

THE B.A.S.

The Boston Audio Society
P.O. Box 7
Boston, Mass. 02215

SPEAKER

May
1973

The Boston Audio Society does not endorse or criticize products, dealers, or services. Opinions expressed herein reflect the views of their authors and are for the information of members.

May meeting. This month's meeting of the B.A.S. will be held on an unusual date: Thursday May 3 at 7:30 p. m. Dr. Oskar Heil, inventor of the Heil "Air Motion Transformer" loudspeaker manufactured by ESS, will describe and demonstrate how this novel speaker works. Feel free to invite knowledgeable friends. We especially welcome other speaker designers to this special BAS meeting. It will be held in Room 314 of B. U. 's Sherman Union at 775 Commonwealth Avenue. Enter the basement corridor from Commonwealth Ave. or from the rear access road and use the elevator to ascend to the third floor.

Questionnaire. About 30 members have returned their BAS Questionnaire so far. If you haven't yet, please fill it out and return it -- either mail it back or bring it to the May meeting. We have to establish a deadline date of May 10 so that we can compile, analyze, and report on the results in the June newsletter. We will assume that any member who does not return his/her questionnaire does not want to have a voice in deciding BAS policies and programs.

Adventures in Sound. Here is the schedule for the next few weeks of Victor Campos's program (WGBH-FM every Sunday at 3:30 p.m.), in which he plays master tapes (mostly Dolby-A) without limiting or compression and without tape hiss, inner-groove distortion, clicks, pops, warps, mistracking, or other distortions.

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|---------|--|
| May 6. | Brahms: Hungarian Dance #5 (Ormandy; RCA)
Dvorak: Terzetto (Guarneri Quartet; RCA)
Sibelius: Symphony #2 (Ormandy; RCA)
Moussorgsky: Night on Bald Mountain (Ormandy; RCA) |
| May 13. | Shostakovitch: Symphony #14 (Ormandy; RCA)
Tchaikovsky: Serenade for Strings (Somary; Vanguard) |
| May 20. | Handel: Water Music (Somary; Vanguard)
Rachmaninoff: Piano Concerto, #2 (Rubinstein, Ormandy; RCA)
Beethoven: Wellington's Victory (Ormandy; RCA) |
| May 27. | Dukas: The Sorcerer's Apprentice (Ormandy; RCA)
Persichetti: Sinfonia Janiculum (Ormandy; RCA)
Wagner: Magic Fire Music, Invocation of Alberich, Entrance of the Gods into Valhalla, Dawn and Siegfried's Rhine Journey, Funeral Music, Brunnhilde's Immolation (Ormandy; RCA) |
| June 3. | Bizet: Carmen (Metropolitan Opera, Horne, McCracken, Bernstein; DGG). Length 155 min. Program starts at 2:00 p. m. |

Remember that this program may go off the air by midsummer unless it gets a lot of postcards supporting it. We've seen some of Victor's tentative listings for broadcasts later in the summer and fall if the program stays on the air; they include some of the best recordings we know of from such labels as Vanguard, Mercury, RCA, Philips, and others. So take 10 minutes and a stamp, and write!

BAS Publication. Do some of your favorite records sound like Rice Krispies ? If they don't yet they probably will after a few dozen playings, unless you make a concerted effort to keep grit out of the grooves and remove the dirt that is already in them. The clean groove need not be only the compulsion of a fastidious few; we can all benefit, and with less sweat and bother than might at first be supposed. Learn from Jim Brinton about a few good habits, a few good tools, and a record-washing procedure that is astonishingly effective both in restoring ostensibly ruined discs to new life and in ensuring a long life for brand-new records -- described in this month's featured BAS Publication.

Tape Dubbing Service. Al Southwick and Marty Gasman have volunteered to form a Dubbing Committee which will undertake to provide desired tape recordings to members. If you miss one of Victor Campos's "Adventures in Sound," an edition of "Shop Talk," or a BSO broadcast, request a tape. The Dubbing Committee will also undertake to provide dubs of out-of-print records and other material of interest. Marty will coordinate requests with the availability of source material, and Al Southwick (and others if the volume is large) will do the dubbing. Incidentally, if you know when you will be away and what dubs you will want, sending in your requests in advance will help ensure the availability of the source material.

