APPENDIX B

REPORT ON

"NINE-DOT BRAILLE" CONFERENCE

HELD AT

AMERICAN FOUNDATION FOR THE BLIND

JULY 6, 1962

Submitted by:

Carl T. Rodgers
Program Specialist in Braille and Other Tactual Aids

PARTICIPANTS

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Mr. Howard M. Liechty, Editor of the "New Outlook for the Blind" and Member of the Board of Trustees of the American Foundation for the Blind

Mr. George F. Meyer, Executive Director
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Dr. Thomas A. Benham
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American Foundation for the Blind and Research Associate of the Department of Electrical Engineering
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Mr. Robert Strom
Inventor and Protagonist of the "Nine-Dot Braille" and an undergraduate student at Harvard University

Mr. Arthur L. Voorhees
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Dr. Everett E. Wilcox
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Miss Joan M. Stapleton, Secretary
American Foundation for the Blind

PARTICIPANTS INVITED -- UNABLE TO ATTEND

Mr. Ted Glazer
Manager, Systems Division
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Mr. M. Robert Barnett
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"NINE-DOT BRAILLE" CONFERENCE

This Conference was held on July 6, 1962, from 10:00 a.m. to 4:00 p.m. in the Helen Keller Room of the American Foundation for the Blind. Miss Gruber opened the Conference by stating its purpose as follows:

> One of the major responsibilities of the American Foundation for the Blind is to evaluate all ideas, systems, methods, aids, etc., that are formally presented to the Foundation for this purpose. Within the past two months, Mr. Robert Strom presented to the Foundation a complete system of "Nine-Dot Braille" for evaluation. The Program Specialist in Braille, Mr. Carl T. Rodgers, made the preliminary investigations, and as a result of his findings, he recommended to the Foundation administration that a small group of totally blind readers be convened for the purpose of further analysis and exploration of this "Nine-Dot Braille.

Miss Gruber then established a most satisfactory auditory rapport among those present by having each of them make a brief statement of self-identification. Following this, the Program Specialist in Braille described the content and the arrangement of the Conference material; told how it had been prepared and duplicated; explained some of the technical difficulties which were encountered in producing the material on a somewhat crude prototype "Nine-Dot Braille" slate; and stressed that all of the samples and the spacing values used were tentative and subject to whatever changes and revisions might be indicated by reader reaction and adequate research studies.

GENERAL DISCUSSION TOPICS:

1. Legibility and Spacing Values of "Nine-Dot" Characters

It was observed by the participants that "bunching of dots" and widely-spaced, isolated dots decrease reading facility. Among such signs were the "any" sign (dots 1-2-3-4-6-7-8-9), the "ity" sign (dots 1-3-4-5-6-7-8-9), and the "an" sign (dots 1-9).

It was also noted that "Nine-Dot Braille" characters which did not "overcrowd" the sense of touch are more easily read. Among such symbols were the "is" sign (dots 2-4-9), the "ate" sign (dots 1-8-9), and the "ly" sign (dots 1-2-3-7-9).

It was suggested that some of the signs which appeared "bunched together" might be made more legible by appropriate alterations of the spacing values of the nine-dot cell, and it was agreed that optimal spacing values would have to be established through adequate research. It was stated that the findings of the study entitled "Readability of Braille as a Function of Three Spacing Variables" by Meyers, Ethington and Ashcroft was a fine contribution to the field of research in braille and a good starting point for further investigations concerning suitable spacing values, dot diameter, and dot height.

2. The Writing of "Nine-Dot Braille"

Mr. Strom's "Nine-Dot Braille" slate was examined by the participants. It was pointed out that dot 5, being the middle point of the square, (the nine-dot cell) might be difficult to write, to which Mr. Strom, who had punched out all of the "Nine-Dot Braille" Conference material replied that he had encountered no difficulty with the writing of characters containing dot 5. Brief mention was also made of a keyboard suitable for writing "Nine-Dot Braille" as well as for manual operational requirements.

