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The ARSC Grading Project: Phase One

Proper grading of vintage recordings and the establishment of a "standardized" grading system has been the focus of heated discussions since record collecting began. The ARSC Grading Project is the first attempt to methodically evaluate current grading conventions and statistically project a universal grading protocol. This article summarizes Phase One of this project; Phase Two will be presented upon completion.

Last year, as chair of the ARSC Dealer's Committee, I initiated a project aimed at establishing a standardized grading system for vintage records. Being well aware of the controversy that would inevitably surround an initiative of this nature, I sought the advice of a number of established dealers. Though some expressed reservations as to the feasibility of such a project, all were most encouraging and all but one were willing to help. The team I assembled to assist me in this project consisted of approximately 20 dealers. They were selected based on the following criteria:

1) They had to have several years of experience as dealers.

2) They had to have a generally excellent reputation among collectors *and* dealers.

3) They had to be involved with publishing lists that would require detailed grading of large numbers of individual records.

4) They did *not* have to be members of ARSC, though this factor was taken into consideration.

It was my intention to include dealers in every category and era of vintage recordings, so as not to bias this study towards the "standardized" protocol of any given area. There were many excellent dealers that could have been chosen but weren't, in order to maintain this balance. The final panel of participants included Martin Bryan, Harry Butler, David Canfield, Jim Cartwright, Gene Earle, Tom Hawthorne, Warren Hicks, Warren Hodgdon, Larry Holdridge, Gene Joslin, Brad Kay, Joe Lauro, Dave Norbeck and Jim Peters, Russ Shor, Steve Smolian, Mike Stewart, Milt Weiss, the late Don Wetzell, and Pete Whelan.

To my knowledge, no effort has ever been made on such a scale to evaluate the grading conventions used by the major record dealers. Up until now, record grading

has been entirely subjective, and the discussion of grading systems and dealer competence has been purely theoretical. The reason for this is simple. It has never before been possible to compare actual grades submitted by an experienced panel of dealers on the same group of records. This has now been accomplished, and we now have the ability to move the discussion from the theoretical to the empirical.

Why is a standardized grading system necessary? Perhaps it is not; after all, we have survived thus far without one. However, as long as each collector, dealer and archive maintains their own differing standards, nothing but confusion will prevail. This fact was made evident in the study itself. Of the dealers who participated, two used a numerical scale; four used varying combinations of the letters A through F; fourteen used scales employing some or all of the letters N, E, V, F, G and P; and many used pluses, minuses or combination grades such as 3-4 or EE-. And just what do these letters stand for, anyway? We all would agree that N means new and E means excellent. But does VG really mean Very Good, and does F really mean Fair? The results of our survey would indicate not.

The underlying problem is one of communication. In order to understand what any given grade means to a particular dealer, we must first see examples of records that he has graded. And if that dealer is not consistent in his grading, we still may not know what to expect from him. Archival institutions have special problems, generally brought about through the use of inexperienced or volunteer staff. Grading requires the attention of one experienced in the field of vintage recordings, and many archives don't have the resources to commit knowledgeable staff to such a tedious, time-consuming task. The bottom line is, record grading in today's market is an art, not a science. In the interest of the hobby at large, we need to move away from the subjectivity inherent in today's grading systems.

A parenthetical note would be in order here. Some have suggested that ARSC adopt standards and conventions already in use by certain collector publications, particularly those aimed towards jazz and blues collectors. However, to do so would have slighted many thousands of collectors who find their interests outside the relatively narrow scope of this particular musical genre. I have the feeling that those who collect operatic and classical recordings would take great offense to the suggestion that their grading conventions should be abandoned in favor of what the jazz collectors have come to know and love! Furthermore, the grading systems used by jazz and blues collectors are inherently flawed, and the results of this project demonstrated that there is little more consistency in the jazz and blues market than there is in any other area. One must also bear in mind that ARSC was formed to serve the needs of *all* persons and institutions interested in sound recordings. And due to the fact that many (if not most) member archives acquisition records in more than one musical genre, the need for a grading system that would apply across the board is apparent.

Before I get into the actual data, I will briefly describe how the initial phase of the study was carried out. Drawing from hundreds of records in my possession, I assembled a group of 55 recordings (28 acoustic and 27 electric) representing most major types of 78 rpm discs and virtually every condition that one is likely to encounter. These records also exhibited most of the different types of damage and inherent flaws that one would expect to see when evaluating a large quantity of vintage recordings. Once I had graded them myself, I placed each record in an unmarked sleeve and randomly assigned it a number from 1 to 55. This number was applied directly to the

record with a small sticker to eliminate confusion.

I then sent this box of records on its 12,000 mile journey. Every dealer was provided a set of instructions and a grading form. Each dealer, upon receiving the box of records, graded them as if he was putting them into his own auction list. Dealers were also asked to describe the type of light they used when grading their records. The box was then forwarded to the next grader, each dealer returning his completed forms to me. Participants were asked not to discuss the records among themselves so as not to taint or bias the survey. No dealer had access at any time to my grades or to the grades submitted by their fellow participants.

As I received the grading sheets, I entered the data into my computer just as it was reported, trying to retain as much of the original nomenclature as possible. Once all the responses were in and the records had finally made their way back home, I removed the records from their sleeves and sorted them in bright sunlight from 1 to 55 based on their actual wear, using the side most worn. Because each record was compared to the others, a relatively high degree of accuracy was attained. Though there were a few tough calls, the general progression from *wiped out* to *brand new* was established.

After having entered this information into the database, it was now possible to sort the 55 records by actual condition. Table I shows the submitted grades of 12 participants with the records ordered by relative wear. (Note: Due to space considerations and the need to retain grader anonymity, some of the tables reproduced in this article are incomplete. Table I includes responses only from those graders who used similar nomenclature, and is in no particular order.)