Tapes will be provided either with or without noise reduction (Dolby B, DBX, or both); with DBX a compression of 1:2 is suggested in order to provide significant noise reduction with minimum noise modulation ("breathing"). Unless you specify otherwise, musical programs will be recorded on low-noise tape (reel) or CrO₂ (cassette), "Shop Talk" on standard tape. In general the duplicator tapes of broadcasts will be erased and re-used after three months, so get your requests in early. For each dub you will be charged the cost of the blank tape (which will be bulk-purchased by the BAS) plus a \$2.00 service fee. (The cost of the tapes for the revolving master file will come out of the treasury.) The availability of non-current items such as old BSO broadcasts will depend largely upon what tapes various members may have that could be borrowed for dubbing.

To get things started we would like to compile lists of both what is wanted and what is available. If you want something, or if you have something which others might like, please send a postcard to Box 7, Boston 02215. Requests should include the following data.

TAPE DUB REQUEST

Item desired; broadcast date (for record give year released or catalog no.)

Reel? _____ Cassette? _____ Dolby? _____ DBX? _____ (Ratio _____)
 Name, address, phone no. _____

April meeting. About 40 members attended the meeting of the BAS on April 15. A very productive free-for-all discussion of BAS activities took place, thanks to the active participation of nearly everyone who was there. A great many excellent ideas were presented and some potentially valuable programs were initiated. The extent of the discussion can only superficially be represented in the following summary.

Ampex is issuing pre-recorded cassettes and quarter-track open-reel tapes done on low-noise tape with Dolby-B noise reduction, and featuring performances from major labels such as London and DGG. If you want to participate in a group purchase of such tapes, see Al Southwick or Ted Sarhanis. They have an Ampex catalog.

It was suggested that the BAS donate to WGBH (especially in support of "Adventures in Sound"), WBUR (for "Shop Talk"), and/or the BSO. Joel Sandberg proposed that any such donation be deferred until the end of our fiscal year when the amount of spare cash in the BAS treasury will be better known than it can be now.

Methods of increasing the membership of the BAS were discussed. The Executive Committee will follow up on some of these. It was proposed that the BAS become a member of the Audio Engineering Society, so that the AES Journal would be available for circulation among members who want it. Bulk purchases of Watts record-cleaning devices from England, at a considerable saving, will be looked into. Marty Gasman suggested that instead of group-purchasing new BASF or similar tape, we might consider bulk-buying slightly used 3M tape from DAK in California, also at a major saving in cost.

It was requested that the BAS newsletter print advance listings of concerts by non-union musicians which could be recorded on-location by members. (Of course getting permission to record usually would still have to be arranged on-the-spot with the musicians.) We hope that the questionnaire will tell us whether enough members are interested in on-location recording to justify tracking down such concert information and putting it in the newsletter. If not, perhaps those interested members should form a Live Recording Group to compile and share this and other information.

In this context we call to your attention a concert on Friday May 4 at 8 pm in St. Paul's Church in Harvard Square, featuring an excellent chamber chorus called The Mastersingers and non-union musicians called The Aeolian Consort playing authentic Renaissance and Baroque instruments (viols, sackbuts, etc.), in a program of vocal/choral/instrumental music from the 1500's and 1600's. They have tentatively expressed willingness to permit recording; definite word will be given at the May 3rd BAS meeting (the previous night). Admission to the concert is \$1.50 - \$3.00.

It was suggested that we obtain tapes of the three hi-fi oriented radio programs in New York -- perhaps by arranging with the New York Audio Society to swap them for tapes of "Adventures in Sound" and "Shop Talk." This can be looked into, but it would involve a lot of work for the Dubbing Committee (8 or 10 90-minute dubs every month) plus the cost of the tape.

It was also requested that tapes of "Adventures in Sound," "Shop Talk," and BSO broadcasts be made available for members who miss specific broadcasts. This request was answered by formation of the Dubbing Committee.

Much interest was expressed in the problem of clean FM reception in the city -- with overload and cross-modulation, multipath, ignition noise, the inadequacy of indoor antennas, etc. Bill Shelton also suggested comparative evaluation of tuners to determine which are best suited to urban use, which may not be the same as the best tuners for suburban or fringe-area use. Ted Sarhanis will head a committee to collect and disseminate members' experiences in these areas and to investigate promising new approaches. Its proposed name is the Civic FM Committee.