3. "Nine-Dot Braille" Structure

The Nine-Dot cell was developed simply by adding the column of dots 7,8,9 to the right of the conventional braille cell. It was suggested at the Conference that the added column might be placed at the left, rather than at the right of the conventional cell for the purpose of using combinations of the dots of the added column much the same as dots 4, 5, 6 of the standard cell are presently used in compound symbols. This would retain, more compactly, the already existing symbols of Grade 2 braille, avoiding obsolescence and affording the possibility for the creation of new symbols. Mr. Strom and the Program Specialist in braille stated that this alternative for developing nine-dot characters might be quite feasible since the nine-dot characters would then be truly an extension of the six-dot cell characters. Mention was made by Mr. Meyer of the possibility of a variable cell in order that some of the characters might occupy less space than the full nine-dot cell. It was felt by some of the participants that this idea, which would be feasible through a properly constructed slate or machine, might serve to save considerable space and lend continuity to the legibility of the characters.

4. Purposes and Needs of Braille

Mr. Meyer, addressing himself directly to the Program Specialist in braille, asked him to state his "impressions" concerning braille needs. The following summarizes Mr. Rodgers' effort to answer Mr. Meyer's request.

"First, I believe that as a system of touch reading and writing for blind persons, braille is a multi-purpose system. When we speak of 'needs', what needs are we talking about? Are we talking about the needs of the reader who wants to read for recreation only? Are we talking about the needs of the 'John Covicis' who need an orthographic system for the accurate recording of current mathematical and scientific concepts and data? Consider the orthographic discrepancies that exist between the symbols provided for in Braille Chemical Notations and How to Use Them by Loomis and Mitchell, and the symbols of the Nemeth Code. At the present time, braille mathematical and scientific notation is in a state of complete fuidity. Are we talking about the needs of the blind musician, whose present braille notation is highly technical and multi-celled? When speaking of 'needs' we have to break them down the way we do when dealing with the needs of any handicapped group -- into highly individualized needs. Each available medium -- braille, talking book records, tapes -- must be used to meet the needs of <u>individuals</u>."

The rest of the discussion on the question of needs revealed the feeling that a nine-dot system would be welcomed by "the blind individual seeking a way in which to record highly specialized work", but that "the individual who reads non-technical braille is going to rebel."

<u>SOME CRITERION TO USE IN DEVELOPING NINE-DOT CHARACTERS</u>

The following is a summary of the ideas offered by the participants to give order and meaning to the potential creation of "Nine-Dot Braille":

1. Wherever possible there should be strict adherence to the principle of orthographic representation (each symbol to be assigned <u>one</u> meaning).

2. Concentrate on developing characters not now available in braille for representing certain existing ink-print characters.

3. While absolute standardization of symbols and symbol meanings does not really exist in inkprint, it would seem wise to establish code uniformity by providing braille equivalents for those inkprint symbols used most commonly and having the least variations of meaning.

4. Whenever possible use the right side of the "Nine-Dot Cell" for the special symbols of mathematical and scientific notation, using the left side of the cell only when it becomes necessary to avoid confusion with a symbol of the literary code.

5. New characters should be created according to a consistent pattern or system of development.

6. "Nine-Dot Braille" characters should be developed in keeping with logical inkprint presentation. For example the representation of the inkprint notation which means "a-sub-one" should be designed so as to read exactly like that, and not "a-one-sub."

7. In developing "Nine-Dot-Braille" make it as compatible as possible with the old system so as to reduce the necessity of learning an entirely new system.

8. The establishment, through scientific experimentation, of optimal spacing values as an indispensable requisite to the legibility of nine-dot characters.

9. Experimentation with other types of cells, such as 2 points vertical and 4 points horizontal, etc., should be included in future research on touch reading.

BRAILLE SYMBOLS FOR "PRINCIPIA MATHEMATIC" AND MATHEMATICAL LOGIC

For the purpose of illustrating the urgency for creating a system of touch reading and writing that can adequately meet the requirements of modern symbology, Mr. Strom read a passage from the book Principia Mathematica, a reading "must" for students of higher mathematics, and which cannot be made available to blind mathematicians because the existing mathematical braille notation provides no orthographic equivalents for the symbols used in this book. Mr. Strom stated that suitable single-cell equivalent symbols could be provided by "Nine-Dot Braille", for not only Principia Mathematica but mathematical logic as well.