Though interesting, our table still was not of much use. In order to empirically analyze the data, it was necessary to convert each submitted grade to a number. Since some of the participating dealers used as many as 15 or more grades, I created a table that encompassed 21 increments, providing me with a 0 to 20 scale. I then took each grade that a given participant used and placed it on this scale by comparing his responses with the other graders. Once this had been accomplished, each submitted grade was converted to its numerical equivalent. (If a dealer submitted different grades for each side of a given record, the lower grade was always used.) Table II shows the converted numerical grades for all twenty graders.

Using this chart of converted grades, Mike Sherman calculated the mean (or average) grade as well as the standard deviation for each record. In order to demonstrate the methods employed in calculating these values and to gain a clearer understanding of their meaning, let us examine the following imaginary examples:

	Grader A	Grader B	Grader C	Grader D	Mean	Standard Deviation
Record 1	10	13	3	10	9	3.67
Record 2	17	11	3	5	9	5.48
Record 3	18	18	16	17	17.25	.83

Mean values were derived simply by adding the numerical grades for each record and dividing by the total number of graders. Standard deviation measures the variability of the data about the mean and is calculated using the following formula (x = dealer's grade on a particular record, E(x) = mean grade of record and p(x) = probability of occurrence):

Standard Deviation =

It is not really important that readers understand the mathematics involved; it is important, however, that one understands how standard deviations are used. An examination of the sample table reveals that Record 1 has a significantly lower standard deviation than Record 2, even though they both have the same mean grade of 9. This tells us that Record 2 was much harder to grade. Perhaps this record had a defect which some dealers took into account while others did not. Record 3, on the other hand, had a very small standard deviation, as all four graders were in close agreement with each other. In our survey, Record 2 would have been thrown out.

Now let us look at Grader C in the above example. Comparing his grades with those of the other three dealers, it would appear that C was a very poor grader. On Records 1 and 2 (both of which have the same mean grade of 9), Grader C submitted a grade of 3. This is obviously not good in either instance, but the standard deviations enable us to quantify just how bad Grader C missed on each record. On Record 1, Grader C was 6 points away from the mean. This was almost *double* the standard deviation of 3.67, a reprehensible error to be sure. Contrast this with C's results on Record 2. Even though C was still 6 points away from the mean, the standard deviation was a whopping 5.48. In other words, because there was so much disagreement among the four graders on this particular record, C's grade was not nearly as unreasonable on Record 2 as it was on Record 1.

In order to evaluate the overall accuracy of the surveyed dealers, we took each participant's numerical grades and calculated the difference between those grades and the mean for every record in the survey. We then divided this result by the standard deviation of each record to figure his "weighted error" on that record. These amounts were then totaled for each grader, and the resulting sum represented that grader's accuracy in relation to his peers. The following table charts the individual weighted errors for each record and grader:

	Grader A	Grader B	Grader C	Grader D
Record 1	.27	1.09	1.63	.27
Record 2	1.46	.36	1.09	.73
Record 3	.90	.90	1.51	.30
Total Weighted Error	2.63	2.35	4.23	1.3

It can be seen that Grader D was very accurate in his grading (based on the results submitted by the other graders), while Grader C was extremely poor. In our survey, Grader C's results would have been eliminated from the mix. By eliminating Grader C and Record 2 and then recalculating the means and standard deviations for the remaining graders and records, more accurate results could be obtained.

In the actual survey, 7 records had excessively high standard deviations and were therefore removed from the survey. The two dealers with the highest total weighted error were also removed. After these adjustments were made, the means and standard deviations were recalculated for the remaining 48 records. These final figures are shown in the last two columns of Table II (Converted Grades). Those records and graders that were eliminated from the survey are italicized.

After resorting the records by their newly calculated means, I placed the actual records in that order. It was now a simple matter to pull representative records from the survey group to provide the benchmarks for our new grading scale. Or so I thought! After laying the records next to each other in order of their average grades, I discovered to my horror that they were in no order at all. Records that were near mint and records that were wiped out were basically in the proper positions, but the 40 records that fell between those two extremes were hopelessly mixed up. Figure I compares the mean grades of the 48 survey records with their relative progression of wear. One can readily see my problem. After (literally) several hours of sorting, resorting, and juggling the data, it became obvious that there was no way to use the survey results in conjunction with the survey records and develop an accurate, usable grading system.

Why are the results so skewed? A careful examination of the data reveals a number of factors. First, and probably most importantly, many graders took defects into account when grading the records. The most obvious example of this is record number 10. This record exhibited little if any groove wear, but it had one fatal flaw: an edge chip that extended into the first 18 grooves! Some dealers properly described this record as E with an edge chip to 18 grooves, while others simply graded it V. Obviously, a grade of V does not adequately convey the true condition of this record. To one degree or another, this problem manifested itself throughout the survey. Though the 7 records with the highest standard deviations were removed from the survey, many more records were affected by this problem, though to a lesser extent.

A second reason that the grades were not more consistent resulted from the fact that many of the participating dealers were not experienced in grading certain types of records. Several dealers stated that they did not feel qualified to grade Berliners, post-war recordings, acoustic records or whatever. Other participants may have had similar reservations without mentioning them on their response sheet.

A third problem is that not every dealer is a highly skilled, accurate and consistent grader. Additionally, certain dealers only made use of 6 or 7 grading increments. This would have skewed their responses to a certain degree when placed on a 21 point scale.

If this study proved anything, it demonstrated just how great a need there is for a simple, accurate and concise grading system. If twenty of the country's best known dealers couldn't agree on the conditions of a relatively small group of recordings, how can a newcomer to the hobby expect to excel in this area?