Laurie Coté and several others emphasized that the BAS, both in its meetings and in its publications, should place greater emphasis on discussing music, recommending performances, and raising our level of musical understanding.

BAS equipment test clinics have been requested, but since very few members bothered to participate in last fall's tape recorder clinic after much enthusiasm had been expressed for it, the Executive Committee is reluctant to set up similar open clinics. Perhaps clinics could be held once a year, and members who wish to participate could make a written application to have their equipment tested and tuned up. Marty Gasman proposed that we open our test clinics to the general public; this would be a good way to get consistently measured performance data on a lot of gear, but if a crowd came it would impose a massive workload on the few BAS members doing the work.

It was suggested that, to save on postage, the monthly BAS mailing should be reduced in scope -- that such features as record recommendations, equipment test reports, articles about music, and the various other planned BAS publications should be distributed only to the members at the meetings or sent by mail only in response to specific requests. Do you want to continue automatically receiving all BAS publications ?

Bill Shelton raised the question of devices for getting good TV audio reception. The results from add-on devices for TV sets are limited by interference from the video and sync signals, so a separate TV audio tuner or TV-to-FM frequency converter is wanted. Several manufacturers have considered marketing such devices but believe that they would not sell. If enough BAS members are interested we might be able to stimulate the design of such a device by presenting a manufacturer with a block of firm orders.

It was suggested, and voted, that henceforth a period of time (not to exceed a half-hour) at the beginning of each meeting will be reserved for free-for-all discussion. You are encouraged (and requested!) to bring up suggestions for BAS activities, reports on your experience with various pieces of equipment, notes pro and con on service agencies, recommendations of (or blasts at) records and concerts. We all have different equipment, records, opportunities, and experiences; let's use the meetings to learn from each other, rather than only coming to hear somebody talk at us.

Al Southwick suggested that we put together an "ear-training" seminar -- to train our ears to recognize, from their audible effects, various kinds of defects such as cone breakup, tape saturation, amplifier clipping, flutter (as opposed to wow), peaks and valleys in response, THD IM, crossover distortion, tracing error due to cartridge misalignment, etc.

Harry Zwicker volunteered to serve as a coordinator for organizing car pools to Tanglewood during the summer. More details on this next month.

The following topics have been suggested for either written BAS publication or presentation at meetings. Do you see one you would like to write or speak on?

- How to bias and equalize recorders.
- How to get good FM reception in the city.
- Evaluative reports on stereo system accessories.
- Equipment reviews.
- In-depth discographies, recommended recordings of various classes of music.,
- Discussions of conductors (not wires!), with discographies.
- Hot tips from members: one-paragraph notes on bargain opportunities, experiences with gear, other items of interest.
- Optimizing indoor reception in apartment buildings.
- "How to overcome audiophilia and enjoy the music."
- Active equalization (a how-to discussion).
- How to get persistently unsatisfactory products fixed (with the names and addresses of the most effective people to complain to, from the dealer to the FTC).
- Bibliographies of good articles on each of various topics.
- Practical guidelines for evaluating loudspeakers.
- A guide to live recording techniques, mike choice and placement, etc.
- Another questionnaire on: Your experiences with service agencies and factory service; why you like the speaker you bought; what influenced your choice of tape recorder.

Used Equipment Exchange. The BAS Used Equipment Exchange, which Joel Sandberg has operated, has not elicited a single sale in its six months of operation, so he has suggested that the service be discontinued. Instead we will try to make the exchange easier for you to use by providing a cumulative listing of all items which have been announced for sale by BAS members. If after a further trial of a couple of months no one has found the service useful, it will be discontinued. In the listings which follow, some items are accompanied by the owner's name and phone number. In other cases call Joel (244-2357) to get the name of the owner.