The material prepared by the Program Specialist in Braille included the four following questions, the answers to which sum up the participants' consensus of opinion on what action, if any, the American Foundation for the Blind might take regarding Mr. Strom's "Nine-Dot Braille" proposal:

1. In general, does it appear that the reading finger can span and comprehend Nine-Dot characters?

   Dr. Benham ---- Yes.
   Dr. Slagle ---- Yes.
   Mr. Dupress --- Yes.

   Mr. Ingham ---- Yes, but samples of "Nine-Dot Braille" should be produced with more adequate writing equipment in order to be able to judge better.

   Mr. Meyer ---- Yes, it could be.

2. Does it appear that some of the characters are especially difficult to read?

   Dr. Benham ---- Yes, some are hard to read, but if dot height and spacing values were uniform, they would be easier to read. Uniformity and better character designing (placing indicators before instead of after the basic symbols) would, I think, make the system easy to read.

   Dr. Slagle ---- Yes, characters that have many dots are difficult to read. The use of dot 5 might, in general, be avoided when you have a choice. Sparsely-located dots cause difficulty.

   Mr. Ingham ---- Yes, characters with too many dots are hard to read. Also, the column of dots 7,8,9, might make for easier reading if added at the left instead of at the right of the basic cell.

Mr. Meyer ---- Yes, difficulties increase when you consider adjacent characters. Because of the spacing values which have been used for this material, you can't tell where one cell leaves off and the other begins.

Mr. Dupress -- I will agree with the group that where there are only a few dots, left or right, the characters are difficult to read. There is need for research on this.

3. Would it be desirable to treat the "Nine-Dot Cell" as an extension of the "Six-Dot Cell" in developing nine-dot symbols?

All agreed in the affirmative, since this would avoid rendering the old system obsolete, would eliminate the need for relearning many new characters and would, therefore, result in potential subjects being more willing to cooperate in field-testing projects.

4. From the standpoint of present-day orthographic needs on the one hand, and of tactual legibility requirements on the other, does the "Nine-Dot Braille" concept appear sufficiently promising to justify undertaking the extensive and comprehensive experimentation, field-testing, and other long-range steps necessary for the development of the proposed concept into an optimal, multi-purpose system of touch reading and writing?

All agreed that additional investigation must precede any large-scale experimentation and other long-range action. As part of further preliminary investigation, the participants recommended a better-constructed, more sophisticated "Nine-Dot Braille" slate to afford better evaluation of the readability of nine-dot characters. A few Foundation people and a few well selected outsiders should continue the investigation. Furthermore, a second conference on "Nine-Dot Braille" was recommended, at which time a definite decision could be made in answer to question 4.

The protagonist of "Nine-Dot Braille" posed the query: "Do you think we can recommend experimentation as to the size of the cell and specific values?" The unanimous reply was "Definitely Yes".

Finally, everyone recommended gradual and thorough investigation, evaluation and data gathering of the proposed system, with emphasis on technical needs for the benefit of the blind student of higher mathematics in particular and technical training in general. Stress was laid on making no announcements or taking any action which might lead to a renewal of a "War of the Dots" or "Battle of the Types" among the users of braille or among the workers in the field.

APPENDIX C

MATHEMATICS OF SIX-DOT BRAILLE AND EXPANDED PUNCTOGRAPHIC CODES FOR TOUCH READING AND WRITING

Submitted by: Dr. Abraham Nemeth
Assistant Professor of Mathematics

THE MATHEMATICS OF SIX-DOT BRAILLE AND EXPANDED FUNCTOGRAPHIC CODES FOR TOUCH READING AND WRITING

Submitted by: Dr. Abraham Nemeth
Assistant Professor of Mathematics

A. COMPARISON OF SPACE REQUIREMENTS OF SIX-DOT BRAILLE WITH "NINE-DOT BRAILLE".

Spacing Parameters

Between dot centers within a single cell........... .090 inches
Between right side of one cell and left side of next cell....................................... .160 inches
Between bottom of cell on one line and top of cell on next line....................................... .220 inches