Though there may never be a final, perfect solution to the grading problem, there is much room for improvement. Phase Two of the grading study will be conducted over the next few months. Using the data derived from this study as much as possible, I will assemble another group of records that will exhibit varying degrees of wear over an 11 point scale. These records will be free from defects; other than wear, they will be in perfect condition. I will then circulate this group of records among the twenty study participants for their input. Pending a general consensus of the dealers involved, these records will become the benchmarks for a new 0 to 10 grading system.

Assuming that this phase of the study is successful, the results will then be published in a monograph with each point on the scale represented by a photograph of the actual benchmark record. This publication will enable even a novice to grade most vintage records with a relative degree of accuracy and consistency. This monograph will also include a discussion, with photos, of defects and flaws along with definitions and suggested abbreviations.

General Observations

On Visual Grading

One of the big questions long debated by collectors and dealers concerns relative versus absolute grading. In other words, should a Berliner recording with 90% wear be given the same grade as a post-war Victor Red Seal with 90% wear? Most dealers (including those who mean to do otherwise) will tend to grade the RCA recording much more harshly. After all, the average Berliner record may have 80% wear while the average post-war operatic recording may only have 5% wear.

However, if one is to derive an empirical grading scale that may be used with any vintage record, there is really only one choice: all records must be judged by the same standards. Perhaps a Berliner that grades 9 does not exist. So be it. If you graded a very lightly worn Berliner as a 9 because you had never seen a better example, what would you do if you ever *did* encounter an unworn Berliner? In our survey, dealers were split on this issue. Most acknowledged the need for consistency regardless of record type, but a few felt that early recordings should be graded more leniently.

While we are on this subject, it should be mentioned that the presence or absence of *surface luster* is not necessarily an indication of groove wear. An experienced collector knows that some records were pressed with materials that exhibited more of a matte finish than a brilliant sheen. The general reflectivity of the lead-in and run-out areas will usually confirm whether or not this is the case. If a dull finish is the result of exposure to a chemical agent, high humidity or other external factors, this characteristic should be noted as a defect.

On Aural Grading

The reason that vintage recordings should not be graded aurally is simple: the 78 rpm format was never truly standardized on an industry-wide level. Groove dimensions and configurations, playing speeds, equalization curves and pressing materials varied widely over the 70-year period we are concerned with. As a result, a recording will never sound its best unless it is played with the right size and shape of stylus at the correct speed and with the correct equalization. Beyond this, the addition of filters and scratch removers can dramatically improve the sound of any given record. Though most advanced dealers and archives will possess the proper type of equipment required to optimize the recorded signal, this cannot be assumed. It is an even greater assumption to count on the average collector possessing this type of equipment. In fact, many collectors play their records with large steel needles on original acoustic phonographs! For these reasons, an aural grade is of marginal value. Any given record may sound great on one system and awful on another.

This is not to say that a dealer should not mention aural qualities when grading a record. In fact, this is most useful when comparisons are being made. For example, to say that a particular record sounds great does not really say much. On the other hand, if you mention that the record sounds better or worse than one might expect based on its type, condition or age, that establishes a reference point for the experienced collector. This, however, has its limitations and should only be used with discretion.

On Defects

Table III provides a general summary of all the defects noted for each record in the survey. It is interesting to note how many dealers mentioned particular faults. For instance, several dealers missed hair cracks altogether. This is unfortunate, but to be expected. In fact, the majority of complaints that I receive from my bidders concern

hair cracks that I did not catch when I was grading the record. If your light does not hit the record at just the right angle, many hair cracks are impossible to see. It was also interesting to see how various defects were described. Sixteen graders made note of the label scratches on Record 6, but only 6 of those dealers correctly identified the scratches as a reviewer's X. Record 23 had a fault which was described variously as a bad pit, filled needle dig, pressing indentation, rough bump, pressure mark and deep scuff patch! As previously mentioned, one of the objectives of Phase Two will be to identify various defects and to suggest standardized nomenclature and abbreviations for describing them.

Several dealers not only mentioned obvious defects, they also described how these flaws affected the playing of the record. Comments such as audible scuff; bubble thumps 4 times; small scratch clicks; needle dig passes, but will sound; and rough area swishes were frequently made. This practice is to be applauded, as it serves to better communicate to the buyer just what condition the record is in. Obvious drawbacks to this practice would include the amount of additional time it takes to listen to the record in question, the nature of the equipment used to sample the record (a scratch may not sound on a Victrola, but may be obtrusive on a modern turntable), and the question of where to draw the line when describing audible faults.

One of the primary lessons learned from this study is that when grading a record, wear must be isolated from defects. In other words, the grade assigned to any given record must be based solely on the degree of groove wear present, defects being described separately. This is not to say, however, that every defect should always be mentioned. A record in poor condition is expected to have a certain number of scuffs, scratches and/or label problems. Rather than describe in detail the various flaws present on a worn out record, one should automatically assume that minor flaws are present. Generally speaking, it might be preferable to describe the *absence* of expected flaws on a record in this condition.

So what defects should be mentioned? Without a doubt, the following defects should be noted regardless of the record's overall condition: cracks and hair cracks; edge chips and/or flakes extending into the recorded portion of the record; needle digs, bubbles and needle runs that cause the record to skip or repeat; warpage; and any major, unexpected problems such as extra holes drilled into the record, foreign substances adhering to the record surface, enlarged spindle holes, etc. Certainly, any defect that may prevent a weighted cartridge from properly tracking the record is important enough to warrant description. Natural pressing flaws should also be noted, even when a knowledgeable collector would expect them. It goes without saying that a detailed description of all label defects would be in order when describing a rare label, even if the record itself is graded at the bottom of the scale.

Defects such as scratches, scuffs, grainy surfaces, edge damage not affecting playing grooves and label problems should always be mentioned on higher grade records. Experience, common sense and integrity will enable any dealer to properly describe a record; when a question does arise, one should always err on the side of conservatism and mention the defect. Phase Two will attempt to address the types of minor defects that would be expected for different grades.