BOSTON AUDIO SOCIETY - Used equipment for Sale

Acoustech XII amp
MacIntosh 2105
RCA microphone (model ?)
Rectilinear 3 (pair) Speaker
KLH 35 Compact audio system
Advent 101 Dolby unit
ADC 26 Phono cartridge
Dual 1019 Turntable
Dual 1209
Dual 1210
Dual 1218
Garrard A70
Garrard Lab 80
Garrard SL95B
PE 2020
Thorens 150, arm, and Shure Supertrack (brand new) (Dennis Boyer)

Ampex 32 cassette tape recorder
Ampex 52 cassette tape recorder
Ampex 122 Tape deck
Ampex 1450 reversible four-track tape deck (Al Southwick)
Uher Varicord 63 tape recorder
Uher 7000D
TDK SD150-7 recording tape
Scotch 207 Tape
Records - symphonic (and small amount of others)
Audio 400 Head Demagnetizer
Watts Parastat MK-4
Watts Parastat MKIIA
R.B. Annis 20 Magnetometer
Tektronix 317 oscilloscope
Cooling Fan
I.C. 7400 series
Tubes - EL34/6CA7
Manual - Revox and others
Record Cases

Crown IM analyzer (never used) \ |
Dual 1215 | (Marty Gasman
Sony TC 124CS | 969-2767)
Sansui 6 Receiver /
Advent 101 Dolby (warranty) (Al Foster 353-0114)

19 April 73

Northeastern University
Department of Music

Concert Schedule

- May 1, 1973 * MUSIC AT NOON, #4 (open)
Ballroom -- 12:30 pm
- May 3, 1973 * TWILIGHT SERIES, #5, Andrew Wolf, pianist
Ballroom -- 6:30 pm
- May 8, 1973 * MUSIC AT NOON, #5, Early Music Players
directed by Helen Keaney
Ballroom -- 12:30 pm
- May 15, 1973 * MUSIC AT NOON, #6, Roland Nadeau, pianist
(A Dedication Concert to Mr. Julius Santis)
Ballroom -- 12:30 pm
- May 22, 1973 * MUSIC AT NOON, #7, A Student Happening
directed by Jeanne Ryder
Ballroom -- 12:30 pm
- May 30, 1973 NU CHORUS CONCERT, Raymond Smith, Conductor
Joshua Jacobson, Associate Conductor
Ballroom -- 8:20 pm
- June 7, 1973 NU ORCHESTRA CONCERT, Joel Suben, Conductor
Ballroom -- 8:20 pm

These concerts are sponsored by: Northeastern University
Department of Music
Room 307 Ell Bldg.
360 Huntington Avenue
Boston, Mass. 02115
Roland Nadeau, Chairman
Reginald Haché, Artistic Director

If you desire to tape any of these concerts, permission should be obtained in advance.

*Julius Santis Memorial Concert Series

Cleaner Records for Cleaner Sound

by James B. Brinton,
New England Editor,
Electronics Magazine

It seems to be the audiophile's natural condition to grumble about rumble, clicks, pops and generally poor record quality. But these flaws are at least partly repairable, and working on the hypothesis that it doesn't make sense to gripe about something one can prevent, this article aims to explain a bit of the "why" and a good deal of the "how" in record cleaning.

Records come supplied with noise-producing dirt. Fresh from the pressing plant, they are sealed in their sleeves and cases complete with plastic scraps, dust, and other less visible forms of dirt -- all of which cause unwanted sound when hit by the stylus, and much of which can be removed.

What not to do. There is a wide variety of record care products on the market today, but most of these items are worthless at best, and harmful at worst. Among the most common, and probably the most harmful, record care products available are the so-called cleaning cloths or sprays. The cloth is usually cotton doped with some unspecified, greasy-feeling compound which is supposed not only to remove dust from discs but in some cases prevent static charges from forming. Such cloths should be avoided; not only can their "silicones" collect in the record grooves, offering a handy matrix into which dust can settle and embed itself, but also the act of wiping records tends to scrape more dirt into the grooves than would collect otherwise. Sprays provide the same drawbacks at a higher price.

Next is the "radioactive cleaning brush;" usually a camel's hair brush with an isotope of polonium mounted near the base of the brush. The radioactive decay particles emitted by the polonium are supposed to ionize the air between the brush and disc, helping to dissipate any static charge that might have formed, and aiding the brush in removing dust. These expensive brushes just don't work; in order to generate enough radioactivity to operate as advertised, such brushes would have to use a particle-generating isotope with emissions probably harmful to the user. As is, these brushes succeed only in moving dust from place to place in the grooves of your discs and remove little. They are ineffective and unnecessary.

There are other cleaning schemes, some quite complex and using combinations of high pressure water blasts with vacuum cleaning. Some even have advocated ultrasonic baths to clean records. But fortunately, elaborate solutions like these aren't needed to supply a satisfactory degree of cleanliness.

