DOCUMENT RESUME

ED 103 492 TM 004 373

TITLE Electronics Assembler (electronics) 726.781. Technical Report on Development of USES Specific Aptitude Test Battery.

INSTITUTION Manpower Administration (DOL), Washington, D.C. U.S. Employment Service.

REPORT NO S-310R74

PUB DATE Oct 74

NOTE 21p.

EDRS PRICE MF-$0.76 HC-$1.58 PLUS POSTAGE

DESCRIPTORS *Aptitude Tests; *Cutting Scores; *Electricians; Electronics; Evaluation Criteria; Job Applicants; *Job Skills; Job Training; Occupational Guidance; Personnel Evaluation; *Personnel Selection; Test Reliability

IDENTIFIERS Electronics Assembler; GATB; *General Aptitude Test Battery

ABSTRACT

The United States Training and Employment Service General Aptitude Test Battery (GATB), first published in 1947, has been included in a continuing program of research to validate the tests against success in many different occupations. The GATB consists of 12 tests which measure nine aptitudes: General Learning Ability; Verbal Aptitude; Numerical Aptitude; Spatial Aptitude; Form Perception; Clerical Perception; Motor Coordination; Finger Dexterity; and Manual Dexterity. The aptitude scores are standard scores with 100 as the average for the general working population, and a standard deviation of 20. Occupational norms are established in terms of minimum qualifying scores for each of the significant aptitude measures which, when combined, predict job performance. Cutting scores are set only for those aptitudes which aid in predicting the performance of the job duties of the experimental sample. The GATB norms described are appropriate only for jobs with content similar to that shown in the job description presented in this report. A description of the validation sample is also included. (RC)

October 1974

U.S. Employment Service
Technical Report
S-310R74

Development of USES

APTITUDE TEST BATTERY FOR

ELECTRONICS ASSEMBLER

(electronics)
726.781

U S DEPARTMENT OF LABOR
Manpower Administration

Technical Report on Development of USES Specific Aptitude Test Battery

For

Electronics Assembler (electronics) 726.781

S-310R74

Developed in Cooperation with the
California, Colorado, Connecticut, Florida,
Oklahoma, Oregon, Pennsylvania, Utah, and Virginia
State Employment Services

U. S. DEPARTMENT OF LABOR
Peter J. Brennan, Secretary

Manpower Administration
William H. Kolberg
Assistant Secretary for Manpower

October 1974

Development of USES Specific Aptitude Test Battery S-310R74

For

Electronics Assembler (electronics) 726.781

RESEARCH SUMMARY

This report describes the research which resulted in the development of the following Specific Aptitude Test Battery for use in selecting inexperienced or untrained individuals for training as Electronics Assemblers:

Aptitude	Cutting Score
S - Spatial Aptitude	70
P - Form Perception	90
Q - Clerical Perception	95
K - Manual Dexterity	90

Sample:
Validation Sample: 15 males and 170 females employed as Electronics Assemblers by various companies in the North, South and West (see Appendix 2). A total of 82 were minority group members (50 Blacks, 13 Spanish Surnamed, 5 Orientals, 3 American Indians and 2 French Canadians) and 103 nonminority group members.

Cross-Validation Sample: 147 female applicants for employment as Electronics Assemblers at Litton Industries, Salt Lake City, Utah. This study was conducted prior to the requirement of providing minority group information. Therefore, minority group status of sample members is unknown.

Criterion:
Supervisory ratings. Criterion data were collected during 1973 for the validation sample and during 1963 for the cross-validation sample.

Design:
Validation Study: Concurrent (test and criterion data were collected at approximately the same time).

Cross-Validation Study: Longitudinal (tests were administered just prior to employment and criterion data were collected two months later.