On Light

One of the questions asked of each grader pertained to the type of light they use when grading records. As with every other aspect of the survey, answers were across the board. Their responses are summarized here:

1 incandescent, 60 watt
2 incandescent, 50 watt
3 incandescent
4 halogen lamp
5 incandescent, two 150 watt spotlights
6 incandescent spotlight
13 incandescent + daylight
14 incandescent, 200 watt
15 daylight
16 incandescent + daylight
7 incandescent
8 incandescent, 60 watt
9 incandescent + daylight
10 incandescent
11 incandescent + fluorescent
12 incandescent flood + daylight
17 daylight
18 daylight
19 incandescent + fluorescent
20 incandescent

Based on personal experience, light used to accurately grade records must be bright, concentrated and consistent. It must not vary from grading session to grading session if consistency is to be achieved. For this reason, natural light is best avoided. Though bright sunlight is ideally suited to record grading, the time of day, season of the year and prevailing atmospheric conditions all affect the brightness and quality of the light. Anyone grading large quantities of records over long periods of time would be well advised to use a bright incandescent bulb of consistent wattage.

Acknowledgments

In closing, I would like to thank the dealers who participated in the survey. It goes without saying that without their assistance and input, this study could never have been accomplished. What is not so immediately obvious is the fact that each dealer was required to drop whatever he was doing when the box of survey records arrived, grade the records and forward them to the next dealer within a three-day period. If the graders had not been as faithful as they were in this regard, Phase One could not have been completed in time for my presentation at the June ARSC convention in New York. I especially want to thank my good friend and colleague, Mike Sherman, for his efforts and expertise. Mike's advice in the early stages of this experiment guided me in structuring the project, and his analysis of the raw data was essential to an understanding of the results. Finally, I would like to thank the members of the Executive Committee who encouraged me to tackle this daunting task and provided me with a budget sufficient to see it through to completion.

Kurt Nauck is chair of the ARSC Dealer's Committee. He is a professional record auctioneer and proprietor of Nauck's Vintage Records. He is a frequent contributor to numerous collector publications, and is currently at work on a number of projects, including The American Vintage Record Labelography: a Discography of American 78 rpm and Cylinder Records on CD ROM, *and* Nauck's Guide to Vintage Record Collecting, *a primer for beginning collectors.*

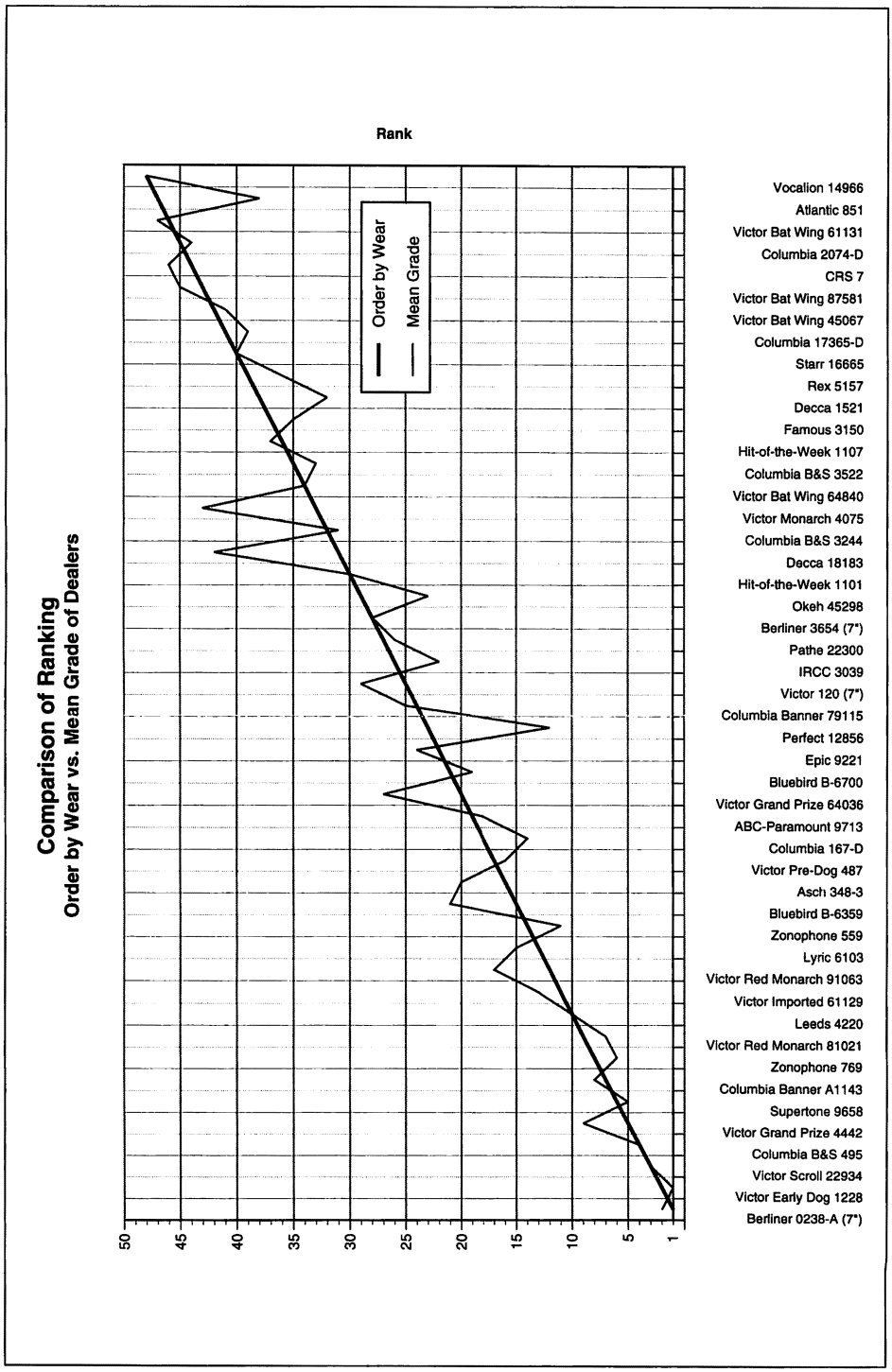
Comparison of Ranking
Order by Wear vs. Mean Grade of Dealers
Rank
Order by Wear
Mean Grade
50
45
40
35
30
25
20
15
10
5
1
Vocalion 14966
Atlantic 851
Victor Bat Wing 61131
Columbia 2074-D
CRS 7
Victor Bat Wing 87581
Victor Bat Wing 45067
Columbia 17365-D
Starr 16665
Rex 5157
Decca 1521
Famous 3150
Hit-of-the-Week 1107
Columbia B&S 3522
Victor Bat Wing 64840
Victor Monarch 4075
Columbia B&S 3244
Decca 18183
Hit-of-the-Week 1101
Okeh 45298
Berliner 3654 (7")
Pathe 22300
IRCC 3039
Victor 120 (7")
Columbia Banner 79115
Perfect 12856
Epic 9221
Bluebird B-6700
Victor Grand Prize 64036
ABC-Paramount 9713
Columbia 167-D
Victor Pre-Dog 487
Asch 348-3
Bluebird B-6359
Zonophone 559
Lyric 6103
Victor Red Monarch 91063
Victor Imported 61129
Leeds 4220
Victor Red Monarch 81021
Zonophone 769
Columbia Banner A1143
Supertone 9658
Victor Grand Prize 4442
Columbia B&S 495
Victor Scroll 22934
Victor Early Dog 1228
Berliner 0238-A (7")