In normal six-dot braille, it is possible to emboss 40 cells to the line and 25 lines to the page if the dimensions of the page are 11 inches by 11½ inches while still maintaining suitable margins. With the same spacing parameters for "Nine-Dot Braille", it is possible to emboss 29 cells per line and 25 lines per page while still maintaining suitable margins. There are thus 1,000 cells per page available in six-dot braille compared with 725 cells per page available in "Nine-Dot Braille". Proper comparison of the two systems requires that the spacing parameters be assumed equal in both.

It is assumed that ordinary adult prose has been transcribed in the two systems being compared. Because of the variable length of words and syllables, it is not possible to emboss either all of the 1,000 cells per page in six-dot braille or all of the 725 cells per page of "Nine-Dot Braille". It is estimated that an average of 1.6 cells per line are unused at the ends of lines for these reasons. Accordingly, there will be 40 cells per page lost in either system. There will thus be 960 cells per page available for six-dot braille and 685 cells per page available for "Nine-Dot Braille". The 40-cell-per-page loss constitutes a 4 per cent loss in six-dot braille, but a 5.5 per cent loss in "Nine-Dot Braille". We will continue to assume, from this point onward, that there are 960 cells and 685 cells per page, respectively, available for braille transcription in the two systems.

It has been proposed that a nine-dot cell be regarded as composed of a left third to accommodate either composition signs or "prefixes" of two-cell contractions, and a right two-thirds to accommodate letters or part-word signs affected by such composition signs, or the "bodies" of two-cell contractions. Four of the six composition signs of English Braille can be accommodated in the left third of a nine-dot cell. These are the capital, italic, letter, and accent signs. The number sign and the termination sign cannot be accommodated in this way.

Each two-cell combination of composition sign followed by a single letter or part-word sign, or of a prefix followed by the body of six-dot braille can be accommodated in a single cell of "Nine-Dot Braille", so that there is a gain in "Nine-Dot Braille" of one efficiency unit. In order for "Nine-Dot Braille" to be more efficient than six-dot braille with respect to the amount of space occupied, "Nine-Dot Braille" must score a gain in excess of 275 efficiency units, since this is the number by which the cells per page in "Nine-Dot Braille" falls short of the cells per page in six-dot braille.

In English Braille, Grade Two, there are 47 two-cell contractions. A survey of adult prose material suggests that the frequency of occurrence of such contractions is at the rate of about 25 per page of six-dot braille. Since there are seven prefixes and 56 bodies available, it is theoretically possible to construct 7 x 56 or 392 two-cell contractions, as in Grade Three. It will be assumed that the rules for forming contractions can be formulated in such a way that no conflict arises from the dual role played by four of the prefixes as composition signs. Whether the increased number of contractions acts to slow down or to speed up the reading rate is a psychological matter for investigation, and is entirely disregarded here. Thus, when 392 is compared with 47, it is seen that the incidence of two-cell contractions could be about eight and one-third times as great as is the case in grade two. It will therefore be assumed that the density of two-cell contractions would be eight and one-third times as great when using all the possible 392 two-cell contractions than is the case when using the 47 two-cell contractions of English Braille.

It may therefore be expected that the frequency of occurrence of two-cell contractions would be at the rate of (8 1/3) times 25 or about 209 occurrences per page of six-dot braille. This is a somewhat generous assumption, since it is likely that the first 47 two-cell contractions of English Braille have a greater frequency of occurrence than the remaining possible 345 two-cell contractions.

A survey of adult prose material suggests that the occurrence of the capital, italic, letter, and accent signs combined is at the rate of about 15 per page of six-dot braille, grade two. If the fully contracted system of 392 two-cell contractions were used, these composition signs would occur in 751 (that is, 960 - 209) cells instead of in 960 cells, as in grade two braille. At the rate of 15 occurrences in 751 cells, there would be 19 composition signs per page of highly-contracted six-dot braille.