The late Cecil Watts, best known for his invention of the Dust Bug, has left a series of cleaning products which, when used with care, not only can clean your records adequately in the first place, but keep them clean during their lifetimes.

Basic care. Since the Dust Bug is the most familiar Watts product, and since most audiophiles are likely to own one already, its use and abuse will be described first. In appearance, it's like a tiny plastic tone arm. The Dust Bug mounts beside the turntable and has a small plastic brush at the business end to reach into the groove and presumably knock dust loose. There's a plush covered cylinder behind the brush which is supposed to remove the dust thus kicked up.

The Bib Groov-Kleen is similar to the Bug, but includes a counterweight. The drag of the Dust Bug often can slow a turntable, but the Groov-Kleen's variable tracking force makes possible similar performance without making the music flat.

The principle is a good one, and the Dust Bug and products like it are among the most common useful record care devices. Unfortunately, they are easily misused. The most common abuse is over-application of the so-called antistatic fluid supplied with the Bug; the fluid, which appears to serve little useful purpose, dries in the grooves contributing noise Watts never meant to be there.

Users either put too much or too little fluid on the Bug. At worst, the Bug is run dry, scraping the dust in the disc's grooves around and around, gradually abrading them. Those who use their Bugs dry are for some reason usually those who fail to clean them after play. Thus their record cleaning device gradually becomes a contaminator.

Watts intended the Dust Bug: (a) to be used on clean discs to begin with, (b) to be used slightly dampened so as to collect any dust that might fall on the disc during play, and (c) to act as a static discharge device thus partly preventing attraction of more dust.

Unfortunately, most users use the Dust Bug alone in the naive belief that their records already are clean when new and need only to be kept that way; many run the Bug dry, as noted above, and this in turn defeats Watts' third intention, that of static charge removal.

Static. Humidity in the listening room is one of the best overall solutions to static-caused clicks and pops. Low cost (\$5 or less) steam-type humidifiers can be placed in the room to raise relative humidity not only to a more tolerable level for human beings but also to a level high enough to help prevent formation of static charges, and to help bleed off existing charges. Do not aim the steamer at the turntable; the idea is to get moisture into the air, not onto the record player. Properly moistened record cleaning tools also help bleed off static charges from discs.

Thus: Before using your Dust Bug, make sure the disc is clean and make sure the Bug is moist -- but not with antistatic fluid. Instead use distilled water; it works just as well to discharge static electricity and to help the Bug pull out the dust. Most importantly, distilled water leaves no residue to collect in the grooves, and this means cleaner sound.

Tap water may be almost as good as distilled. But some supplies yield nearly as much sediment as water. Users must judge for themselves on this, but distilled water is very inexpensive, very clean, and contains no dissolved chemicals. It's probably worth the small outlay.

Better basics. If the Dust Bug alone can't "clean" records, what's needed? Watts' line also includes the so-called Preener, Parastat, and Stylus Cleaning Brush. The Preener is a plush covered cylinder meant to be used with new discs, or discs in new condition. Watts claims that the Preener can remove all dust from the record surface without resort to antistatic agents. It will not remove old antistatic films, or greasy deposits. The Preener's plush pile is impregnated with what Watts calls a "non-ionic compound" said to leave no residue. There's disagreement about this and the Preener may in fact make for greasy grooves with continued use. There's a wick along the axis of the Preener which is soaked with water with the intention of wetting the plush pad. This doesn't work very well, and a better method -- and one which also assures that the Preener itself is dustless when used - is to wipe it gently with a lint-free cloth damp with distilled water. The wiping pulls off old dust and assures that the plush bristles are themselves damp, thus old dust isn't reapplied and new dust is removed.

Watts recommends that the Preener be used while the turntable is rotated by hand, if possible, and the slower the better in order for the plush to penetrate the grooves. Hold the Preener with the fingertips at either end of its axis (remember that your hands are a source of oil; don't touch the plush), and rotate the turntable forward, then backward. Either use a different side of the Preener between applications, or clean the whole device. The purpose of the backward rotation is to get at particles "hidden" from the plush, behind curves in the grooves; this may seem unimportant, but elliptical styli are especially good at finding such "hidden" dirt, and abusing the ears with it. Preen both ways.

To remove collected dust, rotate the Preener a few degrees. The dust should rise out of the grooves in a neat windrow on the plush pad. Always move the cleaning tool along the direction of the grooves; never try to pull dust in toward the center or outward.