Table I Submitted Grades

Record	Type	Order	Comments	1	2	3
Vocalion 14966	E	1		N-	E++	E+
Atlantic 851	E	2		N-	N-	E+
Victor Bat Wing 61131	A	3		E+	N-	E+
Columbia 2074-D	E	4		N-	E+	E+
CRS 7	E	5	heavy pressure marks	N-	E+/N-	E-
Victor Bat Wing 87581	A	6		N-	E+	E-
Victor Bat Wing 45067	A	7		N-	E	E-
Columbia 17365-D	E	8		N-/E+	EE+	E-
Starr 16665	E	9	hair crack, heat marks	E+	E+	V+
Victor Red Scroll 1347	E	10	edge chip to 18 grooves	E-	E/EE-	G+
Rex 5157	A	11		E++	EE+	V+
Decca 1521	E	12	large bubble	E	EE+	V+
Famous 3150	E	13		E	E	V+
Columbia A2579	A	14	heavy scratches	EE-	E	V+
Hit-of-the-Week 1107	E	15		EE+	EE+	V+
Columbia B&S 3522	A	16	grainy	E++	E	V+
Victor Bat Wing 64840	A	17		VV+	EE-	V-
Victor Monarch 4075	A	18		EE-	EE-	V+
Columbia B&S 3244	A	19	bubbles	E	E	V+
Decca 18183	E	20	light grainy	EE+	E	E-
Hit-of-the-Week 1101	E	21		E+	E	V+
Okeh 45298	E	22	edge flake to 9 grooves	E-	E-V+	V-
Berliner 3654 (7")	A	23	natural pressing indentations	EE+	E	E-
Pathe 22300	A	24		E	E	V+
IRCC 3039	E	25		N-	E+	E-
Victor 120 (7")	A	26		E	E-	V-
Columbia Banner 79115	A	27		E-	E-	G+
Perfect 12856	E	28	hair crack, heat damage	E	E	V-
Epic 9221	E	29		EE-	E-	V-
Bluebird B-6700	E	30		E-	EE-	V-
Victor Grand Prize 64036	A	31		EE+	E-	V+
ABC-Paramount 9778	E	32	jukebox cull	EE-	EE-	V+
ABC-Paramount 9713	E	33	potential 5 groove edge flake	E-	E—	V+
Columbia 167-D	E	34	heavy pressure marks	VV-	V	P
Victor Pre-Dog 487	A	35		E	V++	V-
Asch 348-3	E	36	hair cracks	V-	VV+	F
Bluebird B-6359	E	37	hair crack	V+	E-	G-
Hit-of-the-Week 1074	E	38	lamination crack	EE-	EE-	E-
Zonophone 559	A	39		V+E-	VV+	G+
Lyric 6103	A	40		E-	V+	G-
Victor Red Monarch 91063	A	41		V+	VV+	G+
Victor Imported 61129	A	42		E-	V+	V-
Leeds 4220	A	43	heat damage	EE-	V+	G+
Decca 30301	E	44	jukebox cull	V/E-	V/E	V-
Victor Red Monarch 81021	A	45	hair crack	V-	V+	F
Zonophone 769	A	46	stressed grooves	V+E-	V-	G-
Berliner 40124 (7")	A	47	natural pressing indentations	E	VV+	G-
Bluebird B-7080	E	48	jukebox cull	V+	V/EE-	G-
Columbia Banner A1143	A	49		V-	V	F
Supertone 9658	E	50		V—	V-	F
Victor Grand Prize 4442	A	51	stressed grooves	V—	V-	P
Columbia B&S 495	A	52		V-	V	F
Victor Scroll 22934	E	53	needle run repeats	V—	G	P
Victor Early Dog 1228	A	54	needle digs	E-	VV-	G+
Berliner 0238-A (7")	A	55		V—	G	P