The occurrence of the double capital sign or of the double italic sign might also be taken into account. However, the single capital sign followed by a two-cell contraction can result in a gain of only one, and not two, efficiency units in nine-dot braille. Because these two factors tend partially to cancel each other, and because the occurrence of either is relatively rare, we neglect both factors.

The 209 occurrences per page of two-cell contractions in highly contracted six-dot braille, plus the occurrence of 19 composition signs per page result in a gain of 228 efficiency units when the same material is embossed in "Nine-Dot Braille". As was indicated earlier, a gain of 275 efficiency units is required just to break even. The gain of 228 units of efficiency thus falls short of the break-even point by 47 efficiency units. We must therefore conclude that if the same spacing parameters and the same set of two-cell contractions are used both in six-dot and in "Nine-Dot Braille", six-dot braille still has an advantage over "Nine-Dot Braille" with respect to space requirements.

An alternative suggestion has been made that the "prefix-body" concept be abandoned, and that each nine-dot character be made to represent a contractable combination in its own right. From this point of view no more contractions are available than in the prefix-body concept, and its application can only result in a permutation of the available nine-dot characters for the representation of the desirable contractable combinations.

If each of the spacing parameters is reduced by .010 inches, it would be possible to emboss 42 cells of six-dot braille per line compared with 31 cells of "Nine-Dot Braille" per line. It would also be possible to emboss 27 lines per page in each system. With the new parameters there would thus be 1,134 cells per page of six-dot braille compared with 837 cells per page for "Nine-Dot Braille". Again allowing a loss of 1.6 cells at the end of each line due to the variable length of words and syllables in each system, there would be available 1,091 cells of six-dot braille per page compared with 794 cells of "Nine-Dot Braille" per page and the break-even point would come with a gain of 297 units of efficiency. The increase from 960 cells to 1,091 cells per page represents a gain of about 13.7 per cent. If there are 128 occurrences of two-cell contractions and composition signs using the standard parameters, then, at the same rate, there would be 259 such occurrences using the smaller spacing parameters. "Nine-Dot Braille" would thus provide 259 units of efficiency per page but this is still 38 units of efficiency short of the break-even point. We must again conclude that six-dot braille still remains more efficient than "Nine-Dot Braille" with respect to space requirements even when the smaller parameters are used.

The apparent advantage of "Nine-Dot Braille" over six-dot braille which is evidenced in the sample materials distributed to the conference participants comes from the fact that the nine-dot transcriptions were made using both the smaller parameters as well as a highly contracted system, whereas the six-dot braille with which it was compared used standard parameters together with the standard contractions of Grade Two.

B. COMPARISON OF INTRINSIC AMBIGUITIES IN SIX-DOT AND "NINE-DOT BRAILLE".

As is well known, many of the characters of six-dot braille are intrinsically ambiguous, and that their precise orientation within the cell is often indicated by the placement of a full cell of dots in an adjacent position. In the reading of standard prose material, such ambiguity is almost entirely resolved both by the presence of adjacent characters which serve as orienting symbols, and by the context of the material itself. What role each of these factors plays in the resolution of these ambiguities is not known. We shall here be concerned only with intrinsic ambiguity, and both of the factors which resolve it will therefore be absent.

Characters vary with respect to their degree of ambiguity. Thus a one-dot character has six degrees of intrinsic ambiguity; the letter b has four degrees of ambiguity, since, without orientation and context, it could be taken as dots 1-2, 2-3, 4-5, or 5-6; the letter c has three degrees of ambiguity since, without orientation and context, it could be taken as dots 1-4, 2-5, or 3-6; the letter e has two degrees of ambiguity since, without orientation and context, it could be taken as dots 1-5 or 2-6; the letter m has but one degree of ambiguity, since it can only be taken as dots 1-3-4. It is thus clear that a rating of one constitutes no ambiguity at all. It is proposed, then, to neglect the space, and to rate the ambiguity of each of the remaining 63 characters of six-dot braille and the remaining 511 characters of "Nine-Dot Braille". The average of these ratings, obtained by dividing the sum of the ratings in each system by 63 and by 511, respectively, will then be a measure of the intrinsic ambiguity of each system and these intrinsic ambiguities may then be compared.