Watts' ultimate on-the-turntable cleaning tool is the Manual Parastat. It includes, sandwiched between two plush pads like those of the Preener, a nylon brush which is supposed to penetrate the grooves, kicking up accumulated dirt and grit. The tip diameter of the bristles

is about 0.00025 inch, so it can indeed get into the grooves. The same strictures observed for the Preener should be observed with the Parastat. Never touch the part of the tool that touches the disc; always use the device barely moist with distilled water -- and cleaned after its last application; run the turntable both forward and backward to remove hidden dirt, cleaning the Parastat between forward and backward rotations.

For all three of these Watts products, observe the following rules. Clean them frequently, if possible between sides of records being played. Keep them in a clean place; although the Parastat and Preener are packaged in an effort to keep them from picking up dirt off tabletops, etc., it is better by far to keep them in a plastic bag. Keep your grease-producing fingers off the active areas of the devices. Don't use Watts' -- or any other -- antistatic fluid. Always use the devices slightly damp, preferably with distilled water.

Your discs will only be as clean as the tools you clean them with, thus if you insist on clean and quiet records, your tools must also be pristine. And must be used every time you play your records.

Washing your discs. It is possible to settle for either a Parastat- or Preener-clean record, and to follow with the Dust Bug at each playing. Depending on your personal sensitivity to noisy surfaces, this can be quite satisfactory. But for the maximum in cleanliness and the minimum in dirt-caused noise, wash your records before their first play.

There's good reason for this. Even with today's light stylus pressures, the forces exerted on the groove wall are extremely high. Thus, any dirt in the groove on the first play will leave some evidence of its having been there -- a microscopic chip out of the groove wall, for example. Sometimes the stylus will force a piece of grit into the wall where it will remain forever to plague you. And even use of the Parastat before each play can't remove all the dirt.

Watts has thought of this too and supplies the Record Wash Brush, which is in fact the nylon brush found in the Parastat. But its application is far different.

Washing discs sounds formidable but isn't. The equipment list is short and simple: a soft plastic dishpan, an old well-washed pillowcase, the wash brush, distilled water, and a wetting agent to help the water penetrate to the bottom of the grooves. Kodak Photo-Flo 200 is recommended.

First clean the washing area with damp paper towels, then fill the dishpan with distilled water at a temperature somewhere between 80 and 90 degrees F (Don't use hot water unless you are prepared to deal with badly warped records as the result.) Lay out the pillowcase, fold it in half across its short dimension. Add wetting agent to the

distilled water at the rate of no more than one drop per cup of water; the right mix suds very slightly, and it's possible to see a real difference in the way the water creeps into the grooves with and without the wetting agent.

Remembering that your hands can act as a dirt carrier, first damp dust the plastic cover of the record jacket(s), open the seal and remove the disc in its inner liner, meanwhile puffing a little air into the cardboard jacket to remove what dust might lurk there. Remove and throw away the liner; it carries as much dirt as the disc and it's illogical to wash a record only to put it back into a dirty liner. Fresh, clean plastic-lined inner jackets are widely available for about ten cents each, and worth the outlay.

Wash your hands, then wash the record using the brush, stroking gently but firmly along the line of the grooves. Make sure the disc is thoroughly wet as it is brushed, and rotate it to bring each part to the bottom of the dishpan.

Make sure that you hold the disc by rim and label; avoid touching the grooves and the possibility of getting them fingerprinted. Also, avoid getting the label wet; record companies claim that they "bond" labels to discs these days, but don't trust this. Label dyes can run; so can some adhesives, especially on older records you may be trying to rejuvenate through washing. At worst, the label can come loose and slide down over the grooves leaving a trail of adhesive behind it. Give the label a swipe with a damp cloth, but don't wet it.

After the record has been scrubbed, place it within the fold of the pillowcase, and press-dry it. It isn't necessary to get the disc completely dry in this step, and is impossible in fact; just get the majority of the water off and move quickly to the turntable with your disc.

Now remove all remaining moisture from the disc with either a Preener or Parastat, preferably the latter because of its brush. This is the most important step in the wash process and serves two purposes: first, the Parastat, itself moistened with distilled water, removes large amounts of dirt loosened, but not floated away in the wash process; and second, since the wetting agent is a powerful detergent (but without the contaminating oils or aromatic chemicals of kitchen detergents) and may subtly attack the disc over a matter of years, the "parastating" serves to dilute and rinse away the wash mixture.