7	9	12	13	14	15	16	17	19
E+	E+/E+	N-	E+ to N-	N-	N-	N	E/E-	N-
EE+/E+	E to E+/E+	N	N-	N-	N-	E+	E+	N-
E	E+	E+	E+ to N-	E+	E+	N	E+	N-
EE+	E to E+	E+	E+	N-	E+	E+	E-	N-
EE+	E to E+	EE+	E	E+	E	E+	V	N-
EE+	E	EE+	E+	E+	E+	EE+	E-	E+
EE-/E	E- to E	E+	E+	E+	E-/E+	E	E-	N-
E	E to E+	EE+	E	E/E-	E	EE+	E	N-/E+
EE+	E to E+	E+	N-	E+	E	EE+	V-/V	N-
E-/EE-	V+	E	V+/E-	E	V+/E-	E-	G/V	E/E-
EE-	E-	E	E+	E-	E	E	E	E
EE-/E	E	E+/E	E+ to N-	E+	E	EE+	E-/V+	E-
E-/EE-	E-	E/E-	E	E-	E-	EE-	V	E
V+	V+ to E-	EE-	E-	E-	E-	V++	V	E
E-	E-	E-	E-	E	E	E	V+	E-
E	E- to E	E-	E+	E-	E	E+	V+	E
E-	E-	E-	V+	E-	E-	EE-	V+	E
E-	V to V+	E-	E- to E	V+	E-	E-	V-	E
E-	V+ to E-	EE-	E-	E-	E-	EE+	V+	E-
EE-	E- to E	E/E+	E	E	E	EE-/E	E-/V+	E/E+
E-	V+	E-	V+ to E-	V+	E	E	V	E-
E-V+	V+	E-	V+	E-	V+	E-	G+	E-
E	E-	E—	E	V+	E	E	V	V+
EE-/E-V+	V	E-	V+ to E-	V+	V+	E-	G	V+
EE-	E-	EE-	E	E	E-	E+	E/E-	V+
E-V+	V to V+	V+	E-	V+	E-	E-	V+	V
VV+	V+	E—	V+	E-	V to V+	V+	V-	V+
E-	V+ to E-	E—	E-/V-	E-	E-	E-	V-	E/E-
V+	E-/E	E-	V+/E-	V+	E-	V+	V/V-	V+
V+	V+ to E-	E-	V+ to E-/V+	V+/E-	V+	V+	V-	E-
E-	V to V+	E-	E- to E	V	V+	V++	V	V
E-V+	E- to E	E	E-/V+	V+	E-	E-	V+	V/V+
E-V+	E-	E/E-	V+/V+ to E-	V+	V+	V+/V	G/G+	V/V+
V	V- to V	V	V-	V	V/V-	VV+	G-	V+/V
E-V+	V	V	V+	V	V+/V+	V+	G+	F
VV-	V to V-	V	V-	V	V-	V-	G	V
V+	V+	V/V+	V	V+	V+/V	VV+	V-	V+/V
E-	V- to V	E-	V+	E	E-	E	V	V+
E-V+	V	V+	V+ to E-	V-	V	V+	G	F
V	V- to V	E—	V	V-/V	V-	V+	V/V-	V
V+	V	V++	V to V+	V+	V+	V	G	V
V+	V	V++	V+	V	V	V	G+	V
V+	V	V+	V+	V-	V-	V+	G+	F
V+	E-/E	V/E-	V+	G-/E-	V/E	E-	V-/G-	E-/V
V+	G+	V+	V	V-	V	VV+	G	V
VV+	V-	VV+	V- to V	V	V to V+	VV+	G	V
V+	V+	V+	V+	V-	V	E-	V-	F
VV+/V+	V/E	V+/E-	V-/E-	V/V+	V/V+	V/V+E-	V-/V+	V/E-
VV+	V-	V	V	G/G+	V	V	G/G-	V
V	V-	V-	G+	G/G-	G+	V-	G+	V-
VV-	V-	V-	V-	G	G	G+	G	F
V-	G	V	V to V+	G-	G+ to V-	V	G-	V-
G	G+	G-	G	P	G-	G+	F+	P
V+	V-	V+	V+	G	V	V-	G+	F
V-	G-	F	G	P	G	G+	G	P

