer, response does start to drop off somewhat above 5 kHz and is attenuated by some 4 to 5 dB at 15 kHz. The 50-dB quieting point is reached with an input signal of 23.3 dBf (8.0 μV/300 ohms), while muting threshold was set for 34.7 dBf (30 μV/300 ohms). We measured a capture ratio of 1.3 dB, and AM suppression measured 50 dB, as claimed. We note that Pioneer provides an alternate channel selectivity specification of 25 dB but cannot imagine what that specification is supposed to convey. It surely does not refer to an audio signal that is 12 MHz removed from the desired signal. Yet, if it is a measure of the rejection of a signal 400 kHz removed from the desired audio signal, that has no real meaning in the case of TV audio frequency allocations.

Listening and Use Tests

While Pioneer does supply a T-wire indoor dipole antenna for use with the TVX-9500, our own experiences with the product prompt us to strongly advise the use of an outdoor TV antenna, if possible. That old monster "multipath" is every bit as much of a problem here as it is in the case of ordinary FM reception, if not more so. It's hardly ever a question of inadequate signal strength (unless you really live in a TV fringe area), but those reflections can distort received audio from TV stations, even when the signals are fed into a magnificent stereo component system. Using a two-set coupler to your existing TV antenna is a good idea if you can tolerate a couple of dB of signal loss (which, in many cases, won't be detected, either visually or audibly).

Hooked up to an outdoor antenna, the TVX-9500 performed very well indeed, being limited only by the quality of audio being broadcast by our local TV channels. We were amazed at the *variation* in audio quality we observed when tuning from channel to channel (or even on the same channel when programming switched from a live-taped studio event to a movie or, even worse, to some commercials. Some of the commercial voices sounded no better than a voice recorded and reproduced by a portable cassette deck). On the other hand, tuning to a fine concert, such as the ones often broadcast by our local Public Broadcasting Service station, was a sheer delight to both eye and ear! All it took was a simple A-B test (turn down the hi-fi volume control and turn up the TV's control) to realize that the potential for good TV sound exists and has always existed.

Now all that remains is for the TV stations around the country to avail themselves of that potential (just using the diplexing method won't help if the program's sound is of low quality to begin with). In the meanwhile, ownership of a tuner such as Pioneer's TVX-9500 will at least enable the user to enjoy the sounds of those programs where audio is worth listening to and to complain to the originators of TV programs where the audio is inferior. *Leonard Feldman*