Special cases. Absolute purists will want to rinse their discs in distilled water to help remove wetting agent even before press drying their discs with the pillowcase. You can get away without this.

For records that water alone won't wash, some authorities recommend a solution of 50 percent grain alcohol and 50 percent distilled

water. Such alcohol is available through pharmacies by prescription, but the prescriptions aren't hard to get and can save liquor taxes -- if you have an understanding doctor. Fortunately, experience with this cleaning agent is limited; try it on a few records you can afford to lose before trusting it fully. In any event, its use should be followed by a distilled water rinse. If safe, it should be the answer to fingerprints and other dust-holding greasy deposits. But so-called "hot," or chemically active solvents should generally be avoided, and most alcohols are "hot."

If alcohol fails, another, and perhaps safer solvent is Freon Eleven. Freon Twelve is familiar as the propellant in spray cans and itself has some cleaning power, but Freon Eleven is a cleaner without peer. It has the happy capability of dissolving nearly everything undesirable without harming the object cleaned. It is relatively nontoxic, won't burn, and is chemically stable in use; it is safe for metals, carbon composition resistances (like those found in potentiometers), and nearly all plastics -- including records.

Freon Eleven is available in spray cans; spray the dirty area and loosen the dirt with a separate wash brush from that normally used. If the dirt is too much for a wash brush, use toweling first and follow with the brush. It is important not to spray too much Freon onto the disc at a time. It evaporates so quickly that its cooling effect condenses moisture out of the air as ice, and may freeze the dirt rather than dislodging it. Start with small amounts; you'll probably stay with them.

Although Freon itself leaves no residue on evaporation, the solution of Freon plus dirt may not be totally removed when the solvent evaporates. Thus, again, rinse the formerly dirty disc in distilled water before parastating and play.

For those in doubt about Freon Eleven, note that NASA has approved its use in manned spacecraft. That's not true of alcohol. It is a fair bet that if Freon is safe enough for manned spaceflight, it is safe enough for your records.

Around the spindle. Clean records aren't much good without clean record playing equipment, and the turntable can be a record's single greatest source of dirt over its lifetime. Those with foam-topped turntables, like AR's, are the most unfortunate of audiophiles. Dropping a disc onto one of these platters -- whether its dust cover has been used or not -- assures a more than adequate supply of dust on the bottom of the record. The platter covers supplied by Thorens and others are preferred over foam as they can be wiped with damp cloths and kept far cleaner than the latter.

The best solution is a platter mat with concentric rings which support the record at its center and edges only, never touching the

grooves. These are available as accessory items from Lafayette Radio and similar outlets. But they may be too heavy for some turntables with exceptionally compliant damping. It is possible for some such mats to weigh down some turntables so much that they drag, adding rumble and defeating the initial purpose.

But there is a way out. Purchase the small rubber wafers sold in electronics supply shops as feet for small chassis boxes and glue at least six around the edge of your turntable at even intervals. This hexagon of tiny "feet" will prevent the grooves from contacting dirt-bearing surfaces and provide more than adequate support for records at today's one to three gram tracking forces. As a side benefit to audiophiles who can't afford ultra complex tonearms like the SME or Rabco, these feet come in a variety of heights and can be used to raise or lower the level of the disc above the turntable. This gives users of uncomplicated record players almost as much control over stylus rake and tracking angle as possible with adjustable arms, and at about one-hundredth the cost. With a little experimentation with various wafers, it's possible to make your elliptical stylus ride straight up in the groove and also to approach the nominal 15 degree tracking angle for the stylus cantilever assembly.

The stylus. Even with clean records and a clean turntable assembly, you still are not ready to play your discs. Chances are good that your stylus needs cleaning first. Again Watts comes to the rescue with the Stylus Cleaning Brush, a microminiature version of the Preener with bristles stiff enough to remove dirt, but flexible enough to be safe for your stylus assembly.

If you have been playing records for some time without cleaning your stylus, you may have built up a sizable amount of attached dirt. This dirt can not only interfere with clean tracing of the grooves, but also adds to the effective tip mass of the stylus. In both cases, stylus dirt detracts from the performance of what may be a very costly cartridge; for best sound, clean the stylus with each play.