We use the letters A, B, and C to designate the dots in the left third of a nine-dot cell from top to bottom, respectively; the numbers from 1 to 6 are used for the remaining dots of the nine-dot cell in complete correspondence with the dot numbering of six-dot braille. In "Nine-Dot Braille" a one-dot character has nine degrees of ambiguity; a character consisting of dots A-B has six degrees of ambiguity since it could be taken as dots A-B, B-C, 1-2, 2-3, 4-5, or 5-6; etc.

While it is possible to assign an ambiguity rating to each character of each system by inspection, it is also possible to develop a formula for this purpose. With each character there is associated a certain number of exterior blank columns and exterior blank rows.

To find the number of exterior blank columns associated with any character, start from the left edge and from the right edge of the cell and count the number of blank columns which are present. For example, the character which consists of dot 1 in six-dot braille has one blank exterior column; the same character in "Nine-Dot Braille" has two blank exterior columns. The character consisting of dots 1-3-4 has no blank exterior columns in six-dot braille, but has one blank exterior column in "Nine-Dot Braille". The character consisting of dots A-C-4-6 in "Nine-Dot Braille" has no exterior blank columns although the middle column is blank. In a similar way, to find the number of exterior blank rows associated with a character, start from the top edge and from the bottom edge of the cell, and count the number of blank rows which are present. For example, the character consisting of dot 1 has two blank exterior rows in both systems, the character consisting of dots 1-3-4-6 has no blank exterior rows in either system even though the middle row of this character is blank.

We let c denote the number of blank exterior columns associated with a character. In six-dot braille, c can have one of the values 0 or 1; in "Nine-Dot Braille" it can have one of the values 0, 1, or 2. Similarly, we let r denote the number of blank exterior rows associated with a character. In both systems r can have one of the values 0, 1, or 2. If R denotes the ambiguity rating for any character, then the formula for R is $R=(c+1)(r+1)$. For example, the character consisting of dot 1 in six-dot braille has associated with it one blank column and two blank rows. Therefore for this character, $R = (1+1)(2+1) = 2 \times 3 = 6$. The same character in "Nine-Dot Braille" has associated with it two blank columns and two blank rows, so that $R = (2+1)(2+1) = 3 \times 3 = 9$ for this character in "Nine-Dot Braille". The formula for R holds equally well for any rectangular cell such as the two-by-two cell of New York Point and the four-by-two cell of the German shorthand system.

The tables which follow list the 63 characters of six-dot braille and the 511 characters of "Nine-Dot Braille", together with the ambiguity rating of each character in each system. It is found that the average ambiguity for six-dot braile is 2.05 and that the corresponding rating for "Nine-Dot Braille" is 1.72. We, therefore, conclude that "Nine-Dot Braille" has less intrinsic ambiguity than six-dot braille and that the ratio of the ambiguities is 1.72/2.05, or .84; "Nine-Dot Braille" is only .84 as ambiguous as six-dot braille.

TABLE 1

INTRINSIC AMBIGUITY OF SIX-DOT BRAILLE

NOTE: In the following table the column headed (1) specifies the six-dot braille characters by dot numbers; hyphens are omitted between these numbers. The column headed (2) specifies the ambiguity rating of the corresponding character in column (1).

(1)	(2)	(1)	(2)	(1)	(2)
1	6	123	2	1235	1
2	6	124	2	1236	1
3	6	125	2	1245	2
4	6	126	1	1246	1
5	6	134	1	1256	1
6	6	135	1	1345	1
12	4	136	1	1346	1
13	2	145	2	1356	1
14	3	146	1	1456	1
15	2	156	1	2345	1
16	1	234	1	2346	1
23	4	235	2	2356	2
24	2	236	2	2456	1
25	3	245	2	3456	1
26	2	246	1	12345	1
34	1	256	2	12346	1
35	2	345	1	12356	1
36	3	346	1	12456	1
45	4	356	2	13456	1
46	2	456	2	23456	1
56	4	1234	1	123456	1

Total rating	129
Average rating	2.05

TABLE 2

INTRINSIC AMBIGUITY OF "NINE-DOT BRAILLE"

NOTE: In the following table the column headed (1) specifies the "Nine-Dot Braille" characters by dot numbers; hyphens are omitted between these numbers. The column headed (2) specifies the ambiguity rating of the corresponding character in column (1).