Validity of Battery:
Validation Sample:
Phi coefficient for total sample = .31 (P/2 < .0005)
Phi coefficient for Black subsample = .22 (P/2 < .05)
Phi coefficient for nonminority subsample = .37 (P/2 < .0005)
Cross-Validation Sample:
Phi coefficient for total sample = .29 (P/2 < .0005)

Effectiveness of Battery for Validation Sample:
For the total validation sample, 66% of the nontest-selected individuals in this study were in the high criterion group; if they had been test-selected 77% would have been in the high criterion group. 34% of the nontest-selected individuals in this study were in the low criterion group; if they had been test-selected 23% would have been in the low criterion group. The effectiveness of the battery is shown in Table 1.

TABLE 1

Effectiveness of Battery for Total Validation Sample

	Without Tests	With Tests
High Criterion Group	66%	77%
Low Criterion Group	34%	23%

Comparison of Minority and Nonminority Groups:
No differential validity for this battery was found. The difference between the phi coefficients for Black and nonminority group members is not statistically significant (CR = -1.01). The battery is fair to Blacks, since the proportion of Blacks who met the cutting scores approximated the proportion who were in the high criterion group; 49% of the Blacks met the cutting scores and 51% were in the high criterion group.

JOB ANALYSIS

A job analysis was performed by observation of the workers' performance on the job and in consultation with the workers' supervisors. On the basis of the job analysis, the job description shown in Appendix 4 was prepared which was used to (1) select an experimental sample of workers who were performing the job duties; (2) choose an appropriate criterion or measure of job performance;

(3) determine which aptitudes are critical, important, or irrelevant to job performance (see Tables 2 and 6); and (4) provide information on the applicability of the test battery resulting from this research.

TABLE 2

Qualitative Analysis

Aptitude	Rationale
S - Spatial Aptitude	Required to visualize final assembly from diagrams and specifications.
P - Form Perception	Required to perceive detail, make visual comparisons, select appropriate circuit boards and component parts, follow model and inspect for quality and tolerances.
Q - Clerical Perception	Required to read diagrams, micrometers, scales, gauges and to maintain production and inspection records.
K - Motor Coordination	Required for rapid production line handling of components, circuit boards and tools.
F - Finger Dexterity	Required to use small hand tools and assemble small components.
M - Manual Dexterity	Required to use tools such as soldering gun and wire cutters, to package completed circuit boards and to position and assemble chassis using hand tools.

EXPERIMENTAL TEST BATTERY

All 12 tests of the GATB, B-1002B were administered during 1973 to the validation sample and during 1963 to the cross-validation sample.

CRITERIA

Validation Sample:

The immediate supervisor rated each worker. The ratings were obtained by means of personal visits of State test development analysts who explained the rating procedure to the supervisors.

Two ratings were obtained from each supervisor with an interval of two weeks between the ratings. Since sample members' test scores are confidential, supervisors had no knowledge of the test scores of the workers.

A descriptive rating scale was used. The scale (see Appendix 3) consists of 6 items. Five of these items cover different aspects of job performance. The sixth item is a global item on the Electronics Assembler's "all-around" ability. Each item has five alternatives corresponding to different degrees of job proficiency. For the purpose of scoring the items, weights of 1 to 5 were assigned to the responses. The total score on the rating scale is the sum of the weights for the six items. The possible range for each rating is 6 - 30.

A review of the job description indicated that the subjects covered by the rating scale were directly related to important aspects of job performance:

A - Amount of work: Electronics Assembler must efficiently complete a large number of electronic assemblies.

B - Quality of work: Electronics Assembler must insure that all completed materials meet rigid quality standards.

C - Accuracy of work: Electronics Assembler must insure that all components and materials assembled meet rigid specifications and tolerances.

D - Amount of knowledge: Electronics Assembler must have specific knowledge of electronic materials and their assembly.

E - Variety of job duties: Electronics Assembler must be able to perform a sufficient number of operations to complete all necessary assembly required in specifications.

F - "All-around" ability: Electronics Assembler's value to the employer involves a combination of the aspects of job performance listed above.

A reliability coefficient of .83 was obtained between the initial ratings and the re-ratings, indicating a significant relationship. Therefore, the final criterion score consists of the combined scores of the two ratings. The possible range for the final criterion is 12 - 60. The mean score on the final criterion was 44.0 with a standard deviation of 7.4. The relationship between the criterion and age, education and job experience is shown in Table 3.