The task is simple with a new cartridge or stylus; dampen the Watts brush with distilled water and stroke the stylus from the back of the cartridge to the front, slanting a bit to each side of the cartridge centerline. This should be enough to keep the diamond clean if it is clean to start with.

But a stylus in use may have attracted some hardened material to it -- antistatic fluid, vinyl, "silicones," airborne grease, etc. Often distilled water won't be enough to cope with such deposits, and again Freon Eleven is the answer. Very carefully, spray the stylus itself, then wipe with the Watts brush. Spray from the rear toward the front of the cartridge to avoid blowing dirt into the suspension; spray the stylus rather than the brush to prevent ice from forming on the bristles and possibly harming the assembly.

Some advocate use of camera lens cleaning brushes for stylus cleaning, and some audio products use similar brushes.

Note, however, that these soft-bristled brushes are designed to dust off optical equipment without damaging delicate anti-reflective coatings -- and these coatings can have just about the same consistency as the deposits you are trying to get rid of. If the deposits are quite hard such brushes won't remove them without relatively large amounts of solvent, and it is never wise to use too much solvent around your stylus. Also, these brushes are quite absorbent and if used improperly can soak the stylus assembly despite your best intentions. This is bad policy, especially with less expensive styli which are not press-fit into their cantilever arms. Some of these use minute amounts of adhesive to assure attachment of stylus and cantilever, and thus the remote possibility exists that the bond could dissolve, ruining the business end of your cartridge. Best policy is to use the correct brush and small amounts of a benign solvent like Freon Eleven.

Where to find it and what to pay. The Watts line of record care products is widely available and variably discounted. Generally, Hi-Fi emporia will offer Dust Bugs for about \$6.50; if you already have a tired Dust Bug, Watts now offers replacement plush pads and nylon brushes for \$2.00 to \$3.00 -- a saving of half to two-thirds of the new price.

The Preener, which with the Dust Bug forms the basic minimum set of record care equipment, is offered for \$3.00 to \$4.00.

The Manual Parastat will run a cool \$12.00 or so, depending on the vendor. It is worth the amount, especially if you intend to wash new discs or rejuvenate old ones through washing. In less critical use, its dual plush pads make it the equivalent of two Preeners.

The Record Wash Brush is offered for approximately \$3.50, while the Stylus cleaning Brush costs about \$1.35 to \$2.50. Both last indefinitely, and so are very inexpensive over time.

Kodak Photo-Flo 200 wetting agent is available from any semi-professional photo supply house, as for example, Copley Camera. A four-ounce bottle, enough to wash hundreds of discs, costs only about 65¢.

Freon Eleven is available in 24-ounce spray cans about 10 inches high costing about \$2.97 at You-Do-It Electronics, 40 Franklin St., Needham. This is just off Route 128. It is labeled "TV Tape and Head Cleaner" and comes from the Rawn Chemical Co. In passing note that Freon also is useful in cleaning tape heads, capstans, pucks, tape guides, and is preferred by many who have tried it over Ampex head cleaner and alcohols. If your interests extend to tape, Freon is doubly valuable to you.

Lint-free cloth -- the material with which you should clean and dampen your Watts cleaning tools -- is difficult to find in that most lint-free cloths aren't really lint free. A good compromise is "Miracloth," a pressed Rayon fabric which at least has the good manners to show loose fibres when it begins to break down. Miracloth also is inexpensive enough so that it can be changed frequently; a package of three 14 by 16 inch cloths -which can themselves be cut up into smaller patches -- costs from 49¢ to 79¢ at local groceries or supermarkets.

Humidity is the best static fighter, especially helpful in the extra dry winter months, and can be had from a variety of humidifiers. The April '73 issue of Consumer Reports evaluates competing units, but the best combination of price and performance seems to be the Hanksraft model 217A, offered at about \$4.00 in Star Markets. If Star is out of stock, the Hanksraft Co., Reedsburg, Wisc. 53959, should be able to supply you.

Discounts on most Watts products are available from mail-order houses such as International Hi-Fi Distributors, Baltimore. But discounts just as good may be had locally if you shop around; K&L of Watertown appear to have some of the lower prices on record care goods. If you can't shop, pick the discounter whose price -- plus mailing costs -- is lowest; you may lose in handling charges what you save by mail.