Table II Converted Grades

Record	Order	1	2	3	4	5	6	7	8	9	10	11
Vocalion 14966	1	19	19	20	20	*20*	20	20	15	20	20	20
Atlantic 851	2	19	20	20	18	*20*	20	19	19	18	20	19
Victor Bat Wing 61131	3	17	20	20	18	*16*	18	18	20	20	20	20
Columbia 2074-D	4	19	18	20	16	*19*	20	19	20	18	18	17
CRS 7	5	19	18	18	11	*14*	20	19	13	18	18	17
Victor Bat Wing 87581	6	19	18	18	18	*16*	20	19	19	17	18	17
Victor Bat Wing 45067	7	19	15	18	16	*16*	20	16	17	16	18	17
Columbia 17365-D	8	17	17	18	18	*19*	20	18	20	18	18	17
Starr 16665	9	17	18	15	18	*19*	20	19	19	18	18	17
Victor Red Scroll 1347	*10*	*11*	*13*	*7*	*0*	*5*	*4*	*13*	*13*	*12*	*16*	*10*
Rex 5157	11	18	17	15	18	*17*	18	16	15	15	16	17
Decca 1521	12	15	17	15	11	*18*	13	16	19	17	16	17
Famous 3150	13	15	15	15	14	*14*	16	13	13	15	16	13
Columbia A2579	*14*	*13*	*15*	*15*	*2*	*9*	*10*	*7*	*8*	*14*	*13*	*13*
Hit-of-the-Week 1107	15	16	17	15	16	*16*	20	13	15	15	11	17
Columbia B&S 3522	16	18	15	15	18	*16*	16	18	15	16	16	17
Victor Bat Wing 64840	17	6	13	11	11	*11*	13	13	13	15	16	13
Victor Monarch 4075	18	13	13	15	12	*14*	13	13	15	11	13	13
Columbia B&S 3244	19	15	15	15	14	*10*	16	13	13	14	13	17
Decca 18183	20	16	15	18	16	*14*	16	16	15	16	13	17
Hit-of-the-Week 1101	21	17	15	15	14	*16*	16	13	15	12	13	13
Okeh 45298	22	11	10	11	2	*5*	13	10	13	12	13	6
Berliner 3654 (7")	23	16	15	18	11	*19*	16	18	13	15	13	15
Pathe 22300	24	15	15	15	11	*16*	13	10	11	9	13	13
IRCC 3039	25	19	18	18	16	*19*	16	16	19	15	11	19
Victor 120 (7")	26	15	11	11	11	*14*	13	10	8	11	11	13
Columbia Banner 79115	27	11	11	7	9	*3*	13	4	8	12	9	13
Perfect 12856	28	15	15	11	11	*11*	16	13	13	14	11	13
Epic 9221	29	13	11	11	12	*14*	13	7	11	15	9	10
Bluebird B-6700	30	11	13	11	9	*9*	10	7	11	14	9	6
Victor Grand Prize 64036	31	16	11	15	14	*9*	16	13	15	11	11	13
ABC-Paramount 9778	*32*	*13*	*13*	*15*	*14*	*11*	*16*	*10*	*13*	*16*	*5*	*10*
ABC-Paramount 9713	33	11	10	15	11	*11*	7	10	8	15	7	6
Columbia 167-D	34	4	4	0	2	*0*	4	3	4	7	5	3
Victor Pre-Dog 487	35	15	9	11	7	*13*	13	10	4	9	9	6
Asch 348-3	36	2	5	2	2	*0*	4	2	4	7	3	1
Bluebird B-6359	37	7	11	4	7	*1*	7	7	8	12	7	6
Hit-of-the-Week 1074	*38*	*13*	*13*	*18*	*16*	*19*	*20*	*13*	*13*	*7*	*5*	*17*
Zonophone 559	39	9	5	7	11	*7*	13	10	8	9	5	10
Lyric 6103	40	11	7	4	4	*5*	4	3	11	7	3	1
Victor Red Monarch 91063	41	7	5	7	4	*3*	7	7	8	9	7	6
Victor Imported 61129	42	11	7	11	4	*9*	13	7	11	9	7	6
Leeds 4220	43	13	7	7	4	*9*	13	7	4	9	5	6
Decca 30301	*44*	*5*	*4*	*11*	*11*	*9*	*10*	*7*	*13*	*15*	*1*	*10*
Victor Red Monarch 81021	45	2	7	2	2	*1*	4	7	4	2	5	6
Zonophone 769	46	9	2	4	4	*5*	4	4	8	4	3	3
Berliner 40124 (7")	*47*	*15*	*5*	*4*	*9*	*3*	*16*	*7*	*11*	*12*	*3*	*1*
Bluebird B-7080	*48*	*7*	*4*	*4*	*16*	*5*	*10*	*4*	*13*	*9*	*3*	*13*
Columbia Banner A1143	49	2	4	2	4	*1*	4	4	8	4	1	6
Supertone 9658	50	1	2	2	11	*5*	4	3	6	4	1	1
Victor Grand Prize 4442	51	1	2	0	0	*0*	1	2	1	4	1	1
Columbia B&S 495	52	2	4	2	7	*3*	4	1	11	1	1	3
Victor Scroll 22934	53	1	0	0	2	*0*	4	0	4	2	1	1
Victor Early Dog 1228	54	11	3	7	7	*5*	7	7	8	4	3	3
Berliner 0238-A (7")	55	1	0	0	0	*0*	4	1	1	0	0	1