(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
A	9	ABC	3	B36	2	AB12	4	A256	1
B	9	AB1	4	B45	2	AB13	2	A345	1
C	9	AB2	4	B46	1	AB14	2	A346	1
1	9	AB3	2	B56	2	AB15	2	A356	1
2	9	AB4	2	C12	2	AB16	1	A456	1
3	9	AB5	2	C13	2	AB23	2	BC12	2
4	9	AB6	1	C14	1	AB24	2	BC13	2
5	9	AC1	2	C15	1	AB25	2	BC14	1
6	9	AC2	2	C16	1	AB26	1	BC15	1
AB	6	AC3	2	C23	4	AB34	1	BC16	1
AC	3	AC4	1	C24	1	AB35	1	BC23	4
A1	6	AC5	1	C25	2	AB36	1	BC24	1
A2	4	AC6	1	C26	2	AB45	2	BC25	2
A3	2	A12	4	C34	1	AB46	1	BC26	2
A4	3	A13	2	C35	2	AB56	1	BC34	1
A5	2	A14	3	C36	3	AC12	2	BC35	2
A6	1	A15	2	C45	1	AC13	2	BC36	2
BC	6	A16	1	C46	1	AC14	1	BC45	1
B1	4	A23	2	C56	2	AC15	1	BC46	1
B2	6	A24	2	123	3	AC16	1	BC56	2
B3	4	A25	2	124	4	AC23	2	B123	2
B4	2	A26	1	125	4	AC24	1	B124	2
B5	3	A34	1	126	2	AC25	1	B125	2

TABLE 2 (Continued)

(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
B6	2	A35	1	134	2	AC26	1	B126	1
C1	2	A36	1	135	2	AC34	1	B134	1
C2	4	A45	2	136	2	AC35	1	B135	1
C3	6	A46	1	145	4	AC36	1	B136	1
C4	1	A56	1	146	2	AC45	1	B145	2
C5	2	BC1	2	156	2	AC46	1	B146	1
C6	3	BC2	4	234	2	AC56	1	B156	1
12	6	BC3	4	235	4	A123	2	B234	1
13	3	BC4	1	236	4	A124	2	B235	2
14	6	BC5	1	245	4	A125	2	B236	2
15	4	BC6	1	246	2	A126	1	B245	2
16	2	B12	4	256	4	A134	1	B246	1
23	6	B13	2	345	2	A135	1	B256	2
24	4	B14	2	346	2	A136	1	B345	1
25	6	B15	2	356	4	A145	2	B346	1
26	4	B16	1	456	3	A146	1	B356	2
34	2	B23	4	ABC1	2	A156	1	B456	1
35	4	B24	2	ABC2	2	A234	1	C123	2
36	6	B25	3	ABC3	2	A235	1	C124	1
45	6	B26	2	ABC4	1	A236	1	C125	1
46	3	B34	1	ABC5	1	A245	2	C126	1
56	6	B35	2	ABC6	1	A246	1	C134	1
C135	1	AB245	2	BC256	2	ABC345	1	B12356	1
C136	1	AB246	1	BC345	1	ABC346	1	B12456	1
C145	1	AB256	1	BC346	1	ABC356	1	B13456	1
C146	1	AB345	1	BC356	2	ABC456	1	B23456	1
C156	1	AB346	1	BC456	1	AB1234	1	C12345	1
C234	1	AB356	1	B1234	1	AB1235	1	C12346	1
C235	2	AB456	1	B1235	1	AB1236	1	C12356	1

TABLE 2 (continued)