TABLE 3

Means, Standard Deviations (SD) and Pearson Product-Moment Correlations with the Criterion (r) for Age, Education and Experience

Validation Sample

	Mean	SD	r
Age (years)	35.3	10.4	.102
Education (years)	11.5	1.5	-.067
Experience (months on current job)	50.2	51.6	.169*

* Significant at the .05 level

About one third of the workers are considered to be marginal workers. Therefore, the criterion distribution was dichotomized so as to include, as close as possible, one third of the sample in the low criterion group. The criterion cutting score was set at 41 which places 34% in the low criterion group and 66% in the high criterion group.

Cross-Validation Sample:

The criterion data consisted of pooled ratings made by the first and second line supervisors. The ratings were obtained by means of personal visits of State test development analysts who explained the rating procedure to the supervisors. Verbal instructions covering the same concepts as are contained in "Suggestions to Raters" on the rating form for the validation sample were also given. Each supervisor rated each worker independently. Differences were discussed and, in consultation with the State test development analyst, reconciled to obtain the pooled ratings. Workers were rated after they had been on the job for a period of two months; pooled re-ratings were made two weeks later. Supervisors had no knowledge of the test scores of the workers.

A descriptive rating scale was used. The scale (see Appendix 3) consists of five performance items. Four of these items cover different aspects of job performance. The fifth item is a global item on the Electronics Assembler's "all-around" ability. Each item has four alternative responses corresponding to different

degrees of job proficiency. For the purpose of scoring the items, weights of 1 to 4 were assigned to the responses. The total score on the rating scale is the sum of the weights for the five items. The possible range is 5 - 20.

A review of the job description indicated that the subjects covered by the rating scale were directly related to important aspects of job performance:

1 - Quantity of work: Electronics Assembler must efficiently complete a large number of electronic assemblies.

2 - Quality of work: Electronics Assembler must insure that all completed materials meet rigid quality standards.

3 - Speed of learning: Electronics Assembler must learn new procedures and techniques quickly in order to sustain satisfactory pace of assembly.

4 - Aptitude for job: Electronics Assembler must have skill and proficiency to perform important aspects of the job efficiently.

5 - "All-around" ability: Electronics Assembler's value to the employer involves a combination of the aspects of job performance listed above.

A reliability coefficient of .86 was obtained between the initial ratings and the re-ratings, indicating a significant relationship. Therefore, the final criterion score consists of the combined scores of the two ratings. The possible range is 10 - 40. The mean score on the final criterion was 28.3 with a standard deviation of 6.5.

The relationship between the criterion and age and education is shown in Table 4.

TABLE 4

Means, Standard Deviations (SD) and Pearson Product-Moment Correlations with the Criterion (r) for Age and Education

Cross-Validation Sample

	Mean	SD	r
Age (years)	31.3	7.8	-.135
Education (years)	11.7	.9	-.122

About one third of the workers are considered to be marginal workers. Therefore, the criterion distribution was dichotomized so as to include as close as possible to one third of the sample in the low criterion group. The criterion cutting score was set at 27 which places 32% in the low criterion group and 68% in the high criterion group.

SAMPLE

6

Validation Sample:

The validation sample consisted of 185 Electronics Assemblers (15 males and 170 females) employed at various companies in the North, South and West (see Appendix 2). A total of 82 were minority group members (59 Blacks, 13 Spanish Surnamed, 5 Orientals, 3 American Indians and 2 French Canadians) and 103 were nonminority group members. The means and standard deviations for age, education and experience of the total sample are shown in Table 3. Sample members were not test-selected. All workers had been employed at least one month in a job whose duties are similar to those found in the job description in Appendix 4. Descriptive statistics for subgroups of the sample are shown in Appendix 1.

Cross-Validation Sample:

The cross-validation sample consisted of 147 female applicants for employment at Litton Industries, Salt Lake City, Utah. This study was conducted prior to the requirement of providing minority group information. Therefore, minority group status of the sample members is unknown. The means and standard deviations for age and education of sample members are shown in Table 4. Sample members were not test-selected. All workers had been employed two months in a job whose duties are similar to those found in the job description in Appendix 4.