12	13	14	15	16	17	18	19	*20*	Std Dev	Mean
19	19	20	20	20	17	19	19	*20*	1.27	19.22
20	20	20	20	19	20	19	19	*20*	.68	19.39
18	19	19	19	20	20	19	19	*20*	.94	19.11
18	18	20	19	19	17	19	19	*14*	1.12	18.56
17	17	19	16	19	13	19	19	*1*	2.42	17.22
17	18	19	19	18	17	16	18	*17*	.97	18.06
18	18	19	13	16	17	19	19	*14*	1.69	17.28
17	17	14	16	18	18	19	18	*14*	1.33	17.67
18	20	19	16	18	10	19	19	*9*	2.24	17.67
16	*11*	*17*	*10*	*12*	*4*	*4*	*14*	*1*	-	-
16	18	14	16	16	18	16	16	*20*	1.21	16.39
16	19	19	16	18	15	19	14	*14*	2.15	16.22
14	17	14	13	14	13	12	16	*14*	1.33	14.33
15	*15*	*14*	*13*	*10*	*13*	*6*	*16*	*4*	-	-
14	15	17	16	16	15	16	14	*17*	1.83	15.44
14	18	14	16	19	15	19	16	*17*	1.57	16.39
14	11	14	13	14	15	16	16	*9*	2.34	13.17
14	16	11	13	12	10	16	16	*14*	1.73	13.28
15	15	14	13	18	15	16	14	*14*	1.37	14.72
16	17	17	16	14	15	16	16	*14*	1.12	15.83
14	13	11	16	16	13	16	14	*17*	1.58	14.22
14	11	14	10	12	7	6	14	*1*	3.22	10.5
12	17	11	16	16	13	9	11	*9*	2.57	14.17
14	13	11	10	12	4	12	11	*9*	2.57	11.78
15	17	17	13	19	17	19	11	*9*	2.52	16.39
6	15	11	13	12	15	12	7	*9*	2.48	11.39
12	11	14	8	8	10	6	11	*9*	2.59	9.83
12	4	14	13	12	10	16	14	*4*	2.69	12.61
14	11	11	13	8	10	12	11	*9*	1.96	11.22
14	11	11	10	8	10	6	14	*9*	2.45	10.28
14	16	8	10	10	13	12	7	*9*	2.63	12.5
16	*11*	*11*	*13*	*12*	*15*	*2*	*7*	*9*	-	-
14	11	11	10	4	4	9	7	*9*	3.2	9.44
3	4	8	4	6	2	2	7	*4*	1.97	4.0
3	11	8	10	8	7	9	2	*9*	3.2	8.39
3	4	8	4	2	4	2	7	*4*	1.94	3.67
3	7	11	6	6	10	4	7	*9*	2.39	7.22
14	*11*	*17*	*13*	*16*	*13*	*16*	*11*	*17*	-	-
6	13	5	6	8	4	9	2	*9*	2.95	7.78
12	7	5	4	8	10	9	7	*9*	3.11	6.5
9	9	11	10	4	4	6	7	*4*	1.99	7.06
9	11	8	6	4	7	4	7	*9*	2.62	7.89
6	11	5	4	8	7	9	2	*9*	2.97	7.06
3	*11*	*1*	*6*	*12*	*2*	*12*	*7*	*14*	-	-
6	7	5	6	6	4	6	7	*4*	1.82	4.89
4	5	8	8	6	4	6	7	*4*	2.01	5.17
6	*11*	*5*	*6*	*12*	*10*	*6*	*2*	*4*	-	-
6	*4*	*8*	*6*	*4*	*10*	*4*	*7*	*4*	-	-
3	7	2	6	4	2	9	7	*9*	2.24	4.39
2	2	1	2	2	7	2	4	*4*	2.52	3.17
2	4	2	1	0	4	2	2	*1*	1.25	1.67
3	9	1	3	4	2	4	4	*4*	2.71	3.67
1	0	0	0	0	0	2	0	*1*	1.29	1.0
6	11	2	6	2	7	2	2	*4*	2.87	5.44
0	0	0	1	0	4	4	0	*1*	1.43	0.94

Table III Defect Summary

1) Vocalion 14966
1 - grainy
3 - bubbles

2) Atlantic 851
none

3) Victor Bat Wing 61131
3 - light marks

4) Columbia 2074-D
4 - small marks

5) CRS 7
15 - pressure marks

6) Victor Bat Wing 87581
16 - label scratches
(6 - reviewer's X)
3 - light grainy

7) Victor Bat Wing 45067
3 - light marks

8) Columbia 17365-D
3 - light lamination cracks
2 - small needle digs

9) Starr 16665
8 - hair crack
16 - label tear side B
6 - heat marks

10) Victor Red Scroll 1347
18 - edge chip several grooves sd B

11) Rex 5157
8 - edge flakes not to grooves

12) Decca 1521
17 - large bubble side A

13) Famous 3150
7 - label crack

14) Columbia A2579
18 - bad scratches

15) Hit-of-the-Week 1107
3 - minor edge flakes

16) Columbia B&S 3522
10 - grainy

17) Victor Bat Wing 64840
9 - label cracks
7 - light scratches

18) Victor Monarch 4075
2 - light marks

19) Columbia B&S 3244
15 - bubbles

20) Decca 18183
5 - bubbles (or grainy)

21) Hit-of-the-Week 1101
4 - light marks

22) Okeh 45298
20 - large edge flake to several grooves

23) Berliner 3654 (7")
15 - natural pressing depression or bad dig

24) Pathe 22300
8 - scuffs

25) IRCC 3039
3 - light marks

26) Victor 120 (7")
8 - natural pressing bubbles

27) Columbia Banner 79115
9 - writing on label

28) Perfect 12856
10 - hair crack
12 - heat damage

29) Epic 9221
7 - scuffs and small scratches

Note: Boxed records had high standard deviations and were therefore removed from the survey.

30) Bluebird B-6700
18 - edge flake

31) Victor Grand Prize 64036
4 - label needle run
1 - grainy

32) ABC-Paramount 9778
4 - scuffs
1 - jukebox cull

33) ABC-Paramount 9713
10 - potential edge flake

34) Columbia 167-D
16 - pressure marks

35) Victor Pre-Dog 487
14 - label tear
7 - light scratches and scuffs

36) Asch 348-3
13 - hair cracks

37) Bluebird B-6359
11 - sticker on label
10 - hair crack

38) Hit-of-the-Week 1074
7 - lamination crack

39) Zonophone 559
8 - scratches and scuffs

40) Lyric 6103
4 - stressed grooves
9 - scratches

41) Victor Red Monarch 91063
9 - label tear
3 - needle dig
4 - lightly stressed grooves

42) Victor Imported 61129
13 - hair crack on reverse (blank side)
2 - stressed grooves

43) Leeds 4220
6 - heat damage
7 - small scratches and marks

44) Decca 30301
2 - jukebox cull (or dirty)
2 - grainy

45) Victor Red Monarch 81021
7 - hair crack
3 - stressed grooves

46) Zonophone 769
7 - stressed grooves
7 - scratches and scuffs

47) Berliner 40124 (7")
18 - natural pressing indentations

48) Bluebird B-7080
5 - jukebox cull

49) Columbia Banner A1143
4 - marks and scuffs

50) Supertone 9658
6 - stressed grooves

51) Victor Grand Prize 4442
8 - stressed grooves
2 - hair cracks
6 - heavy scratches

52) Columbia B&S 495
4 - stressed grooves

53) Victor Scroll 22934
8 - stressed grooves
(3 - groove repeats)

54) Victor Early Dog 1228
11 - needle digs
3 - stressed grooves

55) Berliner 0238-A (7")
4 - needle digs
4 - heavy wear