(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
C236	2	AC123	2	B1236	1	AB1245	2	C12456	1
C245	1	AC124	1	B1245	2	AB1246	1	C13456	1
C246	1	AC125	1	B1246	1	AB1256	1	C23456	1
C256	2	AC126	1	B1256	1	AB1345	1	123456	2
C345	1	AC134	1	B1345	1	AB1346	1	ABC1234	1
C346	1	AC135	1	B1346	1	AB1356	1	ABC1235	1
C356	2	AC136	1	B1356	1	AB1456	1	ABC1236	1
C456	1	AC145	1	B1456	1	AB2345	1	ABC1245	1
1234	2	AC146	1	B2345	1	AB2346	1	ABC1246	1
1235	2	AC156	1	B2346	1	AB2356	1	ABC1256	1
1236	2	AC234	1	B2356	2	AB2456	1	ABC1345	1
1245	4	AC235	1	B2456	1	AB3456	1	ABC1346	1
1246	2	AC236	1	B3456	1	AC1234	1	ABC1356	1
1256	2	AC245	1	C1234	1	AC1235	1	ABC1456	1
1345	2	AC246	1	C1235	1	AC1236	1	ABC2345	1
1346	2	AC256	1	C1236	1	AC1245	1	ABC2346	1
1356	2	AC345	1	C1245	1	AC1246	1	ABC2356	1
1456	2	AC346	1	C1246	1	AC1256	1	ABC2456	1
2345	2	AC356	1	C1256	1	AC1345	1	ABC3456	1
2346	2	AC456	1	C1345	1	AC1346	1	AB12345	1
2356	4	A1234	1	C1346	1	AC1356	1	AB12346	1
2456	2	A1235	1	C1356	1	AC1456	1	AB12356	1
3456	2	A1236	1	C1456	1	AC2345	1	AB12456	1
ABC12	2	A1245	2	C2345	1	AC2346	1	AB13456	1
ABC13	2	A1246	1	C2346	1	AC2356	1	AB23456	1
ABC14	1	A1256	1	C2356	2	AC2456	1	AC12345	1
ABC15	1	A1345	1	C2456	1	AC3456	1	AC12346	1
ABC16	1	A1346	1	C3456	1	A12345	1	AC12356	1
ABC23	2	A1356	1	12345	2	A12346	1	AC12456	1
ABC24	1	A1456	1	12346	2	A12356	1	AC13456	1

TABLE 2 (Continued)

(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
ABC25	1	A2345	1	12356	2	A12456	1	AC23456	1
ABC26	1	A2346	1	12456	2	A13456	1	A123456	1
ABC34	1	A2356	1	13456	2	A23456	1	BC12345	1
ABC35	1	A2456	1	23456	2	BC1234	1	BC12346	1
ABC36	1	A3456	1	ABC123	2	BC1235	1	BC12356	1
ABC45	1	BC123	2	ABC124	1	BC1236	1	BC12456	1
ABC46	1	BC124	1	ABC125	1	BC1245	1	BC13456	1
ABC56	1	BC125	1	ABC126	1	BC1246	1	BC23456	1
AB123	2	BC126	1	ABC134	1	BC1256	1	B123456	1
AB124	2	BC134	1	ABC135	1	BC1345	1	C123456	1
AB125	2	BC135	1	ABC136	1	BC1346	1	ABC12345	1
AB126	1	BC136	1	ABC145	1	BC1356	1	ABC12346	1
AB134	1	BC145	1	ABC146	1	BC1456	1	ABC12356	1
AB135	1	BC146	1	ABC156	1	BC2345	1	ABC12456	1
AB136	1	BC156	1	ABC234	1	BC2346	1	ABC13456	1
AB145	2	BC234	1	ABC235	1	BC2356	2	ABC23456	1
AB146	1	BC235	2	ABC236	1	BC2456	1	AB123456	1
AB156	1	BC236	2	ABC245	1	BC3456	1	AC123456	1
AB234	1	BC245	1	ABC246	1	B12345	1	BC123456	1
AB235	1	BC246	1	ABC256	1	B12346	1	ABC123456	1
AB236	1								

Total rating 877
Average rating 1.72