STATISTICAL RESULTS

TABLE 5

N=185

Statistical Results for Validation Sample

Aptitude	Mean	SD	r
G - General Learning Ability	89.6	17.1	.323**
V - Verbal Aptitude	92.0	14.0	.303**
N - Numerical Aptitude	90.1	18.0	.283**
S - Spatial Aptitude	95.8	19.0	.244**
P - Form Perception	107.2	21.8	.242**
Q - Clerical Perception	110.2	16.2	.223**
K - Motor Coordination	110.0	17.6	.145*
F - Finger Dexterity	112.5	22.0	.140*
M - Manual Dexterity	112.7	21.8	.152*

*Significant at the .05 level
**Significant at the .01 level

Table 6 summarizes the qualitative analysis and statistical results shown in Tables 2 and 5 and shows the aptitudes considered for inclusion in the battery.

TABLE 6

Summary of Qualitative and Quantitative Data for Validation Sample

	Aptitudes								
Type of Evidence	G	V	N	S	P	Q	K	F	M
"Critical" on Basis of Job Analysis									
"Important" on Basis of Job Analysis				X	X	X	X	X	X
"Irrelevant" on Basis of Job Analysis									
Relatively High Mean						X	X	X	X
Relatively Low Standard Deviation		X							
Significant Correlation with Criterion	X	X	X	X	X	X	X	X	X
Aptitudes Considered for Inclusion in the Battery	G	V	N	S	P	Q	K	F	M

The information in Table 5 indicates that the following aptitudes should be considered for inclusion in the battery: G, V, N, S, P, Q, K, F and M. The objective is to develop a battery of 2, 3 or 4 aptitudes with cutting scores set at five point intervals at the point (a) where about the same percent will meet the cutting scores as the percent placed in the high criterion group and (b) which will maximize the relationship between the battery and the criterion. The cutting scores are set at approximately one standard deviation below the mean aptitude scores of the sample, with deviations above or below these points to achieve the objectives indicated above.

The following battery was developed:

Aptitude	Cutting Score
S - Spatial Aptitude	70
P - Form Perception	90
Q - Clerical Perception	95
M - Manual Dexterity	90

VALIDITY OF BATTERY

TABLE 7
Validity of Battery for Total Validation Sample

	Below Cutting Scores	Meeting Cutting Scores	Total
High Criterion Group	30	92	122
Low Criterion Group	35	28	63
Total	65	120	185

Phi Coefficient = .31
Significance level = P/2 < .0005

TABLE 7a
Validity of Battery for Black Validation Subsample

	Below Cutting Scores	Meeting Cutting Scores	Total
High Criterion Group	12	18	30
Low Criterion Group	18	11	29
Total	30	29	59

Phi Coefficient = .22
Significance level = P/2 < .05

TABLE 7b
Validity of Battery for Nonminority Validation Subsample

	Below Cutting Scores	Meeting Cutting Scores	Total
High Criterion Group	13	64	77
Low Criterion Group	15	11	26
Total	28	75	103

Phi Coefficient = .37 (Yates' Corrected)
Significance level = P/2 < .0005

TABLE 8
Validity of Battery for Cross-Validation Sample

	Below Cutting Scores	Meeting Cutting Scores	Total
High Criterion Group	24	76	100
Low Criterion Group	25	22	47
Total	49	98	147

Phi Coefficient = .29
Significance level = P/2 < .0005

OCCUPATIONAL APTITUDE PATTERN

This occupation was incorporated into OAP-42 in Section II of the 1970 edition of the Manual for the USES General Aptitude Test Battery with a double asterisk (**) because the aptitudes contained in the battery are not within 10 points of those in OAP-42 but a significant phi coefficient was obtained between the criterion and the OAP-42 cutting scores of S-90, P-85 and M-85. A phi coefficient of .14 (P/2 < .05) was obtained for the validation sample and a phi coefficient of .23 (P/2 < .005) was obtained for the cross-validation sample.

APPLICABILITY OF BATTERY

The aptitude test battery may be used in the selection of inexperienced applicants for the job described in Appendix 4.

APPENDIX 1

Descriptive Statistics for Black and Nonminority Subgroups of Validation Sample

	Black (N=59)			Nonminority (N=103)		
Variable	Mean	SD	Range	Mean	SD	Range
Aptitude G	79.4	13.7	52-127	96.0	16.3	59-129
Aptitude V	83.7	11.6	63-133	96.8	13.1	70-127
Aptitude N	79.8	15.3	46-117	95.3	17.4	53-138
Aptitude S	88.2	17.9	55-127	99.9	18.5	58-150
Aptitude P	99.3	20.6	33-145	110.5	21.5	56-157
Aptitude Q	104.2	15.0	70-136	114.5	15.9	77-154
Aptitude K	108.7	18.4	60-148	109.9	16.9	68-157
Aptitude F	110.4	22.8	67-173	113.6	22.1	55-160
Aptitude M	109.7	20.7	64-165	113.0	22.7	58-169
Criterion	40.8	7.7	22-56	45.9	6.7	31-60
Age	39.2	10.1	19-62	36.4	10.1	19-59
Education	11.8	1.2	9-15	11.3	1.4	8-16
Experience (months on current job)	47.4	38.5	3-196	51.5	57.0	1-346

APPENDIX 2

Geographic Distribution of Validation Sample

	Black Subsample	Total Sample
North	16	46
South	35	71
West	8	68
Total	59	185

Organizations Contributing Samples

Validation Sample

North:

Burroughs Corporation	Downington, Pennsylvania
Edwards Manufacturing Company	Norwalk, Connecticut
Perkin-Elmer Corp.	Norwalk, Connecticut

South:

General Electric, Inc.	Salem & Lynchburg, Virginia
Honeywell, Inc. Aerospace Division	Clearwater, Florida
Honeywell Information Systems, Inc.	Oklahoma City, Oklahoma

West:

Electronic Memories	Hawthorne, California
Electronic Specialty Division	Portland, Oregon
Hewlett-Packard	Colorado Springs & Loveland, Colorado
Hewlett-Packard	McMinnville, Oregon
Sperry UNIVAC Communications and Terminals Division	Salt Lake City, Utah
White's Electronics, Inc.	Sweet Home, Oregon

Cross-Validation Sample

West:

Litton Industries	Salt Lake City, Utah

APPENDIX 3

U.S. DEPARTMENT OF LABOR • MANPOWER ADMINISTRATION

DESCRIPTIVE RATING SCALE

for

Validation Sample

SCORE _____

RATING SCALE FOR _____

D.O.T. Title and Code

Directions: Please read the "Suggestions to Raters" and then fill in the items which follow. In making your ratings, only one box should be checked for each question.

SUGGESTIONS TO RATERS

We are asking you to rate the job performance of the people who work for you. These ratings will serve as a "yardstick" against which we can compare the test scores in this study. The ratings must give a true picture of each worker or this study will have very little value. You should try to give the most accurate ratings possible for each worker.

These ratings are strictly confidential and won't affect your workers in any way. Neither the ratings nor test scores of any workers will be shown to anybody in your company. We are interested only in "testing the tests." Ratings are needed only for those workers who are in the test study.

Workers who have not completed their training period, or who have not been on the job or under your supervision long enough for you to know how well they can perform this work should not be rated. Please inform the test technician about this if you are asked to rate any such workers.

Complete the last question only if the worker is no longer on the job.

In making ratings, don't let general impressions or some outstanding trait affect your judgment. Try to forget your personal feelings about the worker. Rate only on the work performed. Here are some more points which might help you:

1. Please read all directions and the rating scale thoroughly before rating.
2. For each question compare your workers with "workers-in-general" in this job. That is, compare your workers with other workers on this job that you have known. This is very important in small plants where there are only a few workers. We want the ratings to be based on the same standard in all the plants.
3. A suggested method is to rate all workers on one question at a time. The questions ask about different abilities of the workers. A worker may be good in one ability and poor in another: for example, a very slow worker may be accurate. So rate all workers on the first question, then rate all workers on the second question, and so on.
4. Practice and experience usually improve a worker's skill. However, one worker with six months' experience may be a better worker than another with six years' experience. Don't rate one worker as poorer than another merely because of a lesser amount of experience.
5. Rate the workers according to the work they have done over a period of several weeks or months. Don't rate just on the basis of one "good" day, or one "bad" day or some single incident. Think in terms of each worker's usual or typical performance.
6. Rate only the abilities listed on the rating sheet. Do not let factors such as cooperativeness, ability to get along with others, promptness and honesty influence your ratings. Although these aspects of a worker are important, they are of no value for this study as a "yardstick" against which to compare aptitude test scores.

NAME OF WORKER (Print) (Last) (First)

SEX: MALE_____ FEMALE_____

Company Job Title: _____

How often do you see this worker in a work situation?

- ☐ All the time.
- ☐ Several times a day.
- ☐ Several times a week.
- ☐ Seldom.

How long have you worked with this worker?

- ☐ Under one month.
- ☐ One to two months.
- ☐ Three to five months.
- ☐ Six months or more.

A. How much can this worker get done? (Worker's ability to make efficient use of time and to work at high speed.) (If it is possible to rate only the quantity of work which a person can do on this job as adequate or inadequate, use #2 to indicate "inadequate" and #4 to indicate "adequate.")

- ☐ 1. Capable of very low work output. Can perform only at an unsatisfactory pace.
- ☐ 2. Capable of low work output. Can perform at a slow pace.
- ☐ 3. Capable of fair work output. Can perform at an acceptable pace.
- ☐ 4. Capable of high work output. Can perform at a fast pace.
- ☐ 5. Capable of very high work output. Can perform at an unusually fast pace.

B. How good is the quality of work? (Worker's ability to do high-grade work which meets quality standards.)

- ☐ 1. Performance is inferior and almost never meets minimum quality standards.
- ☐ 2. Performance is usually acceptable but somewhat inferior in quality.
- ☐ 3. Performance is acceptable but usually not superior in quality.
- ☐ 4. Performance is usually superior in quality.
- ☐ 5. Performance is almost always of the highest quality.

C. How accurate is the work? (Worker's ability to avoid making mistakes.)

- ☐ 1. Makes very many mistakes. Work needs constant checking.
- ☐ 2. Makes frequent mistakes. Work needs more checking than is desirable.
- ☐ 3. Makes mistakes occasionally. Work needs only normal checking.
- ☐ 4. Makes few mistakes. Work seldom needs checking.
- ☐ 5. Rarely makes a mistake. Work almost never needs checking.

MA 7-66
Apr. 1973

D. How much does the worker know about the job? (Worker's understanding of the principles, equipment, materials and methods that have to do directly or indirectly with the work.)

- ☐ 1. Has very limited knowledge. Does not know enough to do the job adequately.
- ☐ 2. Has little knowledge. Knows enough to get by.
- ☐ 3. Has moderate amount of knowledge. Knows enough to do fair work.
- ☐ 4. Has broad knowledge. Knows enough to do good work.
- ☐ 5. Has complete knowledge. Knows the job thoroughly.

E. How large a variety of job duties can the worker perform efficiently? (Worker's ability to handle several different operations.)

- ☐ 1. Cannot perform different operations adequately.
- ☐ 2. Can perform a limited number of different operations efficiently.
- ☐ 3. Can perform several different operations with reasonable efficiency.
- ☐ 4. Can perform many different operations efficiently.
- ☐ 5. Can perform an unusually large variety of different operations efficiently.

F. Considering all the factors already rated, and only these factors, how good is this worker? (Worker's all-around ability to do the job.)

- ☐ 1. Performance usually not acceptable.
- ☐ 2. Performance somewhat inferior.
- ☐ 3. A fairly proficient worker.
- ☐ 4. Performance usually superior.
- ☐ 5. An unusually competent worker.

Complete the following ONLY if the worker is no longer on the job.

G. What do you think is the reason this person left the job? (It is not necessary to show the official reason if you feel that there is another reason, as this form will not be shown to anybody in the company.)

- ☐ 1. Fired because of inability to do the job.
- ☐ 2. Quit, and I feel that it was because of difficulty doing the job.
- ☐ 3. Fired or laid off for reasons other than ability to do the job (i.e., absenteeism, reduction in force).
- ☐ 4. Quit, and I feel the reason for quitting was not related to ability to do the job.
- ☐ 5. Quit or was promoted or reassigned because the worker had learned the job well and wanted to advance.

RATED BY	TITLE	DATE
COMPANY OR ORGANIZATION	LOCATION (City, State, ZIP Code)	

GPO 863-716

MA 7-66
Apr. 1973

Descriptive Rating Scale
for
Cross-Validation Sample

Person to be Rated

1. Quantity of work: How much does this person get done?

   ☐ A. Does much more than expected.

   ☐ B. Does a little more than expected.

   ☐ C. Does a little less than expected.

   ☐ D. Does less than expected.

2. Quality of work: What is this person's ability to do high-grade work which meets quality standards?

   ☐ A. Work rarely needs checking.

   ☐ B. Work needs somewhat less than normal checking.

   ☐ C. Work needs somewhat more than normal checking.

   ☐ D. Work needs more checking than is desirable.

3. Speed of learning: How quickly does this person learn new job duties (tasks, work methods, and operating procedures)?

   ☐ A. Learns new job duties much faster than most workers.

   ☐ B. Learns new job duties a little faster than most workers.

   ☐ C. Learns new job duties a little more slowly than most workers.

   ☐ D. Learns new job duties more slowly than most workers.

4. Aptitude for job: How skillful is this person? Does she show a "knack" for this type of work?

   ☐ A. Much more proficient than most workers.

   ☐ B. A little more proficient than most workers.

   ☐ C. A little less proficient than most workers.

   ☐ D. Less proficient than most workers.

5. "All around" ability: Considering only the four factors already rated, what is this person's "all around" ability to do her job?

   ☐ A. An unusually competent worker--performance generally superior.

   ☐ B. A valuable worker--performance generally very good.

   ☐ C. A fairly proficient worker--performance generally acceptable.

   ☐ D. A less capable worker--performance rather limited.

APPENDIX A S-310R74

Electronics Assembler (electronics) 726.781

JOB DUTIES

Assembles electronic components and equipment such as circuit boards, digital computers, oscilloscopes and amplifiers; wires instruments using small hand tools and electronic test equipment:

Verifies information on production documents; checks shop traveler, engineering change orders, shortage records, and operation sheets before beginning any phase of production work. Insures that information and instructions on these documents are complete and consistent.

Prepares circuit board components such as diodes, resistors, capacitors, and transistors by clipping and bending leads. May cut wire to size and strip insulation from ends. Installs hardware such as eyelets, component holders, clips, brackets, and soldering posts following specifications.

*Positions components on circuit boards. Attaches wires to terminals following specifications.

*Solders circuit board connections, regulating soldering heat to obtain the best connection following specifications.

*Wires instruments by attaching connectors to unit frame and inserting ends of wire into plug slots following specifications.

*Makes visual and mechanical checks on production quality and work tolerances, using such devices as micrometer, scales, and height gauges. May perform electrical checks using circuit testers, simple testing equipment, or operation of assembled instrument. The principal visual checks are (1) for proper placement of wires to observe that the completed item is the same as one known to be correctly wired; (2) for the correct directional placement of integrated circuits and similar components to insure that the polarity dots are in the correct places; and (3) for correct soldering to note that the soldered connections are firm and without voids or excessive resin.

Maintains production and inspection records according to appropriate production sequence.

---

*These job duties were designated as critical job duties as they must be performed competently if the job is to be performed in a satisfactory manner. Electronics Assemblers spend about 70% of their working hours performing these job duties.

GPO 883-788